Whitehaven

Blackwater North Extension Project

Appendix D
Terrestrial Ecological Assessment



Blackwater North Extension Project - Terrestrial Ecological Assessment

9 April 2026

Whitehaven Blackwater Pty Ltd
Level 31, 12 Creek Street, Brisbane, QLD, 4000



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Definitions

Term	Definition
Broad vegetation group	A pragmatic, higher level grouping of regional ecosystems and vegetation communities that provide an overview of the vegetation across Queensland (Neldner et al., 2025). They describe major ecological patterns and relationships across Queensland, independent of bioregions and land zones, and facilitate comparisons with vegetation in other States and internationally.
Disturbance Footprint	The approximately 2,316.58 ha (rounded to 2,317 ha) area in which Whitehaven plans to develop infrastructure and conduct mining operation for the Project.
Environmentally sensitive area	Environmentally sensitive areas as described in the Queensland *Environmental Protection Regulation 2019*.
Groundwater dependent ecosystem	Ecosystems that require access to groundwater to meet all or some of their water requirements on a permanent or intermittent basis for maintenance of the ecosystem (Richardson et al., 2011).
High-value regrowth	Vegetation communities that conform with the definition under the VM Act and referenced by Neldner et al. (2025). Specifically, this comprises native vegetation regrowth that is greater than 15 years old and meets the minimum cover requirements specified by Neldner et al. (2025).
Non-remnant vegetation	All vegetation that is not mapped as remnant vegetation. May include regrowth, heavily thinned or logged and significantly disturbed vegetation that fails to meet the structural and/or floristic characteristics of remnant vegetation. It also includes urban and cropping land (Neldner et al., 2025).
Regional ecosystem	A vegetation community in a bioregion that is consistently associated with a particular combination of geology, landform and soil (Neldner et al., 2025). Regional ecosystems are described in the Regional Ecosystem Description Database, produced by the Queensland Herbarium.
Remnant vegetation	A regional ecosystem that has not undergone recent clearing. It is defined under the Queensland *Vegetation Management Act 1999* as: forming the predominant canopy of the vegetation— (i) covering more than 50% of the undisturbed predominant canopy; and (ii) averaging more than 70% of the vegetation's undisturbed height; and (iii) composed of species characteristic of the vegetation's undisturbed predominant canopy.
The Project	The extension to current mining activities associated with Environmental Authority (EA) EPML00717813, i.e. the Blackwater Mine North Extension Project.
Threatened Ecological Community	An ecological community is a naturally occurring group of native plants, animals and other organisms that are interacting in a unique habitat. Its structure, composition and distribution are determined by environmental factors such as soil type, position in the landscape, altitude, climate and water availability. Threatened ecological communities are listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Term	Definition
Threatened species	A threatened species is any plant or animal species that is at risk of extinction. Species listed as extinct (EX), extinct in the wild (XW), critically endangered (CE), endangered (E), vulnerable (V) or conservation dependent (CD) under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* or extinct (EX), extinct in the wild (XW), critically endangered (CE), endangered (E), vulnerable (V) under the Queensland *Nature Conservation Act 1992*.
Study Area	An area located in Mining leases (ML) 1759 and ML 1762 covering approximately 6,907.49 ha in which E2M have undertaken the terrestrial ecological assessment.
Vegetation community	An area of vegetation which is relatively uniform with respect to structure and floristic composition (Neldner et al., 2025).
Wet season survey	The wet season ecological assessment conducted in March 2025 by E2M targeting ecological matters suitable for wet season conditions.

Abbreviations

Abbreviation	Description
ALA	Atlas of Living Australia
AU	Assessment unit
Biosecurity Act	Queensland *Biosecurity Act 2014*
BoM	Bureau of Meteorology
Bonn	Convention on the Conservation of Migratory Species of Wild Animals/Bonn Convention
Brigalow TEC	Brigalow (*Acacia harpophylla* dominant and co-dominant) Threatened Ecological Community
BVGs	Broad Vegetation Groups
BWM	Blackwater Mine
CAMBA	China-Australia Migratory Bird Agreement
CHPP	Coal handling and preparation plant
DAF	Department of Agriculture and Fisheries
DAWE	Former Commonwealth Department of Agriculture, Water and the Environment (now DCCEEW)
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DEE	Former Commonwealth Department of the Environment and Energy (now DCCEEW)
DEHP	Former Queensland Department of Environment and Heritage Protection (now DETSI)
DES	Former Queensland Department of Science (now DETSI)
DETSI	Queensland Department of Environment, Tourism and Science and Innovation
DEWHA	Former Commonwealth Department of the Environment, Water, Heritage and the Arts (now DCCEEW)
DotE	Former Commonwealth Department of the Environment (now DCCEEW)
DNRMMRRD	Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development
DSEWPaC	Former Commonwealth Department of Sustainability, Environment, Water, Population and Communities (now DCCEEW)
E2M	E2M Pty Ltd
EA	Environmental Authority
EMM	EMM Pty Ltd
EO Act	Queensland *Environmental Offsets Act 2014*
EO Policy	The Environmental Offsets Policy 2022 Version 1.12
EO Regulation	Queensland *Environmental Offsets Regulation 2014*

Abbreviation	Description
EP Act	Queensland *Environment Protection Act* 1994
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
EP Regulation	Queensland *Environmental Protection Regulation 2019*
ESA	Environmentally Sensitive Areas
GBRMP	Great Barrier Reef Marine Park
GMMP	Groundwater Monitoring and Management Program
GDE	Groundwater dependent ecosystem
HEC	High Ecological Significance
HEV	High Ecological Value
IBRA	Interim Biogeographic Regionalisation of Australia
IUCN	Internation Union for Conservation of Nature
JAMBA	Japan-Australia Migratory Bird Agreement
KoRV	Koala retrovirus
LGA	Local Government Area
LIKT	Locally important Koala tree
MHQA	Modified Habitat Quality Guide
ML	Mining lease
MNES	Matters of National Environmental Significance
MNES SIA Guidelines	*EPBC Act Matters of National Environmental Significance: Significant Impact Guidelines 1.1*
MSES SRI Guideline	*Queensland Environmental Offsets Policy – Significant Residual Impact Guideline*
MSES	Matters of State Environmental Significance
NC Act	Queensland *Nature Conservation Act 1992*
NRM	Natural Resource Management
OAG	Offset assessment guide
PEM	Prescribed Environmental Matter
PMST	Protected Matters Search Tool
Poplar box TEC	Poplar box Grassy Woodland on Alluvial Plains Threatened Ecological Community
RE	Regional ecosystem
REDD	Regional Ecosystem Description Database
ROKAMBA	Republic of Korea-Australia Migratory Bird Agreement
ROM	Run-of-mine

Abbreviation	Description
SA	Surface Area
SAT	Koala spot assessment technique
SEVT TEC	Semi Evergreen Vine Thicket Threatened Ecological Community of the Brigalow Belt (North and South) and Nandewar Bioregions
SO	Stream Order
SPRAT	Species Profile and Threats Database
SRI Guideline	*Queensland Environmental Offsets Policy: Significant Impact Guideline*
TCP	Thermal coal plant
TEC	Threatened ecological community
TSSC	Threatened Species Scientific Committee
VM Act	Queensland *Vegetation Management Act 1999*
Whitehaven	Whitehaven Coal Ltd
Whitehaven Blackwater	Whitehaven Blackwater Pty Ltd
WoNS	Weeds of National significance

Executive Summary

E2M Pty Ltd (E2M) was engaged by Whitehaven Blackwater Pty Ltd (Whitehaven Blackwater) to conduct a desktop assessment and field surveys to validate and characterise ecological values of interest to the proposed extension of the existing Blackwater Mine (BWM) south-west of the town of Blackwater, hereby referred to as the Project. The purpose of the assessment was to identify and evaluate terrestrial Matters of National Environmental Significance (MNES), Matters of State Environmental Significance (MSES) and Environmentally Sensitive Areas (ESAs) that have potential to be impacted by the Project. This report summarises the desktop and subsequent field assessments undertaken by E2M within the Study Area as well as the results from previous field surveys conducted by EMM Pty Ltd (EMM).

The Study Area is located on approximately 6,907.49 hectares (ha) of predominately gently undulating to flat landscape. It has a long history of cattle grazing and the environment has been subject to past clearance and modification. The majority of the Study Area consists of improved/disturbed pasture dominated by non-native grasses and *Acacia harpophylla* (Brigalow) regrowth shrublands. These areas have been subject to livestock impacts, pasture improvement and weed encroachment.

