Appendix E
Ecological assessment report



Bowen Pipeline
Ecological Assessment Report

Prepared for Bowen Pipeline Company Pty Ltd
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Job 8704

saunders havill group

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Acronyms

AKF	Australian Koala Foundation
DBH	Diameter at Breast Height
DES	Department of Environment and Science (Qld)
EPA	*Environmental Protection Act 1994* (Qld)
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999* (Cth)
EVNT	endangered, vulnerable or near threatened (as listed under the NCA)
FMP	Fauna Management Plan
ha	hectares
KHA	Koala Habitat Area
KPA	Koala Priority Area
km	kilometers
LGA	Local Government Area
m	metres
mm	millimetres
MNES	Matters of National Environmental Significance
MSES	Matters of State Environmental Significance
NCA	*Nature Conservation Act 1992 (Qld)*
NCAR	*Nature Conservation Animals Regulation 2020 (Qld)*
NCPR	*Nature Conservation Plants Regulation 2020* (Qld)
PMR	Protected Matters Report
PMST	Protected Matters Search Tool
PR	*Planning Regulation 2017* (Qld)
RE	Regional Ecosystem
RMP	Rehabilitation Management Plan
SAT	Spot Assessment Technique
SHG	Saunders Havill Group
SPP	*State Planning Policy 2017* (Qld)
TEC	Threatened Ecological Community
VCFMP	Vegetation Clearing and Fauna Management Plan
VMA	*Vegetation Management Act 1999* (Qld)

1. Introduction

The Environmental Management Division of Saunders Havill Group was engaged by The Bowen Pipeline Company to prepare an Ecological Assessment Report for the proposed Bowen Pipeline Development (hereafter the 'pipeline') to provide to Bowen a freshwater supply sourced from the Burdekin River south of Home Hill in Queensland. This report provides a review of the project areas ecological values in accordance with Commonwealth and State Government legislation.

The proposed pipeline will connect the Burdekin River via multiple pump stations through private land and along the existing Bruce Highway and Rail Line to Bowen in order to supply the burgeoning horticultural industry in the region with a reliable drip irrigation water supply. The project area is bounded by large rural properties, small towns and the cities of Home Hill and Bowen, as well as isolated bushland areas. The project area context is displayed in **Figure 1** and site aerial in **Figure 2**.

The proposed pipeline footprint deliberately falls within a highly modified and disturbed landscape almost entirely composed of non-remnant vegetation situated mostly adjoining existing transport infrastructure tenures. Areas of relative environmental value are confined to major waterways where the proposed pipeline will run parallel to existing infrastructure and be tunnel bored to mitigate additional impacts to these potentially sensitive areas.

The project area has been subject to flora and fauna assessments to address various approval requirements including targeted surveys. The results of these assessments are summarised and presented in this report.

1.1. Purpose of the report

The purpose of this Ecological Assessment Report (EAR) is to present and comment on the outcomes of field surveys undertaken to assess potential environmental impacts of the proposed pipeline. Furthermore, this project is intended to proceed through a Ministerial Infrastructure Designation (MID). The MID will facilitate the efficient and timely supply of infrastructure; and satisfy statutory requirements and budgetary commitments of the State for the supply of infrastructure.

Of note, separate assessments of potential facilitated impacts from the pipeline construction and operation and the aquatic habitat and impacts where the intake structure is to be located within the Burdekin River have been undertaken by specialist consultants Adaptive Strategies and FRC Environmental, respectively, and their reports on these matters are provided separately.



Legend

- Bowen Pipeline alignment
- Pump station locations
- World heritage area boundary
- Great Barrier reef marine park boundary

Figure 1 Project Context

File ref. 8704 E Figure 1 EX Context E
Date 23/02/2024
Project Bowen Pipeline

0 5 10 15 20 25 30 km

Scale (A4): 1:800,000 [GDA 2020 MGA Z55]

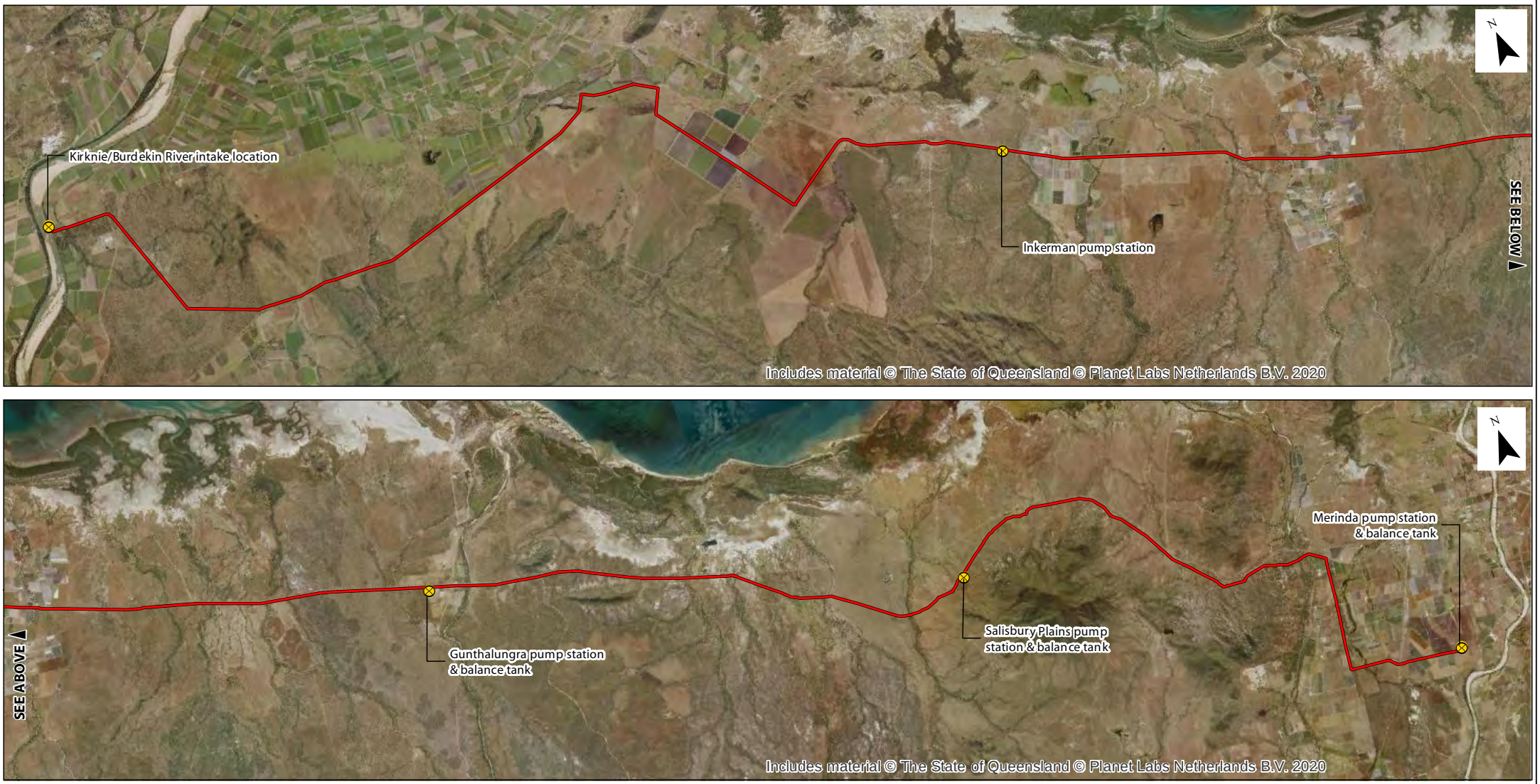
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Layer Sources Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2024)



Legend

- Bowen Pipeline alignment
- Pump station locations

Figure 2 Aerial

0 1 2 3 4 5 6 7 8 km

Scale (A4): 1:200,000 [GDA 2020 MGA Z55]

Bowen Pipeline Company Pty Ltd

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File ref. 8704 E Figure 2 EX Aerial E
Date 23/02/2024
Project Bowen Pipeline

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2. Ecological assessment methodology and process

The following steps were undertaken in the preparation of this assessment:

1. desktop analysis
2. legislation and policy review
3. field survey
4. Analysis and recommendations

2.1. Desktop analysis methodology

Prior to the commencement of field surveys, a desktop analysis was conducted to identify relevant information for the site. The following information was reviewed:

- Search of the Commonwealths EPBC Protected Matters Search Tool
- Search of DES Wildlife Online Database for the study area and surrounds
- Commonwealth and State Government Environmental Databases
- State Government Environmental Overlay Mapping (*i.e.,* SARA and SPP Mapping)
- Existing ecological reports and plans for the subject area

A review of aerial photography history was undertaken to assist with the broad delineation of vegetation communities and determine historical disturbance patterns to local vegetation communities.

2.2. Field survey methodology

Detailed flora and fauna surveys were undertaken over the application area on the following dates:

- 2017 – (30th May – 1st June, 31st July – 4th August and 11th – 15th September)
- 2019 – (4th – 6th March)
- 2020 – (3rd – 7th August)
- 2022 – (14th – 19th November)
- 2023 – (30th January – 4th February, 19th – 23rd June and 27th – 31st November)
- 2024 – (6th – 7th February)

These surveys were carried out using recognised survey methods to describe various on-site habitat and vegetation characteristics. Survey methodologies undertaken on site are described in the following subsections. Aerial imagery and state mapping indicates the majority of the pipeline includes minor drainage channels and grazing paddocks.

2.2.1 General Searches and Species Identification

Focal points within the project area, including every flow path crossed by the pipeline and any remnant vegetation patches, were walked to ensure all vegetation communities and species were recorded and identified. Particular attention was paid to any threatened species that were listed as possibly occurring on or within the vicinity of the application site and specific micro assemblages which may support these threatened species.

2.2.2 Observational Survey

A detailed observational survey of the vertebrate fauna present on or that may utilise the study area, including faunal lists and significance status of species under the EPBC Act including the Japan – Australia Migratory Bird Agreement and the Bonn Convention; and Queensland's *Nature Conservation Act 1992* (NCA).

2.2.3 Waterway Assessments

All potential major waterways along the proposed alignment were assessed as per AUSRIVAS protocols.

2.2.4 Specific Surveys for *Eucalyptus raveretiana*

Potential habitat for this species, including all flow paths traversed by the proposed pipeline, was systematically surveyed and all specimen locations and details recorded using DGPS.

2.2.5 Spotlighting

All major waterway and potential habitat features were surveyed by spotlighting. Spotlighting was conducted at the point where the alignment crosses the potential habitat and immediately adjoining.

2.2.6 Fauna Cameras

Infra-red cameras were deployed at potential habitat locations along the alignment to detect fauna activity. Cameras were deployed for a period of 48 hours.

2.2.7 Ultrasonic Bat Detection

Sampling for ultrasonic bat frequencies was conducted utilising the Wildlife Acoustics 'Echo Meter Touch' on an iOS platform at potential habitat locations along the alignment. Ultrasonic sampling was conducted at the point where the alignment crosses the potential habitat and immediately adjoining

2.2.8 Identification

Identification of habitat values within the area relevant to terrestrial vertebrate fauna, including ecological corridors.

2.2.9 Description

A description of the major flora and fauna habitats present.

3. Legislation, policy and planning instruments

3.1. *Environment Protection and Biodiversity Conservation Act 1999*

The Australian Government's key piece of environmental legislation is the *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act). The EPBC Act aims to protect and manage matters of environmental significance which include nationally and internationally important flora, fauna, ecological communities and heritage places.

A Protected Matters Search for the project area was undertaken through the Environment Protection and Biodiversity Conservation Online Protected Matters Search Tool (PMST). The search provides a list of wetlands of international significance, threatened ecological communities and threatened species which have the potential to be temporarily or permanently located within a two (2) kilometre buffer of the subject area. Table 1 lists a summary of the search results relevant to the site. The complete results of this search are included in **Appendix A**.

Table 1: EPBC Act PMST

World Heritage Properties		
Great Barrier Reef		
Threatened Ecological Communities		
Poplar Box Grassy Woodland on Alluvial Plains (Endangered) – community may occur Semi-evergreen Vine Thickets of the Brigalow Belt (North and South) and Nandewar Bioregions (Endangered) – community likely to occur		
Threatened species		
Scientific name	**Common name**	**Status**
BIRDS		
Calidris acuminata	Sharp-tailed Sandpiper	Vulnerable
Calidris canutus	Red Knot, Knot [855]	Endangered
Calidris ferruginea	Curlew Sandpiper [856]	Critically Endangered
Charadrius leschenaultia	Greater Sand Plover	Vulnerable
Erythrotriorchis radiatus	Red Goshawk [942]	Vulnerable
Falco hypoleucos	Grey Falcon [929]	Vulnerable
Gallinago hardwickii	Latham's Snipe	Vulnerable
Geophaps scripta scripta	Squatter pigeon [64440]	Vulnerable

Threatened species		
Scientific name	**Common name**	**Status**
Hirundapus caudacutus	White-throated Needletail [682]	Vulnerable
Limosa lapponica baueri	Bar-tailed Godwit (Baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable
Neochmia ruficauda ruficauda	Star Finch (eastern), Star Finch (southern) [26027]	Endangered
Numenius madgascariensis	Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered
Poephila cincta cincta	Black-throated Finch (southern) [64447]	Endangered
Rostratula australis	Australian Painted Snipe [77037]	Endangered
Tyto novaehollandiae kimberli	Masked Owl [26048]	Vulnerable
SHARKS		
Pristis pristis	Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable
MAMMALS		
Dasyurus hallucatus	Northern Quoll [331]	Endangered
Macroderma gigas	Ghost Bat [174]	Vulnerable
Petauroides minor	Greater Glider (Northern) [92008]	Vulnerable
Petauroides volans	Greater Glider (Southern and Central) [92008]	Endangered
Phascolarctos cinereus	Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered
Saccolaimus saccolaimus nudicluniatus	Bare-rumped Sheath-tailed Bat, Bare-rumped Sheathtail Bat [66889]	Vulnerable
Xeromys myoides	Water Mouse, False Water Rat, Yirrkoo [66]	Vulnerable
PLANTS		
Aristida grantica	[4065]	Endangered
Dichanthium setosum	Bluegrass [14159]	Vulnerable
Eucalyptus raveretiana	Black Ironbox [16344]	Vulnerable
Omphalea celata	[64586]	Vulnerable
Phaius australis	Lesser Swamp-orchid [5872]	Endangered
Solanum graniticum	Granite Nightshade [84819]	Endangered

Threatened species		
Scientific name	**Common name**	**Status**
REPTILES		
Egernia rugosa	Yakka Skink [1420]	Vulnerable

3.2. *Nature Conservation Act 1992*

The NCA classifies and protects significant areas (protected areas) and protects threatened plant and animal species. The *Nature Conservation (Plants) Regulation 2020* and *Nature Conservation (Animals) Regulation 2020* list plant and animal species presumed extinct, endangered, vulnerable, near threatened, least concern, international or prohibited. The schedules of these regulations were considered in this assessment using a wildlife online database extract with a 5 km radius from the central point of the subject site. The list of threatened species under the regulations with the potential to occur on or near the project are presented in Table 2 (refer **Appendix B** for complete Wildlife Online search extract).

Table 2: Wildlife Online search results

Scientific name	Common name	Status
BIRDS		
Calidris canutus	Red Knot	Endangered
Calidris ferruginea	Curlew Sandpiper	Critically Endangered
Calidris tenuirostris	Great Knot	Critically Endangered
Charadrius leschenaultii	Greater Sand Plover	Vulnerable
Charadrius mongolus	Lesser Sand Plover	Endangered
Esacus magnirostris	Beach Stone-Curlew	Vulnerable
Geophaps scripta scripta	Squatter Pigeon	Vulnerable
Limosa lapponica baueri	Western Alaskan Bar-tailed Godwit	Vulnerable
Numenius madagascariensis	Eastern Curlew	Endangered
Poephila cincta cincta	Black-throated Finch	Endangered
Rostratula australis	Australian Painted Snipe	Endangered
MAMMALS		
Dugong dugon	Dugong	Vulnerable
Orcaella heinsohni	Australian Snubfin Dolphin	Vulnerable
Phascolarctos cinereus	Koala	Endangered
Taphozous australis	Coastal Sheathtail Bat	Near Threatened
REPTILES		
Chelonia mydas	Green Turtle	Vulnerable

Scientific name	Common name	Status
PLANTS		
Aristida grantica		Endangered
Livistona drudei	Halifax Fan Palm	Vulnerable
Croton magneticus		Vulnerable

The protected plants regulatory framework under the NCA commenced on 31 March 2014, establishing survey and approval triggers, and processes for clearing protected plants. The protected plant definition includes all presumed extinct, endangered, vulnerable and/or near threatened (EVNT) as well as special least concern plant species listed by name in *Nature Conservation (Plants) Regulation 2020* and least concern wildlife, not listed by name but identified as a plant indigenous to Australia. Furthermore, the plant must be considered *in the wild* in order to be a protected plant.

The NCA identifies *in the wild* as 'in an independent state of natural liberty'. Several factors influence whether a protected plant is *in the wild*:

- the process by which the plant has become established, *i.e.*, either initiated through human intervention or naturally occurring;
- the natural range of the plant species; and/or
- the ecological situation in which the plant is found.

Typically, planted specimens are not considered *in the wild* and an authority or permission is not necessary for the taking of such specimens. The *Operational Policy Wildlife Management*[1] provides further information on this definition.

If a specimen is confirmed as *in the wild,* the plant must not be 'taken'—which includes being cleared—unless the taking is under:

- a conservation plan applicable to the plant;
- a license, permit or other authority under a regulation; or
- an exemption under a regulation.

A search of the Flora Survey Trigger Map identifies that a small portion of the eastern extent of the pipeline towards Merinda is located within a 'High Risk' Area. If there are *in the wild* protected plants on-site that will be cleared, the person/entity completing the clearing will need a clearing permit unless an exemption applies.

[1] Department of Environment and Heritage Protection 2015. *When a protected plant in Queensland is considered to be 'in the wild' Operational policy*.

3.3. *Vegetation Management Act 1999*

The *Vegetation Management Act 1999* (VMA) is the key mechanism by which the Queensland Government protects the state's environmental resources pertaining to vegetation. Under the VMA, a series of maps delineate vegetation features across the landscape and features are assigned a conservation value directly related to the extent remaining in the landscape. The VMA also protects other natural resource elements associated with the protected vegetation such as essential habitat (where listed threatened species have been known to occur), wetlands and watercourses.

The Regulated Vegetation Management Map shows vegetation categories used to determine clearing requirements. While areas shown on the map as *Category X* are not regulated under the VMA, those shown as *Category A, B, C or R* are subject to clearing requirements. The latter vegetation categories can only be cleared in accordance with an exemption, self-assessable vegetation clearing code, area management plan or development approval. A Supporting Map defining REs, wetlands, watercourses and essential habitat, accompanies the Regulated Vegetation Management Map. Approval to clear native vegetation that is identified as *Category A, B, C or R* is required under the *Planning Act 2016* unless an exemption applies.

A property search of the Regulated Vegetation Management Map identifies that the project area intersects Category B Regulated Vegetation, which is protected under the VMA. The Vegetation Management Supporting Map indicates that the project area potentially impacts on the following Category B remnant Regional Ecosystems listed in **Table 3** and presented in **Plan Set 1**. Refer to **Section 4.4** for Site References and extended site descriptions.

Table 3: Regional Ecosystems Mapped Within the Alignment

Site Reference	Description	Regional Ecosystems	Status
1	Burdekin River	Of Concern RE 11.3.4 and Least Concern RE 11.3.25	Indicators present (Predominantly RE 11.3.4)
3-5	Remnant Polygon 1 (-19.72862, 147.29547) to (-19.72768, 147.33834)	Composite Least Concern vegetation RE 11.12.1/11.12.9, RE 11.3.30/11.3.7 and RE 11.3.9/11.3.31 Composite Of Concern vegetation: RE11.3.30/11.3.9/11.3.13/11.3.33	Indicators present
10-18	Remnant Polygon 2 -19.75426, 147.37739) to (-19.76998, 147.44338)	Composite Least Concern vegetation; RE 11.3.7/11.3.25 and 11.12.1/11.12.9 Of Concern RE 11.3.31/11.3.7/11.3.9/11.3.13	Indicators present
18	Constructed Creek	Composite Least Concern RE 11.3.25b/11.3.7/11.3.27x1b	Indicators present
21	Un-named Drainage Feature	Least Concern RE 11.3.25b and Composite Of Concern RE 11.3.35/11.3.30/11.3.13	Indicators present
27	Wangaratta Creek	Least Concern RE 11.3.25b	Absent

Site Reference	Description	Regional Ecosystems	Status
29	Slater Creek	Least Concern RE 11.3.25b	Indicators present
30	Spring Creek	Least Concern RE 11.3.25b	Absent
32	Arrow Creek	Least Concern RE 11.3.25b and Composite Of Concern RE 11.3.35/11.3.7/11.3.13/11.3.30	Indicators present
36	Rocky Ponds Creek	Least Concern RE 11.3.25b	Indicators present
43	RM Creek	Composite Of Concern RE 11.3.9/11.3.7/11.3.13/11.3.33, Least Concern RE 11.3.25	Indicators present (RE 11.3.25)
44	Molongle Creek	Least Concern RE 11.3.25	Indicators present
47	Un-named Creek	Of Concern RE 11.3.34	Absent
50	Armstrong Creek	Least Concern RE 11.3.25	Indicators present
52	Cape Creek	Least Concern RE 11.3.25	Indicators present
54	Sandy Creek	Least Concern RE 11.3.25	Indicators present
56	Big Jack Creek	Least Concern RE 11.3.25	Indicators present
57-60	Remnant Polygon 3 (-19.91048, 147.78882) to (-19.91950, 147.82451)	Composite Of Concern RE 11.3.7/11.3.13, Of Concern RE 11.3.34, Composite Least Concern RE 11.3.9/11.3.30 and Least Concern RE11.3.25	Indicators present
58	Jack Creek	Least Concern RE 11.3.25	Indicators present
60	Elliot River	Least Concern RE 11.3.25	Indicators present
60	Remnant Polygon 4 (-19.90965, 147.78448) to (-19.90979, 147.78541)	Least Concern RE 11.3.29a	Indicators present
62	Maiden Creek	Least Concern RE 11.3.29a	Indicators present
61-78	Remnant Polygon 5 (-19.92946, 147.86145) to (-19.94761, 147.91734)	Composite Least Concern RE 11.3.32/11.12.1/11.3.10/11.12.9, Least Concern RE 11.3.29, and Composite Of Concern RE 11.3.9/11.3.33/11.3.32/11.3.12	Indicators present
83	Un-named Creek	Composite Of Concern RE 11.3.32/11.3.30/11.3.33	Absent
91	Plain Creek	Least Concern RE 11.3.25	Indicators present
94	Splitters Creek	Least Concern RE 11.3.25	Indicators present
119	Remnant Polygon 6 (-19.96996, 148.06689) to	Composite Least Concern RE 11.12.13/11.12.4 and composite Of	Indicators present

Site Reference	Description	Regional Ecosystems	Status
	(-19.97580, 148.07047)	Concern RE 11.12.1/11.3.30/11.3.32/11.3.33	
124	Goodbye Creek	Composite Least Concern RE 11.12.1/11.3.10/11.3.30/11.3.32	Indicators present
128-130	Remnant Polygon 7 (-20.01189, 148.10033) to (-20.01108, 148.11171)	Composite Least Concern RE 11.12.1/11.3.10/11.3.30/11.3.32 and Composite Least Concern RE 11.12.7/11.12.4	Indicators present
131-135	Remnant Polygon 8 (-20.01051, 148.11501) to (-20.01212, 148.12951)	Composite Least Concern RE 11.3.9/11.3.7/11.3.10/11.3.25 and Composite Least Concern RE 11.12.7/11.12.4	Indicators present
134	Euri Creek Western Branch	Composite Least Concern RE 11.3.9/11.3.7/11.3.10/11.3.25	Indicators present
135	Euri Creek	Least Concern RE 11.3.25b	Indicators present
139	Un-named Drainage Feature	Least Concern RE 11.3.7	Absent
140	Un-named Formed Creek	Least Concern RE 11.3.7	Indicator species limited

Descriptions for each mapped Category B remnant Regional Ecosystem are provided in **Table 4**, below.

Table 4: Regional Ecosystem Descriptions

RE Code	Status	Description
RE11.1.1 (NB – Category R buffer mapping only)	Least Concern	*Sporobolus virginicus grassland on Quaternary estuarine deposits. Sporobolus spp. usually dominates pure stands although a wide range of other species may be present as scattered individuals including Fimbristylis ferruginea, Cyperus victoriensis, C. scariosus, and sometimes Eleocharis spiralis, Mnesithea rottboellioides, Marsilea mutica, Vincetoxicum carnosum, Ischaemum australe, Cyperus polystachyos, Ceratopteris thalictroides and Diplachne fusca. Occasional emergent stunted mangroves, usually Avicennia marina or Ceriops australis, may occur as isolated individuals or along small channels. There may also be a minor presence of salt-tolerant forbs such as Suaeda australis, S. arbusculoides, Salicornia quinqueflora subsp. Quinqueflora or Tecticornia australasica. Occurs on supratidal flats which are often only inundated by highest spring tides. Often occurs on the landward side of intertidal flats; seaward margins irregularly inundated with tidal waters and dissected by small tidal channels. Formed from Quaternary estuarine sediments with deep grey or black and grey saline cracking clays with occasional mottling, minor gilgai occasionally present. (BVG1M: 35b)*
RE 11.3.4	Of Concern	*Eucalyptus tereticornis woodland to open forest. Other tree species that may be present include E. camaldulensis, Corymbia tessellaris, C. clarksoniana, E. melanophloia, E. platyphylla or Angophora floribunda. E. crebra and Lophostemon suaveolens may be locally common. A shrub layer is usually absent, and a grassy ground layer is prominent,*

RE Code	Status	Description
		and may include any of Bothriochloa bladhii subsp. bladhii, Aristida spp., Heteropogon contortus, Dichanthium spp. and Themeda triandra. Occurs on Cainozoic alluvial plains and terraces. Occurs on variety of soils, including deep cracking clays, medium to fine textured soils, and deep texture-contrast soils. (BVG1M: 16c)
RE 11.3.7	Least Concern	*Corymbia clarksoniana, C. tessellaris and C. dallachiana woodland to open woodland. There is usually a secondary tree layer, including Acacia salicina, Lysiphyllum hookeri or Grevillea striata. Occurs on levees and plains formed from Quaternary alluvial deposits. Soils are usually deep uniform sands with minor areas of sandy red earths. (BVG1M: 9e).*
RE 11.3.9	Least Concern (Wetland – Floodplain)	*Eucalyptus platyphylla with occasional trees of Corymbia clarksoniana, C. intermedia, E. tereticornis or Lophostemon suaveolens woodland to open woodland. A lower tree layer of Melaleuca viridiflora is occasionally present. This association has a grassy ground layer, with species including Heteropogon contortus, Sorghum nitidum, Chrysopogon fallax, Alloteropsis semialata and Aristida holathera, or in some situations with short grasses such as Chloris spp., Fimbristylis dichotoma, Cyperus spp., Schizachyrium fragile and Ectrosia leporina. Occurs on Cainozoic alluvial plains, on sandy surface with clay subsoil. Usually with "wet" influence, either closely adjacent to major river, or undergoes inundation relatively frequently. May occur in wet depressions. (BVG1M: 9e).*
RE 11.3.10	Least Concern	*Eucalyptus brownii woodland to open woodland. The ground layer is typically tussock grasses, including Aristida spp., Chloris spp., Fimbristylis dichotoma, Eriachne spp., Eragrostis spp. and Chrysopogon fallax. Areas on fertile soils may contain Heteropogon contortus, Bothriochloa bladhii and Chrysopogon fallax. Occurs on Cainozoic alluvial plains. (BVG1M: 17a).*
RE 11.3.12	Least Concern	*Melaleuca viridiflora woodland to open woodland, occasionally with M. argentea and M. dealbata. Occasional midstratum of Grevillea pteridifolia and Acacia leptocarpa. Ground layer of perennial grasses such as Themeda triandra, Elionurus citreus, Ectrosia leporina, Eriachne rara, Eremochloa bimaculata, Thaumastochloa pubescens, Eragrostis brownii and Ischaemum australe. Occurs on alluvial plains on strongly duplex clay soils with restricted drainage. (BVG1M: 21a)*
RE 11.3.13	Of Concern	*Grevillea striata open woodland, with Corymbia tessellaris, C. clarksoniana or C. dallachiana occasionally present as isolated emergent trees. A shrub layer may be present, including Acacia crassicarpa, A. salicina, Atalaya hemiglauca, Bursaria incana, Carissa ovata, Pandanus spiralis or Psydrax attenuata. The ground layer is sparse to dense, including Neptunia gracilis, Epaltes australis, Sida spp. and Brunoniella australis or grasses such as Themeda triandra, Panicum decompositum, Dichanthium sericeum and Sporobolus spp. Occurs on Cainozoic alluvial plains on flat coastal lowlands. (BVG1M: 27c).*
RE 11.3.25	Least Concern	*Eucalyptus tereticornis or E. camaldulensis woodland to open forest. Other tree species, including Casuarina cunninghamiana, E. coolabah, Melaleuca bracteata, Melaleuca viminalis, Livistona spp. (in north), Melaleuca spp. and Angophora floribunda, may occur. A tall shrub layer may occur, including Acacia salicina, A. stenophylla and Lysiphyllum carronii. Low shrubs are present, but rarely form a conspicuous layer. The*

RE Code	Status	Description
		ground layer is open to sparse and dominated by perennial grasses, sedges or forbs. Occurs on fringing levees and banks of major rivers and drainage lines of alluvial plains throughout the region. Soils are very deep, alluvial, grey and brown cracking clays with or without some texture contrast. These are usually moderately deep to deep, soft or firm, acid, neutral or alkaline brown sands, loams or black cracking or non-cracking clays, and may be sodic at depth (Burgess 2003). (BVG1M: 16a).
RE 11.3.25b	Least Concern	*Melaleuca leucadendra and/or M. fluviatilis, Nauclea orientalis open forest. A range of other canopy or sub-canopy tree species also occur including Pandanus tectorius, Livistona spp., Eucalyptus tereticornis, Corymbia tessellaris, Millettia pinnata, Casuarina cunninghamiana, Livistona decora, Lophostemon suaveolens or L. grandiflorus, rainforest species and, along drainage lines, Eucalyptus camaldulensis or E. tereticornis. A ground layer of tall grasses such as Chionachne cyathopoda, Mnesithea rottboellioides or Heteropogon triticeus may be present. Often occurs on coarse sand spits and levees within larger river channels. Riverine wetland or fringing riverine wetland. (BVG1M: 22c).*
RE 11.3.25f	Least Concern	*Main river channels. Open water or exposed stream beds and bars. Usually devoid of emergent vegetation although scattered trees and shrubs such as Melaleuca viminalis or Melaleuca spp. May be present and aquatic species may be abundant particularly in water holes and lagoons. Occurs in river channels. Riverine wetland or fringing riverine wetland. (BVG1M: 16d).*
RE 11.3.27b (NB – Category R buffer mapping only)	Least Concern	*Vegetation ranges from open water +/- aquatics and emergents such as Potamogeton crispus, Myriophyllum verrucosum, Chara spp., Nitella spp. Nymphaea violacea, Ottelia ovalifolia, Nymphoides indica, N. crenata, Potamogeton tricarinatus, Cyperus difformis, Vallisneria caulescens and Hydrilla verticillata. Often with fringing woodland, commonly Eucalyptus camaldulensis or E. coolabah but also a wide range of other species including Eucalyptus platyphylla, E. tereticornis, Melaleuca spp., Acacia holosericea or other Acacia spp. Occurs on billabongs. Lacustrine wetland (e.g. lake). (BVG1M: 34d)*
RE 11.3.29a	Least Concern	*Eucalyptus crebra +/- Corymbia dallachiana +/- C. erythrophloia, E. moluccana woodland. (BVG1M: 18b).*
RE 11.3.30	Least Concern	*Eucalyptus crebra or E. paedoglauca and Corymbia dallachiana woodland. Forms an open woodland to open forest in places. Has a grassy ground layer of Heteropogon contortus, Bothriochloa bladhii, Themeda triandra, Sehima nervosum, Enneapogon spp., with forbs such as Indigofera spp., Glycine tabacina, Galactia tenuiflora and Tephrosia juncea common. Occurs on older floodplain complexes on Cainozoic alluvial plains. (BVG1M: 18b).*
RE 11.3.31	Least Concern	*Ophiuros exaltatus and/or Dichanthium spp. tussock grassland. The ground layer has a variable composition, with drier areas dominated by Ophiuros exaltatus, Iseilema membranaceum or Dichanthium spp. or Brachyachne tenella. Other common and sometimes dominant grasses include Themeda triandra, Heteropogon contortus, Eulalia aurea, Imperata cylindrica, Eriochloa pseudoacrotricha, Bothriochloa spp., Panicum decompositum and Sporobolus spp. Other species include Neptunia spp., Rhynchosia minima, Crotalaria spp., Euphorbia spp., Aristida latifolia, Sida spp. and*

RE Code	Status	Description
		Desmodium spp. Trees such as Eucalyptus platyphylla, Grevillea striata, Corymbia dallachiana or C. erythrophloia may occur as emergent isolated trees or tall shrubs. Occurs on older floodplain complexes on Cainozoic alluvial plains. Black or dark grey earths or brown clays, in some areas with strong gilgai or debil debil microrelief. Often with self-mulching surface, and alkaline subsoil. (BVG1M: 32a)
RE 11.3.32	Least Concern	*Allocasuarina luehmannii low open woodland. Emergent Corymbia dallachiana and C. erythrophloia may occur. A shrub layer may occur, typically dominated by Allocasuarina luehmannii with occasional Bursaria incana and/or Denhamia cunninghamii. A thin ground layer of perennial grasses or sedges may occur. Occurs on older floodplain complexes on Cainozoic alluvial plains. (BVG1M: 18a).*
RE 11.3.33	Of Concern	*Eremophila mitchellii low open woodland. Emergent isolated Grevillea striata or Corymbia tessellaris or C. dallachiana may occur. Occasional shrubs of Vachellia bidwillii, Carissa ovata or Grevillea striata may occur. There may be a ground layer of Enchylaena tomentosa and Sporobolus spp. or Fimbristylis spp. Usually the ground layer is sparse or bare. Occasional grasses include Oxychloris scariosa, Eragrostis spp., and Aristida spp. Occurs on older floodplain complexes on Cainozoic alluvial plains. Common soils are yellow podsols and grey clays or sandy loams over heavy clays. (BVG1M: 26a).*
RE 11.3.34	Of Concern	*Acacia tephrina low woodland to low open woodland. Other Acacia spp. may occur, including Acacia oswaldii and Acacia salicina. A low shrub layer of Eremophila mitchellii, Carissa ovata or Scaevola spinescens may occur, with a usually sparse ground layer of Dactyloctenium radulans, Astrebla squarrosa, Leptochloa spp., Dichanthium spp., Paspalidium caespitosum, Panicum spp., Eragrostis spp. and Sporobolus spp. Occurs on older floodplain complexes on Cainozoic alluvial plains. Associated soils are usually grey calcareous or saline clays with gilgai microrelief. (BVG1M: 27a).*
RE 11.3.35	Least Concern	*Eucalyptus platyphylla, Corymbia clarksoniana woodland, occasionally with Corymbia tessellaris. A secondary tree layer commonly occurs, including Planchonia careya, Pandanus spiralis, Melaleuca viridiflora or M. nervosa and Petalostigma pubescens. The ground layer is usually tussock grasses, including Themeda triandra, Heteropogon contortus, Mnesithea rottboellioides and Bothriochloa decipiens, together with herbs or forbs such as Glycine tabacina, Galactia tenuiflora or Sida hackettiana. Occurs on Cainozoic alluvial plains. Older floodplain complexes, major stream levees and lighter deltaic deposits. (BVG1M: 9e).*
RE 11.12.1	Least Concern	*Eucalyptus crebra +/- Corymbia erythrophloia woodland to open woodland. E. melanophloia is rarely present and may be locally dominant. Also includes localised areas may be dominated by E. persistens. Occurs on ranges on igneous rocks. (BVG1M: 13c).*
RE 11.12.4	Least Concern	*Araucaria cunninghamii is a common emergent from the general canopy layer. Canopy species include Falcataria toona, Ficus virens, Canarium australianum, Alstonia scholaris, Planchonella pohlmaniana, Cleistanthus dallachyanus and Backhousia citriodora. Common shrub or understorey species are Mackinlaya macrosciadea, Baloghia inophylla, Polyalthia nitidissima, Bosistoa medicinalis and*

RE Code	Status	Description
		Aglaia sapindina. The sparse ground layer includes species such as Scleria sphacelata and Adiantum hispidulum. Vines and epiphytes are common and include Microsorum punctatum, Cissus oblonga, Smilax australis and Pisonia aculeata. Eucalyptus moluccana often associated with lower slopes on sandy sites. Occurs on low hills, ranges and boulder strewn slopes formed from Mesozoic to Proterozoic igneous rocks including granite. (BVG1M: 7a).
RE 11.12.7	Least Concern	*Eucalyptus crebra woodland with patches of semi-evergreen vine thicket. Occurs on boulder strewn hills formed on Mesozoic to Proterozoic igneous rocks. (BVG1M: 13c).*
RE 11.12.9	Least Concern	*Eucalyptus platyphylla, Corymbia dallachiana, C. tessellaris and E. drepanophylla woodland. Corymbia clarksoniana, Eucalyptus drepanophylla and E. platyphylla dominate the woodland canopy. Other species sometimes present are Corymbia erythrophloia, C. dallachiana, Eucalyptus tereticornis, E. exserta and C. tessellaris. On Mt Burrumbush, E. acmenoides is present. The shrub layer is sparse to moderately dense, and may include Acacia leptostachya, Planchonia careya, Flueggea virosa subsp. melanthesoides, Albizia procera, Larsenaikia ochreata, Dodonaea viscosa, Pandanus spiralis and Coelospermum reticulatum. The ground layer is dominated by grasses up to 2 metres high. Species include Heteropogon triticeus, Heteropogon contortus, Mnesithea rottboellioides, Themeda triandra and Sorghum nitidum. Other ground layer species include Chamaecrista absus var. absus, Cajanus reticulatus and Grewia savannicola. Occurs on lower slopes of Mesozoic to Proterozoic igneous rocks. (BVG1M: 9b).*
RE 11.12.13	Least Concern	*Eucalyptus crebra, Corymbia erythrophloia, C. dallachiana and C. tessellaris +/- C. intermedia +/- E. acmenoides +/- Canarium australianum mixed woodland or open forest. Occurs on coastal hills formed on Mesozoic to Proterozoic igneous rocks. (BVG1M: 13c)*

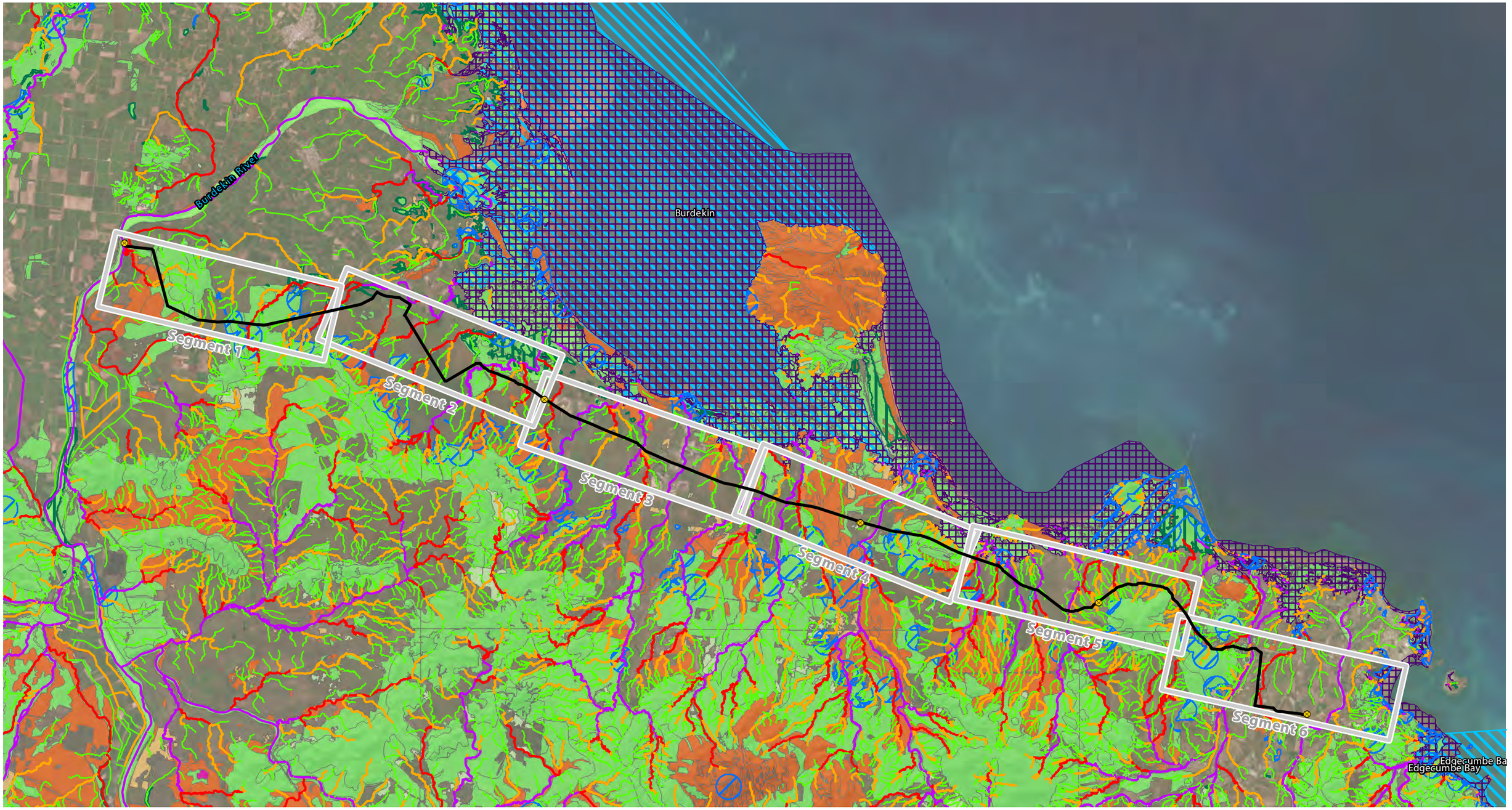
Most Category C and R Regrowth polygons mapped along the alignment include the above Regional Ecosystems, however, the following additional Regional Ecosystems are also represented as Regulated Regrowth (refer **Table 5**). These mapping layers are where Category R are essentially mapped buffers to drainage lines that rely largely upon pre-clear mapping and are generally not reflected on-ground.

Table 5: Additional Regrowth Regional Ecosystem Descriptions

RE Code	Status	Description
RE 11.1.1	Least Concern	*Sporobolus virginicus grassland on Quaternary estuarine deposits. Sporobolus spp. usually dominates pure stands although a wide range of other species may be present as scattered individuals including Fimbristylis ferruginea, Cyperus victoriensis, C. scariosus, and sometimes Eleocharis spiralis, Mnesithea rottboellioides, Marsilea mutica, Vincetoxicum carnosum, Ischaemum australe, Cyperus polystachyos, Ceratopteris thalictroides and Diplachne fusca. Occasional emergent stunted mangroves, usually Avicennia marina or Ceriops australis, may occur as isolated individuals or along small channels. There may also be a minor presence of salt-tolerant forbs such as Suaeda australis, S. arbusculoides, Salicornia quinqueflora subsp.*

RE Code	Status	Description
		Quinqueflora or Tecticornia australasica. Occurs on supratidal flats which are often only inundated by highest spring tides. Often occurs on the landward side of intertidal flats; seaward margins irregularly inundated with tidal waters and dissected by small tidal channels. Formed from Quaternary estuarine sediments with deep grey or black and grey saline cracking clays with occasional mottling, minor gilgai occasionally present. (BVG1M: 35b)
RE 11.3.9	Least Concern	*Eucalyptus platyphylla with occasional trees of Corymbia clarksoniana, C. intermedia, E. tereticornis or Lophostemon suaveolens woodland to open woodland. A lower tree layer of Melaleuca viridiflora is occasionally present. This association has a grassy ground layer, with species including Heteropogon contortus, Sorghum nitidum, Chrysopogon fallax, Alloteropsis semialata and Aristida holathera, or in some situations with short grasses such as Chloris spp., Fimbristylis dichotoma, Cyperus spp., Schizachyrium fragile and Ectrosia leporina. Occurs on Cainozoic alluvial plains, on sandy surface with clay subsoil. Usually with "wet" influence, either closely adjacent to major river, or undergoes inundation relatively frequently. May occur in wet depressions. (BVG1M: 9e)*
RE 11.3.27b	Least Concern	*Vegetation ranges from open water +/- aquatics and emergents such as Potamogeton crispus, Myriophyllum verrucosum, Chara spp., Nitella spp. Nymphaea violacea, Ottelia ovalifolia, Nymphoides indica, N. crenata, Potamogeton tricarinatus, Cyperus difformis, Vallisneria caulescens and Hydrilla verticillata. Often with fringing woodland, commonly Eucalyptus camaldulensis or E. coolabah but also a wide range of other species including Eucalyptus platyphylla, E. tereticornis, Melaleuca spp., Acacia holosericea or other Acacia spp. Occurs on billabongs. Lacustrine wetland (e.g. lake). (BVG1M: 34d)*

1.01 Qld State Environmental Layers Context





NOTES
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LEGEND

- Bowen Pipeline
- Pump station location
- VM Essential Habitat
- VM Wetland

Regional Ecosystems mapping

- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C or R area containing endangered regional ecosystems
- Category C or R area containing of concern regional ecosystems
- Category C or R area that is a least concern regional ecosystem

Waterways

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

- Tidal waterway
- Fish habitat area

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
E	23/02/2024	Final Alignment	TC	AD

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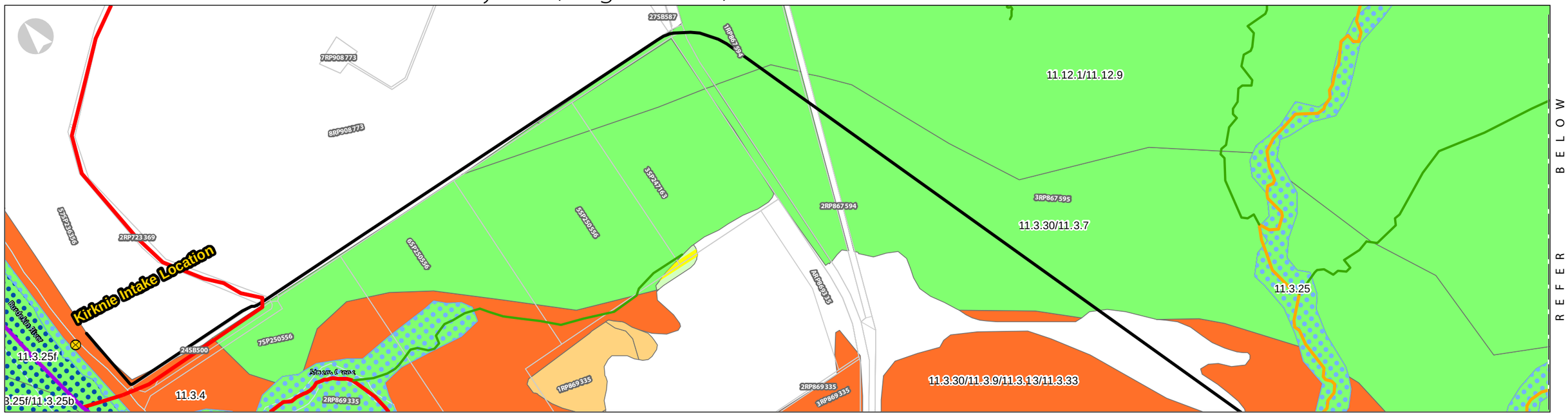
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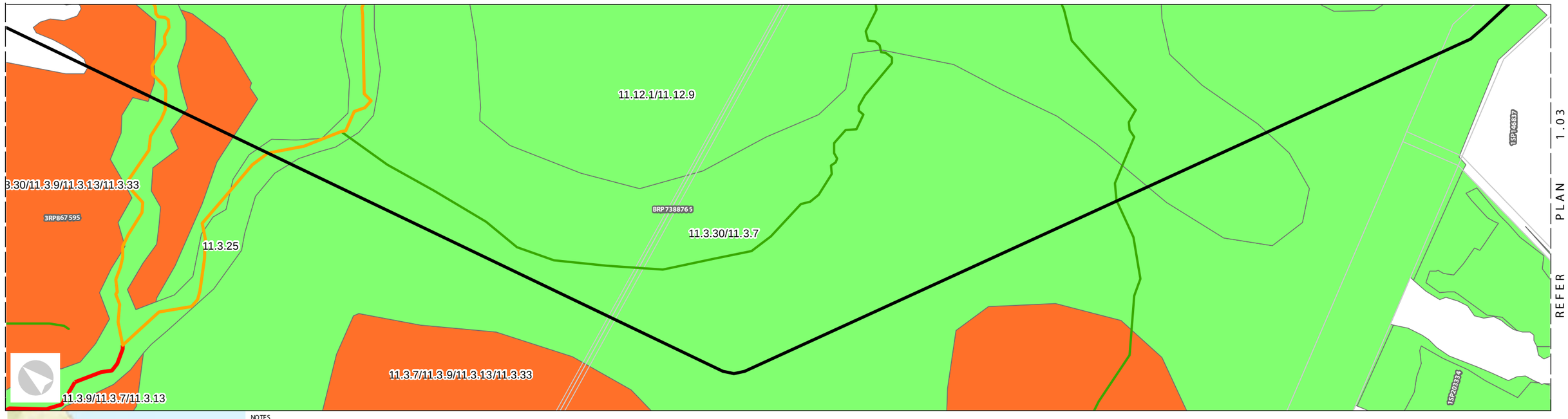
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1.02 Qld State Environmental Layers (Segment 1)







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LEGEND

- Bowen Pipeline
- Intake/Pump Stations
- Qld DCDB
- VM Essential Habitat
- VM Wetland

Regional Ecosystems mapping
- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C or R area containing endangered regional ecosystems
- Category C or R area containing of concern regional ecosystems
- Category C or R area that is a least concern regional ecosystem
- VMA Category R
- VMA Watercourses

EPA Wetlands
- HES
- GES
- State Marine Parks

Waterways
Risk of Impact
- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

- Tidal waterway
- Fish habitat area

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
F	23/02/2024	Final Alignment	TC	LB

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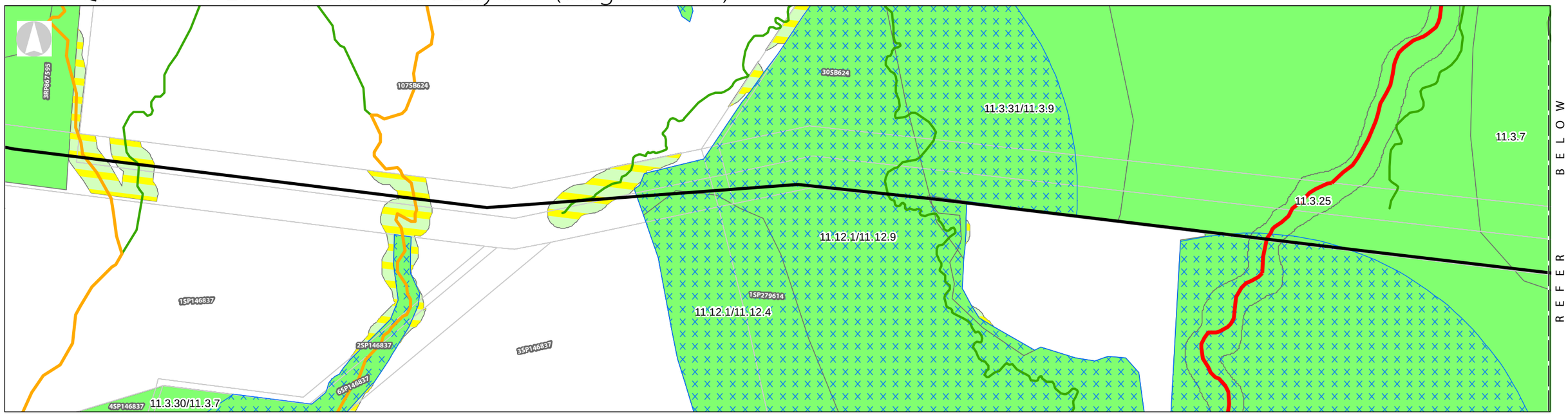
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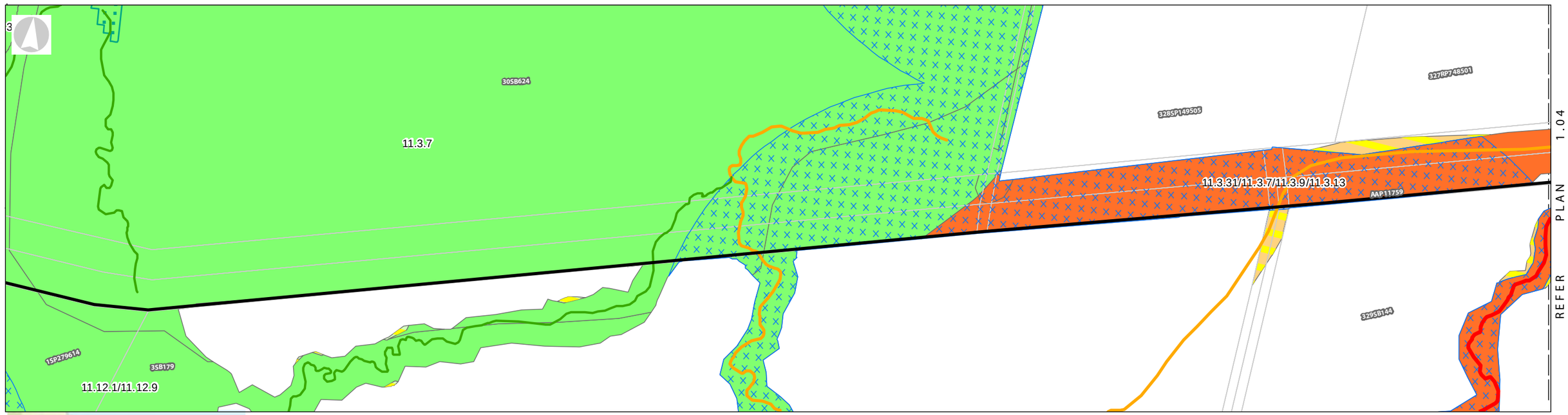
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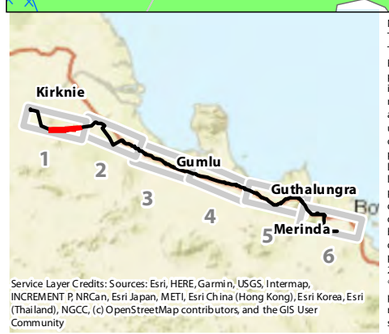
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1.03 Qld State Environmental Layers (Segment 1)







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LEGEND

- Bowen Pipeline
- Intake/Pump Stations
- Qld DCDB
- VM Essential Habitat
- VM Wetland

Regional Ecosystems mapping

- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C or R area containing endangered regional ecosystems
- Category C or R area containing of concern regional ecosystems
- Category C or R area that is a least concern regional ecosystem
- VMA Category R

EPA Wetlands

- HES
- GES
- State Marine Parks

Waterways

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

- Tidal waterway
- Fish habitat area

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
F	23/02/2024	Final Alignment	TC	AD

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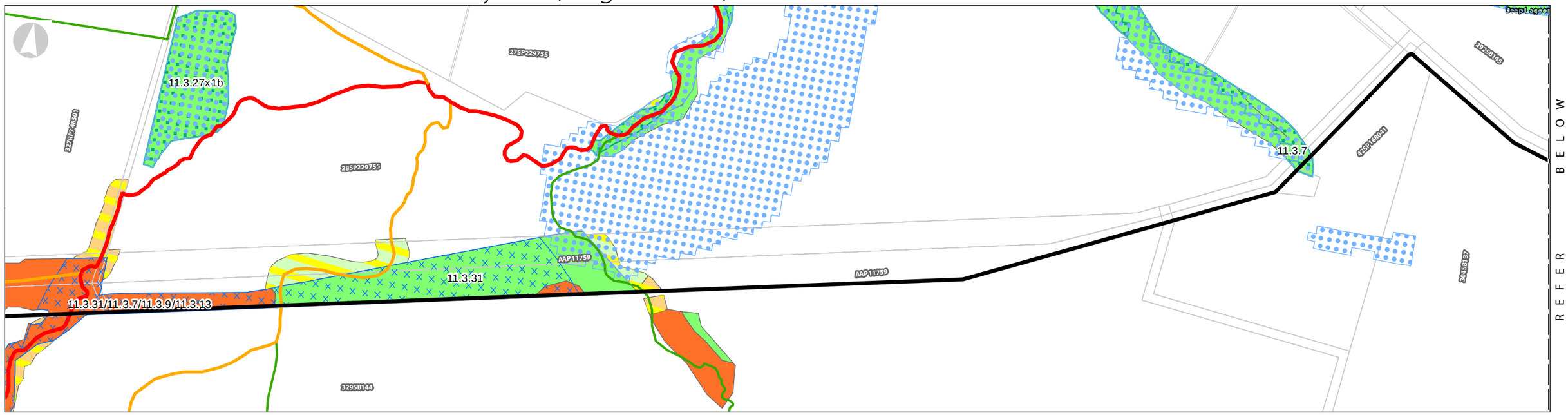
BOWEN PIPELINE

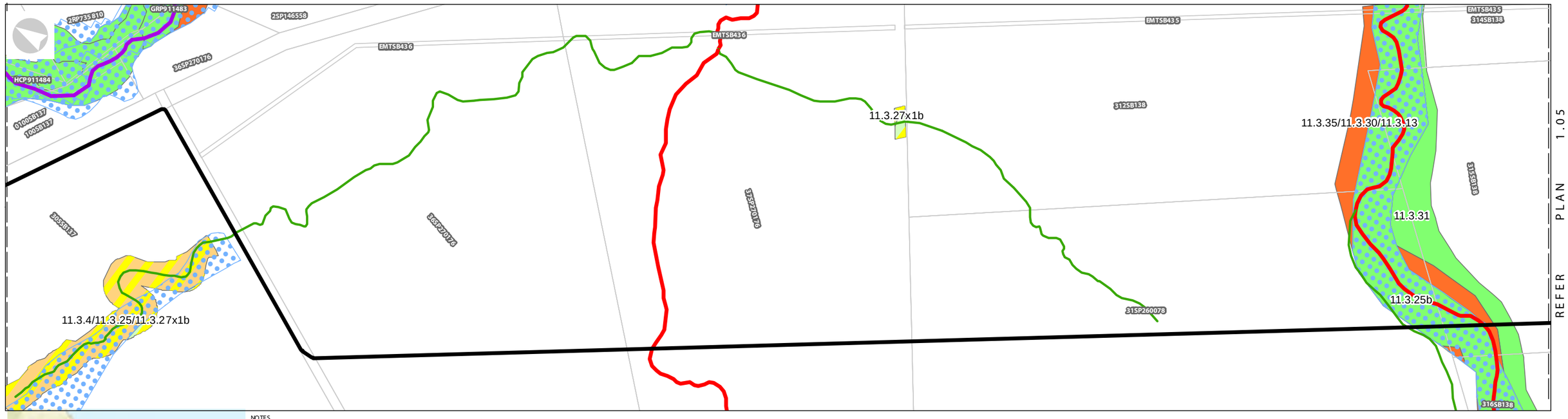
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1.04 Qld State Environmental Layers (Segment 2)







NOTES
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LEGEND

- Bowen Pipeline
- Intake/Pump Station
- Qld DCDB
- VM Essential Habitat
- VM Wetland

Regional Ecosystems mapping
- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C or R area containing endangered regional ecosystems
- Category C or R area containing of concern regional ecosystems
- Category C or R area that is a least concern regional ecosystem
- VMA Category R

EPA Wetlands
- HES
- GES
- State Marine Parks

Waterways

Risk of Impact
- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

- Tidal waterway
- Fish habitat area

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
F	16/02/2024	Final Alignment	TC	AD

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Universal Transverse Mercator GDA 2020 MGA Zone 55 1:13,000 @ A3

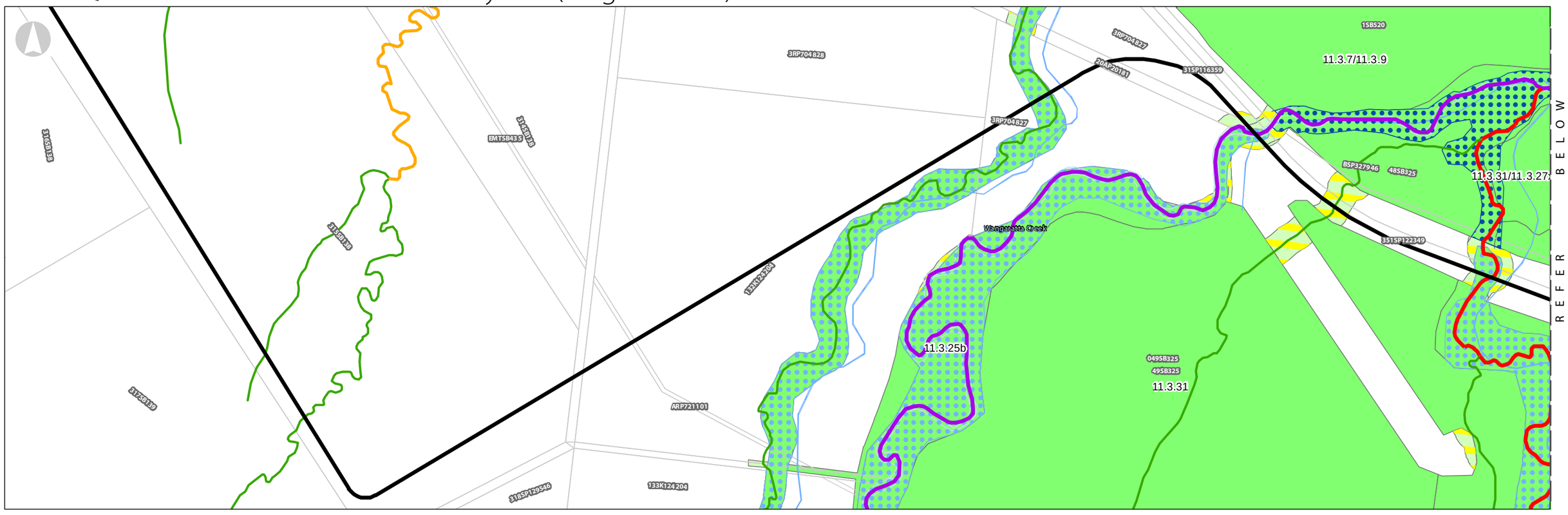
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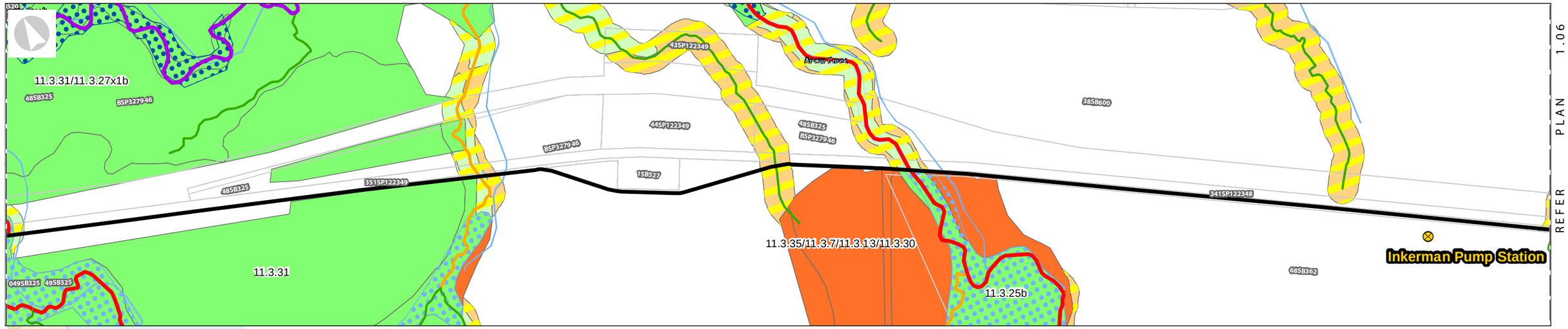
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1.05 Qld State Environmental Layers (Segment 2)







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LEGEND

- Bowen Pipeline
- Intake/Pump Stations
- Qld DCDB
- VM Essential Habitat
- VM Wetland

Regional Ecosystems mapping
- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C or R area containing endangered regional ecosystems
- Category C or R area containing of concern regional ecosystems
- Category C or R area that is a least concern regional ecosystem
- VMA Category R

EPA Wetlands
- HES
- GES
- State Marine Parks

Waterways
Risk of Impact
- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major
- Tidal waterway
- Fish habitat area

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
F	16/02/2024	Final Alignment	TC	AD

0 50 100 150 200 400 600 m

Universal Transverse Mercator GDA 2020 MGA Zone 55 1:13,000 @ A3

BOWEN PIPELINE

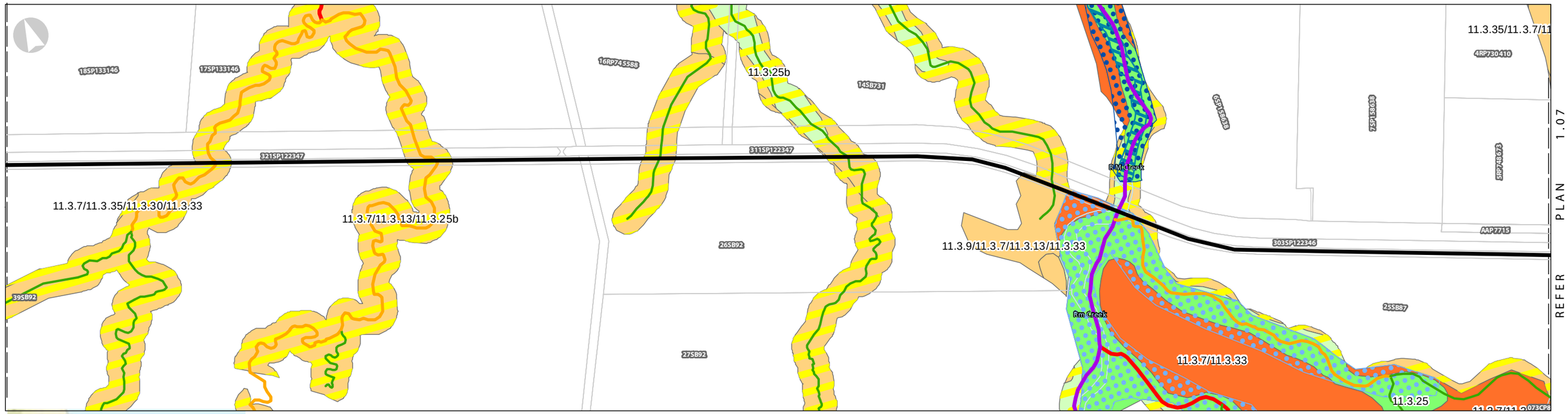
saunders havill group

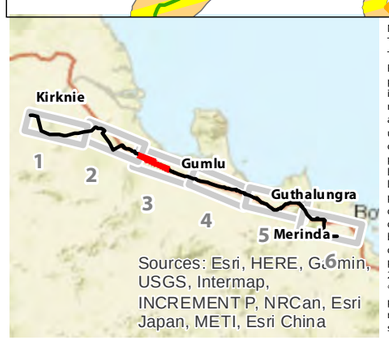
Bowen Pipeline Company Pty Ltd

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1.06 Qld State Environmental Layers (Segment 3)







NOTES
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LEGEND

- Bowen Pipeline
- Intake/Pump Station
- Qld DCDB
- VM Essential Habitat
- VM Wetland

Regional Ecosystems mapping
- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C or R area containing endangered regional ecosystems
- Category C or R area containing of concern regional ecosystems
- Category C or R area that is a least concern regional ecosystem
- VMA Category R

EPA Wetlands
- HES
- GES
- State Marine Parks

Waterways

Risk of Impact
- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

- Tidal waterway
- Fish habitat area

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
F	16/02/2024	Final Alignment	TC	AD

0 50 100 150 200 400 600 m

Universal Transverse Mercator GDA 2020 MGA Zone 55 1:13,000 @A3

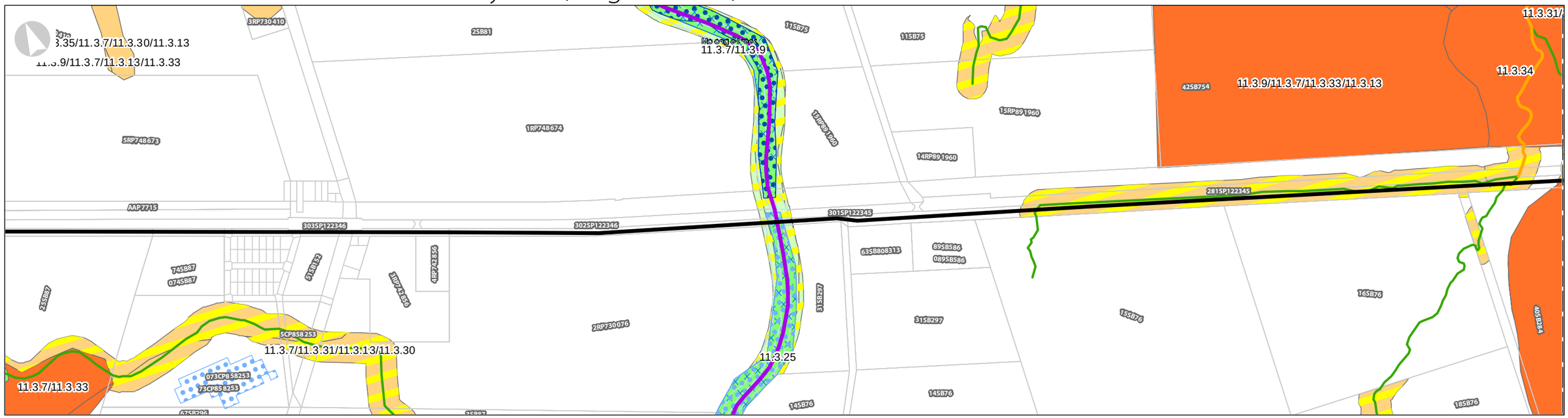
BOWEN PIPELINE

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1.07 Qld State Environmental Layers (Segment 3)







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LEGEND

- Bowen Pipeline
- Intake/Pump Stations
- Qld DCDB
- VM Essential Habitat
- VM Wetland

Regional Ecosystems mapping
- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C or R area containing endangered regional ecosystems
- Category C or R area containing of concern regional ecosystems
- Category C or R area that is a least concern regional ecosystem
- VMA Category R

EPA Wetlands
- HES
- GES
- State Marine Parks

Waterways
- Tidal waterway
- Fish habitat area

Risk of Impact
- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
F	16/02/2024	Final Alignment	TC	AD

0 50 100 150 200 400 600 m

Universal Transverse Mercator GDA 2020 MGA Zone 55 1:13,000 @ A3

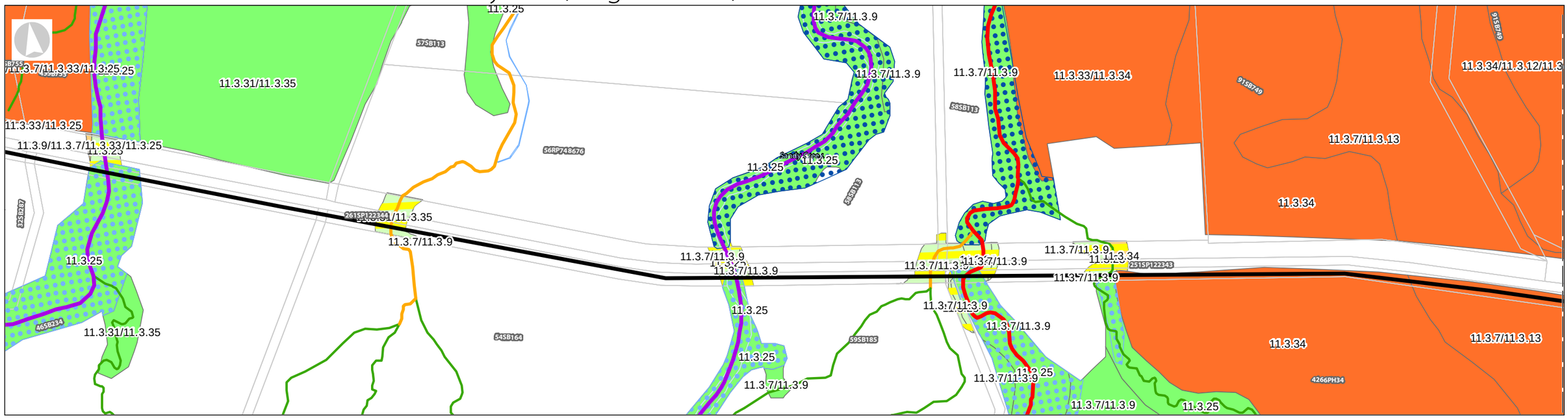
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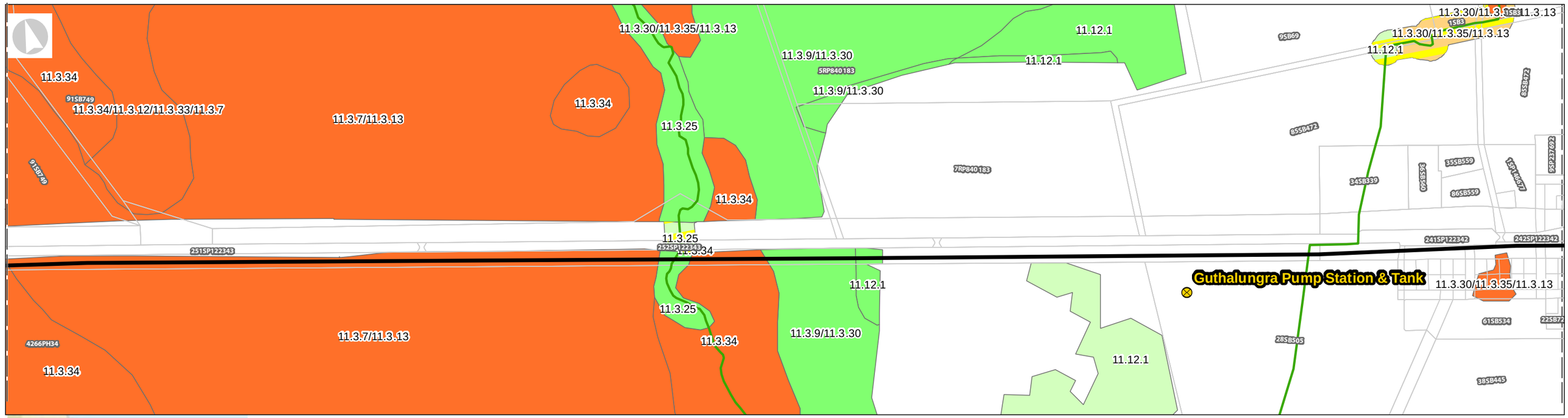
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1.08 Qld State Environmental Layers (Segment 4)







NOTES
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LEGEND

- Bowen Pipeline
- Intake/Pump Station
- Qld DCDB
- VM Essential Habitat
- VM Wetland

Regional Ecosystems mapping
- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C or R area containing endangered regional ecosystems
- Category C or R area containing of concern regional ecosystems
- Category C or R area that is a least concern regional ecosystem
- VMA Category R

EPA Wetlands
- HES
- GES
- State Marine Parks

Waterways
Risk of Impact
- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

- Tidal waterway
- Fish habitat area

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
F	16/02/2024	Final Alignment	TC	AD

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Universal Transverse Mercator GDA 2020 MGA Zone 55 1:13,000 @ A3

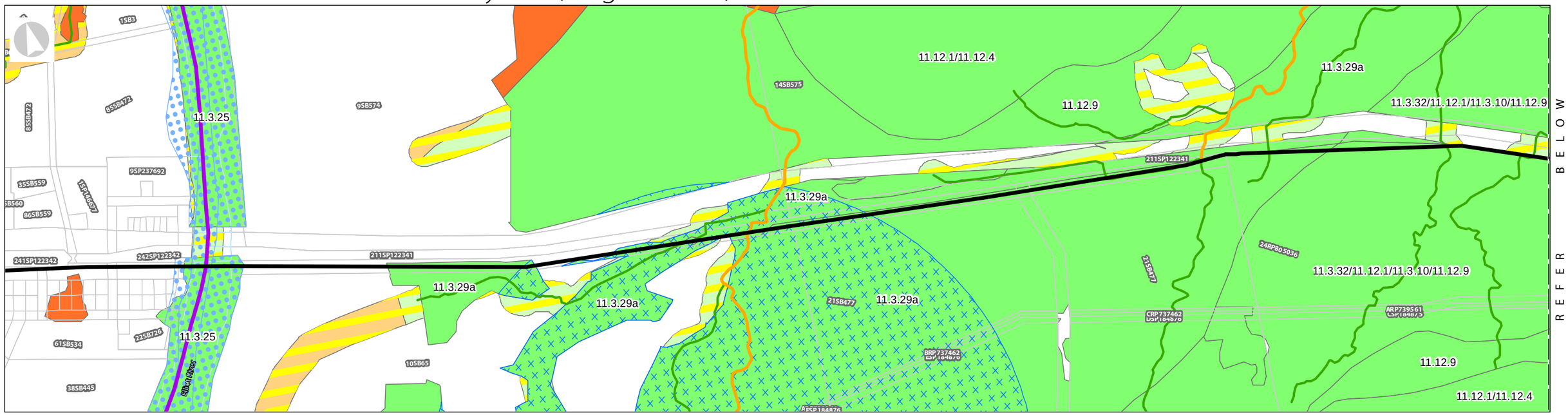
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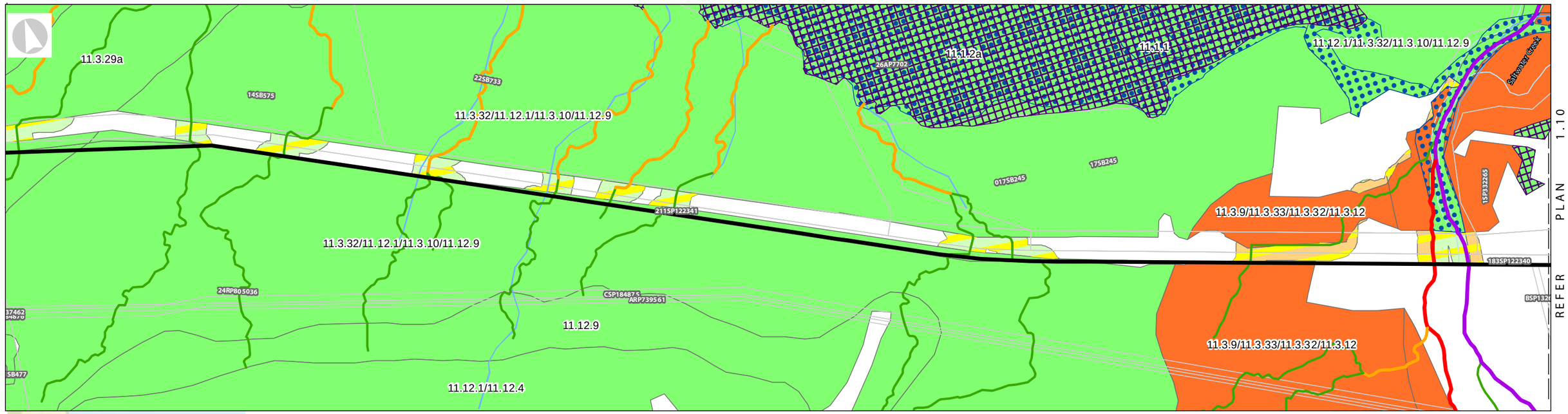
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1.09 Qld State Environmental Layers (Segment 4)







NOTES
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LEGEND

- Bowen Pipeline
- Intake/Pump Stations
- Qld DCDB
- VM Essential Habitat
- VM Wetland

Regional Ecosystems mapping
- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C or R area containing endangered regional ecosystems
- Category C or R area containing of concern regional ecosystems
- Category C or R area that is a least concern regional ecosystem
- VMA Category R