The initial EMM surveys occurred between 2018 and 2020 and identified a number of MNES and MSES for consideration to the Project. Further surveys conducted by E2M occurred throughout 2025 included a wet season survey (flora and fauna) in March, late wet season surveys (habitat quality) in April and May and a dry season survey (flora and fauna) in September and October. Initial desktop findings and previous field results from EMM surveys revealed a number of environmental matters known, likely or possibly occurring within the Study Area, including both threatened and/or migratory species and ecological communities listed under State and Commonwealth legislation. Further, E2M field surveys re-confirmed the presence of *Solanum elachophyllum*, Brigalow Threatened Ecological Community (TEC), Fork-tailed swift and regional ecosystems (RE) listed as endangered and vulnerable under the Queensland (QLD) *Nature Conservation Act 1992* (NC Act).

Terrestrial ecological matters known to occur in the Study Area include:

- Eight MNES, including:
  - One TEC, namely Brigalow (*Acacia harpophylla* dominant and co-dominant) (Brigalow TEC) listed as endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
  - Five threatened fauna species listed under the EPBC Act:
    - Australian painted snipe (*Rostratula australis*) listed as endangered under the EPBC Act;
    - Koala (*Phascolarctos cinereus*) listed as endangered under the EPBC Act;
    - Latham's snipe (*Gallinago hardwickii*) listed as vulnerable under the EPBC Act;
    - Ornamental snake (*Denisonia maculata*) listed as vulnerable under the EPBC Act; and
    - Squatter pigeon (southern) (*Geophaps scripta scripta*) listed as vulnerable under the EPBC Act.
  - Migratory fauna species listed under the EPBC Act:
    - Fork-tailed swift (*Apus pacificus)*; and
    - Latham's snipe (*Gallinago hardwickii*).
- 16 MSES, including:
  - Regulated Vegetation including:
    - RE 11.3.1 listed as endangered under the *Vegetation Management Act 1999* (VM Act) and the Biodiversity Status.

- RE 11.4.9 listed as endangered under the VM Act and the Biodiversity Status.
- RE 11.9.5 listed as endangered under the VM Act and the Biodiversity Status.
- RE 11.3.2 listed as of concern under the VM Act.
- RE 11.3.3 listed as of concern under the VM Act.
- REs within a defined distance of a watercourse, including:
  - RE 11.3.1;
  - RE 11.3.2;
  - RE 11.3.3;
  - RE 11.3.6; and
  - RE 11.3.27.

- Protected wildlife habitat as defined in the QLD *Environmental Offsets Regulation 2014* (EO Regulation) for:
  - One threatened flora species, *Solanum elachophyllum* listed as endangered under the NC Act; and
  - Five threatened fauna species listed under the NC Act (as per EPBC threatened fauna listed species above).
- MSES Connectivity Areas comprising remnant vegetation, including State-significant and/or regionally important corridors linking areas of fauna habitat.
- ESAs, including three endangered REs classified as Category B ESAs.

Terrestrial ecological matters considered likely or possibly occurring within the Study Area include:

- MNES including:
  - Glossy ibis (*Plegadis falcinellus*); and
  - White-throated needletail (*Hirundapus caudacutus*).
- MNES and MSES including:
- South-eastern Glossy black-cockatoo (*Calyptorhynchus lathami lathami*);
- Painted honeyeater (*Grantiella picta*); and
  - Sharp-tailed sandpiper (*Calidris acuminata*).
- MSES including:
  - Short-beaked echidna (*Tachyglossus aculeatus*).

The majority (97.65 percent; 2,262.07 ha) of the Disturbance Footprint (2,316.58 ha rounded to 2,317 ha) has been historically cleared and is characterised as non-remnant. The Project would require the progressive removal of 3.93 ha of remnant vegetation and 39.78 ha of high value regrowth vegetation.

While the Project would avoid, mitigate, and manage environmental impacts associated with construction and operation, residual impacts on conservation significant matters will still occur. Assessment of residual impacts against relevant guidelines determine the Project is likely to result in a significant impact on:

- One MNES: Brigalow TEC.
- Two MSES:
  - Regulated vegetation, comprising endangered RE 11.3.1; and
  - Protected wildlife habitat for *Solanum elachophyllum*.

Habitat quality scoring has been undertaken for those MNES and MSES matters that are likely to be significantly impacted by the Project in line with the State and Commonwealth guidelines. Residual impacts on these matters would be offset in accordance the *EPBC Act Environmental Offsets Policy* and *Queensland Environmental Offsets Policy*.

1 Introduction

1.1 Purpose

This terrestrial ecological assessment was prepared by E2M Pty Ltd (E2M) for the Blackwater North Extension Project (the Project) as part of a major Environmental Authority (EA) amendment application and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) referral.

1.2 Project background

The Blackwater Mine (BWM) is an existing, open cut metallurgical coal mine located approximately 20 kilometres (km) south-west of Blackwater in the Bowen Basin, Queensland (Figure 1).

The BWM has been in operation since 1967 and operates in accordance with, amongst other authorisations, EA EPML00717813, granted under the QLD *Environmental Protection Act 1994* (EP Act).

The BWM is a joint venture between Whitehaven (70 percent [%]), Nippon Steel Corporation (20%) and JFE Steel Corporation (10%). Whitehaven Blackwater Pty Ltd (Whitehaven Blackwater), a wholly owned subsidiary of Whitehaven Coal Ltd (Whitehaven), is the operator of BWM.

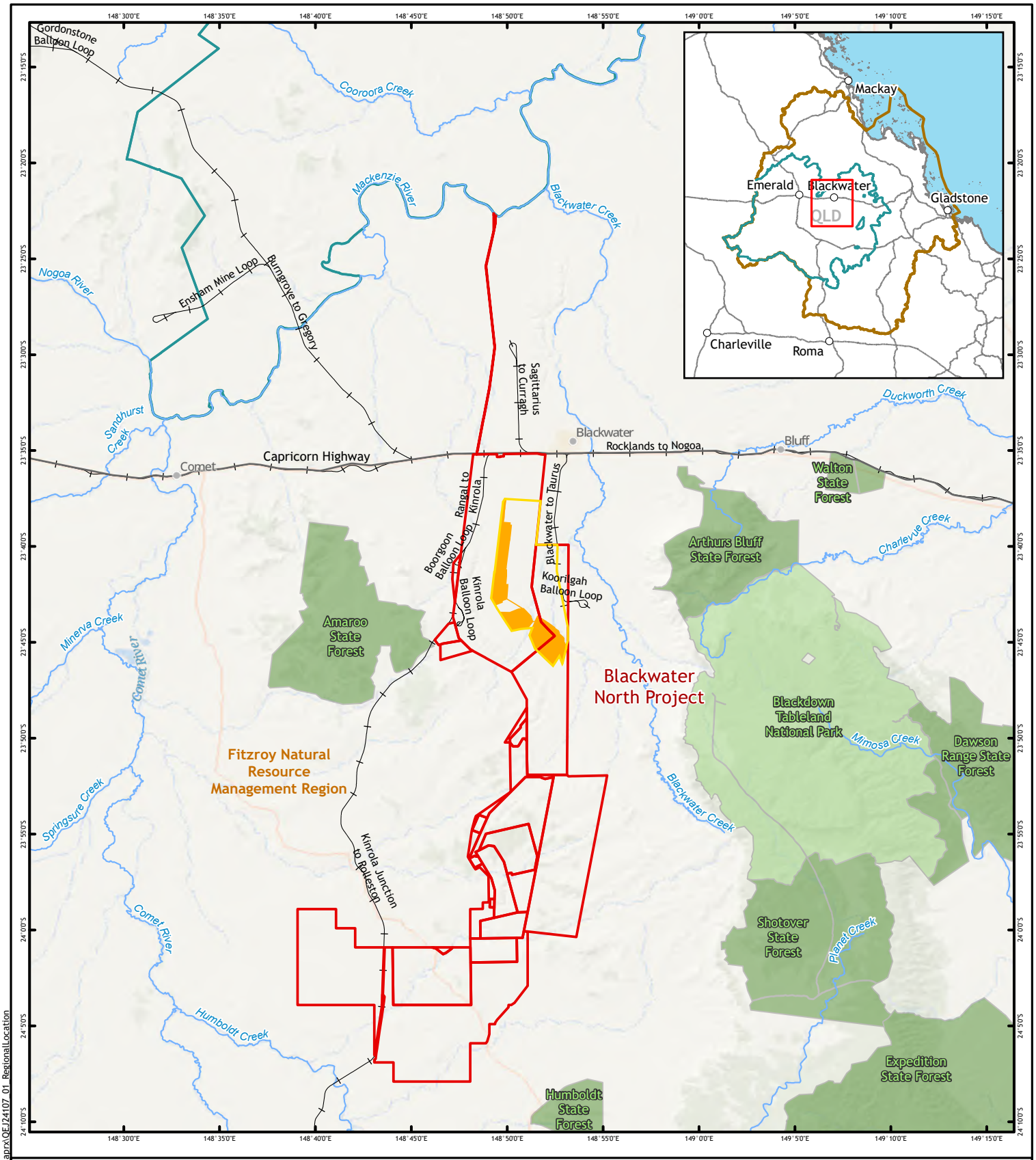
The existing BWM comprises a series of open-cut mining pits along an approximate 80 km long strike length. The BWM extracts coal using drill and blast methods, draglines, dozers and truck and shovel fleets for overburden removal and haulage. Existing infrastructure at BWM includes two rail spurs and balloon loops from the Bauhinia Railway Line, a coal handling and preparation plant (CHPP), thermal coal plant (TCP), product stockpiles, run-of-mine (ROM) coal stockpiles, tailings storage facility, in-pit spoil (i.e. overburden) dumps, train-load out facilities, water management infrastructure and other supporting infrastructure (e.g. haul roads, access roads, laydown areas, electricity transmission lines, workshops and offices).

Whitehaven Blackwater proposes to develop the Project, which would extend the current open cut mining development at the BWM to within Surface Area (SA) 7 on Mining Lease (ML) 1762 and SA 10 on ML 1759 (Figure 1 and Figure 2). The Project is expected to optimise mining operations at BWM allowing ongoing employment and economic benefits from the BWM to the local area, region and State of Queensland.

The Project would include the following activities:

- extension of open cut operations into SA 7 on ML1762 and SA 10 on ML1759 to allow mining of additional coal reserves to approximately 2055;
- extraction of an additional 200 million tonnes (Mt) (approximately) of ROM coal;
- continued extraction of up to 19 Mtpa of ROM coal;
- continued use of existing BWM infrastructure (e.g. CHPP, TCP, ROM and product coal stockpiles,
- train load-out, water management, tailings management and other supporting infrastructure);
- construction and operation of new water management and water storage infrastructure in support of extended mining operations;
- development of waste rock emplacement areas;
- continued co-disposal of coarse rejects with waste rock and disposal of tailings into an approved tailings storage facility or in-pit void;
- construction of semi-permanent tailings cells to be utilised for the disposal of fine rejects;

- progressive rehabilitation of the Project;
- ongoing exploration activities in the Project area; and
- other associated infrastructure, equipment and activities.



Legend

- Railway
- Road
- Watercourse
- Study Area
- Blackwater Mining Lease
- Disturbance Footprint
- NRM Region
- Isaac Regional Council

Protected Area

- National Park
- State Forest

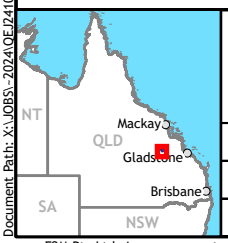
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Kilometres

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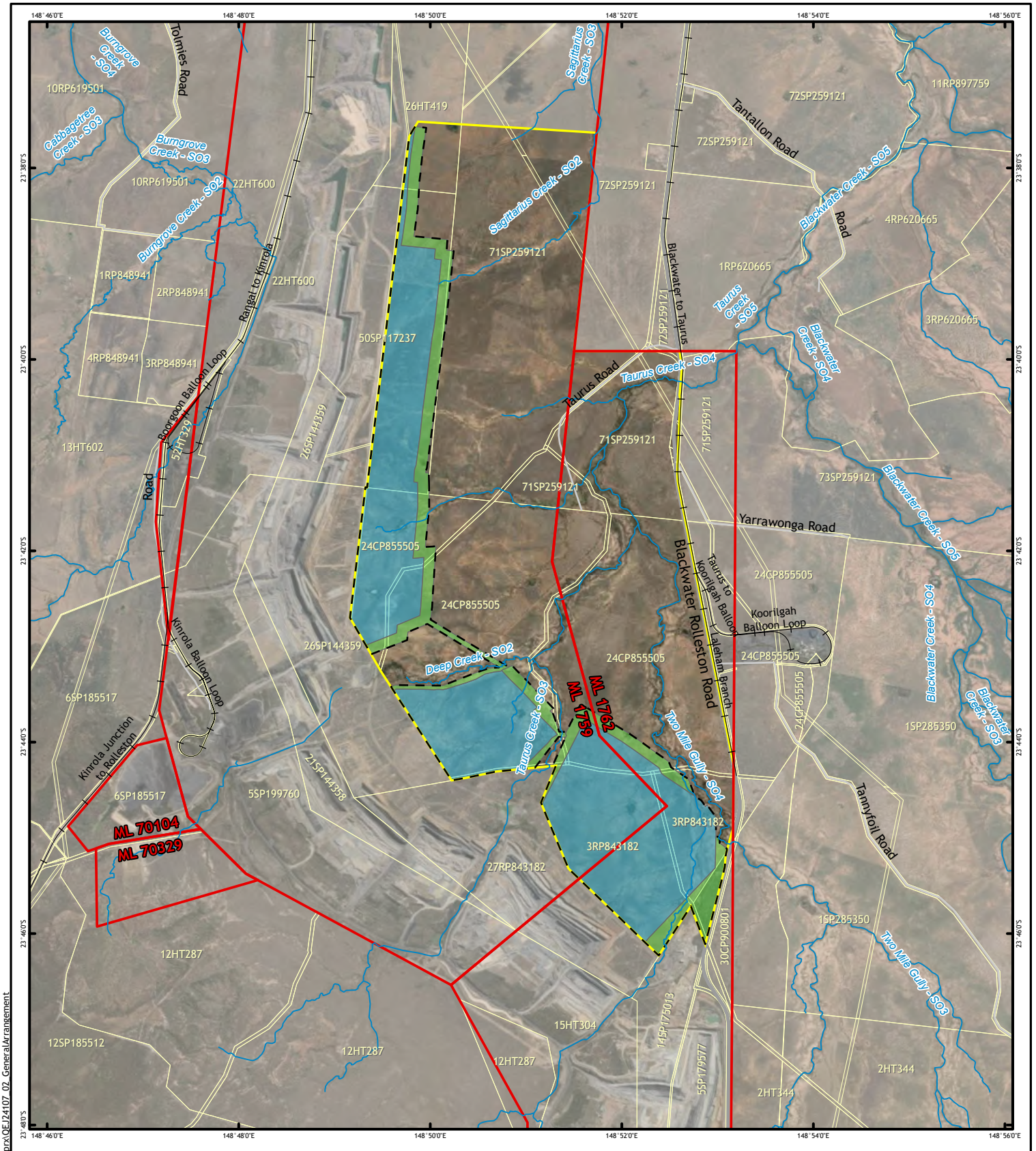
FIGURE 1: REGIONAL LOCATION

Blackwater North Ecological Assessment
Whitehaven Coal

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1 of 1	QEJ24107	1

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Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Proposed Open Cut Extension
- Proposed Infrastructure Area
- Cadastre

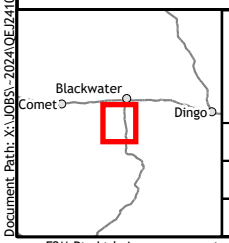
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FIGURE 2: PROPOSED GENERAL ARRANGEMENT

Blackwater North Ecological Assessment
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1 of 1	QEJ24107	1

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1.3 Scope of the assessment

The Study Area covers 6,907.49 hectares (ha) and is located within ML 1759 (SA10) and ML 1762 (SA 7). The Study Area (Figure 2) has been designed to encompass the disturbance footprint extending from the existing mine to the Blackwater - Rolleston Rail corridor. The Project's Disturbance Footprint covers a 2,316.41 ha subset of the Project's ML 1759 and ML 1762.

This report documents the terrestrial ecological values in the vicinity of the Project and provides an assessment of the potential impacts of the Project on terrestrial ecology. Specifically, it provides:

- a desktop review of relevant background information and available environmental databases;
- flora surveys to verify the extent, composition, condition and conservation values of:
  - Regional Ecosystems (REs) in accordance with Neldner *et al*. (2025);
  - potential Threatened Ecological Communities (TECs) protected under the EPBC Act; and
  - Environmentally Sensitive Areas (ESAs) identified under the EP Act.
- fauna surveys to identify fauna species assemblages and habitat types (including threatened species);
- targeted surveys for conservation significant flora and fauna species identified under the EPBC Act and QLD *Nature Conservation Act 1992* (NC Act);
- habitat quality assessments in accordance with the *Guide to determining terrestrial habitat quality (version 1.2)* (Department of Environment and Heritage Protection [DEHP], 2017) for environmental offsets;
- occurrence of Weeds of National Significance (WoNS) (Australian Weeds Committee, 2012) and restricted biosecurity matter under the Queensland *Biosecurity Act 2014* (Biosecurity Act);
- an assessment of the potential indirect, direct and cumulative impacts of the Project on terrestrial ecology (including threatened species and communities); and
- a description of recommended avoidance and mitigation measures and management plans to minimise impacts to terrestrial ecology.