EPA Wetlands
- HES
- GES
- State Marine Parks

Waterways

Risk of Impact
- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

- Tidal waterway
- Fish habitat area

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
F	16/02/2024	Final Alignment	TC	AD

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Universal Transverse Mercator GDA 2020 MGA Zone 55 1:13,000 @ A3

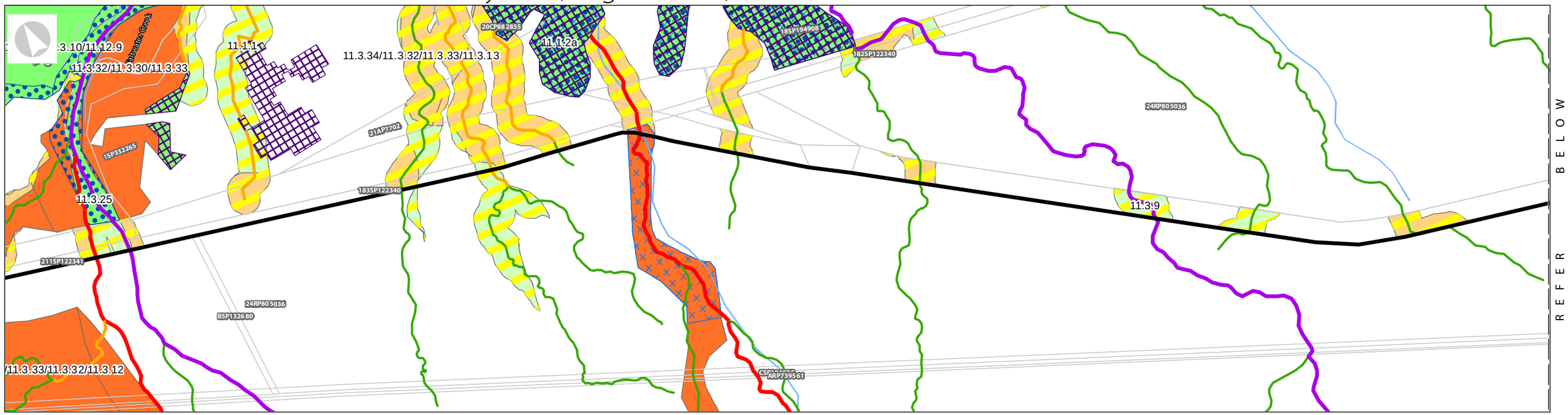
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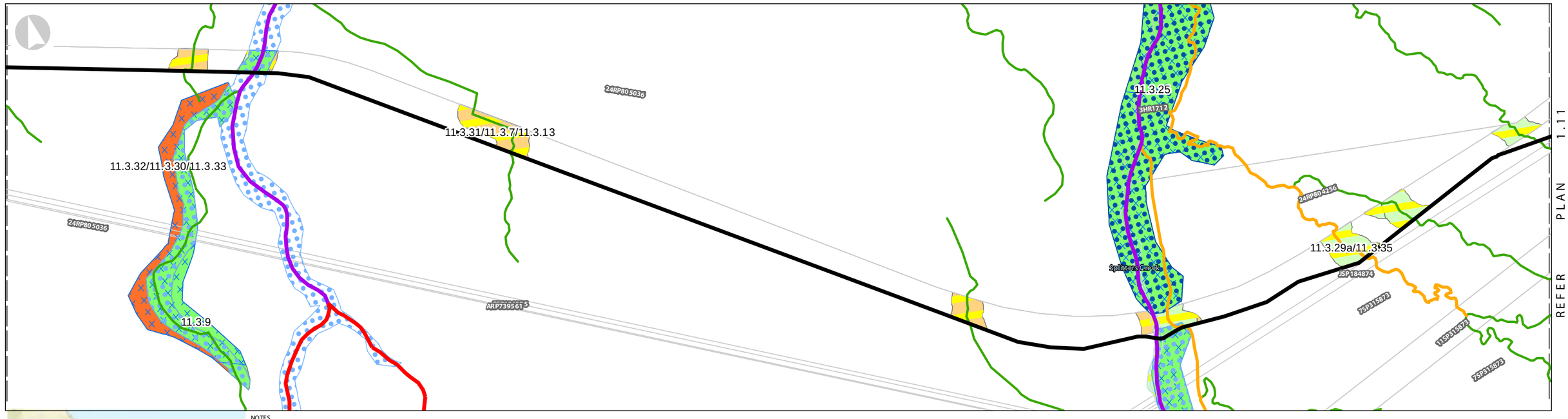
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1.10 Qld State Environmental Layers (Segment 5)







NOTES
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LEGEND

- Bowen Pipeline
- Intake/Pump Station
- Qld DCDB
- VM Essential Habitat
- VM Wetland

Regional Ecosystems mapping
- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C or R area containing endangered regional ecosystems
- Category C or R area containing of concern regional ecosystems
- Category C or R area that is a least concern regional ecosystem
- VMA Category R

EPA Wetlands
- HES
- GES
- State Marine Parks

Waterways
Risk of Impact
- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major
- Tidal waterway
- Fish habitat area

PLAN ISSUE

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
F	16/02/2024	Final Alignment	TC	AD

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Universal Transverse Mercator GDA 2020 MGA Zone 55 1:13,000 @ A3

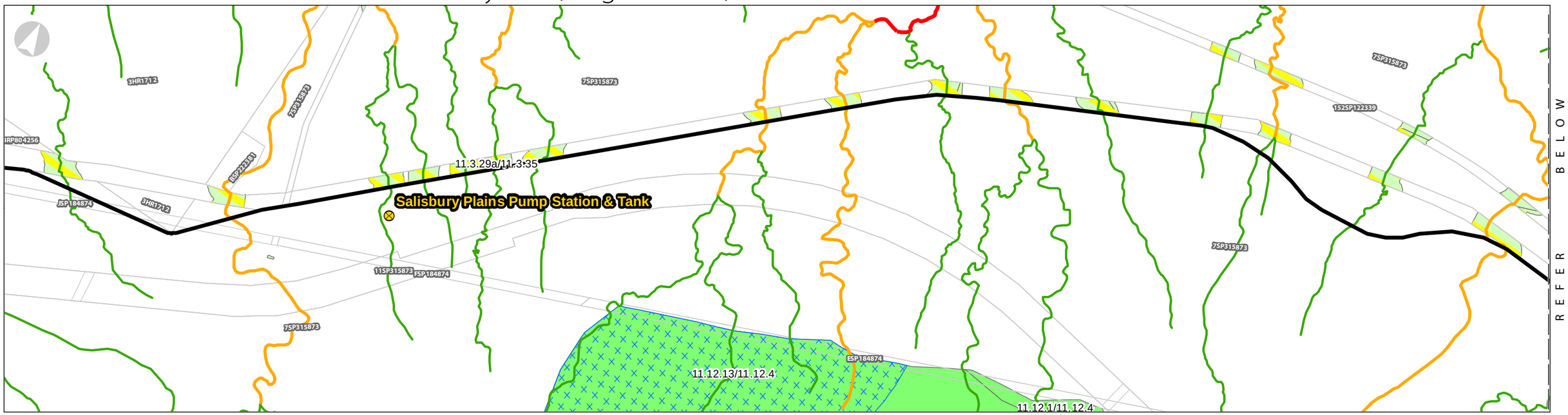
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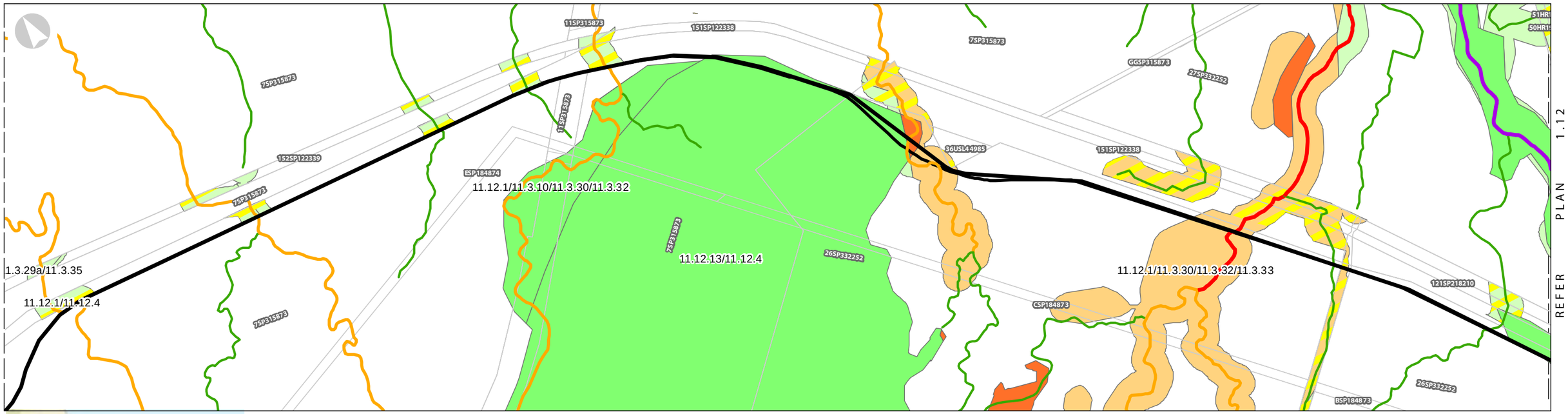
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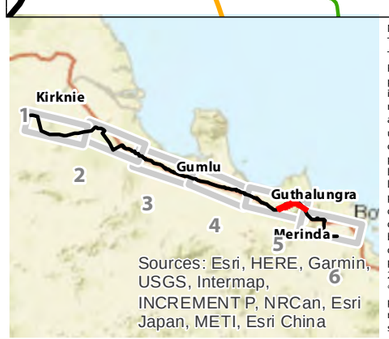
Bowen Pipeline Company Pty Ltd

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1.11 Qld State Environmental Layers (Segment 5)







NOTES
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LEGEND

- Bowen Pipeline
- Intake/Pump Station
- Qld DCDB
- VM Essential Habitat
- VM Wetland

Regional Ecosystems mapping
- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C or R area containing endangered regional ecosystems
- Category C or R area containing of concern regional ecosystems
- Category C or R area that is a least concern regional ecosystem
- VMA Category R

EPA Wetlands
- HES
- GES
- State Marine Parks

Waterways

Risk of Impact
- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

- Tidal waterway
- Fish habitat area

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
F	16/02/2024	Final Alignment	TC	AD

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Universal Transverse Mercator GDA 2020 MGA Zone 55 1:13,000 @ A3

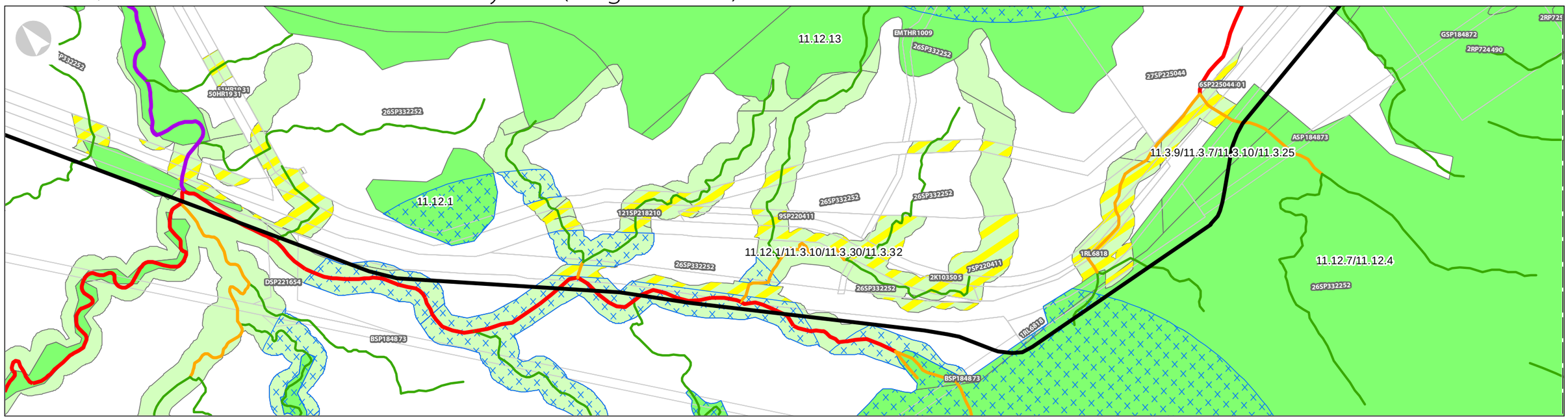
BOWEN PIPELINE

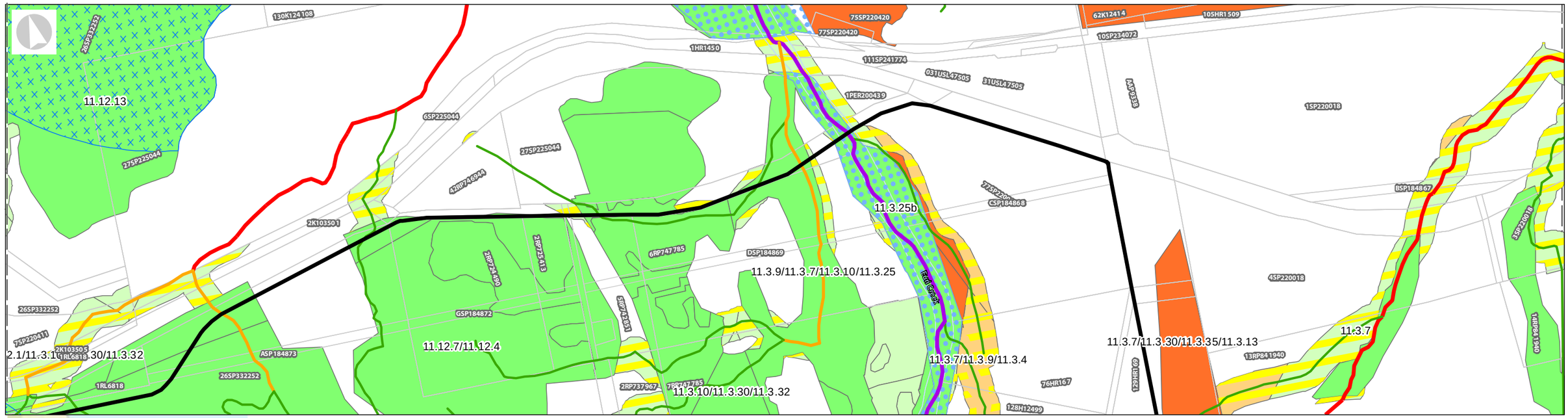
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1.12 Qld State Environmental Layers (Segment 6)







NOTES

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LEGEND

- Bowen Pipeline
- Intake/Pump Station
- Qld DCDB
- VM Essential Habitat
- VM Wetland

Regional Ecosystems mapping

- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C or R area containing endangered regional ecosystems
- Category C or R area containing of concern regional ecosystems
- Category C or R area that is a least concern regional ecosystem
- VMA Category R

EPA Wetlands

- HES
- GES
- State Marine Parks

Waterways

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

- Tidal waterway
- Fish habitat area

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
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0 50 100 150 200 400 600 m

Universal Transverse Mercator GDA 2020 MGA Zone 55 1:13,000 @ A3

BOWEN PIPELINE

saunders havill group

Bowen Pipeline Company Pty Ltd

Address Kirknie - Merinda 16/02/2024 8704 E 112 Environmental F

1.13 Qld State Environmental Layers (Segment 6)







NOTES
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LEGEND

- Bowen Pipeline
- Intake/Pump Station
- Qld DCDB
- VM Essential Habitat
- VM Wetland

Regional Ecosystems mapping
- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C or R area containing endangered regional ecosystems
- Category C or R area containing of concern regional ecosystems
- Category C or R area that is a least concern regional ecosystem
- VMA Category R

EPA Wetlands
- HES
- GES
- State Marine Parks

Waterways
Risk of Impact
- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

- Tidal waterway
- Fish habitat area

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
F	16/02/2024	Final Alignment	TC	AD

0 50 100 150 200 400 600 m

Universal Transverse Mercator GDA 2020 MGA Zone 55 1:13,000 @ A3

BOWEN PIPELINE

saunders havill group

Bowen Pipeline Company Pty Ltd

Address Kirknie - Merinda 16/02/2024 8704 E 113 Environmental F

3.4. *Biosecurity Act 2014*

The *Biosecurity Act 2014* commenced on 1 July 2016 and establishes a framework to regulate and control invasive plants and animals. Under the Biosecurity Act, land owners are responsible for taking all reasonable and practical steps to minimise the risks associated with invasive plants and animals under their control. These steps are known as the general biosecurity obligation.

The Biosecurity Act 2014 categorises restricted matter (restricted plants and animals) into the following:

- Category 1: must be reported to an inspector within 24 hours (includes Red Imported Fire Ants, amongst others).
- Category 2: must be reported within 24 hours Biosecurity Queensland on 13 25 23.
- Category 3: must not be distributed either by sale or gift, or released into the environment.
- Category 4: must not be moved.
- Category 5: must not be kept.
- Category 6: must not be fed (animals).
- Category 7: must be euthanised (animals).

Restricted matters will be managed as per the requirements of the Biosecurity Act.

3.5. *Fisheries Act 1994*

The *Fisheries Act 1994* regulates the use, conservation and improvement of Queensland's fisheries resources and fish habitats. The Fisheries Act seeks to ensure adequate provision for fish movement and habitat access during development processes that include:

- Building work in or adjacent to a declared Fish Habitat Area (FHA);
- Carrying out operational work completely or partly within a declared fish habitat area;
- Carrying out operational work that is the removal, destruction or damage of marine plants; and
- Carrying out Waterway Barrier Works.

Developments that involve any of these above activities require assessment against Module 5: Fisheries Resources of the SDAP.

The proposed pipeline will have an intake structure requiring seasonal bunding within the Burdekin River and cross waterways mapped under the Fisheries Data Layer (**Plan Set 1**). The proposed works will therefore need to be conducted within Accepted Development Requirements or require assessment against State Code 18: Constructing or raising waterway barrier works in fish habitats of the SDAP.

3.6. *Environmental Protection Act 1994*

The key piece of environmental legislation in Queensland is the *Environmental Protection Act 1994* (EPA). The EPA protects the environment with a focus on ecologically sustainable development. It creates a general duty for all people, companies and government bodies to take all reasonable and practicable steps to avoid harm to the environment. Under the EPA, it is an offence to cause harm to the environment, and to not notify authorities if you are doing an activity and become aware that it is causing environmental harm.

The Queensland Government is committed to the statutory protection of wetlands in catchments adjoining the Great Barrier Reef lagoon, with a focus on actions outlined in the Reef Water Quality Protection Plan 2013.

The Department of State Development, Infrastructure and Planning (DSDIP) is an assessment manager or referral agency for a development application for material change of use, reconfiguring a lot or operational works involving high impact earthworks (as defined in the Planning Regulation 2017) in wetland protection areas (WPA). Under the Sustainable Planning Regulation 2017, high impact earthworks is defined as operational work that involves changing the form of land, or placing a structure on land, in a way that diverts water to or from a wetland.

A search of the Map of Referrable Wetlands identifies the project area contains both General Ecological Significance Wetlands (refer Plan Set 1). As such, referral to Department of Environment and Science (DES) will be required as part of the State assessment process.

3.7. *Coastal Protection and Management Act 1995*

The *Coastal Protection and Management Act 1995* (Qld) seeks to protect the coastal resources of the coastal zone. The Act establishes a framework for the protection, conservation, rehabilitation and management of the coastal zone with regard to the core objectives of the national strategy for ecologically sustainable development in the use of the Coastal Zone. The Act also ensures decisions about land use and development safeguard life and property from the threat of coastal hazards.

Coastal Development is managed to protect coastal resources through the planning and development framework established under the *Planning Act 2017* (Qld) (PA). Specifically, coastal development requiring assessment under the PA is required to respond to State Code 8: Coastal Development and Tidal Works of the State Development Assessment Provisions specifically in relation to:

- Tidal Works; and
- Development in a Coastal Management District.

The project is located within the Coastal Management District adjoining tidally influenced locations along the proposed alignment. A response to State Code 8 is therefore required.

3.8. State Planning Policy

On the 3rd of July 2017, the Queensland Government's single State Planning Policy (SPP) came into effect, replacing the superseded State Planning Policy from April 2016. There are 17 State interests outlined in the SPP that must be considered in every Planning Scheme across Queensland. These State interests align under five broad themes:

1. Liveable communities and housing
2. Economic growth
3. Environment and heritage
4. Safety and resilience to hazards
5. Infrastructure

The integration of the SPP into local Planning Schemes ensures that the most important State planning interests are protected and managed in a relevant way across Queensland. The State Government works with Councils to ensure that State interests are adequately reflected in their Schemes, and the Planning Minister provides the final approval of these schemes.

Due to Council diversity, the State Government does not mandate how State interests should be applied. Rather, as Councils prepare their local Planning Schemes, they need to show how the State interests will be reflected locally. Each of the 17 State interests in the SPP is supported by a guideline to help Councils put the policy into action.

The subject site is mapped as containing Matters of State Environmental Significance reflected in the previously discussed State overlays (refer **Plan Set 1**).

4. Ecological survey results

4.1. Introduction

The project area has been purposefully located within existing linear infrastructure and agricultural areas to minimise the potential for adverse impacts on noteworthy environmental features. Based on desktop analyses, the subject area was extensively surveyed by SHG Ecologists to ascertain the presence or not of listed threatened species under the EPBC Act or NCA as per the methodologies described in **Section 2**. Areas identified as the least disturbed or potentially containing higher value habitat or marine plants were targeted for specific survey methodologies (refer **Plan 2** for targeted field survey effort and results). Crossing locations within this dataset were targeted for potential field verification of rating values relative to desktop assessment, with the value of some locations downgraded based on ground rectification of values. The only threatened species located within the project area was *Eucalyptus raveretiana* (Black Ironbox) which was present within disturbed riparian habitat adjoining infrastructure at major watercourse locations, and *Geophaps scripta scripta* (Squatter Pigeon) which was observed across large grazing properties in the far west of the alignment. This species is known throughout the Brigalow Belt and favours habitat associated with cattle grazing pastures. In addition, the *Crocodylus porosus* (Estuarine Crocodile) has been observed within the Burdekin River during field surveys, a known location for the species.

The results of the field assessment, along with desktop searches, review of previous consultant studies for the project area and professional experience were utilised to inform the likelihood of occurrence schedule in **Appendix C**. Based on this assessment, the only threatened species expected to occur within the project area are *Eucalyptus raveretiana* (Black Ironbox), *Crocodylus porosus* (Estuarine Crocodile – Marine Migratory, refer FRC Environmental aquatic ecology report completed separately) and *Geophaps scripta scripta* (Squatter Pigeon). In relation to adjoining MNES and MSES, please refer to the Adaptive Strategies facilitated impacts assessment also completed separately.

Eucalyptus raveretiana (Black Ironbox) individuals were only recorded sporadically at ten (10) larger drainage lines along the proposed alignment and the Burdekin River waterway corridor (refer **Plan Set 2** and **Table 6**, below, and **Section 4.2-4.4** for Site specifics). All of the locations where specimens of Black Ironbox were located within the project pipe alignment are to be tunnel bored to avoid direct impacts. Black Ironbox specimens were also located downstream of the proposed pipeline on the other side of the rail alignment at two lower order flow path locations where conventional trenching will be undertaken. All major and high order flow paths with riparian habitat features and all locations where Black Ironbox have been identified will be managed under site specific Environmental Management Plans to mitigate potential adverse impacts from pipeline construction on this listed species (**Table 6** and **Section 4.2**). Notably, the recorded Black Ironbox specimens are currently persisting adjacent to existing high disturbance levels associated with the Bruce Highway and rail line, as well as adjoining long established agricultural pursuits.

Geophaps scripta scripta (Squatter Pigeon) were observed within cattle grazing paddocks in the western extent of the alignment. The species is known to occur within the area and favours habitats consistent with disturbed cattle grazing paddocks. It is considered that the relatively small impact area of the proposed alignment and

temporary impact status will have no significant impact on the availability of suitable habitat for the species given the abundance of open cattle grazing paddocks. Furthermore, any impacts are likely to be short-term during construction only.

2.01. Field Survey Effort (Context)



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LEGEND

Bowen pipeline

Detailed survey site

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
F	28/02/2024	Alignment Changes	TC	LB

0 1 2 4 6 8 10 km

Universal Transverse Mercator GDA 2020 MGA Zone 55 1:300,000 @ A3

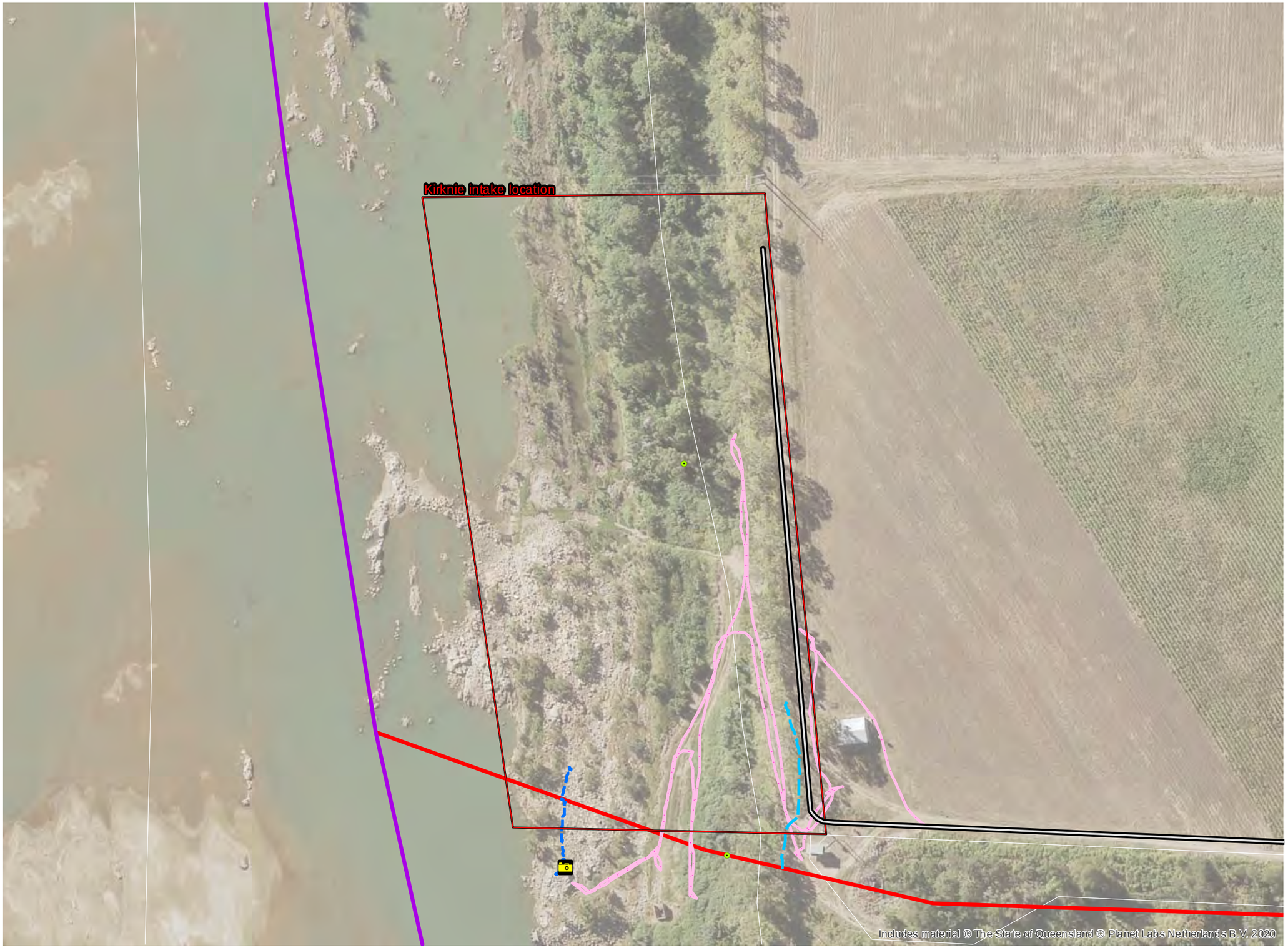
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Bowen Pipeline Company Pty Ltd

BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 28/02/2024 8704 E201 Waterway Field Survey F

2.02. Site 1 - Field Survey Effort



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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
- Spotlight & ANABAT survey line
- Motion camera location
- Marine plant areas
- Fauna observation

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
F	28/02/2024	Alignment Changes	TC	LB

0 10 20 40 m

Universal Transverse Mercator GDA 2020 MGA Zone 55 1:1,500 @ A3

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BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 28/02/2024 8704 E 202 Waterway Field Survey F

2.03. Site 2 - Field Survey Effort



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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
- Spotlight & ANABAT survey line
- Motion camera location
- Marine plant areas
- Fauna observation

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
F	28/02/2024	Alignment Changes	TC	LB

0 10 20 40 m

Universal Transverse Mercator GDA 2020 MGA Zone 55 1:1,000 @ A3

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Bowen Pipeline Company Pty Ltd

BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 28/02/2024 8704 E 202 Waterway Field Survey F

2.04. Site 23 - Field Survey Effort



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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
- Spotlight & ANABAT survey line
- Motion camera location
- Marine plant areas
- Fauna observation

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
F	28/02/2024	Alignment Changes	TC	LB

0 10 20 40 m

Universal Transverse Mercator GDA 2020 MGA Zone 55 1:1,000 @ A3

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Bowen Pipeline Company Pty Ltd

BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 28/02/2024 8704 E 202 Waterway Field Survey F

2.05. Site 27 - Field Survey Effort



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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
- Spotlight & ANABAT survey line
- Motion camera location
- Marine plant areas
- Fauna observation

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
F	28/02/2024	Alignment Changes	TC	LB

0 10 20 40 m

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BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 28/02/2024 8704 E202 Waterway Field Survey F

2.06. Site 29 - Field Survey Effort



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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
- Spotlight & ANABAT survey line
- Motion camera location
- Marine plant areas
- Fauna observation

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
F	28/02/2024	Alignment Changes	TC	LB

0 10 20 40 m

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BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen | 28/02/2024 | 8704 E202 Waterway Field Survey F

2.07. Site 34 - Field Survey Effort



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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
- Spotlight & ANABAT survey line
- Motion camera location
- Marine plant areas
- Fauna observation

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
F	28/02/2024	Alignment Changes	TC	LB

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ITransverseMercator GDA 2020 MGA Zone 55 1:1,000 @ A3

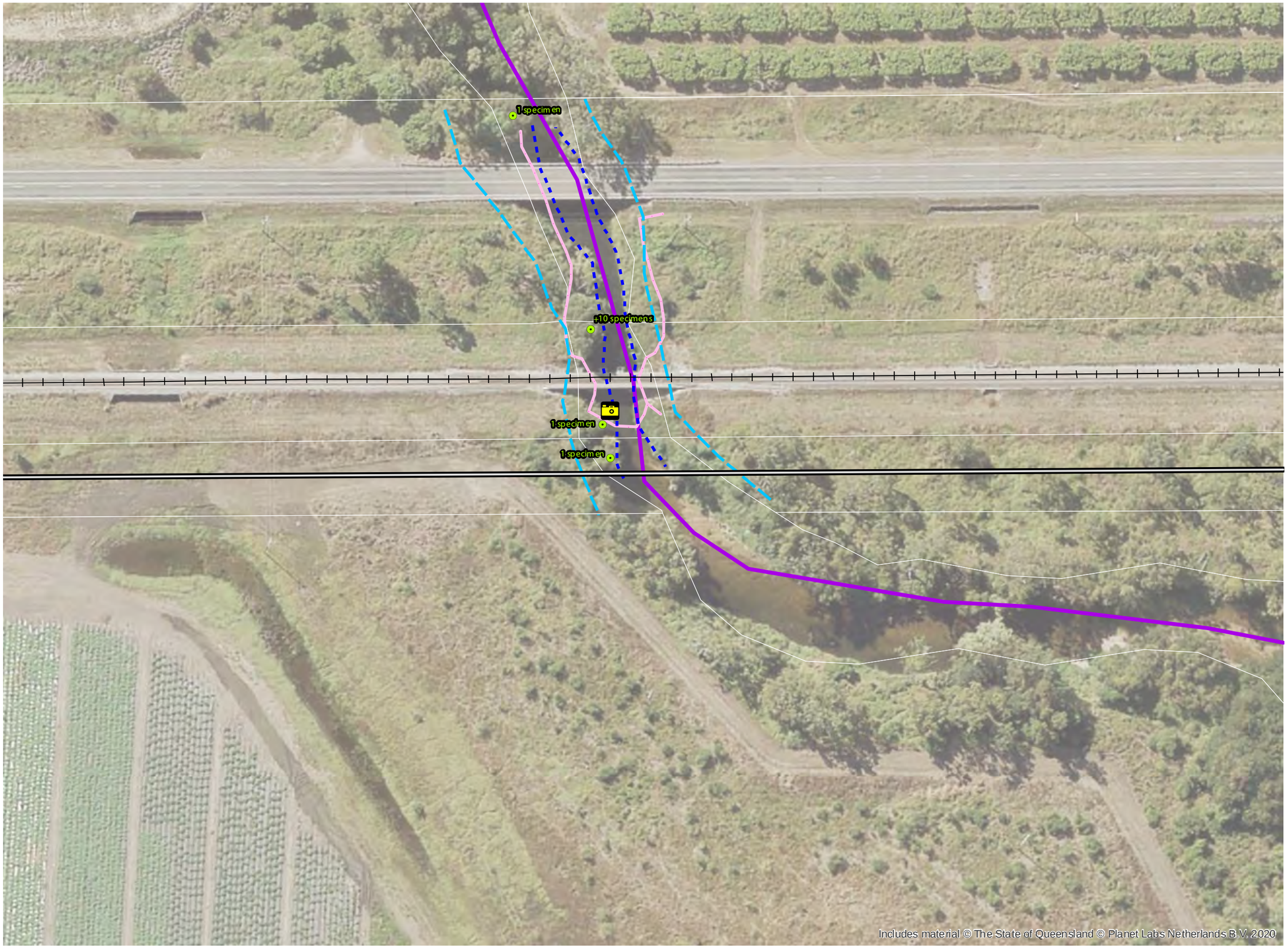
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BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 28/02/2024 8704 E 202 Waterway Field Survey F

2.08. Site 36 - Field Survey Effort



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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
- Spotlight & ANABAT survey line
- Motion camera location
- Marine plant areas
- Fauna observation

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
F	28/02/2024	Alignment Changes	TC	LB

0 10 20 40 m

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BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 28/02/2024 8704 E202 Waterway Field Survey F

2.09. Site 37 - Field Survey Effort



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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
- Spotlight & ANABAT survey line
- Motion camera location
- Marine plant areas
- Fauna observation

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
F	28/02/2024	Alignment Changes	TC	LB

0 10 20 40 m

alTransverseMercator GDA 2020 MGA Zone 55 1:1,000 @ A3

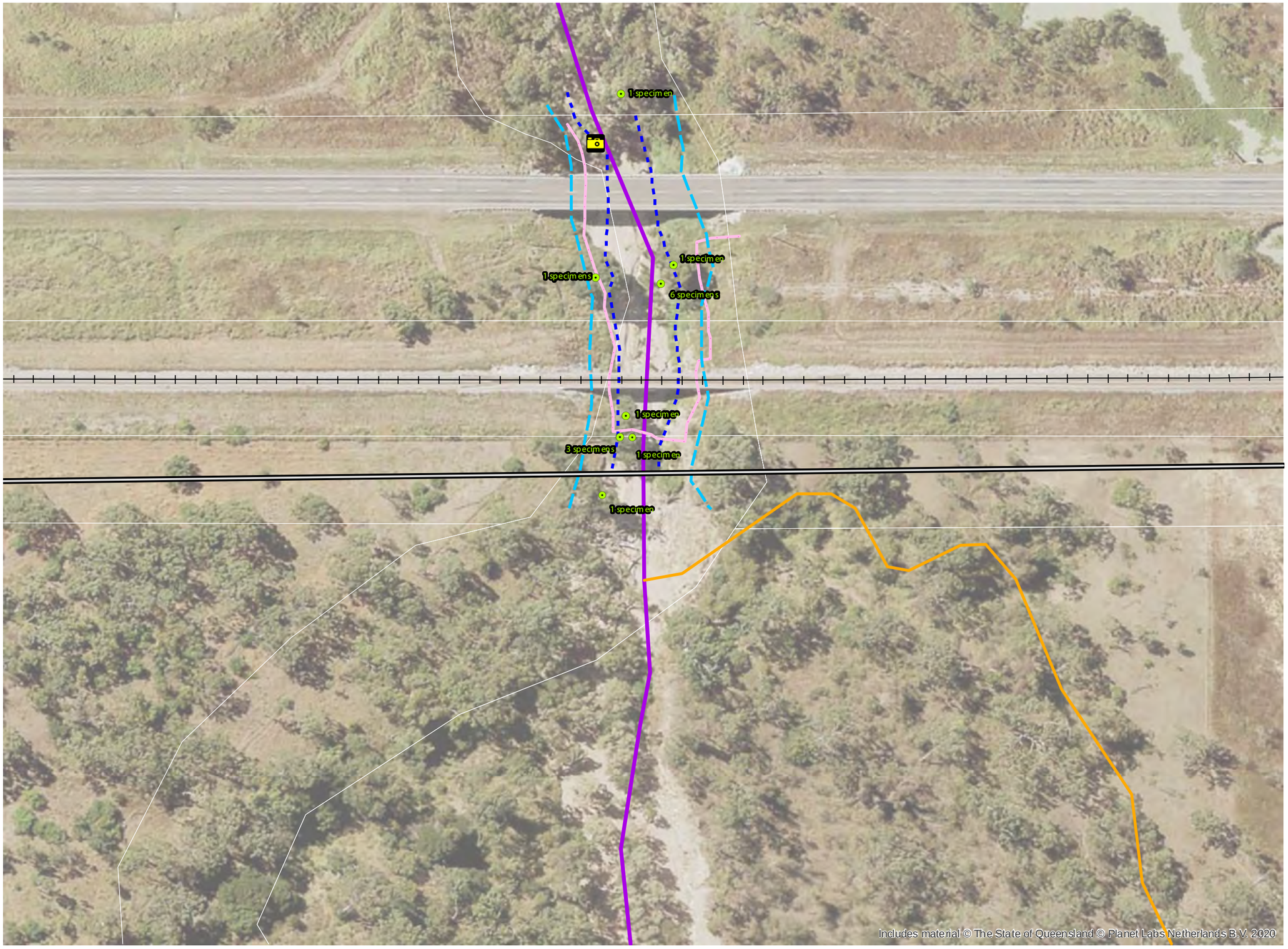
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Bowen Pipeline Company Pty Ltd

BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 28/02/2024 8704 E 202 Waterway Field Survey F

2.10. Site 43 - Field Survey Effort



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Layer Sources: QLD GIS Layers (QLD Gov. Information Service 2023)

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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
- Spotlight & ANABAT survey line
- Motion camera location
- Marine plant areas
- Fauna observation

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
F	28/02/2024	Alignment Changes	TC	LB

0 10 20 40 m

Transverse Mercator GDA 2020 MGA Zone 55 1:1,000 @ A3

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Bowen Pipeline Company Pty Ltd

BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 28/02/2024 8704 E 202 Waterway Field Survey F

2.11. Site 44 - Field Survey Effort



NOTES
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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
- Spotlight & ANABAT survey line
- Motion camera location
- Marine plant areas
- Fauna observation

PLAN ISSUE:

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A	20/12/2017	Preliminary Draft	TC	MS
F	28/02/2024	Alignment Changes	TC	LB

0 10 20 40 m

alTransverseMercator GDA2020 MGA Zone 55 1:1,000 @A3

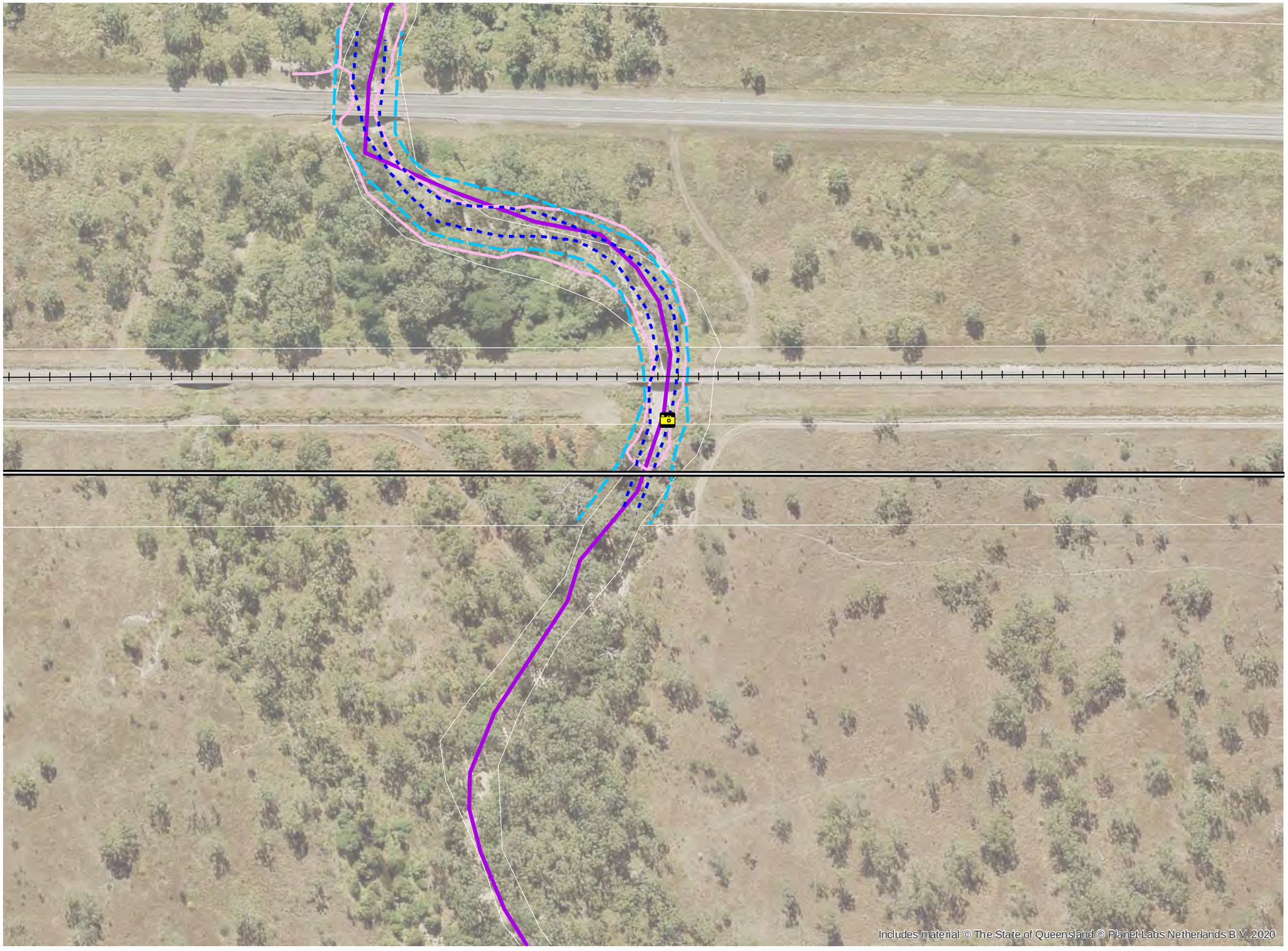
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Bowen Pipeline Company Pty Ltd

BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 28/02/2024 8704 E202 Waterway Field Survey F

2.12. Site 50 - Field Survey Effort



NOTES
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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
- Spotlight & ANABAT survey line
- Motion camera location
- Marine plant areas
- Fauna observation

PLAN ISSUE:

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F	28/02/2024	Alignment Changes	TC	LB

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salTransverseMercator GDA2020 MGA Zone 55 1:1,500 @A3

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Bowen Pipeline Company Pty Ltd

BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 28/02/2024 8704 E202 Waterway Field Survey F

2.13. Site 52 - Field Survey Effort



NOTES
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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
- Spotlight & ANABAT survey line
- Motion camera location
- Marine plant areas
- Fauna observation

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
F	28/02/2024	Alignment Changes	TC	LB

0 10 20 40 m

alt Transverse Mercator GDA 2020 MGA Zone 55 1:1,000 @ A3

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Bowen Pipeline Company Pty Ltd

BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 28/02/2024 8704 E 202 Waterway Field Survey F

2.14. Site 54 - Field Survey Effort



NOTES
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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
- Spotlight & ANABAT survey line
- Motion camera location
- Marine plant areas
- Fauna observation

PLAN ISSUE:

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F	28/02/2024	Alignment Changes	TC	LB

0 10 20 40 m

Universal Transverse Mercator GDA 2020 MGA Zone 55 1:1,000 @ A3

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Bowen Pipeline Company Pty Ltd

BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 28/02/2024 8704 E202 Waterway Field Survey F

2.15. Site 56 - Field Survey Effort



NOTES
This plan was prepared as a desktop assessment tool.
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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
- Spotlight & ANABAT survey line
- Motion camera location
- Marine plant areas
- Fauna observation

PLAN ISSUE:

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F	28/02/2024	Alignment Changes	TC	LB

0 10 20 40 m

Universal Transverse Mercator GDA 2020 MGA Zone 55 1:1,000 @ A3

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Bowen Pipeline Company Pty Ltd

BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 28/02/2024 8704 E 202 Waterway Field Survey F

2.16. Site 60 - Field Survey Effort



NOTES
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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
- Spotlight & ANABAT survey line
- Motion camera location
- Marine plant areas
- Fauna observation

PLAN ISSUE:

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A	20/12/2017	Preliminary Draft	TC	MS
F	28/02/2024	Alignment Changes	TC	LB

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alTransverseMercator GDA2020 MGA Zone 55 1:1,250 @A3

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Bowen Pipeline Company Pty Ltd

BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 28/02/2024 8704 E202 Waterway Field Survey F

2.17. Site 79a and 79b - Field Survey Effort



NOTES
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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
- Spotlight & ANABAT survey line
- Motion camera location
- Marine plant areas
- Fauna observation

PLAN ISSUE:

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F	28/02/2024	Alignment Changes	TC	LB

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Bowen Pipeline Company Pty Ltd

BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 28/02/2024 8704 E202 Waterway Field Survey F

2.18. Site 81-85 - Field Survey Effort



NOTES
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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
- Spotlight & ANABAT survey line
- Motion camera location
- Marine plant areas
- Fauna observation

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
F	28/02/2024	Alignment Changes	TC	LB

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alTransverseMercator GDA2020 MGA Zone 55 1:1,250 @A3

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Bowen Pipeline Company Pty Ltd

BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 28/02/2024 8704 E202 Waterway Field Survey F

2.19. Site 81-85 - Field Survey Effort



NOTES
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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
- Spotlight & ANABAT survey line
- Motion camera location
- Marine plant areas
- Fauna observation

PLAN ISSUE:

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0 10 20 40 m

alTransverseMercator GDA 2020 MGA Zone 55 1:1,250 @ A3

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Bowen Pipeline Company Pty Ltd

BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 28/02/2024 8704 E 202 Waterway Field Survey F

2.21. Site 81-85 - Field Survey Effort



NOTES
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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
- Spotlight & ANABAT survey line
- Motion camera location
- Marine plant areas
- Fauna observation

PLAN ISSUE:

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F	28/02/2024	Alignment Changes	TC	LB

0 10 20 40 m

Transverse Mercator GDA 2020 MGA Zone 55 1:1,000 @ A3

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Bowen Pipeline Company Pty Ltd

BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 28/02/2024 8704 E202 Waterway Field Survey F

2.22. Site 81-85 - Field Survey Effort



NOTES
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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
- Spotlight & ANABAT survey line
- Motion camera location
- Marine plant areas
- Fauna observation

PLAN ISSUE:

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0 10 20 40 m

Transverse Mercator GDA 2020 MGA Zone 55 1:1,000 @ A3

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Bowen Pipeline Company Pty Ltd

BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 28/02/2024 8704 E202 Waterway Field Survey F

2.23. Site 91 - Field Survey Effort



NOTES
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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
- Spotlight & ANABAT survey line
- Motion camera location
- Marine plant areas
- Fauna observation

PLAN ISSUE:

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F	28/02/2024	Alignment Changes	TC	LB

0 10 20 40 m

Universal Transverse Mercator GDA 2020 MGA Zone 55 1:1,000 @ A3

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Bowen Pipeline Company Pty Ltd

BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 28/02/2024 8704 E 202 Waterway Field Survey F

2.24. Site 94 - Field Survey Effort



NOTES
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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
- Spotlight & ANABAT survey line
- Motion camera location
- Marine plant areas
- Fauna observation

PLAN ISSUE:

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F	28/02/2024	Alignment Changes	TC	LB

0 10 20 40 m

Universal Transverse Mercator GDA 2020 MGA Zone 55 1:1,000 @ A3

saunders havill group

Bowen Pipeline Company Pty Ltd

BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 28/02/2024 8704 E 202 Waterway Field Survey F

2.25. Site 124 - Field Survey Effort



NOTES
This plan was prepared as a desktop assessment tool.
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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
- Spotlight & ANABAT survey line
- Motion camera location
- Marine plant areas
- Fauna observation

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
F	28/02/2024	Alignment Changes	TC	LB

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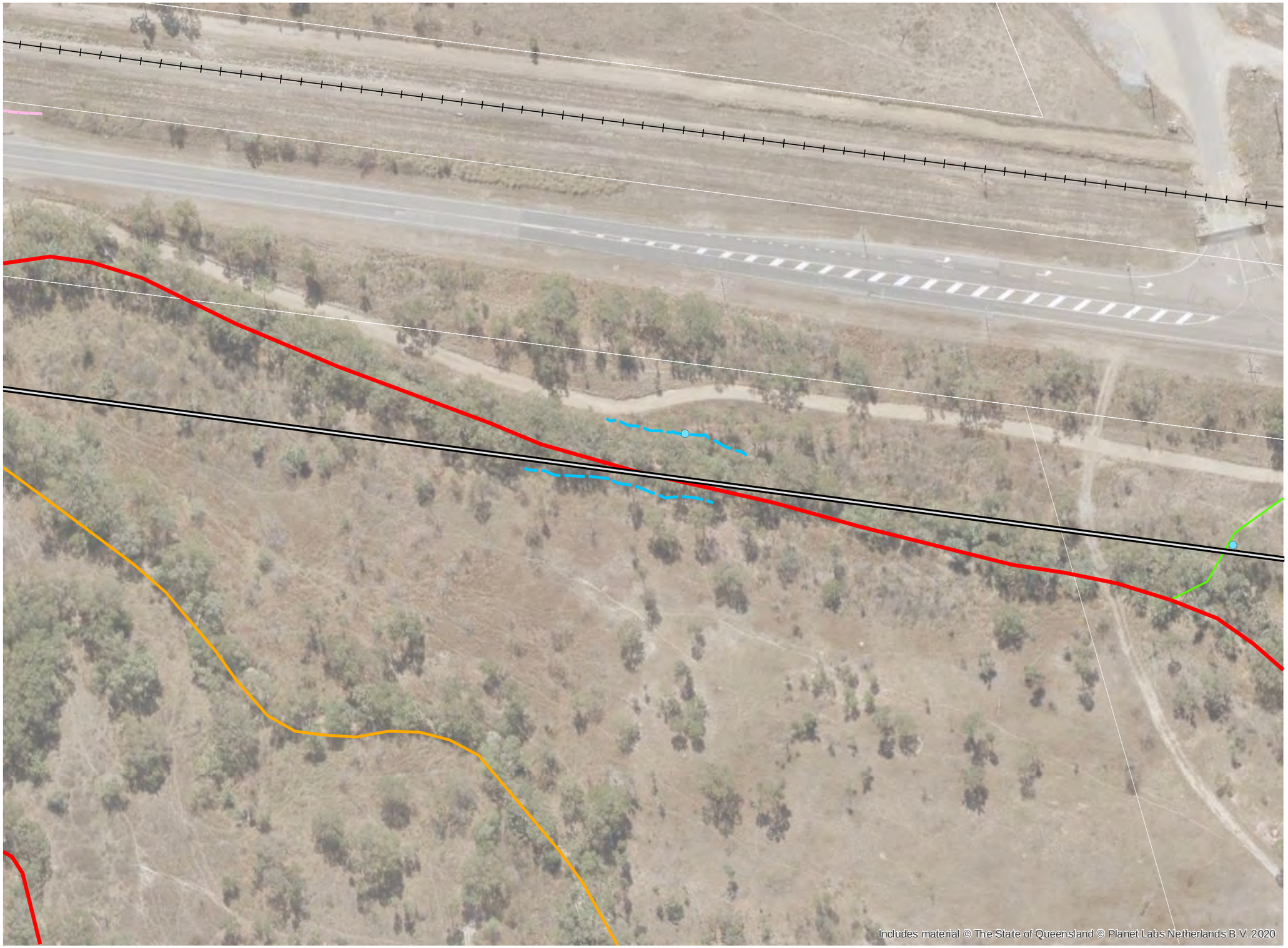
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BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 28/02/2024 8704 E 202 Waterway Field Survey F

2.26. Site 125 - Field Survey Effort



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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
- Spotlight & ANABAT survey line
- Motion camera location
- Marine plant areas
- Fauna observation

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0 10 20 40 m

Transverse Mercator GDA 2020 MGA Zone 55 1:1,000 @ A3

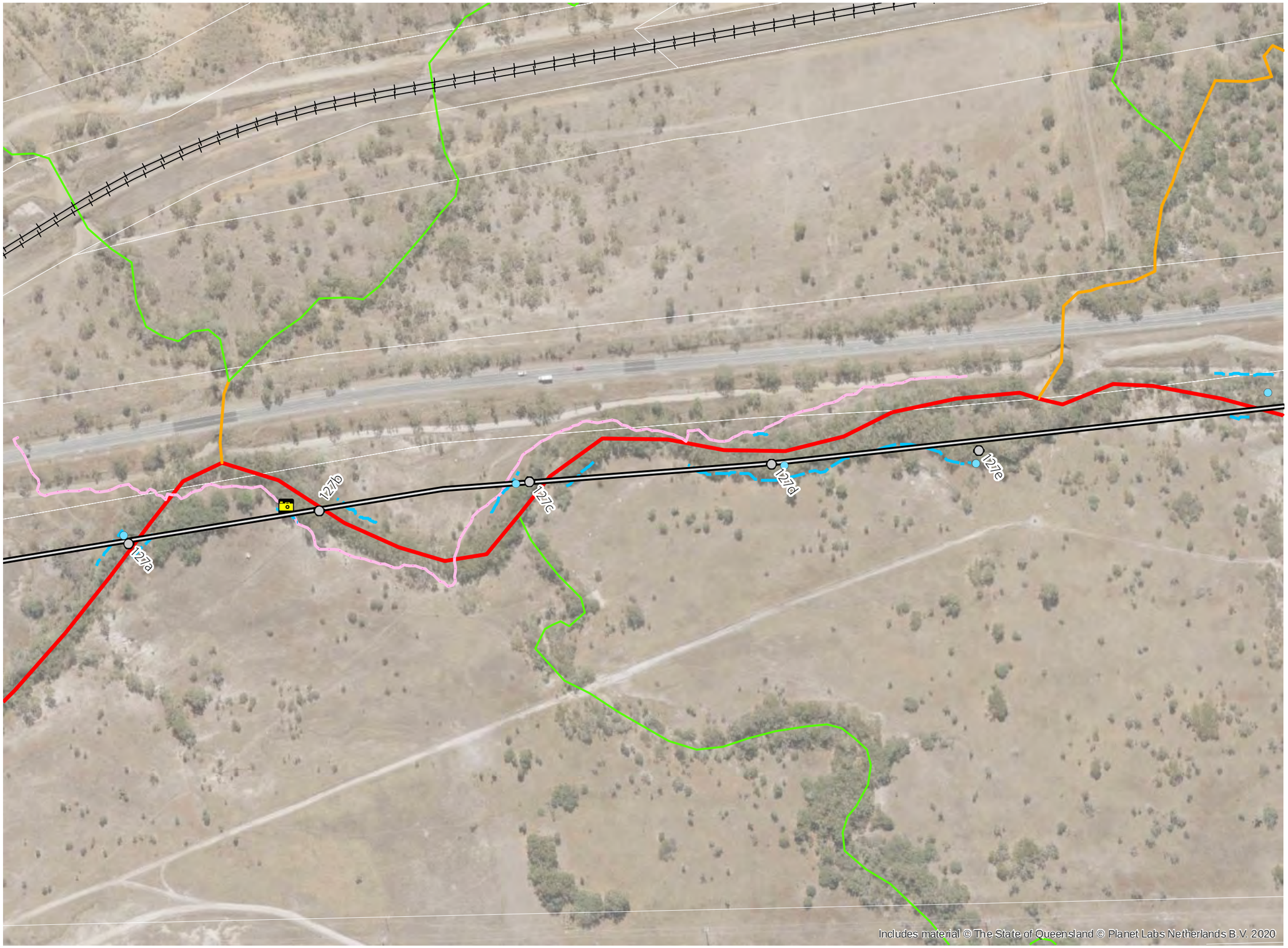
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BOWEN PIPELINE

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2.27. Site 127a - e - Field Survey Effort



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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
- Spotlight & ANABAT survey line
- Motion camera location
- Marine plant areas
- Fauna observation

PLAN ISSUE:

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0 10 20 40 m

ITransverseMercator GDA 2020 MGA Zone 55 1:2,500 @ A3

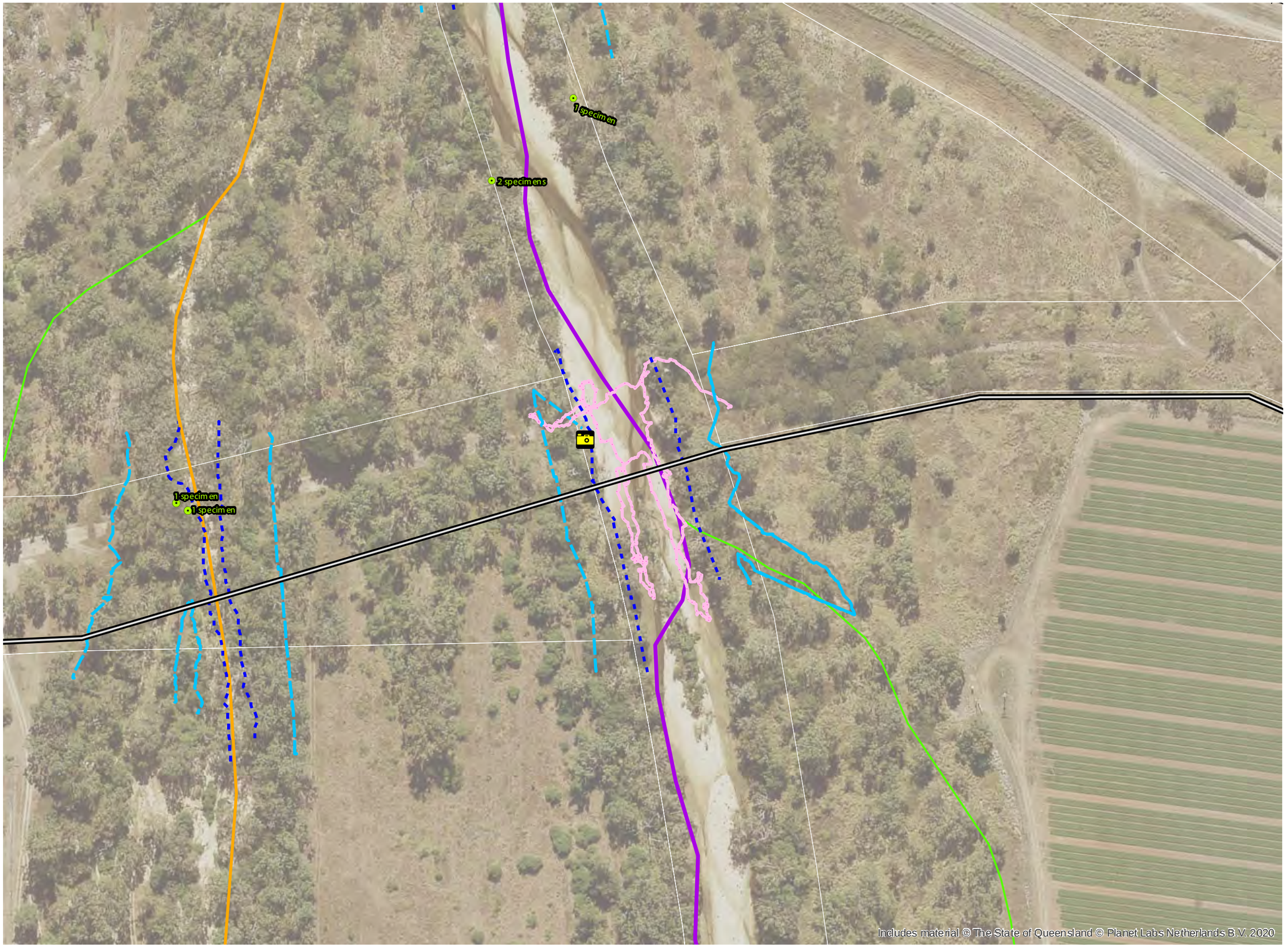
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BOWEN PIPELINE

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2.28. Site 135 - Field Survey Effort



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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
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- Fauna observation

PLAN ISSUE:

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F	28/02/2024	Alignment Changes	TC	LB

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2.29. Site 140 - Field Survey Effort



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LEGEND

- Qld DCDB
- Railway lines
- Bowen pipeline

Fisheries Act Waterways mapping

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Field survey

- Waterway low bank
- Waterway top of bank
- Waterway assessment
- Eucalyptus raveretiana
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BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 28/02/2024 8704 E 202 Waterway Field Survey F

Table 6: *Eucalyptus raveretiana* (Black Ironbox) Occurrence Summary

Site Reference	Description	Black Ironbox Specifics	Notes
1	Burdekin river	1 specimen adjacent to intake pump location	Will be tunnel bored under a site specific Environmental Management Plan
36	Rocky Ponds Creek	13 specimens in or near pipe alignment	Will be tunnel bored under a site specific Environmental Management Plan
37	Kanaka Creek	15 specimens upstream of the pipe alignment	Works to be conducted under a site specific Environmental Management Plan
43	RM Creek	15 specimens in or near pipe alignment	Will be tunnel bored under a site specific Environmental Management Plan
44	Molongle Creek	20 specimens in or near pipe alignment	Will be tunnel bored under a site specific Environmental Management Plan
54	Sandy Creek	5 specimens in or near pipe alignment	Will be tunnel bored under a site specific Environmental Management Plan
56	Big Jack Creek	2 specimens downstream of the pipe alignment	Works to be conducted under a site specific Environmental Management Plan
60	Elliot River	12 specimens in or near pipe alignment	Will be tunnel bored under a site specific Environmental Management Plan
134	Euri Creek (Western Branch)	3 specimens upstream of pipe alignment	Will be tunnel bored under a site specific Environmental Management Plan
135	Euri Creek	2 specimens upstream of pipe alignment	Will be tunnel bored under a site specific Environmental Management Plan

4.1.1 Project Area Habitat

The proposed pipeline is to be predominantly located within existing road and rail infrastructure areas and agricultural properties that are considered relatively disturbed and so unlikely to support the vast majority of the MNES with potential to occur. Where the alignment traverses across private properties, these areas demonstrated high levels of disturbance for fence lines, access tracks and cattle grazing. Areas that maintain the highest habitat values, including remnant and riparian vegetation features, are generally confined to the major watercourses traversed by the proposed pipeline alignment. These areas are currently compromised by existing infrastructure and are to be tunnel bored and managed under site specific Environmental Management Plans to mitigate the potential for adverse impacts on retained habitat values.

The remainder of the project area is considered extremely disturbed and unlikely to harbour noteworthy species or values.

Refer to **Sections 4.2** to **4.4** for further details on site specific habitat values within the project area.

4.1.2 Project Area Flora

A total of one-hundred and seventeen (117) flora species were located within the project area, including federally listed *Eucalyptus raveretiana* as outlined above (refer **Table 7**). A high proportion of recorded flora species are introduced and these include some listed as restricted under the *Biosecurity Act 2014*. All areas of remnant vegetation within the project area are relatively disturbed, if still intact, due to adjoining adverse influences associated with linear infrastructure and agricultural pursuits.

Refer to **Sections 4.2 to 4.4** for further details on site specific riparian and remnant habitat values within the project area.

Table 7: Project Area Flora List

Scientific Name	Common Name
Acacia farnesiana	Prickly Acacia
Acacia leptostachya	Slender Wattle
Acacia salicina	Sally Wattle
Ageratum houstonianum	Blue billygoat Weed
Allocasuarina cunninghamiana	River Sheoak
Alloteropsis semialata	Cockatoo Grass
Alphitonia excelsa	Soap Tree
Angophora leiocarpa	Smooth-barked Apple
Argemone mexicana	Mexican Poppy
Argyreia nervosa	Woodrose
Aristida calycina	Dark Wiregrass
Aristida latifolia	Feathertop Wiregrass
Bidens pillosa	Cobbler Peg
Bothriochloa decipiens	Pitted Bluegrass
Brachiaria decumbens	Signal Grass
Brachiaria mutica	Para Grass
Breynia oblongifolia	Coffee Bush
Capillipedium parviflorum	Scented-top Grass
Capillipedium spicigerum	Scent Top Grass
Carissa ovata	Currant Bush
Cenchrus ciliaris	Buffel Grass
Chloris gayana	Rhodes Grass
Chloris virgata	Faethertop Rhodes Grass

Scientific Name	Common Name
Clitoria ternatea	Asian Pigeonwings
Conyza sumatrensis	Tall Fleabane
Corymbia clarksoniana	Clarkson's Bloodwood
Corymbia dallachiana	Ghost Gum
Corymbia erythrophloia	Variable-barked Bloodwood
Corymbia intermedia	Pink Bloodwood
Corymbia tessellaris	Moreton Bay Ash
Cryptostegia grandiflora	Rubber Vine
Cupaniopsis anacarioides	Tuckeroo
Cyperus involucratus	False Papyrus
Dichanthium sericeum	Queensland Bluegrass
Diploglottis australis	Native Tamarind
Erythrina vespertilio	Bat's Wing Coral
Eucalyptus acmenoides	Queensland White Mahogany
Eucalyptus crebra	Narrow-leaved Ironbark
Eucalyptus melanophloia	Silver-leaved Ironbark
Eucalyptus platyphylla	White Gum
Eucalyptus raveretiana	Black Ironbox
Eucalyptus siderophloia	Grey Ironbark
Eucalyptus tereticornis	Forest Red Gum
Euphorbia sp.	-
Eustrephus latifolius	Wombat Berry
Exocarpus latifolius	Native Cherry
Ficus coronata	Sandpaper Fig
Ficus obliqua	Small-leaved Fig
Ficus racemosa	Cluster Fig
Ficus virens	White Fig
Fimbristylis nutans	A Fringe Rush
Gomphrena celosioides	Gomphrena Weed
Grevillea striata	Beefwood
Heteropogon contortus	Black Speargrass
Hybanthus stellarioides	Spade Flower

Scientific Name	Common Name
Imperata cylindrica	Blady Grass
Lantana camara	Lantana
Leucaena leucocephala	Leucaena
Limnocharis flava	Yellow Burr Head
Livistona australis	Cabbage Tree
Lomandra longifolia	Basket Grass
Lophostemon grandiflorus	Northern Swamp Box
Lophostemon suaveolens	Swamp Box
Lysiphyllum carronii	Red Bauhinia
Lysiphyllum hookeri	White Flowered Bauhinia
Macroptilium atropurpureum	Siratro
Mangifera indica	Mango Tree
Megathyrsus maximus	Guinea Grass
Melaleuca bracteata	Black Tea-tree
Melaleuca fluviatilis	River Tea-tree
Melaleuca leucadendra	Weeping Paperbark
Melaleuca viminalis	Weeping Tea-tree
Melaleuca viridiflora	Broad-leaved Paperbark
Melinis repens	Red Natal Grass
Mimosa pudica	Common Sensitive Plant
Momordica charantia	Bitter Melon
Nauclea orientalis	Leichhardt Tree
Neonotonia wightii	Green Glycine
Pandanus spiralis	Pandanus
Pandanus tectorius	Pandanus
Parsonsia straminea	Monkey Rope
Passiflora foetida	Stinking Passionflower
Passiflora suberosa	Corky Passionflower
Passiflora subpeltata	White Passion
Persicaria decipiens	Slender Knotweed
Petalostigma pubescens	Quinine Bush
Phragmites australis	Common Reeds

Scientific Name	Common Name
Phyllostachys aurea	Golden Bamboo
Planchonia careya	Cocky Apple
Pleiogynium timorense	Burdekin Plum
Ricinus communis	Castor Oil Plant
Saccharum officinarum	Sugar Cane
Schinus terebinthifolius	Broadleaf Pepper Tree
Schoenoplectus mucronatus	Star Clubrush
Senna pendula	Easter Cassia
Sesuvium portulacastrum	-
Sida cordifolia	Flannel Weed
Sida rhombifolia	Common Sida
Solanum mauritianum	Wild Tobacco
Solanum seaforthianum	Brazillian Nightshade
Sorghum halapense	Johnson Grass
Sporobolus fertilis	Paramatta Grass
Sporobolus virginicus	Salt Couch
Sporobulus virginicus	Marine Couch
Stachytarpheta cayennensis	Snakeweed
Stachytarpheta jamaicensis	Blue Snake Weed
Stylosanthes scabra	Shrubby Stylo
Suaeda australis	Seablite
Tecticornia indica spp	-
Themeda quadrivalis	Grader Grass
Themeda triandra	Kangaroo Grass
Tridax procumbens	Tridax Daisy
Typha orientalis	Bulrush
Urena lobata	Urena Burr
Vachellia farnesiana	Mimosa Bush
Xanthium occidentale	Noogoora Burr
Zizyphus mauritiana	Chinee Apple

4.1.3 Project Area Fauna

A total of fifty-five (55) fauna species were recorded within the project area (refer **Table 8**). The majority of these are considered relatively common native or feral species likely to occur in disturbed environments associated with linear infrastructure. This is with exception to two threatened species; Saltwater Crocodile (*Crocodylus porosus*), which was observed in the Burdekin River, and Squatter Pigeon (*Geophaps scripta scripta*), which were observed in cattle grazing paddocks in the western extent of the alignment near the Burdekin River. Both of these species are known to the area and are not considered to be significantly impacted by the proposal due to a general lack of optimal habitat value along the proposed pipeline and overall disturbance of the vegetation along the alignment. Refer to associated report from FRC Environmental for further information on the impact potential to aquatic species.

Refer to **Sections 4.2 to 4.4** for further details on site specific fauna and fauna habitat values within the project area.

Table 8: Project Area Fauna List

Scientific Name	Common Name
Alisterus scapularis	King Parrot
Antaresia maculosa	Spotted Python
Aquila audax	Wedge-tailed Eagle (Fly-over)
Ardea alba	Great Egret (Fly-over)
Ardea intermedia	Intermediate Egret (Fly-over)
Ardea pacifica	White-necked Heron
Bos taurus	Cow
Cacatua galerita	Sulphur Crested Cockatoo
Cacatua sanguinea	Little Corella
Calyptorhynchus banksii	Red-tailed Black Cockatoo
Canis familiaris	Dog
Centropus phasianinus	Pheasant Coucal
Coracina novaehollandiae	Black-faced Cuckoo Shrike
Coturnix ypsilophora	Brown Quail
Corvus orru	Torresian Crow
Cracticus nigrogularis	Pied Butcherbird
Cracticus tibicen	Australian Magpie
Crocodylus porosus	Saltwater Crocodile
Dacelo leachii	Blue Winged Kookaburra

Scientific Name	Common Name
Dicrurus bracteatus	Spangled Drongo
Egretta alba	Great Egret
Elanus axillaris	Black-shouldered Kite
Elseyornis melanops	Black-chested Dotterel (Fly-over)
Ephippiorhynchus asiaticus	Black-necked Stork (Fly-over)
Falco berigora	Brown Falcon
Geophaps scripta scripta	Squatter Pigeon
Grallina cyanoleuca	Magpie Lark
Grus rubicunda	Brolga (Call)
Haliastur sphenurus	Whistling Kite
Hirundo neoxena	Welcome Swallow
Isoodon macrourus	Northern Bandicoot
Lichenostomus flavus	Yellow Honeyeater
Litoria caerulea	Green Tree Frog
Litoria rothii	Roth's Tree Frog
Macropus agilis	Agile Wallaby
Macropus giganteus	Eastern Grey Kangaroo
Malurus melanocephalus	Red-backed Fairy Wren
Manorina melanocephala	Noisy Miner
Merops ornatus	Rainbow Bee-eater (Fly-over)
Milvus migrans	Black Kite
Ninox boobook	Mopoke Owl
Numida meleagris	Guineafowl
Ocyphaps lophotes	Crested Pigeon
Phalacrocoracidae	Cormorant
Platycercus adscitus	Pale-headed Rosella
Poecilia reticulata	Guppies
Pseudonaja textilis	Eastern Brown Snake
Rhinella marina	Cane Toad
Rhipidura leucophrys	Willy Wagtail
Sus scrofa	Wild Pig
Taeniopygia bichenovii	Double-barred Finch

Scientific Name	Common Name
Threskiornis spinicollis	Straw-necked Ibis
Todiramphus sanctus	Sacred Kingfisher
Trichoglossus moluccanus	Rainbow Lorikeet
Trichosurus vulpecula	Brush-tail Possum

4.2. Flow Path Assessments

A total of 140 flow paths are present along the proposed alignment with several flowpaths including multiple crossings (refer **Figure 3**). All 140 identified flow paths were assessed in the field between 2017 and 2024 (refer **Appendix D** for individual site assessment details and results).

- 2017 – (30th May – 1st June, 31st July – 4th August and 11th – 15th September)
- 2019 – (4th – 6th March)
- 2020 – (3rd – 7th August)
- 2022 – (14th – 19th November)
- 2023 – (30th January – 4th February, 19th – 23rd June and 27th – 31st November)
- 2024 – (6th – 7th February)

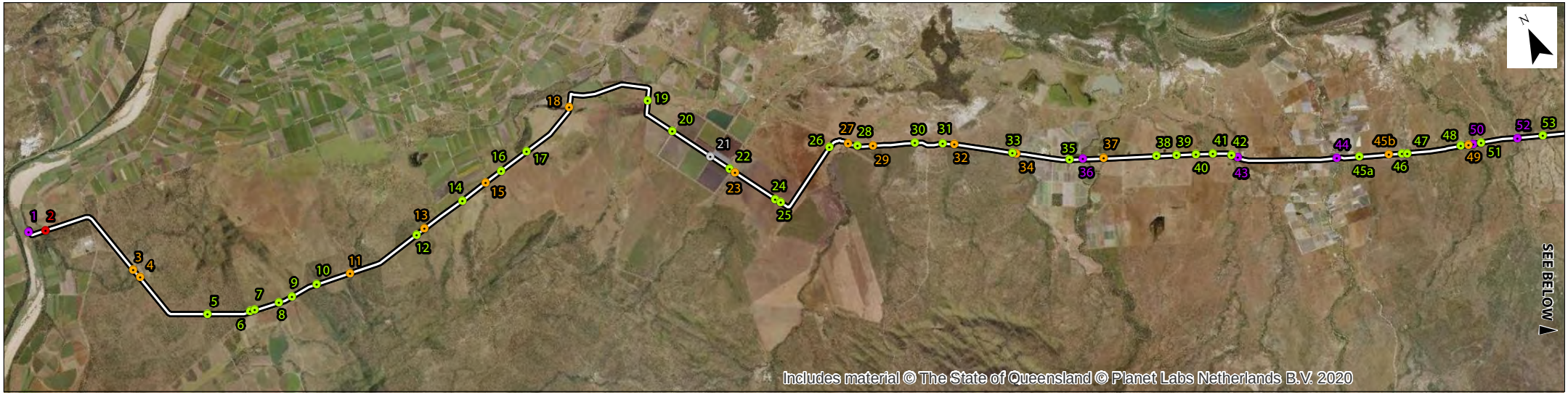
A field data template based on AUSRIVAS protocols and relevant legislative definitions for both water and habitat features was applied at each flow path assessed, as well as a photographic record of site features.

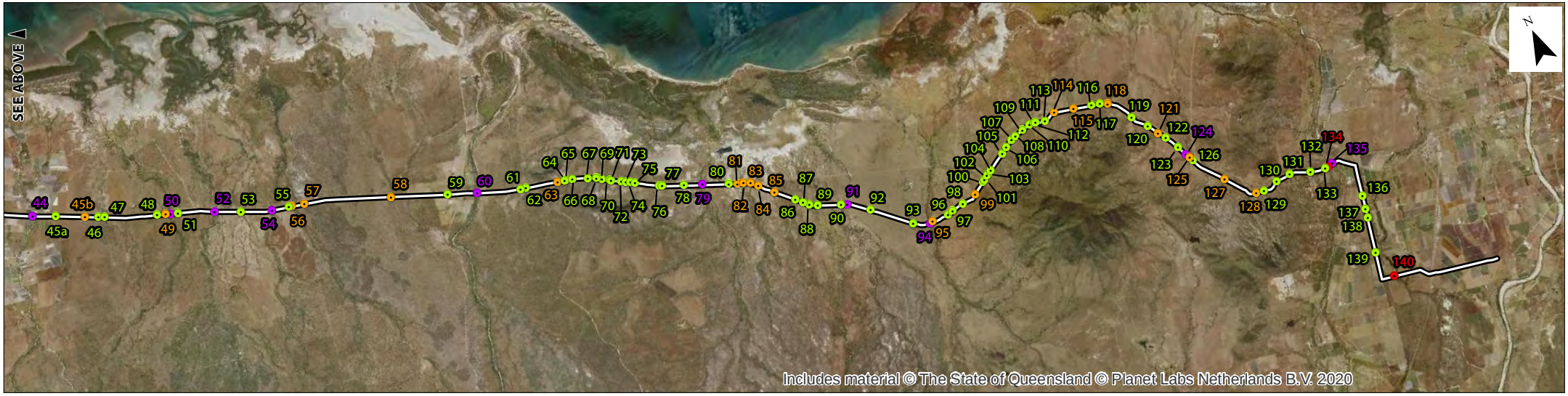
Based on the results of the preliminary flow path assessment, four categories of recommendation-based outcomes are proposed for each flow path which are summarised in **Table 9** and the following subsections, below. These recommendations reflect the potential significance of environmental matters encountered, ranging from generic management plans to tunnel boring and area specific Environmental Management Plans to mitigate potential adverse impacts.

Table 9: Flow Path Assessment Ratings Summary

Rating	Description	Recommendation
Major	Riverine and aquatic ecosystem occurring with Major level natural features and/or values (e.g. riparian vegetation)	Implementation of tunnel bore technique to minimise impacts on the riverine system Detailed seasonal studies undertaken as per area specific Environmental Management Plans
High	Riverine and aquatic ecosystem observed with High level natural features and/or values	Implementation of tunnel bore technique to minimise impacts on the riverine system
Moderate	Low potential for environmental impacts on natural values and/or features	Feature specific management plans required (e.g. VMP/FMP) Seasonal construction parameters apply

Rating	Description	Recommendation
Low	Limited to no impact on natural values and/or features	Generic management plans





Legend

Bowen Pipeline alignment

Field assessment - risk rating

- Absent
- Low
- Moderate
- High
- Major

Figure 3 *Flow Path Assessment Sites - Field Survey Rating*

File ref.	8704 E Figure 3 EX WC Rating G
Date	*27/02/2024*
Project	*Bowen Pipeline*

0 1 2 3 4 5 6 7 8 *km*

Scale (A4): 1:175,000 *[GDA 2020 MGA Z55]*

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Layer Sources *Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2024)*

4.2.1 Major Rating Summary

Flow paths rated 'Major' typically contained established riparian or remnant features supporting stable riverine and aquatic ecosystems (refer **Photo 1**). The potential for important species to occur in these areas is considered elevated due to the relative quality of habitat features available. Tunnel boring to effectively mitigate potential adverse impacts on these habitat features is recommended in conjunction with an area specific Environmental Management Plan to reduce the likelihood of potential adverse indirect impacts.



Photo 1: Typical 'MAJOR' rating flow path

4.2.2 High Rating Summary

Flow paths rated 'High' typically maintained ephemeral riverine and aquatic ecosystems in the absence of true supporting riparian habitat (refer **Photo 2**). There is potential for important species to occur in these areas due to the presence of habitat features. Tunnel boring to effectively mitigate potential adverse impacts on these habitat features is recommended.



Photo 2: Typical 'HIGH' rating flow path

4.2.3 Moderate Rating Summary

Flow paths rated 'Moderate' typically maintained limited habitat features and do not support true riverine nor aquatic ecosystems within a relatively disturbed and fragmented landscape (refer **Photo 3**). Feature specific management plans, such as Vegetation and Fauna Management Plans, to effectively mitigate potential adverse impacts on these lower order habitat features is recommended.



Photo 3: Typical 'MODERATE' rating flow path

4.2.4 Low Rating Summary

Flow paths rated 'Low' typically did not maintain noteworthy habitat features and occur within a relatively disturbed and fragmented landscape (refer **Photo 4**). Generic management plans (e.g. sediment and erosion control) are recommended to mitigate potential adverse indirect impacts that could arise from works on these features.



Photo 4: Typical 'LOW' rating flow path

4.2.5 Flow Path Results Summary

Table 10 and **Figure 3** provide the details and ratings for each assessment site.

Table 10: Flow Path Ratings

Site Number	Site Name	Northing	Easting	Rating
1	Burdekin River	-19.72622	147.27513	Major
2	Un-named Drainage Feature	-19.72684	147.28016	High
3	Stokes Creek Tributary	-19.75072	147.30225	Moderate
4	Stokes Creek	-19.75401	147.30315	Moderate
5	Un-named Drainage Feature	-19.77423	147.31916	Low
6	Un-named Drainage Feature	-19.77949	147.33294	Low
7	Un-named Drainage Feature	-19.77968	147.33459	Low
8	Un-named Drainage Feature	-19.78068	147.34328	Low
9	Un-named Drainage Feature	-19.78074	147.34839	Low
10	Un-named Drainage Feature	-19.78052	147.35815	Low
11	Six Mile Creek	-19.78184	147.37005	Moderate
12	Un-named Drainage Feature	-19.77961	147.39690	Low
13	Four Mile Creek	-19.77893	147.40013	Moderate
14	Un-named Drainage Feature	-19.77565	147.41615	Low
15	Two Mile Creek	-19.77358	147.42619	Moderate
16	Un-named Drainage Feature	-19.77224	147.43269	Low
17	Un-named Drainage Feature	-19.76993	147.44381	Low
18	Constructed Creek	-19.76259	147.46359	Moderate
19	Constructed Drainage Feature	-19.77162	147.48939	Low
20	Constructed Drainage Feature	-19.78410	147.49281	Low
21	Un-named Drainage Feature	-19.79684	147.50115	Absent
22	Un-named Drainage Feature	-19.80322	147.50532	Low
23	Yellow Gin Creek	-19.80513	147.50658	Moderate
24	Un-named Drainage Feature	-19.81855	147.51542	Low
25	Un-named Drainage Feature	-19.82043	147.51666	Low
26	Un-named Drainage Feature	-19.81071	147.54004	Low
27	Wangaratta Creek	-19.81196	147.54654	Moderate
28	Un-named Drainage Feature	-19.81408	147.54901	Low

Site Number	Site Name	Northing	Easting	Rating
29	Slater Creek	-19.81617	147.55391	Moderate
30	Spring Creek	-19.82110	147.56776	Low
31	Un-named Drainage Feature	-19.82501	147.57632	Low
32	Arrow Creek	-19.82698	147.58000	Moderate
33	Un-named Drainage Feature	-19.83755	147.59713	Low
34	Wilson Creek	-19.83823	147.59824	Moderate
35	Un-named Drainage Feature	-19.84754	147.61425	Low
36	Rocky Ponds Creek	-19.84918	147.61849	Major
37	Kanaka Creek	-19.85174	147.62507	Moderate
38	Waistcoat Creek	-19.85833	147.64210	Low
39	Gates Creek	-19.86083	147.64856	Low
40	Un-named creek	-19.86333	147.65502	Low
41	Un-named creek	-19.86543	147.66045	Low
42	Un-named creek	-19.86857	147.66604	Low
43	RM Creek	-19.87006	147.66766	Major
44	Monongle Creek	-19.88390	147.69882	Major
45 (a)	Un-named Drainage Feature	-19.88666	147.70637	Low
45 (b)	Un-named Drainage Feature	-19.89003	147.71587	Moderate
46	Un-named Drainage Feature	-19.89160	147.72030	Low
47	Un-named Drainage Feature	-19.89223	147.72208	Low
48	Armstrong Creek Overflow	-19.89741	147.73979	Low
49	Armstrong Creek tributary	-19.89812	147.74262	Moderate
50	Armstrong Creek	-19.89852	147.74422	Major
51	Un-named Drainage Feature	-19.89917	147.74682	Low
52	Cape Creek	-19.90271	147.75900	Major
53	Un-named Drainage Feature	-19.90564	147.76745	Low
54	Sandy Creek	-19.90874	147.77778	Major
55	Un-named Drainage Feature	-19.90963	147.78379	Low
56	Big Jack Creek	-19.90979	147.78488	Moderate
57	Un-named Drainage Feature	-19.91043	147.78928	Moderate
58	Jack Creek	-19.91788	147.81847	Moderate
59	Un-named Drainage Feature	-19.92341	147.83725	Low

Site Number	Site Name	Northing	Easting	Rating
60	Elliott River	-19.92610	147.84709	Major
61	Maiden Creek Tributary	-19.92973	147.86168	Low
62	Maiden Creek	-19.93002	147.86364	Low
63	Un-named Drainage Feature	-19.93172	147.87485	Moderate
64	Un-named Drainage Feature	-19.93206	147.87720	Low
65	Un-named Drainage Feature	-19.93209	147.87782	Low
66	Un-named Drainage Feature	-19.93248	147.87997	Low
67	Un-named Drainage Feature	-19.93388	147.88526	Low
68	Un-named Drainage Feature	-19.93498	147.88787	Low
69	Un-named Drainage Feature	-19.93573	147.88947	Low
70	Un-named Drainage Feature	-19.93686	147.89191	Low
71	Un-named Drainage Feature	-19.93707	147.89237	Low
72	Un-named Drainage Feature	-19.93857	147.89559	Low
73	Un-named Drainage Feature	-19.93928	147.89712	Low
74	Un-named Drainage Feature	-19.93999	147.89865	Low
75	Un-named Drainage Feature	-19.94058	147.89992	Low
76	Un-named Drainage Feature	-19.94406	147.90748	Low
77	Un-named Drainage Feature	-19.94453	147.90873	Low
78	Un-named Drainage Feature	-19.94673	147.91578	Low
79	Saltwater Creek	-19.94843	147.92130	Major
80	Un-named Marine Mudflat	-19.95133	147.93067	Low
81	Un-named Drainage Feature	-19.95219	147.93346	Moderate
82	Un-named Drainage Feature	-19.95270	147.93549	Moderate
83	Un-named Drainage Feature	-19.95351	147.93797	Moderate
84	Un-named Drainage Feature	-19.95535	147.94012	Moderate
85	Un-named Drainage Feature	-19.95902	147.94475	Moderate
86	Un-named Drainage Feature	-19.96349	147.95057	Low
87	Un-named Drainage Feature	-19.96526	147.95288	Low
88	Un-named Drainage Feature	-19.96654	147.95455	Low
89	Un-named Drainage Feature	-19.96787	147.95741	Low
90	Un-named Drainage Feature	-19.97012	147.96501	Low
91	Plain Creek	-19.97073	147.96711	Major

Site Number	Site Name	Northing	Easting	Rating
92	Un-named Drainage Feature	-19.97514	147.97416	Low
93	Un-named Drainage Feature	-19.98382	147.98652	Low
94	Splitters Creek	-19.98581	147.99212	Major
95	Splitters Creek Tributary	-19.98569	147.99301	Moderate
96	Un-named Drainage Feature	-19.98525	147.99894	Low
97	Un-named Drainage Feature	-19.98452	148.00087	Low
98	Un-named Drainage Feature	-19.98333	148.00516	Low
99	Spring Creek	-19.98189	148.01024	Moderate
100	Un-named Drainage Feature	-19.97890	148.01424	Low
101	Un-named Drainage Feature	-19.97828	148.01510	Low
102	Un-named Drainage Feature	-19.97752	148.01616	Low
103	Un-named Drainage Feature	-19.97698	148.01692	Low
104	Un-named Drainage Feature	-19.97615	148.01807	Low
105	Un-named Drainage Feature	-19.97202	148.02381	Low
106	Un-named Drainage Feature	-19.97057	148.02584	Low
107	Un-named Drainage Feature	-19.96889	148.02844	Low
108	Un-named Drainage Feature	-19.96822	148.03019	Low
109	Un-named Drainage Feature	-19.96721	148.03307	Low
110	Un-named Drainage Feature	-19.96617	148.03610	Low
111	Un-named Drainage Feature	-19.96610	148.03803	Low
112	Un-named Drainage Feature	-19.96617	148.03846	Low
113	Un-named Drainage Feature	-19.96678	148.04167	Low
114	Maria Creek	-19.96530	148.04574	Moderate
115	Mount Stuart Creek	-19.96623	148.05239	Moderate
116	Un-named Drainage Feature	-19.96721	148.05865	Low
117	Un-named Drainage Feature	-19.96769	148.06163	Low
118	Six Mile Creek	-19.96848	148.06409	Moderate
119	Un-named Drainage Feature	-19.97534	148.07062	Low
120	Un-named Drainage Feature	-19.97988	148.07481	Low
121	Breakfast Creek	-19.98312	148.07740	Moderate
122	Un-named Drainage Feature	-19.98556	148.07935	Low
123	Un-named Drainage Feature	-19.98981	148.08223	Low

Site Number	Site Name	Northing	Easting	Rating
124	Goodbye Creek	-19.99266	148.08387	Major
125	Goodbye Creek Tributary	-19.99415	148.08475	Moderate
126	Un-named Drainage Feature	-19.99536	148.08546	Low
127	Little Goodbye Creek	-20.00184	148.09101	Moderate
128	Magnetic Creek Tributary	-20.01240	148.10260	Moderate
129	Magnetic Creek Tributary	-20.01268	148.10543	Low
130	Un-named Drainage Feature	-20.01128	148.11060	Low
131	Un-named Drainage Feature	-20.01046	148.11550	Low
132	Un-named Drainage Feature	-20.01188	148.12274	Low
133	Un-named Drainage Feature	-20.01245	148.12793	Low
134	Euri Creek Tributary	-20.01226	148.12927	High
135	Euri Creek	-20.01181	148.13082	Major
136	Un-named Drainage Feature	-20.02516	148.13710	Low
137	Un-named Drainage Feature	-20.02978	148.13654	Low
138	Un-named Drainage Feature	-20.03244	148.13622	Low
139	Un-named Drainage Feature	-20.04414	148.13479	Low
140	Formed Creek	-20.05350	148.13821	High

Table 11, below, summarises assessments as per the number of each category applied for all 140 flow path assessments.

The vast majority (93 or 66%) of the flow paths assessed were assessed as 'Low' (or absent) and so negligible if any adverse impacts upon natural values are expected at these locations where generic management plans are recommended.

Areas rated as 'Moderate' numbered 31 and generally possess a low potential for adverse environmental impacts provided area specific management plans are applied with consideration of timing to avoid seasonal influences.

Importantly, tunnel boring is recommended at 16 flow path locations, rated 'Major' or 'High', with the former rating also requiring site specific Environmental Management Plans, to mitigate the potential for adverse impacts on the higher value habitat features inherent at these locations.

Table 11: Flow Path Recommendations Summary

Rating	Description	Count
Major	Riverine and aquatic ecosystem occurring with Major level natural features and/or values (e.g. riparian vegetation)	13
High	Riverine and aquatic ecosystem observed with High level natural features and/or values	3
Moderate	Low potential for environmental impacts on natural values and/or features	31
Low	Limited to no impact on natural values and/or features	92
Absent	No evidence of flow path/highly modified for tracks/sugar cane production	1

4.3. Pump Station and Balance Tank Locations Assessment

Pump Station and Balance Tank locations are proposed at relatively disturbed sites where necessary along the proposed alignment at:

- Burdekin River
- Inkerman
- Guthalungra
- Salisbury Plains
- Merinda

Refer to **Plan 3** for Pump Station and Balance Tank location context. The ecological values at each location are provided below.

3.01. Context - Pump Stations



NOTES
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LEGEND

- Bowen pipeline
- Pump Station

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
E	28/02/2024	Final Alignment	TC	AD

0 1 2 4 6 8 10 km

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3.02. Pump Stations - Kirknie Intake Location



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LEGEND

- QLD DCDB
- Bowen pipeline
- Pump Station
- Indicative pump station boundary

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
E	28/02/2024	Final Alignment	TC	AD

0 5 10 20 30 40 50 m

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3.03. Pump Stations - Inkerman Pump Station



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LEGEND

- QLD DCDB
- Bowen pipeline
- Pump Station
- Indicative pump station boundary

PLAN ISSUE:

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E	28/02/2024	Final Alignment	TC	AD

0 5 10 20 30 40 50 m

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3.04. Pump Stations - Guthalungra Pump Station & Tank



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LEGEND

- QLD DCDB
- Bowen pipeline
- Pump Station
- Indicative pump station boundary

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
E	28/02/2024	Final Alignment	TC	AD

0 5 10 20 30 40 50 m

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3.05. Pump Stations - Salisbury Plains Pump Station & Tank



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LEGEND

- QLD DCDB
- Bowen pipeline
- Pump Station
- Indicative pump station boundary

PLAN ISSUE:

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E	28/02/2024	Final Alignment	TC	AD

0 5 10 20 30 40 50 m

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3.06. Pump Stations - Merinda Pump Station & Tank



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LEGEND

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- Bowen pipeline
- Pump Station
- Indicative pump station boundary

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0 5 10 20 30 40 50 m

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4.3.1 Kirknie Intake Pump Station Assessment

This assessment relates to the intake pump station location at the Burdekin River, considering the riparian and terrestrial values present at the proposed location. Please refer to the FRC Environmental report accompanying this referral for further information regarding potential impacts on aquatic values in the Burdekin River as result of the intake structure.

The proposed intake pump station is located on the Burdekin River west of Lot 57 on SP236356 north of Barry Road (refer **Plan 3.02**). Currently, the site is utilised for agricultural production and intensive cropping with a river pump station already present to the south. The property is adjacent the Burdekin Riverbank and is mapped with non-remnant and remnant vegetation under the VMA. Much of the remnant mapping is within the neighbouring property to the south and adjacent to the Burdekin River. Remnant vegetation on the lower slopes of the Burdekin River is mapped as *Least Concern* RE 11.3.25 whilst the upper slopes are mapped with *Of Concern* RE 11.3.4 (refer **Plan Set 1**). On-ground observations confirmed that vegetation reflected remnant mapping, with the lower stream area of the Burdekin River reflecting RE 11.3.25 whilst the upper reaches reflected RE 11.3.4, albeit in a highly disturbed state.

The bank where the pump station is proposed is highly modified, with access tracks cut into the area for the adjacent separate pump station currently under construction to the south. Movement of heavy machinery and trucks was noted on this access track at the time of assessment, with much of the canopy vegetation absent or restricted to the high upper banks or directly adjacent to the river. Historical and on-going land use has resulted in vegetation being highly disturbed and dominated by invasive species; *Argemone mexicana* (Mexican Poppy), *Megathyrsus maximus* (Guinea Grass), *Ricinus communis* (Castor Oil Plant), *Solanum mauritianum* (Wild Tobacco), *Senna pendula* (Easter Cassia) and *Xanthium occidentale* (Noogoora Burr) (refer **Table 12** and **Photos 5-7**). Dominance of weeds is largely consistent throughout the riverbank until the lower bank where a rocky substrate is present and is characterised by scattered *Melaleuca fluviatilis* (River Bottlebrush), *Pleiogynium timoriense* (Burdekin Plum) and *Melaleuca viminalis* (Weeping Bottlebrush), reflecting remnant mapping. Invasive vine and shrub species are, however, still significant through this vegetation. Beyond this vegetation, sand is the dominant substrate and vegetation is not present due to the highly dynamic environment of the Burdekin River.

Canopy vegetation on the upper banks include *Eucalyptus tereticornis* (Forest Red Gum), *Corymbia dallachiana* (Ghost Gum), *Eucalyptus platyphylla* (Poplar Gum), *Corymbia tessellaris* (Moreton Bay Ash), *Eucalyptus melanophloia* (Silver-leaved Ironbark) and *Lophostemon suaveolens* (Swamp Box). Notably a single specimen of *Eucalyptus raveretiana* (Black Ironbox) was recorded within the proposed intake pump location. The shrub layer is largely absent, consisting largely of the aforementioned invasive species due to disturbance in the area, with the ground layer almost entirely invasive grasses. In general, the intake pump station location holds limited to no ecological values given its historical and current agricultural land uses, lack of native vegetation and heavily weeded state.

A drainage feature is mapped through the site of the proposed pump and tank location; however, no waterway features were observed on site (refer **Figure 3 Site 1**).

Fauna observed at the site were largely common avian species, however, one (1) Saltwater Crocodile (*Crocodylus porosus*) was sighted in the Burdekin River at the time of assessment (Refer **Table 13**). It is noted that this species is known to inhabit the Burdekin River. This species is listed as *Vulnerable* under the NCA and therefore requires special considerations. Assessments by Aquatic Ecologists from FRC Environmental indicate the pump station to be low risk for aquatic fauna including Saltwater Crocodiles. Refer to the associated FRC Environmental Report for further information.



Photo 5: Highly disturbed bank vegetation (upper) where intake station is proposed.



Photo 6: Highly disturbed bank vegetation (lower) where intake station is proposed.



Photo 7: Adjacent pump station works.

Table 12: Burdekin River Flora Species List

Strata	Scientific Name	Common Name
T1/T2	*Corymbia dallachiana*	Ghost Gum
	Corymbia intermedia	Pink Bloodwood
	Corymbia tessellaris	Moreton Bay Ash
	Eucalyptus melanophloia	Silver-leaved Ironbark
	Eucalyptus platyphylla	Poplar Gum
	Eucalyptus tereticornis	Forest Red Gum
	Lophostemon suaveolens	Swamp Box
	Melaleuca fluviatilis	River Bottlebrush
	Melaleuca viminalis	Weeping Bottle Brush
	Pleiogynium timorense	Burdekin Plum
Shrub/Ground	*Argemone mexicana*	Mexican Poppy
	Chloris gayana	Rhodes Grass
	Gomphrena celosioides	Gomphrena Weed
	Megathyrsus maximus	Guinea Grass
	Momordica charantia	Bitter Melon
	Ricinus communis	Castor Oil Plant
	Passiflora subpeltata	White Passionflower
	Schinus terebinthifolius	Broadleaf Pepper Tree
	Senna pendula	Easter Cassia
	Sida cordifolia	Flannel Weed
	Solanum mauritianum	Wild Tobacco
	Solanum seaforthianum	Brazillian Nightshade
	Sorghum halapense	Johnson Grass
	Sporobolus fertilis	Paramatta Grass
	Stachytarpheta jamaicensis	Blue Snake Weed
	Xanthium occidentale	Noogoora Burr

Table 13: Burdekin River Fauna Species List

Scientific Name	Common Name
Aquila audax	Wedge-tail Eagle
Egretta alba	Great Egret

Scientific Name	Common Name
Coracina novaehollandiae	Black-faced Cuckoo-shrike
Corvus orru	Torresian Crow
Cracticus tibicen	Australian Magpie
Crocodylus porosus	Saltwater Crocodile
Grallina cyanoleuca	Magpie Lark
Hirundo neoxena	Welcome Swallow
Manorina melanocephala	Noisy Miner
Ocyphaps lophotes	Crested Pigeon
Rhipidura leucophrys	Willy Wagtail
Trichoglossus haematodus moluccanus	Rainbow Lorikeet

4.3.2 Inkerman Pump Station

The proposed pump location at Inkerman on Lot 68 on SB362 is utilised as cattle pastoral production and agricultural land (refer **Plan 3.03**). The land is mapped as 'non remnant' under the VMA (refer **Plan Set 1**) and contains limited native vegetation (refer **Table 14** and **Photos 8-10**).

The native canopy species are extremely sparse, with scattered *Eucalyptus platyphylla* (White Gum), *Corymbia erythrophloia* (Variable-barked Bloodwood), *Corymbia tessellaris* (Moreton Bay Ash), *Corymbia dallachiana* (Ghost Gum) and *Grevillea striata* (Beefwood). The shrub layer is dominated by *Ziziphus mauritiana* (Chinee Apple), an identified restricted plant under the Biosecurity Act. The ground layer consists of a mix of native grasses, *Gomphrena celosioides* (Gomphrena) and *Sida cordifolia* (Flannel weed). The pump location is largely devoid of ecological values given the paucity of native vegetation, weed infestation, highly disturbed nature and historical land uses.

Only common fauna were observed at the Inkerman pump station site (refer **Table 15**).



Photo 8: Chinee Apple dominated shrub layer with sporadic Ghost Gum.



Photo 9: Isolated White Gum and Moreton Bay Ash at the proposed Inkerman Pump location.



Photo 10: Chinee Apple dominant shrub layer.

Table 14: Inkerman Flora Species List

Strata	Scientific Name	Common Name
T1/T2	*Acacia salicina*	Sally Wattle
	Corymbia dallachiana	Ghost Gum
	Corymbia erythrophloia	Variable-barked Bloodwood
	Eucalyptus platyphylla	White Gum
	Grevillea striata	Beefwood
Shrub/Ground	*Argemone mexicana*	Mexican Poppy
	Aristida calycina	Dark Wiregrass
	Aristida latifolia	Feathertop Wiregrass
	Bothriochloa decipiens	Pitted Bluegrass
	Cryptostegia grandiflora	Rubber Vine
	Gomphrena celosioides	Gomphrena Weed
	Heteropogon contortus	Black Speargrass
	Macroptilium atropurpureum	Siratro
	Sorghum halapense	Johnson Grass
	Stachytarpheta jamaicensis	Blue Snake Weed
	Stylosanthes scabra	Shrubby Stylo
	Zizyphus mauritiana	Chinee Apple

Table 15: Inkerman Fauna Species List

Scientific Name	Common Name
Alisterus scapularis	King Parrot
Corvus orru	Torresian Crow
Dacelo leachii	Blue Winged Kookaburra
Falco berigora	Brown Falcon
Grallina cyanoleuca	Peewee Mudlark
Hirundo neoxena	Welcome Swallow
Milvus migrans	Fork-tailed Kite
Rhipidura leucophrys	Willy Wagtail
Taeniopygia bichenovii	Double-barred Finch

4.3.3 Guthalungra Pump Station

The pump and balance tank location at Guthalungra is proposed within non-remnant vegetation on Lot 28 on SB505. Lot 28 is utilised as active and fallow cropping land (refer **Plan 3.04**). The fallow cropping land towards the eastern boundary of Lot 28 is heavily weeded with *Argemone Mexicana* (Mexican Poppy) and *Gomphrena celosioides* (Gomphrena) (refer **Table 16** and **Photos 11-13**).

Lot 4266 on PH34 on the western boundary of the proposed pump and tank location is utilised as cattle farming and agricultural land mapped as 'non-remnant' under the VMA (refer **Plan Set 1**).

Only common fauna were observed at the Guthalungra pump station site (refer **Table 17**).



Photo 11: Fallow cropping land within the proposed Guthalungra pump and balance tank location.



Photo 12: Active cropping land within the proposed Guthalungra Pump and Balance Tank location.



Photo 13: Heavily weeded fallow cropping land towards the eastern boundary of Lot 28.

Table 16: Guthalungra Flora Species List

Strata	Scientific Name	Common Name
T1/T2	*Acacia salicina*	Sally Wattle
	Angophora leiocarpa	Smooth-barked Apple
	Corymbia dallachiana	Ghost Gum
	Corymbia erythrophloia	Variable-barked Bloodwood
	Corymbia tessellaris	Moreton Bay Ash
	Eucalyptus crebra	Narrow-leaved Ironbark
	Eucalyptus platyphylla	White Gum
	Eucalyptus siderophloia	Grey Ironbark
	Grevillea striata	Beefwood
	Petalostigma pubescens	Quinine Bush
Shrub/Ground	*Argemone mexicana*	Mexican Poppy
	Aristida calycina	Dark Wiregrass
	Aristida latifolia	Feathertop Wiregrass
	Bothriochloa decipiens	Pitted Bluegrass
	Carissa ovata	Currant Bush
	Cryptostegia grandiflora	Rubber Vine
	Gomphrena celosioides	Gomphrena Weed
	Heteropogon contortus	Black Speargrass
	Macroptilium atropurpureum	Siratro
	Sida cordifolia	Sida
	Sorghum halapense	Johnson Grass
	Stachytarpheta jamaicensis	Blue Snake Weed
	Stylosanthes scabra	Shrubby Stylo
	Themeda triandra	Kangaroo Grass
	Zizyphus mauritiana	Chinee Apple

Table 17: Guthalungra Fauna Species List

Scientific Name	Common Name
Cacatua galerita	Sulphur Crested Cockatoo
Corvus orru	Torresian Crow
Falco berigora	Brown Falcon

Scientific Name	Common Name
Grallina cyanoleuca	Peewee Mudlark
Haliastur sphenurus	Whistling Kite
Hirundo neoxena	Welcome Swallow
Milvus migrans	Fork-tailed Kite
Platycercus adscitus	Pale-headed Rosella
Rhipidura leucophrys	Willy Wagtail
Taeniopygia bichenovii	Double-barred Finch

4.3.4 Salisbury Plains Pump Station

The proposed pump and balance tank location at Salisbury Plains on Lot 7 on SP275843 is utilised as cattle pastoral production and agricultural land (refer **Plan 3.05**). The land is mapped as 'non remnant' under the VMA (refer **Plan Set 1**) and contains limited native vegetation (refer **Table 18** and **Photos 14-16**).

The area consists of scattered *Corymbia dallachiana* (Ghost gum), *Corymbia tessellaris* (Moreton Bay Ash) and *Eucalyptus crebra* (Narrow-leaved Red Gum). The shrub layer is sparse consisting of scattered exotic and native species such as *Lysiphyllum hookeri* (White Flowered Bauhinia) and *Acacia farnesiana* (Prickly Acacia). The ground layer consists of a mix of exotic and native grasses indicative of the local land-use.

A drainage feature is mapped through the site of the proposed pump and tank location; however, no waterway features were observed on site (refer **Figure 3 Site 99**).

Only common fauna were observed at the Salisbury Plains pump location (refer **Table 19**).



Photo 14: Open paddocks with scattered native vegetation within Salisbury Plains Pump and Balance Tank location.



Photo 15: Open paddocks with scattered native vegetation within Salisbury Plains Pump and Balance Tank location.



Photo 16: Sparse native and exotic vegetation at the shrub within Salisbury Plains Pump and Balance Tank location.

Table 18: Salisbury Plains Flora List

Strata	Scientific Name	Common Name
T1/T2	*Acacia salicina*	Sally Wattle
	Acacia farnesiana	Prickly Acacia
	Corymbia dallachiana	Ghost Gum
	Corymbia tessellaris	Moreton Bay Ash
	Eucalyptus platyphylla	White Gum
	Lysiphyllum hookeri	White Flowered Bauhinia
Shrub/Ground	*Argemone mexicana*	Mexican Poppy
	Aristida calycina	Dark Wiregrass
	Aristida latifolia	Feathertop Wiregrass
	Bothriochloa decipiens	Pitted Bluegrass
	Cryptostegia grandiflora	Rubber Vine
	Gomphrena celosioides	Gomphrena Weed
	Heteropogon contortus	Black Speargrass
	Macroptilium atropurpureum	Siratro
	Sorghum halapense	Johnson Grass

Table 19: Salisbury Plains Fauna List

Scientific Name	Common Name
Alisterus scapularis	King Parrot
Coracina novaehollandiae	Black-faced Cuckoo Shrike
Corvus orru	Torresian Crow
Cracticus nigrogularis	Pied Butcherbird
Dacelo leachii	Blue Winged Kookaburra
Falco berigora	Brown Falcon
Grallina cyanoleuca	Peewee Mudlark
Haliastur sphenurus	Whistling Kite
Hirundo neoxena	Welcome Swallow
Lichenostomus flavus	Yellow Honeyeater
Manorina melanocephala	Noisy Miner
Merops ornatus	Rainbow Bee-eater (Fly-over)
Milvus migrans	Fork-tailed Kite

Scientific Name	Common Name
Rhipidura leucophrys	Willy Wagtail
Taeniopygia bichenovii	Double-barred Finch
Trichoglossus moluccanus	Rainbow Lorikeet

4.3.5 Merinda Pump Station

The proposed pump and balance tank location at Merinda on Lot 94 on HR1038 is utilised as agricultural land (refer **Plan 3.06**). The land is mapped as 'non remnant' under the VMA (refer **Plan Set 1**) and contains limited native vegetation (refer **Table 20** and **Photos 17-19**). The proposed location lies within an area dominated by agricultural practices. As such, vegetation has been largely cleared with some scattered trees such as *Corymbia dallachiana* (Ghost gum), *Corymbia tessellaris* (Moreton Bay Ash) and *Acacia salicina* (Sally Wattle) and exotic grasses including *Sorghum halepense* (Johnson grass) along the road edge.

Only common fauna were observed at the Merinda pump location (refer **Table 21**).



Photo 17: Agricultural land with exotic grasses at Merinda Pump and Balance Tank Station.



Photo 18: Agricultural land with exotic grasses and scattered trees at Merinda Pump and Balance Tank Station.



Photo 19: Agricultural land with exotic grasses and scattered trees at Merinda Pump and Balance Tank Station.

Table 20: Merinda Flora List

Strata	Scientific Name	Common Name
T1/T2	*Acacia salicina*	Sally Wattle
	Corymbia dallachiana	Ghost Gum
	Corymbia tessellaris	Moreton Bay Ash
Shrub/Ground	*Argemone mexicana*	Mexican Poppy
	Aristida calycina	Dark Wiregrass
	Gomphrena celosioides	Gomphrena Weed
	Sorghum halapense	Johnson Grass

Table 21: Merinda Fauna List

Scientific Name	Common Name
Coracina novaehollandiae	Black-faced Cuckoo Shrike
Corvus orru	Torresian Crow
Cracticus nigrogularis	Pied Butcherbird
Falco berigora	Brown Falcon
Grallina cyanoleuca	Peewee Mudlark
Haliastur sphenurus	Whistling Kite
Hirundo neoxena	Welcome Swallow
Manorina melanocephala	Noisy Miner
Merops ornatus	Rainbow Bee-eater (Fly-over)
Milvus migrans	Fork-tailed Kite
Rhipidura leucophrys	Willy Wagtail

4.4. Compromised Remnant Polygons Assessment

From Plan Set 5, there are eight (8) locations with remnant vegetation values that are mapped as encroaching into the existing access track, road and/or rail corridor where the pipeline alignment is proposed. Some of these areas are considered to be largely mapping anomalies at the GIS scale, with on-ground observations finding the majority of the mapped areas to be extremely disturbed as a result of historical clearing, on-going cattle grazing and surrounding land use (i.e. Bruce Highway, agricultural and primary industry production land). Refer to **Plan 4** for mapped remnant polygons.

4.01. Context - Mapped Remnant Polygons



NOTES
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LEGEND

- Remnant RE Area

Regional Ecosystems (RE)

- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C area containing endangered regional ecosystems
- Category C area containing of concern regional ecosystems
- Category C area that is a least concern regional ecosystem
- Bowen pipeline

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A	20/12/2017	Preliminary Draft	TC	MS
E	23/02/2024	Final Alignment	TC	AD

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Universal Transverse Mercator GDA 2020 MGA Zone 55 1:300,000 @ A3

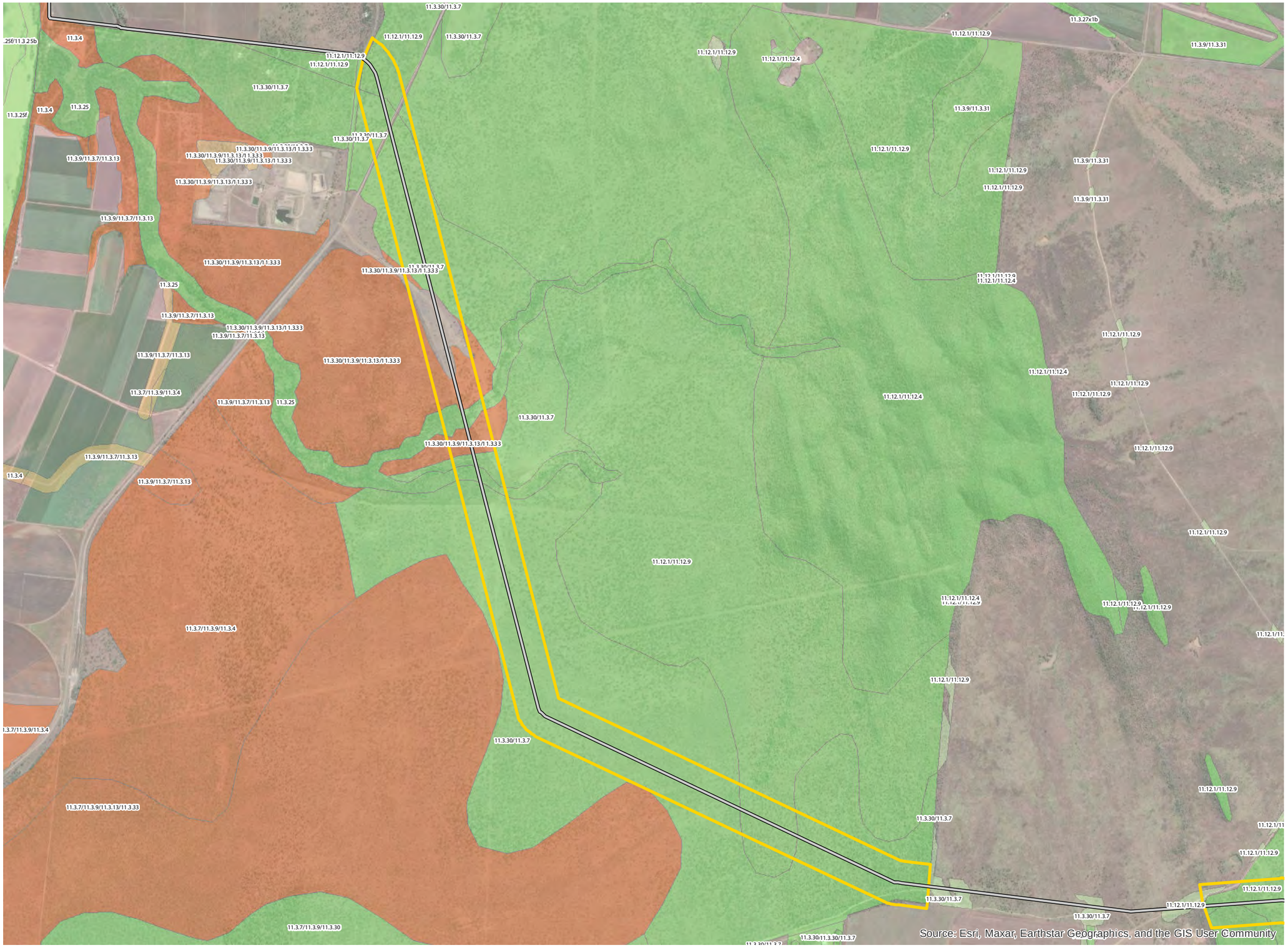
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4.02. Remnant Polygon 1 - East of Burdekin River



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LEGEND

Regional Ecosystems (RE)

- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C area containing endangered regional ecosystems
- Category C area containing of concern regional ecosystems
- Category C area that is a least concern regional ecosystem
- Bowen pipeline
- Remnant RE Area

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A	20/12/2017	Preliminary Draft	TC	MS
E	23/02/2024	Final Alignment	TC	AD

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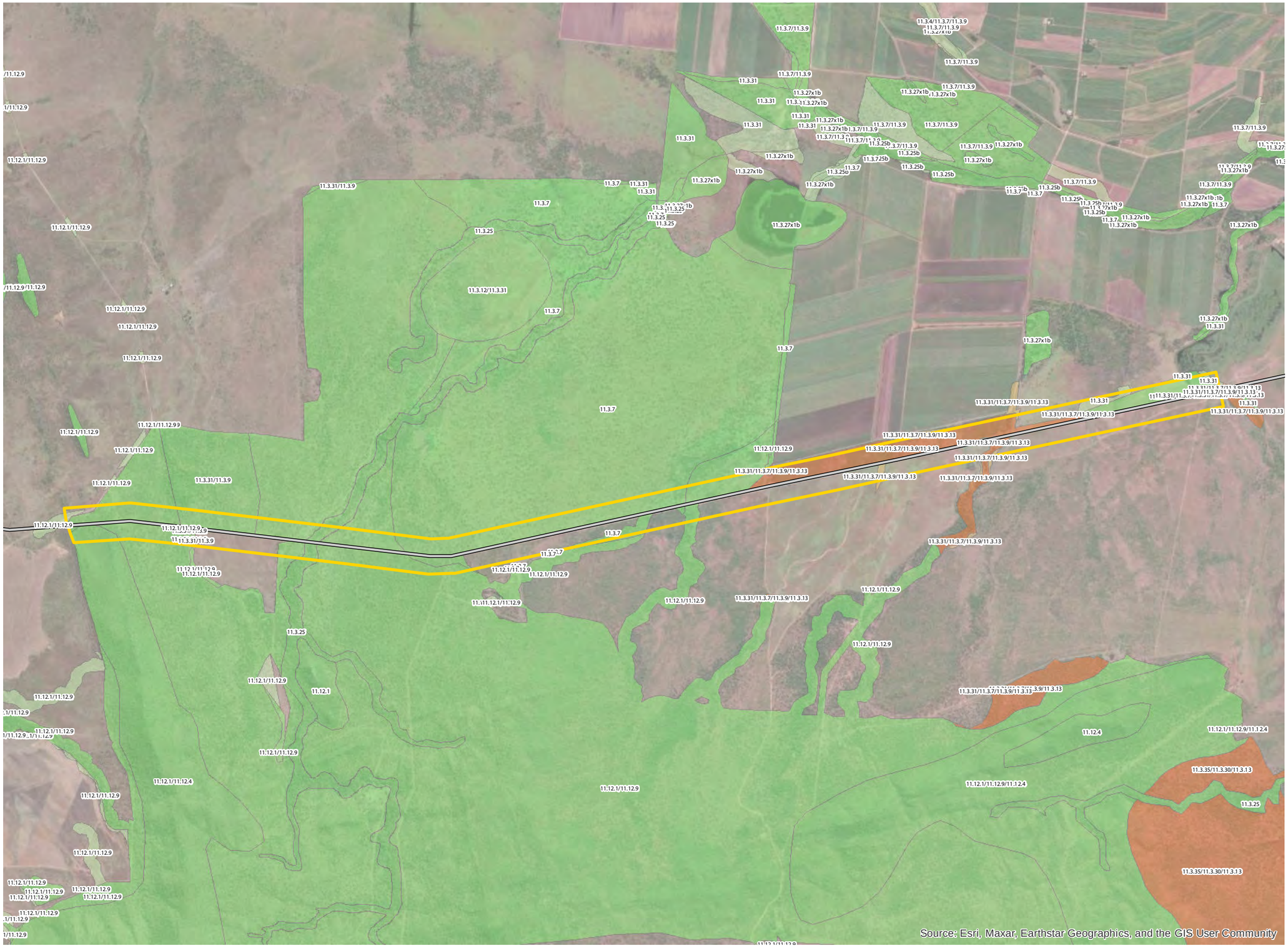
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4.03. Remnant Polygon 2 - Inkerman Station



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LEGEND

Regional Ecosystems (RE)

- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C area containing endangered regional ecosystems
- Category C area containing of concern regional ecosystems
- Category C area that is a least concern regional ecosystem
- Bowen pipeline
- Remnant RE Area

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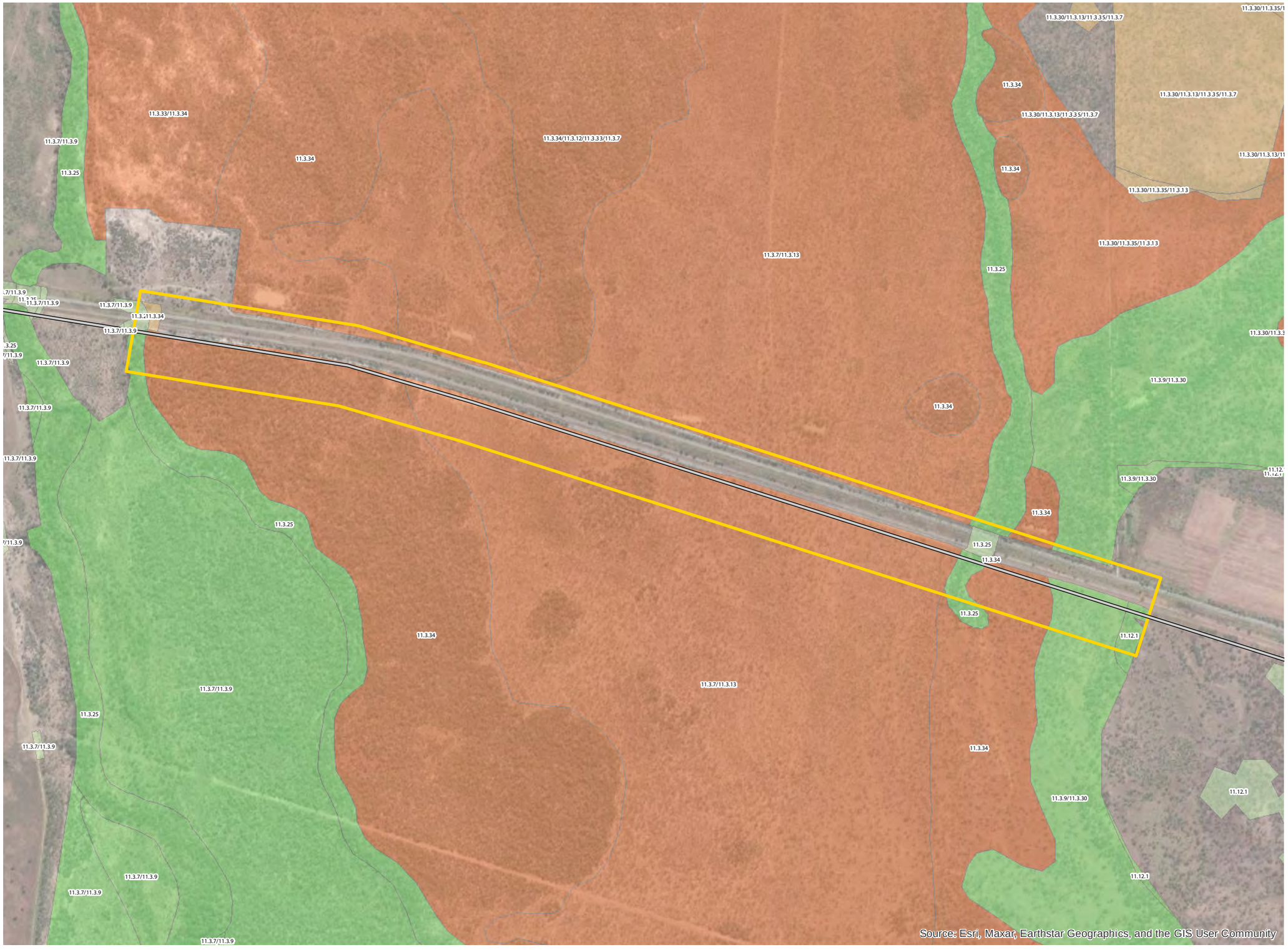
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4.04. Remnant Polygon 3 - Big Jack Creek



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LEGEND

Regional Ecosystems (RE)

- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C area containing endangered regional ecosystems
- Category C area containing of concern regional ecosystems
- Category C area that is a least concern regional ecosystem
- Bowen pipeline
- Remnant RE Area

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A	20/12/2017	Preliminary Draft	TC	MS
E	23/02/2024	Final Alignment	TC	AD

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4.05. Remnant Polygon 4 - East of Elliot River



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LEGEND

Regional Ecosystems (RE)

- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C area containing endangered regional ecosystems
- Category C area containing of concern regional ecosystems
- Category C area that is a least concern regional ecosystem
- Bowen pipeline
- Remnant RE Area

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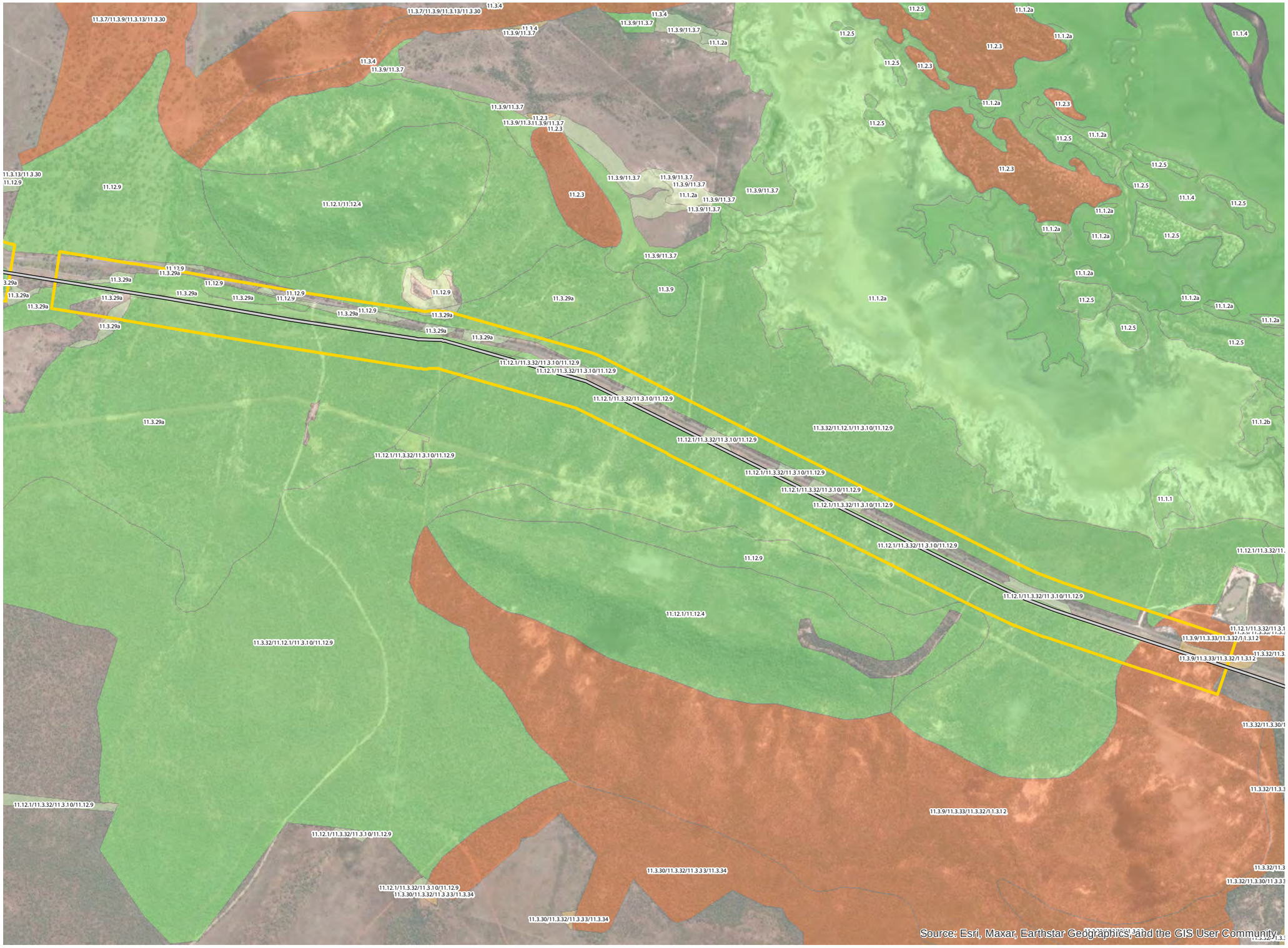
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4.06. Remnant Polygon 5 - Maiden Creek to Saltwater Creek



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LEGEND

Regional Ecosystems (RE)

- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C area containing endangered regional ecosystems
- Category C area containing of concern regional ecosystems
- Category C area that is a least concern regional ecosystem
- Bowen pipeline
- Remnant RE Area

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E	23/02/2024	Final Alignment	TC	AD

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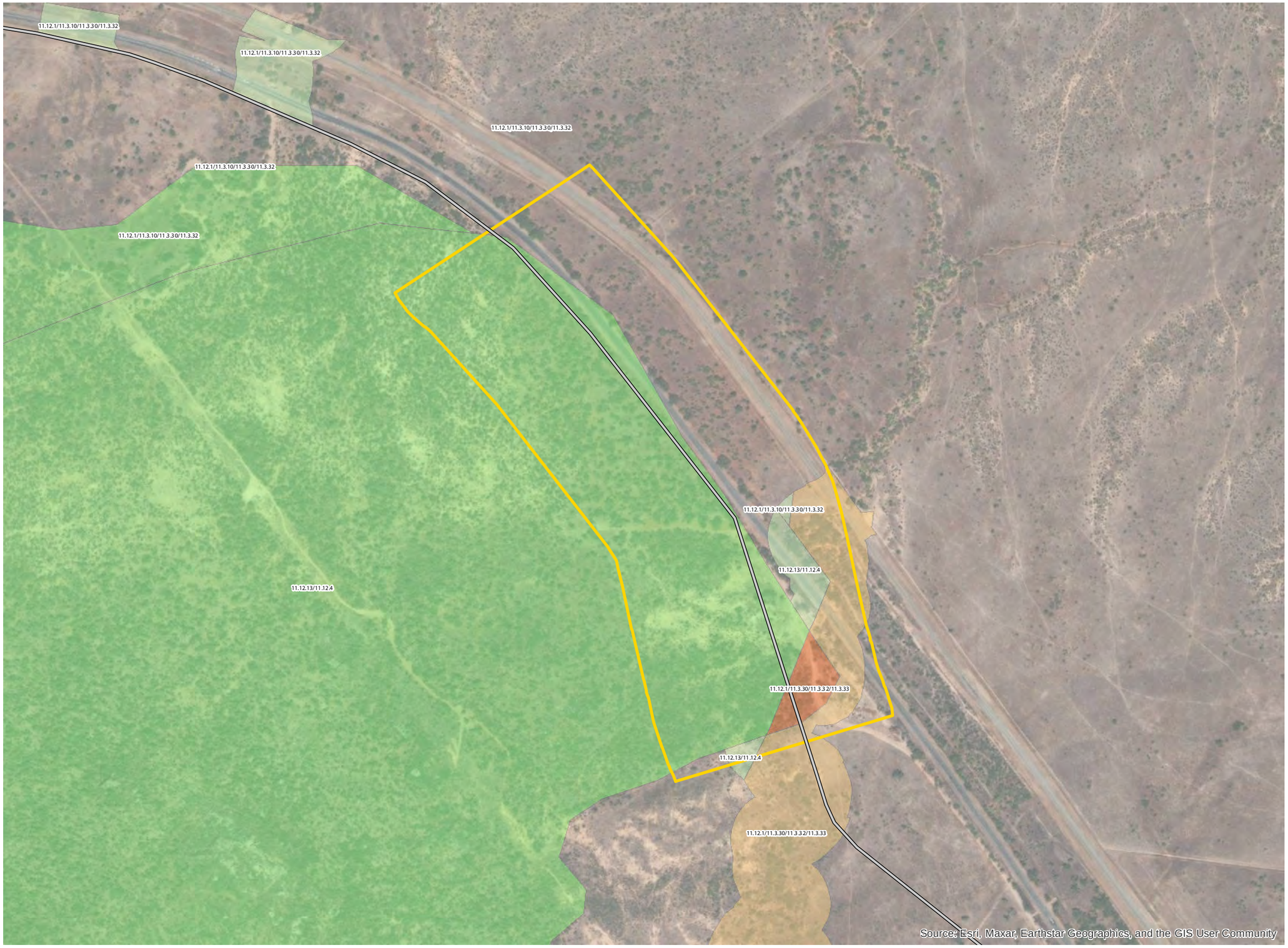
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4.07. Remnant Polygon 6 - East of Six Mile Creek



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LEGEND

Regional Ecosystems (RE)

- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C area containing endangered regional ecosystems
- Category C area containing of concern regional ecosystems
- Category C area that is a least concern regional ecosystem
- Bowen pipeline
- Remnant RE Area

PLAN ISSUE:

Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
E	23/02/2024	Final Alignment	TC	AD

0 100 m

Universal Transverse Mercator GDA 2020 MGA Zone 55 1:5,000 @A3

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BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 23/02/2024 8704 E 402 Remnant RE E

4.08. Remnant Polygon 7 - South of Magnetic Creek



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LEGEND

Regional Ecosystems (RE)

- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C area containing endangered regional ecosystems
- Category C area containing of concern regional ecosystems
- Category C area that is a least concern regional ecosystem
- Bowen pipeline
- Remnant RE Area

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Issue	Date	Description	Drawn	Checked
A	20/12/2017	Preliminary Draft	TC	MS
E	23/02/2024	Final Alignment	TC	AD

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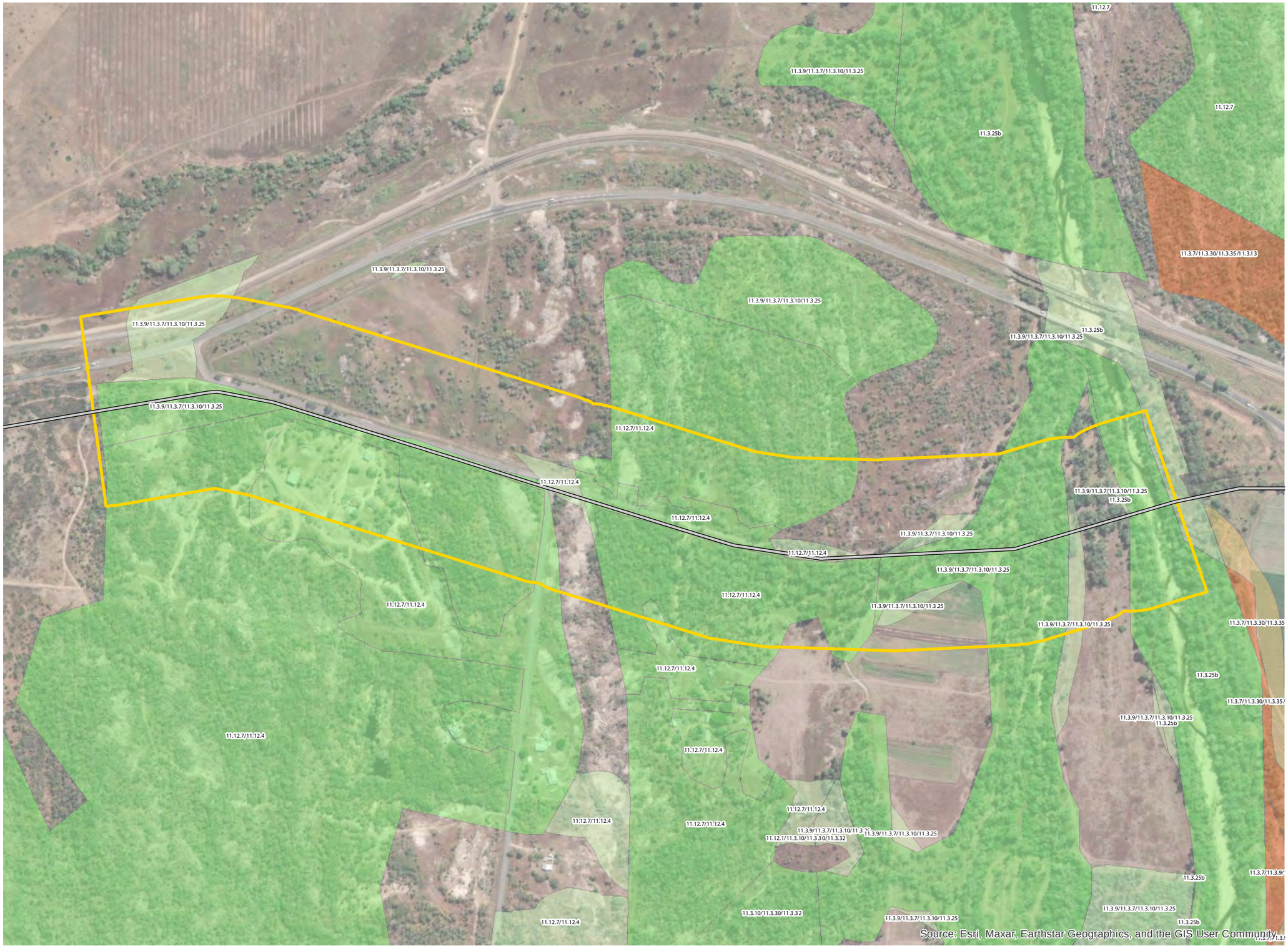
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BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 23/02/2024 8704 E 402 Remnant RE E

4.09. Remnant Polygon 8 - East of Magnetic Creek Along West Euri Road



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LEGEND

Regional Ecosystems (RE)

- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- Category C area containing endangered regional ecosystems
- Category C area containing of concern regional ecosystems
- Category C area that is a least concern regional ecosystem
- Bowen pipeline
- Remnant RE Area

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0 100 m

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BOWEN PIPELINE

ADDRESS/RPD: Bruce Highway, Home Hill - Bowen 23/02/2024 8704 E 402 Remnant RE E

4.4.1 Remnant Polygon 1 – East of Burdekin River

Remnant Polygon 1 is situated east of the Burdekin River and encompasses Sites 3 to 5. The proposed alignment heads in a south-east direction and traverses through mapped remnant vegetation containing *Least Concern* Regional Ecosystems (REs), and a small area of *Of Concern* REs. The four separate composite REs that comprise this polygon are *Least Concern* RE 11.12.1/11.12.9, RE 11.3.30/11.3.7, *Of Concern* RE 11.3.30/11.3.9/11.3.13/11.3.33, and RE 11.3.25. RE11.3.25 is associated with mapped waterways which is detailed within **Appendix D** (Flow path report). This polygon is largely contained within Shannon Downs Station, with intensive sugar cane farming to the north. The land containing remnant vegetation is currently utilised for cattle grazing, with Inkerman Mill rail line intersecting the northwestern portion of the vegetation. The understorey has been largely cleared for cattle grazing and remains only along the southwestern portion of the alignment as a dense weed infestation of *Ziziphus mauritiana* (Chinee Apple), *Vachellia nilotica* (Prickly Acacia), and *Cryptostegia grandiflora* (Rubber Vine). Field surveys observed that vegetation is generally sparse, dominated by introduced pasture grass, and multiple access tracks and fence lines are present across the polygon close to the proposed alignment.

Where remnant vegetation is mapped as RE 11.12.1/11.12.9, field surveys identified vegetation to be mostly reflective of RE 11.12.1. The canopy layer was dominated by *Eucalyptus crebra* (Narrow-leaved Ironbark), with *Corymbia erythrophloia* (Variable-barked Bloodwood), *Corymbia tessellaris* (Moreton Bay Ash), and some *Corymbia dallachiana* (Ghost Gum). The subcanopy was generally absent, and where present comprised of the same species as within the canopy. The native shrub layer was minimal, consisting largely of the regenerating canopy layer species. Introduced species were more prevalent in the shrub layer, including *Ziziphus mauritiana* (Chinee Apple) and *Cryptostegia grandiflora* (Rubber Vine). The ground layer is largely invasive grass and forb species including *Chloris virgata* (Feathertop Rhodes Grass), *Sida rhombifolia* (Common Sida) and *Clitoria ternatea* (Asian Pigeonwings) (Refer **Table 22** and **Photo 20**).

Vegetation within mapped RE 11.3.30/11.3.7 was observed to reflect this mapping, with the canopy dominated by *Eucalyptus crebra* (Narrow-leaved Gum) and *Corymbia dallachiana* (Ghost Gum), with *Corymbia tessellaris* (Moreton Bay Ash), *Corymbia erythrophloia* (Variable-barked Bloodwood), and *Eucalyptus platyphylla* (White Gum). The subcanopy was generally absent, and where present comprised of the same species as within the canopy. The native shrub layer was minimal, consisting largely of the regenerating canopy layer species. Introduced species were more prevalent in the shrub layer, including *Ziziphus mauritiana* (Chinee Apple), *Vachellia nilotica* (Prickly Acacia), and *Cryptostegia grandiflora* (Rubber Vine). These weeds were most prevalent within nearby waterways. The ground layer is similarly disturbed with invasive *Chloris virgata* (Feathertop Rhodes Grass), *Sida rhombifolia* (Common Sida) and *Gomphrena celosioides* (Gomphrena Weed) present. Vegetation within this ecosystem was observed to be sparse closest to the boundary and fence lines due to historical clearing for farm tracks (Refer **Table 22** and **Photo 21**).

Vegetation within RE 11.3.30/11.3.9/11.3.13/11.3.33, of which the alignment intersects a relatively small area, is dominated by RE 11.3.30/11.3.9, with elements of RE 11.3.13. The canopy layer is dominated by *Corymbia dallachiana* (Ghost Gum) and *Eucalyptus crebra* (Narrow-leaved Ironbark), with *Corymbia clarksoniana* (Clarkson's Bloodwood), *Eucalyptus platyphylla* (White Gum), and sparse *Grevillea striata* (Beefwood). The subcanopy layer was generally absent, and where present comprised of the same species as within the canopy. The native shrub layer was also generally absent, dominated instead by patches of dense *Cryptostegia*

grandiflora (Rubber Vine), *Vachellia nilotica* (Prickly Acacia), *Acacia farnesiana* (Mimosa Bush), and *Ziziphus mauritiana* (Chinee Apple). The ground layer was minimal, dominated by pasture grasses where present (Refer **Table 22** and **Photo 22**). Notably, the proposed alignment generally follows areas of relatively high disturbance including access tracks.

Fauna species observed within remnant polygon 1 were largely common avian species associated with disturbed areas (refer **Table 23**). Notably, the EPBC listed *Geophaps scripta scripta* (Squatter Pigeon) was recorded on this property. This species is relatively common in the local area with suitable habitat associated with cattle grazing paddocks.



Photo 20: Remnant polygon 1 – Characteristics of Least Concern RE 11.12.1/11.12.9.



Photo 21: Remnant polygon 1 – Characteristics of Least Concern RE 11.3.30/11.3.7.



Photo 22: Remnant polygon 1 – Characteristics of Least Concern RE 11.3.30/11.3.9.

Table 22: Remnant Polygon 1 Flora Species List

Strata	Scientific Name	Common Name
T1/T2	*Corymbia dallachiana*	Ghost Gum
	Corymbia erythrophloia	Variable-barked Bloodwood
	Corymbia tessellaris	Moreton Bay Ash
	Cupaniopsis anacardioides	Tuckeroo
	Eucalyptus crebra	Narrow-leaved Ironbark
	Eucalyptus platyphylla	White Gum
	Grevillea striata	Beefwood
	Lophostemon grandiflorus	Northern Swamp Box
	Planchonia careya	Cocky Apple
Shrub/Ground	*Acacia leiocalyx*	Early Flowering Black Wattle
	Acacia salicina	Sally Wattle
	Brachiaria decumbens	Signal Grass
	Chloris virgata	Feathertop Rhodes Grass
	Clitoria ternatea	Asian Pigeonwings
	Cryptostegia grandiflora	Rubber Vine
	Dichanthium sericeum	Queensland Bluegrass
	Gomphrena celosioides	Gomphrena Weed
	Heteropogon contortus	Black Speargrass
	Melinis repens	Red Natal Grass
	Sida rhombifolia	Common Sida
	Stachytarpheta jamaicensis	Blue Snake Weed
	Stylosanthes scabra	Shrubby Stylo
	Vachellia farnesiana	Mimosa Bush
	Vachellia nilotica	Prickly Acacia
	Zizyphus maurtiana	Chinee Apple

Table 23: Remnant Polygon 1 Fauna Species List

Scientific Name	Common Name	Conservation Significance
Bos taurus	Cow	N/A
Calyptorhynchus banksia	Red-tailed Black Cockatoo	Least Concern (Pop. Decreasing)
Centropus phasianinus	Pheasant Coucal	Least Concern
Coracina novaehollandiae	Black-faced Cuckoo Shrike	Least Concern
Corvus orru	Torresian Crow	Least Concern
Cracticus tibicen	Australian Magpie	Least Concern
Dicrurus bracteatus	Spangled Drongo	Least Concern
Dacelo leachii	Blue-winged Kookaburra	Least Concern
Dacelo novaeguineae	Laughing Kookaburra	Least Concern
Elanus axillaris	Black-shouldered Kite	Least Concern
Geophaps scripta scripta	Squatter Pigeon	Vulnerable
Grallina cyanoleuca	Magpie-lark	Least Concern
Haliastur sphenurus	Whistling Kite	Least Concern
Malurus melanocephalus	Red-backed Fairy Wren	Least Concern
Milvus migrans	Black Kite	Least Concern
Ocyphaps lophotes	Crested Pigeon	Least Concern
Trichoglossus moluccanus	Rainbow Lorikeet	Least Concern

4.4.2 Remnant Polygon 2 – Leichardt Station and Inkerman Station

Remnant polygon 2 encompasses sites 10 to 18. The alignment is entirely contained within a stock route that runs through a remnant polygon and intersects *Least Concern* and *Of Concern* REs. The stock route and surrounding paddocks are utilised for cattle grazing. The alignment intersects multiple remnant polygons of; RE 11.12.1/11.12.9, RE 11.3.7, RE 11.12.1/11.12.4, and RE 113.31/11.3.9. Further east polygons of *Of Concern* RE 11.3.31/11.3.7/11.3.9/11.3.13 and *Least Concern* RE11.3.31 are present. Given the current and historical land uses, vegetation is typically cleared along fence lines to facilitate access tracks.

Where vegetation is mapped as RE11.12.1/11.12.9, on-ground surveys identified species reflective of this composite RE. The canopy layer was dominated by a mixture of *Corymbia erythrophloia* (Variable-barked Bloodwood), *Eucalyptus crebra* (Narrow-leaved Ironbark) and *Eucalyptus platyphylla* (White Gum), with *Corymbia dallachiana* (Ghost Gum) and *Corymbia tessellaris* (Moreton Bay Ash). The subcanopy and native shrub layers were generally absent, but where present were comprised of the regenerating canopy species. Invasive species were present in the shrub layer as sparse individuals, but more often as dense patches of

Cryptostegia grandiflora (Rubber Vine), *Vachellia nilotica* (Prickly Acacia), and *Ziziphus mauritiana* (Chinee Apple). The ground layer was also minimal, likely as a result of cattle grazing, and dominated by introduced pasture grasses with some natives such as *Heteropogon contortus* (Black Speargrass) and *Themeda triandra* (Kangaroo Grass) (refer **Table 24** and **Photo 23**).

Where vegetation is mapped as RE 11.3.31/11.3.9, located between Sites 15 and 16, mapping indicates the grassland RE 11.3.31 is the more dominant RE, on-ground surveys found the vegetation to be more reflective of the woodland RE 11.3.9. The canopy layer was dominated by *Eucalyptus platyphylla* (White Gum), with *Corymbia dallachiana* (Ghost Gum), *Corymbia tessellaris* (Moreton Bay Ash), *Corymbia clarksoniana* (Clarkson's Bloodwood), and *Eucalyptus crebra* (Narrow-leaved Ironbark). The native subcanopy and shrub layers were minimal, reflective of the regenerating canopy species where present. Introduced species were more prevalent in the shrub layer, including *Cryptostegia grandiflora* (Rubber Vine) and *Vachellia nilotica* (Prickly Acacia). The ground layer was grassy, with various introduced and native species including *Chloris gayana* (Rhodes Grass), *Megathyrsus maximus* (Guinea Grass), and *Themeda quadrivalvis* (Grader Grass), and *Heteropogon contortus* (Black Speargrass) and *Chrysopogon fallax* (Ribbon Grass) **Table 24** and **Photo 24**).

Where vegetation is mapped as RE 11.3.7, species present are indicative of this RE. The canopy is dominated by *Corymbia dallachiana* (Ghost Gum), with *Corymbia clarksoniana* (Clarkson's Bloodwood), *Corymbia tessellaris* (Moreton Bay Ash), and *Eucalyptus crebra* (Narrow-leaved Ironbark) present. The understorey of this polygon has been predominantly cleared for cattle grazing and weed control. To the south of this polygon is vegetation mapped as non-remnant, which contains many of the same native tree species but is heavily infested with *Cryptostegia grandiflora* (Rubber Vine), *Vachellia nilotica* (Prickly Acacia), and *Ziziphus mauritiana* (Chinee Apple). The few native shrubs and subcanopy species present in this remnant polygon are regenerating canopy layer. The ground layer is also minimal and, where present, dominated by invasive grass species including *Chloris virgata* (Feathertop Rhodes Grass), *Sida rhombifolia* (Common Sida), and *Sporobolus fertilis* (Parramatta Grass) (Refer **Table 24** and **Photo 25**).

The *Of Concern* vegetation is mapped within the road reserve north of Inkerman Station, which historically has been used as a stock route and currently contains cattle. An access track is present along the southern fence line of this road reserve, where canopy species are absent, this is where the proposed alignment is intended, which reduces overall impact to remnant vegetation. On-ground observations of the *Of Concern* remnant vegetation in Polygon 2 confirmed the presence of composite RE 11.3.31/11.3.7/11.3.9/11.3.13. Outside of the disturbed fence line, the area is largely characterised by open woodland dominated by *C. dallachiana* (Ghost Gum) with scattered *E. platyphylla* (White Gum) and *E. crebra* (Narrow-leaved Ironbark). Land use for agriculture has resulted in a lack of shrub layer, with the area dominated by invasive shrub species *Ziziphus maurtiana* (Chinee Apple), *Vachellia farnesiana* (Mimosa Bush) and *Cryptostegia grandiflora* (Rubber Vine). The ground layer does contain areas of *Heteropogon contortus* (Blackspear Grass), reflecting RE 11.3.31, however, the majority of the area is dominated by invasive species; *Chloris virgata* (Feathertop Rhodes Grass), *Mimosa pudica* (Common Sensitive Plant) and *Stachytarpheta cayennensis* (Snakeweed). The eastern portion of the *Of Concern* RE mapping lacks canopy vegetation however contains ground layer species reflective of RE 11.3.31, which is a grassland RE. This area was observed to also contain *Sporobolus virginicus* (Salt Couch) which is included in this RE (refer **Table 24** and **Photo 26**).

Fauna species observed within remnant polygon 2 were largely common avian species associated with disturbed areas (refer **Table 25**).



Photo 23: Remnant polygon 2 – Characteristics of Least Concern RE 11.12.1/11.12.9.



Photo 24: Remnant Polygon 2 - Characteristics of Least Concern RE 11.3.31/11.3.9.



Photo 25: Remnant polygon 2 – Characteristics of Least Concern RE 11.3.7.



Photo 26: Remnant polygon 2 – Characteristics of Of Concern RE 11.3.31/11.3.7/11.3.9/11.3.13

Table 24: Remnant polygon 2 Flora Species List

Strata	Scientific Name	Common Name
T1/T2	*Corymbia dallachiana*	Ghost Gum
	Corymbia clarksoniana	Clarkson's Bloodwood
	Corymbia erythrophloia	Variable-barked Bloodwood
	Corymbia tessellaris	Moreton Bay Ash
	Eucalyptus crebra	Narrow-leaved Ironbark
	Eucalyptus platyphylla	White Gum
	Grevillea striata	Beefwood
	Lophostemon grandiflorus	Northern Swamp Box
	Melaleuca fleucadendra	Weeping Paperbark
	Melaleuca fluviatilis	River Tea-tree
Shrub/Ground	*Acacia salicina*	Sally Wattle
	Brachiaria decumbens	Signal Grass
	Chloris virgata	Feathertop Rhodes Grass

Strata	Scientific Name	Common Name
	Chloris gayana	Rhodes Grass
	Clitoria ternatea	Asian Pigeonwings
	Chrysopogon fallax	Ribbon Grass
	Cryptostegia grandiflora	Rubber Vine
	Gomphrena celosioides	Gomphrena Weed
	Heteropogon contortus	Black Speargrass
	Hybanthus stellarioides	Spade Flower
	Megathyrsus maximus	Guinea Grass
	Melinis repens	Red Natal Grass
	Mimosa pudica	Common Sensitive Plant
	Passiflora subpeltata	White Passionflower
	Passiflora suberosa	Corky Passion
	Sida cordifolia	Flannel Weed
	Sida rhombifolia	Common Sida
	Sporobolus fertilis	Parramatta Grass
	Sporobolus virginicus	Salt Couch
	Stachytarpheta cayennensis	Snakeweed
	Stachytarpheta jamaicensis	Blue Snake Weed
	Themeda quadrivalvis	Grader Grass
	Themeda triandra	Kangaroo Grass
	Vachellia farnesiana	Mimosa Bush
	Zizyphus maurtiana	Chinee Apple

Table 25: Remnant Polygon 2 Fauna Species List

Scientific Name	Common Name	Conservation Significance
Bos taurus	Cow	N/A
Cacatua galerita	Sulphur-crested Cockatoo	Least Concern
Centropus phasianinus	Pheasant Coucal	Least Concern
Coracina novaehollandiae	Black-faced Cuckoo Shrike	Least Concern
Corvus orru	Torresian Crow	Least Concern

Scientific Name	Common Name	Conservation Significance
Cracticus tibicen	Australian Magpie	Least Concern
Cracticus nigrogularis	Pied Butcherbird	Least Concern
Grallina cyanoleuca	Magpie-lark	Least Concern
Haliastur sphenurus	Whistling Kite	Least Concern
Macropus giganteus	Eastern Grey Kangaroo	Least Concern
Manorina melanocephala	Noisy Miner	Least Concern
Numida meleagris	Guineafowl	N/A
Ocyphaps lophotes	Crested Pigeon	Least Concern
Rhipidura leucophrys	Willy Wagtail	Least Concern
Trichoglossus moluccanus	Rainbow Lorikeet	Least Concern

4.4.3 Remnant Polygon 3 – Big Jack Creek

Remnant Polygon 3 extends from Big Jack Creek to the Elliot River, encompassing Site 56 to Site 60 (refer **Figure 4.04**). The vegetation within the mapped 'remnant' composite polygon is representative largely of *Of Concern* RE11.3.7/11.3.13, with smaller polygons of *Of Concern* RE 11.3.34, *Least Concern* RE 11.3.9/11.3.30. This polygon runs parallel to the Bruce Highway and North Coast rail line. The land is currently utilised for cattle grazing, containing a relatively sparse understorey and scattered canopy species, which is consistent with this land use.

The canopy layer is dominated by *Corymbia dallachiana* (Ghost Gum), *Eucalyptus platyphylla* (White Gum), *C. tessellaris* (Moreton Bay Ash) and *C. erythrophloia* (Variable-barked Bloodwood). The shrub layer is sparse due to historical land clearing, however, scattered restricted invasive species, *Ziziphus maurtiana* (Chinee Apple) and *Cryptostegia grandiflora* (Rubber Vine), are present. The ground layer is dominated by native grasses including *Bothriochloa decipiens* (Pitted Bluegrass), *Aristida calycina* (Dark Wiregrass), *Aristida latifolia* (Feathertop Wiregrass), *Themeda triandra* (Kangaroo Grass) and *Heteropogon contortus* (Black Speargrass) (refer **Table 26** and **Photos 26-27**).

Only common fauna were observed within the Remnant Polygon 3 site, which is anticipated due to the highly disturbed nature of the surrounding area (refer **Table 27**).



Photo 27: Remnant polygon 3 – vegetation characteristics along alignment



Photo 28: Remnant polygon 3 – vegetation characteristics along alignment

Table 26: Remnant Polygon 3 Flora Species List

Strata	Scientific Name	Common Name
T1/T2	*Acacia leptostachya*	Slender Wattle

Strata	Scientific Name	Common Name
	Acacia salicina	Sally Wattle
	Corymbia dallachiana	Ghost Gum
	Corymbia erythrophloia	Variable-barked Bloodwood
	Corymbia tessellaris	Moreton Bay Ash
	Eucalyptus crebra	Narrow-leaved Ironbark
	Eucalyptus platyphylla	White Gum
	Grevillea striata	Beefwood
Shrub/Ground	*Aristida calycina*	Dark Wiregrass
	Aristida latifolia	Feathertop Wiregrass
	Bothriochloa decipiens	Pitted Bluegrass
	Cryptostegia grandiflora	Rubber Vine
	Gomphrena celosioides	Gomphrena Weed
	Heteropogon contortus	Black Speargrass
	Macroptilium atropurpureum	Siratro
	Sida cordifolia	Flannel Weed
	Sorghum halapense	Johnson Grass
	Stachytarpheta jamaicensis	Blue Snake Weed
	Stylosanthes scabra	Shrubby Stylo
	Themeda triandra	Kangaroo Grass
	Zizyphus maurtiana	Chinee Apple

Table 27: Remnant Polygon 3 Fauna Species List

Scientific Name	Common Name	Conservation Significance
Alisterus scapularis	King Parrot	Least Concern
Cacatua galerita	Sulphur Crested Cockatoo	Least Concern
Centropus phasianinus	Pheasant Coucal	Least Concern
Coracina novaehollandiae	Black-faced Cuckoo Shrike	Least Concern
Corvus orru	Torresian Crow	Least Concern
Cracticus nigrogularis	Pied Butcherbird	Least Concern
Cracticus tibicen	Australian Magpie	Least Concern

Scientific Name	Common Name	Conservation Significance
Dacelo leachii	Blue Winged Kookaburra	Least Concern
Falco berigora	Brown Falcon	Least Concern
Grallina cyanoleuca	Peewee Mudlark	Least Concern
Haliastur sphenurus	Whistling Kite	Least Concern
Hirundo neoxena	Welcome Swallow	Least Concern
Macropus giganteus	Eastern Grey Kangaroo	Least Concern
Milvus migrans	Fork-tailed Kite	Least Concern
Rhipidura leucophrys	Willy Wagtail	Least Concern
Taeniopygia bichenovii	Double-barred Finch	Least Concern
Todiramphus sanctus	Sacred Kingfisher	Least Concern
Trichoglossus moluccanus	Rainbow Lorikeet	Least Concern

4.4.4 Remnant Polygon 4 – East of Elliot River

Remnant Polygon 4 is situated east of Elliot River, west of Site 59 (refer **Plan 4.05**). The vegetation within the mapped 'remnant' polygon reflects *Least Concern* RE11.3.29a with on-ground observations finding the vegetation present to be representative of this mapping. This polygon runs parallel to the Bruce Highway and rail line and the land is currently utilised for cattle grazing, resulting in a relatively sparse understorey. Vegetation has been cleared within 10 meters of the boundary fence line. A single drainage feature is present to the south of the polygon.

The canopy layer is dominated by *Eucalyptus crebra* (Narrow-leaved Ironbark), *Corymbia dallachiana* (Ghost Gum) and *E. platyphylla* (White Gum). The shrub layer is sparse due to historical land clearing consisting of scattered canopy species regrowth as well as scattered restricted invasive species *Zizyphus maurtiana* (Chinee Apple). The ground layer is dominated by native grasses including *Bothriochloa decipiens* (Pitted Bluegrass), *Aristida calycina* (Dark Wiregrass), *Aristida latifolia* (Feathertop Wiregrass), *Themeda triandra* (Kangaroo Grass) and *Heteropogon contortus* (Black Speargrass) (refer **Table 28** and **Photos 28-29**).

As a result of historical clearing the remnant vegetation closest to the proposed alignment is largely devoid of habitat value. This is reflected in fauna observations, with common generalist fauna observed within the Remnant Polygon 4 site (refer **Table 29**).