2 Existing environment

2.1 Study Area overview

The Study Area is located approximately 4.5 km southeast of the town of Blackwater and extends south for approximately 17.5 km, covering approximately 6,907.49 ha. The Study Area is bounded by the approved mining areas at BWM to the west, and Ardurad Road and Blackwater Rolleston Road to the east. The Study Area comprises of mix of non-remnant pasture primarily used for cattle grazing, with occasional patches of remnant and regrowth vegetation primarily associated with drainage lines and watercourses.

2.2 Regional context

The Project is located within the Central Highlands Local Government Area (LGA). This LGA comprises an area of approximately 59,834 square kilometres (km^2). It also occurs within the Brigalow Belt bioregion, which encompasses approximately 216,000 km^2 of central Queensland, extending from Townsville in the north to Narrabri in New South Wales in the south (Sattler & Williams, 1999). Brigalow forests and woodlands growing on clay soils are one of the major vegetation types that characterise the region (Sattler & Williams, 1999). While historically brigalow vegetation covered up to six million ha of the bioregion in Queensland, extensive broad scale clearing, predominantly for agriculture, has greatly reduced the extent of this community throughout the bioregion (Sattler & Williams, 1999). In addition to remnant brigalow vegetation, other ecosystems that typify the bioregion include eucalypt forest and woodlands, grasslands, dry rainforest, cypress pine woodland and riparian communities (Sattler & Williams, 1999).

The Interim Biogeographic Regionalisation of Australia (IBRA) divides the Brigalow Belt bioregion into the Brigalow Belt North and Brigalow Belt South (Sattler & Williams, 1999). The geology of the Brigalow Belt North bioregion, in which the Project is located, is characterised by Permian volcanics and Permian-Triassic sediments, Carboniferous and Devonian sediments and volcanics and Cambrian/Ordovician rocks (and associated Tertiary deposits) (Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development [DNRMMRRD], 2025a).

The Study Area lies within the Isaac – Comet Downs biogeographic subregion of the Brigalow Belt bioregion. While areas within and directly surrounding the Study Area are predominately cleared for agricultural use, large areas of remnant vegetation still occur in the nearby surrounding landscape as part of Amaroo State Forest 4.5 km to the west, Arthurs Bluff State Forest 8.5 km to the east and Blackdown Tableland National Park 11.5 km to the southeast.

2.3 Climate

The Study Area is characterised by a sub-tropical, semi-arid climate with high rainfall variability (Bureau of Meteorology [BoM], 2025). The average annual rainfall for the Blackwater area is approximately 546 millimetres (mm) and is predominantly seasonal, characterised by wet summers and dry winters (Figure 3)[1]. The average monthly temperatures range between a maximum of 34.8 degrees Celsius (°C) and a minimum of 9.5 °C recorded during December and July respectively (Figure 4)[1].

[1] Meteorological data was collected from Queensland Government weather data for the central coordinates of the project (-23.58,148.89) (BoM, 2025).

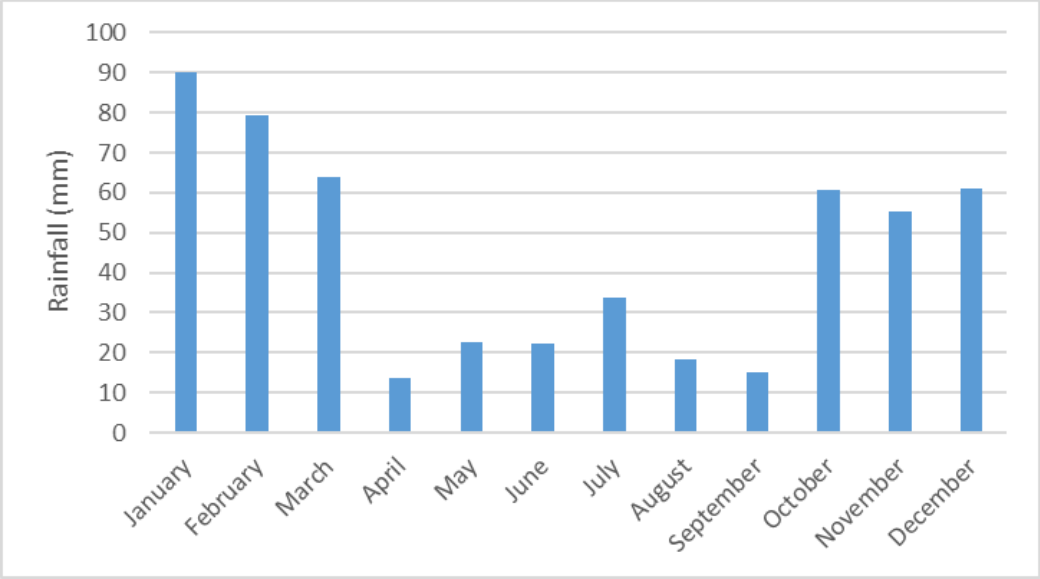


Figure 3: Average monthly rainfall and variability for the Blackwater area between 2014 and 2024 (BoM, 2025)

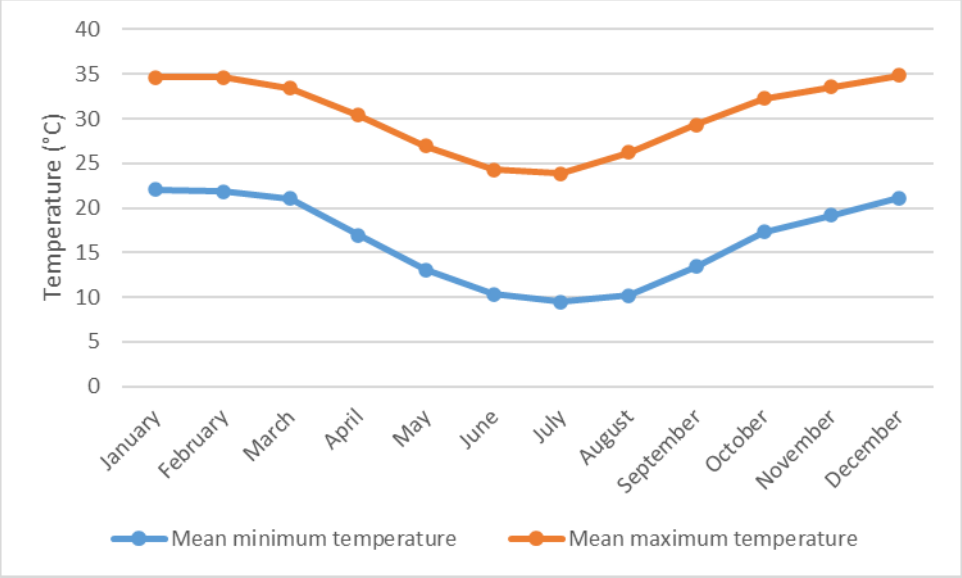


Figure 4: Average monthly temperatures for the area between 2014 and 2024 (BoM, 2025)

2.4 Topography

The Study Area has gently undulating topography, and ranges from approximately 200 m above Australian Height Datum through the centre of the Study Area to 230 metres (m) in the southern and western extents of the Study Area (Queensland Government, 2026).

2.5 Hydrology

The Study Area is intersected by several moderate watercourses, including:

- Taurus Creek in the east (stream order [SO] 4);
- Two Mile Gully in the southeast (SO 4);
- Deep Creek in the southwest (SO 2); and
- Sagittarius Creek in the north (SO 2).

Permanent water sources, such as dams, troughs and bores, are scattered throughout the Study Area.

2.6 Geology

The Geological Survey of Queensland (2024) Detailed Surface Geology Mapping and GeoScience Australia (2023) 1:100,000 geology mapping identified four geological units mapped within the Study Area (Table 1). Based on these mapped geological units, five potential land zones, as described by Wilson & Taylor (2012), may be present including:

- Land Zone 3;
- Land Zone 4;
- Land zone 5;
- Land zone 9; and
- Land Zone 10.