Photo 29: Remnant polygon 4 – Vegetation characteristics along alignment



Photo 30: Remnant polygon 4 – Vegetation characteristics along alignment

Table 28: Remnant Polygon 4 Flora Species List

Strata	Scientific Name	Common Name
T1/T2	*Acacia leptostachya*	Slender Wattle
	Acacia salicina	Sally Wattle
	Corymbia dallachiana	Ghost Gum
	Eucalyptus crebra	Narrow-leaved Ironbark
	Eucalyptus platyphylla	White Gum
Shrub/Ground	*Aristida calycina*	Dark Wiregrass
	Aristida latifolia	Feathertop Wiregrass
	Bothriochloa decipiens	Pitted Bluegrass
	Gomphrena celosioides	Gomphrena Weed
	Heteropogon contortus	Black Speargrass
	Sida cordifolia	Flannel Weed
	Sorghum halapense	Johnson Grass
	Stylosanthes scabra	Shrubby Stylo
	Themeda triandra	Kangaroo Grass
	Zizyphus maurtiana	Chinee Apple

Table 29: Remnant Polygon 4 Fauna Species List

Scientific Name	Common Name	Conservation Significance
Centropus phasianinus	Pheasant Coucal	Least Concern
Coracina novaehollandiae	Black-faced Cuckoo Shrike	Least Concern
Corvus orru	Torresian Crow	Least Concern
Cracticus nigrogularis	Pied Butcherbird	Least Concern
Cracticus tibicen	Australian Magpie	Least Concern
Dacelo leachii	Blue Winged Kookaburra	Least Concern
Grallina cyanoleuca	Magpie Lark	Least Concern
Haliastur sphenurus	Whistling Kite	Least Concern
Hirundo neoxena	Welcome Swallow	Least Concern
Rhipidura leucophrys	Willy Wagtail	Least Concern
Trichoglossus moluccanus	Rainbow Lorikeet	Least Concern

4.4.5 Remnant Polygon 5 – Maiden Creek to Saltwater Creek

Remnant Polygon 5 extends from Maiden Creek in the west to the Saltwater Creek in the east, which encompasses Site 61 through Site 78 (refer **Plan 4.06**). On ground surveys of remnant polygon 5 found that vegetation within the mapped 'remnant' composite polygon is representative of *Least Concern* RE11.3.32/11.12.1/11.3.10/11.12.9. Remnant polygon 5 runs parallel to the Bruce Highway and rail line with land currently utilised for cattle grazing, containing a relatively sparse understorey, consistent with this land use. Multiple watercourses and drainage features traverse this polygon, including four *low-risk* waterways for waterway barrier works (WWBW) and one *moderate-risk* WWBW. These waterways are discussed further in **Section 4.2**.

Field surveys found that on areas of higher ground, the canopy layer is dominated by *Corymbia dallachiana* (Ghost Gum), *Eucalyptus platyphylla* (White Gum) and *C tessellaris* (Moreton Bay Ash), while in the depressions and lower slopes, the canopy layer is dominated by *Melaleuca fluviatilis* (River Tea-tree) and *M. leucadendra* (Weeping Paperbark). The shrub layer is sparse due to historical land clearing, however, scattered restricted invasive species, *Ziziphus maurtiana* (Chinee Apple) and *Cryptostegia grandiflora* (Rubber Vine,) are present. The ground layer is dominated by native grasses such as *Bothriochloa decipiens* (Pitted Bluegrass), *Aristida calycina* (Dark Wiregrass), *Aristida latifolia* (Feathertop Wiregrass), *Themeda triandra* (Kangaroo Grass) and *Heteropogon contortus* (Black Speargrass). However, the drainage features and watercourses are heavily weeded with *Stachytarpheta jamaicensis* (Blue Snake Weed), *Argemone mexicana* (Mexican Poppy), *Gomphrena celosioides* (Gomphrena Weed) and *Sorghum halapense* (Johnson Grass) (refer **Table 30** and **Photos 30-32**).

Heavy disturbance throughout the area as well as the adjacency to the Bruce Highway and North Coast rail line has limited habitat value within remnant polygon 5. Consequently, only generalist fauna were observed within remnant polygon 5 (refer **Table 31**).



Photo 31: Remnant polygon 5 – Vegetation characteristics along alignment



Photo 32: Remnant polygon 5 – Vegetation characteristics along alignment



Photo 33: Remnant polygon 5 – Vegetation characteristics along alignment

Table 30: Remnant Polygon 5 Flora Species List

Strata	Scientific Name	Common Name
T1/T2	*Acacia salicina*	Sally Wattle
	Corymbia dallachiana	Ghost Gum
	Corymbia erythrophloia	Variable-barked Bloodwood
	Corymbia tessellaris	Moreton Bay Ash
	Eucalyptus crebra	Narrow-leaved Ironbark
	Eucalyptus platyphylla	White Gum
	Grevillea striata	Beefwood
	Melaleuca fluviatilis	River Tea-tree
	Melaleuca leucadendra	Weeping Paperbark
	Pandanus spiralis	Pandanus
	Planchonia careya	Cocky Apple
Shrub/Ground	*Argemone mexicana*	Mexican Poppy

Strata	Scientific Name	Common Name
	Aristida calycina	Dark Wiregrass
	Aristida latifolia	Feathertop Wiregrass
	Bothriochloa decipiens	Pitted Bluegrass
	Cryptostegia grandiflora	Rubber Vine
	Gomphrena celosioides	Gomphrena Weed
	Heteropogon contortus	Black Speargrass
	Macroptilium atropurpureum	Siratro
	Sida cordifolia	Sida
	Sorghum halapense	Johnson Grass
	Stachytarpheta jamaicensis	Blue Snake Weed
	Stylosanthes scabra	Shrubby Stylo
	Themeda triandra	Kangaroo Grass
	Zizyphus maurtiana	Chinee Apple

Table 31: Remnant Polygon 5 Fauna Species List

Scientific Name	Common Name
Alisterus scapularis	King Parrot
Aquila audax	Wedge-tailed Eagle (Fly-over)
Cacatua galerita	Sulphur Crested Cockatoo
Coracina novaehollandiae	Black-faced Cuckoo Shrike
Corvus orru	Torresian Crow
Cracticus nigrogularis	Pied Butcherbird
Cracticus tibicen	Australian Magpie
Dacelo leachii	Blue Winged Kookaburra
Falco berigora	Brown Falcon
Grallina cyanoleuca	Magpie Lark
Haliastur sphenurus	Whistling Kite
Hirundo neoxena	Welcome Swallow
Macropus giganteus	Eastern Grey Kangaroo
Manorina melanocephala	Noisy Miner

Scientific Name	Common Name
Milvus migrans	Fork-tailed Kite
Rhipidura leucophrys	Willy Wagtail
Taeniopygia bichenovii	Double-barred Finch

4.4.6 Remnant Polygon 6 – East of Six Mile Creek

Remnant Polygon 6 is situated east of Six Mile Creek adjacent Site 119 (refer **Plan 4.07**). The vegetation within the mapped 'remnant' polygon contains composite *Least Concern* RE11.12.13/11.12.4 with on-ground observations of this vegetation finding it to be representative of this mapping. This polygon runs parallel to the Bruce Highway with evidence of historical clearing and thinning observed in the remnant polygon. The land is currently utilised for cattle grazing, containing a relatively sparse understorey and highly disturbed ground layer in portions, consistent with the land use.

The canopy layer is dominated by *Eucalyptus crebra* (Narrow-leaved Ironbark) and *Corymbia erythrophloia* (Variable-barked Bloodwood) at a height of approximately 12-14 meters (refer **Table 32** and **Photos 33-34**). The shrub layer is sparse due to historical land clearing with scattered native *Planchonia careya* (Cocky Apple) and regenerating canopy species. The ground layer consists largely of native grasses such as *Bothriochloa decipiens* (Pitted Bluegrass), *Aristida calycina* (Dark Wiregrass), *Aristida latifolia* (Feathertop Wiregrass), *Themeda triandra* (Kangaroo Grass) and *Heteropogon contortus* (Black Speargrass).

Only common fauna were observed within Remnant Polygon 6, reflecting the historical and on-going land uses in the area limiting significant habitat value (refer **Table 33**).



Photo 34: Remnant polygon 6 – Vegetation characteristics along alignment



Photo 35: Remnant polygon 6 – Vegetation characteristics along alignment

Table 32: Remnant Polygon 6 Flora Species List

Strata	Scientific Name	Common Name
T1/T2	*Acacia salicina*	Sally Wattle
	Corymbia dallachiana	Ghost Gum
	Corymbia erythrophloia	Variable-barked Bloodwood
	Corymbia tessellaris	Moreton Bay Ash
	Eucalyptus crebra	Narrow-leaved Ironbark
	Eucalyptus platyphylla	White Gum
	Grevillea striata	Beefwood
	Planchonia careya	Cocky Apple
Shrub/Ground	*Argemone mexicana*	Mexican Poppy
	Aristida calycina	Dark Wiregrass
	Aristida latifolia	Feathertop Wiregrass
	Bothriochloa decipiens	Pitted Bluegrass
	Gomphrena celosioides	Gomphrena Weed
	Heteropogon contortus	Black Speargrass
	Macroptilium atropurpureum	Siratro
	Sida cordifolia	Flannel Weed
	Sorghum halapense	Johnson Grass
	Stylosanthes scabra	Shrubby Stylo
	Themeda triandra	Kangaroo Grass
	Zizyphus maurtiana	Chinee Apple

Table 33: Remnant Polygon 6 Fauna Species List

Scientific Name	Common Name
Coracina novaehollandiae	Black-faced Cuckoo Shrike
Corvus orru	Torresian Crow
Cracticus nigrogularis	Pied Butcherbird
Cracticus tibicen	Australian Magpie
Grallina cyanoleuca	Magpie Lark
Haliastur sphenurus	Whistling Kite

Scientific Name	Common Name
Hirundo neoxena	Welcome Swallow
Manorina melanocephala	Noisy Miner
Rhipidura leucophrys	Willy Wagtail

4.4.7 Remnant Polygon 7 – South of Magnetic Creek

Remnant polygon 7 is intersected by a tributary of Magnetic Creek and contains Site 128 to 130 (refer **Plan 4.08**). Remnant vegetation mapping within the area contains *Least Concern* regional ecosystems with the largest portion containing composite RE 11.12.1/11.3.10/11.3.30/11.3.32, RE11.12.7/11.12.4 and RE 11.3.9/11.3.7/11.3.10/11.3.25. On-ground surveys have identified that the vegetation within the mapped remnant vegetation is representative of this mapping however little evidence of vine thicket RE11.12.4 was present with the majority of the area reflective of RE11.12.7. This polygon runs parallel to the Bruce Highway with the land currently utilised for cattle grazing. Vegetation is consistent with this land use, with the understory observed to be relatively sparse and the ground layer highly disturbed in areas. A tributary of Magnetic Creek is present through the centre of this polygon.

Field surveys identified that within the elevated portions of this remnant vegetation, the canopy layer consists of *Corymbia erythrophloia* (Variable-barked Bloodwood), *Eucalyptus Crebra* (Narrow-leaved Ironbark), *Corymbia dallachiana* (Ghost Gum), *Eucalyptus platyphylla* (White Gum) and *C. tessellaris* (Moreton Bay Ash). Whereas in the depressions and lower slopes of the vegetation, the canopy layer is dominated by *Melaleuca fluviatilis* (River Tea-tree), *Pandanus spiralis* (Pandanus) and *M. leucadendra* (Weeping Paperbark) (refer **Table 34** and **Photos 35-36**).

As noted preciously, the shrub layer was disturbeddue to historical land clearing and on-going land use for cattle grazing. The ground layer is also sparse in areas due to the exposed rock, however, native grasses such as *Bothriochloa decipiens* (Pitted Bluegrass), *Aristida calycina* (Dark Wiregrass), *Aristida latifolia* (Feathertop Wiregrass), *Themeda triandra* (Kangaroo Grass) and *Heteropogon contortus* (Black Speargrass) were present. The drainage features and watercourses showed varying levels of erosion and weed infestation including *Stachytarpheta jamaicensis* (Blue Snake Weed), *Argemone mexicana* (Mexican Poppy), *Gomphrena celosioides* (Gomphrena Weed) and *Sorghum halapense* (Johnson Grass).

Only common fauna were observed within Remnant Polygon 7, reflecting the historical and on-going land uses in the area limiting significant habitat value (refer **Table 35**).



Photo 36: Remnant polygon 7 – Vegetation characteristics along alignment



Photo 37: Remnant polygon 7 – Vegetation characteristics along alignment

Table 34: Remnant Polygon 7 Flora Species List

Strata	Scientific Name	Common Name
T1/T2	*Acacia leptostachya*	Slender Wattle
	Acacia salicina	Sally Wattle
	Corymbia dallachiana	Ghost Gum
	Corymbia erythrophloia	Variable-barked Bloodwood
	Corymbia tessellaris	Moreton Bay Ash
	Eucalyptus crebra	Narrow-leaved Ironbark
	Eucalyptus platyphylla	White Gum
	Melaleuca fluviatilis	River Tea-tree
	Melaleuca viridiflora	Broad-leaved Paperbark
	Pandanus spiralis	Pandanus

Strata	Scientific Name	Common Name
Shrub/Ground	*Argemone mexicana*	Mexican Poppy
	Aristida calycina	Dark Wiregrass
	Aristida latifolia	Feathertop Wiregrass
	Bothriochloa decipiens	Pitted Bluegrass
	Carissa ovata	Currant Bush
	Cryptostegia grandiflora	Rubber Vine
	Gomphrena celosioides	Gomphrena Weed
	Heteropogon contortus	Black Speargrass
	Macroptilium atropurpureum	Siratro
	Sida cordifolia	Flannel Weed
	Sorghum halapense	Johnson Grass
	Stachytarpheta jamaicensis	Blue Snake Weed
	Stylosanthes scabra	Shrubby Stylo
	Themeda triandra	Kangaroo Grass

Table 35: Remnant Polygon 7 Fauna Species List

Scientific Name	Common Name
Corvus orru	Torresian Crow
Cracticus tibicen	Australian Magpie
Grallina cyanoleuca	Magpie Lark
Haliastur sphenurus	Whistling Kite
Hirundo neoxena	Welcome Swallow
Milvus migrans	Fork-tailed Kite
Rhinella marina	Cane Toad
Rhipidura leucophrys	Willy Wagtail
Taeniopygia bichenovii	Double-barred Finch

4.4.8 Remnant Polygon 8 – East of Magnetic Creek along West Euri Road

Remnant Polygon 8 runs south of the Bruce Highway, extending east and running parallel to West Euri Road and adjoining the two branches of Euri Creek, with sites 131 through to 135 encompassed in this area (refer **Plan 4.09**). Mapped remnant vegetation within this polygon contains two composite *Least Concern* regional

ecosystems; RE11.3.9/11.3.7/11.3.10/11.3.25 and RE11.12.7/11.12.4. On-ground surveys found that the vegetation within these areas are generally reflective of this mapping, however, much of the vegetation closest to the proposed alignment has been highly modified by road infrastructure and surrounding agricultural and rural land uses. The land is currently utilised for cattle grazing in parts as well as rural residential housing areas.

The vegetation community occurs on exposed igneous rock adjacent and consists of *Corymbia clarksoniana* (Clarkson Bloodwood), *Eucalyptus platyphylla* (White Gum), *Melaleuca fluviatilis* (River Tea-tree), *Planchonia careya* (Cocky Apple) with *Acacia salicina* (Sally Wattle) regrowth. Vegetation along Euri Creek is dominated by *M. leucadendra* (Weeping Paperbark), *M. fluviatilis* (River Tea-tree) and *Pandanus* spp. Notably, *Eucalyptus raveretiana* (Black Ironbox), which is listed as *Near Threatened*, was also recorded within the waterway. Vegetation west of the waterway is dominated by *E. tereticornis* (Forest Red Gum), *C. tessellaris* (Moreton Bay Ash) and *E. platyphylla* (White Gum).

It is noted that the area is heavily weed infested at the ground layer and shrub layers, consisting of *Sorghum halepense* (Johnson Grass), *Lantana camara* (Lantana), *Ziziphus mauritiana* (Chinee Apple), *Macroptilium atropurpureum* (Siratro), *Ageratum houstonianum* (Blue Billy Goat) and *Gomphrena celosioides* (Gomphrena Weed). The high levels of invasive species and limited native shrub layer is consistent with the modified environment and historical land use of the area (refer **Table 36** and **Photos 37-39**).

Only common fauna were observed within remnant polygon 8, reflecting the historical and on-going land uses in the area limiting significant habitat value (refer **Table 37**).



Photo 38: Remnant polygon 8 – Vegetation characteristics along alignment, heavily weeded



Photo 39: Remnant polygon 8 – Vegetation characteristics along alignment



Photo 40: Remnant polygon 8 – Vegetation characteristics along alignment

Table 36: Remnant polygon 8 Flora Species List

Strata	Scientific Name	Common Name
T1/T2	*Acacia leptostachya*	Slender Wattle
	Acacia salicina	Sally Wattle
	Corymbia clarksoniana	Clarkson's Bloodwood
	Corymbia tessellaris	Moreton Bay Ash
	Eucalyptus crebra	Narrow-leaved Ironbark
	Eucalyptus platyphylla	White Gum
	Eucalyptus raveretiana	Black Ironbox
	Eucalyptus tereticornis	Forest Red Gum
	Melaleuca fluviatilis	River Tea-tree
	Melaleuca leucadendra	Weeping Paperbark
	Pandanus spiralis	Pandanus
	Planchonia careya	Cocky Apple
Shrub/Ground	*Ageratum houstonianum*	Blue Billy Goat
	Argemone mexicana	Mexican Poppy
	Aristida calycina	Dark Wiregrass
	Aristida latifolia	Feathertop Wiregrass
	Bothriochloa decipiens	Pitted Bluegrass
	Cryptostegia grandiflora	Rubber Vine
	Gomphrena celosioides	Gomphrena Weed
	Heteropogon contortus	Black Speargrass
	Lantana camara	Lantana
	Lomandra longifolia	Basket Grass
	Macroptilium atropurpureum	Siratro
	Parsonsia straminea	Monkey Rope
	Sida cordifolia	Flannel Weed
	Sorghum halapense	Johnson Grass
	Stachytarpheta jamaicensis	Blue Snake Weed
	Stylosanthes scabra	Shrubby Stylo
	Themeda triandra	Kangaroo Grass

Table 37: Remnant Polygon 8 Fauna Species List

Scientific Name	Common Name
Centropus phasianinus	Pheasant Coucal
Corvus orru	Torresian Crow
Cracticus tibicen	Australian Magpie
Grallina cyanoleuca	Magpie Lark
Haliastur sphenurus	Whistling Kite
Hirundo neoxena	Welcome Swallow
Macropus giganteus	Eastern Grey Kangaroo
Manorina melanocephala	Noisy Miner
Rhipidura leucophrys	Willy Wagtail
Taeniopygia bichenovii	Double Barred Finch
Trichoglossus moluccanus	Rainbow Lorikeet

5. Conclusions

Ecological Assessments were conducted across the project area from 2017-2024 to describe ecological values present. The survey effort was designed to provide adequate information to assess the likelihood of occurrence and impact on matters listed under the EPBC Act or NCA.

The following conclusions have been made:

- The proposed project area is highly modified due to the maintenance of adjoining linear infrastructure and past agricultural practices and vegetation clearing. Exotic flora were prevalent across the entire project area.
- Regulated Vegetation as mapped under the *Vegetation Management Act 1999* was confirmed within the project area, although these areas are compromised by adjoining disturbance and rural land-uses.
- Two threatened fauna species were observed during field surveys, *Crocodylus porosus* (Saltwater Crocodile) (refer FRC report) and *Geophaps scripta scripta* (Squatter Pigeon). Squatter Pigeons were observed within cattle grazing paddocks adjacent to the alignment near the Burdekin River. This species is known to the area and is not considered to be significantly impacted by the proposal due to the availability of suitable habitat (cattle grazing paddocks) along the proposed pipeline and overall disturbance of the vegetation along the alignment.
- No other threatened fauna species listed under the EPBC Act or NCA were recorded during field studies, and they are not expected to occur given the inherent levels of disturbance.
- No Koala sightings were recorded within the project area and they are not expected to occur given the lack of suitable habitat and inherent levels of disturbance.
- One threatened flora species, *Eucalyptus raveretiana* (Black Ironbox), listed as Vulnerable under the EPBC Act was recorded within and adjoining the project area. Individual Black Ironbox were only recorded as sporadic specimens at larger drainage lines along the proposed alignment, which are to be tunnel bored and managed under site specific Environmental Management Plans to mitigate potential adverse impacts from pipeline construction on this listed species. Notably, the specimens are currently persisting adjacent to existing high disturbance levels associated with adjoining linear infrastructure and agricultural pursuits.
- No Threatened Ecological Communities were recorded within the project area, and they are not expected to occur given the inherent levels of disturbance.
- As such, the proposed pipeline is unlikely to have a significant impact on environmental values due largely to the relatively disturbed nature of the strategically chosen pipeline alignment.

6. Appendices

Appendix A

Environment Protection and Biodiversity Conservation Act 1999

Protected Matters Search Tool Results

Appendix B

Nature Conservation Act 1992

Wildlife Online Search Results

Appendix C

Likelihood of occurrence Schedule for Threatened Species

Appendix D

Flow Path Assessment Details

Appendix A

Environment Protection and Biodiversity Conservation Act 1999

Protected Matters Search Tool Results

Australian Government

Department of Climate Change, Energy, the Environment and Water

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: 27-Feb-2024

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:	1
National Heritage Places:	1
Wetlands of International Importance (Ramsar	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	39
Listed Migratory Species:	40

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:	37
Whales and Other Cetaceans:	2
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:	1
Regional Forest Agreements:	None
Nationally Important Wetlands:	3
EPBC Act Referrals:	21
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

World Heritage Properties [Resource Information]

Name	State	Legal Status	Buffer Status
Great Barrier Reef	QLD	Declared property	In buffer area only

National Heritage Places [Resource Information]

Name	State	Legal Status	Buffer Status
Natural			
Great Barrier Reef	QLD	Listed place	In buffer area only

Wetlands of International Importance (Ramsar Wetlands) [Resource Information]

Ramsar Site Name	Proximity	Buffer Status
Bowling green bay	20 - 30km upstream from Ramsar site	In buffer area only

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	Buffer Status
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community may occur within area	In feature area
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Community likely to occur within area	In buffer area only

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	Buffer Status
BIRD			
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris canutus			
Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat likely to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area	In feature area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat likely to occur within area	In feature area
Neochmia ruficauda ruficauda Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Poephila cincta cincta Southern Black-throated Finch [64447]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Rostratula australis](#) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
[Tringa nebularia](#) Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In feature area
[Tyto novaehollandiae kimberli](#) Masked Owl (northern) [26048]	Vulnerable	Species or species habitat likely to occur within area	In feature area
MAMMAL			
[Dasyurus hallucatus](#) Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat known to occur within area	In feature area
[Macroderma gigas](#) Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Petauroides minor](#) Greater Glider (northern), Greater Glider (north-eastern Queensland) [92008]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Petauroides volans](#) Greater Glider (southern and central) [254]	Endangered	Species or species habitat likely to occur within area	In feature 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 known to occur within area	In feature area
[Saccolaimus saccolaimus nudicluniatus](#) Bare-rumped Sheath-tailed Bat, Bare-rumped Sheathtail Bat [66889]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Xeromys myoides](#) Water Mouse, False Water Rat, Yirrkoo [66]	Vulnerable	Species or species habitat likely to occur within area	In feature area
PLANT			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Aristida granitica [4065]	Endangered	Species or species habitat known to occur within area	In feature area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Eucalyptus raveretiana Black Ironbox [16344]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Omphalea celata [64586]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat may occur within area	In feature area
Solanum graniticum Granite Nightshade [84819]	Endangered	Species or species habitat may occur within area	In feature area
REPTILE			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
SHARK			
Pristis pristis Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat may occur within area	In feature area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Breeding likely to occur within area	In buffer area only
Sphyrna lewini Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only

Listed Migratory Species		[Resource Information]	
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Anous stolidus Common Noddy [825]		Species or species habitat may occur within area	In buffer area only
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area	In buffer area only
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Phaethon lepturus](#) White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In buffer area only
[Sternula albifrons](#) Little Tern [82849]		Species or species habitat may occur within area	In buffer area only
Migratory Marine Species			
[Anoxypristis cuspidata](#) Narrow Sawfish, Knifetooth Sawfish [68448]		Species or species habitat likely to occur within area	In buffer area only
[Caretta caretta](#) Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
[Chelonia mydas](#) Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Crocodylus porosus](#) Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area	In feature area
[Dermochelys coriacea](#) Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
[Eretmochelys imbricata](#) Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
[Lamna nasus](#) Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area	In buffer area only
[Lepidochelys olivacea](#) Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat may occur within area	In buffer area only
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat may occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Orcaella heinsohni Australian Snubfin Dolphin [81322]		Species or species habitat may occur within area	In buffer area only
Pristis pristis Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat may occur within area	In feature area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Breeding likely to occur within area	In buffer area only
Sousa sahulensis as Sousa chinensis Australian Humpback Dolphin [87942]		Breeding known to occur within area	In buffer area only
Migratory Terrestrial Species			
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Myiagra cyanoleuca](#) Satin Flycatcher [612]		Species or species habitat likely to occur within area	In feature area
[Rhipidura rufifrons](#) Rufous Fantail [592]		Species or species habitat likely to occur within area	In feature area
[Symposiachrus trivirgatus as Monarcha trivirgatus](#) Spectacled Monarch [83946]		Species or species habitat known to occur within area	In feature area
Migratory Wetlands Species			
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Calidris canutus](#) Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
[Charadrius leschenaultii](#) Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Limosa lapponica](#) Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Numenius madagascariensis			
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pandion haliaetus			
Osprey [952]		Species or species habitat known to occur within area	In feature area
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In feature area
Tringa stagnatilis			
Marsh Sandpiper, Little Greenshank [833]		Species or species habitat likely to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Anous stolidus			
Common Noddy [825]		Species or species habitat may occur within area	In buffer area only
Anseranas semipalmata			
Magpie Goose [978]		Species or species habitat may occur within area overfly marine area	In feature area
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis			
Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area	In buffer area only
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area	In buffer area only
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely to occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In feature area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In buffer area only
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rostratula australis as Rostratula benghalensis (sensu lato)			
Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Sternula albifrons as Sterna albifrons			
Little Tern [82849]		Species or species habitat may occur within area	In buffer area only
Symposiachrus trivirgatus as Monarcha trivirgatus			
Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area	In feature area
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Tringa stagnatilis			
Marsh Sandpiper, Little Greenshank [833]		Species or species habitat likely to occur within area overfly marine area	In buffer area only
Reptile			
Caretta caretta			
Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Chelonia mydas			
Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Crocodylus porosus			
Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area	In feature area
Dermochelys coriacea			
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Eretmochelys imbricata			
Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Lepidochelys olivacea			
Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Natator depressus			
Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only

Whales and Other Cetaceans			[Resource Information]
Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Orcaella heinsohni			
Australian Snubfin Dolphin [81322]		Species or species habitat may occur within area	In buffer area only
Sousa sahulensis			
Australian Humpback Dolphin [87942]		Breeding known to occur within area	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Burdekin	Fish Habitat Area (B)	QLD	In feature area

Nationally Important Wetlands		[Resource Information]
Wetland Name	State	Buffer Status
Abbot Point - Caley Valley	QLD	In buffer area only
Burdekin Delta	QLD	In feature area
Southern Upstart Bay	QLD	In feature area

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Galilee Infrastructure Corridor Project	2012/6489		Post-Approval	In buffer area only
Controlled action				

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Abbot Point Coal Terminal Project	2012/6250	Controlled Action	Completed	In feature area
Alpha Coal Project - Mine and Rail Development	2008/4648	Controlled Action	Post-Approval	In feature area
Alpha Coal Project - Port Options Development	2008/4647	Controlled Action	Completed	In feature area
Aurukun Bauxite Project Abbot Point Infrastructure	2008/4595	Controlled Action	Completed	In feature area
Aurukun Bauxite Project Abbot Point Refinery	2008/4594	Controlled Action	Completed	In buffer area only
Aurukun Bauxite Project Abbot Point Transport Corridor	2008/4593	Controlled Action	Completed	In feature area
Bowen Pipeline	2021/8993	Controlled Action	Referral Decision	In feature area
Central Queensland Integrated Rail Project	2012/6321	Controlled Action	Completed	In feature area
Cooper to Abbot Point liquid natural gas (LNG) facility, Capling Project, QLD	2014/7175	Controlled Action	Completed	In feature area
Establishment of Galilee Coal Mine and Associated Infrastructure	2009/4737	Controlled Action	Post-Approval	In feature area
expansion of fish farm activities	2003/1274	Controlled Action	Completed	In feature area
Koonandah Hard Rock Quarry, Bowen, QLD	2018/8366	Controlled Action	Further Information Request	In buffer area only
New Multi Cargo Facility, Abbot Point, Queensland	2009/4837	Controlled Action	Completed	In feature area
North Galilee Basin Rail Project, Qld	2013/6885	Controlled Action	Post-Approval	In feature area
The Burdekin Cassava Project	2010/5514	Controlled Action	Post-Approval	In feature area
Water for Bowen project	2006/2527	Controlled Action	Completed	In feature area
Not controlled action				
Abbot Point to Bogie River Rail Upgrade (GAP 50) Project	2010/5482	Not Controlled Action	Completed	In feature area
Highway re-alignment and reconstruction	2001/461	Not Controlled Action	Completed	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Salisbury Plains Light Industrial Infrastructure Facilities Development, Bowen, QLD	2014/7270	Not Controlled Action	Completed	In feature area

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 are 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

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

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

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
- 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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Appendix B

Nature Conservation Act 1992

Wildlife Online Search Results

Queensland Government

WildNet species list

Search Criteria: Species List for a Defined Area
Species: All
Type: Native
Queensland status: Rare and threatened species
Records: All
Date: All
Latitude: 19.6447 to 20.0596
Longitude: 147.3951 to 148.1745
Email: liambrzezinski@saundershavill.com
Date submitted: Tuesday 27 Feb 2024 10:39:55
Date extracted: Tuesday 27 Feb 2024 10:40:03

The number of records retrieved = 19

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Information about your Species lists request is logged for quality assurance, user support and product enhancement purposes only.
The information provided should be appropriately acknowledged as being derived from WildNet database when it is used. As the WildNet Program is still in a process of collating and vetting data, it is possible the information given is not complete. Go to the WildNet database webpage (https://www.qld.gov.au/environment/plants-animals/species-information/wildnet) to find out more about WildNet and where to access other WildNet information products approved for publication. Feedback about WildNet species lists should be emailed to wildlife.online@des.qld.gov.au.

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Burhinidae	*Esacus magnirostris*	beach stone-curlew		V		16
animals	birds	Charadriidae	*Charadrius leschenaultii*	greater sand plover		V	V	42
animals	birds	Charadriidae	*Charadrius mongolus*	lesser sand plover		E	E	37
animals	birds	Columbidae	*Geophaps scripta scripta*	squatter pigeon (southern subspecies)		V	V	6
animals	birds	Estrildidae	*Poephila cincta cincta*	black-throated finch (white-rumped subspecies)		E	E	1
animals	birds	Rostratulidae	*Rostratula australis*	Australian painted-snipe		E	E	11
animals	birds	Scolopacidae	*Calidris canutus*	red knot		E	V	17
animals	birds	Scolopacidae	*Calidris ferruginea*	curlew sandpiper		CR	CE	39
animals	birds	Scolopacidae	*Calidris tenuirostris*	great knot		CR	V	38
animals	birds	Scolopacidae	*Limosa lapponica baueri*	Western Alaskan bar-tailed godwit		V	E	58
animals	birds	Scolopacidae	*Numenius madagascariensis*	eastern curlew		E	CE	78
animals	mammals	Delphinidae	*Orcaella heinsohni*	Australian snubfin dolphin		V		2
animals	mammals	Dugongidae	*Dugong dugon*	dugong		V		2
animals	mammals	Emballonuridae	*Taphozous australis*	coastal sheathtail bat		NT		2
animals	mammals	Phascolarctidae	*Phascolarctos cinereus*	koala		E	E	1
animals	reptiles	Cheloniidae	*Chelonia mydas*	green turtle		V	V	5
plants	land plants	Arecaceae	*Livistona drudei*	Halifax fan palm		V		1/1
plants	land plants	Euphorbiaceae	*Croton magneticus*			V		3/3
plants	land plants	Poaceae	*Aristida granitica*			E	E	4/4

CODES

I - Y indicates that the taxon is introduced to Queensland and has naturalised.

Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992.*
The codes are Extinct (EX), Extinct in the Wild (PE), Critically Endangered (CR), Endangered (E), Vulnerable (V), Near Threatened (NT), Special Least Concern (SL) and Least Concern (C).

A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999.*
The values of EPBC are Extinct (EX), Extinct in the Wild (XW), Critically Endangered (CE), Endangered (E), Vulnerable (V) and Conservation Dependent (CD).

Records - The first number indicates the total number of records of the taxon (wildlife records and species listings for selected areas).
This number is output as 99999 if it equals or exceeds this value. A second number located after a / indicates the number of specimen records for the taxon.
This number is output as 999 if it equals or exceeds this value.

Appendix C

Likelihood of occurrence Schedule for Threatened Species

8704 HABITAT ASSESSMENT FOR THREATENED SPECIES

Matters of National Environmental Significance

Name		EPBC Act Status	Proximity	Description	Likelihood of Occurrence	Risk
Properties	Great Barrier Reef	World and Nationally Listed	3-5km to the east	The GBR is one of the world's most unique and biologically diverse ecosystems. Covering 348,000 square kilometres, it's the world's most extensive coral reef system. The GBR is located to the east of the alignment (ranging between 3-5km).	The GBR is located to the east of the alignment (ranging between 3-5km, refer Attachment 1). Due to the chosen alignment and the relatively limited operational impacts of underground pipe networks, no direct impacts on world and nationally listed properties are predicted. Management of nationally important areas against any construction or indirect impacts will be completed in accordance with guideline requirements under the EPBC Act. An assessment of the 'facilitated' impacts associated with this project has been completed by Adaptive and FRC environmental. The report completed by Adaptive Strategies concludes that there is limited potential for the project to facilitate consequential development that is not regulated or assessed through existing planning and development schemes. The report by FRC Environmental found that the controls in place for water allocations will likely reduce the potential for adverse impacts on the GBR.	No Risk
Wetland of International Importance (Ramsar Wetlands)						
Bowling Green Bay		World and Nationally Listed	20-30km upstream from Ramsar site	Bowling Green Bay occupies a total area 35 500 hectares divided as: (a) Mountainous areas above 20m: Cape Cleveland, The Cone, Storth Hill, Feltham Cone: 4000 hectares or approximately 11% of the area; (b) Elevated Coastal Sand Dunes above 10 meters: only small areas of this land-type fall within the proposed area; (c) Coastal Plain below 20 meters, most much less: approximately 32000 hectares or 89% of the total area.	The proposed pipeline starts at the Burdekin River, approximately 30km south of Bowling Green Bay. The pipeline extends in a south-east direction, away from Bowling Green Bay. Given the distance of the proposed alignment from Bowling Green Bay and the high levels of modification within the local area, there is considered to be no risk that the proposed development will impact Bowling Green Bay.	No Risk
Listed Threatened Ecological Communities						
Name		**EPBC Act Status**	**Type of Presence**	**Description of Community**	**Likelihood of Occurrence**	**Risk**
Poplar Box Grassy Woodland on Alluvial Plains		Endangered	Community may occur within area	Poplar Box Grassy Woodland is characterised by a species rich understorey of native tussock grasses, herbs and scattered shrubs, and the dominance of openly spaced trees, such as poplar/bimble box (Eucalyptus populnea). This ecological community mostly occurs as scattered remnant patches inland of the Great Dividing Range in New south Wales and Queensland within the Brigalow Belt North, Brigalow Belt South, Cobar Peneplain, Darling Riverine Plains, NSW South Western Slopes and Riverina IBRA bioregions. In Queensland, the national ecological community included four (4) regional ecosystems within the Brigalow Belt Bioregion at the time of listing (RE11.3.2, RE11.3.17, RE11.4.7 and 11.4.12).	No species representing these characteristics or vegetation communities were observed along the proposed alignment. No RE's likely to support this TEC are mapped within the area of the proposed alignment. Further, targeted field surveys along the alignment where ecological factors (*i.e.,* soil type, geography, tidal influence etc.) may support TECs confirmed that nil were present along or within immediate proximity to the proposed alignment.	No Risk
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions		Endangered	Community likely to occur within area	Semi-evergreen vine thicket (SEVT) is considered an extreme form of dry seasonal subtropical rainforest. It's generally characterised by the prominence of trees with microphyll sized leaves, the presence of Brachychiton spp as emergents from the vegetation, and the thickets	No species representing these characteristics or vegetation communities were observed along the proposed alignment. Further, targeted field surveys along the alignment where mapped regional ecosystems or ecological factors (*i.e.,* soil type, geography, tidal influence etc.) may support TECs	No Risk

			occurring in areas with a subtropical, seasonally dry climate on soils of high to medium fertility. In Queensland, the national ecological community included ten (10) regional ecosystems within the Brigalow Belt Bioregion at the time of listing (RE11.2.3, RE11.3.11, RE11.4.1, RE11.5.15, RE11.8.3, RE11.8.6, RE11.8.13, RE11.9.4, RE11.9.8 and RE11.11.18).	confirmed that nil were present along or within immediate proximity to the proposed alignment.	

Birds							
Scientific Name	**Common Name**		**Status**	**EPBC Code**	**Description of Community / Habitat**	**Likelihood of Occurrence**	**Risk**
Calidris acuminata	Sharp-tailed Sandpiper	Vulnerable	Vulnerable	874	In Queensland, the species is widespread along the coast and is sparsely scattered inland, particularly in central and south-western regions. The species also occurs in both freshwater and saline habitats	The species is widespread with records throughout the local area. In general the proposed alignment contains limited freshwater ecosystems confined to several major waterways. The vast majority of the alignment contains dry, highly modified drainage channels.	Low Risk
Calidris canutus	Red Knot	Endangered	Endangered	855	The Red Knot mainly inhabit intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They are occasionally seen on terrestrial saline wetlands near the coast, such as lakes, lagoons, pools and pans, and recorded on sewage ponds and saltworks, but rarely use freshwater swamps. They rarely use inland lakes or swamps.	No suitable habitat was observed along the proposed alignment.	No Risk
Calidris ferruginea	Curlew Sandpiper	Critically Endangered	Critically Endangered	856	Curlew Sandpipers mainly occur on intertidal mudflats in sheltered Coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. Curlew Sandpipers forage on mudflats and Nearby shallow water. Roosting generally occurs on bare dry shingle, Shell or sand beaches, sand spit sand is lets in or around coastal or near coastal lagoons and other wetlands.	No suitable habitat was observed along the proposed alignment	No Risk
Charadrius lechenaultii	Greater Sand Plover	Vulnerable	Vulnerable	877	In the non-breeding grounds in Australasia, the Greater Sand Plover is almost entirely coastal, inhabiting littoral and estuarine habitats. They mainly occur on sheltered sandy, shelly or muddy beaches with large intertidal mudflats or sandbanks, as well as sandy estuarine lagoons. They seldom occur at shallow freshwater wetlands.	Suitable habitat for this species in the form of mudflats is lacking. It is unlikely that this species would occur.	No Risk
Charadrius mongolus	Lesser Sand Plover	Endangered	Endangered	879	The Lesser Sand Plover is found on sand and mudflats. This species feeds on small molluscs, worms and crustaceans.	Suitable habitat for this species in the form of mudflats is lacking. It is unlikely that this species would occur.	No Risk
Erythrotriorchis radiatus	Red Goshawk	Endangered	Vulnerable	942	The Red Goshawk occurs over wooded and forested lands of tropical and warm-temperate Australia, coastal and sub-coastal. This species prefers forest and woodland with a mosaic of vegetation types, large prey populations (birds), and permanent water. The vegetation types include eucalypt woodland, open forest, tall open forest, gallery rainforest, swamp sclerophyll forest, and rainforest margins.	Elements of suitable habitat were observed along the proposed alignment, however due to the lack of records within or adjacent to the site, it's highly unlikely that this species would occur.	Low Risk
Esacus magnirostris	Beach Stone-curlew	Vulnerable	-	-	The Beach Stone-Curlew occurs on open, undisturbed beaches, islands, reefs, and estuarine intertidal sand and mudflats, preferring beaches with estuaries or mangroves nearby. However, this species also frequents river mouths, offshore sandbars associated with coral atolls, reefs and rock platforms and coastal lagoons.	Suitable habitat for this species in the form of beach and mudflats is lacking. It is unlikely that this species would occur.	Low Risk
Falco hypoleucos	Grey Falcon	Vulnerable	Vulnerable	929	The Grey Falcon occurs in arid and semi-arid Australia. The species appears to be absent from Cape York Peninsular, area east of the Great	Areas of suitable habitat were observed along the proposed alignment. However, no records of Grey	Low Risk

					Dividing Rage in Queensland and New South Wales. The species frequents timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined water courses.	Falcon have been observed in the area and are rarely identified east of the Great Dividing Range.	
Geophaps scripta scripta	Squatter Pigeon (southern)	Vulnerable	Vulnerable	64440	This species inhabits open grasslands and woodlands typically with a native understorey although may occur in artificial pasture.	Suitable vegetation to support this species is present along and adjoining the alignment. This species is known to occur in disturbed landscapes such as cleared paddock and is often observed adjacent to cattle drinking stations. The species was observed on grazing properties where the alignment is proposed. However, given the comparatively small area of impact of the proposed works and the availability of suitable habitat in the region. The proposed development is considered a low risk to the species.	Low risk
Hirundapus caudacutus	White-throated Needletail	Vulnerable	Vulnerable	682	In Australia, the White-throated Needletail is almost exclusively aerial, it has been stated that conventional habitat descriptions are inapplicable. However, they occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. When flying above farmland, they are more often recorded above partly cleared pasture.	Suitable habitat was observed along the proposed alignment. However, as the majority of the area has been cleared with few retained trees it is unlikely that the species will utilise the area.	Low Risk
Limosa lapponica baueri	Western Alaskan Bar-tailed Godwit	Vulnerable	Vulnerable	86380	The Bar-tailed Godwit is found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It's often found around beds of seagrass and, sometimes, in nearby saltmarsh. The Bar-tailed Godwit usually forages near the edge of water or in shallow water, mainly in tidal estuaries and harbours. Roosting usually occurs on sandy beaches, sandbars, spits, and also in near-coastal saltmarsh.	No suitable habitat was observed along the proposed alignment	No Risk
Neochmia ruficauda ruficauda	Star Finch	Endangered	Endangered	26027	The Star Finch occurs mainly in grasslands and grassy woodlands that are located close to bodies or fresh water. This species also occurs in cleared or suburban areas such as along roadsides and in towns. The Star Finch feeds on the seeds of grasses and other annual plants, and on insects.	Suitable habitat occurs along the proposed alignment, however due to the lack of records within adjacent to the project, it's highly unlikely that this species would occur.	Low Risk
Numenius madagascariensis	Eastern Curlew	Endangered	Critically Endangered	847	During the non-breeding season in Australia, the Eastern Curlew is most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass. The Eastern Curlew mainly forages during the non-breeding season on soft sheltered intertidal sandflats or mudflats, open and without vegetation or covered with seagrass, often near mangroves, on sandflats and in saltmarsh, rockpools and among rubble on coral reefs, and on ocean beaches near the tideline. Roosting generally occurs during high tide periods on sandy spits, sandbars and islets, especially on beach sand near the high-water mark, and among coastal vegetation including low saltmarsh or mangroves.	No suitable habitat was observed along the proposed alignment	No Risk

Poephila cincta cincta	Southern Black-throated Finch	Endangered	Endangered	64447	The Black-throated Finch (southern) occurs mainly in grassy, open woodlands and forests, typically dominated by Eucalyptus, Corymbia and Melaleuca, and occasionally in tussock grasslands or other habitats (for example freshwater wetlands), often along or near watercourses, or in the vicinity of water. It occurs at two general locations: in the Townsville region, where it is considered to be locally common at a few sites around Townsville and Charters Towers; and at scattered sites in central-eastern Queensland (between Aramac and Great Basalt Wall National Park). It has been absent from Brisbane and its surrounds since the 1930s.	Suitable habitat occurs along the proposed alignment. However, due to the close proximity of the project to a major road network (Bruce Highway), the highly fragmented nature of the riparian vegetation caused by historical trunk infrastructure upgrades (road and rail) and the light and noise pollution caused by vehicular traffic, it's unlikely that this species would occur.	Low Risk
Rostratula australis	Australian Painted Snipe	Endangered	Endangered	77037	The Australian Painted Snipe is usually found in shallow inland wetlands, either freshwater or brackish, that are either permanently or temporarily filled. The species has a scattered distribution throughout many parts of Australia, with a single record from Tasmania.	No suitable habitat was observed along the proposed alignment	No Risk
Tyto novaehollandiae Kimberli	Masked Owl	Vulnerable	Vulnerable	26048	In northern Australia, the Masked Owl has been recorded from riparian forest, rainforest, open forest, Melaleuca swamps and the edges of mangroves, as well as along the margins of sugar cane fields. The Masked Owl is known to have a large home range (1000 1100ha), requires large trees with large hollows for nesting and feeds on predominantly mammals.	Suitable habitat occurs along the proposed alignment. However, due to the close proximity of the project to a major road network (Bruce Highway), the highly fragmented nature of the riparian vegetation caused by historical trunk infrastructure upgrades (road and rail) and the light and noise pollution caused by vehicular traffic, it's unlikely that this species would occur.	No Risk
Mammals							
Scientific Name	**Common Name**		**Status**	**EPBC Code**	**Description of Community / Habitat**	**Likelihood of Occurrence**	**Risk**
Dasyurus hallucatus	Northern Quoll	-	Endangered	331	The Northern Quoll occupies a diversity of habitats across its range which includes rocky areas, eucalypt forest and woodlands, rainforests, sandy lowlands and beaches, shrubland, grassland and desert. Northern Quoll generally encompasses some form of rocky area for denning purposes with surrounding vegetated habitats used for foraging and dispersal. Rocky habitats support higher densities and/or longer-lived individuals with the species range, due to more protection from predators, better nutrition and less exposure to agricultural practices.	No suitable den habitat was observed along the proposed alignment	No Risk
Dugong dugon	Dugong	Vulnerable	-	-	Dugongs feed exclusively on seagrass and occur in locations where seagrass grows which is primarily on a sandy sea floor in shallow, warm water. In Australia, dugongs occur in the shallow coastal waters of northern Australia from the Queensland/New South Wales border in the east to Shark Bay on the Western Australian coast.	No suitable habitat in the form of marine water and seagrass is present.	No Risk
Macroderma gigas	Ghost Bat	Endangered	Vulnerable	174	The Ghost Bat is the largest microchiropteran bat in Australia and the second largest in the world. They currently occupy habitats ranging from the arid Pilbara to tropical savanna woodlands and rainforests. During the day they roost in caves, rock crevices and old mines. Roost sites used permanently are generally deep natural caves or disused mines with relatively stable temperatures. They are carnivores, with a	No suitable roosting habitat was observed along the proposed alignment	No Risk

					broad diet comprising small mammals including other bats, birds, reptiles, frogs and large insects.		
Petauroides minor	Greater Glider (northern)	Vulnerable	Vulnerable	92008	The Greater Glider is an arboreal nocturnal marsupial that is mostly restricted to eucalypt forests and woodlands, although it occurs in highest abundance in taller, montane, moist eucalypt forests with abundant (large) hollow-bearing trees for shelter and a variety of eucalypt species for feeding. Diet consists of eucalypt leaves, and occasionally flowers. Small home ranges and low dispersability make this species sensitive to clearing and fragmentation, with low persistence in small forest fragments.	Suitable habitat for the species is generally lacking from the site with the majority of the proposed pipeline within cleared modified areas. Furthermore, the pipeline is to be located close to main roads and infrastructure which is a significant deterrent for the species.	No risk
Petauroides volans	Greater Glider (southern and central)	Endangered	Vulnerable	254	The Greater Glider is an arboreal nocturnal marsupial that is mostly restricted to eucalypt forests and woodlands, although it occurs in highest abundance in taller, montane, moist eucalypt forests with abundant (large) hollow-bearing trees for shelter and a variety of eucalypt species for feeding. Diet consists of eucalypt leaves, and occasionally flowers. Small home ranges and low dispersability make this species sensitive to clearing and fragmentation, with low persistence in small forest fragments.	Suitable habitat for the species is generally lacking from the site with the majority of the proposed pipeline within cleared modified areas. Furthermore, the pipeline is to be located close to main roads and infrastructure which is a significant deterrent for the species.	No risk
Orcaella heinsohni	Australian Snubfin Dolphin	Vulnerable	-	-	Within Australia, Australian Snubfin Dolphins have been recorded almost exclusively in coastal and estuarine waters. It is doubtful that they venture very far upstream in river systems, although occasional vagrants may venture upstream.	Suitable habitat to support this species is absent from the survey locations which are predominantly drainage features.	No Risk
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)	Koala	Endangered	Endangered	85104	They are found in a range of habitats, from coastal islands and tall eucalypt forests to low woodlands inland. The species is known from the surrounding area and evidence has been recorded on-site.	Opportunistic searches and spotlighting of this species did not find any individual specimens. Given the close proximity of the project to a major road network (Bruce Highway), the highly fragmented nature of the riparian vegetation caused by historical trunk infrastructure upgrades (road and rail) and the light and noise pollution caused by vehicular traffic, it's unlikely that this species would occur. If this species did occur, it would be during the movement between more suitable habitat patches.	Low Risk
Saccolaimus saccolaimus nudicluniatus	Bare-rumped Sheath-tailed Bat	Endangered	Vulnerable	66889	The Bare-rumped Sheath-tailed Bat occurs mostly in lowland areas, typical in a range of woodland, forest and open environments. The Bare-rumped Sheath-tailed Bat has been suggested to forage over habitat edges of rainforest and in forest clearings. The small number of confirmed roosts located in Australia have all been in tree hollows.	Suitable habitat occurs along the proposed alignment. However, due to the small number of roosts, close proximity of the project to a major road network (Bruce Highway), the highly fragmented nature of the riparian vegetation caused by historical trunk infrastructure upgrades (road and rail) and the light and noise pollution caused by vehicular traffic, it's unlikely that this species would occur.	Low Risk
Taphozous australis	Coastal Sheathtail Bat	Near Threatened	-	-	The coastal sheathtail bat forages within about one kilometre of the ocean, in habitat including sand dune scrub, mangroves, melaleuca swamps, coastal heathlands, open eucalypt forest, and grasslands. Coastal sheathtail bats that roost on coastal islands off Cape York Peninsula have been observed to fly to the mainland to forage.	Suitable foraging habitat occurs along the proposed alignment. However, given the close proximity of the project to a major road network (Bruce Highway), the highly fragmented nature of the riparian vegetation caused by historical trunk infrastructure upgrades (road and rail) and the light	Low Risk

						and noise pollution caused by vehicular traffic, it's unlikely that this species would occur.	
Xeromys myoides	Water Mouse	Vulnerable	Vulnerable	66	The Water Mouse has been documented in three distinct locations (Northern Territory, Central South Queensland and South-east Queensland), all requiring similar habitat, including mangroves and the associated saltmarsh, sedgelands, clay pans, heathlands and freshwater wetlands. The main difference at each location is the littoral, supralittoral and terrestrial vegetation which differs in structure and composition. These differences dictate the species' nesting behaviour. In Central South Queensland, the Water Mouse has only been captured in the high inter- tidal zone in tall, closed fringing mangrove forest.	No suitable habitat was observed along the proposed alignment.	No Risk
Plants							
Scientific Name	**Common Name**	**NCA Status**	**EPBC Act Status**	**EPBC Code**	**Description of Community / Habitat**	**Likelihood of Occurrence**	**Risk**
Aristida granitica	-	Endangered	Endangered	4065	*Aristida granitica* is known only from the type locality in the foothills of Mt Pring, 10km west of Bowen, Queensland, where it is common. This species grows in sandy soil derived from granite sand in eucalypt woodland. The only known population occurs in an area of remnant vegetation and is therefore currently protected from broad-scale clearing.	Given the known restricted distribution of this species, it's unlikely that this species would occur.	No Risk
Croton magneticus	-	Vulnerable	-	-	*Croton magneticus* is a deciduous small tree or shrub that grows up to 5 m high. This plant occurs in north-east Queensland between Greenvale in the north to near Collinsville in the south. It grows in deciduous vine thickets on soils derived from sandstone, granite or acid agglomerate substrates. It is noted to be rare to occasional on Gloucester Island and Mount Stuart, frequent to common on Magnetic Island, Mt Abbot and Mt Blackjack.	Suitable vine thicket habitat is not present. In addition, this species was not observed in survey locations. It is unlikely that it would occur.	No Risk
Dichanthium setosum	Bluegrass	-	Vulnerable	14159	Bluegrass is associated with heavy basaltic black soils and red-brown loams with clay subsoil. This species is often found in moderately disturbed areas such as cleared woodland, grassy roadside remnants and highly disturbed pasture.	Suitable habitat occurs along the proposed alignment. However, due to the highly disturbed nature of the vegetation within the easement in which the alignment is proposed and the highly fragmented nature of the vegetation caused by historical trunk infrastructure upgrades (road and rail), it's unlikely that this species would occur.	Low Risk
Eucalyptus raveretiana	Black Ironbox	-	Vulnerable	16344	Black Ironbox usually grows along watercourses, and sometimes on river flats or open woodland. Soil varies from sand through to heavy clay. Altitudinal range is 0-300m and the climate of the area is sub-tropical with an annual rainfall of 650-1100mm. Black Ironbox does not occur in pure stands, but is co-dominant with species such as Broad-leaved Teatree, Forest Red Gum, Moreton Bay Ash (RE11.3.25a) and occasionally in semi-evergreen vine thicket (RE11.3.11). The distribution of Black Ironbox overlaps with three (3) EPBC Act-listed threatened ecological communities being, Brigalow, Bluegrass dominant grassland on the Brigalow Belt Bioregion and Semi evergreen vine thickets of the Brigalow Belt and Nandewar Bioregions.	Known and regularly recorded along the proposed alignment within the major watercourses. Species was typically recorded on the low-bank of the watercourse system. The specimens of Black Ironbox recorded along the proposed pipeline alignment currently persist in a location suffering from elevated disturbance associated with adjoining linear infrastructure and agricultural pursuits. As such, the specimens identified are not considered to constitute an important population of the species.	Low Risk

						Drainage lines where Black Ironbox are located within the direct pipeline alignment will be tunnel bored to avoid clearing the specimens and mitigate the potential for direct adverse impacts. All areas where the species was recorded, including those where Black Ironbox occur downstream of the pipeline, will be managed under site specific Environmental Management Plans to further mitigate adverse impact potential.	
Omphalea celata	-	Vulnerable	Vulnerable	64586	*Omphalea celata* is known from three (3) sites in central east Queensland. Locations include Hazelwood Gorge, near Eungella; Gloucester Island, near Bowen; and Cooper Creek in the Homevale Station area, north-west of Nebo. This species is known to grow in fragmented semi-evergreen vine thicket along watercourses on weathered metamorphics in a steep- sided gorge at an altitude of 560m and in rocky granitic gullies near Araucaria microphyll vineforest.	No suitable habitat was observed along the proposed alignment	No Risk
Phaius australis	Lesser Swamp-orchid	Endangered	Endangered	5872	The Lesser Swamp-orchid is commonly associated with coastal wet heath/sedge land wetlands, swampy grassland or swampy forest and often where Broad-leaved Paperbark or Swamp Mahogany are found. Typically, the Lesser Swamp-orchid is restricted to the swamp-forest margins, where it occurs in swamp sclerophyll forest (Broad-leaved Paperbark/Swamp Mahogany/Swamp Box (Lophostemon suaveolens), swampy rainforest (often with sclerophyll emergent), or fringing open forest. It is often associated with rainforest elements such as Bangalow Palm (Archontophoenix cunninghamiana) or Cabbage Tree Palm (Livistona australis).	Suitable habitat is generally absent from the area of the proposed alignment. Where potentially suitable habitat is present, the pipeline is proposed to be tunnel bored to reduce any impacts on vegetation. Furthermore, the species has not been observed within the proposed alignment following multiple surveys.	No risk
Solanum graniticum	Granite Nightshade	Endangered	Endangered	84819	Solanum graniticum is endemic to Queensland. It is found on Gloucester Island (near Bowen), and adjacent parts of the mainland, and at Eungella Dam. Solanum graniticum grows in open eucalypt woodland on hillsides with shallow soil derived from granite or granodiorite	Given the majority of the proposed pipeline is situated within highly modified areas utilised for cattle grazing, sugar cane farming or roads and rail corridors. It's considered unlikely the species would be present within the alignment. Furthermore, field surveys have not identified the species within the proposed alignment.	Low Risk
Reptiles							
Scientific Name	**Common Name**		**Status**	**EPBC Code**	**Description of Community / Habitat**	**Likelihood of Occurrence**	**Risk**
Caretta caretta	Loggerhead Turtle	Endangered	Endangered		The loggerhead turtle has a worldwide distribution in coastal tropical and subtropical waters. In Australia, loggerheads occur in coral reefs, bays and estuaries in tropical and warm temperate waters off the coast of Queensland, Northern Territory, Western Australia and New South Wales.	No coastal tropical water or coral reefs are present within the proposed alignment	No risk
Chelonia mydas	Green Turtle	Vulnerable	Vulnerable	1765	Green turtles occur in seaweed-rich coral reefs and inshore seagrass pastures in tropical and subtropical areas of the Indo-Pacific region.	Suitable marine habitat for this species is not present along the alignment.	No Risk
Dermochelys coriacea	Leatherback Turtle	Endangered	Endangered	1768			No Risk

					Leatherback turtles are most commonly reported feeding in coastal waters in central eastern Australia (from the Sunshine Coast in southern Queensland to central New South Wales); south-east Australia (from Tasmania, Victoria and eastern South Australia) and in south-western Western Australia	The proposed pipeline is not situated within coastal waters therefore there is no risk for the proposed development to impact the species.	
Egernia rugosa	Yakka Skink	Vulnerable	Vulnerable	1420	The Yakka Skink is known to occur in open dry sclerophyll forest, woodland and shrub. The core habitat of this species is within the Mulga Lands and Brigalow Belt South Bioregions. The Yakka Skink is commonly found in cavities under and between partly buried rocks, logs or tree stumps, root cavities and abandoned animal burrows.	No suitable habitat was observed along the proposed alignment. Further, no Mulga or Brigalow vegetation communities were observed during the field assessment.	No Risk
Eretmochelys imbricata	Hawksbill Turtle	Vulnerable	Vulnerable	1766	Hawksbill turtles use a variety of habitats during different stages of their life cycle, but largely inhabit nearshore foraging grounds, especially healthy coral reef habitats.	No suitable habitat in the form of coral reefs are found ion the vicinity of the proposed development	No risk
Lepidochelys olivacea	Olive Ridley Turtle	Endangered	Endangered	1767	Olive ridley turtles occur in shallow, protected waters, especially in soft-bottomed habitats. They are distributed across the tropics but are rarely found around oceanic islands.	Not suitable coastal habitat for the species is present within the proposed alignment.	No Risk
Natator depressus	Flatback Turtle	Vulnerable	Vulnerable	59257	All known breeding sites of the flatback turtle occur in tropical Australia, on beaches and islands in Queensland, the Northern Territory and Western Australia. They feed in the northern coastal regions of Australia, ranging as far south as the Tropic of Capricorn.	Not suitable coastal habitat for the species is present within the proposed alignment.	No Risk
Sharks							
Scientific Name	**Common Name**		**Status**	**EPBC Code**	**Description of Community / Habitat**	**Likelihood of Occurrence**	**Risk**
Pristis pristis	Freshwater Sawfish	-	Vulnerable	60756	The preferred habitat of the Freshwater Sawfish is mud bottoms of rivers embayment and estuaries, but they are also found well upstream. They are not found near riparian vegetation. They are usually found in turbid channels of large rivers over soft mud bottoms more than 1m deep, but they will move into shallow waters when travelling upstream or while hunting prey. Freshwater Sawfish are often associated with deeper sections of rivers adjacent to a sand or silt shallow, such as a sandbar or shallow backwater.	No suitable habitat was observed along the proposed alignment.	No Risk
Pristis zijsron	Green Sawfish	-	Vulnerable	68442	Green Sawfish are bottom dwelling rays, commonly found in near-shore coastal environments including estuaries, river mouths, embankments and along sandy and muddy beaches	The site lacks any coastal environments suitable for the species.	No Risk
Sphyrna lewini	Scalloped Hamerhead		Conservation Dependent	85267	The scalloped hammerhead has a circum-global distribution in tropical and sub-tropical waters. The scalloped hammerhead shows strong genetic population structuring across ocean basins as it rarely ventures into or across deep ocean waters, but ranges quite widely over shallow coastal shelf waters. Consequently, there is very little structuring from the eastern to western extents within Australia and it is likely to be a shared stock with Indonesia	Coastal habitat areas ae not present within the proposed pipeline alignment	No Risk
Listed Migratory Species (others not listed above)							
Migratory Marine Birds							
Scientific Name	**Common Name**	**NCA Status**	**Status**	**EPBC Code**	**Description of Community / Habitat**	**Likelihood of Occurrence**	**Risk**

Anous stolidus	Common Noddy	-	Migratory	825	During the breeding season, the Common Noddy usually occurs on or near islands, on rocky islets and stacks with precipitous cliffs, or on shoals or cays of coral or sand. During the non-breeding period, the species occurs in groups throughout the pelagic zone (open ocean).	Costal cliffs/rocky islets are not present within the proposed alignment	No risk
Apus pacificus	Fork-tailed Swift	-	Migratory	678	This species is almost exclusively aerial and mostly occur over inland pains but sometimes above foothills or in coastal areas.	Possible as fly-over species, however, no impact to this species is likely.	No Risk
Fregata ariel	Lesser Frigatebird	-	Migratory	1012	The Lesser Frigatebird breeds on small, remote tropical and sub-tropical islands, in mangroves or bushes, and even on bare ground.	No suitable habitat in the form of small remote islands is present within the alignment.	No Risk
Fregata minor	Greater Frigatebird	-	Migratory	1013	The Greater Frigatebird breeds on small, remote tropical and sub-tropical islands, in mangroves or bushes and occasionally on bare ground.	No suitable habitat in the form of small remote islands is present within the alignment.	No Risk
Phaethon lepturus	White-tailed Tropicbird	-	Migratory	1014	In Australia, the White-tailed Tropicbird (Indian Ocean) nests in Pisonia trees amongst Pisonia-coconut vegetation, and on sandy ground. At the species level, the White-tailed Tropicbird is most commonly associated with marine habitats in tropical waters with sea-surface temperatures of more than 22°C	The preferred habitat for the species is not present within the proposed alignment, such as Pisonia-coconut vegetation and marine habitats.	No Risk
Sternula albifrons	Little Tern	-	Migratory	82849	Little terns inhabit sheltered coastal environments, including lagoons, estuaries, river mouths, deltas, lakes, bays, harbours and inlets. Especially those with exposed sandbanks or sand spits as well as exposed open beaches.	No suitable habitat for the species is present within the proposed alignment	No Risk
Migratory Marine Species							
Scientific Name	**Common Name**	**NCA Status**	**EPBC Act Status**	**EPBC Code**	**Description of Community / Habitat**	**Likelihood of Occurrence**	**Risk**
Crocodylus porosus	Saltwater Crocodile	Vulnerable	Migratory	1774	The Saltwater Crocodile mostly occurs in tidal rivers, coastal floodplains and channels, billabongs and swamps up to 150km inland from the coast. Salt-water Crocodiles usually inhabits the lower (estuarine) reaches of rivers, while the upper reaches are inhabited by Fresh-water Crocodiles. In Queensland, this species is usually restricted to coastal waterways and floodplain wetlands.	Species known to occur within the Burdekin River. The assessment by FRC Environmental concluded that the action will not have a significant impact on the Estuarine Crocodile as the project extent does not support important habitat for the Estuarine Crocodile. As such, the action will not substantially modify, destroy or isolate an area of important habitat, seriously disrupt the lifecycle of an ecologically significant proportion of the population or result in invasive species. Specifically, due to controls implemented during construction and operation.	Low Risk
Lamna nasus	Porbeagle	-	Migratory	83288	The Porbeagle primarily inhabits oceanic waters and areas around the edge of the continental shelf. They occasionally move into coastal waters, but these movements are temporary. The Porbeagle utilises a	The proposed pipeline is not situated within oceanic/coastal waters. It is not anticipated that the proposed development will impact marine environments.	No Risk

					broad vertical range of the water column and is known to dive to depths exceeding 1300 m		
Mobula alfredi as Manta alfredi	Reef Manta Ray	-	Migratory	90033	Inhabits shallow waters along coral reefs.	No coral reefs are present within the proposed alignment. The pipeline project is anticipated to have no impact on marine environments.	No Risk
Mobula birostris as Manta birostris	Giant Manta Ray		Migratory		Found mainly in near-shore waters, near coral and rocky reefs; sometimes found over deep water	No coral reefs are present within the proposed alignment. The pipeline project is anticipated to have no impact on marine environments.	No Risk
Sousa sahulensis as Sousa chinensis	Australian Humpback Dolphin	-	Migratory	87492	Along the Australian coast, humpback dolphins are more likely to be found in relatively shallow and protected coastal habitats such as inlets, estuaries, major tidal rivers, shallow bays, inshore reefs and coastal archipelagos.	The species has been recorded off the coast of Ayr however the proposed pipeline project is not considered to have an impact on this area	No Risk
Migratory Terrestrial Species							
Scientific Name	**Common Name**	**NCA Status**	**Status**	**EPBC Code**	**Description of Community / Habitat**	**Likelihood of Occurrence**	**Risk**
Cuculus optatus	Oriental Cuckoo	-	Migratory	86651	Non-breeding habitat only: monsoonal rainforest, vine thickets, wet sclerophyll forest or open Casuarina, Acacia or Eucalyptus woodlands. Frequently at edges or ecotones between habitat types.	No suitable habitat was observed along the proposed alignment.	No Risk
Monarcha melanopsis	Black-faced Monarch	-	Migratory	609	The Black-faced Monarch mainly occurs in rainforest ecosystems, including semi-deciduous vine thickets, complex notophyll vine forests, tropical (mesophyll) rainforest, subtropical (notophyll) rainforest, mesophyll (broadleaf) thicket/shrubland, warm temperate rainforest, dry (monsoon) rainforest and occasionally cool temperate rainforest.	No suitable habitat was observed along the proposed alignment.	No Risk
Monarcha trivirgatus	Spectacled Monarch	-	Migratory	610	The Spectacled Monarchs natural habitats are subtropical or tropical moist lowland forests, subtropical or tropical mangrove forests, and subtropical or tropical moist montane forests. Its preference is for thick understorey areas.	No suitable habitat was observed along the proposed alignment.	No Risk
Motacilla flava	Yellow Wagtail	-	Migratory	644	Satin Flycatchers inhabit heavily vegetated gullies in eucalypt dominated forests and taller woodlands, and on migration occur in coastal forests, woodlands, mangroves and drier woodlands and open forests.	No suitable habitat was observed along the proposed alignment.	No Risk
Myiagra cyanoleuca	Satin Flycatcher	-	Migratory	612	This insectivorous bird inhabits mostly well-watered open grasslands and the fringes of wetlands Roosts in mangroves and other dense vegetation. Listed as an extremely uncommon migrant to Australia under the draft referral guideline for 14 birds listed as a migratory species under the EPBC Act.	Observations of this species have been primarily from NSW. This migratory species may be present but highly unlikely due to lack of historical observations or suitable roosting habitat.	No Risk
Rhipidura rufifrons	Rufous Fantail	-	Migratory	592	The Rufous fantail mainly inhabits wet sclerophyll forests, often in gullies dominated by Eucalypts such as Eucalyptus microcorys,	No suitable habitat was observed along the proposed alignment.	No Risk

					Eucalyptus pilularis, Eucalyptus resiniferia and a number of other Eucalyptus species.		
Migratory Wetland Species							
Scientific Name	**Common Name**	**EPBC Act Status**		**EPBC Code**	**Description of Community / Habitat**	**Likelihood of Occurrence**	**Risk**
Actitis hypoleucos	Common Sandpiper	Migratory		59309	The species utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats. The Common Sandpiper has been recorded in estuaries and deltas of streams, as well as on banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties. The muddy margins utilised by the species are often narrow, and may be steep. The species is often associated with mangroves, and sometimes found in areas of mud littered with rocks or snags.	No suitable habitat was observed along the proposed alignment.	No Risk
Calidris acuminata	Sharp-tailed Sandpiper	Migratory		874	The Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline saltlakes inland. They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry. They tend to occupy coastal mudflats mainly after ephemeral terrestrial wetlands have dried out, moving back during the wet season.	No suitable habitat was observed along the proposed alignment.	No Risk
Calidris melanotos	Pectoral Sandpiper	Migratory		858	The Pectoral Sandpiper prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. The species is usually found in coastal or near coastal habitat but occasionally found further inland. It prefers wetlands that have open fringing mudflats and low, emergent or fringing vegetation, such as grass or samphire. The species has also been recorded in swamp overgrown with lignum. They forage in shallow water or soft mud at the edge of wetlands.	No suitable habitat was observed along the proposed alignment.	No Risk
Gallinago hardwickii	Latham's Snipe	Migratory		863	Latham's Snipe occurs in permanent and ephemeral wetlands. They usually inhabit open, freshwater wetlands with low, dense vegetation.	No suitable habitat was observed along the proposed alignment.	No Risk
Limosa lapponica	Bar-tailed Godwit	Migratory		844	The Bar-tailed Godwit is found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It is found often around beds of seagrass and, sometimes, in nearby saltmarsh.	No suitable habitat was observed along the proposed alignment.	No Risk
Pandion haliaetus	Osprey	Migratory		952	Eastern Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers.	Possible as a flyover species, however, no impact to this species is likely.	No Risk
Tringa nebularia	Common Greenshank	Migratory		832		No suitable habitat was observed along the proposed alignment.	No Risk

				The Common Greenshank is found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. The species is known to forage at the edges of wetlands in soft mud or mudflats.		
Other Matters Protected by the EPBC Act						
Listed Marine Species (others not listed above)						
Scientific Name	**Common Name**	**EPBC Act Status**	**EPBC Code**	**Description of Community / Habitat**	**Likelihood of Occurrence**	**Risk**
Anseranas semipalmata	Magpie Goose	Migratory	978	The magpie goose is mainly found in shallow wetlands with dense growth or rushes or sedges	Possible as a fly-over species, however, no impact to this species is likely.	No Risk
Apus pacificus	Fork-tailed Swift	Migratory	678	This species is almost exclusively aerial and mostly occur over inland plains but sometimes above foothills or in coastal areas.	Possible as a fly-over species, however, no impact to this species is likely.	No Risk
Ardea ibis	Cattle Egret	Migratory	59542	The Cattle egret occurs in tropical and temperate grasslands, wooded lands and terrestrial wetlands. It often forages away from water on low lying grasslands, improved pastures and croplands and is commonly found in cattle fields and other farm areas that contain livestock.	Observed regularly within adjacent properties along the proposed alignment due to the dominance of cattle grazing and rural land uses.	Low Risk
Chrysococcyx osculans	Black-eared Cuckoo	Migratory	705	The Black-eared Cuckoo is found in drier country where species such as mulga and mallee form open woodlands and shrublands. It is often found in vegetation along creek beds.	Suitable habitat was observed on site; however, no records of the species have identified on or adjacent to the proposed alignment.	Low Risk
Haliaeetus leucogaster	White-bellied Sea Eagle	Migratory	943	The White-bellied Sea-eagle is found in coastal habitats and around terrestrial wetlands in tropical and temperate regions of mainland Australia and its offshore islands. The habitats are characterised by the presence of large areas of open water.	Possible as a fly-over species, however, no impact to this species is likely.	No Risk
Merops ornatus	Rainbow Bee-eater	Migratory	670	The Rainbow bee-eater occurs mainly in open forests and woodlands, shrub lands, and in various cleared or semi-cleared habitats, including farmland and areas of human habitation.	Possible as a fly-over species, however, no impact to this species is likely.	No Risk

Appendix D

Flow Path Assessment Details



Flowpath Values Assessment Report

Bowen Pipeline
Prepared for Bowen Pipeline Company Pty Ltd
28 February 2024

Job 8704

Document control

Document: Flowpath Values Assessment Report prepared by Saunders Havill for Bowen Pipeline Company Pty Ltd

Document Issue

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Prepared by
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1. Introduction

This report provides an assessment of environmental values at drainage path crossings along the proposed Bowen Pipeline alignment and is intended to provide additional information in support of a referral under the Environment Protection and Biodiversity Conservation Act 1999 and State Assessment under relevant legislation.

Of note, detailed fieldworks have been undertaken at all crossing locations except some that are obviously extremely disturbed where a desktop only assessment is considered adequate and has been provided. The following field surveyed were undertaken where suitable:

- Waterway Assessments – All potential major waterways along the proposed alignment were assessed as per AUSRIVAS protocols.
- Specific surveys for *Eucalyptus raveretiana* – Potential habitat for this species, including all flow paths traversed by the proposed pipeline, was systematically surveyed and all specimen locations and details recorded using DGPS
- Spotlighting – All major waterway and potential habitat features were surveyed by spotlighting
- Fauna Cameras – Infra-red cameras were deployed at potential habitat locations along the alignment to detect fauna activity
- Ultrasonic Bat Detection – Sampling for ultrasonic bat frequencies was conducted utilising the Wildlife Acoustics 'Echo Meter Touch' on an iOS platform at potential habitat locations along the alignment
- Identification – Identification of habitat values within the area relevant to terrestrial vertebrate fauna, including ecological corridors; and
- Description – A description of the major fauna habitats present

The above data have been compiled in the summary notes for each locations listed below.

2. Flow Path Assessments

2.1. Site 1 Summary

Overview	Comment
Site #	1
Stream Order	9
Field Determination	**Major River (Burdekin River)**
	Continuous bed and bank features present, with riparian vegetation. Permanent water flowing and pooling. The Burdekin River is identified as a major river in North Queensland.
Prelim. Recommendation Rating	Major
Final Recommendation Rating	Major
GPS location	-19.72622° N 147.27513° E (GDA 2020-MGA 55)
Local land use	Pump station and crop production
Average Bankful Width	400-500m
Dominant Substrate	Soils associated with land zone 3
Variety of Habitats	Riparian vegetation, permanent water flowing and pooling and adjacent vegetation community(s)
Flow regime	Permanent
Channel shading	0%
Macrophytes	Present

General description and habitat attributes

The river has established bed and banks with riparian vegetation present. The flow path and regime of the Burdekin River is obvious, with a high velocity of water flowing during heavy rainfall events. Habitat features were present within the riparian vegetation for avi-fauna, while permanent water flowing, and pooling provides suitable habitat for aquatic fauna. Remnant 'Of Concern' vegetation in proximity to intake locations. Whilst conducting surveys an Estuarine Crocodile (*Crocodylus porosus*) was recorded within the Burdekin River, a species Vulnerable under the NCA. Notably a small Stream Order 3 flow path adjacent the Burdekin River at this point is not present with construction and disturbance along the upper banks removing any evidence of drainage. South of the alignment construction is currently underway for a pump station with vehicle tracks and excavation within the north. A current pump feeds a man-made channel that runs east and north between farmland, no natural waterways were noted adjacent this area.

Vegetation above the upper banks in the east is completely cleared and observed to be used for crop production and agricultural activity. Vegetation is largely confined to the upper and lower banks. The upper banks were confirmed as containing elements of RE 11.3.4; *Corymbia dallachiana* (Ghost Gum), *Eucalyptus melanophloia* (Silver-leaved Ironbark), *Eucalyptus tereticornis* (Forest Red Gum), *Corymbia tessellaris* (Moreton Bay Ash), and *Eucalyptus platyphylla* (White Gum). The understorey of the upper bank areas were highly disturbed with invasive species, *Argemone mexicana* (Mexican Poppy), *Ricinus communis* (Castor Oil Plant), *Gomphrena celosioides* (Gomphrena Weed), *Megathyrsus maximus* (Guinea Grass) and *Chloris gayana* (Rhodes Grass).

Vegetation on the lower banks within this area was confirmed to represent RE 11.3.25F, with Melaleuca species dominant; *Melaleuca fluviatilis* (River Tea-tree), *Melaleuca bracteata* (Black Tea-tree), with *Pleiogynium timorense* (Burdekin Plum) and *Ficus coronata* (Sandpaper Fig). One (1) *Eucalyptus raveretiana* (Black Ironbox) is located within the approximate intake pump location, a species listed as Vulnerable under the EPBC Act.

Recommendations

- Implementation of tunnel bore technique to minimise impacts on the creek and watercourse system;
- Avoid remnant vegetation areas
- Further detailed seasonal studies required to assist in the preparation of area specific environmental management plan(s).

Site #	**1 (Flora)**		
Location:	**Burdekin River – River Pump Station**		
	Scientific Name	**Common Name**	**Upper/Lower Banks**
T1/T2	*Corymbia dallachiana*	Ghost Gum	Upper
	Eucalyptus tereticornis	Forest Red Gum	Upper
	Corymbia intermedia	Pink Bloodwood	Upper
	Corymbia tessellaris	Moreton Bay Ash	Upper
	Eucalyptus melanophloia	Silver-leaved Ironbark	Upper
	Eucalyptus platyphylla	Poplar Gum	Upper
	Lophostemon suaveolens	Swamp Box	Upper
	Eucalyptus raveretiana	Black Ironbox	Upper
	Petalostigma pubescens	Quinine Bush	Upper
	Diploglottis australis	Native Tamarind	Lower
	Melaleuca fluviatilis	River Teatree	Lower
	Melaleuca bracteata	Black Tea-tree	Lower
	Melaleuca linariifolia	Snow-in-Summer	Lower
	Ficus coronata	Sandpaper Fig	Lower
	Pleiogynium timorense	Burdekin Plum	Lower
Shrub	*Ricinus communis*	Castor Oil Plant	
	Senna pendula	Easter Cassia	
	Xanthium occidentale	Noogoora Burr	
	Argemone mexicana	Mexican Poppy	
	Macroptilium atropurpureum	Siratro	
Ground	*Sorghum halapense*	Wild Sorghum	
	Megathyrsus maximus	Guinea Grass	
	Tribulus terrestris	Caltrop	
	Chloris gayana	Rhodes Grass	
	Momordica charantia	Bitter Melon	
	Sporobolus fertilis	Paramatta Grass	
	Stachytarpheta jamaicensis	Blue Snake Weed	
	Passiflora subpeltata	White Passion	
	Argyreia nervosa	Elephant Creeper	
	Gomphrena celosioides	Gomphrena Weed	

Site #	**1 (Fauna)**	
Location:	**Burdekin River**	
	Scientific Name	**Common Name**
	Crocodylus porosus	Estuarine Crocodile
	Macropus agilis	Agile Wallaby
	Coracina novaehollandiae	Black-faced Cuckoo-shrike
	Aquila audax	Wedge-tail Eagle
	Rhipidura leucophrys	Willy Wagtail
	Corvus orru	Torresian Crow
	Grallina cyanoleuca	Peewee Mudlark
	Cracticus torquatus	Grey Butcherbird
	Haliastur sphenurus	Whistling Kite

Cracticus tibicen	Australian Magpie
Ocyphaps lophotes	Crested Pigeon
Manorina melanocephala	Noisy Minor
Egretta alba	Great Egret



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 1

Site Number: 1
Burdekin River

Field Assessment
Risk Rating: Major

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.2. Site 2 Summary

Overview	Comment	
Site #	2	
Stream Order	-	
Field Determination	**Modified Creek**	
	Formed, modified creek with distinguishable beds and banks surrounded by agriculture and cattle paddocks. The waterway has an altered concrete flow path that channels water from the Burdekin River to better suit the surrounding land uses. Large culverts are present where Barry Road crosses the waterway. True riparian vegetation is limited and water flow is permanent.	
Prelim. Recommendation Rating	High	
Final Recommendation Rating	High	
GPS location	-19.72688 ° N	147.28022° E (GDA 2020-MGA 55)
Local land use	Cattle grazing and agriculture	
Average Bankful Width	8 m	
Dominant Substrate	Soils associated with land zone 3.	
Variety of Habitats	Agriculture farming and cattle grazing paddocks. Scattered remnant vegetation along waterway. Grasses dominant downstream.	
Flow regime	Permanent	
Channel shading	30%	
Macrophytes	Absent	

General description and habitat attributes

The watercourse is not as a high waterway under the *Fisheries Act 1994*. On-ground surveys found this waterway to be comprised of an entirely altered concrete flow path, with large culverts to allow Barry Road to cross. The water is channelled from the Burdekin River and is brought through the large areas of surrounding agriculture and cattle grazing paddocks. There is limited true riparian vegetation as a result of this modification, as well as relatively limited habitat values compared to what would be expected from a waterway with a permanent water flow. Vegetation is dominated by *Eucalyptus tereticornis* (Forest Red Gum) and *Corymbia tessellaris* (Moreton Bay Ash), with *Nauclea orientalis* (Leichhardt tree). Further downstream grasses begin to dominate. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

'- Implementation of tunnel bore technique to minimise impacts on the creek and watercourse system (if required);
'- Feature specific management plan(s) required (e.g. VMP/FMP);
'- Seasonal construction parameters apply



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 2

Site Number: 2
Un-named creek

Field Assessment
Risk Rating: High

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.3. Site 3 Summary

Overview	Comment
Site #	3
Stream Order	2
Field Determination	**Watercourse (Stokes Creek tributary)** Eroded watercourse within remnant vegetation. Continuous bed and bank features. Limited riparian vegetation present, water likely present following heavy rain.
Prelim. Recommendation Rating	Moderate
Final Recommendation Rating	Moderate
GPS location	-19.75401° N 147.30315° E (GDA 2020-MGA 55)
Local land use	Cattle grazing
Average Bankful Width	10-12 m
Dominant Substrate	Rock/Bedrock
Variety of Habitats	Some true riparian vegetation, surroundings partially cleared remnant vegetation for cattle grazing, dominated by pasture grasses. Habitat features limited.
Flow regime	Ephemeral
Channel shading	25%
Macrophytes	Absent

General description and habitat attributes

The watercourse is mapped as a Stream Order 2 VMA watercourse, and a moderate waterway under the *Fisheries Act 1994*. On-ground surveys found the watercourse to be disturbed, with partially eroded bed and bank features. The watercourse is mapped as Category B (remnant) vegetation, with species generally reflective of RE11.3.25. Some riparian species, including *Melaleuca leucadendra* (Weeping Paperbark), *Melaleuca fluviatilis* (River Tea-tree), and *Lophostemon grandiflora* (Northern Swamp Box) were present. Weeds were present in the waterway, and more frequent in the surrounding area including *Cryptostegia grandiflora* (Rubber Vine) and *Ziziphus mauritiana* (Chinee Apple). Beyond the watercourse species including *Corymbia dallachiana* (Ghost Gum), *Corymbia erythrophloia* (Variable-barked Bloodwood), *Acacia leiocalyx* (Early Flowering Black Wattle), and *Eucalyptus crebra* (Narrow-leaved Ironbark), reflective of surrounding remnant vegetation, though the shrub and ground layers are highly disturbed as a result of cattle grazing. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

'- Feature specific management plan(s) required (e.g. VMP/FMP);
'- Seasonal construction parameters apply



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 3

Site Number: 3
Un-named creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.4. Site 4 Summary

Overview	Comment	
Site #	4	
Stream Order	2	
Field Determination	**Formed Creek (Stokes Creek)**	
	Eroded watercourse within remnant vegetation. Continuous bed and bank features. Limited riparian vegetation present, with water likely present following heavy rain.	
Prelim. Recommendation Rating	Moderate	
Final Recommendation Rating	Moderate	
GPS location	-19.77423° N	147.31916° E (GDA 2020-MGA 55)
Local land use	Cattle grazing	
Average Bankful Width	4-6 m	
Dominant Substrate	Soils associated with Landzone 3.	
Variety of Habitats	Limited riparian vegetation, surroundings partially cleared remnant vegetation for cattle grazing, dominated by pasture grasses. Habitat features limited.	
Flow regime	Ephemeral	
Channel shading	15%	
Macrophytes	Absent	

General description and habitat attributes

The watercourse is mapped as a Stream Order 2 VMA watercourse, and a moderate waterway under the *Fisheries Act 1994*. On-ground surveys found the watercourse to be disturbed, with partially eroded bed and bank features. The watercourse is mapped as Category B (remnant) vegetation, with vegetation indicative of RE11.3.25. Vegetation in the watercourse included riparian species *Lophostemon grandiflora* (Northern Swamp Box), as well as *Cupaniopsis anacardioides* (Tuckeroo) and *Acacia salicina* (Sally Wattle). There was a moderate infestation of the invasive *Cryptostegia grandiflora* (Rubber Vine) in and more densely surrounding the watercourse. Surrounding vegetation included *Corymbia tessellaris* (Moreton Bay Ash), *Eucalyptus platyphylla* (White Gum), *Corymbia dallachiana* (Ghost Gum), and *Corymbia erythrophloia* (Variable-barked Bloodwood), though the shrub and ground layers are highly disturbed as a result of cattle grazing and dominated by pasture grasses such as *Megathyrsus maximus* (Guinea Grass). No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

'- Feature specific management plan(s) required (e.g. VMP/FMP);
'- Seasonal construction parameters apply



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 4

Site Number: 4
Un-named creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.5. Site 5 Summary

Overview	Comment
Site #	5
Stream Order	1
Field Determination	**Drainage Feature**
	Overland flow path within cattle grazing paddock and heavily weed infested. No bed and bank features observed, nor any riparian vegetation. No sign of permanent flow or potential for pooling water.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.77479° N 147.31889° E (GDA 2020-MGA 55)
Local land use	Cattle grazing
Average Bankful Width	Absent
Dominant Substrate	Soils associated with Landzone 3.
Variety of Habitats	Dominated by heavy weed infestation and pasture grasses, previously cleared for cattle. Habitat features absent.
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The drainage feature is mapped as a Stream order 1 VMA watercourse and a low waterway under the *Fisheries Act 1994*. On-ground surveys found the drainage feature to be highly disturbed with no observable bed and bank features and no macrophytes or riparian vegetation. Despite mapping indicating the area as containing Category B (remnant) vegetation the area was largely devoid of native vegetation as a result of historical clearing and heavy weed infestation. Instead, the area is dominated by *Vachellia nilotica* (Prickly Acacia), *Ziziphus mauritiana* (Chinee Apple), and *Cryptostegia grandiflora* (Rubber Vine). The surrounding vegetation is largely indistinguishable from the drainage feature, with the same weed infestation and some scattered mature *Eucalyptus crebra* (Narrow-leaved Ironbark) and *Corymbia erythrophloia* (Variable-barked Bloodwood). No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

'- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 5

Site Number: 5
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.6. Site 6 Summary

Overview	Comment	
Site #	6	
Stream Order	2	
Field Determination	**Drainage Feature**	
	Overland flow path within stock route road reserve. No continuous bed and bank features nor any riparian vegetation. No sign of permanent flow or potential for pooling water.	
Prelim. Recommendation Rating	Moderate	
Final Recommendation Rating	Low	
GPS location	-19.77949° N	147.33294° E (GDA 2020-MGA 55)
Local land use	Cattle grazing	
Average Bankful Width	Absent	
Dominant Substrate	Soils associated with Landzone 3.	
Variety of Habitats	Scattered mature Eucalypts, cleared for cattle/access tracks, dominated by pasture grasses. Habitat features absent.	
Flow regime	Ephemeral	
Channel shading	0%	
Macrophytes	Absent	

General description and habitat attributes

The drainage feature is mapped as a Stream order 1 VMA watercourse and a moderate waterway under the *Fisheries Act 1994*. On-ground surveys found the drainage feature to be a highly disturbed overland flow path with discontinuous bed and bank features and no true riparian vegetation or macrophytes. The surrounding vegetation is mapped as regrowth. The surrounding area was highly modified road reserve, dominated by pasture grasses and containing scattered mature native trees including *Eucalyptus platyphylla* (White Gum), *Eucalyptus crebra* (Narrow-leaved Ironbark), and *Corymbia dallachiana* (Ghost Gum). These species are reflective of the mapped RE 11.3.30 regrowth. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

'- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 6

Site Number: 6
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.7. Site 7 Summary

Overview	Comment
Site #	7
Stream Order	1
Field Determination	**Drainage Feature**
	Eroded drainage feature within a stock route road reserve. Discontinuous bed and bank features, and no riparian vegetation or macrophytes present. Constructed dam adjacent to access road.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.77968° N 147.33459° E (GDA 2020-MGA 55)
Local land use	Cattle grazing
Average Bankful Width	3-4 m where present
Dominant Substrate	Soils associated with Landzone 3.
Variety of Habitats	Absent riparian vegetation, cleared for stock route road reserve, dominated by pasture grasses. Habitat features absent.
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The drainage feature is mapped as a Stream order 1 VMA watercourse and a low waterway under the *Fisheries Act 1994*. On-ground surveys found the drainage feature to be a shallow drainage line, with discontinuous bed and banks and no macrophytes or true riparian vegetation. The drainage feature ends in a constructed dam modified for an access road, where a small amount of standing water was present during surveys. The channel does not continue downstream of the dam. The surrounding vegetation is dominated by pasture grasses and scattered mature *Eucalyptus platyphylla* (White Gum) and *Corymbia dallachiana* (Ghost Gum). East of the drainage feature, *Eucalyptus crebra* (Narrow-leaved Ironbark) were also present. It is likely that water would temporarily flow along this drainage feature after heavy rain. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

'- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 7

Site Number: 7
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.8. Site 8 Summary

Overview	Comment
Site #	8
Stream Order	2
Field Determination	**Drainage Feature**
	Eroded drainage feature within a stock route road reserve. Discontinuous bed and bank features, and no riparian vegetation or macrophytes present. Modified for access tracks
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.78068° N 147.34328° E (GDA 2020-MGA 55)
Local land use	Cattle grazing
Average Bankful Width	2-3 m where present
Dominant Substrate	Soils associated with Landzone 3.
Variety of Habitats	Absent vegetation, cleared for cattle, dominated by pasture grasses. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The drainage feature is mapped as a Stream order 2 VMA watercourse and a moderate waterway under the *Fisheries Act 1994*. On-ground surveys found the drainage feature to be a highly disturbed scour channel with discontinuous bed and bank features. The area was largely devoid of native vegetation as a result of clearing for cattle grazing and modified for access tracks. Instead, the area is dominated by pasture grasses and so habitat features such as channel shading and overhanging roots are absent. The area was partially weed infested, with *Vachellia nilotica* (Prickly Acacia), *Ziziphus mauritiana* (Chinee Apple), and *Cryptostegia grandiflora* (Rubber Vine). Surrounding vegetation was also dominated by pasture grasses, with scattered *Eucalyptus platyphylla* (White Gum), *Corymbia tessellaris* (Moreton Bay Ash), and *Eucalyptus crebra* (Narrow-leaved Ironbark) further east. Cattle damage is heavily evident throughout, impacting the flow path which shows no signs of permanent or semi-permanent flow, lacking riparian and macrophyte vegetation. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

'- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 8

Site Number: 8
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.9. Site 9 Summary

Overview	Comment	
Site #	9	
Stream Order	1	
Field Determination	**Drainage Feature**	
	Overland flow path within stock route road reserve. No continuous bed and bank features nor any riparian vegetation or macrophytes. No sign of permanent flow or pooling water.	
Prelim. Recommendation Rating	Low	
Final Recommendation Rating	Low	
GPS location	-19.78074° N	147.34839° E (GDA 2020-MGA 55)
Local land use	Cattle grazing	
Average Bankful Width	Absent	
Dominant Substrate	Soils associated with Landzone 3.	
Variety of Habitats	Absent riparian vegetation, understorey cleared for cattle, dominated by pasture grasses. Habitat features absent	
Flow regime	Ephemeral	
Channel shading	10%	
Macrophytes	Absent	

General description and habitat attributes

The drainage feature is mapped as a Stream order 1 VMA watercourse and a low waterway under the *Fisheries Act 1994*. On-ground surveys found the drainage feature to be an overland flow path with no discernible channel, bed and bank features, and absent riparian vegetation and macrophytes. The area is mapped as regrowth vegetation and has been modified for access tracks. The area is dominated by pasture grasses, with *Eucalyptus crebra* (Narrow-leaved Ironbark) and *Corymbia erythrophloia* (Variable-barked Bloodwood). The understorey is cleared for cattle grazing and road reserve use, and some *Ziziphus mauritiana* (Chinee Apple) and *Cryptostegia grandiflora* (Rubber Vine) weeds are present. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

'- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 9

Site Number: 9
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.10. Site 10 Summary

Overview	Comment	
Site #	10	
Stream Order	1	
Field Determination	**Drainage Feature**	
	Drainage feature within cattle paddock. No continuous bed and bank features nor any riparian vegetation or macrophytes. Temporary water flow present following heavy rains. Modified for property access tracks	
Prelim. Recommendation Rating	Low	
Final Recommendation Rating	Low	
GPS location	-19.78052° N	147.35815° E (GDA 2020-MGA 55)
Local land use	Cattle grazing	
Average Bankful Width	Absent	
Dominant Substrate	Soils associated with Landzone 3.	
Variety of Habitats	Absent vegetation, partially cleared for cattle, dominated by pasture grasses. Habitat features absent	
Flow regime	Ephemeral	
Channel shading	0%	
Macrophytes	Absent	

General description and habitat attributes

The drainage feature is mapped as a Stream order 1 VMA watercourse and a low waterway under the *Fisheries Act 1994*. Continuous bed and bank features were not observed, instead representing an eroded flow path and low-lying depression. The flowpath has been modifed by property access tracks to the north and south. There is no evidence of permanent or semi-permanent flow, lacking true riparian vegetation and macrophytes, with flow likely only present during heavy rains. Surrounding area mapped as containing Category B (remnant) vegetation however stock route fenceline cleared on the northern and southern sides and dominated by pasture grasses, with weeds including *Cryptostegia grandiflora* (Rubber Vine) and *Ziziphus mauritiana* (Chinee Apple) present. Subsequently habitat features, such as channel shading and overhanging roots, are absent from this area. Vegetation beyond the drainage feature included mature *Eucalyptus crebra* (Narrow-leaved Ironbark), *Eucalyptus platyphylla* (White Gum), and *Corymbia dallachiana* (Ghost Gum), with *Passiflora suberosa* (Corky Passion), indicative of mapped RE 11.3.31. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

'- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 10

Site Number: 10
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.11. Site 11 Summary

Overview	Comment
Site #	11
Stream Order	3
Field Determination	**Formed Creek (Six Mile Creek)**
	Waterway with continuous and distinguishable bed and bank features. The creek did not contain flowing water, nor were macrophytes present however riparian species present. This waterway holds water immediately following rain events.
Prelim. Recommendation Rating	Moderate
Final Recommendation Rating	Moderate
GPS location	-19.78184° N 147.37005° E (GDA 2020-MGA 55)
Local land use	Cattle grazing
Average Bankful Width	7-10 m
Dominant Substrate	Sandy
Variety of Habitats	Riparian vegetation, cattle paddock with cleared understorey and disturbed remnant vegetation. Habitat features limited.
Flow regime	Ephemeral
Channel shading	20%
Macrophytes	Absent

General description and habitat attributes

The waterway is mapped as a Stream order 3 VMA watercourse and a high waterway under the *Fisheries Act 1994*. The beds and banks of the watercourse are distinguishable, with the riparian zone present but macrophytes absent. True riparian vegetation consisted of *Lophostemon grandiflorus* (Northern Swamp Box), *Melaleuca leucadendra* (Weeping Paperbark), and *Melaleuca fluviatilis* (River Tea-tree) reflective of remnant RE11.3.25. Some native grasses were present, though pasture grasses still dominated the ground cover. Some areas of the bank were infested with *Cryptostegia grandiflora* (Rubber Vine). The surrounding land is used for cattle grazing, with a cleared understorey and sparse mature *Corymbia erythrophloia* (Variable-barked Bloodwood), *Eucalyptus crebra* (Narrow-leaved Ironbark), and *Corymbia dallachiana* (Ghost Gum), species indicative of adjacent mapped RE 11.12.1. Notably, this waterway has been modified for property access tracks and associated clearing. Habitat features were present in the form of dense leaf litter and occasional woody debris. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

'- Feature specific management plan(s) required (e.g. VMP/FMP);
'- Seasonal construction parameters apply



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 11

Site Number: 11
Un-named creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.12. Site 12 Summary

Overview	Comment	
Site #	12	
Stream Order	1	
Field Determination	**Drainage Feature**	
	Drainage feature within stock route road reserve in cattle paddock. Discontinuous bed and bank features, and absent riparian vegetation and macrophytes indicate flowpath holds water immediately following heavy rains.	
Prelim. Recommendation Rating	Low	
Final Recommendation Rating	Low	
GPS location	-19.77961° N	147.39690° E (GDA 2020-MGA 55)
Local land use	Cattle grazing	
Average Bankful Width	Absent	
Dominant Substrate	Soils associated with Landzone 3	
Variety of Habitats	Cattle grazing paddocks and remnant vegetation. Habitat features limited	
Flow regime	Ephemeral	
Channel shading	0%	
Macrophytes	Absent	

General description and habitat attributes

The drainage feature is mapped as a Stream order 1 VMA watercourse and a low waterway under the *Fisheries Act 1994*. On-ground surveys found the drainage feature to be highly disturbed with discontinuous bed and bank features largely formed by erosion. Surronding vegetation mapped as Category B (remnant) vegetation with *Eucalyptus platyphylla* (White Gum) and *Corymbia dallachiana* (Ghost Gum), indicative of RE 12.11.9. The surrounding area also contains scattered weeds including *Cryptostegia grandiflora* (Rubber Vine) and *Ziziphus mauritiana* (Chinee Apple), and the paddock south contains dense *Ziziphus mauritiana* (Chinee Apple). Notably, clearing has occurred along property fence lines and to establish access tracks. The drainage feature shows no signs of permanent or semi-permanent flow, lacking macrophytes and riparian vegetation, and therefore is likely to only contain water immediately following heavy rain. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

'- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 12

Site Number: 12
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.13. Site 13 Summary

Overview	Comment
Site #	13
Stream Order	2
Field Determination	**Formed Creek (Four Mile Creek)**
	Heavily eroded watercourse within cattle paddock. Continuous bed and bank features present but lacking true riparian vegetation and macrophytes indicating this watercourse holds water immediately following heavy rains.
Prelim. Recommendation Rating	Moderate
Final Recommendation Rating	Moderate
GPS location	-19.77893° N 147.40013° E (GDA 2020-MGA 55)
Local land use	Cattle grazing
Average Bankful Width	6 m
Dominant Substrate	Sandy
Variety of Habitats	Cattle grazing paddocks, remnant vegetation. Habitat features limited.
Flow regime	Ephemeral
Channel shading	5%
Macrophytes	Absent

General description and habitat attributes

The watercourse is mapped as a Stream Order 2 VMA watercourse, and a moderate waterway under the *Fisheries Act 1994*. On-ground surveys found the watercourse to be disturbed and heavily eroded, but with distinguishable bed and bank features. No true riparian vegetation or macrophytes present, and likely to temporarily flow after heavy rains but there is no evidence of permanent flow. Category B (remnant) vegetation mapped within and surrounding the watercourse, which includes scattered mature *Eucalyptus crebra* (Narrow-leaved Ironbark), *Corymbia clarksoniana* (Clarkson's Bloodwood), and *Corymbia tessellaris* (Moreton Bay Ash), indicative of the mapped RE 11.3.7. Vegetation present in the watercourse includes *Corymbia tessellaris* (Moreton Bay Ash) and the invasive *Argyreia nervosa* (Elephant Creeper), *Cryptostegia grandiflora* (Rubber Vine), and *Passiflora foetida* (Stinking Passion). Cleared access tracks are present on both sides of the fenceline. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

'- Feature specific management plan(s) required (e.g. VMP/FMP);
'- Seasonal construction parameters apply



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 13

Site Number: 13
Un-named creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

Bowen Pipeline Company Pty Ltd

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.14. Site 14 Summary

Overview	Comment
Site #	14
Stream Order	2
Field Determination	**Drainage Feature**
	The absence of riparian and macrophyte species indicates this drainage feature only holds water for a short period immediately following rainfall. Bed and bank features were not observed. The watercourse is within the road reserve, and is heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.77565° N 147.41615° E (GDA 2020-MGA 55)

Local land use	Agricultural production and cattle grazing
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Weed dominated vegetation. Habitat Features absent.
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

This drainage feature exists as a low-lying eroded flow path through a cleared portion of the road reserve utilised for an access track. Bed and bank features are not evident, with no water noted at the time of assessment, indicating the flow regime is ephemeral following heavy rainfall. No riparian nor macrophyte vegetation were present. Surrounding vegetation contained largely invasive species such as *Ziziphus mauritiana* (Chinee Apple), *Chloris gayana* (Rhodes Grass), and *Vachellia nilotica* (Prickly Acacia). Habitat features were absent due to the historical and on-going disturbance for access tracks. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 14

Site Number: 14
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.15. Site 15 Summary

Overview	Comment	
Site #	15	
Stream Order	3	
Field Determination	**Formed Creek (Two Mile Creek)**	
	Formed creek with distinguishable beds and banks. The creek did not contain flowing water, nor were macrophytes present, but riparian species were observed along the banks indicating the waterway holds water immediately following rain events. Portions of the waterway were heavily weed infested and the surrounding vegetation highly modified.	
Prelim. Recommendation Rating	Moderate	
Final Recommendation Rating	Moderate	
GPS location	-19.77358° N	147.42619° E (GDA 2020-MGA 55)
Local land use	Agricultural production and cattle grazing	
Average Bankful Width	5 m	
Dominant Substrate	Soils associated with landzone 3	
Variety of Habitats	Scattered riparian vegetation, cleared paddock, weed dominated areas, disturbed remnant vegetation. Habitat features present but limited.	
Flow regime	Ephemeral	
Channel shading	5%	
Macrophytes	Absent	

General description and habitat attributes

The beds and banks of the formed creek are partially distinguishable. The riparian zone contained some scattered *Lophostemon grandifloras* (Northern Swamp Box) and *Melaleuca fluviatilis* (River Tea-tree). The dominant substrate is sandy. Vegetation adjoining the watercourse is highly disturbed and dominated by weeds species such as *Ziziphus mauritiana* (Chinee Apple) and *Ricinus communis* (Caster Oil Plant). The area is highly disturbed, with clearing obvious within 10m of the creek bed. Habitat features were confined to the channel and scattered riparian species. No threatened flora or fauna listed under the EBPC Act nor NCA were observed across the site.

Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Further detailed seasonal studies required to assist in the preparation of area specific environmental management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 15

Site Number: 15
Two Mile Creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.16. Site 16 Summary

Overview	Comment	
Site #	16	
Stream Order	2	
Field Determination	**Drainage Feature**	
	Low-lying drainage feature with discontinuous bed and bank features. Standing water present and *Typha orientalis* (Typha) indicting extended periods of water presence. This waterway was heavily weed infested.	
Prelim. Recommendation Rating	Low	
Final Recommendation Rating	Low	
GPS location	-19.77220° N	147.43270° E (GDA 2020-MGA 55)
Local land use	Agricultural production and cattle grazing	
Average Bankful Width	3m	
Dominant Substrate	Black Soils	
Variety of Habitats	Cleared grass, scattered canopy trees and production paddocks. Habitat features limited.	
Flow regime	Semi-permanent following heavy rains and run off from surrounding paddocks.	
Channel shading	0%	
Macrophytes	Present	

General description and habitat attributes

This drainage feature exists as a low-lying flow path through largely cleared paddocks within the road reserve. Macrophytes were present in patches, but no other riparian vegetation was observed. The adjacent vegetation included a moderate density of *Ziziphus mauritiana* (Chinee Apple) and *Cryptostegia grandiflora* (Rubber Vine), and was dominated by exotic grasses. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s);



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 16

Site Number: 16
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.17. Site 17 Summary

Overview	Comment	
Site #	17	
Stream Order	1	
Field Determination	**Drainage Feature**	
	Cattle grazing paddocks with low-lying flow path. No banks or beds observed. Lack of riparian vegetation suggests this waterway only holds water for a short period following heavy rain. The area was heavily weed infested.	
Prelim. Recommendation Rating	Low	
Final Recommendation Rating	Low	
GPS location	-19.76990° N	147.44384° E (GDA 2020-MGA 55)
Local land use	Agricultural production	
Average Bankful Width	Absent	
Dominant Substrate	Clay soils	
Variety of Habitats	Cleared grazing paddocks with scattered trees. Habitat features absent	
Flow regime	Absent	
Channel shading	0%	
Macrophytes	Absent	

General description and habitat attributes

On-ground assessments found the drainage feature to be a low-lying flow path which holds water for a short period following heavy rain. The area is within cleared paddocks used for grazing, so almost all vegetation and habitat features have been removed. Exotic weeds *Ziziphus mauritiana* (Chinee Apple) were present. Several access tracks traverse through the mapped watercourse. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s);



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 17

Site Number: 17
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.18. Site 18 Summary

Overview	Comment
Site #	18
Stream Order	-
Field Determination	**Constructed creek**
	Formed creek with distinguishable beds and banks. The creek contained flowing water with macrophytes present and riparian species observed along the banks, indicating permanent/semi-permanent flow. Portions of the waterway were heavily weed infested and the surrounding vegetation highly modified.
Prelim. Recommendation Rating	Moderate
Final Recommendation Rating	Moderate
GPS location	-19.76259° N 147.46359° E (GDA 2020-MGA 55)
Local land use	Agricultural production, cattle grazing and residential
Average Bankful Width	7-15 m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Scattered riparian vegetation, cleared paddock, weed dominated areas, disturbed remnant vegetation. Habitat features present but limited.
Flow regime	Ephemeral
Channel shading	75%
Macrophytes	Present

General description and habitat attributes

The beds and banks of the formed creek are distinguishable, with the native species including *Eucalyptus tereticornis* (Forest Red Gum), *Livistonia australis* (Cabbage Tree Palm), *Lophostemon grandifloras* (Northern Swamp Box) and *Melaleuca spp.*. The channel transitions to a low-lying drainage feature further downstream which is dominated by exotic grasses and fewer native trees are present. A frequently used access track is present for neighbouring properties which has likely impacted the hydrology of the mapped waterway. Habitat features were confined to the channel and riparian species. No threatened flora or fauna listed under the EBPC Act nor NCA were observed across the site.

Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Further detailed seasonal studies required to assist in the preparation of area specific environmental management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 18

Site Number: 18
Un-named Creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.19. Site 19 Summary

Overview	Comment	
Site #	19	
Stream Order	1	
Field Determination	**Constructed Drainage Feature**	
	This drainage feature consists of a constructed channel to facilitate sugarcane operation with all native vegetation removed. No beds or banks observed.	
Prelim. Recommendation Rating	Low	
Final Recommendation Rating	Low	
GPS location	-19.77162° N	147.48939° E (GDA 2020-MGA 55)
Local land use	Sugarcane production	
Average Bankful Width	2-5m	
Dominant Substrate	Soils associated with landzone 3	
Variety of Habitats	Sugarcane and constructed drain. Habitat features limited	
Flow regime	Ephemeral	
Channel shading	0%	
Macrophytes	Absent	

General description and habitat attributes

The mapped waterway in this area has been highly modified for the creation of sugarcane paddocks and drainage swales. Large drainage channels were present with several track crossings/culverts. The average bankful width was 2-5m and water was present. All native vegetation has been removed, with only sugarcane paddocks or exposed earth remaining. These drainage features hold water regularly as a result of irrigation for the sugarcane. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 19

Site Number: 19
Constructed drain

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.20. Site 20 Summary

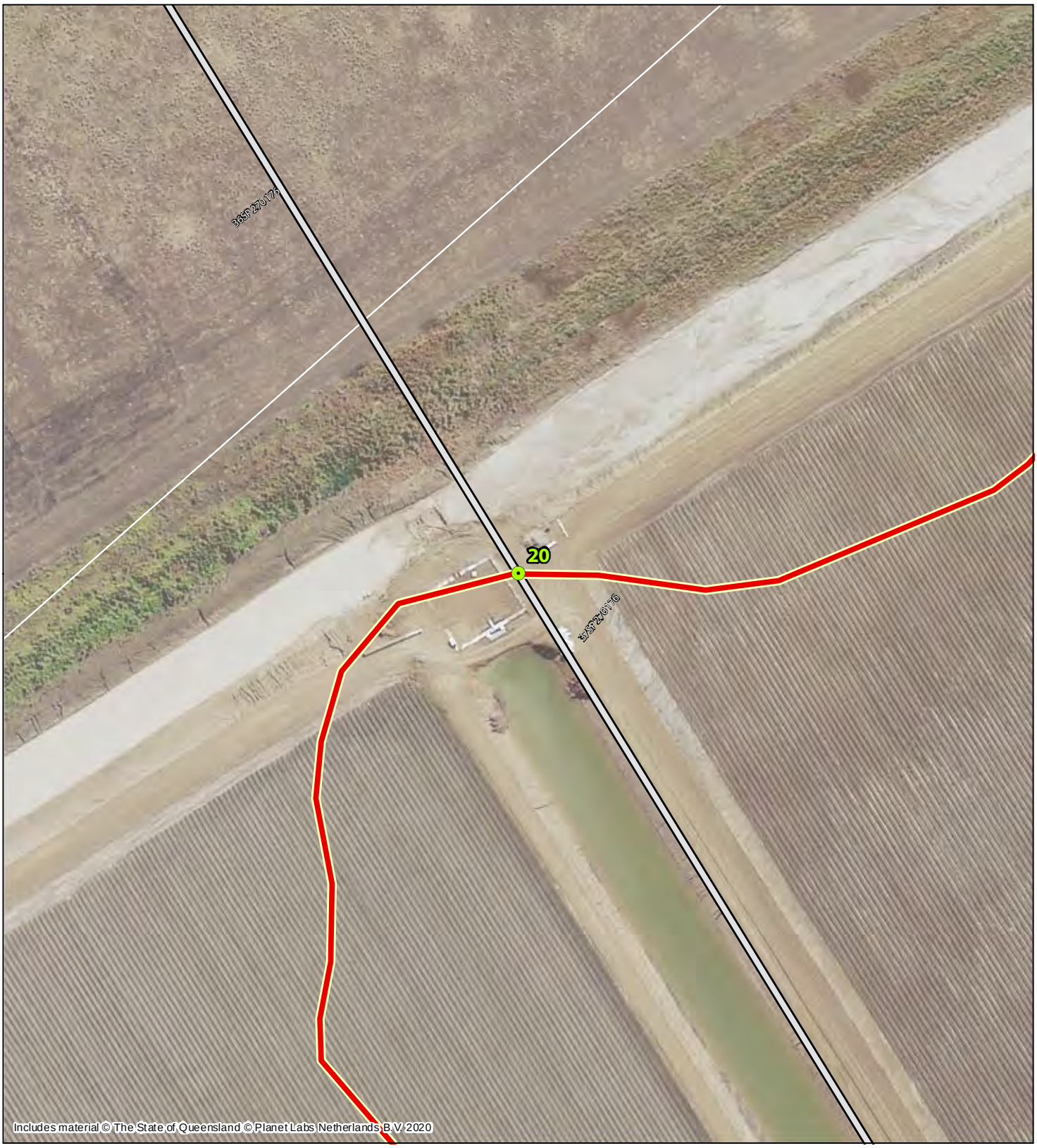
Overview	Comment	
Site #	20	
Stream Order	3	
Field Determination	**Constructed Drainage Feature**	
	This drainage feature consists of a constructed channel to facilitate sugarcane operation with all native vegetation removed. No banks or beds observed.	
Prelim. Recommendation Rating	Moderate	
Final Recommendation Rating	Low	
GPS location	-19.78430° N	147.49294° E (GDA 2020-MGA 55)
Local land use	Sugarcane production	
Average Bankful Width	20m	
Dominant Substrate	Soils associated with landzone 3	
Variety of Habitats	Sugarcane and constructed drain. Habitat features limited	
Flow regime	Ephemeral	
Channel shading	0%	
Macrophytes	Absent	

General description and habitat attributes

The mapped waterway in this area has been highly modified for the creation of sugarcane paddocks and drainage swales. Large drainage channels were present with a several track crossings/culverts. The average bankful width is 20m and water was present. All native vegetation has been removed, with only sugarcane paddocks or exposed earth remaining. These drainage features hold water regularly as a result of sugarcane irrigation. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s);



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 20

Site Number: 20
Constructed drain

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.21. Site 21 Summary

Overview	Comment	
Site #	21	
Stream Order	1	
Field Determination	**Watercourse not present**	
	Cultivation paddock with no waterway features nor vegetation present.	
Prelim. Recommendation Rating	Low	
Final Recommendation Rating	Absent	
GPS location	-19.79684° N	147.50115° E (GDA 2020-MGA 55)
Local land use	Sugarcane and Crop Production	
Average Bankful Width	Absent	
Dominant Substrate	Black Soils	
Variety of Habitats	Tilled paddock utilised for crop production. Habitat features absent.	
Flow regime	Drainage confined to shallow man-made channels and overland flow	
Channel shading	0%	
Macrophytes	Absent	

General description and habitat attributes

The area of the mapped watercourse is completely utilised for sugarcane production with no evidence of a flow patch or native vegetation. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 21

Site Number: 21
Constructed drain

Field Assessment
Risk Rating: Absent

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.22. Site 22 Summary

Overview	Comment
Site #	21
Stream Order	1
Field Determination	**Drainage Feature** The absence of riparian species indicates this drainage feature only holds water for a short period immediately following rainfall. Continuous bed and bank features were not observed, instead representing an eroded flow path and low-lying depression.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.80331° N 147.50539° E (GDA 2020-MGA 55)
Local land use	Sugarcane production and cattle grazing. Habitat features limited
Average Bankful Width	Absent
Dominant Substrate	Soils associated with Landzone 3
Variety of Habitats	Sugarcane, disturbed remnant vegetation and cleared grass. Habitat features highly limited
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The flow path is mapped as a tributary of Yellow Gin Creek and joins the main channel downstream of this point. At this site the flow path has been historically altered by clearing and agricultural activities. Bed and bank features are undistinguished and representative of a low-lying depression with a small amount of standing water. The riparian zone is absent. The majority of the drainage feature runs through open paddock dominated by *Sorghum halepsense* (Johnson Grass), *Clitoria ternatea* (Butterfly Pea), *Sporobolus fertilis* (Parramatta Grass), and *Gomphrena celosioides* (Gomphrena Weed). The area is mapped adjacent to remnant vegetation containing Least concern RE11.3.25b, however canopy and shrub vegetation has been completely cleared and is highly disturbed. The upstream extent is also highly disturbed and lacks vegetation and habitat features. No macrophytes were observed which indicates that this drainage feature only holds water for a short period immediately following rainfall. No threatened flora or fauna listed under the EPBC Act or NCA were observed.

Recommendations

- Generic management plan(s)



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 22

Site Number: 22
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.23. Site 23 Summary

Overview	Comment
Site #	23
Stream Order	3
Field Determination	**Formed Creek (Yellow Gin Creek)** Formed creek with distinguishable beds and banks in parts. Riparian vegetation limited. The creek did not contain flowing water, but areas of standing water were observed during the field survey. No macrophytes were present.
Prelim. Recommendation Rating	Moderate
Final Recommendation Rating	Moderate
GPS location	-19.80513° N 147.50658° E (GDA 2020-MGA 55)
Local land use	Sugarcane production and cattle grazing. Habitat features limited to riparian vegetation along creek bank.
Average Bankful Width	9m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Sugarcane, cleared areas, disturbed remnant vegetation and riparian vegetation. Habitat features present but limited.
Flow regime	Ephemeral
Channel shading	15%
Macrophytes	Absent

General description and habitat attributes

The beds and banks of the formed creek are distinguishable, outlining a sandy channel up to 9m wide. Riparian vegetation is present further downstream in the form of *Melaleuca leucadendra* (Weeping Paperbark), and scattered *Eucalyptus tereticornis* (Forest Red Gum) and *Corymbia tessellaris* (Moreton Bay Ash). Macrophytes were absent, indicating flow is ephemeral. The riparian zone is heavily weeded with *Sorghum halepense* (Johnson Grass), *Ricinus communis* (Castor Oil Plant), *Cryptostegia grandiflora* (Rubber Vine), and *Vachellia nilotica* (Prickly Acacia). At the time of the assessment no flowing water was observed, but there were areas of standing water pools. The vegetation surrounding the waterway is mapped as remnant RE11.3.25b which was confirmed as present, particularly within the lower banks of the waterway. This RE contains *Melaleuca leucadendra* (Weeping Paperbark), *Corymbia tessellaris* (Moreton Bay Ash), and Eucalyptus tereticornis (Forest Red Gum). Vegetation is largely confined to the creek corridor, with only scattered trees on the upper banks. The shrub and ground layers were highly disturbed due to clearing almost up to the bank for surrounding agricultural activities. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site. No aquatic fauna were observed.

Recommendations

- Feature specific management plan(s) required (eg. VMP/FMP);
- Further detailed seasonal studies required to assist in the preparation of area specific environmental management plan(s).

Site #	**23 (Flora)**	
Location:	**Two Mile Creek – Inkerman Station**	
	Scientific Name	**Common Name**
T1/T2	*Corymbia tessellaris*	Moreton Bay Ash
	Ficus racemosa	Cluster Fig
	Eucalyptus tereticornis	Forest Red Gum
	Melaleuca leucadendra	Weeping Paperbark
	Eucalyptus platyphylla	Poplar Gum
	Cupaniopsis anacardioides	Tuckeroo
	Planchonia careya	Cocky Apple
Shrub	*Acacia leiocalyx*	Early Flowering Black Wattle
	Cryptostegia grandiflora	Rubber Vine
	Vachellia nilotica	Prickly Acacia
	Ricinus communis	Castor Oil Plant
	Leucaena leucocephala	Leucaena
	Saccharum officinarum	Sugarcane
Ground	*Sorghum halepense*	Johnson Grass
	Heterioigon contortus	Black Spear Grass
	Ribes uva-crispa	Castor Oil Plant
	Clitoria ternatea	Butterfly Pea
	Stachytarpheta jamaicensis	Blue Snake Weed
	Argyreia nervosa	Elephant Creeper
	Gomphrena celosioides	Gomphrena Weed
	Brachiaria mutica	Para Grass
Site #	**23 (Fauna)**	
Location:	**Two Mile Creek – Inkerman Station**	
	Scientific Name	**Common Name**
	Aprosmictus erythropterus	Red-winged Parrot
	Macropus agilis	Agile Wallaby
	Coracina novaehollandiae	Black-faced Cuckoo-shrike
	Tropidonophis mairii	Keelback
	Rhipidura leucophrys	Willy Wagtail
	Corvus orru	Torresian Crow
	Eurystomus orientalis	Dollarbird
	Cracticus torquatus	Grey Butcherbird
	Pteropus alecto	Black Flying Fox
	Cracticus tibicen	Australian Magpie
	Milvus migrans	Black Kite
	Trichoglossus haematodus moluccanus	Rainbow Lorikeet
	Ninox boobook	Southern Boobok
	Eudynamys orientalis	Eastern Koel
	Centropus phasianinus	Pheasant Coucal
	Haliastur sphenurus	Whistling Kite
	Bos taurus	Cow



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 23

Site Number: 23
Un-named creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.24. Site 24 Summary

Overview	Comment
Site #	24
Stream Order	1
Field Determination	**Drainage Feature**
	Overland flow path within cleared cattle paddock. No continuous bed and bank features nor any riparian vegetation or macrophytes.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.81855° N 147.51542° E (GDA 2020-MGA 55)
Local land use	Cattle grazing
Average Bankful Width	Absent
Dominant Substrate	Soils associated with Landzone 3
Variety of Habitats	Native vegetation absent, cleared for cattle grazing. Habitat features absent.
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The drainage feature is mapped as a Stream order 1 VMA watercourse and a low waterway under the *Fisheries Act 1994*. Continuous bed and bank features were not observed, with flow path indicated by low-lying depression. The surrounding area has been cleared for cattle grazing and is dominated by pasture grasses, with the invasive *Ziziphus mauritiana* (Chinee Apple), *Vachellia nilotica* (Prickly Acacia), and *Cryptostegia grandiflora* (Rubber Vine). No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendation

'- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 24

Site Number: 24
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.25. Site 25 Summary

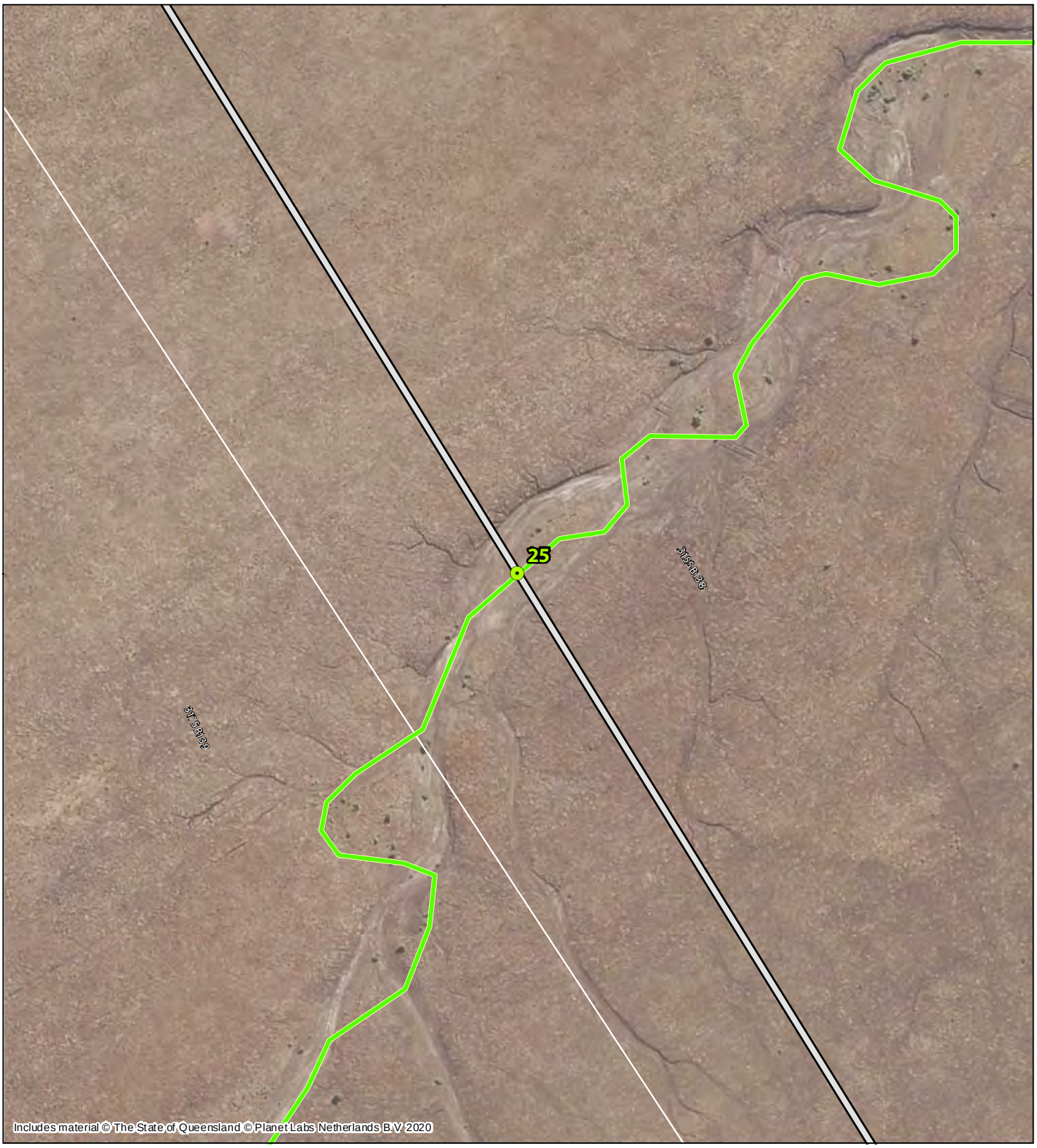
Overview	Comment
Site #	25
Stream Order	1
Field Determination	**Drainage Feature**
	Overland flow path within cleared cattle paddock. No continuous bed and bank features nor any riparian vegetation or macrophytes.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.82043° N 147.51666° E (GDA 2020-MGA 55)
Local land use	Cattle grazing
Average Bankful Width	Absent
Dominant Substrate	Soils associated with Landzone 3
Variety of Habitats	Native vegetation absent, cleared for cattle grazing. Habitat features absent.
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The drainage feature is mapped as a Stream order 1 VMA watercourse and a low waterway under the *Fisheries Act 1994*. Continuous bed and bank features were not observed, with flow path indicated by low-lying depression. The surrounding area has been cleared for cattle grazing and is dominated by pasture grasses, with the invasive *Ziziphus mauritiana* (Chinee Apple), *Vachellia nilotica* (Prickly Acacia), and *Cryptostegia grandiflora* (Rubber Vine). No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

'- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 25

Site Number: 25
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.26. Site 26 Summary

Overview	Comment
Site #	26
Stream Order	3
Field Determination	**Drainage feature**
	Drainage feature within cleared paddock. Discontinuous bed and bank features, and absent riparian vegetation and macrophytes.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.81072° N 147.54004° E (GDA 2020-MGA 55)
Local land use	Sugar cane farm
Average Bankful Width	5 m where present
Dominant Substrate	Soils associated with Landzone 3
Variety of Habitats	Eroded channel with limited vegetation, cleared for agriculture. Habitat features absent.
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The drainage feature is mapped as a Stream order 1 VMA watercourse and a low waterway under the *Fisheries Act 1994*. On-ground surveys found the drainage feature to be a scour channel, highly disturbed with discontinuous bed and bank features largely formed by erosion. Vegetation is mapped Category B (remnant) vegetation however the area was largely cleared for agriculture. Scattered *Eucalyptus tereticornis* (Forest Red Gum) and *Eucalyptus platyphylla* (White Gum) were present. The surrounding area and flow path have been highly modified for future sugar cane operation, including the upstream extent. The flow path shows no signs of permanent or semi-permanent flow, lacking riparian and macrophyte vegetation. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

'- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 26

Site Number: 26
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.27. Site 27 Summary

Overview	Comment	
Site #	27	
Stream Order	5	
Field Determination	**Formed Creek (Wangaratta Creek)**	
	Formed creek with distinguishable beds and banks. Riparian vegetation and macrophytes have been removed due to recent infrastructure upgrades (bridge and culvert). The creek contained no flowing water during the field assessment and was heavily weed infested.	
Prelim. Recommendation Rating	Moderate-High	
Final Recommendation Rating	Moderate	
GPS location	-19.81196° N	147.54654° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and sugarcane farming	
Average Bankful Width	5-10m	
Dominant Substrate	Soils associated with landzone 3	
Variety of Habitats	Sugarcane production, cleared grass, and sporadic trees. Habitat features minimal.	
Flow regime	Ephemeral	
Channel shading	0%	
Macrophytes	Absent	

General description and habitat attributes

The beds and banks of the formed creek are distinguishable, with the riparian zone and macrophytes removed. The creek bed is dominated by sand. The riparian zone upstream is heavily weeded with *Sporobolus fertilis* (Parramatta Grass) and *Ziziphus mauritiana* (Chinee Apple). The creek has an obvious flow path, but no permanent water flowing present. No aquatic fauna was observed at the time of assessment.

Prelim. Recommendations

- Further detailed seasonal studies required to either:

i. Downgrade to Moderate; or

ii. Upgrade to High

- seasonal construction parameters apply

Final Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Seasonal construction parameters apply.

Justification for recommendation rating change

The creek is a steep sloping U shape and is approximately 5m high from the low bank/creek bed. There is approximately 15-20m in width (TOB to TOB). The creek has a highly eroded bed and bank due to the lack of riparian vegetation and heavy weed infestation. The creek is heavily weeded with *Argemone Mexicana (*Mexican Poppy), *Cryptostegia grandiflora* (Rubber Vine), and *Gomphrena celosioides* (Gomphrena). Native vegetation is extremely limited with isolated stands in the adjacent agricultural property. The vegetation is mapped as Category X (Non-remnant) under the VMA. Little to no

vegetation will be impacted during the instatement of the linear infrastructure. Further, no EPBC listed 'vulnerable' *Eucalyptus raveretiana* (Black Ironbox) were identified within the waterway or in the impact area. No permanent water was observed at the time of the second assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 27

Site Number: 27
Wangaratta Creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.28. Site 28 Summary

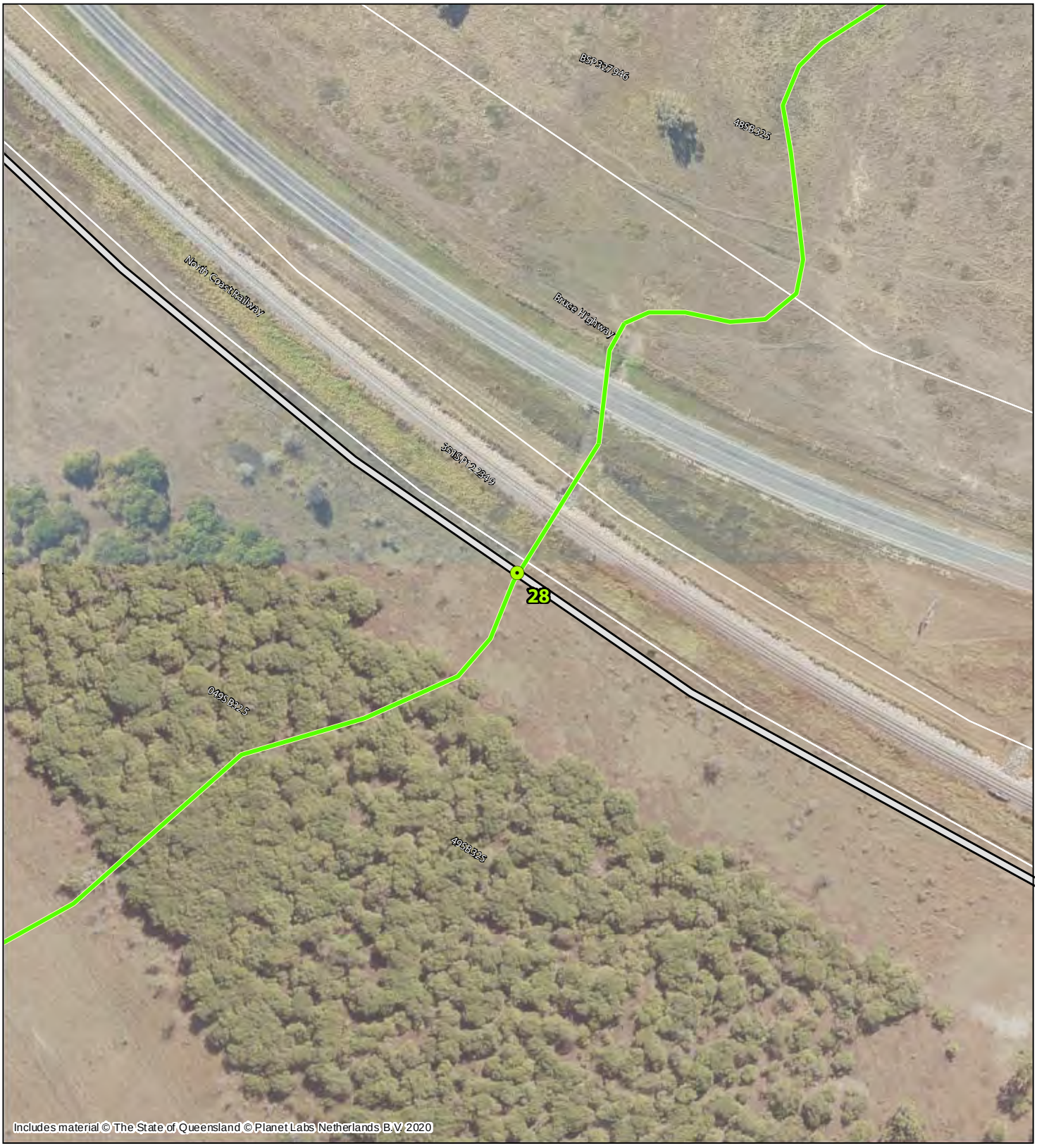
Overview	Comment
Site #	28
Stream Order	1
Determination	**Drainage feature** This drainage feature has been artificially altered by roads and the rail line. The drainage feature does not contain riparian vegetation or a continuous bed and bank. It will only hold water for a short period immediately following rainfall.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.81408° N 147.54901° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks
Average Bankful Width	Absent
Dominant Substrate	Soils associate with Landzone 3
Variety of Habitats	Cattle grazing paddocks. Habitat features limited
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by invasive species *Brachiaria mutica* (Parra Grass) and scattered *Ziziphus mauritiana* (Chinee Apple). The flow path at this site has been historically altered by culvert upgrades, roads and rail line and has an absence of bed and bank features. Habitat features were absent due to the historical agricultural practices in the area. No aquatic fauna or pooling water was observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s);



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 28

Site Number: 28
Un-named Drainage Feature

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.29. Site 29 Summary

Overview	Comment	
Site #	29	
Stream Order	3	
Field Determination	**Formed Creek (Slater Creek)**	
	Formed creek with distinguishable beds and banks. Riparian vegetation is present, but macrophytes are absent. The creek contained no flowing water during the field assessment and was heavily weed infested upstream and downstream.	
Prelim. Recommendation Rating	Moderate-High	
Final Recommendation Rating	Moderate	
GPS location	-19.81617° N	147.55391° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and sugarcane farming	
Average Bankful Width	5-10m	
Dominant Substrate	Soils associated with landzone 3	
Variety of Habitats	Sugarcane production, cleared grass, and riparian vegetation. Habitat features limited.	
Flow regime	Ephemeral	
Channel shading	0%	
Macrophytes	Absent	

General description and habitat attributes

The beds and banks of the formed creek were distinguishable, the riparian zone was present, but macrophytes were absent. The riparian vegetation included *Livistonia australis* (Cabbage Tree Palm), *Melaleuca leucadendra* (Weeping Paperbark), and *Corymbia tessellaris* (Moreton Bay Ash). The creek bed was dominated by sand. The riparian zone understorey is heavily weeded. The creek has an obvious flow path, but no water present. No aquatic fauna was observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Prelim. Recommendations

- Further detailed seasonal studies required to either:

i. Downgrade to Moderate; or

ii. Upgrade to High

- seasonal construction parameters apply

Final Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Seasonal construction parameters apply.

Justification for recommendation rating change

The creek is a gradual sloping U shape and is approximately 5m high from the top of bank to the low bank/creek bed. The creek is approximately 10m in width (TOB to TOB). The creek has a highly eroded bed and bank due to the lack of riparian vegetation and heavy weed infestation. The creek is heavily weeded with *Argemone Mexicana* (Mexican Poppy), *Cryptostegia grandiflora* (Rubber Vine), and *Gomphrena celosioides* (Gomphrena). Adjacent vegetation upstream and downstream is mapped as Category B vegetation (Remnant) RE11.3.31 & 11.3.25b under the VMA and is

representative of this mapping despite being heavily weeded. A cluster of native vegetation is present between the road and rail. There is no native vegetation where the linear infrastructure is proposed. Further, no *Eucalyptus raveretiana* (Black Ironbox), considered Vulnerable under the EPBC, were identified within the waterway or impact area. No permanent water was observed during the second assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 29

Site Number: 29
Slater Creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.30. Site 30 Summary

Overview	Comment	
Site #	30	
Stream Order	2	
Field Determination	**Spring Creek**	
	The absence of riparian species indicates this waterway only holds water for a short period immediately following rainfall. Continuous bed and bank features were not observed. This waterway was heavily weed infested.	
Prelim. Recommendation Rating	Low	
Final Recommendation Rating	Low	
GPS location	-19.82110° N	147.56776° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and sugarcane farming	
Average Bankful Width	Absent	
Dominant Substrate	Soils associated with landzone 3	
Variety of Habitats	Sugarcane and cleared grass. Habitat features absent.	
Flow regime	Ephemeral	
Channel shading	0%	
Macrophytes	Absent	

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by the invasive *Ziziphus mauritiana* (Chinee Apple) and native *Acacia salicina* (Sally Wattle). The flow path at this site has been historically altered by culvert upgrades and has an absence of continuous bed and bank features. Habitat features were absent due to the historical agricultural practices in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 30

Site Number: 30
Spring Creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.31. Site 31 Summary

Overview	Comment	
Site #	31	
Stream Order	1	
Determination	**Drainage Feature**	
	No distinguishable channel or bed and bank features were observed. There was also no riparian vegetation or water observed.	
Prelim. Recommendation Rating	Low	
Final Recommendation Rating	Low	
GPS location	-19.824959° N	147.57632° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming	
Average Bankful Width	Absent	
Dominant Substrate	Soils associated with landzone 3	
Variety of Habitats	Grazing paddocks and agricultural land. Habitat features absent.	
Flow regime	Ephemeral	
Channel shading	0%	
Macrophytes	Absent	

General description and habitat attributes

No defined channel, continuous bed or bank features, riparian vegetation, or water was present at this location. The drainage feature is dominated by pasture grasses associated with the adjacent land-use and has been modified by road and rail infrastructure and boundary clearing. No aquatic fauna was present. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic Management Plans



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 31

Site Number: 31
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.32. Site 32 Summary

Overview	Comment	
Site #	32	
Stream Order	3	
Field Determination	**Formed Creek (Arrow Creek)**	
	Formed creek with distinguishable beds and banks. Riparian vegetation and macrophytes are absent. The creek contained no water during the field assessment and was heavily weed infested. The beds and banks of the creek were heavily eroded.	
Prelim. Recommendation Rating	Moderate	
Final Recommendation Rating	Moderate	
GPS location	-19.82698° N	147.58000° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and sugarcane farming	
Average Bankful Width	5-10m	
Dominant Substrate	Soils associated with landzone 3	
Variety of Habitats	Sugarcane and cleared grass. Habitat features minimal.	
Flow regime	Ephemeral	
Channel shading	0%	
Macrophytes	Absent	

General description and habitat attributes

The beds and banks of the formed creek were distinguishable, while the riparian zone and macrophytes were absent. The creek bed is dominated by sand, and the banks of the creek were heavily eroded. The creek has an obvious flow path, but no water flowing or present. The creek is heavily weeded, dominated by *Ziziphus mauritiana* (Chinee Apple) and *Leucaena leucocephala* (Leucaena). No aquatic fauna was observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Seasonal construction parameters apply.



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 32

Site Number: 32
Arrow Creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.33. Site 33 Summary

Overview	Comment	
Site #	33	
Stream Order	1	
Field Determination	**Drainage Feature**	
	The absence of riparian species indicates this drainage feature only holds water for a short period immediately following rainfall. No continuous bed and bank features were observed. An eroded channel is occasionally visible. A constructed dam with water present was located upstream.	
Prelim. Recommendation Rating	Low	
Final Recommendation Rating	Low	
GPS location	-19.83755° N	147.59713° E (GDA 2020-MGA 55)

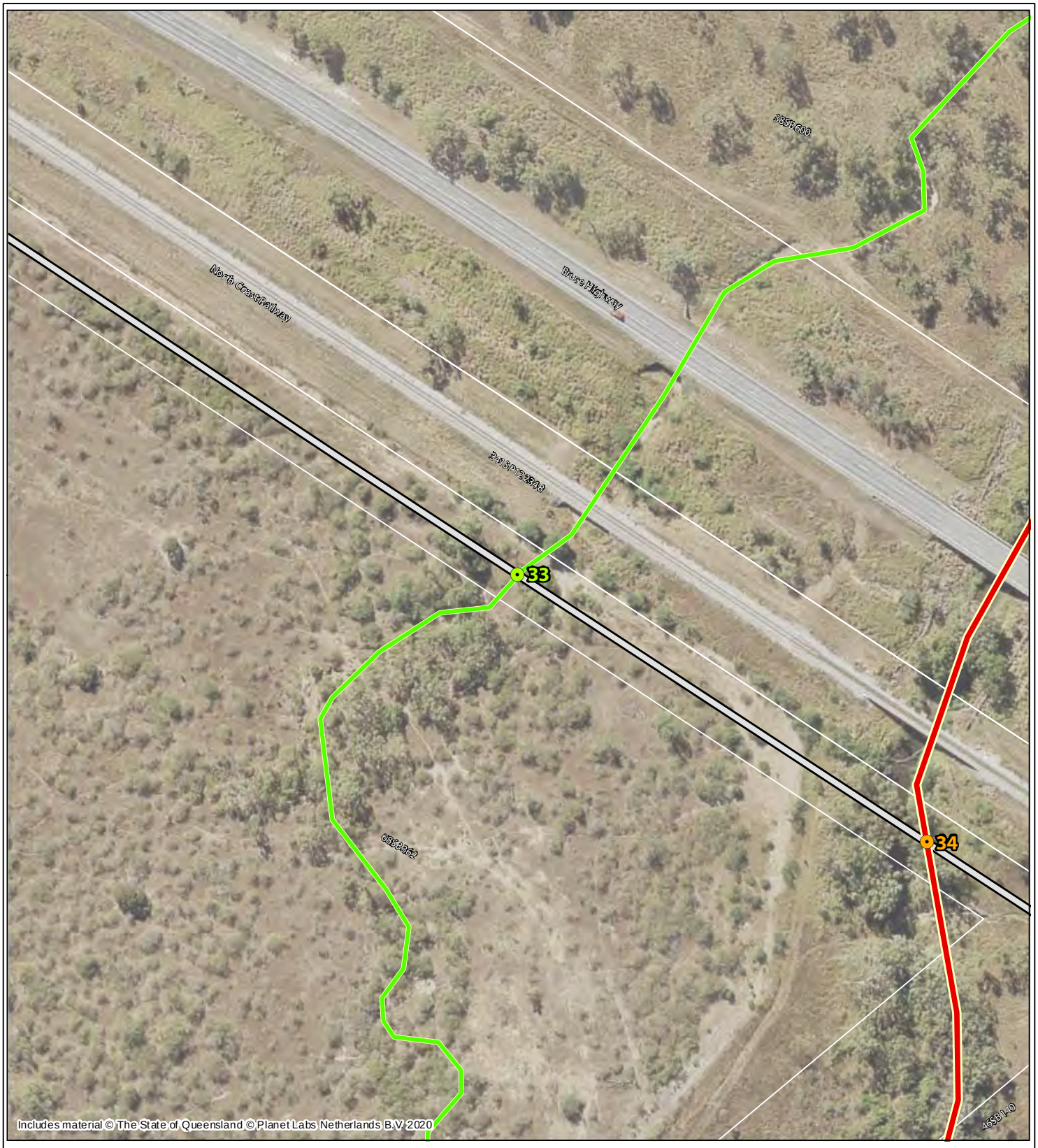
Local land use	Cattle grazing
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cleared grass
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by the invasive species, *Ziziphus mauritiana* (Chinee Apple). Some scattered *Corymbia dallachiana* (Ghost Gum) and *Corymbia clarksoniana* (Clarkson's Bloodwood). The flow path at this site has been historically altered by culvert upgrades and does not have bed and bank features. Habitat features were also absent due to the historical agricultural practices in the area. No aquatic fauna was observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 33

Site Number: 33
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.34. Site 34 Summary

Overview	Comment
Site #	34
Stream Order	3
Field Determination	**Formed Creek (Wilson Creek)**
	Formed creek with distinguishable beds and banks. Riparian vegetation was present, but macrophytes absent. The creek contained minimal flowing water and some slight pooling during the first field assessment, but no water was present during the second.
Prelim. Recommendation Rating	Moderate-High
Final Recommendation Rating	Moderate
GPS location	-19.83823° N 147.59824° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and sugarcane farming
Average Bankful Width	3-7m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Sugarcane production, cleared grass, and riparian vegetation. Habitat features limited.
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The beds and banks of the formed creek are distinguishable and the riparian zone was present, but macrophytes were absent. The riparian vegetation included *Melaleuca leucadendra* (Weeping Paperbark), *Eucalyptus platyphylla* (White Gum), and *Corymbia tessellaris* (Moreton Bay Ash). The creek bed was dominated by sand. The riparian zone understorey was heavily weeded with *Sorghum halepense* (Johnson Grass). The creek has an obvious flow path, and a low volume of standing water pools was present during the first field assessment but not the second. No aquatic fauna was observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Prelim. Recommendations

- Further detailed seasonal studies required to either:

i. Downgrade to Moderate; or

ii. Upgrade to High

- seasonal construction parameters apply

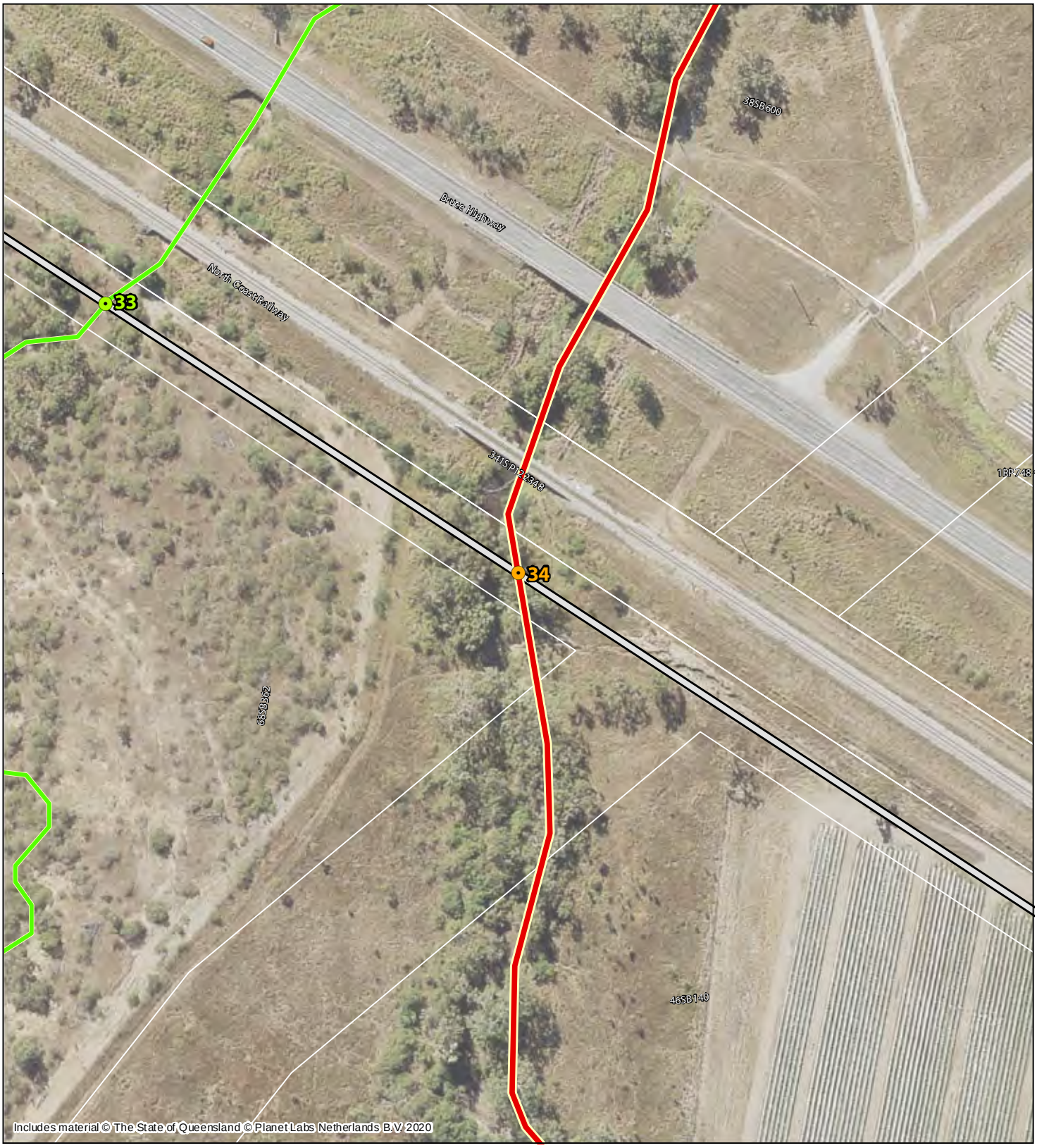
Final Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Seasonal construction parameters apply.

Justification for recommendation rating change

The creek is a gradual sloping U shape and is approximately 10m high from the top of bank to the low bank/creek bed. The creek is approximately 20m in width (TOB to TOB). The creek has a highly eroded bed and bank due to the lack of riparian vegetation. Adjacent vegetation upstream within the neighbouring property is mapped as Category B (Remnant) vegetation RE11.3.7 & 11.3.25b under the VMA, and was representative of this mapping. The native vegetation

present within the road/rail easement where the linear infrastructure is proposed was representative of RE11.3.7 and RE11.3.25, however, due to the high level of fragmentation and historical impacts and disturbance, the vegetation is considered Category X (Non-remnant). Some native vegetation (*Melaleuca leucadendra, Corymbia tessellaris, etc.*) will be impacted by the proposed linear infrastructure, however the impact is unlikely to be significant and these species are not threatened. No flowing or pooling water was observed during the second assessment, indicating that the water observed during the initial assessment was related to recent rainfall events before the assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 34

Site Number: 34
Wilson Creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.35. Site 35 Summary

Overview	Comment	
Site #	35	
Stream Order	2	
Field Determination	**Drainage Feature**	
	This drainage feature has been extremely modified and is heavily weed infested. Riparian species are absent, and a flow path is not obvious. Bed and bank features were not observed.	
Prelim. Recommendation Rating	Low	
Final Recommendation Rating	Low	
GPS location	-19.84754° N	147.61425° E (GDA 2020-MGA 55)
Local land use	Sugarcane farming	
Average Bankful Width	Absent	
Dominant Substrate	Soils associated with landzone 3	
Variety of Habitats	Sugarcane and cleared grass. Habitat features absent	
Flow regime	Ephemeral	
Channel shading	0%	
Macrophytes	Absent	

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by invasive species, *Sporobolus fertilis* (Parramatta Grass) and *Brachiaria decumbens* (Signal Grass). The flow path at this site has been historically altered by culvert upgrades and has an absence of bed and bank features. Habitat features were also absent due to the historical agricultural practices in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 35

Site Number: 35
Un-named Drainage Feature

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.36. Site 36 Summary

Overview	Comment
Site #	36
Stream Order	4
Field Determination	**Formed Creek (Rocky Ponds Creek)**
	Formed creek with distinguishable beds and banks. Riparian vegetation and macrophytes are present. Some parts of the channel contained permanent water.
Prelim. Recommendation Rating	Major
Final Recommendation Rating	Major
GPS location	-19.84918° N 147.61849° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and sugarcane farming
Average Bankful Width	7-15m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Riparian vegetation, water flowing and pooling and adjacent vegetation community(s).
Flow regime	Permanent
Channel shading	5-10%
Macrophytes	Present

General description and habitat attributes

The beds and banks of the formed creek are distinguishable, with the riparian zone and macrophytes present in parts of the channel that contained permanent flowing water. The riparian vegetation included *Melaleuca leucadendra* (Weeping Paperbark*), Eucalyptus platyphylla* (White Gum), and *Corymbia tessellaris* (Moreton Bay Ash). The creek bed was dominated by sand. The riparian zone understorey is heavily weeded with *Sorghum halepense* (Johnson Grass), *Sporobolus fertilis* (Parramatta Grass) and *Ziziphus mauritiana* (Chinee Apple). The creek has an obvious flow path. No aquatic fauna was observed at the time of assessment. *Eucalyptus raveretiana* (Black Ironbox), listed as Vulnerable under the EPBC, was identified within the waterway, however, it will not be impacted by the instatement of the linear infrastructure. Further, no other threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Implementation of tunnel bore technique to minimise impacts on the creek and watercourse system;
- Further detailed seasonal studies required to assist in the preparation of area specific environmental management plan(s).

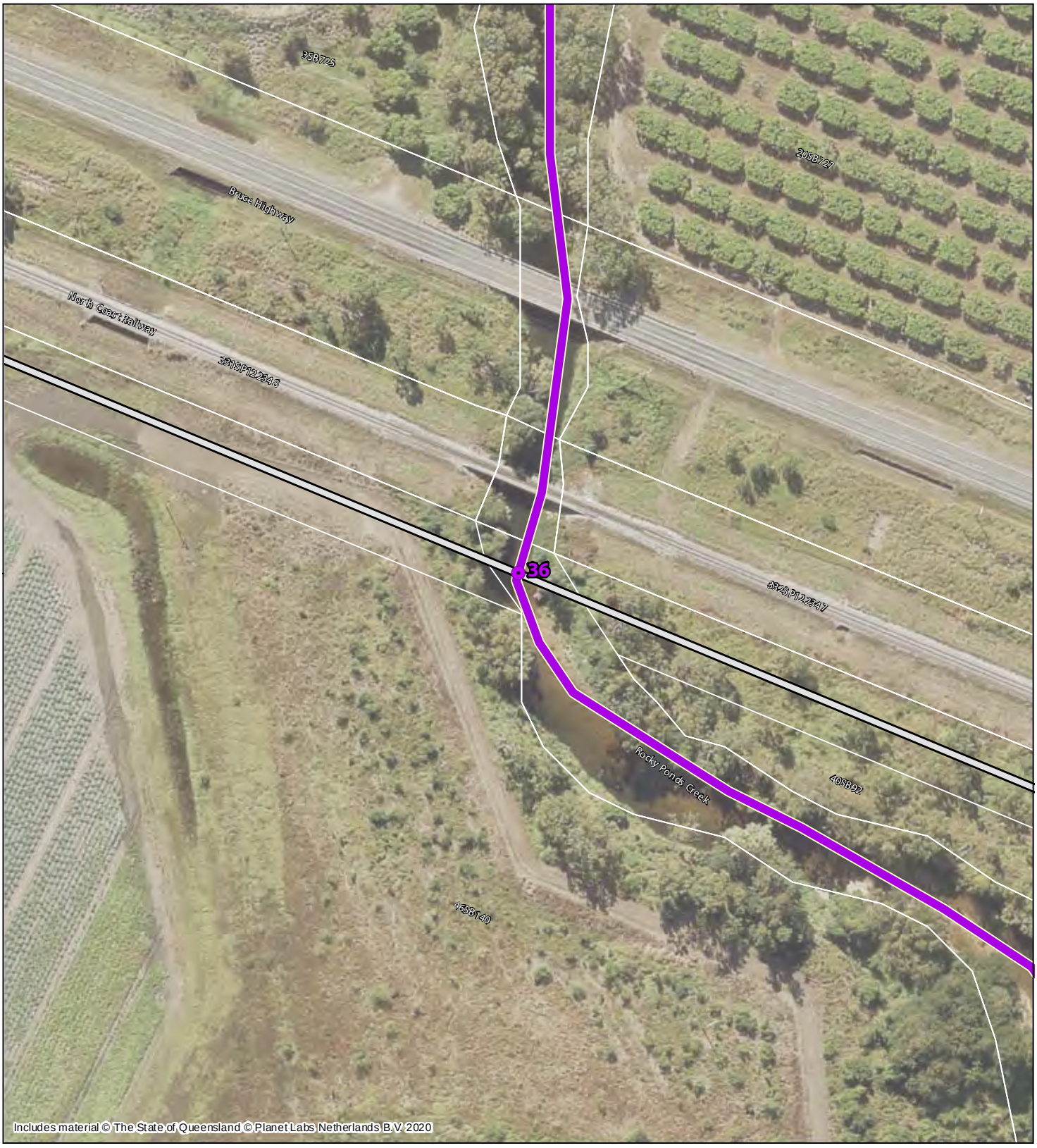
Site # **36 (Flora)**
Location: **Rocky Ponds Creek**

	Scientific Name	**Common Name**
T1/T2	*Melaleuca fluviatilis*	River Tea-tree
	Melaleuca leucadendra	Weeping Paperbark
	Lophostemon grandiflorus	Northern Swamp Box
	Pandanus tectorius	Pandanus
	Eucalyptus raveretiana	Black Ironbox
	Corymbia tessellaris	Moreton Bay Ash
	Ficus racemosa	Clustered Fig
Shrub/Ground	*Sorghum halapense*	Wild Sorghum
	Gomphrena celosioides	Gomphrena Weed
	Xanthium occidentale	Noogoora Burr
	Argyreia nervosa	Woodrose
	Ricinus communis	Castor Oil Plant
	Eustrephus latifolius	Wombat Berry
	Cryptostegia grandiflora	Rubber Vine
	Chloris gayana	Rhodes Grass
	Xanthium occidentale	Noogoora Burr
	Argemone mexicana	Mexican Poppy
	Stylosanthes scabra	Shrubby Stylo

Site # **36 (Fauna)**
Location: **Rocky Ponds Creek**

Scientific Name	**Common Name**
Corvus orru	Torresian Crow
Lichenostomus flavus	Yellow Honeyeater
Hirundo neoxena	Welcome Swallow
Rhipidura leucophrys	Willy Wagtail
Centropus phasianinus	Pheasant Coucal
Haliastur sphenurus	Whistling Kite
Grallina cyanoleuca	Peewee Mudlark
Sus scrofa	Wild Pig (Scats)
Ninox boobook	Mopoke Owl
Milvus migrans	Fork-tailed Kite
Merops ornatus	Rainbow Bee-eater (Fly-over)
Cracticus tibicen	Australian Magpie
Taeniopygia bichenovii	Double-barred Finch
Todiramphus sanctus	Sacred Kingfisher
Phalacrocoracidae	Cormorant
Coracina novaehollandiae	Black-faced Cuckoo Shrike
Manorina melanocephala	Noisy Minor
Canis familiaris	Dog (Footprints)
Cacatua galerita	Sulphur Crested Cockatoo
Dacelo leachii	Blue Winged Kookaburra
Rhinella marina	Cane Toad

Poecilia reticulata	Guppies
Litoria caerulea	Green Tree Frog
Falco berigora	Brown Falcon



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 36

Site Number: 36
Rocky Ponds Creek

Field Assessment
Risk Rating: Major

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.37. Site 37 Summary

Overview	Comment	
Site #	37	
Stream Order	1	
Field Determination	**Formed Creek (Kanaka Creek)**	
	Formed creek with distinguishable beds and banks. Riparian vegetation limited, while macrophytes were absent. No pooling water was recorded during the field survey.	
Prelim. Recommendation Rating	Moderate	
Final Recommendation Rating	Moderate	
GPS location	-19.85174° N	147.62507° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming	
Average Bankful Width	7-15m	
Dominant Substrate	Soils associated with landzone 3	
Variety of Habitats	Riparian vegetation in patches and cleared paddocks. Limited habitat values.	
Flow regime	Ephemeral	
Channel shading	<5%	
Macrophytes	Absent	

General description and habitat attributes

The beds and banks of the formed creek are distinguishable, with a limited riparian zone. Macrophytes were absent. The riparian vegetation included *Melaleuca bracteate* (Black Tea-tree) and *Corymbia tessellaris* (Moreton Bay Ash). The riparian vegetation is heavily fragmented due to trunk infrastructure upgrades. The creek bed is dominated by sand. The riparian zone understorey is heavily weeded with *Sorghum halepense* (Johnson Grass), *Sporobolus fertilis* (Parramatta Grass), and *Ziziphus mauritiana* (Chinee Apple). The creek has an obvious flow path, though no flowing or pooling water was observed during the field survey. No aquatic fauna were observed at the time of assessment. *Eucalyptus raveretiana* (Black Ironbox) were present within creek between the road and railway and north of road, but were not within the proposed alignment and therefore it is not anticipated there will be any significant impact.

Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Seasonal construction parameters apply.