Table 1: Geology and land zones within the Study Area

Geological Unit	Description	Land Zone
Pwj	Late Permian - Calcareous sandstone, calcareous shale, mudstone, coal, concretionary limestone.	9 /10
Rr	Early Triassic / Middle Triassic - Lithic sandstone, pebbly lithic sandstone, green to reddish brown mudstone and minor volcanilithic pebble conglomerate.	9 /10
TQa	Late Tertiary / Quaternary – Locally red-brown mottled, poorly consolidated sand, silty clay, minor gravel; high-level alluvial deposits (generally related to present stream valleys but commonly dissected).	4 / 5
Qa	Quaternary – Quaternary alluvium containing clay, silt, sand and gravel.	3

2.7 Land use

The traditional industries of the Central Highlands region have been primarily beef and mutton, agriculture, timber, and substantial mining development (Bourne et al., 1993). Agriculture is a further emerging industry with agricultural technologies being a particular focus (Central Highlands Development Corporation, 2023). Mining is still the dominant industry in the region, with more residents working in mining than in any other industry. The regional economy is underpinned by a substantial coal deposit that facilitates more than a quarter of Queensland's total coal production (Central Highlands Development Corporation, 2023). The primary land use within the Study Area consists predominately of cattle grazing.

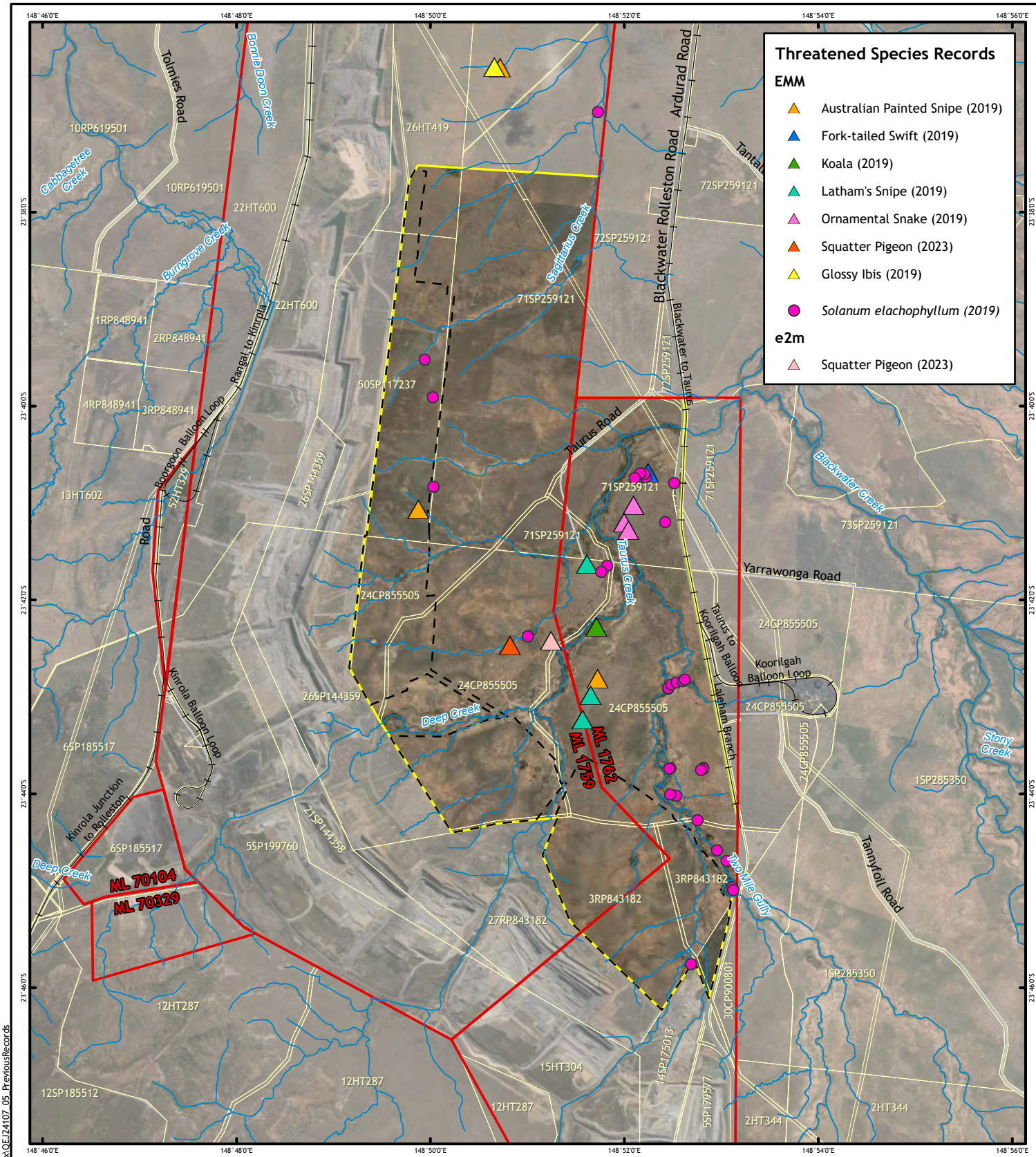
2.8 Previous surveys

Seasonal ecological surveys were commissioned by BM Alliance Coal Operations Pty Ltd and conducted by EMM Pty Ltd (EMM) (EMM, 2023a, 2023b) between 2018 and 2020, for the purpose of preparing a *Terrestrial Ecology Matters of State Environmental Significance Assessment* report (EMM, 2023b) and *Terrestrial Ecology Matters of National Environmental Significance Assessment* report (EMM, 2023a). Additionally, e2m and EMM also conducted supplementary surveys in 2023, as part of the previous assessment.Previous locations of conservation significant flora and fauna species records are depicted in Figure 5.

2.8.1 Flora surveys

Flora surveys were undertaken by EMM over three seasons at several locations across the Study Area. Summer season surveys were undertaken over five days in December 2018. The surveys focused on RE and TEC assessments whilst including threatened flora surveys and habitat assessments. Rainfall for this period were 59 mm in November, and 89 mm in October, with a mean temperature range of 21.7 °C – 34.8 °C. Autumn (post-wet) season flora surveys were undertaken in April 2019 with 62 mm of rain recorded in January, 14.6 mm in February and 179.6 mm in March. Temperatures during this survey period ranged between 14.8 °C and 30.3 °C. Spring (pre-wet) season surveys were conducted in September and October 2019, as well as early summer between 3 – 8 December 2018. 89.6mm of rain was recorded in October 2018, 59.0 mm in November 2018, and 56.6 mm in December 2018. Very little rainfall was recorded up to spring of 2019 with 1.4 mm of rain in August 2019, 0.0 mm in September 2019 and 8.2 mm in October 2019. Temperatures ranged between 24.4°C and 40.7°C during the December surveys (EMM, 2023a).

One TEC listed under the EPBC Act was recorded, namely the Brigalow (*Acacia harpophylla* [*A. harpophylla*] dominant and co-dominant) TEC, listed as Endangered. No Matters of National Environmental Significance (MNES) threatened flora species were identified as occurring within the Study Area or considered likely to occur, although one Matter of State Environmental Significance (MSES) listed threatened flora species, *Solanum elachophyllum*, was identified within the Study Area. The species was detected at 27 separate locations across the Study Area, most frequently on clay or loamy soils in fragmented non-remnant vegetation associated with *A. harpophylla, Lysiphyllum hookeri* and/or *Archidendropsis basaltica* (and mostly outside the proposed Disturbance Footprint – Figure 5). No other MSES flora species were considered likely to occur within the Study Area.



Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre

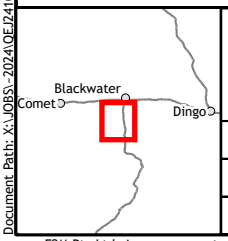
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0 2.5 5

Kilometres

Coordinate System: GDA2020



Notes:
Topographic: © ESRI 2025
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1	Issued for Use	PR	CO	09/04/2026

FIGURE 5: PREVIOUS THREATENED AND MIGRATORY SPECIES RECORDS WITHIN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

Map Number	Job Number	Rev
1 of 1	QEJ24107	1

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2.8.2 Fauna surveys

Fauna surveys were undertaken by four EMM field ecologists during the Autumn season (March 2019 and April 2019) and Spring (September 2019 and October 2019). The Autumn (post-wet) surveys were completed over a period of 12 days, undertaken on 18 – 24th March 2019 (diurnal surveys) and 11 – 15th April 2019 (nocturnal surveys and diurnal surveys). The Spring (pre-wet) surveys were completed over a 13-day period, from 29th September – 4th October 2019 (diurnal surveys) and 15th October – 21st October 2019 (nocturnal surveys). Supplementary Ornamental Snake and Australian painted snipe surveys were undertaken in areas of gilgai over three nights in March 2020 (EMM, 2023a).