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 37

Site Number: 37
Kanaka Creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.38. Site 38 Summary

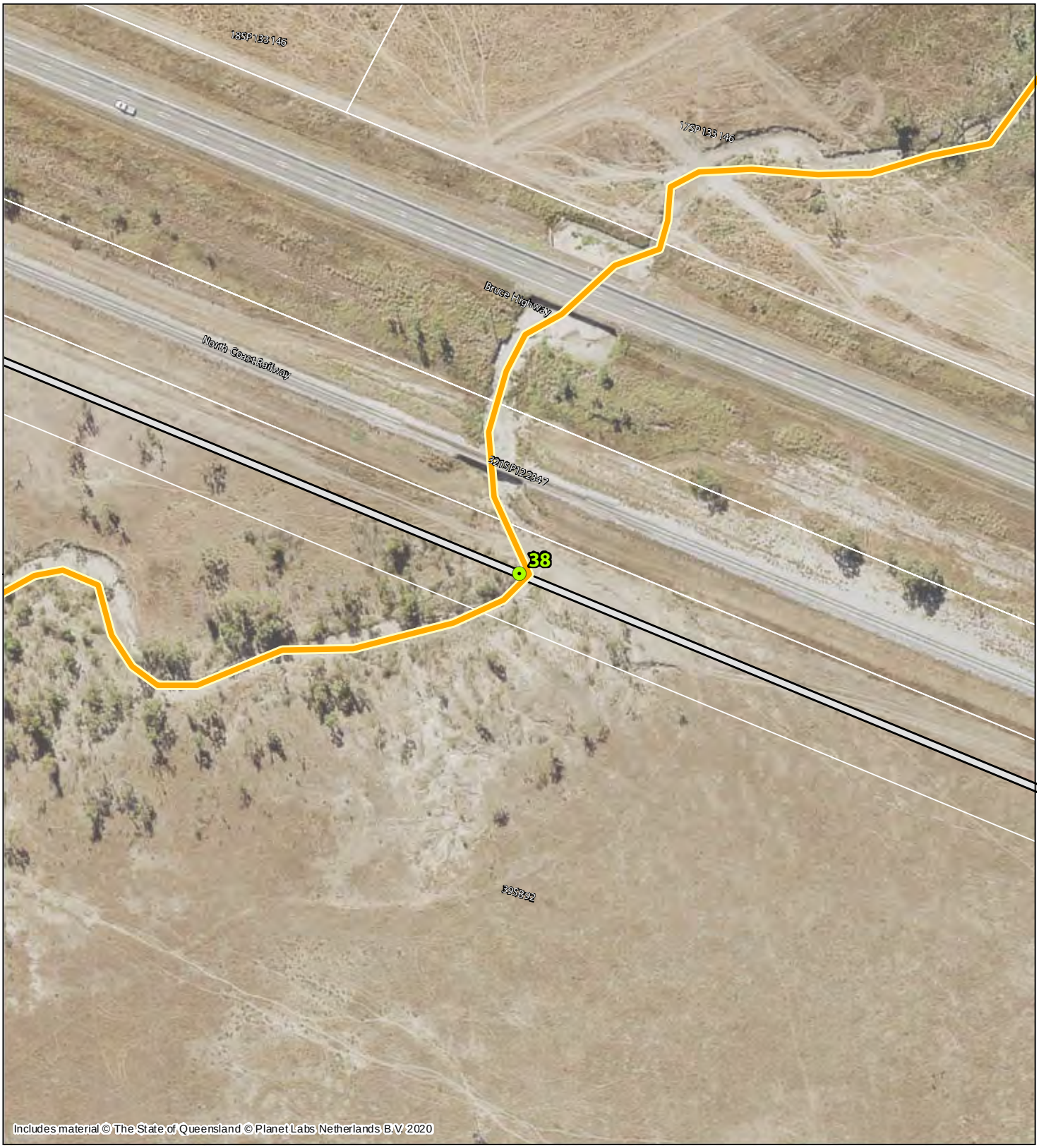
Overview	Comment
Site #	38
Stream Order	2
Field Determination	**Drainage Feature (Waistcoat Creek)** The absence of riparian species and pools indicates the channel holds water for a short period immediately following rainfall. Bed and bank features were observed, however extremely limited. This waterway was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.85833° N 147.64210° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	2-6m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Sugarcane and cleared grass. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by invasive species, *Sorghum halepense* (Johnson Grass), *Cryptostegia grandiflora* (Rubber Vine), and *Ziziphus mauritiana* (Chinee Apple) with scattered native *Lophostemon grandifloras* (Swamp Box) on banks. The flow path at this site has been historically altered by culvert upgrades and has limited bed and bank features. Habitat feature were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 38

Site Number: 38
Waistcoat Creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.39. Site 39 Summary

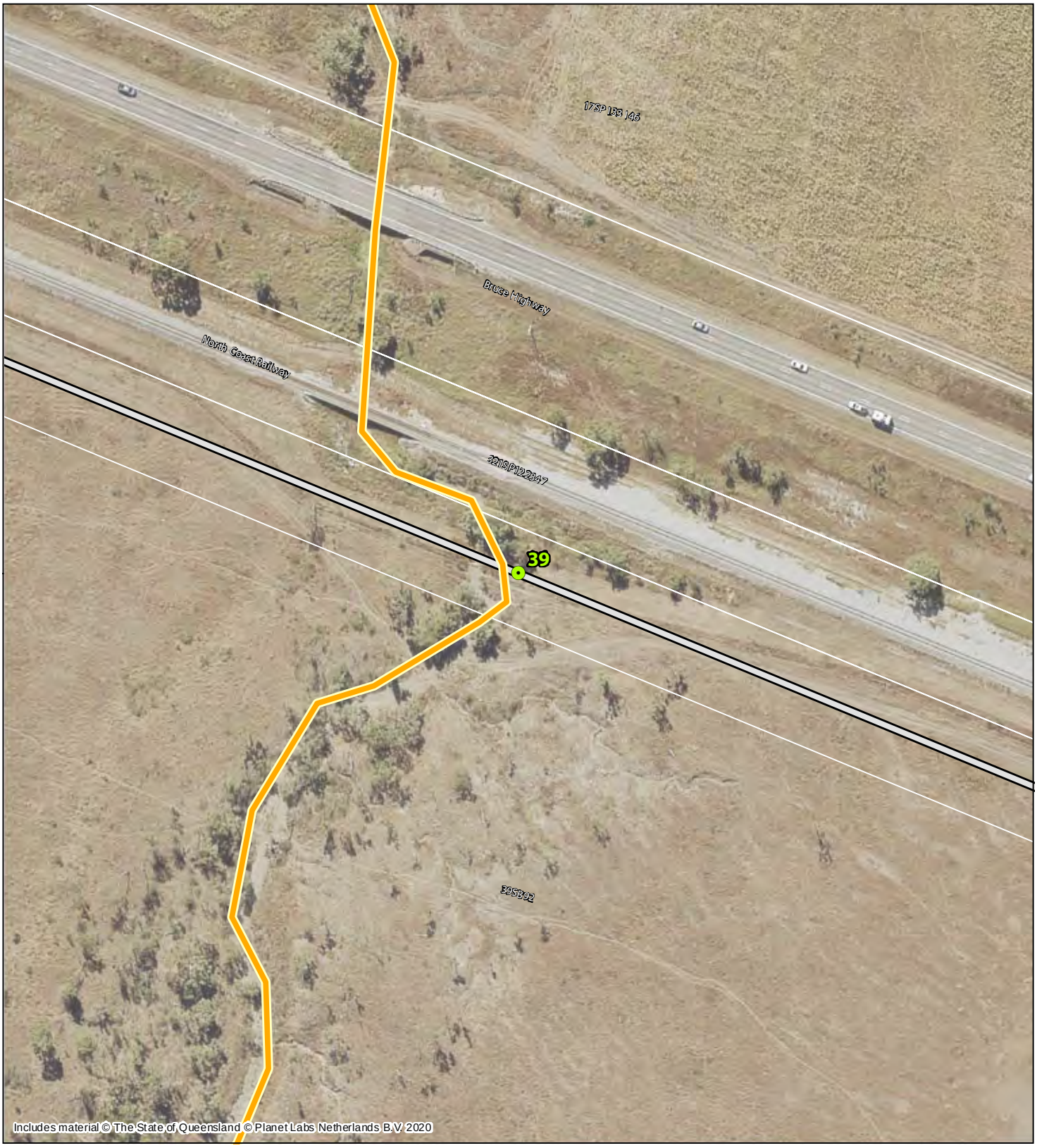
Overview	Comment
Site #	39
Stream Order	2
Field Determination	**Minor Creek (Gates Creek)**
	Riparian species present in patches with eroded channel. Large culvert/bridge upgrade indicates this drainage feature/minor creek pools water for a short period immediately following rainfall. Bed and bank features were observed, however extremely limited.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.86083° N 147.64856° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	2-4m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Sugarcane and cleared grass. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is present in patches dominated by *Melaleuca leucadendra* (Weeping Paperbark). Scattered *Eucalyptus platyphylla* (White Gum) and *Corymbia tessellaris* (Moreton Bay Ash) present beyond top of bank. The flow path at this site has been historically altered by culvert/bridge upgrades and has limited bed and bank features. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 39

Site Number: 39
Gates Creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.40. Site 40 Summary

Overview	Comment	
Site #	40	
Stream Order	1	
Field Determination	**Drainage Feature**	
	The absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. This waterway was heavily weed infested.	
Prelim. Recommendation Rating	Low	
Final Recommendation Rating	Low	
GPS location	-19.86333° N	147.65502° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming	
Average Bankful Width	Absent	
Dominant Substrate	Soils associated with landzone 3	
Variety of Habitats	Sugarcane and cleared grass. Habitat features absent	
Flow regime	Ephemeral	
Channel shading	0%	
Macrophytes	Absent	

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by invasive species, *Sorghum halepense* (Johnson Grass) and *Sporobolus fertilis* (Parramatta Grass). The flow path at this site has been historically altered by culvert upgrades and has no bed and bank features. The drainage feature flows downstream into a neighbouring wetland/swamp. Habitat feature were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 40

Site Number: 40
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.41. Site 41 Summary

Overview	Comment
Site #	41
Stream Order	1
Field Determination	**Drainage Feature**
	The absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed; however, an eroded channel was present in some areas. This waterway was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.86543° N 147.66045° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	3-5m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Sugarcane and cleared grass. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by *Corymbia tessellaris* (Moreton Bay Ash), *Eucalyptus platyphylla* (White Gum), and *Acacia salicina* (Sally Wattle). The flow path at this site has been historically altered by culvert upgrades and access tracks. Habitat feature were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 41

Site Number: 41
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



2.42. Site 42 Summary

Overview	Comment
Site #	42
Stream Order	1
Field Determination	**Drainage Feature** The absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. There is a culvert underneath the train line that allows water flow. Continuous bed and bank features were not observed. This waterway was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.86857° N 147.66604° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Sugarcane and cleared grass. Habitat features limited
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by invasive species, *Sorghum halepense* (Johnson Grass) and *Sporobolus fertilis* (Parramatta Grass). The flow path at this site has been historically altered by culvert upgrades and has no bed and bank features. Habitat features were present approximately 25m south where *Corymbia tessellaris* (Moreton Bay Ash) was present, however the proposed alignment area had been cleared for boundaries and infrastructure upgrades. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 42

Site Number: 42
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.43. Site 43 Summary

Overview	Comment
Site #	43
Stream Order	4
Field Determination	**Formed Creek (RM Creek)**
	Formed creek with distinguishable beds and banks. Riparian vegetation and macrophytes were present. The creek contained a low volume of flowing water in some areas of the channel.
Prelim. Recommendation Rating	Major
Final Recommendation Rating	Major
GPS location	-19.87006° N 147.66766° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	12-20m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Riparian vegetation, permanent water flowing and pooling and adjacent vegetation community(s).
Flow regime	Permanent
Channel shading	<5%
Macrophytes	Present

General description and habitat attributes

The beds and banks of the formed creek are distinguishable, with the riparian zone present and macrophytes recorded where water occurred. The riparian vegetation included *Melaleuca leucadendra* (Weeping Paperbark), *Lophostemon grandifloras* (Northern Swamp Box), *Ficus coronata* (Sandpaper Fig), and *Corymbia tessellaris* (Moreton Bay Ash). The creek bed is dominated by sand, with a high level of erosion in sections of the creek bank. The riparian zone understorey is weeded with *Sorghum halepense* (Johnson Grass), *Sporobolus fertilis* (Parramatta Grass), and *Ziziphus mauritiana* (Chinee Apple). The creek has an obvious flow path, with a low volume of permanent water flowing and pooling. No aquatic fauna was observed at the time of assessment. *Eucalyptus raveretiana* (Black Ironbox) was observed within the waterway and within the proposed alignment however with the utilisation of the tunnel bore technique it will not be impacted. Further, no other threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Implementation of tunnel bore technique to minimise impacts on the creek, threatened species, and watercourse system;
- Further detailed seasonal studies required to assist in the preparation of area specific environmental management plan(s).

Site #	**43 (Flora)**	
Location:	**RM Creek**	
	Scientific Name	**Common Name**
T1/T2	*Melaleuca fluviatilis*	River Teatree
	Corymbia tessellaris	Moreton Bay Ash
	Ficus coronata	Sandpaper Fig
	Lophostemon grandiflorus	Northern Swamp Box
	Eucalyptus raveretiana	Black Ironbox
	Melaleuca leucadendra	Weeping Paperbark
	Livistonia australis	Cabbage Tree
Shrub/Ground	*Sorghum halapense*	Wild Sorghum
	Imperata cylindrica	Blady Grass
	Gomphrena celosioides	Gomphrena Weed
	Zizyphus mauritiana	Chinee Apple
	Themeda quadrivalvis	Grader Grass
	Argyreia nervosa	Woodrose
	Passiflora foetida	Stinking Passionflower
	Euphorbia sp.	-
	Leucaena leucocephala	Leucaena
	Tridax procumbens	Tridax Daisy
	Melinis repens	Red Natal Grass
	Chloris gayana	Rhodes Grass
	Xanthium occidentale	Noogoora Burr
	Argemone mexicana	Mexican Poppy
	Stylosanthes scabra	Shrubby Stylo

Site #	**43 (Fauna)**	
Location:	**RM Creek**	
	Scientific Name	**Common Name**
	Macropus giganteus	Eastern Grey Kangaroo
	Lichenostomus flavus	Yellow Honeyeater
	Hirundo neoxena	Welcome Swallow
	Rhipidura leucophrys	Willy Wagtail
	Centropus phasianinus	Pheasant Coucal
	Haliastur sphenurus	Whistling Kite
	Grallina cyanoleuca	Peewee Mudlark
	Sus scrofa	Wild Pig (Scats)
	Ninox boobook	Mopoke Owl
	Milvus migrans	Fork-tailed Kite
	Merops ornatus	Rainbow Bee-eater (Fly-over)
	Cracticus nigrogularis	Pied Butcherbird
	Cracticus tibicen	Australian Magpie
	Taeniopygia bichenovii	Double-barred Finch
	Todiramphus sanctus	Sacred Kingfisher
	Trichoglossus moluccanus	Rainbow Lorikeet

Aquila audax	Wedge-tailed Eagle (Fly-over)
Coracina novaehollandiae	Black-faced Cuckoo Shrike
Manorina melanocephala	Noisy Minor
Canis familiaris	Dog (Footprints)
Cacatua galerita	Sulphur Crested Cockatoo
Dacelo leachii	Blue Winged Kookaburra
Alisterus scapularis	King Parrot
Rhinella marina	Cane Toad
Falco berigora	Brown Falcon



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 43

Site Number: 43
RM Creek

Field Assessment
Risk Rating: Major

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.44. Site 44 Summary

Overview	Comment
Site #	44
Stream Order	5
Field Determination	**Formed Creek (Molongle Creek)**
	Formed creek with distinguishable beds and banks. Riparian vegetation present, but macrophytes absent due to sandy and extremely dynamic creek bed. The creek contained no/low volume of semi-permanent water flowing during the field assessment.
Prelim. Recommendation Rating	Major
Final Recommendation Rating	Major
GPS location	-19.88390° N 147.69882° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	15-25m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Riparian vegetation, water flowing and pooling and adjacent vegetation community(s).
Flow regime	Semi-permanent
Channel shading	<2%
Macrophytes	Absent

General description and habitat attributes

The beds and banks of the formed creek are distinguishable, with a present riparian zone and absent macrophytes. The riparian vegetation included *Melaleuca leucadendra* (Weeping Paperbark), *Lophostemon suaveolens* (Swamp Box), *Ficus coronata* (Sandpaper Fig), and *Corymbia tessellaris* (Moreton Bay Ash). The creek bed is dominated by sand, with a high level of erosion in some sections of the creek bank. The riparian zone understorey is weeded with *Sorghum halepense* (Johnson Grass) and *Sporobolus fertilis* (Parramatta Grass). The creek has an obvious flow path, with no/low volume of permanent water flowing and pooling. No aquatic fauna were observed at the time of assessment. *Eucalyptus raveretiana* (Black Ironbox), listed as Vulnerable under the EPBC, was observed within the waterway and within the proposed alignment, however will not be impacted due to the utilisation of the tunnel bore technique. No other threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

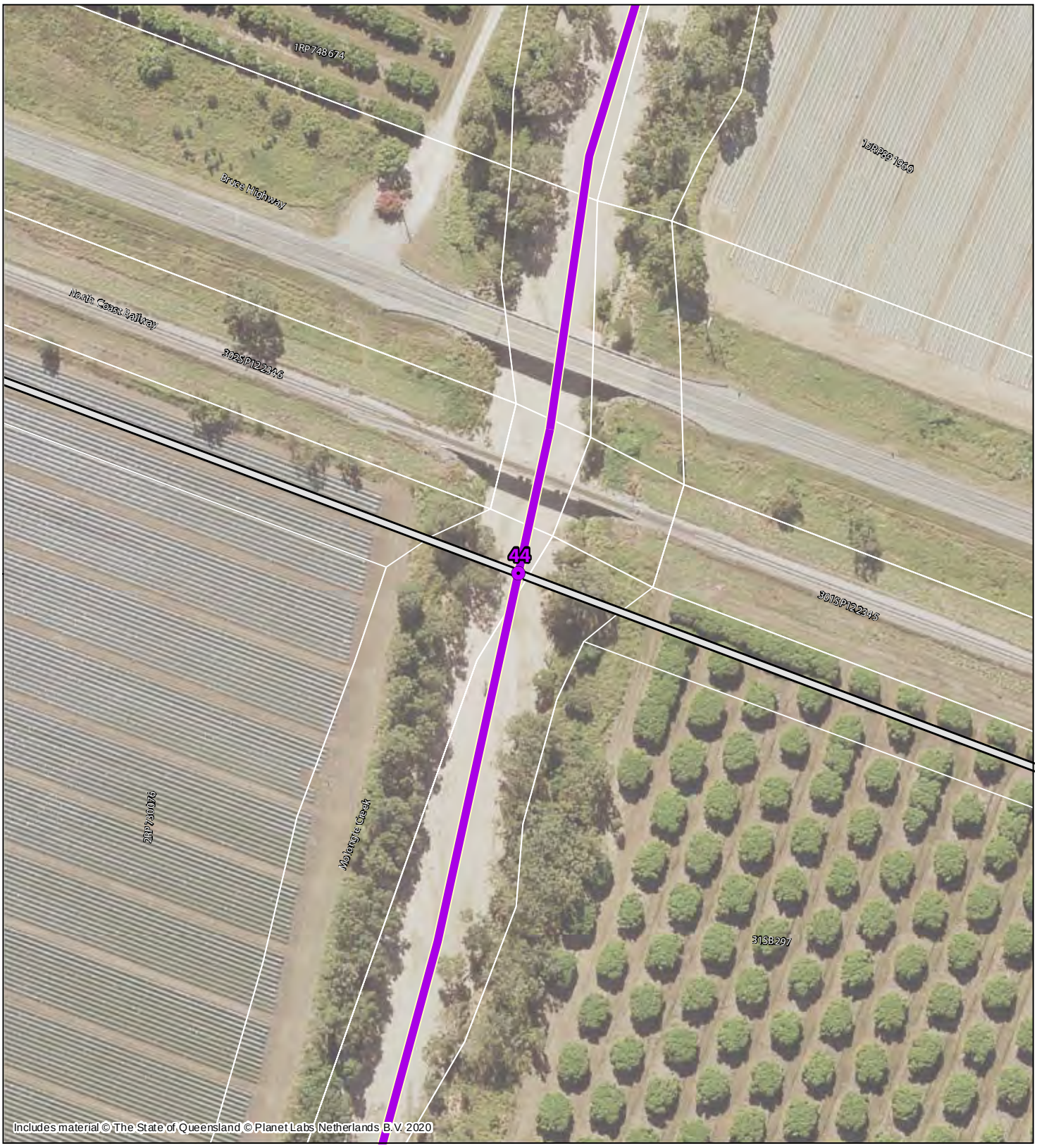
Recommendations

- Implementation of tunnel bore technique to minimise impacts on the creek, protected species, and watercourse system;
- Further detailed seasonal studies required to assist in the preparation of area specific environmental management plan(s).

Site #	**44 (Flora)**	
Location:	**Molongle Creek**	
	Scientific Name	**Common Name**
T1/T2	*Melaleuca fluviatilis*	River Teatree
	Corymbia tessellaris	Moreton Bay Ash
	Ficus coronata	Sandpaper Fig
	Lophostemon grandiflorus	Northern Swamp Box
	Eucalyptus raveretiana	Black Ironbox
	Melaleuca leucadendra	Weeping Paperbark
	Livistonia australis	Cabbage Tree
Shrub/Ground	*Sorghum halapense*	Wild Sorghum
	Imperata cylindrica	Blady Grass
	Gomphrena celosioides	Gomphrena Weed
	Zizyphus mauritiana	Chinee Apple
	Themeda quadrivalvis	Grader Grass
	Argyreia nervosa	Woodrose
	Passiflora foetida	Stinking Passionflower
	Euphorbia sp.	-
	Leucaena leucocephala	Leucaena
	Tridax procumbens	Tridax Daisy
	Melinis repens	Red Natal Grass
	Chloris gayana	Rhodes Grass
	Xanthium occidentale	Noogoora Burr
	Argemone mexicana	Mexican Poppy
	Stylosanthes scabra	Shrubby Stylo

Site #	**44 (Fauna)**	
Location:	**Molongle Creek**	
	Scientific Name	**Common Name**
	Macropus giganteus	Eastern Grey Kangaroo
	Lichenostomus flavus	Yellow Honeyeater
	Hirundo neoxena	Welcome Swallow
	Rhipidura leucophrys	Willy Wagtail
	Haliastur sphenurus	Whistling Kite
	Grallina cyanoleuca	Peewee Mudlark
	Milvus migrans	Fork-tailed Kite
	Merops ornatus	Rainbow Bee-eater (Fly-over)
	Cracticus nigrogularis	Pied Butcherbird
	Cracticus tibicen	Australian Magpie
	Taeniopygia bichenovii	Double-barred Finch
	Todiramphus sanctus	Sacred Kingfisher
	Trichoglossus moluccanus	Rainbow Lorikeet
	Manorina melanocephala	Noisy Minor
	Canis familiaris	Dog (Footprints)
	Cacatua galerita	Sulphur Crested Cockatoo
	Dacelo leachii	Blue Winged Kookaburra

Alisterus scapularis	King Parrot
Rhinella marina	Cane Toad
Falco berigora	Brown Falcon



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 44

Site Number: 44
Monongie Creek

Field Assessment
Risk Rating: Major

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.45. Site 45 Summary

Overview	Comment
Site #	45 (a)
Stream Order	1
Field Determination	**Drainage Feature** The absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. This waterway was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.88666° N 147.70637° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Sugarcane and cleared grass. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by *Acacia salicina* (Sally Wattle) regrowth. Vegetation between drainage features include patches of *Melaleuca leucadendra* (Weeping Paperbark), *Acacia salicina* (Sally Wattle) and invasive *Vachellia farnesiana* (Prickly Acacia). The flow path at this site has been historically altered by culvert upgrades and has no bed and bank features. The flow path runs parallel to property to the next drainage feature. Habitat feature were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).

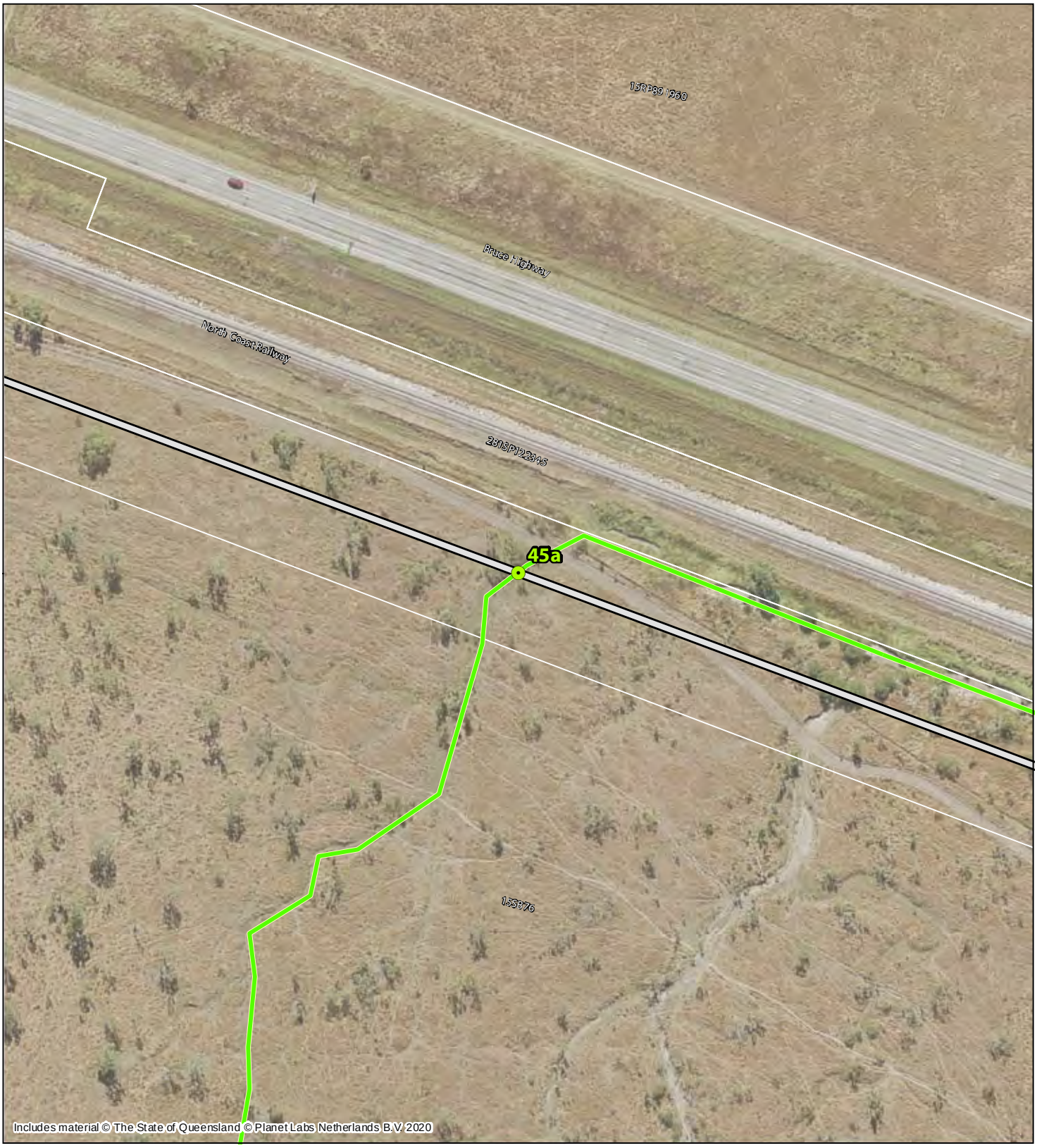
Overview	Comment
Site #	45 (b)
Stream Order	1
Field Determination	**Drainage Feature**
	Waterway with continuous bed and bank features and pooled water present at the time of survey. Macrophytes absent. Some habitat feature present. Water likely to be often present, but ephemeral.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Moderate
GPS location	-19.89010 ° N 147.71626° E (GDA 2020-MGA 55)
Local land use	Agriculture
Average Bankful Width	4-5m
Dominant Substrate	Sandy
Variety of Habitats	Road and rail infrastructure parallel north of waterway. Some habitat features present. Riparian vegetation limited.
Flow regime	Semi-permanent/Ephemeral
Channel shading	25%
Macrophytes	Absent

General description and habitat attributes

The drainage feature is mapped as a Stream order 1 VMA watercourse and a low waterway under the *Fisheries Act 1994*. On-ground surveys found the drainage feature to be disturbed, but with continuous bed and bank features and water present at the time of survey. Macrophytes were not observed, and riparian vegetation was present though limited. Vegetation along the waterway is dominated by *Melaleuca leucadendra* **(**Weeping Paperbark**)**. Vegetation to the south includes *Eucalyptus crebra* **(**Narrow-leaved Ironbark**)**, *Corymbia tessellaris* (Moreton Bay Ash), and *Corymbia dallachiana* (Ghost Gum). Vegetation to the north is heavily weed infested by *Cryptostegia grandiflora* (Rubber Vine) and *Stachytarpheta cayennensis* (Blue Snakeweed). Water is likely to be often present, but not permanent. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

'- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 45a

Site Number: 45a
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 45b

Site Number: 45b
Un-named creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



Upstream



Downstream



Left Bank



Right Bank



2.46. Site 46 Summary

Overview	Comment
Site #	46
Stream Order	2
Field Determination	**Formed Creek (Unnamed)**
	The limited riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Eroded channel present however continuous bed and bank features were not observed. This waterway was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.89160° N 147.72030° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	5-7m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Sugarcane and cleared grass. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is limited, dominated by sparse *Melaleuca leucadendra* (Weeping Paperbark) and *Lophostemon grandifloras* (Northern Swamp Box), and with some *Eucalyptus crebra* (Narrow-leaved Ironbark) and *Eucalyptus platyphylla* (White Gum). The area adjoining the drainage feature is dominated by the invasive *Themeda quadrivalvis* (Grader Grass) and *Sporobolus fertilis* (Parramatta Grass). The flow path at this site has been historically altered by culvert upgrades and has no bed and bank features. Habitat feature were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 46

Site Number: 46
Un-named Creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.47. Site 47 Summary

Overview	Comment
Site #	47
Stream Order	1
Field Determination	**Formed Creek (Unnamed)**
	The limited riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. A deep eroded channel was present, however continuous bed and bank features were not observed. This waterway was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.89223° N 147.72208° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	8-10m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Sugarcane and cleared grass. Habitat features absent
Flow regime	Ephemeral
Channel shading	10%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is limited, with sparse *Melaleuca leucadendra* (Weeping Paperbark) and *Lophostemon grandiflorus* (Northern Swamp Box). The area adjoining the drainage feature is dominated by invasive *Sporobolus fertilis* (Parramatta Grass). The flow path at this site has been historically altered by culvert upgrades and vehicle tracks with limited bed and bank features. Habitat feature were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 47

Site Number: 47
Un-named Creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.48. Site 48 Summary

Overview	Comment
Site #	48
Stream Order	1
Field Determination	**Drainage feature (Armstrong Creek Overflow)** No continuous bed and bank features. Riparian vegetation, macrophytes and pools absent indicating this drainage feature pools water for a short period immediately following rainfall.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.89741° N 147.73979° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Grazing paddocks and agricultural land. Habitat features limited.
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

No distinguishable bed and bank features are present, and riparian vegetation and macrophytes were absent. Vegetation adjacent to the flow path includes *Lophostemon grandifloras* (Northern Swamp Box), *Eucalyptus crebra* (Narrow-leaved Ironbark), *Corymbia tessellaris* (Moreton Bay Ash) and some scattered *Pandanus spiralis* (Screw Palm). The ground layer was dominated by *Themeda quadrivalvis* (Grader Grass) throughout. No aquatic fauna was observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 48

Site Number: 48
Armstrong Creek Overflow

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.49. Site 49 Summary

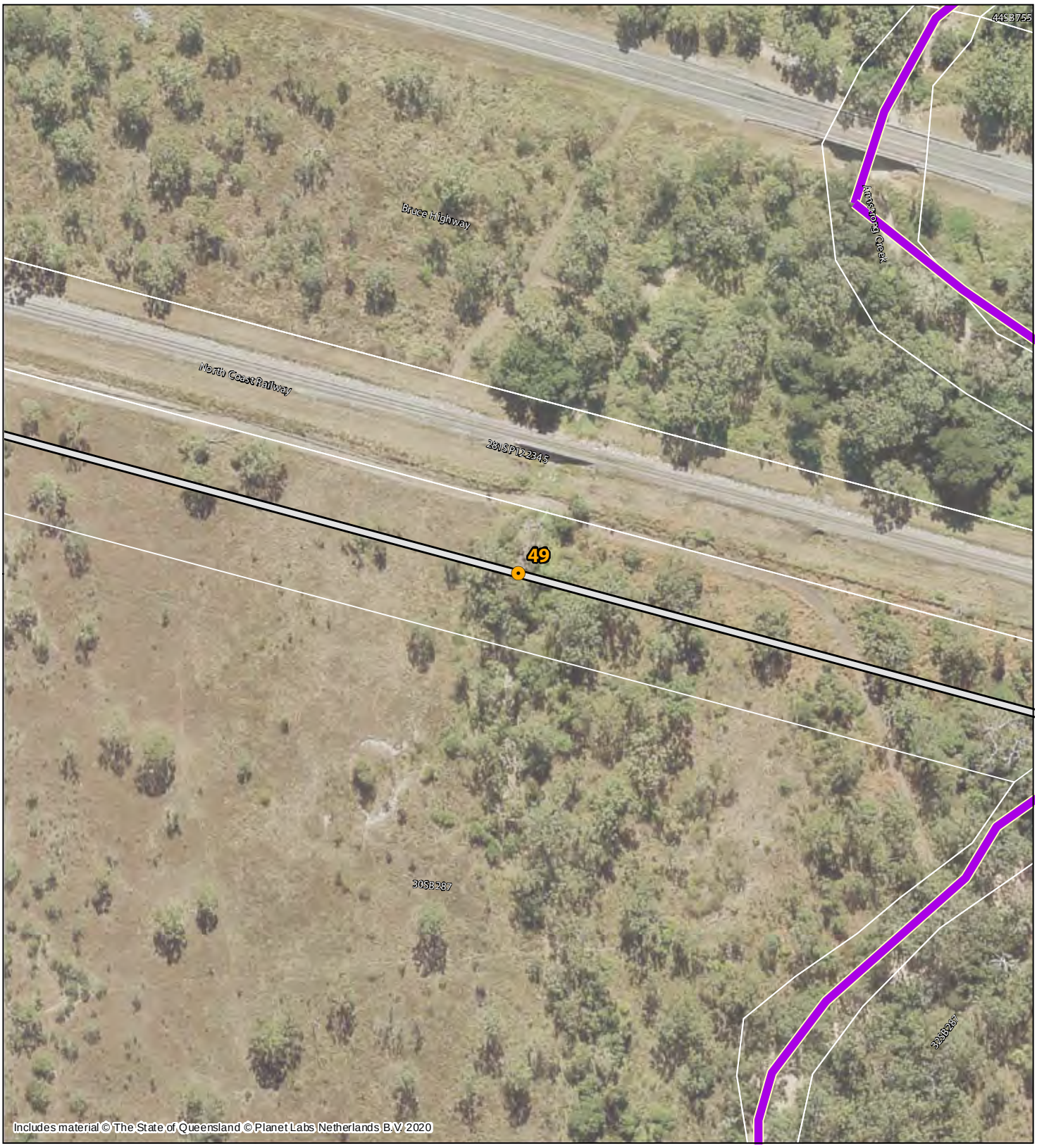
Overview	Comment
Site #	49
Stream Order	4
Field Determination	**Formed Creek (Armstrong Creek Tributary)** Formed creek with bed and bank features present. Riparian vegetation was present however, macrophytes and pools were absent indicating this creek contains flowing/pooled water for a short period immediately following rainfall.
Prelim. Recommendation Rating	Moderate
Final Recommendation Rating	Moderate
GPS location	-19.89812° N 147.74262° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	10m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Grazing paddocks and agricultural land. Habitat features limited.
Flow regime	Ephemeral
Channel shading	5%
Macrophytes	Absent

General description and habitat attributes

Observed channel with distinguishable bed and bank features and riparian vegetation present, but pools of standing water and macrophytes were absent. Riparian vegetation included *Melaleuca leucadendra* (Weeping Paperbark) within channel and on banks. *Eucalyptus platyphylla* (White Gum) and *Corymbia dallachiana* (Ghost Gum) present beyond top of bank. No aquatic fauna was observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Seasonal construction parameters apply



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 49

Site Number: 49
Armstrong Creek tributary

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.50. Site 50 Summary

Overview	Comment
Site #	50
Stream Order	4
Field Determination	**Formed Creek (Armstrong Creek)** Formed creek with distinguishable beds and banks. Riparian vegetation present, while macrophytes absent due to sandy and extremely dynamic creek bed. Some parts of the creek contained a low volume of water flowing during the field assessment.
Prelim. Recommendation Rating	Major
Final Recommendation Rating	Major
GPS location	-19.89852° N 147.74422° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	5-15m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Riparian vegetation, semi-permanent water flowing and pooling and adjacent vegetation community(s).
Flow regime	Semi-permanent
Channel shading	<2%
Macrophytes	Absent

General description and habitat attributes

The beds and banks of the formed creek were distinguishable, the riparian zone present, and macrophytes absent. The riparian vegetation included *Melaleuca leucadendra* (Weeping Paperbark), *Lophostemon grandifloras* (Northern Swamp Box), *Ficus coronata* (Sandpaper Fig), and *Corymbia tessellaris* (Moreton Bay Ash). The creek bed was dominated by sand, with a high level of erosion in sections of the creek bank. The riparian zone understorey was weeded with *Sorghum halepense* (Johnson Grass), *Ziziphus mauritiana* (Chinee Apple), and *Sporobolus fertilis* (Parramatta Grass). The creek has an obvious flow path, with a low volume of semi-permanent water flowing and pooling. No aquatic fauna was observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

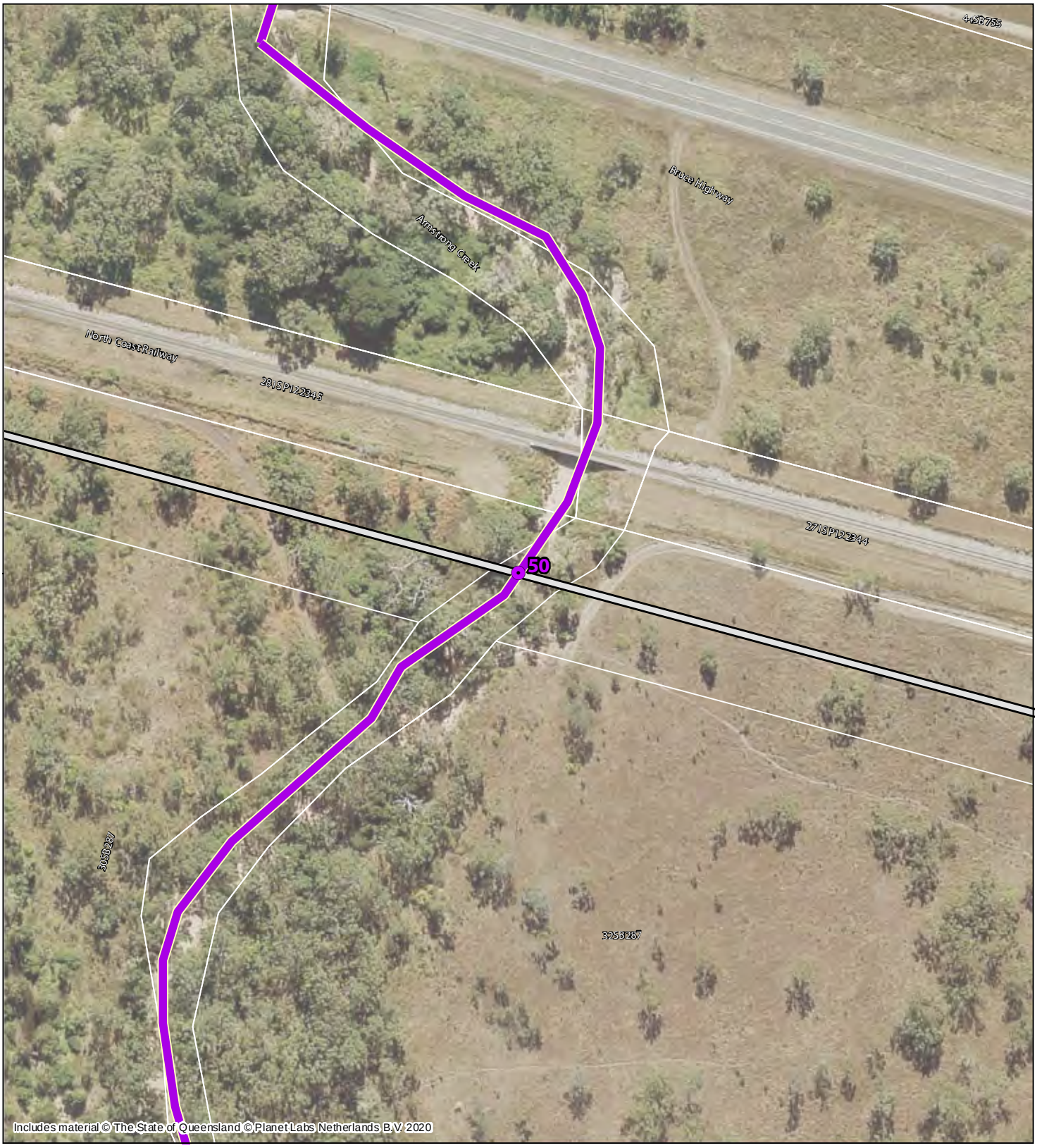
Recommendations

- Implementation of tunnel bore technique to minimise impacts on the creek and watercourse system;
- Further detailed seasonal studies required to assist in the preparation of area specific environmental management plan(s).

Site #	**50 (Flora)**	
Location:	**Armstrong Creek**	
	Scientific Name	**Common Name**
T1/T2	*Melaleuca fluviatilis*	River Teatree
	Melaleuca leucadendra	Weeping Paperbark
	Lophostemon grandiflorus	Northern Swamp Box
	Pandanus tectorius	Pandanus
	Acacia salicina	Willow Acacia
	Pleiogynium timorense	Burdekin Plum
	Cupaniopsis anacarioides	Tuckeroo
	Eucalyptus platyphylla	Polar Gum
Shrub/Ground	*Sorghum halapense*	Wild Sorghum
	Imperata cylindrica	Bladey Grass
	Gomphrena celosioides	Gomphrena Weed
	Zizyphus mauritiana	Chinee Apple
	Themeda quadrivalvis	Grader Grass
	Argyreia nervosa	Woodrose
	Passiflora foetida	Stinking Passionflower
	Euphorbia sp.	-
	Leucaena leucocephala	Leucaena
	Tridax procumbens	Tridax Daisy
	Melinis repens	Red Natal Grass
	Chloris gayana	Rhodes Grass
	Xanthium occidentale	Noogoora Burr
	Argemone mexicana	Mexican Poppy
	Stylosanthes scabra	Shrubby Stylo

Site #	**50 (Fauna)**	
Location:	**Armstrong Creek**	
	Scientific Name	**Common Name**
	Corvus orru	Torresian Crow
	Macropus giganteus	Eastern Grey Kangaroo
	Lichenostomus flavus	Yellow Honeyeater
	Hirundo neoxena	Welcome Swallow
	Rhipidura leucophrys	Willy Wagtail
	Centropus phasianinus	Pheasant Coucal
	Haliastur sphenurus	Whistling Kite
	Grallina cyanoleuca	Peewee Mudlark
	Sus scrofa	Wild Pig (Scats)
	Ninox boobook	Mopoke Owl
	Milvus migrans	Fork-tailed Kite
	Merops ornatus	Rainbow Bee-eater (Fly-over)
	Cracticus nigrogularis	Pied Butcherbird
	Cracticus tibicen	Australian Magpie
	Taeniopygia bichenovii	Double-barred Finch

Trichoglossus moluccanus	Rainbow Lorikeet
Coracina novaehollandiae	Black-faced Cuckoo Shrike
Manorina melanocephala	Noisy Minor
Canis familiaris	Dog (Footprints)
Cacatua galerita	Sulphur Crested Cockatoo
Dacelo leachii	Blue Winged Kookaburra
Alisterus scapularis	King Parrot
Rhinella marina	Cane Toad
Falco berigora	Brown Falcon



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 50

Site Number: 50
Armstrong Creek

Field Assessment
Risk Rating: Major

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.51. Site 51 Summary

Overview	Comment	
Site #	51	
Stream Order	1	
Determination	**Drainage Feature**	
	No formed channel, bed and bank features, macrophytes, or riparian vegetation were observed. No water was present. This drainage feature likely holds water for a short period following rainfall.	
Prelim. Recommendation Rating	Low	
Final Recommendation Rating	Low	
GPS location	-19.89917° N	147.74682° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming	
Average Bankful Width	Absent	
Dominant Substrate	Soils associated with landzone 3	
Variety of Habitats	Grazing paddocks and agricultural land. Habitat features absent.	
Flow regime	Ephemeral	
Channel shading	0%	
Macrophytes	Absent	

General description and habitat attributes

No defined channel or bed and bank features, riparian vegetation, or pools of standing water were present. This mapped drainage feature was dominated by pasture grasses associated with the adjacent land-use and scattered *Eucalyptus platyphylla* (White Gum). No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic Management Plans



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 51

Site Number: 51
Un-named Creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.52. Site 52 Summary

Overview	Comment
Site #	52
Stream Order	4
Field Determination	**Formed Creek (Cape Creek)**
	Formed creek with distinguishable beds and banks. Riparian vegetation present; macrophytes absent due to sandy and extremely dynamic creek bed. Some parts of the creek contained a low volume of permanent water flowing and pooling during the field assessment.
Prelim. Recommendation Rating	Major
Final Recommendation Rating	Major
GPS location	-19.90271° N 147.75900° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	5-15m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Riparian vegetation, permanent water flowing and pooling and adjacent vegetation community(s).
Flow regime	Permanent
Channel shading	<2%
Macrophytes	Absent

General description and habitat attributes

The beds and banks of the formed creek are distinguishable, with the riparian zone present, while macrophytes were absent. The riparian vegetation included *Melaleuca leucadendra* (Weeping Paperbark), *Pandanus spp.*, *Ficus coronata* (Sandpaper Fig), and *Corymbia tessellaris* (Moreton Bay Ash). The creek bed is dominated by sand, with a high level of erosion in sections of the creek bank. The riparian zone understorey was weeded with *Sorghum halepense* (Johnson Grass) and *Sporobolus fertilis* (Parramatta Grass). The creek has an obvious flow path, with a low volume of permanent water flowing and pooling. No aquatic fauna was observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

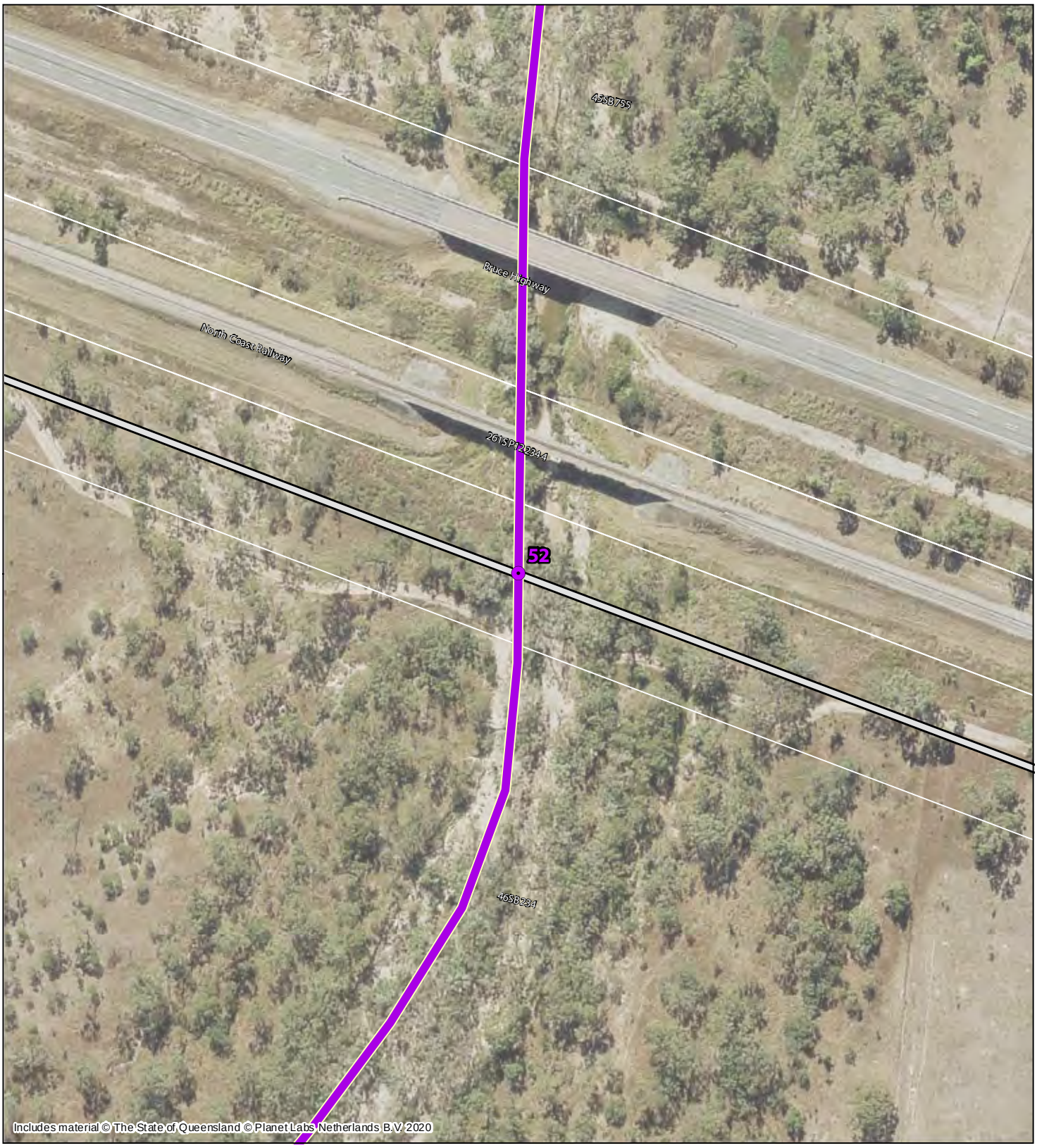
Recommendations

- Implementation of tunnel bore technique to minimise impacts on the creek and watercourse system;
- Further detailed seasonal studies required to assist in the preparation of area specific environmental management plan(s).

Site #	**52 (Flora)**	
Location:	**Cape Creek**	
	Scientific Name	**Common Name**
T1/T2	*Melaleuca fluviatilis*	River Teatree
	Melaleuca leucadendra	Weeping Paperbark
	Lophostemon grandiflorus	Northern Swamp Box
	Pandanus tectorius	Pandanus
	Acacia salicina	Willow Acacia
	Pleiogynium timorense	Burdekin Plum
	Ficus racemosa	Cluster Fig
Shrub/Ground	*Sorghum halapense*	Wild Sorghum
	Imperata cylindrica	Bladey Grass
	Gomphrena celosioides	Gomphrena Weed
	Xanthium occidentale	Noogoora Burr
	Themeda quadrivalvis	Grader Grass
	Argyreia nervosa	Woodrose
	Passiflora foetida	Stinking Passionflower
	Euphorbia sp.	-
	Leucaena leucocephala	Leucaena
	Melinis repens	Red Natal Grass
	Chloris gayana	Rhodes Grass
	Xanthium occidentale	Noogoora Burr
	Ageratum houstonianum	Blue Billygoat Weed
	Stylosanthes scabra	Shrubby Stylo

Site #	**52 (Fauna)**	
Location:	**Cape Creek**	
	Scientific Name	**Common Name**
	Corvus orru	Torresian Crow
	Macropus giganteus	Eastern Grey Kangaroo
	Lichenostomus flavus	Yellow Honeyeater
	Hirundo neoxena	Welcome Swallow
	Rhipidura leucophrys	Willy Wagtail
	Centropus phasianinus	Pheasant Coucal
	Haliastur sphenurus	Whistling Kite
	Grallina cyanoleuca	Peewee Mudlark
	Sus scrofa	Wild Pig (Scats)
	Milvus migrans	Fork-tailed Kite
	Merops ornatus	Rainbow Bee-eater (Fly-over)
	Cracticus nigrogularis	Pied Butcherbird
	Cracticus tibicen	Australian Magpie
	Taeniopygia bichenovii	Double-barred Finch
	Todiramphus sanctus	Sacred Kingfisher
	Trichoglossus moluccanus	Rainbow Lorikeet
	Manorina melanocephala	Noisy Minor

Canis familiaris	Dog (Footprints)
Cacatua galerita	Sulphur Crested Cockatoo
Rhinella marina	Cane Toad
Poecilia reticulata	Guppies
Litoria caerulea	Green Tree Frog
Falco berigora	Brown Falcon



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 52

Site Number: 52
Cape Creek

Field Assessment
Risk Rating: Major

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.53. Site 53 Summary

Overview	Comment
Site #	53
Stream Order	3
Field Determination	**Formed Creek (Unnamed)**
	The limited riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. This waterway was highly modified, and contained some pools of standing water during field assessment.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.90564° N 147.76745° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Sugarcane and cleared grass. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is limited with sparse *Melaleuca leucadendra* (Weeping Paperbark), and *Corymbia tessellaris* (Moreton Bay Ash) and the area adjoining the drainage feature is dominated by invasive *Sorghum halepense* (Johnson Grass) and *Sporobolus fertilis* (Parramatta Grass). The flow path at this site has been historically altered by culvert upgrades and has no bed and bank features. Habitat feature were absent due to the historical agricultural practices and infrastructure upgrades in the area. Clear evidence of cattle access was observed within the mapped watercourse. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 53

Site Number: 53
Un-named Creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.54. Site 54 Summary

Overview	Comment
Site #	54
Stream Order	4
Field Determination	**Formed Creek (Sandy Creek)**
	Formed creek with distinguishable beds and banks. Riparian vegetation present and intact, while macrophytes absent due to sandy and extremely dynamic creek bed. The creek contained a low volume of permanent water flowing during the field assessment.
Prelim. Recommendation Rating	Major
Final Recommendation Rating	Major
GPS location	-19.90874° N 147.77778° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	5-15m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Riparian vegetation, permanent water flowing and pooling and adjacent vegetation community(s).
Flow regime	Permanent
Channel shading	<4%
Macrophytes	Absent

General description and habitat attributes

The beds and banks of the formed creek are distinguishable, with the riparian zone present and intact, while the macrophytes absent. The riparian vegetation included *Melaleuca leucadendra* (Weeping Paperbark), *Lophostemon grandifloras* (Northern Swampbox), *Ficus coronata* (Sandpaper Fig), *Pandanus spp.* and *Corymbia tessellaris* (Moreton Bay Ash). The creek bed is dominated by sand, with a high level of erosion in sections of the creek bank. The riparian zone understorey is weeded with *Sorghum halepense* (Johnson Grass) and *Sporobolus fertilis* (Parramatta Grass). The remnant vegetation mapping over the creek and adjacent is accurate. The creek has an obvious flow path, with a low volume of permanent water flowing and pooling. No aquatic fauna was observed at the time of assessment. *Eucalyptus raveretiana* (Black Ironbox) was observed within the waterway and within the proposed alignment however will not be impacted due the utilisation of the tunnel bore technique. Further, no other threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Implementation of tunnel bore technique to minimise impacts on the creek and watercourse system;
- Further detailed seasonal studies required to assist in the preparation of area specific environmental management plan(s).

Site #	**54 (Flora)**	
Location:	**Sandy Creek**	
	Species Name	**Common Name**
T1/T2	*Melaleuca fluviatilis*	River Teatree
	Melaleuca leucadendra	Weeping Paperbark
	Lophostemon grandiflorus	Northern Swamp Box
	Allocasuarina cunninghamiana	River Sheoak
	Eucalyptus raveretiana	Black Ironbox
	Corymbia tessellaris	Moreton Bay Ash
	Ficus racemosa	Cluster Fig
	Nauclea orientalis	Leichhardt Tree
Shrub/Ground	*Sorghum halapense*	Wild Sorghum
	Gomphrena celosioides	Gomphrena Weed
	Xanthium occidentale	Noogoora Burr
	Argyreia nervosa	Woodrose
	Ricinus communis	Castor Oil Plant
	Eustrephus latifolius	Wombat Berry
	Cryptostegia grandiflora	Rubber Vine
	Chloris gayana	Rhodes Grass
	Xanthium occidentale	Noogoora Burr
	Argemone mexicana	Mexican Poppy
	Stylosanthes scabra	Shrubby Stylo

Site #	**54 (Fauna)**	
Location:	**Sandy Creek**	
	Zoological Name	**Common Name**
	Lichenostomus flavus	Yellow Honeyeater
	Hirundo neoxena	Welcome Swallow
	Rhipidura leucophrys	Willy Wagtail
	Haliastur sphenurus	Whistling Kite
	Milvus migrans	Fork-tailed Kite
	Merops ornatus	Rainbow Bee-eater (Fly-over)
	Cracticus nigrogularis	Pied Butcherbird
	Cracticus tibicen	Australian Magpie
	Taeniopygia bichenovii	Double-barred Finch
	Todiramphus sanctus	Sacred Kingfisher
	Trichoglossus moluccanus	Rainbow Lorikeet
	Manorina melanocephala	Noisy Minor
	Canis familiaris	Dog (Footprints)
	Cacatua galerita	Sulphur Crested Cockatoo
	Litoria rothii	Roth's Tree Frog
	Dacelo leachii	Blue Winged Kookaburra
	Rhinella marina	Cane Toad
	Falco berigora	Brown Falcon



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 54

Site Number: 54
Sandy Creek

Field Assessment
Risk Rating: Major

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.55. Site 55 Summary

Overview	Comment	
Site #	55	
Stream Order	2	
Determination	**Drainage Feature**	
	No formed channel or bed and bank features are. No riparian vegetation was observed within the mapped drainage feature. The flow path has been modified by road and rail infrastructure, and with the lack of macrophytes and riparian vegetation indicates that this drainage feature pools water for a short period of time immediately following rainfall.	
Prelim. Recommendation Rating	Low	
Final Recommendation Rating	Low	
GPS location	-19.90963° N	147.78379° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming	
Average Bankful Width	Absent	
Dominant Substrate	Soils associated with landzone 3	
Variety of Habitats	Grazing paddocks and agricultural land. Habitat features absent.	
Flow regime	Ephemeral	
Channel shading	0%	
Macrophytes	Absent	

General description and habitat attributes

No defined channel or bed and bank features and no riparian vegetation was present. The flow regime of this drainage feature has been highly modified by road and rail infrastructure. The drainage feature is dominated by pasture grasses associated with the adjacent land-use. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic Management Plans



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 55

Site Number: 55
Un-named Drainage Feature

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.56. Site 56 Summary

Overview	Comment
Site #	56
Stream Order	3
Field Determination	**Formed Creek (Big Jack Creek)**
	Formed creek with distinguishable beds and banks. Riparian vegetation was present and intact, and macrophytes absent due to sandy and extremely dynamic creek bed. The creek contained a low volume of water flowing during the field assessment.
Prelim. Recommendation Rating	Major
Final Recommendation Rating	Moderate
GPS location	-19.90979° N 147.78488° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	5-15m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Riparian vegetation, permanent water flowing and pooling and adjacent vegetation community(s).
Flow regime	Permanent
Channel shading	<4%
Macrophytes	Absent

General description and habitat attributes

The beds and banks of the formed creek are distinguishable, with the riparian zone present, and macrophytes absent. The limited riparian vegetation included *Melaleuca leucadendra* (Weeping Paperbark), *Lophostemon grandifloras* (Northern Swamp Box), and *Corymbia tessellaris* (Moreton Bay Ash). The creek bed is dominated by sand, with a high level of erosion in some sections of the creek bank. The riparian zone understorey is weeded with *Sorghum halepense* (Johnson Grass), *Themeda quadrivalvis* (Grader Grass), and *Sporobolus fertilis* (Parramatta Grass). The creek has an obvious flow path, with a low volume of permanent water flowing and pooling. No aquatic fauna was observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Prelim. Recommendations

- Implementation of tunnel bore technique to minimise impacts on the creek and watercourse system;
- Further detailed seasonal studies required to assist in the preparation of area specific environmental management plan(s).

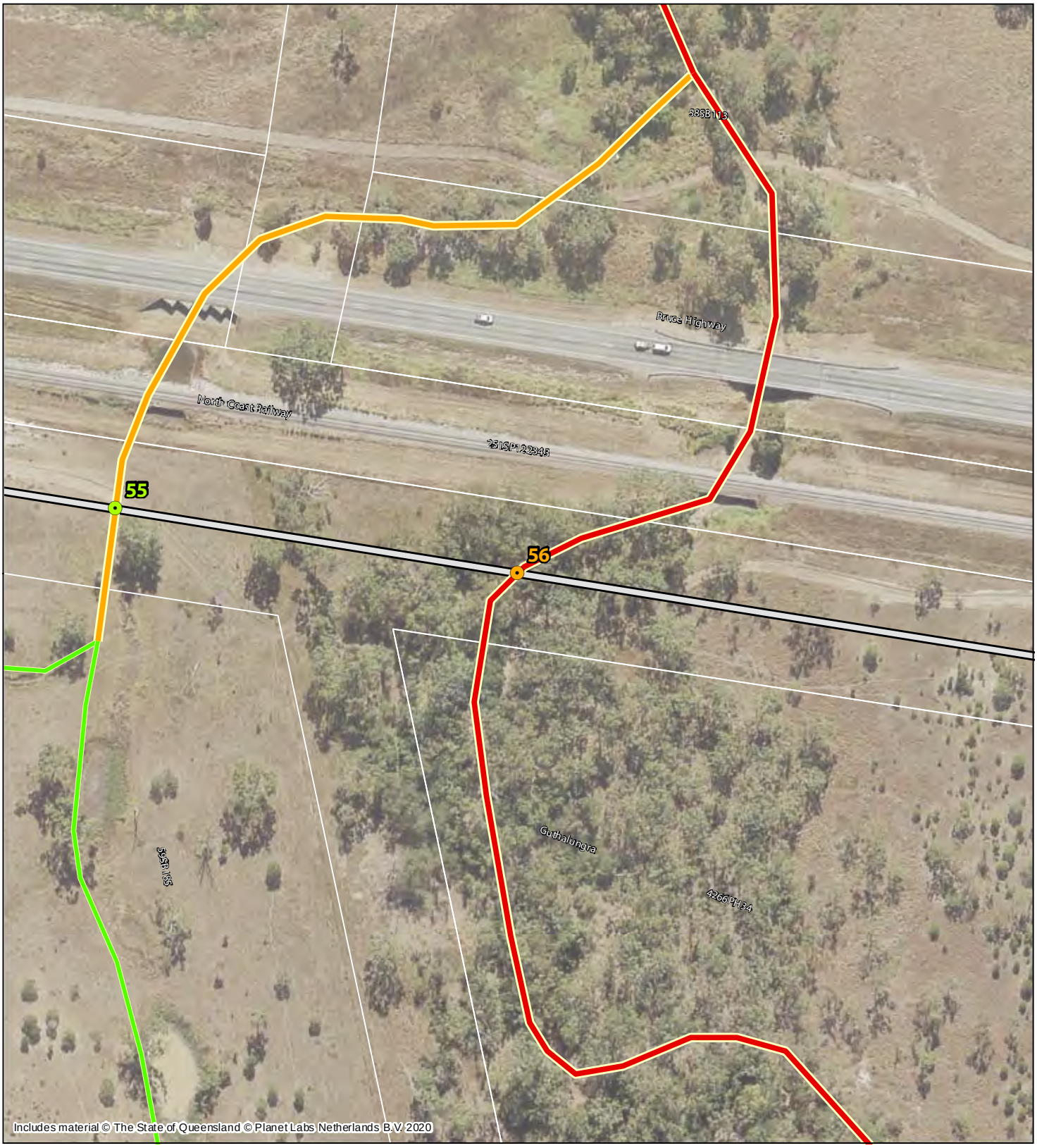
Final Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Seasonal construction parameters apply.

Justification of recommendation rating change

The creek is a gradual sloping U shape and is approximately 5m high from the top of bank to the low bank/creek bed. The creek is approximately 10-15m in width (TOB to TOB). The creek has a highly eroded bed and bank due to the lack of riparian vegetation and heavy weed infestation. The creek and adjacent banks are heavily weeded with *Stachytarpheta spp.*, *Argemone Mexicana* (Mexican Poppy), *Cryptostegia grandiflora* (Rubber Vine), and *Gomphrena celosioides* (Gomphrena Weed). Adjacent vegetation upstream and downstream is mapped as Category B (Remnant) vegetation

(RE11.3.25) under the VMA and was representative of this mapping despite being heavily weeded. Where the linear infrastructure is proposed, beside the rail easement holds limited ecological values and contains limited native vegetation. Native vegetation includes *Melaleuca leucadendra* (Weeping Paperbark), *Lophostemon grandiflorus* (Northern Swamp Box), *Eucalyptus tereticornis* (Forest Red Gum), and *Corymbia tessellaris* (Moreton Bay Ash). Native vegetation may be impacted by the proposed linear infrastructure, however, the impact is unlikely to be significant. *Eucalyptus raveretiana* (Black Ironbox), listed as Vulnerable under the EPBC Act, was observed within the waterway, however, will not be directly impacted during the instatement of the proposed linear infrastructure. Further, no other threatened flora or fauna listed under the EPBC Act or NCA were observed across the site. No permanent water flowing or pooling was observed during the second assessment, indicating that the water observed during the initial assessment was related to recent rainfall events before the assessment.



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 56

Site Number: 56
Big Jack Creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.57. Site 57 Summary

Overview	Comment
Site #	57
Stream Order	1
Field Determination	**Formed Creek (Unnamed)**
	Formed creek with bed and bank features present. Riparian vegetation was present. Around the culvert under the railway were some pools of standing water. No macrophytes were present indicating this creek pools water for a short period immediately following rainfall.
Prelim. Recommendation Rating	Moderate
Final Recommendation Rating	Moderate
GPS location	-19.91043° N 147.78928° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	6-8m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Grazing paddocks and agricultural land. Habitat features limited.
Flow regime	Ephemeral
Channel shading	45%
Macrophytes	Absent

General description and habitat attributes

Observed channel with distinguishable bed and bank features and riparian vegetation present, some stationary water adjacent to culvert. Macrophytes were absent within the channel. Riparian vegetation includes *Melaleuca leucadendra* (Weeping Paperbark), *Eucalyptus tereticornis* (Forest Red Gum), and *Corymbia tessellaris* (Moreton Bay Ash) within channel and on banks. The area surrounding the creek is mapped as remnant Least Concern RE12.11.25 which was confirmed on-ground. Significant eroded/cleared area downstream adjacent to fence line used by cattle and vehicles. No aquatic fauna was observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Seasonal construction parameters apply



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 57

Site Number: 57
Un-named creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.58. Site 58 Summary

Overview	Comment
Site #	58
Stream Order	1
Field Determination	**Formed Creek (Jack Creek)** Formed creek with defined channel and beds and banks. No riparian vegetation or macrophytes present. The creek contained no permanent water flowing during the field assessment indicating this creek pools water for a short period immediately following rainfall.
Prelim. Recommendation Rating	Moderate
Final Recommendation Rating	Moderate
GPS location	-19.91788° N 147.81847° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	4m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Vegetated banks and cleared areas.
Flow regime	Ephemeral
Channel shading	5%
Macrophytes	Absent

General description and habitat attributes

Bed and bank features of the formed creek are present. Riparian vegetation, macrophytes and pools are absent. Vegetation on banks includes *Corymbia tessellaris* (Moreton Bay Ash), *Eucalyptus platyphylla* (White Gum), *Corymbia dallachiana* (Ghost Gum), *and Lophostemon grandifloras* (Northern Swamp Box). The flow path at this site has been historically altered by culvert upgrades and cattle use. Habitat features were limited due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Seasonal construction parameters apply.



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 58

Site Number: 58
Jack Creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.59. Site 59 Summary

Overview	Comment
Site #	59
Stream Order	-
Field Determination	**Drainage Feature**
	Waterway is highly modified for agriculture and by both road and rail infrastructure. This waterway has been completely cleared of trees and has no distinguishable bed or bank features. This waterway is no longer mapped under the VMA and likely only has water present as overland flow during and immediately after heavy rain events.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.92341° N 147.83725° E (GDA 2020-MGA 55)
Local land use	Agriculture
Average Bankful Width	Absent
Dominant Substrate	Soils associated with Landzone 3.
Variety of Habitats	Agricultural land dominated by exotic pasture grass. Habitat features absent. Entirely cleared of trees.
Flow regime	Absent/Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The drainage feature is no longer mapped as a VMA watercourse but is mapped as a low waterway under the *Fisheries Act 1994*. This waterway is considered to be an overland flow path and is largely indistinguishable from the surrounding landscape. Bed and bank features, riparian vegetation, macrophytes, trees, and habitat values are absent. There was no water present at the time of survey and there was no observed potential for water to pool. Vegetation was dominated by exotic pasture grass. Some scattered *Corymbia tessellaris* (Moreton Bay Ash) were present within the road and rail infrastructure to the north. Vegetation was consistent with the mapped Category X (non-remnant). No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

'- Generic management plans(s)



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 59

Site Number: 59
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.60. Site 60 Summary

Overview	Comment
Site #	60
Stream Order	5
	Major River (Elliott River)
Field Determination	Formed river with distinguishable beds and banks. Riparian vegetation present, while macrophytes absent due to sandy and extremely dynamic creek bed. The creek contained permanent water flowing during the field assessment.
Prelim. Recommendation Rating	Major
Final Recommendation Rating	Major
GPS location	-19.92610° N 147.84709° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	30-60m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Riparian vegetation, permanent water flowing and pooling and adjacent vegetation community(s).
Flow regime	Permanent
Channel shading	<5%
Macrophytes	Absent

General description and habitat attributes

The beds and banks of the formed creek are distinguishable, the riparian zone was present, but macrophytes absent. The riparian vegetation included *Melaleuca leucadendra* (Weeping Paperbark), *Lophostemon grandifloras* (Northern Swamp Box), *Ficus coronata* (Sandpaper Fig), and *Corymbia tessellaris* (Moreton Bay Ash). The creek bed is dominated by sand, with a high level of erosion in sections of the creek bank. The riparian zone understorey is weeded with *Sorghum halepense* (Johnson Grass), *Ziziphus mauritiana* (Chinee Apple), and *Sporobolus fertilis* (Parramatta Grass). The creek has an obvious flow path, with permanent water flowing and pooling. No aquatic fauna was observed at the time of assessment. *Eucalyptus raveretiana* (Black Ironbox) was observed within the waterway and proposed alignment, however will not be impacted due to the utilisation of the tunnel bore technique. No other threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Implementation of tunnel bore technique to minimise impacts on the creek and watercourse system;
- Further detailed seasonal studies required to assist in the preparation of area specific environmental management plan(s).

Site #	**60 (Flora)**	
Location:	**Elliott River**	
	Scientific Name	**Common Name**
T1/T2	*Melaleuca fluviatilis*	River Teatree
	Melaleuca leucadendra	Weeping Paperbark
	Lophostemon grandiflorus	Northern Swamp Box
	Corymbia tessellaris	Moreton Bay Ash
	Ficus racemosa	Cluster Fig
	Eucalyptus raveretiana	Black Ironbox
	Corymbia intermedia	Pink Bloodwood
	Allocasuarina cunninghamiana	River Sheoak
	Nauclea orientalis	Leichhardt Tree
	Melaleuca viminalis	Weeping Teatree
Shrub/Ground	*Sorghum halapense*	Wild Sorghum
	Gomphrena celosioides	Gomphrena Weed
	Macroptilium atropurpureum	Siratro
	Xanthium occidentale	Noogoora Burr
	Typha orientalis	Bulrush
	Ricinus communis	Castor Oil Plant
	Persicaria decipiens	Slender Knotweed
	Passiflora suberosa	Passionflower
	Xanthium occidentale	Noogoora Burr
	Argemone mexicana	Mexican Poppy
	Zizyphus mauritiana	Chinee Apple
	Stachytarpheta jamaicensis	Blue Snake Weed
	Stylosanthes scabra	Shrubby Stylo

Site #	**60 (Fauna)**	
Location:	**Elliott River**	
	Scientific Name	**Common Name**
	Corvus orru	Torresian Crow
	Macropus giganteus	Eastern Grey Kangaroo
	Lichenostomus flavus	Yellow Honeyeater
	Hirundo neoxena	Welcome Swallow
	Rhipidura leucophrys	Willy Wagtail
	Haliastur sphenurus	Whistling Kite
	Grallina cyanoleuca	Peewee Mudlark
	Sus scrofa	Wild Pig (Scats)
	Ninox boobook	Mopoke Owl
	Milvus migrans	Fork-tailed Kite
	Merops ornatus	Rainbow Bee-eater (Fly-over)
	Cracticus tibicen	Australian Magpie
	Taeniopygia bichenovii	Double-barred Finch
	Todiramphus sanctus	Sacred Kingfisher
	Trichoglossus moluccanus	Rainbow Lorikeet
	Aquila audax	Wedge-tailed Eagle (Fly-over)

Phalacrocoracidae	Cormorant
Coracina novaehollandiae	Black-faced Cuckoo Shrike
Calyptorhynchus banksii	Red-tailed Black Cockatoo
Manorina melanocephala	Noisy Minor
Canis familiaris	Dog (Footprints)
Cacatua galerita	Sulphur Crested Cockatoo
Litoria rothii	Roth's Tree Frog
Dacelo leachii	Blue Winged Kookaburra
Alisterus scapularis	King Parrot
Rhinella marina	Cane Toad
Poecilia reticulata	Guppies
Litoria caerulea	Green Tree Frog
Falco berigora	Brown Falcon



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 60

Site Number: 60
Elliott River

Field Assessment
Risk Rating: Major

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.61. Site 61 Summary

Overview	Comment	
Site #	61	
Stream Order	1	
Field Determination	**Drainage Feature**	
	Drainage feature with defined channel/bed and bank features. The absence of riparian species, macrophytes and pools indicates this drainage feature pools water for a short period immediately following rainfall. This waterway was heavily weed infested.	
Prelim. Recommendation Rating	Low	
Final Recommendation Rating	Low	
GPS location	-19.92973° N	147.86168° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming	
Average Bankful Width	2-4m	
Dominant Substrate	Soils associated with landzone 3	
Variety of Habitats	Cattle grazing and agricultural practices. Habitat features absent.	
Flow regime	Ephemeral	
Channel shading	0%	
Macrophytes	Absent	

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by invasive species, *Cryptostegia grandiflora* (Rubber Vine) and *Sporobolus fertilis* (Parramatta Grass), with some scattered native *Corymbia platyphylla* (White Gum). The flow path at this site has been historically altered by culvert upgrades. Bed and bank features present. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 61

Site Number: 61
Maiden Creek Tributary

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.62. Site 62 Summary

Overview	Comment
Site #	62
Stream Order	2
Field Determination	**Formed Creek (Maiden Creek)**
	Formed creek with distinguishable bed and bank features. Riparian vegetation, macrophytes and pools absent. The creek is highly modified by culvert upgrades and vehicle tracks and dominated by weed species throughout.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.93002° N 147.86364° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	3m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cleared areas and cattle grazing. No habitat features present.
Flow regime	Permanent
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The beds and banks of the formed creek are distinguishable. Riparian vegetation, macrophytes and pools were absent. Vegetation was dominated by *Cryptostegia grandiflora* (Rubber Vine), *Themeda quadrivalvis* (Grader Grass), and *Sporobolus fertilis* (Parramatta Grass) and is highly modified due to rail infrastructure. No aquatic fauna was observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- General management plans



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 62

Site Number: 62
Maiden Creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.63. Site 63 Summary

Overview	Comment
Site #	63
Stream Order	1
Field Determination	**Drainage Feature** Waterway with continuous bed and bank features and pooled water present at the time of survey. Macrophytes absent. Some habitat feature present. Water likely to be often present, but ephemeral.
Prelim. Recommendation Rating	Moderate
Final Recommendation Rating	Moderate
GPS location	-19.89010 ° N 147.71626° E (GDA 2020-MGA 55)
Local land use	Agriculture
Average Bankful Width	4-5m
Dominant Substrate	Sandy
Variety of Habitats	Road and rail infrastructure parallel north of waterway. Some habitat features present. Riparian vegetation limited.
Flow regime	Semi-permanent/Ephemeral
Channel shading	25%
Macrophytes	Absent

General description and habitat attributes

The drainage feature is mapped as a Stream order 1 VMA watercourse and a low waterway under the *Fisheries Act 1994*. On-ground surveys found the drainage feature to be disturbed, but with continuous bed and bank features and water present at the time of survey. Macrophytes were not observed, and riparian vegetation was present though limited. Vegetation along the waterway is dominated by *Melaleuca leucadendra* (Weeping Paperbark). Vegetation to the south includes *Eucalyptus crebra* (Narrow-leaved Ironbark), *Corymbia tessellaris* (Moreton Bay Ash), and *Corymbia dallachiana* (Ghost Gum). Vegetation to the north is heavily weed infested by *Cryptostegia grandiflora* (Rubber Vine) and *Stachytarpheta cayennensis* (Blue Snakeweed). Water is likely to be often present, but not permanent. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Seasonal construction parameters apply



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 63

Site Number: 63
Un-named creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.64. Site 64 Summary

Overview	Comment
Site #	64
Stream Order	1
Field Determination	**Drainage feature** This waterway is highly modified for rail infrastructure and likely has water present only as overland flow after heavy rain. Bed and bank features, macrophytes, and riparian vegetation were absent. There is a possibility of standing water immediately following heavy rain.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.8866° N 147.70649° E (GDA 2020-MGA 55)
Local land use	Cattle grazing
Average Bankful Width	Absent
Dominant Substrate	Soils associated Landzone 3.
Variety of Habitats	Cattle grazing paddocks, regrowth vegetation. Habitat features limited.
Flow regime	Ephemeral
Channel shading	5%
Macrophytes	Absent

General description and habitat attributes

The watercourse is mapped as a Stream Order 1 VMA watercourse, and a low waterway under the *Fisheries Act 1994*. On-ground surveys found the waterway to be heavily modified and representative of an overland flow path, with water likely only present as a small amount of standing water immediately following heavy rain. Bed and bank features were absent. No macrophytes or true riparian vegetation was present. Scattered *Eucalyptus crebra* (Narrow-leaved Ironbark) are present, which have evidently been historically cleared, with regrowth *Eucalyptus crebra* (Narrow-leaved Ironbark), *Corymbia tessellaris* (Moreton Bay Ash), and *Acacia* species. This is generally representative of the mapped regrowth composite RE 11.39/11.3.7/11.3.33/11.3.13. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

'- Generic management plan(s)



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 64

Site Number: 64
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.65. Site 65 Summary

Overview	Comment
Site #	65
Stream Order	2
Field Determination	**Drainage Feature**
	Defined eroded channel with bed and bank features present. The absence of riparian species, pools, macrophytes and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. This waterway was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.93212° N 147.87781° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	3-5m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cleared areas and vegetation on banks. Habitat features absent
Flow regime	Ephemeral
Channel shading	10%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by the invasive *Themeda quadrivalvis* (Grader Grass) with native *Corymbia tessellaris* (Moreton Bay Ash), *Lophostemon grandifloras* (Northern Swamp Box) and scattered *Pandanus spiralis* (Screw Palm). The flow path at this site has been historically altered by culvert upgrades/rail and road infrastructure. A defined channel with bed and bank features was present. Habitat feature were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 65

Site Number: 65
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.66. Site 66 Summary

Overview	Comment
Site #	66
Stream Order	1
Field Determination	**Drainage Feature**
	The absence of riparian species, macrophytes, pools of water, and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. This waterway was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.93251° N 147.88011° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cleared and open paddocks. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by invasive *Themeda quadrivalvis* (Grader Grass) and *Sporobolus fertilis* (Parramatta Grass) with native *Eucalyptus platyphylla* (White Gum), *Eucalyptus crebra* (Narrow-leaved Ironbark), and *Corymbia tessellaris* (Moreton Bay Ash). *Acacia salicina* (Sally Wattle) regrowth dominates the shrub layer. The flow path at this site is heavily eroded and has been historically altered by culvert upgrades and has no bed or bank features. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 66

Site Number: 66
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.67. Site 67 Summary

Overview	Comment
Site #	67
Stream Order	1
Field Determination	**Drainage Feature**
	The absence of riparian species, macrophytes, pools of water, and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. This waterway was heavily weed infested and cleared from the fenceline.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.93388° N 147.88526° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cleared and open paddocks. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by invasive *Themeda quadrivalvis* (Grader Grass) and *Sporobolus fertilis* (Parramatta Grass), with native *Corymbia clarksoniana* (Clarkson's Bloodwood), *Melaleuca fluviatilis* (Weeping Tea-tree), *Grevillea striata* (Beefwood), and *Allocasuarina luehmannii* (Bull Oak). The flow path at this site is heavily eroded and has been historically altered by culvert upgrades and has no bed or bank features. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 67

Site Number: 67
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.68. Site 68 Summary

Overview	Comment
Site #	68
Stream Order	2
Field Determination	**Drainage Feature** The absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Discontinuous bed and bank features were observed.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.93498° N 147.88787° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	2.5m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cattle grazing paddocks and remnant vegetation. Habitat features present within remnant vegetation
Flow regime	Ephemeral
Channel shading	5%
Macrophytes	Absent

General description and habitat attributes

Filed surveys confirmed the presence of the mapped dominant regional ecosystem (RE11.3.32), with tree species *Eucalyptus crebra* (Narrow-leaved Ironbark), *Eucalyptus platyphylla* (White Gum) and *Allocasuarina luehmannii* (Bull Oak) present where the vegetation had not been fragmented by road and rail infrastructure. The flow path at this site is heavily eroded and has been historically altered by culvert upgrades and has discontinuous bed and bank features. Habitat features were limited to remnant vegetation due to infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 68

Site Number: 68
Un-named Creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.69. Site 69 Summary

Overview	Comment
Site #	69
Stream Order	1
Field Determination	**Drainage Feature**
	The general absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.93573° N 147.88947° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cattle grazing paddocks and remnant vegetation. Habitat features present within remnant vegetation
Flow regime	Ephemeral
Channel shading	15%
Macrophytes	Absent

General description and habitat attributes

The riparian zone contains scattered *Melaleuca fluviatilis* (Weeping Paperbark), with *Eucalyptus crebra* (Narrow-leaved Ironbark), *Planchonia careya* (Cocky Apple), and *Allocasuarina luehmannii* (Bull Oak) associated with the mapped dominant regional ecosystem (RE11.3.32) where the vegetation had not been fragmented by road and rail infrastructure. The flow path at this site is heavily eroded and has been historically altered by culvert upgrades and has no bed and bank features. A cleared access track runs along the southern side of the fence line. Habitat features were present within remnant vegetation although limited within the watercourse. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 69

Site Number: 69
Un-named Drainage Feature

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.70. Site 70 Summary

Overview	Comment
Site #	70
Stream Order	2
Field Determination	**Drainage Feature**
	The general absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. Vegetation was present in the riparian zone, but macrophytes were absent.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.93686° N 147.89191° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	4m (where present)
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cattle grazing paddocks and remnant vegetation. Habitat features present within remnant vegetation
Flow regime	Ephemeral
Channel shading	10%
Macrophytes	Absent

General description and habitat attributes

The riparian zone contains scattered *Melaleuca fluviatilis* (River Tea-tree), *Lophostemon grandiflorus* (Northern Swamp Box), *Planchonia careya* (Cocky Apple), and *Allocasuarina luehmannii* (Bull Oak) associated with the dominant regional ecosystem (RE11.3.32) where the vegetation had not been fragmented by road and rail infrastructure. The flow path at this site is heavily eroded and has been historically altered by culvert upgrades and has no bed and bank features. A cleared access track runs along the southern side of the fence line. Habitat features were present within remnant vegetation although limited within the watercourse. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 70

Site Number: 70
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.71. Site 71 Summary

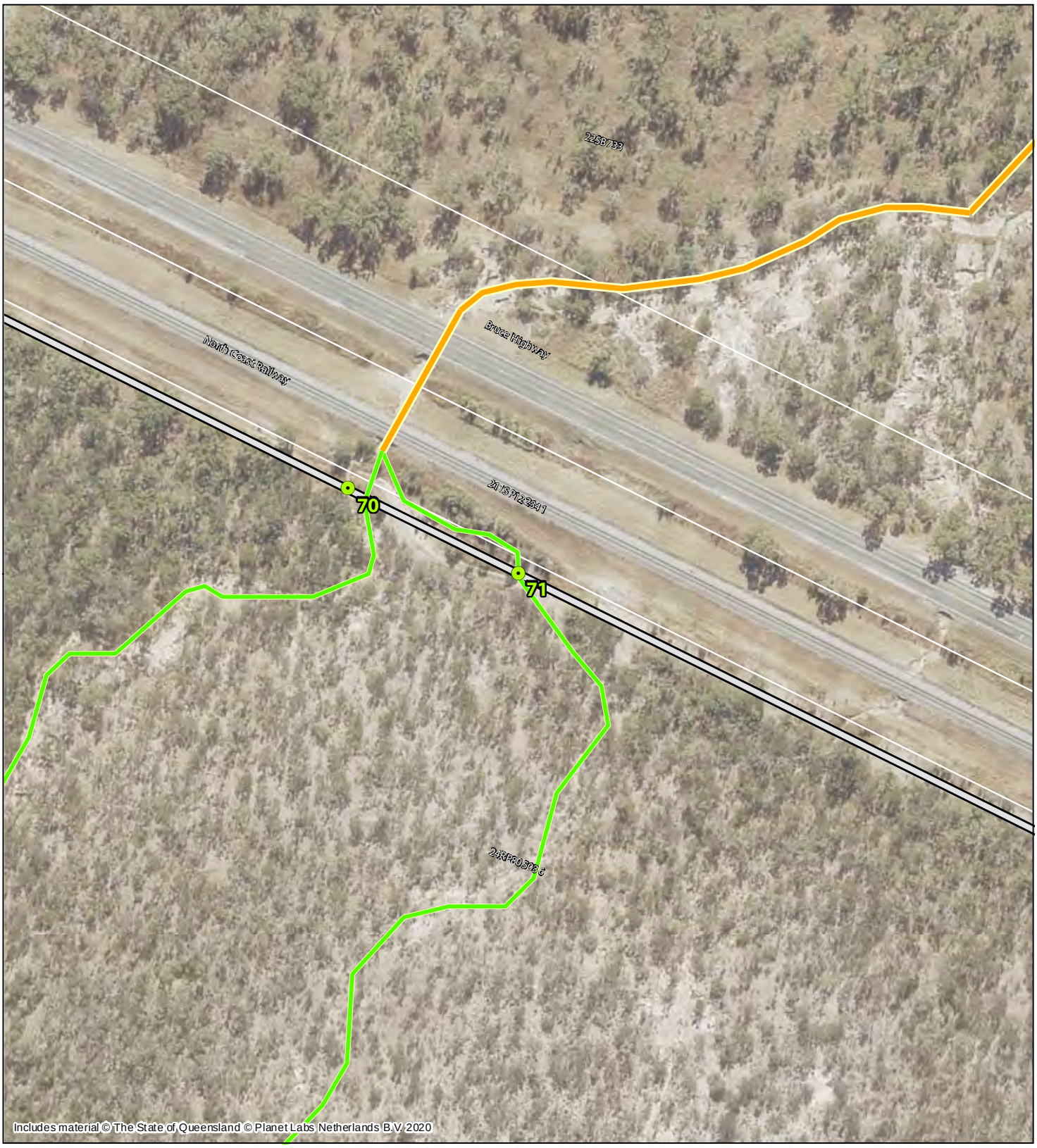
Overview	Comment
Site #	71
Stream Order	1
Field Determination	**Drainage Feature**
	Discontinuous bed and bank features with limited riparian vegetation. The flow path has been modified by road and rail infrastructure. No sign of permanent flow or potential for pooling water.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.937° N 147.8924° E (GDA 2020-MGA 55)
Local land use	Cattle grazing
Average Bankful Width	Absent
Dominant Substrate	Soils associated with Landzone 3.
Variety of Habitats	Remnant vegetation south, cleared for road and rail north. Limited riparian vegetation. Habitat features limited.
Flow regime	Ephemeral
Channel shading	25%
Macrophytes	Absent

General description and habitat attributes

The drainage feature is mapped as a Stream order 1 VMA watercourse and a low waterway under the *Fisheries Act 1994*. On-ground surveys found the drainage feature to be a highly disturbed drainage channel with discontinuous bed and bank features. Riparian vegetation, where present, was dominated by *Melaleuca fluviatilis* (River Tea-tree), *Alphitonia excelsa* (Soap Tree), and Casuarina species. The surrounding native species are indicative of RE 11.12.1 and RE 11.3.32, which are mapped as part of composite RE 11.3.32/11.12.1/11.3.10/11.12.9. The flow path has been highly modified for rail and road infrastructure to the north and shows no signs of permanent or semi-permanent flow, lacking macrophytes and aquatic habitat. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

'- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 71

Site Number: 71
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.72. Site 72 Summary

Overview	Comment
Site #	72
Stream Order	1
Field Determination	**Drainage Feature**
	The general absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. Vegetation was present in the riparian zone, but macrophytes were absent.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.93857° N 147.89559° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cattle grazing paddocks and remnant vegetation. Habitat features present within remnant vegetation
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone contains scattered *Melaleuca fluviatilis* (River Tea-tree), *Planchonia careya* (Cocky Apple), and *Allocasuarina luehmannii* (Bull Oak) associated with the mapped dominant regional ecosystem (RE11.3.32) where the vegetation had not been fragmented by road and rail infrastructure. The flow path at this site is heavily eroded and has been historically altered by culvert upgrades and has no bed and bank features. A cleared access track runs along the southern side of the fence line. Habitat features were present within remnant vegetation although limited within the watercourse. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 72

Site Number: 72
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.73. Site 73 Summary

Overview	Comment
Site #	73
Stream Order	1
Determination	**Drainage Feature**
	The general absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. Vegetation was present in the riparian zone, but macrophytes were absent.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.93928° N 147.89712° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cattle grazing paddocks and remnant vegetation. Habitat features present within remnant vegetation
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone contains scattered *Melaleuca fluviatilis* (River Tea-tree), *Planchonia careya* (Cocky Apple), and *Allocasuarina luehmannii* (Bull Oak) associated with the mapped dominant regional ecosystem (RE11.3.32) where the vegetation had not been fragmented by road and rail infrastructure. The flow path at this site is heavily eroded and has been historically altered by culvert upgrades and has no bed and bank features. A cleared access track runs along the southern side of the fence line. Habitat features were present within remnant vegetation although limited within the watercourse. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic Management Plans



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 73

Site Number: 73
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.74. Site 74 Summary

Overview	Comment
Site #	74
Stream Order	1
Field Determination	**Drainage Feature**
	The general absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. Vegetation was present in the riparian zone, but macrophytes were absent.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.93999° N 147.89865° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cattle grazing paddocks and remnant vegetation. Habitat features present within remnant vegetation
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone contains scattered *Melaleuca fluviatilis* (River Tea-tree), *Planchonia careya* (Cocky Apple), and *Allocasuarina luehmannii* (Bull Oak) associated with the dominant regional ecosystem (RE11.3.32) where the vegetation had not been fragmented by road and rail infrastructure. The flow path at this site is heavily eroded and has been historically altered by culvert upgrades and has no bed and bank features. A cleared access track runs along the southern side of the fence line. Habitat features were present within remnant vegetation although limited within the watercourse. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 74

Site Number: 74
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.75. Site 75 Summary

Overview	Comment
Site #	75
Stream Order	1
Field Determination	**Drainage Feature**
	The general absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. Vegetation was present in the riparian zone, but macrophytes were absent.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.94058° N 147.89992° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cattle grazing paddocks and remnant vegetation. Habitat features present within remnant vegetation
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone contains scattered *Melaleuca fluviatilis* (River Tea-tree), *Planchonia careya* (Cocky Apple), and *Allocasuarina luehmannii* (Bull Oak) associated with the mapped dominant regional ecosystem (RE11.3.32) where the vegetation had not been fragmented by road and rail infrastructure. The flow path at this site is heavily eroded and has been historically altered by culvert upgrades and has no bed and bank features. A cleared access track runs along the southern side of the fence line. Habitat features were present within remnant vegetation although limited within the watercourse. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 75

Site Number: 75
Un-named Drainage Feature

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.76. Site 76 Summary

Overview	Comment
Site #	76
Stream Order	1
Field Determination	**Drainage Feature**
	The absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. Vegetation was present in the riparian zone, but macrophytes were absent.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.94406° N 147.90748° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cattle grazing paddocks and remnant vegetation. Habitat features present within remnant vegetation
Flow regime	Ephemeral
Channel shading	5%
Macrophytes	Absent

General description and habitat attributes

The riparian zone contains scattered *Planchonia careya* (Cocky Apple) and *Allocasuarina luehmannii* (Bull Oak) associated with the mapped dominant regional ecosystem (RE11.3.32) where the vegetation had not been fragmented by road and rail infrastructure. The flow path at this site is heavily eroded and has been historically altered by culvert upgrades and has no bed and bank features. A cleared access track runs along the southern side of the fence line. Habitat features were present within remnant vegetation although limited within the watercourse. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 76

Site Number: 76
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.77. Site 77 Summary

Overview	Comment
Site #	77
Stream Order	1
Field Determination	**Drainage Feature**
	The absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. Vegetation was present in the riparian zone, but macrophytes were absent.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.94453° N 147.90873° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cattle grazing paddocks and remnant vegetation. Habitat features present within remnant vegetation
Flow regime	Ephemeral
Channel shading	5%
Macrophytes	Absent

General description and habitat attributes

The riparian zone contains scattered *Planchonia careya* (Cocky Apple) and *Allocasuarina luehmannii* (Bull Oak) associated with the mapped dominant regional ecosystem (RE11.3.32) where the vegetation had not been fragmented by road and rail infrastructure. *Acacia harpophylla* (Brigalow Acacia) was also present within remnant vegetation. The flow path at this site is heavily eroded and has been historically altered by culvert upgrades and has no bed and bank features. A cleared access track runs along the southern side of the fence line. Habitat features were present within remnant vegetation although limited within the watercourse. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 77

Site Number: 77
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.78. Site 78 Summary

Overview	Comment
Site #	78
Stream Order	1
Determination	**Drainage Feature** The absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. Vegetation was present in the riparian zone but limited, and macrophytes were absent.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.94673° N 147.91578° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cattle grazing paddocks and remnant vegetation. Habitat features present within remnant vegetation
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is largely absent with only scattered *Melaleuca fluviatilis* (River Tea-tree), *Allocasuarina luehmannii* (Bull Oak), and *Acacia harpophylla* (Brigalow Acacia) associated with regional ecosystem (RE11.3.32) where the vegetation had not been fragmented by road and rail infrastructure. The flow path at this site is heavily eroded and has been historically altered by culvert upgrades and has no bed and bank features. A cleared access track runs along the southern side of the fence line. Habitat features were present within remnant vegetation although limited within the watercourse. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic Management Plans



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 78

Site Number: 78
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.79. Site 79 Summary

Overview	Comment
Site #	79 (a)
Stream Order	3
Field Determination	**Formed Creek (Saltwater Creek)**
	Formed creek with distinguishable beds and banks. Riparian vegetation present, while macrophytes absent due to sandy and extremely dynamic creek bed. The creek contained semi-permanent water flowing during the field assessment.
Prelim. Recommendation Rating	Major
Final Recommendation Rating	Major
GPS location	-19.94871° N 147.92221° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	5-15m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Riparian vegetation, permanent water flowing and pooling and adjacent vegetation community(s).
Flow regime	Semi-Permanent
Channel shading	<3%
Macrophytes	Absent

General description and habitat attributes

The beds and banks of the formed creek are distinguishable, with the riparian zone present and macrophytes absent. The riparian vegetation included *Melaleuca leucadendra* (Weeping Paperbark), *Lophostemon grandifloras* (Northern Swamp Box), *Ficus coronata* (Sandpaper Fig), *Pandanus spp., Planchonia careya* (Cocky Apple), and *Corymbia tessellaris* (Moreton Bay Ash). The creek bed is dominated by sand, with a high level of erosion in sections of the creek bank. The riparian zone understorey is weeded with *Sorghum halepense* (Johnson Grass) and *Sporobolus fertilis* (Parramatta Grass). The creek has an obvious flow path, with semi-permanent water. No aquatic fauna was observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Implementation of tunnel bore technique to minimise impacts on the creek and watercourse system;
- Further detailed seasonal studies required to assist in the preparation of area specific environmental management plan(s).

Overview	Comment
Site #	79 (b)
Stream Order	4
Field Determination	**Formed Creek (Saltwater Creek)**
	Formed creek with distinguishable beds and banks. Riparian vegetation present, while macrophytes absent due to sandy and extremely dynamic creek bed. The creek contained semi-permanent water flowing during the field assessment.
Prelim. Recommendation Rating	Major
Final Recommendation Rating	Major
GPS location	-19.948557° N 147.921774° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	5-15m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Riparian vegetation, permanent water flowing and pooling and adjacent vegetation community(s).
Flow regime	Permanent
Channel shading	<3%
Macrophytes	Absent

General description and habitat attributes

The beds and banks of the formed creek are distinguishable, with the riparian zone present, while the macrophytes absent. The riparian vegetation included *Melaleuca leucadendra* (Weeping Paperbark), *Melaleuca fluviatilis* (River Teatree Bottlebrush), *Lophostemon grandifloras* (Northern Swamp Box), *Ficus coronata* (Sandpaper Fig), *Pandanus spp.* and *Corymbia tessellaris* (Moreton Bay Ash). The creek bed is dominated by sand, with a high level of erosion in sections of the creek bank. The riparian zone understorey is weeded with *Sorghum halepense* (Johnson Grass) and *Sporobolus fertilis* (Parramatta Grass). The creek has an obvious flow path, with semi-permanent water flowing and pooling. No aquatic fauna was observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

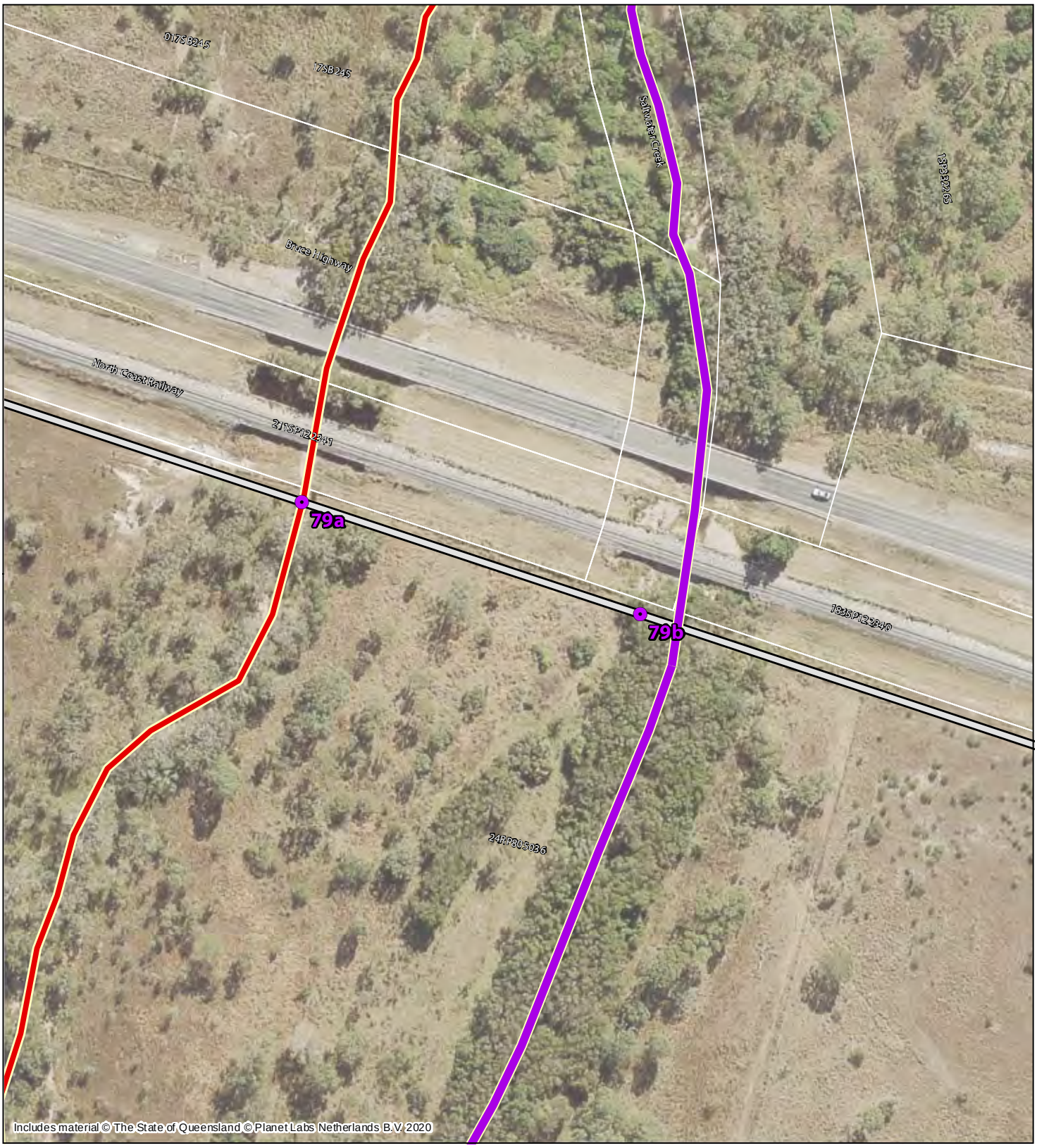
Recommendations

- Implementation of tunnel bore technique to minimise impacts on the creek and watercourse system;
- Further detailed seasonal studies required to assist in the preparation of area specific environmental management plan(s).

Site #	**79 (Flora)**	
Location:	**Saltwater Creek (a & b)**	
	Scientific Name	**Common Name**
T1/T2	*Melaleuca fluviatilis*	River Teatree
	Melaleuca leucadendra	Weeping Paperbark
	Pandanus spiralis	Corkscrew Pandanus
	Lophostemon grandiflorus	Northern Swamp Box
	Planchonia careya	Cocky Apple
	Ficus racemosa	Cluster Fig
Shrub/Ground	*Sorghum halapense*	Wild Sorghum
	Gomphrena celosioides	Gomphrena Weed
	Macroptilium atropurpureum	Siratro
	Argyreia nervosa	Woodrose
	Xanthium occidentale	Noogoora Burr
	Typha orientalis	Bulrush
	Leucaena leucocephala	Leucaena
	Clitoriaternatea	Butterfly Pea
	Passiflora suberosa	Passionflower
	Xanthium pungens	Noogoora Burr
	Melinis repens	Red Natal Grass
	Zizyphus mauritiana	Chinee Apple
	Stachytarpheta jamaicensis	Blue Snake Weed
	Stylosanthes scabra	Shrubby Stylo

Site #	**79 (Fauna)**	
Location:	**Saltwater Creek (a & b)**	
	Scientific Name	**Common Name**
	Corvus orru	Torresian Crow
	Lichenostomus flavus	Yellow Honeyeater
	Hirundo neoxena	Welcome Swallow
	Rhipidura leucophrys	Willy Wagtail
	Centropus phasianinus	Pheasant Coucal
	Haliastur sphenurus	Whistling Kite
	Grallina cyanoleuca	Peewee Mudlark
	Sus scrofa	Wild Pig (Scats)
	Ninox boobook	Mopoke Owl
	Milvus migrans	Fork-tailed Kite
	Taeniopygia bichenovii	Double-barred Finch
	Todiramphus sanctus	Sacred Kingfisher
	Coracina novaehollandiae	Black-faced Cuckoo Shrike
	Manorina melanocephala	Noisy Minor
	Litoria rothii	Roth's Tree Frog
	Dacelo leachii	Blue Winged Kookaburra
	Alisterus scapularis	King Parrot
	Rhinella marina	Cane Toad
	Poecilia reticulata	Guppies

Litoria caerulea	Green Tree Frog
Falco berigora	Brown Falcon



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 79a and 79b

Site Number: 79a and 79b
Saltwater Creek (a) and (b)

Field Assessment
Risk Rating: Major

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



Upstream



Downstream



Left Bank



Right Bank



2.80. Site 80 Summary

Overview	Comment
Site #	80
Stream Order	1
Field Determination	**Drainage feature with marine mudflats** Unnamed marine mudflats surrounding that contains *Chenopodiaceae spp* and *Sporobolus virginicus* (Marine Couch). No riparian vegetation was present. The mapped creek had no defined bed and banks. No water was flowing during the field assessment, with a heavily weeded railway corridor.
Prelim. Recommendation Rating	Moderate
Final Recommendation Rating	Low
GPS location	-19.95133° N 147.93067° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 1/2
Variety of Habitats	Cleared grass and marine mudflats. Habitat features limited.
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

Surrounding un-named marine mudflats that contains *Chenopodiaceae spp* and *Sporobolus virginicus* (Marine Couch) within the wider area. No riparian vegetation was present. The mapped creek had no defined bed and banks. No water was flowing during the field assessment and the area was heavily weeded dominated by *Sorghum halepense* (Johnson Grass) and *Sporobolus fertilis* (Parramatta Grass).

Prelim. Recommendations

- Further detailed seasonal studies required to either:
i. Downgrade to low; or
ii. Remain as Moderate
- Seasonal construction parameters apply

Final Recommendations

- Generic Management Plans

Justification for recommendation rating change

The vegetation is of 'non-remnant' status under the VMA and heavily weed infested at the location of the mapped watercourse, however, the species present within the area are representative of the neighbouring 'remnant' least concern RE11.1.2. Marine species present include, *Sesuvium portulacastrum* (Sea purslane), *Tecticornia indica spp., Suaeda australis* (Seablite) and *Sporobolus virginicus* (Marine Couch). The marine plants observed have been exposed to an array of disturbances such as rail upgrades, regular property maintenances, and slashing, resulting in poor overall health. Further, due to the road and rail upgrades, the hydrological regime of the tidal wetlands associated with Caley Valley have been historically altered. The use of impermeable surfaces and the earthworks required to facilitate the upgrades has resulted in limited to no tidal influence for all marine vegetation south of the Bruce Highway and railway line. Given

the historically impacted nature of the marine plants, the proposed linear infrastructure is unlikely to have a significant impact. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 80

Site Number: 80
Un-named Marine Mudflat

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.81. Site 81 Summary

Overview	Comment
Site #	81
Stream Order	1
Field Determination	**Drainage feature with marine mudflats** Un-named marine mudflats that contains *Chenopodiaceae spp* and *Sporobolus virginicus* (Marine Couch). No riparian vegetation was present. The mapped watercourse had no defined bed and banks. No water was flowing during the field assessment, with a heavily weeded road verge.
Prelim. Recommendation Rating	Moderate-High
Final Recommendation Rating	Moderate
GPS location	-19.95219° N 147.93346° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 1/2
Variety of Habitats	Sugarcane, cleared grass and marine mudflats. Habitat features limited.
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

Unnamed marine mudflats that contains *Chenopodiaceae spp* and *Sporobolus virginicus* (Marine Couch) within the wider area. No riparian vegetation was present. The mapped creek had no defined bed and banks. No water was flowing during the field assessment and the area was heavily weeded dominated by *Sorghum halepense* (Johnson Grass) and *Sporobolus fertilis* (Parramatta Grass).

Prelim. Recommendations

- Further detailed seasonal studies required to either:
i. Downgrade to Moderate; or
ii. Upgrade to High
- Seasonal construction parameters apply

Final Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Seasonal construction parameters apply.

Justification for recommendation rating change

The vegetation is of 'non-remnant' status under the VMA. It should be noted that marine species such as *Sesuvium portulacastrum* (Sea Purslane), *Tecticornia indica spp., Suaeda australis* (Seablite) and *Sporobolus virginicus* (Marine Couch) are present within the proposed linear infrastructure alignment and will be impacted. The marine plants observed have been exposed to an array of disturbances such as rail upgrades and regular property maintenances and slashing, resulting in poor overall health. Further, due to the road and rail upgrades, the hydrological regime of the tidal wetlands associated with Caley Valley have been historically altered. The use of impermeable surfaces and the earthworks required to facilitate the upgrades has resulted in limited to no tidal influence for all marine vegetation south of the Bruce Highway and railway line. Given the historically impacted nature of the marine plants, the proposed linear infrastructure

is unlikely to have a significant impact. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 81

Site Number: 81
Un-named creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.82. Site 82 Summary

Overview	Comment
Site #	82
Stream Order	1
Field Determination	**Drainage feature with marine mudflats** Unnamed marine mudflats that contains *Chenopodiaceae spp* and *Sporobolus virginicus* (Marine Couch). No riparian vegetation was present. The mapped watercourse had no defined bed and banks. No water was flowing during the field assessment, with a heavily weeded road verge.
Prelim. Recommendation Rating	Moderate-High
Final Recommendation Rating	Moderate
GPS location	-19.95219° N 147.93346° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 1/2
Variety of Habitats	Sugarcane, cleared grass and marine mudflats. Habitat features limited.
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

Un-named marine mudflats that contains *Chenopodiaceae spp* and *Sporobolus virginicus* (Marine Couch) within the wider area. No riparian vegetation was present. The mapped creek had no defined bed and banks. No water was flowing during the field assessment and the area was heavily weeded dominated by *Sorghum halepense* (Johnson Grass), *Sporobolus fertilis* (Parramatta Grass), and *Chloris Gayana* (Rhodes Grass)

Prelim. Recommendations

- Further detailed seasonal studies required to either:
i. Downgrade to Moderate; or
ii. Upgrade to High
- Seasonal construction parameters apply

Final Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Seasonal construction parameters apply.

Justification for recommendation rating change

The vegetation is of 'non-remnant' status under the VMA. It should be noted that marine species such as *Sesuvium portulacastrum* (Sea Purslane), *Tecticornia indica spp., Suaeda australis* (Seablite) and *Sporobolus virginicus* (Marine Couch) are present south of the proposed linear infrastructure alignment that may be impacted. The marine plants observed have been exposed to an array of disturbances such as rail upgrades and regular property maintenances and slashing, resulting in poor overall health. Further, due to the road and rail upgrades, the hydrological regime of the tidal wetlands associated with Caley Valley have been historically altered. The use of impermeable surfaces and the earthworks required to facilitate the upgrades has resulted in limited to no tidal influence for all marine vegetation south of the Bruce Highway and railway line. Given the historically impacted nature of the marine plants, the proposed linear infrastructure

is unlikely to have a significant impact. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 82

Site Number: 82
Un-named creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.83. Site 83 Summary

Overview	Comment
Site #	83
Stream Order	3
Field Determination	**Formed Creek (Unnamed)**
	Formed creek with distinguishable beds and banks. Riparian vegetation was present. The creek did not contain flowing water but instead a series of pools were observed during the field survey. No macrophytes were present.
Prelim. Recommendation Rating	Moderate
Final Recommendation Rating	Moderate
GPS location	-19.95350° N 147.93795° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	3-4m
Dominant Substrate	Sand
Variety of Habitats	Sugarcane, cleared grass and riparian vegetation. Habitat features limited.
Flow regime	Semi-permanent
Channel shading	15%
Macrophytes	Absent

General description and habitat attributes

The beds and banks of the formed creek are distinguishable in parts, with the riparian vegetation present. Macrophytes were absent. The riparian zone is heavily weeded with *Sporobolus fertilis* (Parramatta Grass), *Sorghum halepense* (Johnson Grass), and *Chloris Gayana* (Rhodes Grass) The creek consisted of a series of pools, no flowing water was observed at the time of assessment. Heavy rainfall was present during field surveys. No aquatic fauna was observed at the time of assessment.

Final Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Seasonal construction parameters apply.



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 83

Site Number: 83
Un-named creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.84. Site 84 Summary

Overview	Comment
Site #	84
Stream Order	1
Field Determination	**Drainage feature with marine mudflats** Unnamed marine mudflats that contains *Chenopodiaceae spp* and *Sporobolus virginicus* (Marine Couch). No riparian vegetation was present. The mapped watercourse had no defined bed and banks. No water was flowing during the field assessment, with a heavily weeded road verge.
Prelim. Recommendation Rating	Moderate-High
Final Recommendation Rating	Moderate
GPS location	-19.95219° N 147.93346° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 1/2
Variety of Habitats	Sugarcane, cleared grass and marine mudflats. Habitat features limited.
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

Unnamed marine mudflats that contains *Chenopodiaceae spp* and *Sporobolus virginicus* (Marine Couch) within the wider area. No riparian vegetation was present. The mapped creek had no defined bed and banks. No water was flowing during the field assessment and the area was heavily weeded dominated by *Sorghum halepense* (Johnson Grass), *Sporobolus fertilis* (Parramatta Grass) and *Chloris Gayana* (Rhodes Grass)

Prelim. Recommendations

- Further detailed seasonal studies required to either:
i. Downgrade to Moderate; or
ii. Upgrade to High
- Seasonal construction parameters apply

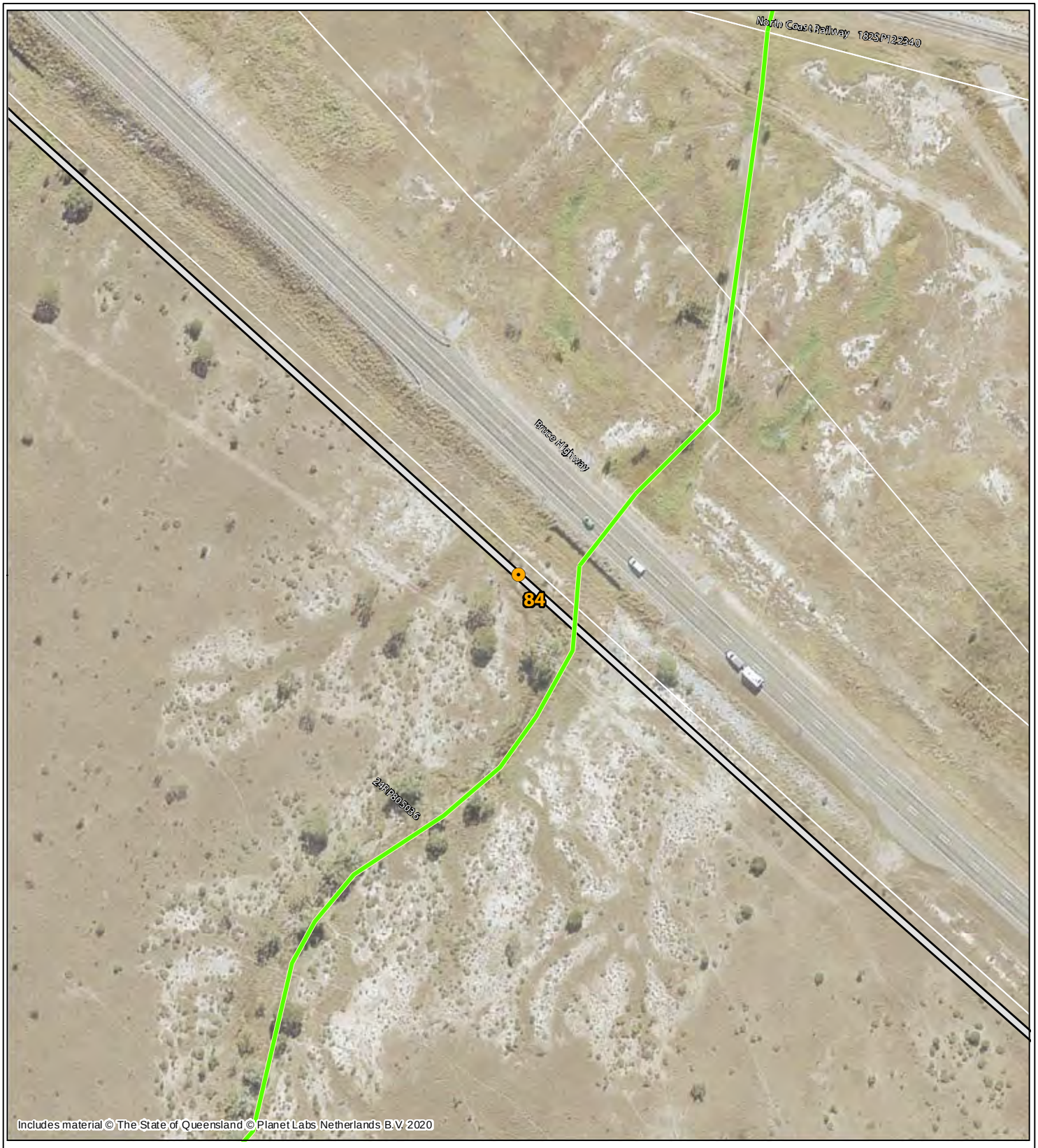
Final Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Seasonal construction parameters apply.

Justification for recommendation rating change

The vegetation is of 'non-remnant' status under the VMA. It should be noted that marine species such as *Sesuvium portulacastrum* (Sea Purslane), *Tecticornia indica spp., Suaeda australis* (Seablite) and *Sporobolus virginicus* (Marine Couch) are present within the proposed linear infrastructure alignment and will be impacted. The marine plants observed have been exposed to an array of disturbances such as rail upgrades and regular property maintenances and slashing, resulting in poor overall health. Further, due to the road and rail upgrades, the hydrological regime of the tidal wetlands associated with Caley Valley have been historically altered. The use of impermeable surfaces and the earthworks required to facilitate the upgrades has resulted in limited to no tidal influence for all marine vegetation south of the Bruce Highway and railway line. Given the historically impacted nature of the marine plants, the proposed linear infrastructure

is unlikely to have a significant impact. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 84

Site Number: 84
Un-named creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.85. Site 85 Summary

Overview	Comment
Site #	85
Stream Order	1
Field Determination	**Formed creek (Unnamed)**
	Formed creek with distinguishable beds and banks. Riparian vegetation, water and macrophytes were present. The creek contained flowing water, however heavy rain was present at the time of assessment.
Prelim. Recommendation Rating	Moderate
Final Recommendation Rating	Moderate
GPS location	-19.95902° N 147.94475° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	4m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Sugarcane, cleared grass and riparian vegetation. Habitat features present.
Flow regime	Permanent
Channel shading	40%
Macrophytes	Present

General description and habitat attributes

The beds and banks of the formed creek are distinguishable, with the riparian zone and macrophytes present. The riparian zone consists predominantly of *Melaleuca leucadendra* (Weeping Paperbark) and *Corymbia tessellaris* (Moreton Bay Ash) with weeds present in the ground layer. Vegetation outside of the mapped watercourse consists of scattered regrowth *Corymbia tessellaris* (Morten Bay Ash). The creek has an obvious flow path, with water present when assessed. The flow regime of this watercourse has been modified by road infrastructure leading to water pooling adjacent to culverts. No aquatic fauna was observed at the time of assessment.

Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Seasonal construction parameters apply.



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 85

Site Number: 85
Un-named creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.86. Site 86 Summary

Overview	Comment
Site #	86
Stream Order	4
Field Determination	**Drainage Feature**
	The absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. This waterway was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.96349° N 147.95057° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cleared paddocks. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by invasive *Sorghum halepense* (Johnson Grass), *Themeda quadrivalvis* (Grader Grass), and *Sporobolus fertilis* (Parramatta Grass). The vegetation has been highly fragmented by road infrastructure. The flow path at this site is heavily eroded and has been historically altered by culvert upgrades and has no bed and bank features. Due to the culvert upgrades, water pools around the culvert. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area, *Corymbia tessellaris* (Moreton Bay Ash) and *Acacia salicina* (Sally Wattle) regrowth was present beyond the waterway. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 86

Site Number: 86
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.87. Site 87 Summary

Overview	Comment
Site #	87
Stream Order	1
Field Determination	**Drainage Feature**
	The absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. This waterway was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.96526° N 147.95288° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cleared paddocks. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by invasive *Sorghum halepense* (Johnson Grass), *Themeda quadrivalvis* (Grader Grass) and *Sporobolus fertilis* (Parramatta Grass). The vegetation has been highly fragmented by road infrastructure. The flow path at this site is heavily eroded and has been historically altered by culvert upgrades and has no bed and bank features. Due to the culvert upgrades, water likely pools around the culvert. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. Scattered *Corymbia tessellaris* (Moreton Bay Ash) present beyond waterway. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 87

Site Number: 87
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.88. Site 88 Summary

Overview	Comment
Site #	88
Stream Order	3
Field Determination	**Drainage Feature**
	The absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. This waterway was heavily weed infested. There was no riparian vegetation or macrophytes.
Prelim. Recommendation Rating	Moderate
Final Recommendation Rating	Low
GPS location	-19.96654° N 147.95455° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Sugarcane and cleared grass. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by invasive *Sorghum halepense* (Johnson Grass), *Themeda quadrivalvis* (Grader Grass) and *Sporobolus fertilis* (Parramatta Grass). The vegetation has been highly fragmented by road and rail infrastructure. The flow path at this site is heavily eroded and has been historically altered by culvert upgrades and has no bed and bank features. Due to the culvert upgrades, water pools around the culvert. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Prelim. Recommendations

- Further detailed seasonal studies required to either:
i. Downgrade to Low; or
ii. Remain as Moderate
- Seasonal construction parameters apply

Final Recommendations

- Generic management plan(s).

Justification for recommendation rating change

The vegetation is of 'non-remnant' status under the VMA. Field assessments identified the watercourse as not containing bed and bank features with limited riparian species present including *Pandanus spiralis* (Screw Palm), and scattered *Corymbia tessellaris* (Moreton Bay Ash) and *Planchonia careya* (Cocky Apple). Most of the mapped watercourse was heavily weed infested with *Argyreia nervosa* (Elephant Creeper) and *Themeda quadrivalvis* (Grader Grass) as a result of historical and contemporary agricultural practices. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 88

Site Number: 88
Un-named Drainage Feature

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.89. Site 89 Summary

Overview	Comment
Site #	89
Stream Order	1
Field Determination	**Drainage Feature**
	The absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. This waterway was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.96787° N 147.95741° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cleared paddocks. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by *Sorghum halepense* (Johnson Grass), *Themeda quadrivalvis* (Grader Grass) and *Sporobolus fertilis* (Parramatta Grass). The vegetation has been highly fragmented by road infrastructure. The flow path at this site is heavily eroded and has been historically altered by culvert upgrades and has no bed and bank features. Due to the culvert upgrades, water likely pools around the culvert. Adjoining vegetation consisted of scattered *Corymbia tessellaris* (Moreton Bay Ash) and *Planchonia careya* (Cocky Apple). Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 89

Site Number: 89
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.90. Site 90 Summary

Overview	Comment
Site #	90
Stream Order	1
Field Determination	**Formed Creek (Unnamed)**
	Riparian species present with limited bed and bank features indicating this watercourse holds water immediately following rain event, no permanent water present at the time of survey and no macrophytes. This waterway was heavily weed infested and modified by culvert upgrades and access track.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.97012° N 147.96501° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	3-5m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cleared paddocks, riparian vegetation. Habitat features limited
Flow regime	Ephemeral
Channel shading	5%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is present consisting of *Melaleuca leucadendra* (Weeping Paperbark) and *Pandanus spiralis* (Screw Palm) with invasive *Sorghum halepense* (Johnson Grass), *Themeda quadrivalvis* (Grader Grass) and *Sporobolus fertilis* (Parramatta Grass). The vegetation has been highly fragmented by road infrastructure. The flow path at this site is heavily eroded and has been historically altered by culvert upgrades and access tracks with limited bed and bank features. Vegetation adjoining watercourse consisted of large *Corymbia tessellaris* (Moreton Bay Ash) and *Eucalyptus tereticornis* (Forest Red Gum). Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 90

Site Number: 90
Un-named Creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.91. Site 91 Summary

Overview	Comment
Site #	91
Stream Order	3
Field Determination	**Formed Creek (Plain Creek)**
	Formed creek with distinguishable beds and banks. Riparian vegetation present and intact, while macrophytes absent due to sandy and extremely dynamic creek bed. The creek contained a low volume of permanent water flowing during the field assessment.
Prelim. Recommendation Rating	Major
Recommendation Rating	Major
GPS location	-19.97073° N 147.96711° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	20-45m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Riparian vegetation, permanent water flowing and pooling and adjacent vegetation community(s).
Flow regime	Permanent
Channel shading	<5%
Macrophytes	Absent

General description and habitat attributes

The beds and banks of the formed creek are distinguishable, with the riparian zone present and intact, while the macrophytes absent. The riparian vegetation included *Melaleuca leucadendra* (Weeping Paperbark), *Lophostemon grandifloras* (Northern Swamp Box), *Ficus coronata* (Sandpaper Fig), *Pandanus spp.* and *Corymbia tessellaris* (Moreton Bay Ash). The creek bed is dominated by sand, with a high level of erosion in sections of the creek bank. The riparian zone understorey is weeded with *Sorghum halepense* (Johnson Grass) and *Sporobolus fertilis* (Parramatta Grass). The creek has an obvious flow path, with a low volume of permanent water flowing and pooling. No aquatic fauna was observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Implementation of tunnel bore technique to minimise impacts on the creek and watercourse system;
- Further detailed seasonal studies required to assist in the preparation of area specific environmental management plan(s).

Site #	**91 (Flora)**	
Location:	**Plain Creek**	
	Scientific Name	**Common Name**
T1/T2	*Melaleuca fluviatilis*	River Teatree
	Pandanus spiralis	Corkscrew Pandanus
	Lophostemon grandiflorus	Northern Swamp Box
	Planchonia careya	Cocky Apple
	Petalostigma pubescens	Quinine Bush
Shrub/Ground	*Sorghum halapense*	Wild Sorghum
	Gomphrena celosioides	Gomphrena Weed
	Macroptilium atropurpureum	Siratro
	Argyreia nervosa	Woodrose
	Xanthium occidentale	Noogoora Burr
	Ageratum houstonianum	Blue billygoat Weed
	Chloris gayana	Rhodes Grass
	Chloris virgata	Faethertop Rhodes Grass
	Passiflora suberosa	Passionflower
	Xanthium pungens	Noogoora Burr
	Melinis repens	Red Natal Grass
	Bidens pillosa	Cobbler Peg
	Stachytarpheta jamaicensis	Blue Snake Weed
	Stylosanthes scabra	Shrubby Stylo

Site #	**91 (Fauna)**	
Location:	**Plain Creek**	
	Scientific Name	**Common Name**
	Corvus orru	Torresian Crow
	Macropus giganteus	Eastern Grey Kangaroo
	Lichenostomus flavus	Yellow Honeyeater
	Hirundo neoxena	Welcome Swallow
	Rhipidura leucophrys	Willy Wagtail
	Haliastur sphenurus	Whistling Kite
	Grallina cyanoleuca	Peewee Mudlark
	Sus scrofa	Wild Pig (Scats)
	Ninox boobook	Mopoke Owl
	Milvus migrans	Fork-tailed Kite
	Merops ornatus	Rainbow Bee-eater (Fly-over)
	Cracticus tibicen	Australian Magpie
	Taeniopygia bichenovii	Double-barred Finch
	Manorina melanocephala	Noisy Minor
	Canis familiaris	Dog (Footprints)
	Cacatua galerita	Sulphur Crested Cockatoo
	Dacelo leachii	Blue Winged Kookaburra
	Alisterus scapularis	King Parrot
	Rhinella marina	Cane Toad
	Litoria caerulea	Green Tree Frog

Falco berigora	Brown Falcon
Litoria rothii	Roth's Tree Frog



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 91

Site Number: 91
Plain Creek

Field Assessment
Risk Rating: Major

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.92. Site 92 Summary

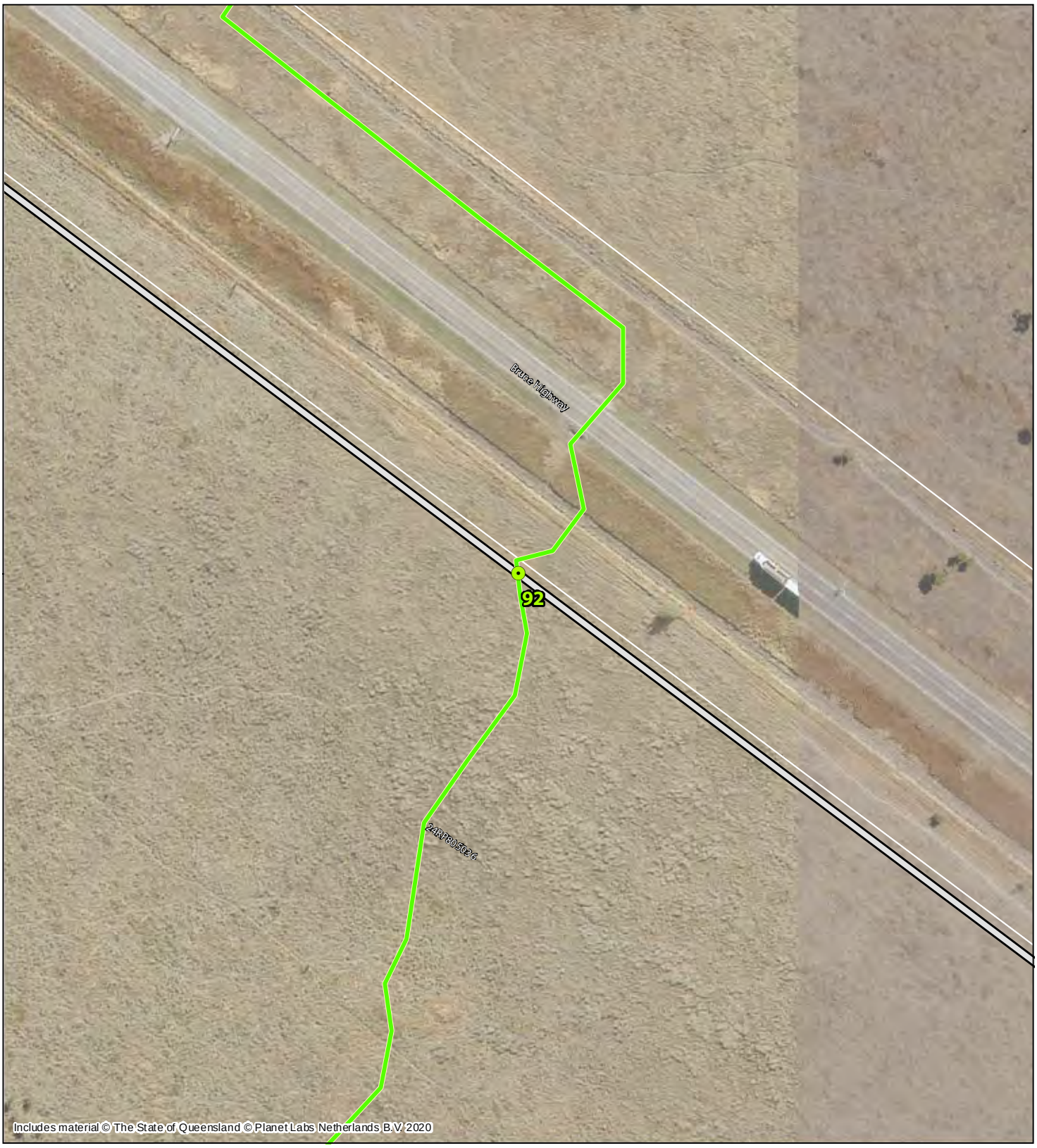
Overview	Comment
Site #	92
Stream Order	1
Field Determination	**Drainage Feature**
	The absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. This waterway was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.97514° N 147.97416° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cleared paddocks. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by invasive *Themeda quadrivalvis* (Grader Grass). The vegetation has been wholly cleared for cattle grazing. The flow path at this site is heavily eroded and has been historically altered by culvert upgrades and has no bed and bank features. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 92

Site Number: 92
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.93. Site 93 Summary

Overview	Comment
Site #	93
Stream Order	1
Field Determination	**Drainage Feature**
	The absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. This waterway was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.98382° N 147.98652° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cleared paddocks. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by invasive *Themeda quadrivalvis* (Grader Grass) with scattered native *Corymbia dallachiana* (Ghost Gum) and *Planchonia careya* (Cocky Apple). The vegetation has been mostly cleared for road infrastructure and cattle grazing. The flow path at this site is heavily eroded and altered by an access track, no bed and bank features present. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 93

Site Number: 93
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.94. Site 94 Summary

Overview	Comment
Site #	94
Stream Order	3
Field Determination	**Formed Creek (Splitters Creek)**
	Formed creek with distinguishable beds and banks. Riparian vegetation present and intact, while macrophytes absent due to sandy and extremely dynamic creek bed. The creek contained a low volume of permanent water flowing during the field assessment.
Prelim. Recommendation Rating	Major
Final Recommendation Rating	Major
GPS location	-19.98581° N 147.99212° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	20-45m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Riparian vegetation, permanent water flowing and pooling and adjacent vegetation community(s).
Flow regime	Permanent
Channel shading	<5%
Macrophytes	Absent

General description and habitat attributes

The beds and banks of the formed creek are distinguishable, with the riparian zone present and intact, while macrophytes absent. The riparian vegetation included *Melaleuca leucadendra* (Weeping Paperbark), *Lophostemon grandifloras* (Northern Swamp Box), *Ficus coronata* (Sandpaper Fig), *Pandanus spp.* and *Corymbia tessellaris* (Moreton Bay Ash). The creek bed is dominated by sand, with a high level of erosion in sections of the creek bank. The riparian zone understorey is weeded with *Sorghum halepense* (Johnson Grass) and *Sporobolus fertilis* (Parramatta Grass). The creek has an obvious flow path which is branched, with a low volume of permanent water flowing and pooling. No aquatic fauna was observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Implementation of tunnel bore technique to minimise impacts on the creek and watercourse system;
- Further detailed seasonal studies required to assist in the preparation of area specific environmental management plan(s).

Site #	**94 (Flora)**	
Location:	**Splitters Creek**	
	Scientific Name	**Common Name**
T1/T2	*Melaleuca fluviatilis*	River Teatree
	Pandanus spiralis	Corkscrew Pandanus
	Lophostemon grandiflorus	Northern Swamp Box
	Nauclea orientalis	Leichhardt Tree
	Planchonia careya	Cocky Apple
	Allocasuarina cunninghamii	River Sheoak
	Corymbia tessellaris	Moreton Bay Ash
	Pleiogynium timorense	Burdekin Plum
	Eucalyptus tereticornis	Forest Red Gum
	Ficus racemosa	Cluster Fig
	Melaleuca viminalis	Weeping Paperbark
Shrub/Ground	*Themeda quadrivalvis*	Grader Grass
	Sorghum halapense	Wild Sorghum
	Gomphrena celosioides	Gomphrena Weed
	Macroptilium atropurpureum	Siratro
	Cenchrus ciliaris	Buffel Grass
	Xanthium occidentale	Noogoora Burr
	Cenchrus siliaris	Buffel Grass
	Melinis repens	Red Natal Grass
	Typha orientalis	Bulrush
	Stachytarpheta jamaicensis	Blue Snake Weed
	Stylosanthes scabra	Shrubby Stylo

Site #	**94 (Fauna)**	
Location:	**Splitters Creek**	
	Scientific Name	**Common Name**
	Corvus orru	Torresian Crow
	Macropus giganteus	Eastern Grey Kangaroo
	Lichenostomus flavus	Yellow Honeyeater
	Hirundo neoxena	Welcome Swallow
	Rhipidura leucophrys	Willy Wagtail
	Grallina cyanoleuca	Peewee Mudlark
	Sus scrofa	Wild Pig (Scats)
	Ninox boobook	Mopoke Owl
	Milvus migrans	Fork-tailed Kite
	Cracticus nigrogularis	Pied Butcherbird
	Cracticus tibicen	Australian Magpie
	Taeniopygia bichenovii	Double-barred Finch
	Todiramphus sanctus	Sacred Kingfisher
	Trichoglossus moluccanus	Rainbow Lorikeet
	Manorina melanocephala	Noisy Minor
	Canis familiaris	Dog (Footprints)
	Cacatua galerita	Sulphur Crested Cockatoo

Dacelo leachii	Blue Winged Kookaburra
Alisterus scapularis	King Parrot
Rhinella marina	Cane Toad
Falco berigora	Brown Falcon



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 94

Site Number: 94
Splitters Creek

Field Assessment
Risk Rating: Major

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.95. Site 95 Summary

Overview	Comment
Site #	95
Stream Order	2
Field Determination	**Splitters Creek Tributary** Discontinuous bed and bank features with limited riparian vegetation. However, no permanent water or macrophytes present. The flow path has been partly modified by road infrastructure and access tracks.
Prelim. Recommendation Rating	Moderate
Final Recommendation Rating	Moderate
GPS location	-19.98559° N 147.99287° E (GDA 2020-MGA 55)
Local land use	Cattle grazing
Average Bankful Width	6 m (where present)
Dominant Substrate	Soils associated with Landzone 3.
Variety of Habitats	Riparian vegetation present but limited, partial clearing for access tracks and cattle grazing. Habitat features limited.
Flow regime	Ephemeral
Channel shading	15%
Macrophytes	Absent

General description and habitat attributes

This watercourse is mapped as a Stream order 2 and a moderate waterway under the *Fisheries Act 1994*. On-ground surveys found the flow path to contain discontinuous bed and banks however no permanent water and no macrophytes. Riparian vegetation was limited to scattered *Melaleuca fluviatilis* (River Tea-tree) and *Casuarina cunninghamiana* (River She-oak) with *Corymbia tessellaris* (Moreton Bay Ash) present throughout. The surrounding vegetation is mapped as remnant RE11.3.25 with some indicator species present. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Seasonal construction parameters apply.



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 95

Site Number: 95
Splitters Creek Tributary

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.96. Site 96 Summary

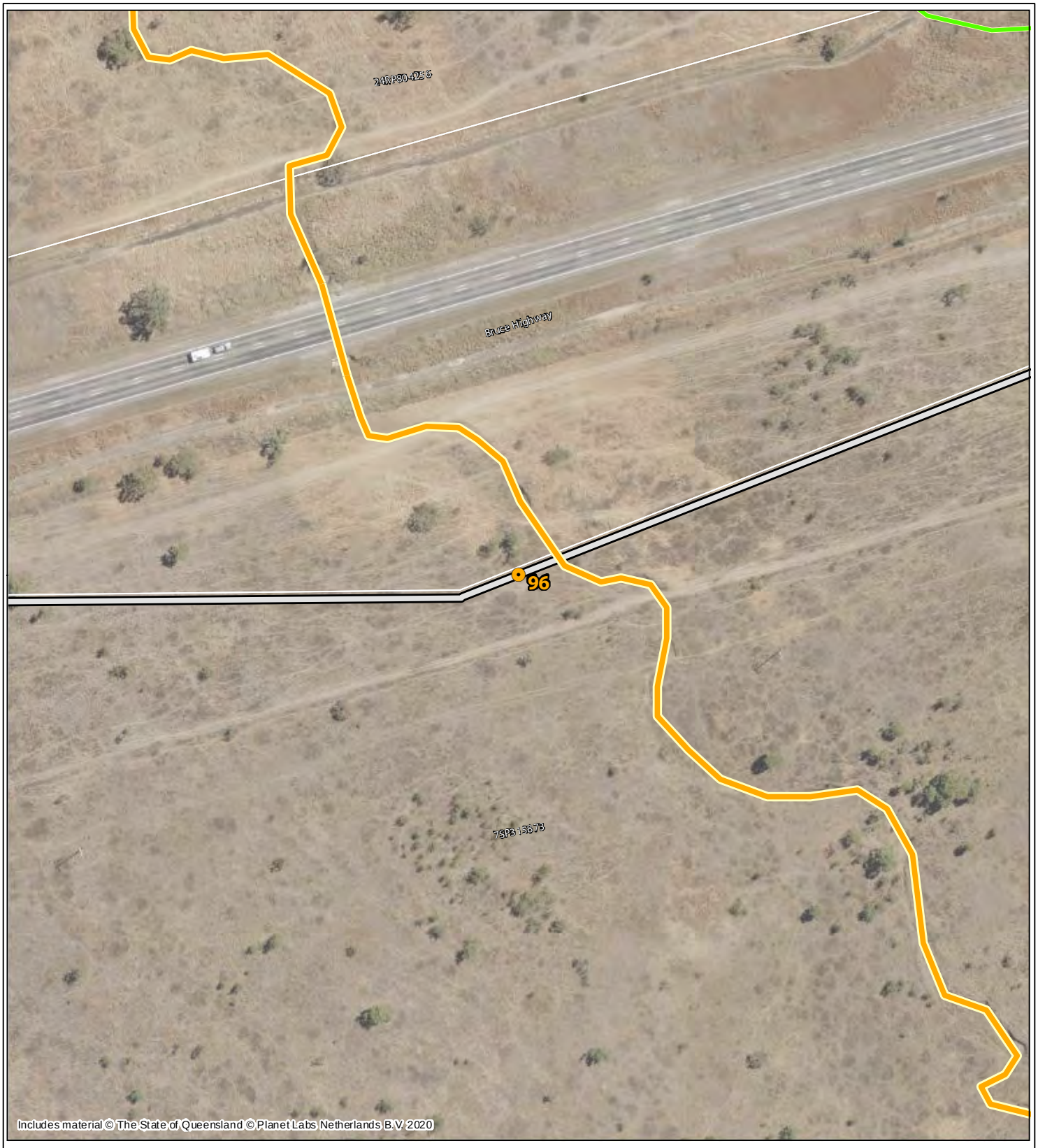
Overview	Comment
Site #	96
Stream Order	2
Field Determination	**Drainage Feature**
	The absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. This waterway was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.98524° N 147.99894° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cleared open paddocks. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by invasive *Sorghum halepense* (Johnson Grass), *Themeda quadrivalvis* (Grader Grass) and *Sporobolus fertilis* (Parramatta Grass) with native *Acacia salicina* (Sally Wattle) and *Planchonia careya* (Cocky Apple) regrowth. The flow path at this site has been historically altered by culvert upgrades, no bed or bank features present. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 96

Site Number: 96
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.97. Site 97 Summary

Overview	Comment
Site #	97
Stream Order	1
Field Determination	**Drainage Feature**
	The absence of riparian species and culvert upgrade indicates this drainage feature is confined to overland flow for a short period immediately following rainfall. Continuous bed and bank features were not observed. This waterway was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.98451° N 148.00085° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cleared open paddocks. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by invasive *Sorghum halepense* (Johnson Grass) and *Themeda quadrivalvis* (Grader Grass) with scattered native *Corymbia dallachiana* (Ghost Gum) and *Planchonia careya* (Cocky Apple) regrowth. The flow path at this site has been historically altered by culvert upgrades and cattle grazing. No bed or bank features were present. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 97

Site Number: 97
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.98. Site 98 Summary

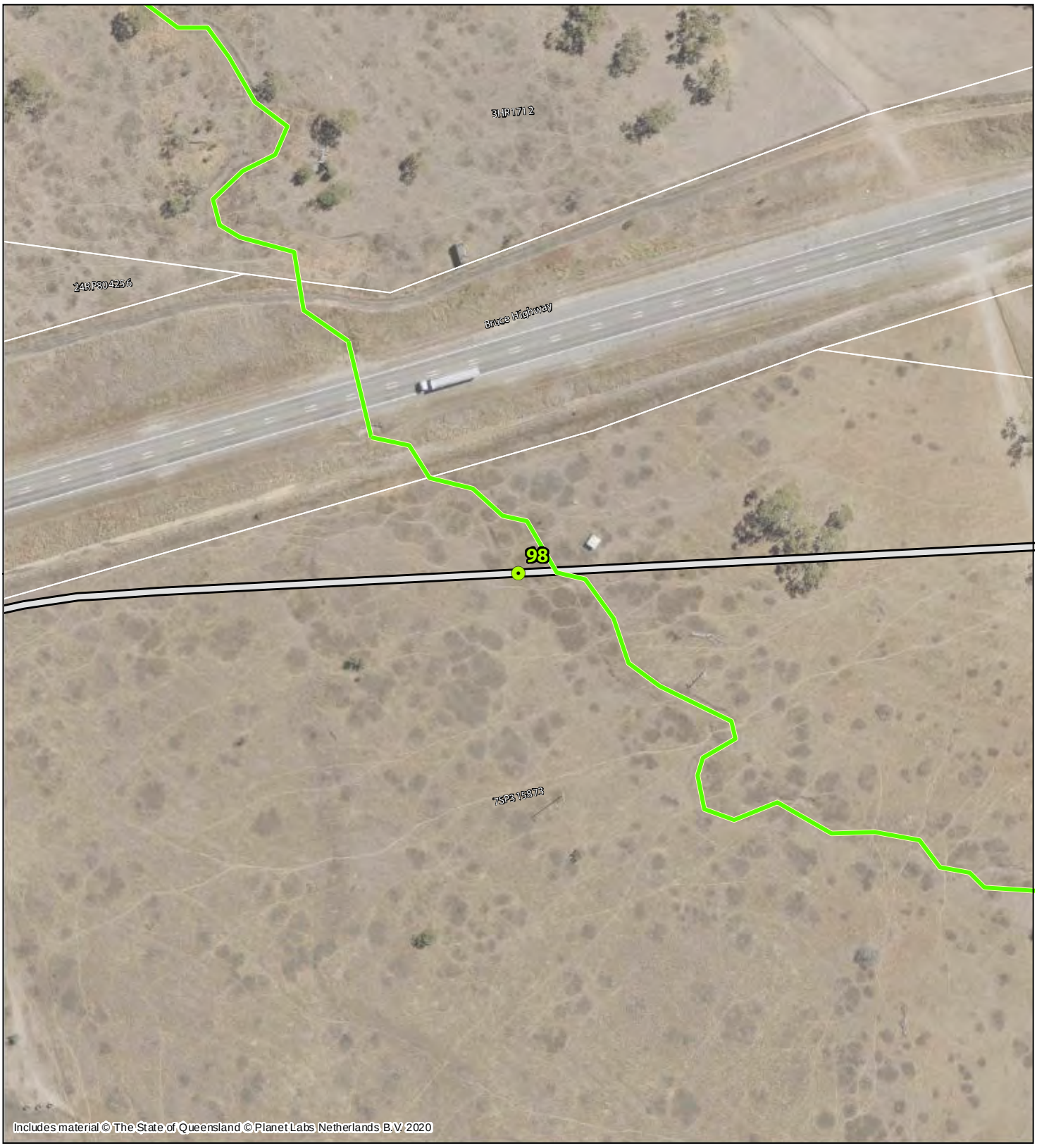
Overview	Comment
Site #	98
Stream Order	1
Determination	**Drainage Feature**
	The absence of riparian species and culvert upgrade indicates this drainage feature is confined to overland flow for a short period immediately following rainfall. Continuous bed and bank features were not observed. This drainage feature was dominated by pasture grasses and heavily weeded.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.98332° N 148.00526° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Grazing paddocks and agricultural land. Habitat features absent.
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by pasture grasses with scattered invasive *Vachellia farnesiana* (Prickly Acacia) and *Cryptostegia grandiflora* (Rubber Vine) consistent with the adjacent land-uses. The flow path at this site has been historically altered by culvert upgrades and cattle grazing. No bed or bank features were present. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic habitat was observed. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic Management Plans



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 98

Site Number: 98
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.99. Site 99 Summary

Overview	Comment
Site #	99
Stream Order	1
Field Determination	**Formed Creek (Spring Creek)**
	Formed creek with defined beds and banks. Riparian vegetation present on banks and within channel, while macrophytes absent. The creek contained no permanent water flowing during the field assessment. The creek has sandy substrate.
Prelim. Recommendation Rating	Moderate
Final Recommendation Rating	Moderate
GPS location	-19.98188° N 148.01020° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Sand
Variety of Habitats	Cleared open paddocks. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

Continuous bed and bank features and riparian vegetation of the formed creek are present, while macrophytes are absent. The riparian vegetation includes *Melaleuca leucadendra* (Weeping Paperbark), *Pandanus spp, Melaleuca bracteate* (Black Tea-tree) and *Lophostemon grandifloras* (Northern Swamp Box). The riparian zone understorey and creek is heavily weeded with *Sorghum halepense* (Johnson Grass), *Themeda quadrivalvis* (Grader Grass) and *Sporobolus fertilis* (Parramatta Grass). Habitat feature were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Seasonal construction parameters apply.



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 99

Site Number: 99
Spring Creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.100. Site 100 Summary

Overview	Comment	
Site #	100	
Stream Order	1	
Determination	**Drainage Feature**	
	The absence of riparian species and culvert upgrade indicates this drainage feature is confined to overland flow for a short period immediately following rainfall. Continuous bed and bank features were not observed. This drainage feature was dominated by pasture grasses	
Prelim. Recommendation Rating	Low	
Final Recommendation Rating	Low	
GPS location	-19.98332° N	148.00526° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming	
Average Bankful Width	Absent	
Dominant Substrate	Soils associated with landzone 3	
Variety of Habitats	Grazing paddocks and agricultural land. Habitat features absent.	
Flow regime	Ephemeral	
Channel shading	0%	
Macrophytes	Absent	

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by pasture grasses with scattered invasive *Vachellia farnesiana* (Prickly Acacia) and *Cryptostegia grandiflora* (Rubber Vine) consistent with the adjacent land-uses. The flow path at this site has been historically altered by culvert upgrades and cattle grazing. No bed or bank features were present. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic habitat was observed. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic Management Plans



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 100

Site Number: 100
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.101. Site 101 Summary

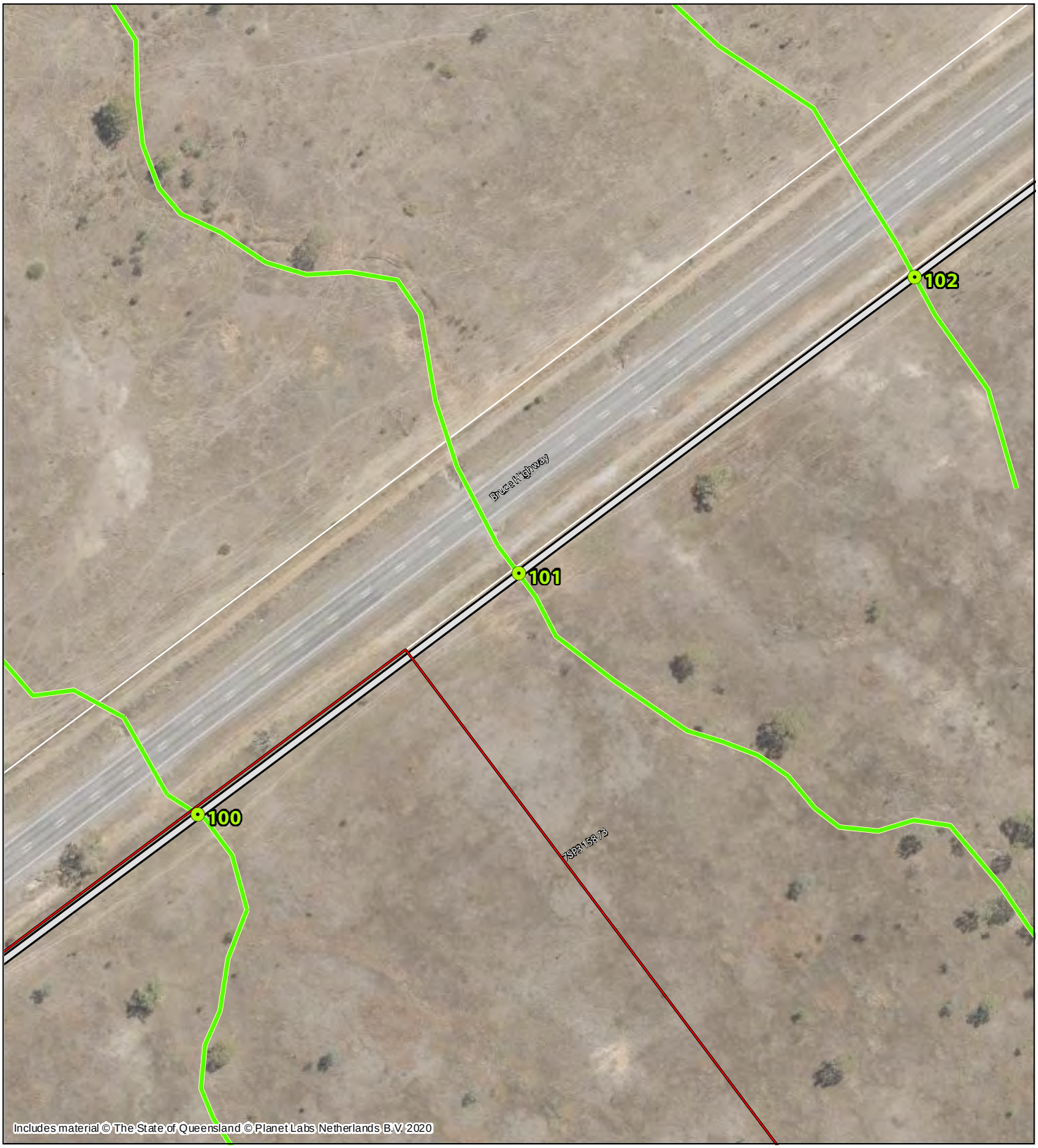
Overview	Comment	
Site #	101	
Stream Order	1	
Determination	**Drainage Feature**	
	The absence of riparian species and culvert upgrade indicates this drainage feature is confined to overland flow for a short period immediately following rainfall. Continuous bed and bank features were not observed. This drainage feature was dominated by pasture grasses	
Prelim. Recommendation Rating	Low	
Final Recommendation Rating	Low	
GPS location	-19.98332° N	148.00526° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming	
Average Bankful Width	Absent	
Dominant Substrate	Soils associated with landzone 3	
Variety of Habitats	Grazing paddocks and agricultural land. Habitat features absent.	
Flow regime	Ephemeral	
Channel shading	0%	
Macrophytes	Absent	

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by pasture grasses with scattered invasive *Planchonia careya* (Cocky Apple) consistent with the adjacent land-uses. The flow path at this site has been historically altered by culvert upgrades and cattle grazing. No bed or bank features were present. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic habitat was observed. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic Management Plans



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 101

Site Number: 101
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.102. Site 102 Summary

Overview	Comment
Site #	102
Stream Order	1
Determination	**Drainage Feature**
	The absence of riparian species and culvert upgrade indicates this drainage feature is confined to overland flow for a short period immediately following rainfall. Continuous bed and bank features were not observed. This drainage feature was dominated by pasture grasses
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.98332° N 148.00526° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Grazing paddocks and agricultural land. Habitat features absent.
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by pasture grasses with scattered invasive *Planchonia careya* (Cocky Apple) consistent with the adjacent land-uses. The flow path at this site has been historically altered by culvert upgrades and cattle grazing. No bed or bank features were present. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic habitat was observed. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic Management Plans



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 102

Site Number: 102
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.103. Site 103 Summary

Overview	Comment	
Site #	103	
Stream Order	1	
Determination	**Drainage Feature**	
	The absence of riparian species and culvert upgrade indicates this drainage feature is confined to overland flow for a short period immediately following rainfall. Continuous bed and bank features were not observed. This drainage feature was dominated by pasture grasses	
Prelim. Recommendation Rating	Low	
Final Recommendation Rating	Low	
GPS location	-19.98332° N	148.00526° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming	
Average Bankful Width	Absent	
Dominant Substrate	Soils associated with landzone 3	
Variety of Habitats	Grazing paddocks and agricultural land. Habitat features absent.	
Flow regime	Ephemeral	
Channel shading	0%	
Macrophytes	Absent	

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by pasture grasses with scattered invasive *Planchonia careya* (Cocky Apple) consistent with the adjacent land-uses. The flow path at this site has been historically altered by culvert upgrades and cattle grazing. No bed or bank features were present. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic habitat was observed. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic Management Plans



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 103

Site Number: 103
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.104. Site 104 Summary

Overview	Comment	
Site #	104	
Stream Order	1	
Determination	**Drainage Feature**	
	The absence of riparian species and culvert upgrade indicates this drainage feature is confined to overland flow for a short period immediately following rainfall. Continuous bed and bank features were not observed. This drainage feature was dominated by pasture grasses	
Prelim. Recommendation Rating	Low	
Final Recommendation Rating	Low	
GPS location	-19.98332° N	148.00526° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming	
Average Bankful Width	Absent	
Dominant Substrate	Soils associated with landzone 3	
Variety of Habitats	Grazing paddocks and agricultural land. Habitat features absent.	
Flow regime	Ephemeral	
Channel shading	0%	
Macrophytes	Absent	

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by pasture grasses with scattered invasive *Planchonia careya* (Cocky Apple) consistent with the adjacent land-uses. The flow path at this site has been historically altered by culvert upgrades and cattle grazing. No bed or bank features were present. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic habitat was observed. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic Management Plans



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 104

Site Number: 104
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.105. Site 105 Summary

Overview	Comment
Site #	105
Stream Order	2
Field Determination	**Drainage Feature**
	Minimal riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. This waterway was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.97201° N 148.02380° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cleared open paddocks. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by *Sorghum halepense* (Johnson Grass), *Themeda quadrivalvis* (Grader Grass) and *Sporobolus fertilis* (Parramatta Grass) with scattered *Pandanus spp.* (Pandanus) and *Melaleuca leucadendra* (Weeping Paperbark). The vegetation has been highly fragmented by road and rail infrastructure. The flow path at this site has been historically altered by culvert upgrades and has no bed and bank features. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 105

Site Number: 105
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.106. Site 106 Summary

Overview	Comment
Site #	106
Stream Order	1
Field Determination	**Drainage Feature**
	The presence of limited riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. This waterway was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.97055° N 148.02582° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cleared open paddocks. Habitat features absent
Flow regime	Ephemeral
Channel shading	10%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by invasive *Sorghum halepense* (Johnson Grass), *Themeda quadrivalvis* (Grader Grass) and *Sporobolus fertilis* (Parramatta Grass) with scattered *Lophostemon grandifloras* (Northern Swamp Box) and *Lysiphyllum hookeri* (Hooker's Bauhinia) The vegetation has been highly fragmented by road and rail infrastructure. The flow path at this site has been historically altered by culvert upgrades and has no bed and bank features. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 106

Site Number: 106
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.107. Site 107 Summary

Overview	Comment
Site #	107
Stream Order	1
Field Determination	**Drainage Feature**
	The absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. This waterway was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.96886° N 148.02843° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Open paddocks. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by invasive *Sorghum halepense* (Johnson Grass), *Themeda quadrivalvis* (Grader Grass) and *Sporobolus fertilis* (Parramatta Grass). The vegetation has been highly fragmented by road and rail infrastructure. The flow path at this site has been historically altered by culvert upgrades and has no bed and bank features. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 107

Site Number: 107
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.108. Site 108 Summary

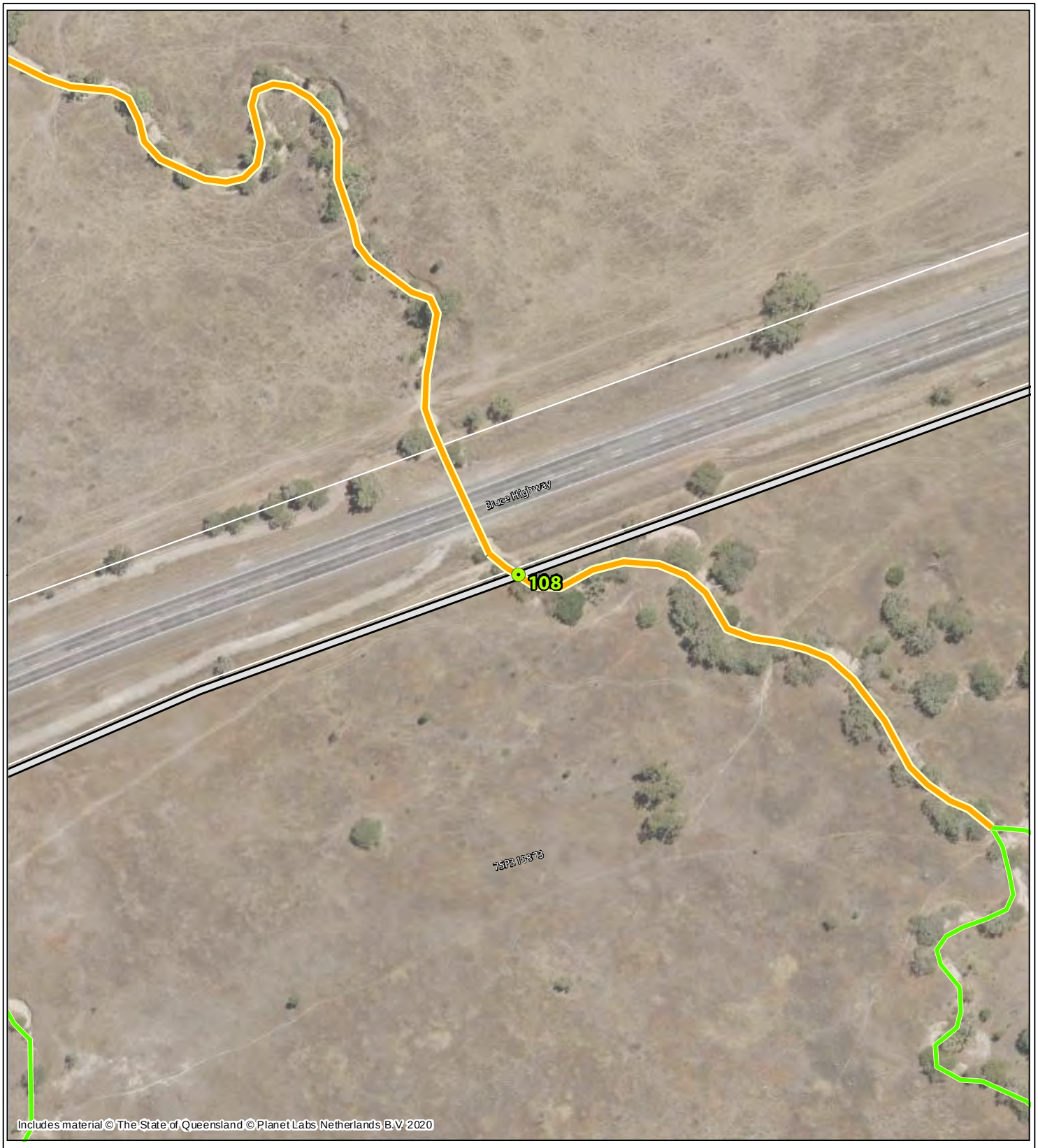
Overview	Comment
Site #	108
Stream Order	1
Field Determination	**Drainage Feature**
	Culvert upgrades and adjacent land-uses indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. This waterway was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.96820° N 148.03017° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	5m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Sugarcane and cleared grass. Habitat features absent
Flow regime	Ephemeral
Channel shading	40%
Macrophytes	Absent

General description and habitat attributes

Riparian vegetation was present confined to the area of the drainage channel including *Melaleuca leucadendra* (Weeping Paperbark). The vegetation has been highly fragmented by road and rail infrastructure. The flow path at this site has been historically altered by culvert upgrades and has limited bed and bank features. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 108

Site Number: 108
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.109. Site 109 Summary

Overview	Comment
Site #	109
Stream Order	1
Field Determination	**Drainage Feature**
	The absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. This waterway was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.96720° N 148.03305° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cleared open paddocks. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

This drainage feature was dominated by invasive *Argyreia nervosa* (Elephant Creeper), *Vachellia farnesiana* (Prickly Acacia), and *Sporobolus fertilis* (Parramatta Grass) with scattered native *Corymbia tessellaris* (Moreton Bay Ash) and *Corymbia erythrophloia* (Variable-barked Bloodwood). The flow path at this site has been historically altered by culvert upgrades and historical clearing and has no bed and bank features. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 109

Site Number: 109
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.110. Site 110 Summary

Overview	Comment
Site #	110
Stream Order	1
Field Determination	**Drainage Feature**
	The absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.96581° N 148.03600° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Sugarcane and cleared grass. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by *Sorghum halepense* (Johnson Grass), *Themeda quadrivalvis* (Grader Grass) and *Sporobolus fertilis* (Parramatta Grass). The vegetation has been highly fragmented by road and rail infrastructure. The flow path at this site has been historically altered by culvert upgrades and has no bed and bank features. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 110

Site Number: 110
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.111. Site 111 Summary

Overview	Comment
Site #	111
Stream Order	1
Field Determination	**Drainage Feature**
	The absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.96552° N 148.03821° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cleared paddocks and scattered trees. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by pasture grasses with scattered *Corymbia tessellaris* (Moreton Bay Ash), *Planchonia careya* (Cocky Apple) and *Corymbia erythrophloia* (Variable-barked Bloodwood). The flow path at this site has been historically altered by culvert upgrades and cattle grazing and has no bed and bank features. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 111

Site Number: 111
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.112. Site 112 Summary

Overview	Comment
Site #	112
Stream Order	1
Field Determination	**Drainage Feature**
	The absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.96552° N 148.03821° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cleared paddocks and scattered trees. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by pasture grasses with scattered *Corymbia tessellaris* (Moreton Bay Ash), *Planchonia careya* (Cocky Apple) and *Corymbia erythrophloia* (Variable-barked Bloodwood). The flow path at this site has been historically altered by culvert upgrades and cattle grazing and has no bed and bank features. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 112

Site Number: 112
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.113. Site 113 Summary

Overview	Comment
Site #	113
Stream Order	1
Field Determination	**Drainage Feature**
	The absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.96524° N 148.04188° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Sugarcane and cleared grass. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by pasture grasses with scattered *Corymbia erythrophloia* (Variable-barked Bloodwood) and *Planchonia careya* (Cocky Apple). The vegetation has been highly fragmented by road and rail infrastructure. The flow path at this site has been historically altered by culvert upgrades and cattle grazing and has no bed and bank features. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 113

Site Number: 113
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.114. Site 114 Summary

Overview	Comment
Site #	114 (a)
Stream Order	2
Field Determination	**Formed Creek (Maria Creek)** Formed creek with distinguishable beds and banks. Scattered riparian vegetation present, while macrophytes are absent. The creek contained no water flowing during the field assessment.
Prelim. Recommendation Rating	Moderate-High
Final Recommendation Rating	Moderate
GPS location	-19.96478° N 148.04545° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	6-8m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Sugarcane, cleared grass and limited riparian vegetation. Habitat features limited.
Flow regime	Ephemeral
Channel shading	25%
Macrophytes	Absent

General description and habitat attributes

The beds and banks of the formed creek are distinguishable, with the riparian zone present, while the macrophytes were absent. The riparian vegetation included *Melaleuca leucadendra* (Weeping Paperbark) and *Lophostemon grandifloras* (Northern Swamp Box). The creek bed is dominated by sand. The riparian zone understorey is heavily weeded with pasture grasses. The creek has an obvious flow path, however no permanent water flowing. No aquatic fauna was observed at the time of assessment.