EMM (EMM, 2023a, 2023b) confirmed the presence of five threatened EPBC Act listed species, including:

- Australian painted snipe (*Rostratula australis*) was observed on three occasions within or in proximity to the Study Area, once within cleared gilgai habitat and another two within dams observed in gilgai areas. While dams may provide more permanent foraging opportunities and ephemeral wetland habitat provide periodical foraging opportunities, no suitable breeding habitat identified within the Study Area.
- The Squatter pigeon (southern) (G*eophaps scripta scripta*) was recorded in the Study Area on two occasions during supplementary ecology surveys (undertaken by e2m and EMM) commissioned in June-August 2023, in the vicinity of two dams around Taurus Road (2 km outside the proposed Disturbance Footprint - Figure 5). Despite not being observed in over 600 hours of earlier baseline surveys, the species was found in a fragmented, degraded habitat dominated by Buffel grass, which is not ideal for the species.
- The Ornamental snake (*Denisonia maculata*) was recorded in gilgai areas between Taurus Creek and the Blackwater-Rolleston Road (4 km outside the proposed Disturbance Footprint – Figure 5). The species was found near each other over three nights of searching in March 2020, but the species appears to be scarce in the Study Area. Habitat degradation, including heavy disturbances and isolation of gilgai areas, likely reduces the species' presence.
- Koala (*Phascolarctos cinereus*) was recorded through indirect signs on three occasions. Koala scratches were recorded on *Eucalyptus tereticornis* on two occasions along Taurus Creek. Additionally, Koala scat was recorded along a tributary of Taurus Creek in the central portion of the Study Area. The Koala's status in the Study Area is likely limited to transient individuals, and the Study Area does not appear to support a permanent population.
- Latham's snipe (*Gallinago hardwickii*) was recorded at three locations across the Study Area in ephemeral gilgai habitat, which the species is likely to utilise periodically for foraging.

In addition to the Latham's snipe, EMM (EMM, 2023a) confirmed the presence of two additional migratory EPBC Act listed species:

- Glossy ibis (*Plegadis falcinellus*) was recorded once during autumn surveys on a dam in the north of the Study Area.
- Fork-tailed swift (*Apus pacificus*) was recorded on a single occasion with six individuals observed flying above the Study Area.

2.8.3 Fauna habitat surveys

EMM conducted habitat assessments across 165 sites during the survey period, where they analysed sites to determine suitable habitat presence for threatened species. This included 41 general habitat assessments during the Autumn flora survey period, and 11 during the Spring flora survey period. An additional 83 supplementary assessments were completed in June 2023, and a further in September 2023

(EMM, 2023a, 2023b). EMM's habitat assessments involved identification of the following micro-habitat attributes:

- presence of fallen logs, leaf litter, rocks;
- vegetation groundcover;
- presence of cracking soils;
- presence of rocky overhangs, caves, decorticating bark;
- foraging resources such as native grasses, preferred food trees for Koalas etc;
- available water sources;
- animal breeding places (hollow-bearing trees, dens, nests);
- presence and abundance of weeds; and
- signs of pest animals.

3 Methods

The terrestrial ecological values of the Study Area were evaluated through desktop and field assessments that were conducted in accordance with the relevant Commonwealth and State Government survey guidelines. The following sections detail the methods employed to conduct both the desktop and the field assessments as well as the survey effort undertaken.

3.1 Desktop assessment

A desktop assessment was undertaken to identify potential MNES within the Study Area prior to field surveys and to inform the likelihood of occurrence assessment (Appendix A). The assessment included a review of the following:

- Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) EPBC Act Protected Matters Search Tool (PMST) (DCCEEW, 2025a);
- Queensland Department of the Environment, Tourism, Science and Innovation (DETSI) WildNet Database (DETSI, 2025a);
- DETSI Protected Plants Flora Survey Trigger Map (DETSI, 2025b);
- DNRMMRRD- Regulated Vegetation Management Map and Vegetation Management Supporting Map, including essential habitat, watercourse and wetland mapping (DNRMMRRD, 2025a);
- DETSI remnant REs and pre-clear mapping (Version 13) and associated Regional Ecosystem Description Database (REDD) (Version 13) (Queensland Herbarium, 2023) definitions;
- Atlas of Living Australia (ALA) species search (ALA, 2025);
- GeoScience Australia 1:100,000 drainage network of Queensland (Geoscience Australia, 2023);
- DNRMMRRD, Detailed Surface Geology Map (DNRMMRRD, 2025b);
- Bureau of Meteorology (BoM) Groundwater Dependent Ecosystem (GDE) Atlas search (BoM, 2026);
- Latest available aerial photography;
- A review of historical aerial photography to determine high value regrowth vegetation (DNRMMRRD, 2025c); and
- Previous ecological assessments (including associated field data) undertaken within the Study Area, including:
  - *Blackwater Terrestrial Ecology Survey Report: Flora and fauna seasonal surveys* (EMM, 2020);
  - *Blackwater Mine—North Extension Project: Terrestrial Ecology Matters of National Environmental Significance Assessment* (EMM, 2023a); and
  - *Blackwater Mine—North Extension Project: Terrestrial Matters of State Environmental Significance Assessment* (EMM, 2023b).

Where desktop sources required a search extent, a 20 km buffer to the approximate centre of the Study Area (-23.6759, 148.8496) was applied. Results of the desktop assessments are provided in Appendix A.

3.2 Field assessment

Field surveys were conducted to identify and characterise the presence, extent and condition of terrestrial ecological values within the Study Area. The methods and timing of surveys followed applicable Commonwealth and State Government survey guidelines, conservation advice, and recovery plans:

- Survey guidelines for Australia's threatened birds (Department of the Environment, Water, Heritage and the Arts [DEWHA], 2010a);

- Survey guidelines for Australia's threatened bats (DEWHA, 2010b);
- Survey guidelines for Australia's threatened reptiles (Department of Sustainability, Environment, Water, Population and Communities [DSEWPaC], 2011a);
- Survey guidelines for Ornamental snake, released in November 2025 following the completion of field surveys (DCCEEW, 2025b);
- Survey guidelines for Australia's threatened mammals (DSEWPaC, 2011b);
- Terrestrial vertebrate fauna survey guidelines for Queensland (Eyre et al., 2022);
- Flora Survey Guidelines – Protected Plants (DETSI, 2025c); and
- Conservation Advice and Recovery Plans for listed threatened species under the EPBC Act, where relevant.

3.2.1 Survey team, timing and conditions

A summary of the survey team and timing for the four ecological surveys is provided in Table 2, with additional information on the survey conditions provided in the following sections.

Table 2: Survey team and timing

Survey Event	Survey Dates	Field Team
Wet Season (flora and fauna survey)	10/03/25 – 19/03/25	• Eamon Amsters (BSc): Professional Ecologist – 5 years' experience • Jeff Heatlie (BSc): Professional Ecologist – 5 years' experience • Tess Ramm (BSc): Professional Ecologist – 2 years' experience • Elizabeth Smith (BSc): Professional Ecologist – 2 years' experience
Late Wet Season (habitat quality survey)	14/04/25 – 17/04/25	• Chays Ogston (BSc -Hons): Principal Ecologist – 12 years' experience • Kaylee Pitt (BSc): Graduate Ecologist – 1.5 years' experience
	19/05/25 – 23/05/25	• Eamon Amsters (BSc): Professional Ecologist – 5 years' experience • Tess Ramm (BSc): Professional Ecologist – 2 years' experience
Dry Season (fauna survey)	23/09/25 – 26/09/25	• Chays Ogston (BSc -Hons): Principal Ecologist – 12 years' experience • Tess Ramm (BSc): Professional Ecologist – 2 years' experience
	29/09/25 – 03/10/25	• Matt Keir (BSc -Hons): Senior Ecologist – 4.5 years' experience • Ash Megginson (BSc): Graduate Ecologist – 0.5 years' experience

3.2.1.1 Wet season (flora and fauna survey) survey conditions

The wet season flora and fauna survey was timed to comply with optimal survey timing for the Brigalow Belt bioregion as detailed in the Terrestrial Vertebrate Fauna Survey Guidelines for Queensland (Eyre et al., 2022). This guideline recommends an autumn (March to mid-May) survey to capture conditions and characteristics of a late wet season period. Conditions during the survey (10 to 19 March 2025) were consistent with historical average temperatures and rainfall at Blackwater (Section 2.3). The Blackwater region had received 52.8 mm from the beginning of March to the end of the survey period (Queensland Government, 2025). Temperatures during the survey period ranged from an average minimum temperature of 21.2 °C to an average maximum temperature of 30.5 °C (Table 3) (Queensland Government, 2025).