Prelim. Recommendations

- Further detailed seasonal studies required to either:
i. Downgrade to Moderate; or
ii. Upgrade to High
- Seasonal construction parameters apply

Final Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Seasonal construction parameters apply.

Justification for recommendation rating change

The creek is a shallow sloping U shape and the top of bank is approximately 1m high from the low bank/creek bed. The creek is approximately 8m in width (TOB to TOB). The creek has a highly eroded bed and bank due to the lack of riparian vegetation and cattle access. The creek is weeded with *Sorghum halepense* (Johnson Grass), *Themeda quadrivalvis* (Grader Grass), *Sporobolus fertilis* (Parramatta Grass) and *Gomphrena celosioides* (Gomphrena Weed). Native vegetation is limited to the creek channel. The vegetation is mapped as Category X (Non-remnant) status under the VMA. Vegetation

will be impacted during the instatement of the linear infrastructure, however the impact is unlikely to be significant. No permanent water was observed at the time of the second assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Overview	Comment
Site #	114 (b)
Stream Order	2
Field Determination	**Formed Creek (Maria Creek)**
	Formed creek with distinguishable beds and banks. Scattered riparian vegetation present, while macrophytes are absent. The creek contained no water flowing during the field assessment.
Prelim. Recommendation Rating	Moderate-High
Final Recommendation Rating	Moderate
GPS location	-19.96478° N 148.04545° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	6-8m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Sugarcane, cleared grass and limited riparian vegetation. Habitat features limited.
Flow regime	Ephemeral
Channel shading	25%
Macrophytes	Absent

General description and habitat attributes

The beds and banks of the formed creek are distinguishable, with the riparian zone present, while the macrophytes were absent. The riparian vegetation included *Melaleuca leucadendra* (Weeping Paperbark) and *Lophostemon grandifloras* (Northern Swamp Box). The creek bed is dominated by sand. The riparian zone understorey is heavily weeded with pasture grasses. The creek has an obvious flow path, however no permanent water flowing. No aquatic fauna was observed at the time of assessment.

Prelim. Recommendations

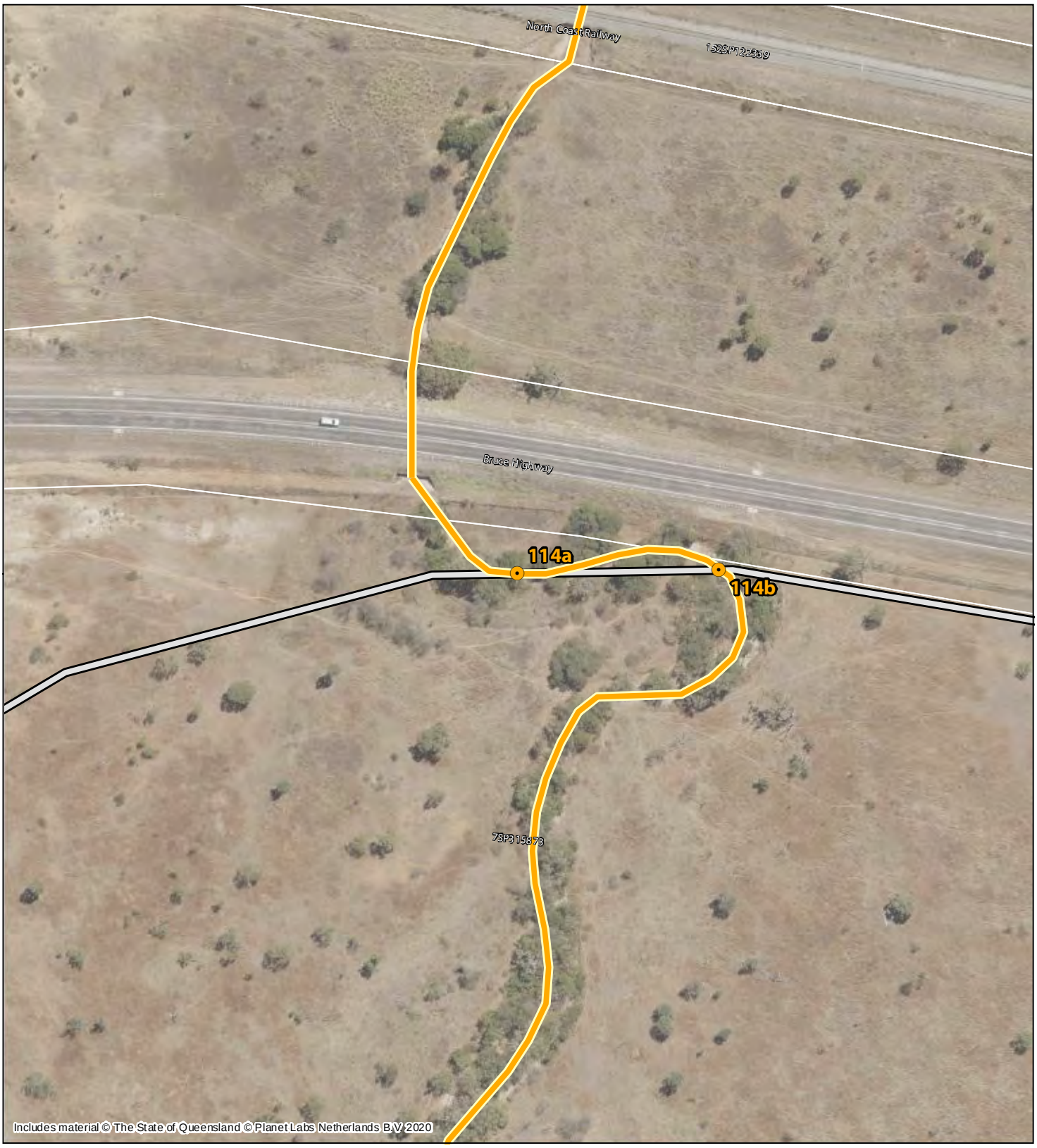
- Further detailed seasonal studies required to either:
i. Downgrade to Moderate; or
ii. Upgrade to High
- Seasonal construction parameters apply

Final Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Seasonal construction parameters apply.

Justification for recommendation rating change

The creek is a shallow sloping U shape and the top of bank is approximately 1m high from the low bank/creek bed. The creek is approximately 8m in width (TOB to TOB). The creek has a highly eroded bed and bank due to limited riparian vegetation and cattle access. The creek is weeded with *Sorghum halepense* (Johnson Grass), *Themeda quadrivalvis* (Grader Grass), *Sporobolus fertilis* (Parramatta Grass) and *Gomphrena celosioides* (Gomphrena Weed). Native vegetation is limited to the creek channel. The vegetation is of 'non-remnant' status under the VMA. Vegetation will be impacted during the instatement of the linear infrastructure; however the impact is unlikely to be significant. No permanent water was observed at the time of the second assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 114a and 114b

Site Number: 114a and 114b
Maria Creek (a) and (b)

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



Upstream



Downstream



Left Bank



Right Bank



2.115. Site 115 Summary

Overview	Comment
Site #	115
Stream Order	2
Field Determination	**Minor Creek (Mount Stuart Creek)**
	Formed creek with distinguishable beds and banks. Limited riparian vegetation present, while macrophytes absent. The creek contained no permanent water flowing during the field assessment. The creek was heavily eroded and contained a high number of weeds.
Prelim. Recommendation Rating	Moderate
Final Recommendation Rating	Moderate
GPS location	-19.96621° N 148.05231° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Sugarcane, cleared grass and limited riparian vegetation. Habitat features limited.
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The beds and banks of the formed creek are distinguishable, with the riparian zone limited, while the macrophytes absent. The riparian vegetation included sparse *Melaleuca leucadendra* (Weeping Paperbark) and *Corymbia tessellaris* (Moreton Bay Ash). The riparian zone understorey and creek is heavily weeded with *Sorghum halepense* (Johnson Grass), *Themeda quadrivalvis* (Grader Grass) and *Sporobolus fertilis* (Parramatta Grass). The flow path at this site has been historically altered by culvert upgrades and is heavily eroded. Habitat feature were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Seasonal construction parameters apply.



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 115

Site Number: 115
Mount Stuart Creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.116. Site 116 Summary

Overview	Comment
Site #	116
Stream Order	1
Determination	**Drainage Feature**
	The absence of riparian species and culvert upgrade indicates this drainage feature is confined to overland flow for a short period immediately following rainfall. Continuous bed and bank features were not observed. This drainage feature was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.96720° N 148.05865° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Grazing paddocks and agricultural land. Habitat features absent.
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is likely dominated by pasture grasses, including *Themeda quadrivalvis* (Grader Grass), consistent with the adjacent land-uses. The flow path at this site has been historically altered by culvert upgrades and cattle grazing. No bed or bank features were observed. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic habitat is present. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic Management Plans



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 116

Site Number: 116
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.117. Site 117 Summary

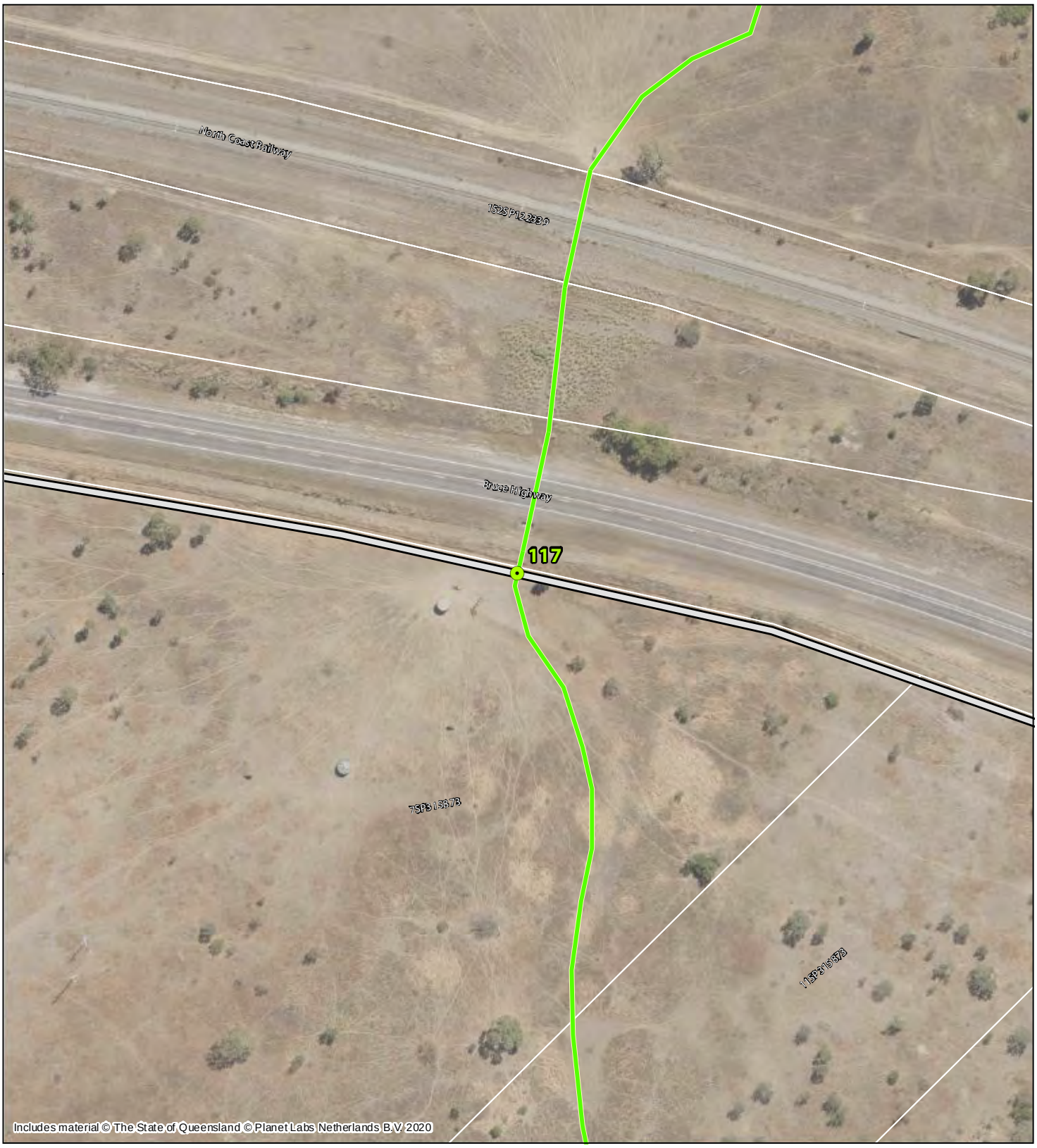
Overview	Comment
Site #	117
Stream Order	1
Determination	**Drainage Feature** The absence of riparian species and culvert upgrade indicates this drainage feature is confined to overland flow for a short period immediately following rainfall. Continuous bed and bank features were not observed. This drainage feature is likely heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.96769° N 148.06163° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Grazing paddocks and agricultural land. Habitat features absent.
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by pasture grasses consistent with the adjacent land-uses. The flow path at this site has been historically altered by culvert upgrades and cattle grazing. No bed or bank features were observed. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic habitat is present. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic Management Plan(s)



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 117

Site Number: 117
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.118. Site 118 Summary

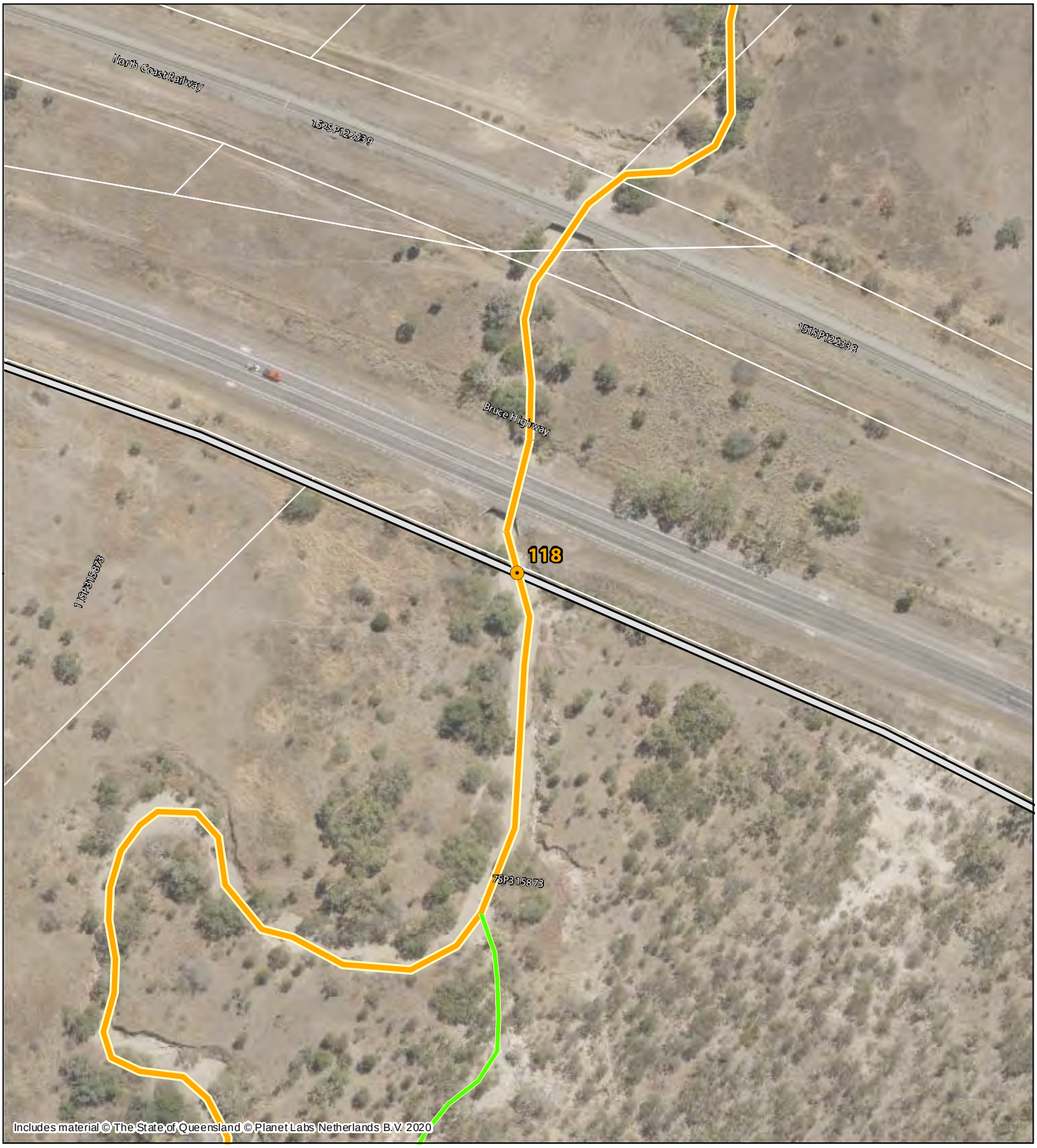
Overview	Comment
Site #	118 (a)
Stream Order	2
Field Determination	**Minor Creek (Six Mile Creek)**
	Formed creek with distinguishable beds and banks. Limited riparian vegetation present, while macrophytes absent. No water flowing was observed during the field assessment. The creek was heavily eroded and contained a high number of weeds.
Prelim. Recommendation Rating	Moderate
Final Recommendation Rating	Moderate
GPS location	-19.96849° N 148.06409° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	8m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Sugarcane and cleared grass. Habitat features limited
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The beds and banks of the formed creek are distinguishable, with the riparian zone limited, while the macrophytes absent. The riparian vegetation included sparse *Melaleuca leucadendra* (Weeping Paperbark), *Corymbia tessellaris* (Moreton Bay Ash) and *Lophostemon grandifloras* (Northern Samp Box). The riparian zone understorey and creek is heavily weeded with *Sorghum halepense* (Johnson Grass), *Themeda quadrivalvis* (Grader Grass) and *Sporobolus fertilis* (Parramatta Grass). The flow path at this site has been historically altered by culvert upgrades and is heavily eroded. Habitat feature were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Seasonal construction parameters apply.



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 118

Site Number: 118
Six Mile Creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.119. Site 119 Summary

Overview	Comment
Site #	119 (a)
Stream Order	2
Field Determination	**Drainage Feature**
	Adjacent land-uses and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were limited to areas of an eroded channel. This waterway was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.97455° N 148.07101° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	2m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cattle grazing and agricultural activities. Habitat features limited to scattered riparian species
Flow regime	Ephemeral
Channel shading	45%
Macrophytes	Absent

General description and habitat attributes

The riparian zone consists of scattered *Melaleuca spp*, *Lophostemon grandifloras* (Northern Swamp Box) and *Pandanus spp.* (Pandanus) and the area adjoining the drainage feature is dominated by pasture grasses. The flow path at this site has been historically altered by culvert upgrades and has discontinuous bed and bank features. Habitat features were limited due to the historical agricultural practices, cattle grazing, access tracks and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic Management Plan(s)

Overview	Comment
Site #	119 (b)
Stream Order	2
Determination	**Drainage Feature**
	The lack of riparian species and culvert upgrades indicates this drainage feature is confined to overland flow for a short period immediately following rainfall. Continuous bed and bank features were not observed. This drainage feature had moderate weed coverage.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.96769° N 148.06163° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Bed Rock
Variety of Habitats	Grazing paddocks and agricultural land. Habitat features absent.
Flow regime	Ephemeral
Channel shading	20%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is limited and consists of scattered *Melaleuca spp*, *Lophostemon grandifloras* (Northern Swamp Box) and *Pandanus spp.* (Pandanus). The area adjoining the drainage feature is dominated by *Acacia spp.* regrowth and pasture grasses consistent with the adjacent land-uses. The flow path at this site has been historically altered by culvert upgrades and cattle grazing. No bed or bank features were observed. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic habitat is present. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic Management Plans

Overview	Comment
Site #	119 (c)
Stream Order	2
Determination	**Drainage Feature**
	The lack of riparian species and culvert upgrades indicates this drainage feature is confined to overland flow for a short period immediately following rainfall. Continuous bed and bank features were not observed. This drainage feature had moderate weed coverage.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.96769° N 148.06163° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	3-4m
Dominant Substrate	Soil associated with Landzone 3
Variety of Habitats	Grazing paddocks and agricultural land. Habitat features absent.
Flow regime	Ephemeral
Channel shading	20%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is limited and consists of scattered *Lophostemon grandifloras* (Northern Swamp Box), *Melaleuca spp,* and *Pandanus spp.* (Pandanus). The area adjoining the drainage feature is dominated by *Alphitonia excelsa* (Soap tree) and *Acacia spp.* regrowth and pasture grasses consistent with the adjacent land-uses. The flow path at this site has been historically altered by culvert upgrades and cattle grazing. No bed or bank features were observed. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic habitat is present. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic Management Plans



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 119

Site Number: 119
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:2,000 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



Upstream



Downstream



Left Bank



Right Bank



Upstream



Downstream



Left Bank



Right Bank



2.120. Site 120 Summary

Overview	Comment
Site #	120
Stream Order	1
Determination	**Drainage Feature**
	The absence of riparian species and culvert upgrade indicates this drainage feature is confined to overland flow for a short period immediately following rainfall. Bed and bank features were not observed. This drainage feature was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.97988° N 148.07520° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Pastoral grass
Variety of Habitats	Grazing paddocks and agricultural land. Habitat features absent.
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by native *Grevillea striata* (Beefwood) and *Heteropogon contortus* (Black Speargrass) regrowth, and pasture grasses consistent with the adjacent land-uses. There is a culvert present under the highway and a cleared track along the southern boundary. The flow path at this site has been historically altered by culvert upgrades and cattle grazing. No bed or bank features were observed. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic habitat were observed using aerial imagery. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic Management Plan(s)



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 120

Site Number: 120
Un-named Drainage Feature

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left



Right



2.121. Site 121 Summary

Overview	Comment
Site #	121
Stream Order	3
Field Determination	**Formed Creek (Breakfast Creek)** Formed creek with distinguishable beds and banks. Limited riparian vegetation present, and macrophytes are absent. The creek contained no flowing water during the field assessment.
Prelim. Recommendation Rating	High-Moderate
Recommendation Rating	Moderate
GPS location	-19.98308° N 148.07760° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	8m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Sugarcane, cleared grass and limited riparian vegetation. Habitat features limited.
Flow regime	Ephemeral
Channel shading	30%
Macrophytes	Absent

General description and habitat attributes

The beds and banks of the formed creek are distinguishable, with the riparian zone present, while the macrophytes were absent. The riparian vegetation included *Melaleuca leucadendra* (Weeping Paperbark), *Melaleuca flavovirens* (Green Bottlebrush), *Corymbia intermedia* (Pink Bloodwood), *Corymbia tessellaris* (Moreton Bay Ash), and *Lophostemon grandifloras* (Northern Swamp Box). The creek bed is dominated by sand and rock. The riparian zone understorey is heavily weeded with *Sorghum halepense* (Johnson Grass), *Themeda quadrivalvis* (Grader Grass) and *Sporobolus fertilis* (Parramatta Grass). The creek has an obvious flow path, however no permanent water flowing. No aquatic fauna was observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Prelim. Recommendations

- Further detailed seasonal studies required to either:
i. Downgrade to Moderate; or
ii. Upgrade to High
- Seasonal construction parameters apply

Final Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Seasonal construction parameters apply.

Justification for recommendation rating change

The creek is a gradual sloping U shape and the top of bank is approximately 4-5m high from the low bank/creek bed. The creek is approximately 10-15m in width (TOB to TOB). The creek has a highly eroded bed and bank due to the lack of riparian vegetation and heavy weed infestation. The creek is heavily weeded with *Sorghum halepense* (Johnson Grass), *Melinis repens* (Red Natal Grass), *Sporobolus fertilis* (Parramatta Grass), *Strachytarpheta spp.* (Snakeweed) and *Gomphrena celosioides* (Gomphrena Weed). Native vegetation is limited with isolated single stands located in the riparian zone. The

native vegetation present includes *Melaleuca leucadendra* (Weeping Paperbark), *Grevillea striata* (Beefwood), *Corymbia erythrophloia* (Variable-barked Bloodwood) and *Pandanus spp.*. The vegetation is Category X (Non-remnant) status under the VMA. Limited vegetation will be impacted during the instatement of the linear infrastructure, however, the impact is unlikely to be significant. No permanent water flowing or pooling was observed during the second assessment, indicating that the water observed during the initial assessment was related to recent rainfall events before the assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 121

Site Number: 121
Breakfast Creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left



Right



2.122. Site 122 Summary

Overview	Comment
Site #	122
Stream Order	1
Field Determination	**Drainage Feature**
	The absence of riparian species and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. This waterway was moderately weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.98534° N 148.07944° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Pastoral grass
Variety of Habitats	Cleared open paddocks. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is absent and the area adjoining the drainage feature is dominated by invasive *Sorghum halepense* (Johnson Grass), *Themeda quadrivalvis* (Grader Grass) and *Sporobolus fertilis* (Parramatta Grass), with native *Eucalyptus platyphylla* (White Gum) and *Planchonia careya* (Cocky Apple). The vegetation has been highly fragmented by road and rail infrastructure. The flow path consists of an eroded channel which has been historically altered by culvert upgrades and has no continuous bed and bank features. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 122

Site Number: 122
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.123. Site 123 Summary

Overview	Comment
Site #	123
Stream Order	1
Field Determination	**Drainage Feature**
	Limited riparian species present and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were not observed. This waterway was heavily weed infested and had no waterway features upstream.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.98986° N 148.08265° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	3m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cleared open paddocks. Habitat features absent.
Flow regime	Ephemeral
Channel shading	40%
Macrophytes	Absent

General description and habitat attributes

The riparian zone is limited within the mapped drainage feature consisting of scattered *Melaleuca leucadendra* (Weeping Paperbark) and *Melaleuca fluviatilis* (River Tea-tree) mostly present beyond drainage feature. The ground layer is dominated by invasive *Chloris gayana* (Rhodes Grass), Sorghum *halepense* (Johnson Grass), *Themeda quadrivalvis* (Grader Grass) and *Sporobolus fertilis* (Parramatta Grass). The vegetation has been highly fragmented by road and rail infrastructure. There is cleared track present along both sides of the boundary. The flow path consists of an eroded channel which has been historically altered by culvert upgrades and has no continuous bed and bank features. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 123

Site Number: 123
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.124. Site 124 Summary

Overview	Comment	
Site #	124	
Stream Order	3	
Field Determination	**Formed Creek (Goodbye Creek)**	
	Formed creek with distinguishable beds and banks. Riparian vegetation present and intact, while macrophytes absent due to sandy and extremely dynamic creek bed. The creek contained multiple standing pools of water during the field assessment, with increased volume downstream under the bridge.	
Prelim. Recommendation Rating	Major	
Final Recommendation Rating	Major	
GPS location	-19.99229° N	148.08420° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks	
Average Bankful Width	8 -10m	
Dominant Substrate	Soils associated with landzone 3	
Variety of Habitats	Riparian vegetation, permanent water flowing and pooling and adjacent vegetation community(s).	
Flow regime	Ephemeral	
Channel shading	45%	
Macrophytes	Absent	

General description and habitat attributes

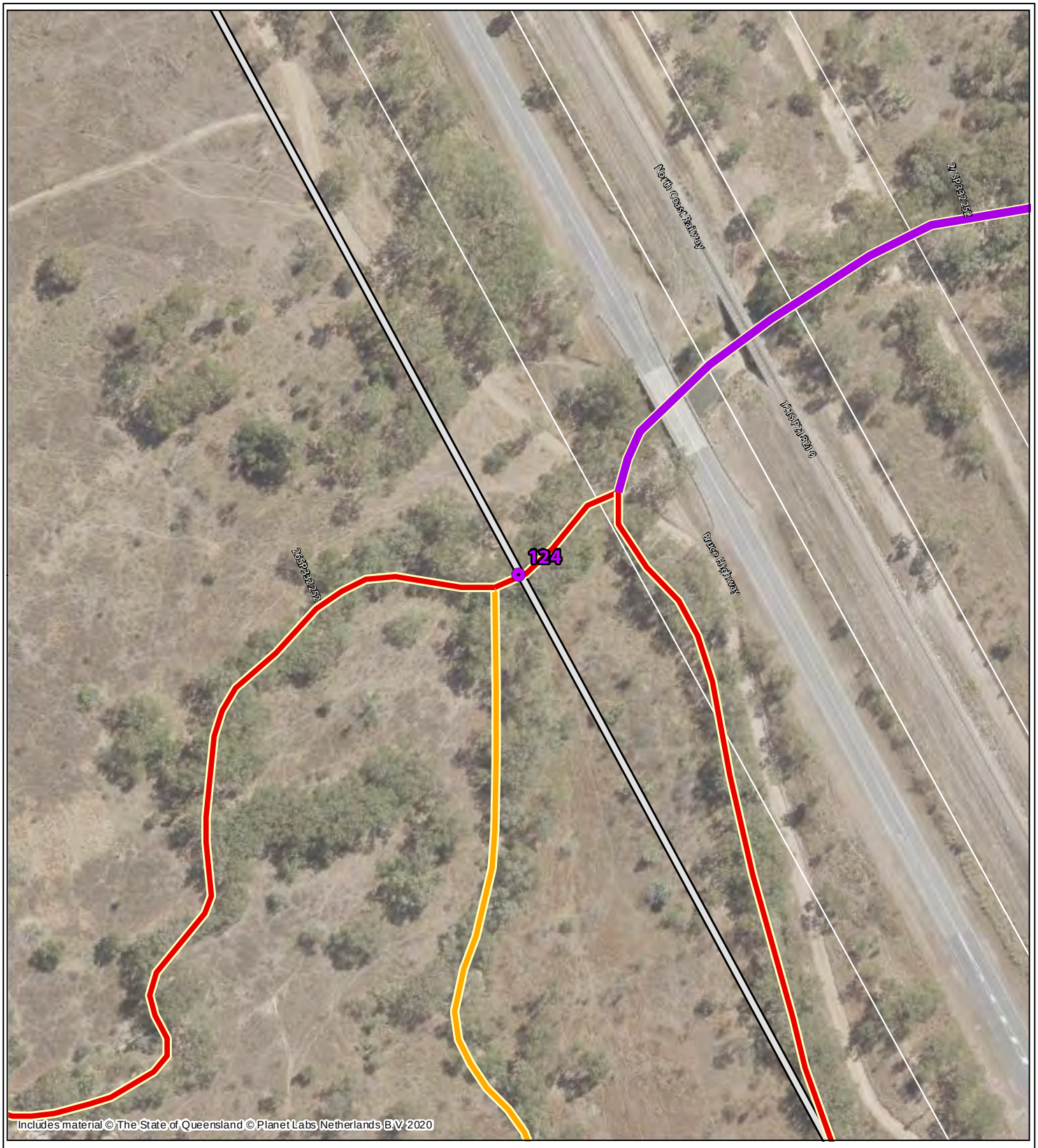
The beds and banks of the formed creek are distinguishable, with the riparian zone present. Macrophytes were absent. The riparian vegetation was dominated by *Melaleuca leucadendra* (Weeping Paperbark) and *Lophostemon grandiflorus* (Northern Swamp Box), and *Pandanus spp.*. *Corymbia tessellaris* (Moreton Bay Ash) and *Imperata cylindrica* (Blady Grass) occurred along the banks. The creek bed is dominated by sand. The riparian zone understorey was heavily weeded with *Sorghum halepense* (Johnson Grass), *Themeda quadrivalvis* (Grader Grass) and *Sporobolus fertilis* (Parramatta Grass). The creek has an obvious flow path with standing pools of water. There is a bridge under the road pass, and larger pools of standing water coalesce underneath. Adjacent vegetation is remnant and includes *Eucalyptus platyphylla* (White Gum), *Lophostemon grandifloras* (Northern Swamp Box), *Corymbia tessellaris* (Moreton Bay Ash), and *Melaleuca leucadendra* (Weeping Paperbark). No aquatic fauna was observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Implementation of tunnel bore technique to minimise impacts on the creek and watercourse system;
- Further detailed seasonal studies required to assist in the preparation of area specific environmental management plan(s).

Site #	**124 (Flora)**	
Location:	**Goodbye Creek**	
	Scientific Name	**Common Name**
T1/T2	*Melaleuca fluviatilis*	River Teatree
	Melaleuca leucadendra	Weeping Paperbark
	Pandanus spiralis	Screw Palm
	Corymbia tessellaris	Moreton Bay Ash
	Lophostemon grandiflorus	Northern Swamp Box
	Corymbia erythrophloia	Variable-barked bloodwood
	Planchonia careya	Cocky Apple
	Eucalyptus platyphylla	White Gum
Shrub/Ground	*Themeda quadrivalvis*	Grader Grass
	Sorghum halapense	Wild Sorghum
	Gomphrena celosioides	Gomphrena Weed
	Macroptilium atropurpureum	Siratro
	Cenchrus ciliaris	Buffel Grass
	Imperata cylindrica	Blady Grass
	Xanthium occidentale	Noogoora Burr
	Sorghum halepense	Johnson Grass
	Sporobolus fertilis	Parramatta Grass
	Cenchrus siliaris	Buffel Grass
	Melinis repens	Red Natal Grass
	Typha orientalis	Bulrush
	Stachytarpheta jamaicensis	Blue Snake Weed
	Stylosanthes scabra	Shrubby Stylo

Site #	**124 (Fauna)**	
Location:	**Goodbye Creek**	
	Scientific Name	**Common Name**
	Corvus orru	Torresian Crow
	Hirundo neoxena	Welcome Swallow
	Rhipidura leucophrys	Willy Wagtail
	Haliastur sphenurus	Whistling Kite
	Grallina cyanoleuca	Peewee Mudlark
	Milvus migrans	Fork-tailed Kite
	Cracticus tibicen	Australian Magpie
	Taeniopygia bichenovii	Double-barred Finch
	Rhinella marina	Cane Toad
	Sus scrofa	Wild Pig (Scats)
	Ninox boobook	Mopoke Owl
	Merops ornatus	Rainbow Bee-eater (Fly-over)
	Cracticus tibicen	Australian Magpie
	Trichoglossus moluccanus	Rainbow Lorikeet
	Coracina novaehollandiae	Black-faced Cuckoo Shrike
	Manorina melanocephala	Noisy Minor
	Dacelo leachii	Blue Winged Kookaburra
	Alisterus scapularis	King Parrot
	Poecilia reticulata	Guppies
	Falco berigora	Brown Falcon



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 124

Site Number: 124
Goodbye Creek

Field Assessment
Risk Rating: Major

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.125. Site 125 Summary

Overview	Comment	
Site #	125	
Stream Order	3	
Field Determination	**Formed Creek (Goodbye Creek Tributary)** Riparian vegetation present and intact, with macrophytes present. Distinguishable bed and bank features. The drainage feature contained semi-permanent water during the field assessment. This waterway was partly weed infested.	
Prelim. Recommendation Rating	Moderate	
Final Recommendation Rating	Moderate	
GPS location	-19.99415° N	148.08475° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks	
Average Bankful Width	6 – 8m	
Dominant Substrate	Soils associated with landzone 3	
Variety of Habitats	Some habitat features	
Flow regime	Semi-permanent water	
Channel shading	35%	
Macrophytes	Present	

General description and habitat attributes

The beds and banks of the waterway are distinguishable, with the riparian zone and macrophytes present. The riparian vegetation was dominated by *Melaleuca leucadendra* (Weeping Paperbark) and *Lophostemon grandiflorus* (Northern Swamp Box), with *Imperata cylindrica* (Blady Grass), and *Pandanus spp.* and *Alphitonia excelsa* (Soap Tree) shrubs. *Eucalyptus platyphylla* (White Gum) is present along the banks. The riparian zone understorey is weeded with *Ageratum houstonianum* (Blue Billygoat Weed). The creek has an obvious flow path with semi-permanent water. Adjacent vegetation is non-remnant with scattered trees, *Corymbia tessellaris* (Moreton Bay Ash), and *Eucalyptus platyphylla* (White Gum). No aquatic fauna was observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Seasonal construction parameters apply.



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 125

Site Number: 125
Goodbye Creek Tributary

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.126. Site 126 Summary

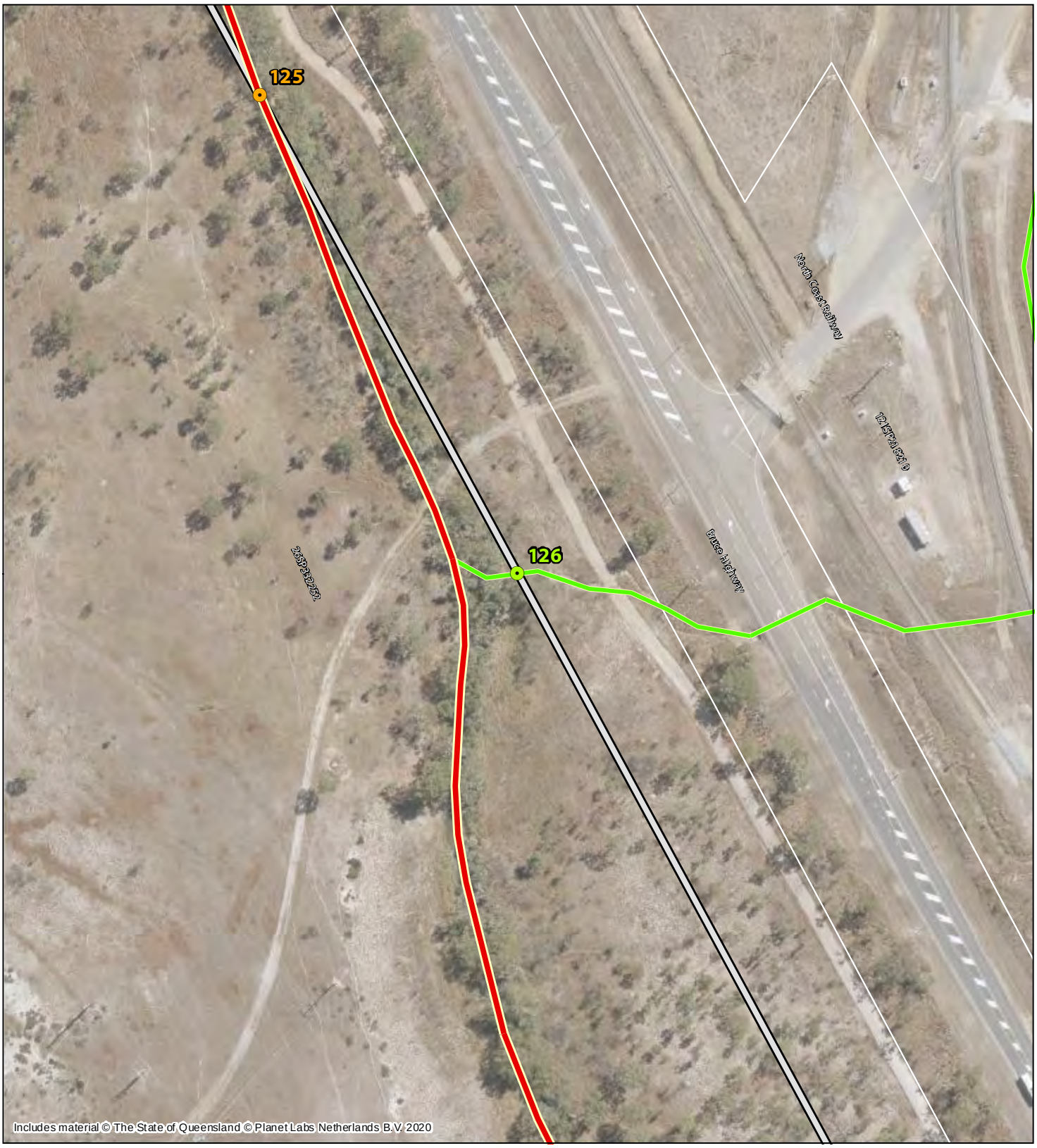
Overview	Comment
Site #	126
Stream Order	1
Field Determination	**Drainage Feature**
	Riparian vegetation absent and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall. An eroded channel was present however continuous bed and bank features were not observed.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-19.99553° N 148.08596° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	2m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cleared open paddocks. Habitat features absent
Flow regime	Ephemeral
Channel shading	20%
Macrophytes	Absent

General description and habitat attributes

Vegetation within the mapped drainage feature is dominated by *Heteropogon contortus* (Black Speargrass) and *Imperata cylindrica* (Blady Grass). Some scattered *Melaleuca fluviatilis* (River Tea-tree) and *Lophostemon grandiflorus* (Northern Swamp Box) present beyond the flow path. The vegetation has been highly fragmented by road and rail infrastructure. The flow path consists of an eroded channel which has been historically altered by culvert upgrades and has no continuous bed and bank features. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 126

Site Number: 126
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.127. Site 127 Summary

Overview	Comment	
Site #	127 (a)	
Stream Order	3	
Field Determination	**Formed Creek (Little Goodbye Creek)** Riparian vegetation species limited and no adjacent vegetation. A vegetated channel was present however continuous bed and bank features were not observed. This waterway contained semi-permanent water and was somewhat weed infested.	
Prelim. Recommendation Rating	High	
Final Recommendation Rating	High	
GPS location	-20.00175° N	148.09196° E (GDA 2020-MGA 55)
Local land use	Cleared	
Average Bankful Width	4m	
Dominant Substrate	Soils associated with landzone 3	
Variety of Habitats		
Flow regime	Semi-permanent	
Channel shading	50%	
Macrophytes	Absent	

General description and habitat attributes

Vegetation within the mapped drainage feature is dominated by *Pandanus spp.* and *Melaleuca leucadendra* (Weeping Paperbark), with a *Lophostemon spp.* understory. *Cyperus distans* (Cyperus Sedge) was present throughout the channel, and *Phragmites australis* (Common Reed) and *Imperata cylindrica* (Blady Grass) are also present. The vegetation has been highly fragmented by road and rail infrastructure, and there is not adjacent vegetation as the surrounding land has been cleared. The flow path consists of an eroded channel which has been historically altered by culvert upgrades and has no continuous bed and bank features. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Final Recommendations

- Implementation of tunnel bore technique to minimise impacts on the creek and watercourse system;
- Further detailed seasonal studies required to assist in the preparation of area specific environmental management plan(s).

Overview	Comment	
Site #	127 (b)	
Stream Order	3	
Field Determination	**Formed Creek (Little Goodbye Creek)** Riparian vegetation species in this waterway are limited and no adjacent vegetation is present. A vegetated channel was present, however continuous bed and bank features were not observed. This waterway was somewhat weed infested.	
Prelim. Recommendation Rating	High	
Final Recommendation Rating	High	
GPS location	-20.00175° N	148.09196° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks	
Average Bankful Width	13m	
Dominant Substrate	Soils associated with landzone 3	
Variety of Habitats		
Flow regime	Ephemeral	
Channel shading	40%	
Macrophytes	Absent	

General description and habitat attributes

Vegetation within the mapped drainage feature is dominated by *Melaleuca leucadendra* (Weeping Paperbark), *Imperata cylindrica* (Blady Grass), and *Sporobolus fertilis* (Parramatta Grass), with *Lophostemon grandiflorus* (Northern Swamp Box) scattered throughout the channel. The vegetation has been highly fragmented by road and rail infrastructure, and there is no adjacent vegetation as the surrounding land has been cleared. The dominant substrate was sandy. The flow path consists of an eroded channel which has been historically altered by culvert upgrades and has no continuous bed and bank features. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Final Recommendations

- Implementation of tunnel bore technique to minimise impacts on the creek and watercourse system;
- Further detailed seasonal studies required to assist in the preparation of area specific environmental management plan(s).

Overview	Comment
Site #	127 (c)
Stream Order	3
Field Determination	**Formed Creek (Little Goodbye Creek)** Riparian vegetation species in this waterway are limited and no adjacent vegetation is present. A vegetated channel without water was present, however continuous bed and bank features were not observed. This waterway was somewhat weed infested.
Prelim. Recommendation Rating	High
Final Recommendation Rating	High
GPS location	-20.00175° N 148.09196° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	8m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	
Flow regime	Ephemeral
Channel shading	35%
Macrophytes	Absent

General description and habitat attributes

Vegetation within the mapped drainage feature is dominated by *Melaleuca leucadendra* (Weeping Paperbark), *Pandanus spp.*, *Imperata cylindrica* (Blady Grass), and *Sporobolus fertilis* (Parramatta Grass), with *Lophostemon grandiflorus* (Northern Swamp Box) and *Ficus rubignosa* (Rock Fig) scattered throughout the channel. The vegetation has been highly fragmented by road and rail infrastructure, and there is no adjacent vegetation as the surrounding land has been cleared. The dominant substrate was a mixture of sand and leaf litter. The flow path consists of an eroded channel which has been historically altered by culvert upgrades and has no continuous bed and bank features. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Final Recommendations

- Implementation of tunnel bore technique to minimise impacts on the creek and watercourse system;
- Further detailed seasonal studies required to assist in the preparation of area specific environmental management plan(s).

Overview	Comment
Site #	127 (d)
Stream Order	3
Field Determination	**Formed Creek (Little Goodbye Creek)** Riparian vegetation species in this waterway are limited and no adjacent vegetation is present. A vegetated channel without water was present, however continuous bed and bank features were not observed. This waterway was somewhat weed infested.
Prelim. Recommendation Rating	High
Final Recommendation Rating	High
GPS location	-20.00175° N 148.09196° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	8m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	
Flow regime	Ephemeral
Channel shading	35%
Macrophytes	Absent

General description and habitat attributes

Vegetation within the mapped drainage feature is dominated by *Melaleuca leucadendra* (Weeping Paperbark), *Pandanus spp.*, *Imperata cylindrica* (Blady Grass), and *Sporobolus fertilis* (Parramatta Grass), with *Lophostemon grandiflorus* (Northern Swamp Box) and *Ficus rubignosa* (Rock Fig) scattered throughout the channel. The vegetation has been highly fragmented by road and rail infrastructure, and there is no adjacent vegetation as the surrounding land has been cleared. The dominant substrate was a mixture of sand and leaf litter. The flow path consists of an eroded channel which has been historically altered by culvert upgrades and has no continuous bed and bank features. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Final Recommendations

- Implementation of tunnel bore technique to minimise impacts on the creek and watercourse system;
- Further detailed seasonal studies required to assist in the preparation of area specific environmental management plan(s).

Overview	Comment
Site #	127 (e)
Stream Order	3
Field Determination	**Formed Creek (Little Goodbye Creek)** Riparian vegetation species in this waterway are limited and no adjacent vegetation is present. A vegetated channel without water was present, however continuous bed and bank features were not observed. This waterway was somewhat weed infested.
Prelim. Recommendation Rating	High
Final Recommendation Rating	High
GPS location	-20.00175° N 148.09196° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	8m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	
Flow regime	Ephemeral
Channel shading	35%
Macrophytes	Absent

General description and habitat attributes

Vegetation within the mapped drainage feature is dominated by *Melaleuca leucadendra* (Weeping Paperbark), *Pandanus spp.*, *Imperata cylindrica* (Blady Grass), and *Sporobolus fertilis* (Parramatta Grass), with *Lophostemon grandiflorus* (Northern Swamp Box) and *Ficus rubignosa* (Rock Fig) scattered throughout the channel. The vegetation has been highly fragmented by road and rail infrastructure, and there is no adjacent vegetation as the surrounding land has been cleared. The dominant substrate was a mixture of sand and leaf litter. The flow path consists of an eroded channel which has been historically altered by culvert upgrades and has no continuous bed and bank features. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Final Recommendations

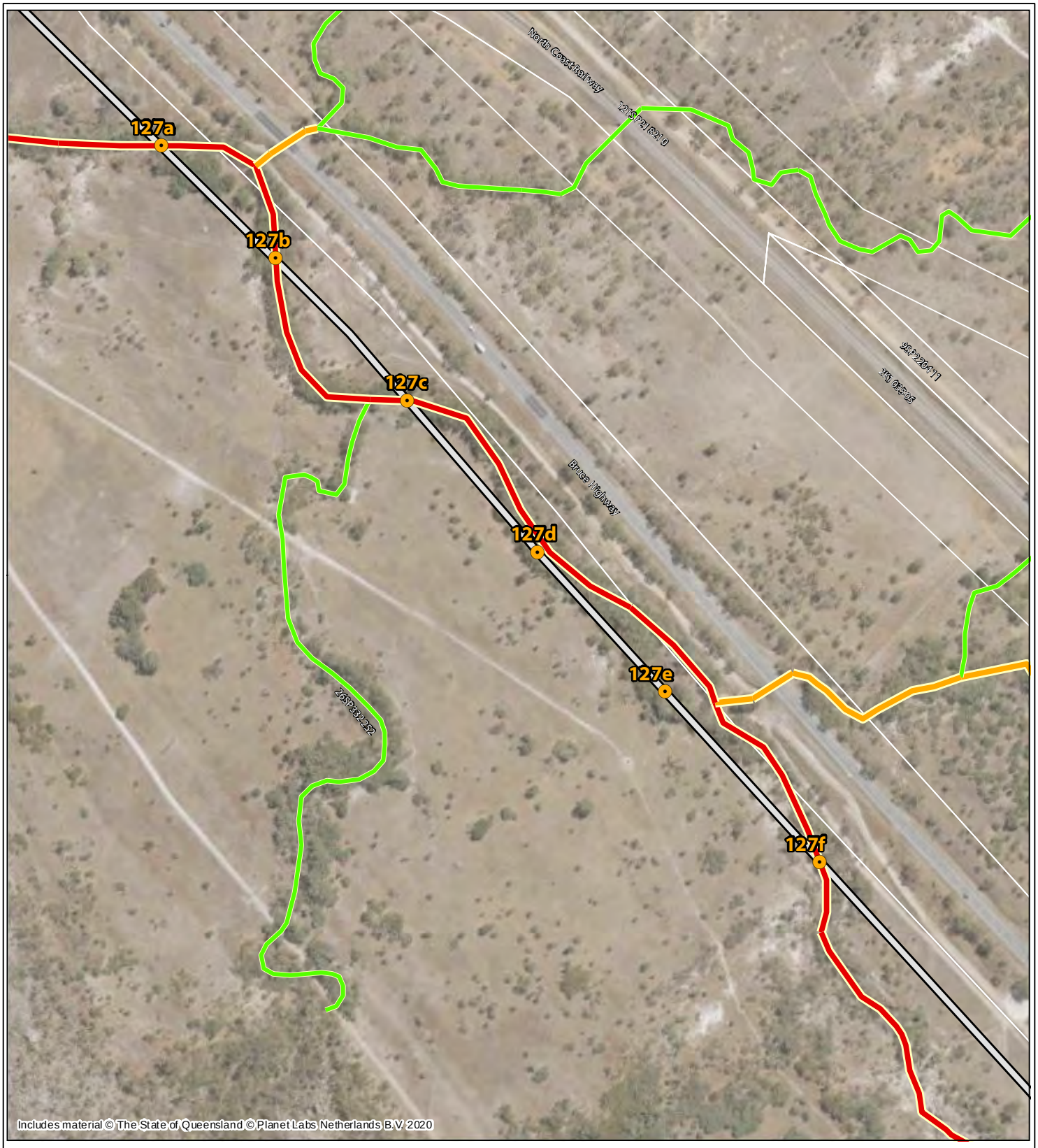
- Implementation of tunnel bore technique to minimise impacts on the creek and watercourse system;
- Further detailed seasonal studies required to assist in the preparation of area specific environmental management plan(s).

Overview	Comment	
Site #	127 (f)	
Stream Order	3	
Field Determination	**Formed Creek (Little Goodbye Creek)** Riparian vegetation species in this waterway are limited and no adjacent vegetation is present. A vegetated channel without water was present, and discontinuous bed and bank features were observed. This waterway was somewhat weed infested.	
Prelim. Recommendation Rating	Moderate	
Final Recommendation Rating	Moderate	
GPS location	-20.00685° N	148.09586° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks	
Average Bankful Width	12m	
Dominant Substrate	Soils associated with landzone 3	
Variety of Habitats	No habitat features	
Flow regime	Ephemeral	
Channel shading	40%	
Macrophytes	Absent	

Vegetation within the mapped drainage feature is dominated by *Melaleuca leucadendra* (Weeping Paperbark), *Pandanus spp.*, with *Imperata cylindrica* (Blady Grass) throughout the channel. The vegetation has been highly fragmented by road and rail infrastructure, and there is no adjacent vegetation as the surrounding land has been cleared. The dominant substrate was a mixture of sand and rock. The flow path consists of an eroded channel which has been historically altered by culvert upgrades and has no continuous bed and bank features. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area. No aquatic fauna were observed at the time of assessment. Pheasant coucal was observed on site, but no threatened flora or fauna listed under the EPBC Act or NCA.

Final Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Seasonal construction parameters apply.



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 127a - f

Site Number: 127a - f
Little Goodbye Creek

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:4,000 [GDA 2020 MGA Z55]

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



Upstream



Downstream



Left Bank



Right Bank



Upstream



Downstream



Left Bank



Right Bank



Upstream



Downstream



Left Bank



Right Bank



Upstream



Downstream



Left Bank



Right Bank



Upstream



Downstream



Left Bank



Right Bank



2.128. Site 128 Summary

Overview	Comment
Site #	128
Stream Order	1
Field Determination	**Formed Creek (Magnetic Creek Tributary)** Riparian vegetation species in this waterway are limited and no adjacent vegetation is present. A vegetated channel with standing pools of water was present, and continuous bed and bank features were observed. Macrophytes were absent.
Prelim. Recommendation Rating	Moderate
Final Recommendation Rating	Moderate
GPS location	-20.01240° N 148.10260° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	6-8m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Some remnant vegetation adjacent to waterway. Habitat features present within remnant vegetation.
Flow regime	Ephemeral
Channel shading	30%
Macrophytes	Present

General description and habitat attributes

Vegetation within the mapped waterway is dominated by *Melaleuca leucadendra* (Weeping Paperbark), *Pandanus spp.*. Along the banks are *Corymbia tessellaris* (Moreton Bay Ash), *Corymbia intermedia* (Pink Bloodwood), and *Eucalyptus platyphylla* (White Gum). Adjacent vegetation is primarily least concern remnant R.E. 11.2.7 which is dominated by *Eucalyptus crebra* (Narrow-leaved Ironbark) and includes *Alphitonia excelsa* (Soap Tree), *Corymbia tessellaris* (Moreton Bay Ash), *Corymbia intermedia* (Pink Bloodwood), *Ficus racemosa* (Clustered Fig), *Planchonia careya* (Cocky Apple), and *Corymbia erythrophloia* (Variable-barked Bloodwood), as well as *Sorghum halepense* (Johnson Grass), *Heteropogon contortus* (Black Speargrass), and *Themeda quadrivalvis* (Grader Grass). The dominant substrate was sand. The flow path consists of a shallow channel with continuous bed and bank features. At the time of field survey there were standing pools of water in the waterway. Habitat features were absent. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Feature specific management plan(s) required (e.g. VMP/FMP);
- Seasonal construction parameters apply.



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 128

Site Number: 128
Magnetic Creek Tributary

Field Assessment
Risk Rating: Moderate

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.129. Site 129 Summary

Overview	Comment
Site #	129
Stream Order	1
Field Determination	**Drainage feature** Riparian vegetation species in this drainage feature are limited, macrophytes were absent. A shallow, eroded channel was present, no bed or bank features were observed, but at the time of surveying some standing pools of water were present. Limited riparian species present and culvert upgrade indicates this drainage feature pools water for a short period immediately following rainfall.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-20.01268° N 148.10543° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	8 – 10m
Dominant Substrate	Bedrock
Variety of Habitats	Cattle grazing paddocks. Habitat features limited.
Flow regime	Ephemeral
Channel shading	20%
Macrophytes	Absent

General description and habitat attributes

Vegetation within the area is dominated by *Pandanus spp.* and *Eucalyptus crebra* (Narrow-leaved Ironbark). Vegetation along the bank is predominantly *Acacia spp.* regrowth. The flow path consists of a shallow, eroded channel without bed and bank features. At the time of field survey there were standing pools of water in the waterway. Habitat features were absent. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s)



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 129

Site Number: 129
Magnetic Creek Tributary

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.130. Site 130 Summary

Overview	Comment
Site #	130
Stream Order	2
Field Determination	**Drainage feature**
	Drainage feature with discontinuous beds and banks. Riparian vegetation present. Macrophytes are absent. The creek contained no volume of water flowing during the field assessment and a high weed count upstream and downstream. The beds and banks of the creek are heavily eroded.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-20.01098° N 148.11035° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	10m
Dominant Substrate	Rock
Variety of Habitats	Cleared open paddocks and riparian vegetation. Limited habitat features.
Flow regime	Ephemeral
Channel shading	25%
Macrophytes	Absent

General description and habitat attributes

Vegetation within the riparian zone is dominated by *Melaleuca leucadendra* (Weeping Paperbark), and *Pandanus spp.*. Along the banks was vegetation consistent with least concern R.E. 11.12.7, such as *Corymbia erythrophloia* (Variable-barked Bloodwood), *Lophostemon grandiflorus* (Northern Swamp Box), *Corymbia tessellaris* (Moreton Bay Ash), *Ficus racemosa* (Clustered Fig), and *Planchonia careya* (Cocky Apple), as well as *Sorghum halepense* (Johnson Grass), *Heteropogon contortus* (Black Speargrass), and *Themeda quadrivalvis* (Grader Grass). The beds and banks of the formed creek are discontinuous. The creek has an obvious flow path, with no volume of permanent water flowing or present. No aquatic fauna was observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s)



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 130

Site Number: 130
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.131. Site 131 Summary

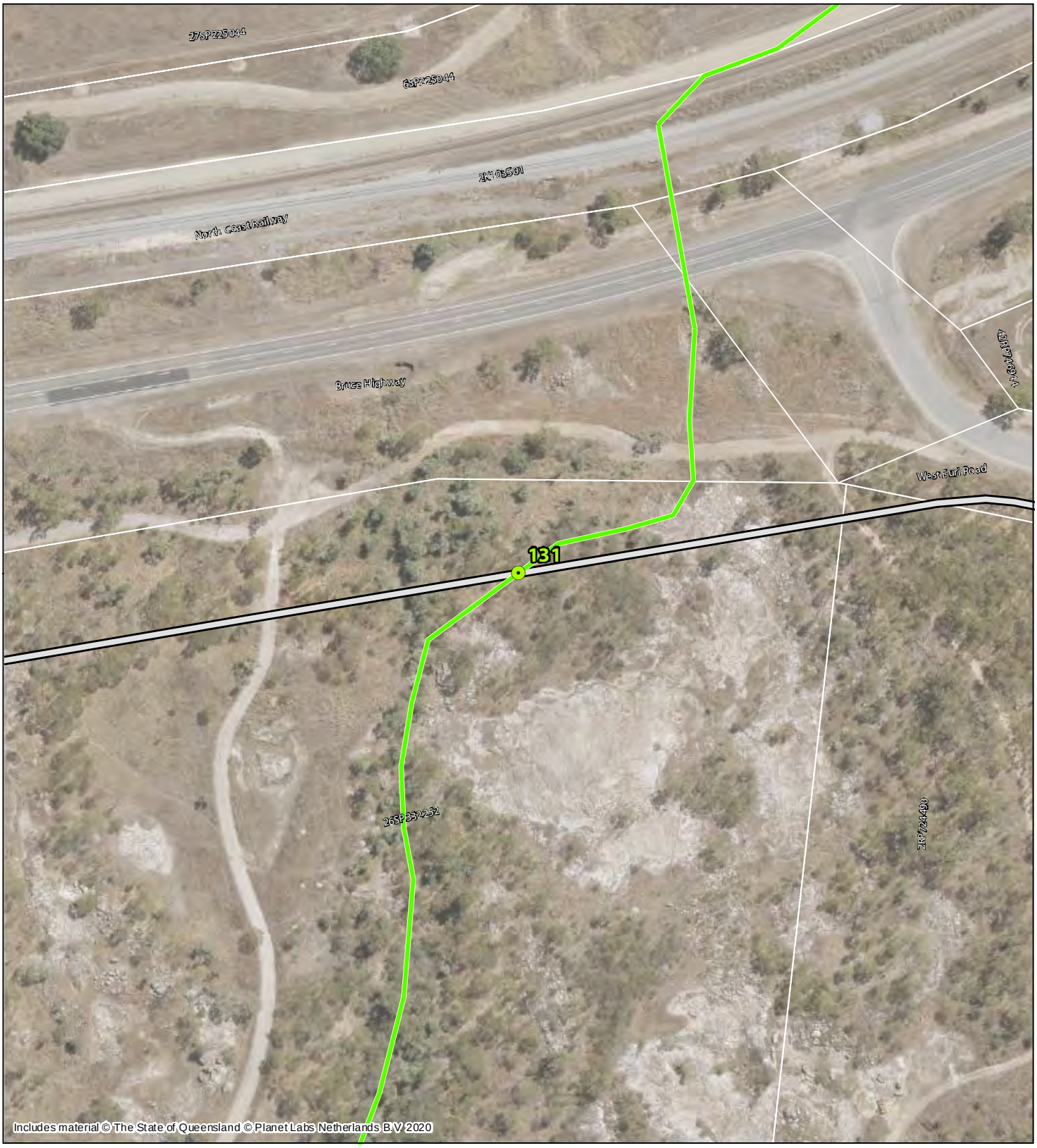
Overview	Comment
Site #	131
Stream Order	1
Field Determination	**Drainage Feature**
	Limited riparian vegetation and leaf litter substrate indicates this drainage feature pools water for a short period immediately following rainfall. Discontinuous bed and bank features were observed.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-20.01021° N 148.11577° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Leaf Litter
Variety of Habitats	Cleared open paddocks and agricultural farming. Habitat features absent
Flow regime	Ephemeral
Channel shading	55%
Macrophytes	Absent

General description and habitat attributes

Vegetation within the mapped drainage feature is dominated by *Pandanus spp.*, scattered *Eucalyptus platyphylla* (White Gum), and *Acacia spp.* regrowth. The flow path has been historically altered by adjacent agricultural farming and culvert upgrades, no bed and banks features were observed. Habitat features were absent due to the historical and current agricultural practices and infrastructure upgrades. No aquatic fauna were observed at the time of assessment. Kookaburra was observed on site, but no threatened flora or fauna listed under the EPBC Act or NCA.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 131

Site Number: 131
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.132. Site 132 Summary

Overview	Comment
Site #	132
Stream Order	1
Field Determination	**Drainage Feature**
	Discontinuous bed and bank features with limited riparian vegetation. The flow path has been modified by road infrastructure. No sign of permanent flow or potential for pooling water.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-20.01187° N 148.12273° E (GDA 2020-MGA 55)
Local land use	Agriculture and remnant vegetation
Average Bankful Width	5m where present
Dominant Substrate	Sandy
Variety of Habitats	Remnant vegetation and limited riparian vegetation. Flow path dominated by exotic grasses. Habitat features limited.
Flow regime	Ephemeral
Channel shading	20%
Macrophytes	Absent

General description and habitat attributes

The drainage feature is mapped as a Stream order 1 VMA watercourse and a low waterway under the *Fisheries Act 1994*. On-ground surveys found the drainage feature to be a highly disturbed as a result of road infrastructure, with Earl Road running directly through the mapped flow path. Riparian vegetation included *Pandanus spiralis* (Screw Palm), *Alphitonia excelsa (*Soap Tree*), Melaleuca leucadendra* (Weeping Paperbark), and Acacia species upstream. The flow path contained discontinuous bed and bank features. The surrounding vegetation is mapped as remnant 11.12.7/11.12.4. Species present include *Eucalyptus crebra* (Narrow-leaved Ironbark) which indicate RE11.12.7 however limited evidence of RE11.12.4 (vine thicket). No threatened flora or fauna listed under the EPBC Act or NCA were observed.

Recommendations

'- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 132

Site Number: 132
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.133. Site 133 Summary

Overview	Comment
Site #	133
Stream Order	1
Field Determination	**Un-named Drainage Feature** Defined channel with bed and bank features. Riparian vegetation present, macrophytes or pools within channel were absent indicating this creek pools water for a short period immediately following rainfall.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-20.01245° N 148.12811° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	1-2m
Dominant Substrate	Sand
Variety of Habitats	Grazing paddocks, agricultural land and riparian vegetation. Habitat features limited.
Flow regime	Ephemeral
Channel shading	25%
Macrophytes	Absent

General description and habitat attributes

Observed channel with distinguishable bed and bank features and riparian vegetation present including *Melaleuca leucadendra* (Weeping Paperbark) and *Melaleuca fluviatilis* (River Tea-tree). *Corymbia tessellaris* (Moreton Bay Ash), *Eucalyptus platyphylla* (White Gum), and *Nauclea orientalis* (Leichhardt Tree) present throughout. No aquatic fauna was observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 133

Site Number: 133
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.134. Site 134 Summary

Overview	Comment
Site #	134
Stream Order	2
Field Determination	**Formed Creek (Euri Creek western branch)** Formed creek with distinguishable beds and banks. Riparian vegetation present and intact, while macrophytes absent due to sandy creek bed. The creek contained no permanent water flowing during the field assessment.
Prelim. Recommendation Rating	High
Final Recommendation Rating	High
GPS location	-20.01226° N 148.12927° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	15-20m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Riparian vegetation and adjacent vegetation community(s).
Flow regime	Semi-permanent
Channel shading	40%
Macrophytes	Absent

General description and habitat attributes

The beds and banks of the formed creek are distinguishable, with the riparian zone present and intact, while the macrophytes absent. The riparian vegetation included *Melaleuca leucadendra* (Weeping Paperbark), *Lophostemon grandifloras* (Northern Swamp Box), *Melaleuca fluviatilis* (River Tea-tree), *Pandanus spp., Corymbia tessellaris* (Moreton Bay Ash), *Eucalyptus tereticornis* (Forest Red Gum) and *Nauclea orientalis* (Leichhardt Tree). The creek bed is dominated by sand, with a high level of erosion in sections of the creek bank. The riparian zone understorey is weeded with *Sorghum halepense* (Johnson Grass) and *Sporobolus fertilis* (Parramatta Grass). No aquatic fauna was observed at the time of assessment. *Eucalyptus raveretiana* (Black Ironbox) was observed within the proposed linear infrastructure. It is not anticipated that *Eucalyptus raveretiana* (Black Ironbox) will impacted due to the utilisation the tunnel bore technique. No other threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Implementation of tunnel bore technique to minimise impacts on the creek and watercourse system;
- Further detailed seasonal studies required to assist in the preparation of area specific environmental management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 134

Site Number: 134
Euri Creek Tributary

Field Assessment
Risk Rating: High

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.135. Site 135 Summary

Overview	Comment
Site #	135
Stream Order	6
Field Determination	**Formed Creek (Euri Creek)**
	Formed creek with distinguishable beds and banks. Riparian vegetation present and intact, while macrophytes absent due to sandy and extremely dynamic creek bed. The creek contained a low volume of permanent water flowing during the field assessment.
Prelim. Recommendation Rating	Major
Final Recommendation Rating	Major
GPS location	-20.01181° N 148.13082° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	45-60m
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Riparian vegetation, permanent water flowing and pooling and adjacent vegetation community(s).
Flow regime	Permanent
Channel shading	<5%
Macrophytes	Absent

General description and habitat attributes

The beds and banks of the formed creek are distinguishable, with the riparian zone present and intact, while the macrophytes absent. The riparian vegetation included *Melaleuca leucadendra* (Weeping Paperbark), *Lophostemon grandifloras* (Northern Swamp Box), *Ficus coronata* (Sandpaper Fig), *Pandanus spp.* and *Corymbia tessellaris* (Moreton Bay Ash). The creek bed is dominated by sand, with a high level of erosion in sections of the creek bank. The riparian zone understorey is weeded with *Sorghum halepense* (Johnson Grass) and *Sporobolus fertilis* (Parramatta Grass). The creek has an obvious flow path, with a low volume of permanent water flowing and pooling. No aquatic fauna was observed at the time of assessment. *Eucalyptus raveretiana* (Black Ironbox) was observed within the waterway, however, will not be impacted during the instatement of the proposed linear infrastructure. Further, no other threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Implementation of tunnel bore technique to minimise impacts on the creek and watercourse system;
- Further detailed seasonal studies required to assist in the preparation of area specific environmental management plan(s).

Site #	**135 (Flora)**	
Location:	**Euri Creek**	
	Scientific Name	**Common Name**
T1/T2	*Allocasuarina cunninghamii*	River Sheoak
	Corymbia dallachiana	Ghost Gum
	Corymbia tessellaris	Moreton Bay Ash
	Eucalyptus raveretiana	Black Ironbox
	Lophostemon grandiflorus	Northern Swamp Box
	Melaleuca fluviatilis	River Tea-tree
	Melaleuca leucadendra	Weeping Paperbark
	Melaleuca viminalis	Weeping Tea-tree
	Nauclea orientalis	Yellow Cheesewood
	Argemone mexicana	Mexican Poppy
Shrub/Ground	*Argyreia nervosa*	Woodrose
	Chloris gayana	Rhodes Grass
	Eucalyptus platyphylla	White Gum
	Euphorbia sp.	-
	Ficus racemosa	Clumping Fig
	Gomphrena celosioides	Gomphrena Weed
	Imperata cylindrica	Blady Grass
	Leucaena leucocephala	Leucaena
	Melinis repens	Red Natal Grass
	Passiflora foetida	Stinking Passionflower
	Sorghum halapense	Wild Sorghum
	Stylosanthes scabra	Shrubby Stylo
	Themeda quadrivalvis	Grader Grass
	Tridax procumbens	Tridax Daisy
	Xanthium occidentale	Noogoora Burr
	Zizyphus mauritiana	Chinee Apple

Site #	**135 (Fauna)**	
Location:	**Euri Creek**	
	Scientific Name	**Common Name**
	Aquila audax	Wedge-tailed Eagle (Fly-over)
	Cacatua galerita	Sulphur Crested Cockatoo
	Canis familiaris	Dog (Footprints)
	Coracina novaehollandiae	Black-faced Cuckoo Shrike
	Corvus orru	Torresian Crow
	Cracticus nigrogularis	Pied Butcherbird
	Cracticus tibicen	Australian Magpie
	Dacelo leachii	Blue Winged Kookaburra
	Ephippiorhynchus asiaticus	Black-necked Stork (Spotlighting)
	Falco berigora	Brown Falcon
	Grallina cyanoleuca	Peewee Mudlark
	Haliastur sphenurus	Whistling Kite
	Hirundo neoxena	Welcome Swallow

Lichenostomus flavus	Yellow Honeyeater
Litoria caerulea	Green Tree Frog
Litoria rothii	Roth's Tree Frog
Macropus giganteus	Eastern Grey Kangaroo
Manorina melanocephala	Noisy Minor
Merops ornatus	Rainbow Bee-eater (Fly-over)
Milvus migrans	Fork-tailed Kite
Ninox boobook	Mopoke Owl
Phalacrocoracidae	Cormorant
Poecilia reticulata	Guppies
Rhinella marina	Cane Toad
Rhipidura leucophrys	Willy Wagtail
Sus scrofa	Wild Pig (Scats)
Taeniopygia bichenovii	Double-barred Finch
Todiramphus sanctus	Sacred Kingfisher
Trichoglossus moluccanus	Rainbow Lorikeet



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 135

Site Number: 135
Euri Creek

Field Assessment
Risk Rating: Major

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.136. Site 136 Summary

Overview	Comment
Site #	136
Stream Order	1
Field Determination	**Drainage Feature**
	No defined channel indicates this drainage feature pools water for a short period immediately following rainfall. Water gathering within low-lying depression. This waterway was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-20.02582° N 148.13868° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cleared open paddocks and agricultural farming. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

Vegetation within the mapped drainage feature is dominated by *Megathyrsus maximus* (Guinea Grass), *Ziziphus mauritiana* (Chinee Apple), and *Cryptostegia grandiflora* (Rubber Vine). Scattered Eucalyptus crebra (Narrow-leaved Ironbark) are present further east were Category B (Remnant) vegetation is mapped. The flow path has been historically altered by access tracks and agricultural farming with clearing up to the western fenceline of the road reserve, no continuous bed and bank features were observed. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 136

Site Number: 136
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.137. Site 137 Summary

Overview	Comment
Site #	137
Stream Order	1
Field Determination	**Drainage Feature**
	No Riparian vegetation or defined channel indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were absent. This waterway was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-20.02975° N 148.13653° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cleared open paddocks and agricultural farming. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

Vegetation within the mapped drainage feature is dominated by *Megathyrsus maximus* (Guinea Grass), *Ziziphus mauritiana* (Chinee Apple) and *Cryptostegia grandiflora* (Rubber Vine). Scattered *Eucalyptus crebra* (Narrow-leaved Ironbark) are present further east. The flow path has been historically altered by access tracks and agricultural farming with clearing up to the western fenceline of the road reserve, no continuous bed and bank features were observed. No aquatic fauna were observed at the time of assessment. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 137

Site Number: 137
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.138. Site 138 Summary

Overview	Comment
Site #	138
Stream Order	1
Field Determination	**Drainage Feature**
	No Riparian vegetation or defined channel indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were absent. This waterway was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-20.03251° N 148.13619° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	Absent
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cleared open paddocks and agricultural farming. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Absent

General description and habitat attributes

Vegetation within the mapped drainage feature is dominated by *Cryptostegia grandiflora* (Rubber Vine) and *Sporobolus fertilis* (Parramatta Grass), *Megathyrsus maximus* (Guinea Grass), *Ziziphus mauritiana* (Chinee Apple). *Argyreia nervosa* (Elephant Ear Vine) *and Vachellia farnesiana* (Prickly Acacia). The flow path has been historically altered by access tracks and agricultural farming, no continuous bed and bank features were observed. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area with clearing up to the western fence line of the road reserve, no continuous bed and bank features were observed. No aquatic fauna were observed at the time of assessment threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 138

Site Number: 138
Un-named creek

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.139. Site 139 Summary

Overview	Comment
Site #	139
Stream Order	1
Field Determination	**Drainage feature** No Riparian vegetation or defined channel indicates this drainage feature pools water for a short period immediately following rainfall. Continuous bed and bank features were absent. This waterway was heavily weed infested.
Prelim. Recommendation Rating	Low
Final Recommendation Rating	Low
GPS location	-20.04414° N 148.13477° E (GDA 2020-MGA 55)
Local land use	Cattle grazing paddocks and agricultural farming
Average Bankful Width	2m discontinuous
Dominant Substrate	Soils associated with landzone 3
Variety of Habitats	Cleared open paddocks and agricultural farming. Habitat features absent
Flow regime	Ephemeral
Channel shading	0%
Macrophytes	Present

General description and habitat attributes

Vegetation within the mapped drainage feature is dominated by *Melinis minutiflora* (Molasses Grass*)*. With *Typha orientalis* (Typha) indicating flow path. The flow path has been historically altered by access tracks and agricultural farming, no continuous bed and bank features were observed. Habitat features were absent due to the historical agricultural practices and infrastructure upgrades in the area with clearing up to the western fence line of the road reserve, no continuous bed and bank features were observed. No aquatic fauna were observed at the time of assessment threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Generic management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 139

Site Number: 139
WW 4 2023

Field Assessment
Risk Rating: Low

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank



2.140. Site140 Summary

Overview	Comment	
Site #	140	
Stream Order	3	
Field Determination	**Modified Creek**	
	Scattered riparian vegetation with semi-permanent/permanent water and continuous bed and bank features. This flow path has been highly modified by a series of access tracks that cross the waterway at the alignment. The channel becomes significantly wider downstream. This waterway was heavily weed infested. At the time of survey flowing water and fish were present.	
Prelim. Recommendation Rating	High	
Final Recommendation Rating	High	
GPS location	-20.05344° N	148.13809° E (GDA 2020-MGA 55)
Local land use	Agricultural farming	
Average Bankful Width	6m	
Dominant Substrate	Soils associated with landzone 3	
Variety of Habitats	Cleared open paddocks and agricultural farming. Aquatic habitat features present.	
Flow regime	Semi-permanent/Permanent	
Channel shading	25%	
Macrophytes	Present	

General description and habitat attributes

Vegetation within the mapped flow path is dominated by exotic *Leucaena leucocephala* (Leucaena) with scattered Pandanus species. These species do not align with the species expected from the mapped RE 11.3.7 along the waterway, indicating a high level of modification and disturbance likely as a result of the surrounding agricultural land uses. The waterway has also been modified by the presence of access tracks, with multiple crossings occurring at the alignment. Nevertheless, relatively continuous bed and bank features and fish were observed. Habitat features were present in the form of aquatic habitat. No threatened flora or fauna listed under the EPBC Act or NCA were observed across the site.

Recommendations

- Implementation of tunnel bore technique to minimise impacts on the creek and watercourse system;
- Further detailed seasonal studies required to assist in the preparation of area specific environmental management plan(s).



Legend

- Qld DCDB
- Bowen Pipeline
- Intake location / pump stations

Risk rating field assessment

- Absent
- Low
- Moderate
- High
- Major

Current DAF risk rating

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major

Figure 140

Site Number: 140
Formed Creek

Field Assessment
Risk Rating: High

File ref. 8704 E Appendix D Flowpath Assessment H
Date *28/02/2024*
Project *Bowen Pipeline*

0 20 40 60 *m*

Scale (A4): 1:1,500 [GDA 2020 MGA Z55]

N

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Layer Sources QLD GIS Layers (QLD Gov. Information Service 2023), Bowen Pipeline (Bowen Pipeline Company Pty Ltd, 2023)

Upstream



Downstream



Left Bank



Right Bank