3.2.1.2 Late wet season (habitat quality surveys) survey conditions

Late wet season surveys (habitat quality surveys) were conducted during suitable flowering and seeding conditions for perennial and annual flora species. Conditions during the surveys (13-17 April and 19-23 May 2025) were characteristic of a typical late wet season, where the dry season approaches, and these temperature and rainfall begin to fall. Although rainfall was higher than expected this late in the season (by about 50mm) (Queensland Government, 2025), temperatures were consistent with historical averages in April and May at Blackwater (Section 2.3).

3.2.1.3 Dry season (fauna survey) survey conditions

Dry season fauna surveys were conducted during optimal survey periods for targeted fauna species. Conditions during the surveys (23 – 26 September and 30 September – 3 October 2025) were characteristic of dry season conditions, where conditions were warm and dry. Maximum and minimum temperatures were typical of the historical averages. Although rainfall was higher than expected this late in the season (by about 50mm) (Queensland Government, 2025), temperatures were consistent with historical averages in April and May at Blackwater (Section 2.3).

Table 3: Summary of field survey timing and conditions

Survey Event	Dates (inclusive)	Total Days / Nights	Climate Conditions			
			Min. Temp. (°C)	Max. Temp (°C)	Rainfall (mm) (prior[1])	Rainfall (mm) (during)
Wet Season (flora and fauna)	10-19 March 2025	5 days 6 nights	19.8	31.7	14.8	67.6
Late Wet Season (habitat quality)	13-17 April 2025	4 days	14.8	29.5	111.6	0
	19-23 May 2025	5 days	23.7	28.0	19.6	0
Dry Season (flora and fauna)	23-26 September 2025	4 days 1 night	8.6	30.7	0	13.0
	30 September – 3 October 2025	4 days 3 nights	14.2	38.3	13.0	0

[1] Rainfall totals include the 30 days prior to the survey period (BoM, 2025).

3.2.2 Flora surveys

Flora survey methods undertaken across the Study Area are detailed in the following sections, with location of flora survey techniques depicted in Figure 6.

3.2.2.1 Regional ecosystems

Ground-truthing and validating vegetation community mapping within the Study Area was conducted in accordance with the *Methodology for surveying and mapping of regional ecosystems and vegetation communities in Queensland* (Neldner et al., 2025). A total of nine tertiary and 136 quaternary vegetation assessments were undertaken across the Study Area (Figure 6). Parameters recorded as part of tertiary surveys included:

- flora species composition;
- relative abundance;
- vegetation structure (height, cover and density of each stratum);
- soil and substrate characteristics (e.g. litter, rock, bare ground); and
- disturbance factors (e.g. evidence of fire, grazing, weed invasion or other environmental pressures).

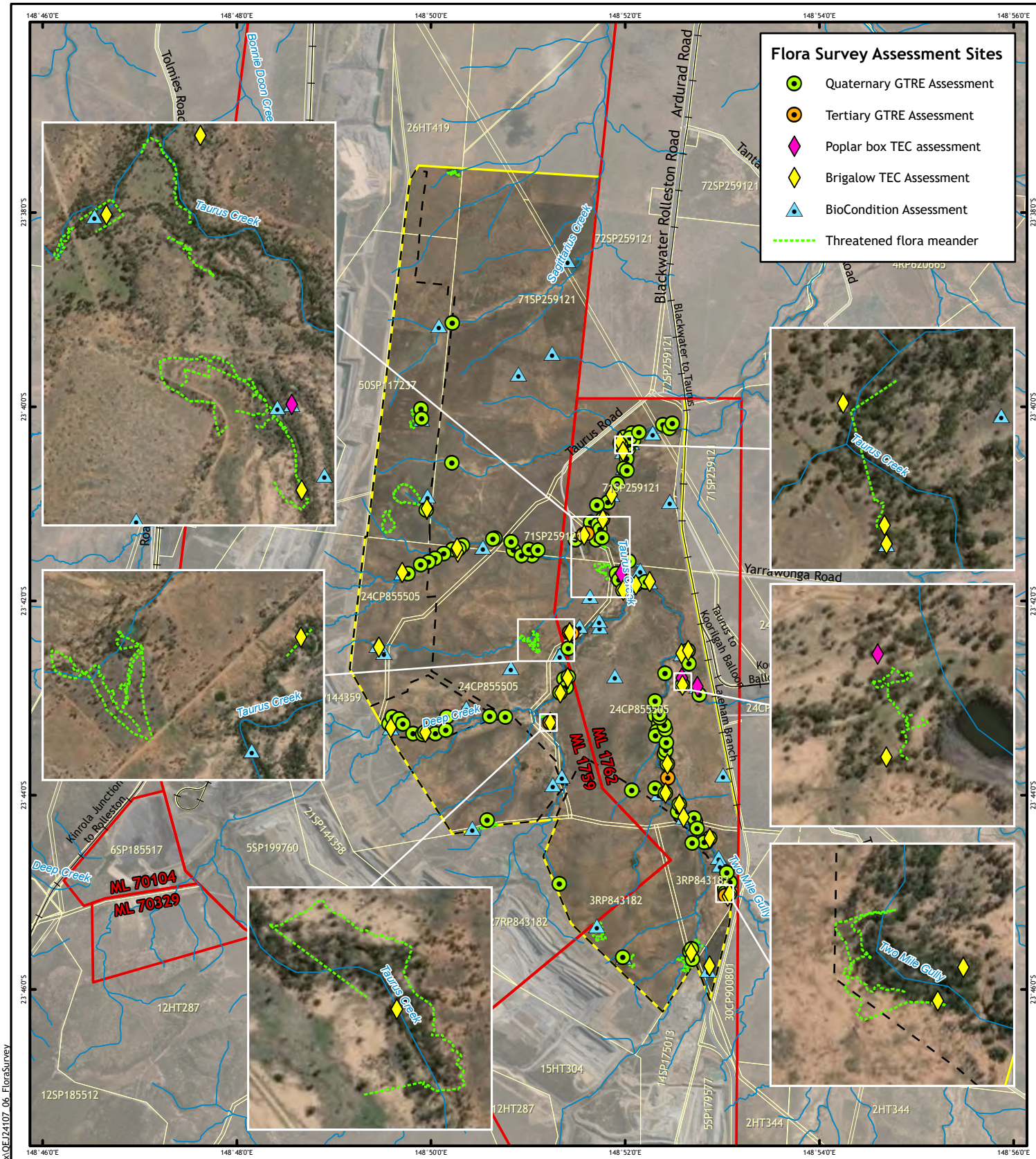
Quaternary surveys are a rapid assessment used to verify RE based on the structure, composition and condition of the ecologically dominant layer. Parameters recorded include:

- species present;
- remnant vegetation cover;
- RE map unit;
- structural code;
- ecologically dominant layer species;
- ecologically dominant layer height (in m);
- ecologically dominant layer cover (in %); and
- land zone.

Vegetation was categorised into three classes based on RE description, vegetation structure and condition. These categories included:

- **Remnant vegetation** - communities that conform with the definition under the Queensland *Vegetation Management Act 1999* (VM Act) and referenced by Neldner et al. (2025). Specifically, this comprises vegetation, part of which forms the predominant canopy of the vegetation:
  - covering more than 50% of the undisturbed predominant canopy;
  - averaging more than 70% of the vegetation's undisturbed height; and
  - composed of species characteristic of the vegetation's undisturbed predominant canopy.
- **High value regrowth** - vegetation communities that conform with the definition under the VM Act and referenced by Neldner et al. (2025). Specifically, this comprises native vegetation regrowth that is greater than 15 years old and meets the minimum cover requirements specified by Neldner et al. (2025).

- **Non-remnant** – all areas that are not mapped as remnant vegetation or high value regrowth. This includes vegetation communities that have been historically cleared/disturbed or heavily modified and areas that have a significant woody component but fails to meet the structural and/or floristic characteristics and/or time since clearing requirements of remnant vegetation or high value regrowth (Neldner et al., 2025). This vegetation category also includes areas of young woody regrowth vegetation, whereby vegetation has been historically cleared within the last 15 years or has been maintained as such from continual land management.



Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre

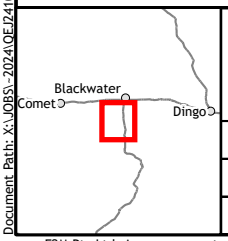
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Kilometres

Coordinate System: GDA2020



Notes:
Topographic: © ESRI 2025
Cadastre: © DNRMMRRD 2025
Ordered Drainage: © DNRMMRRD 2025
Mining Lease: © DNRMMRRD 2025

Rev	Description	Drawn	Approved	Date
1	Issued for Use	PR	CO	02/04/2026

FIGURE 6: FLORA SURVEY SITES

Blackwater North Ecological Assessment
Whitehaven Coal

Map Number	Job Number	Rev
1 of 1	QEJ24107	1

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3.2.2.2 Threatened ecological communities

Where a RE analogous with a TEC was identified, a TEC assessment was undertaken to determine whether the key diagnostic characteristics and condition thresholds for TECs listed under the EPBC Act were met. The assessment criteria, including specific condition thresholds and diagnostic characteristics, were drawn from the 'Approved Listing Advice' documents for each TEC identified during the desktop review. The following sections outline the field assessments undertaken to assess condition thresholds for TECs with analogous REs identified within the Study Area. While additional TECs were identified as potentially occurring within the Study Area during desktop assessment, no analogous REs were confirmed within the Study Area during surveys (refer to Section 4.1.1).

3.2.2.2.1 Brigalow (*Acacia harpophylla* dominant and co-dominant) TEC assessment

To determine whether a vegetation community meets the condition requirements of the Brigalow TEC (Department of the Environment [DotE], 2013a), vegetation communities containing Brigalow were assessed against the minimum thresholds for patch size and weed encroachment. Each vegetation community was also assessed on whether Brigalow (*Acacia harpophylla*) was the dominant or co-dominant species within the tree layer.

Brigalow TEC is limited to patches that meet the following key diagnostic characteristics and condition thresholds (DotE, 2013a):

Key diagnostic characteristics

A patch must include the following key diagnostic characteristics to be considered the Brigalow ecological community:

> *1) The presence of Acacia harpophylla as one of the most abundant tree species in the patch. A. harpophylla is either dominant in the tree layer, or co-dominant with other species (notably Casuarina cristata (Belah), other species of Acacia, or species of Eucalyptus).*
>
> *AND*
>
> *2a) In Queensland (Qld) - the patch is in one of the following Qld bioregions (including outliers) and it meets the description of one of 16 Qld REs determined at the time of the national listing of the Brigalow ecological community under the EPBC Act. The 16 REs are, as described by the* Queensland Herbarium (2013)*:*
>
> *In the Qld Brigalow Belt Bioregion – REs 11.3.1, 11.4.3, 11.4.7, 11.4.8, 11.4.9, 11.4.10, 11.5.16, 11.9.1, 11.9.5, 11.9.6, 11.11.14 and 11.12.21;*
>
> *OR*
>
> *2c) The vegetation in the patch is brigalow regrowth with species composition and structural elements broadly typical of one of the identified Qld REs or New South Wales (NSW) vegetation communities (although species density may be reduced). This can be assumed to be the case where it has been at least 15 years since it was last comprehensively cleared (not just thinned); unless direct evidence proves otherwise.*

Condition thresholds

A patch must meet the following condition thresholds to be considered the Brigalow ecological community:

> *3) The patch is 0.5 ha or more in size;*
>
> *AND*

4) Exotic perennial plants comprise less than 50% of the total vegetation cover of the patch, as assessed over a minimum sample area of 0.5 ha (100 m by 50 m), that is representative of the patch.

Regarding Point 4, Brigalow TEC assessments involved a combination of desktop and field-based assessments to determine if vegetation within the Study Area met the condition thresholds for the Brigalow TEC specified in the Approved Conservation Advice (DotE, 2013a). Field surveys included targeted assessment of patch size (≥0.5ha), canopy cover and height, canopy composition (dominance or co-dominance of *A. harpophylla*) and non-native cover across all vegetation strata. Specific assessment methodologies for condition thresholds are specified in Table 4.

In total 24 Brigalow TEC assessments were undertaken across the Study Area (Figure 6).

Table 4: Brigalow TEC assessment methodology

Criteria/Threshold	TEC Assessment Methodology
Key diagnostic criteria	
Acacia harpophylla is either dominant in the tree layer, or co-dominant with other species.	Assessed in accordance with Methodology for surveying and mapping regional ecosystems and vegetation communities in Queensland (Neldner et al., 2025).
The patch is analogous with one of the prescribed 16 REs within the appropriate bioregion, including Queensland Brigalow Belt Bioregion, Southeast Queensland Bioregion or Queensland Mulga Lands Bioregion. OR The vegetation in the patch is brigalow regrowth with species composition and structural elements broadly typical of one of the identified Queensland REs (i.e. has not been cleared for 15yrs.	• Analogous REs: Ground-truthed REs compared against 16 prescribed REs. • Species composition and structural elements: Structural condition (e.g. cover and height) assessed prescribed RE descriptions, and age of regrowth assessed against historical aerial imagery.
Condition thresholds	
The patch is 0.5 ha or more in size. AND Exotic perennial plants comprise less than 50% of the total vegetation cover of the patch, as assessed over a minimum sample area of 0.5 ha, that is representative of the patch.	• Patch size: assessed spatially, inclusive of where patches extend outside of the Study Area. • Exotic cover: % cover of exotic perennial plants was assessed within each stratum across a 50x100 m plot. Specifically, the total % cover of exotic perennial across all strata was compared against the total vegetation cover across all strata.

3.2.2.2.2 Poplar box grassy woodland on alluvial plains TEC assessment

The Poplar box TEC is associated with REs 11.3.2, 11.3.17, 11.4.7 and 11.4.12 within the Brigalow Belt and Darling Riverine Plains bioregions (Department of the Environment and Energy (DEE), 2019a). These REs form the primary vegetation communities considered representative of the TEC, subject to meeting specific condition thresholds. Poplar box TEC is limited to patches that meet the following key diagnostic characteristics and condition thresholds (DEE, 2019a):

Key diagnostic characteristics

- Location and physical environment:
  - Occurs in the Brigalow Belt North, Brigalow Belt South, Southeast Queensland, Cobar Peneplains, Darling Riverine Plains, New South Wales Southwestern Slopes, Riverina and Murray Darling Depression IBRA bioregions.

- Associated with ancient and recent depositional alluvial plains with clay, clay-loam, loam and sandy loam, typically duplex soils or sodosols. This includes areas that may not be part of currently defined floodplains.

- Structure:
  - A grassy woodland to grassy open woodland with a tree crown cover of 10% or more at patch scale.
  - A tree canopy must be present that shows these features:
    - Canopy tree species capable of reaching 10 m or more in height;
      - *Eucalyptus populnea* (Poplar box) must be present in the canopy and is the dominant tree species; and
    - Where hybrids of Poplar box with other *Eucalyptus* spp. are present, they should be counted as part of the *Eucalyptus populnea* component of the tree canopy when assessing the previous criterion.
  - Mid layer (1-10 m) crown cover of shrubs to small trees is low, about 30% or less. A ground layer (<1 m) mostly dominated across a patch by native grasses, other herbs and occasionally chenopods (during extended dry periods), ranging from sparse to thick (in response to canopy development, soil moisture, disturbance and/or management history).
  - A ground layer (<1 m) mostly dominated across a patch by native grasses, other herbs and occasionally chenopods (during extended dry periods), ranging from sparse to thick (in response to canopy development, soil moisture, disturbance and/or management history).
  - A list of diagnostic native plant species and some of the key native fauna that make up the ecological community is provided in Appendix A of the Approved Conservation Advice (DEE, 2019a); although particular species may be abundant or rare, or not necessarily present, at every location.

Condition thresholds

The ecological community that is protected under national environment law comprises patches that meet the key diagnostic characteristics (above) and at least the minimum condition thresholds (Moderate and High condition categories A, B, or C) set out in Table 5.

Poplar box TEC assessments involved a desktop review and targeted field assessment to determine whether vegetation within the Study Area met the criteria for the Poplar box TEC. Assessments focused on confirming the presence and dominance of Eucalyptus populnea in the canopy, patch size (≥2 ha), and evaluating the condition thresholds including native species richness, ground cover composition, and weed invasion. Field surveys included floristic plots, canopy cover estimates, and identification of key indicator species. Areas of regrowth and disturbance were also assessed to determine if they met the EPBC-defined condition classes (e.g. high or low condition thresholds). Specific assessment methodologies for condition thresholds are specified in Table 5. In total three Poplar box TEC assessments were undertaken across the Study Area (Figure 6).

Table 5: Poplar box TEC condition thresholds

Category and Rationale	Native Cover and Diversity Thresholds	Minimum Patch Size Thresholds*	TEC Assessment Methodology
Class A Highest Quality			
Category A1. Little to no perennial weeds and diverse native understorey	The crown cover of canopy trees in the patch is ≥10% AND ≥ 90% of perennial vegetation cover in the ground layer** is native AND ≥ 30 native plant species per patch in the ground layer	≥ 1 ha	• Patch size: assessed spatially, inclusive of where patches extend outside of the Study Area. • Crown cover: assessed as per *BioCondition Assessment Manual (V2.2)* tree canopy cover method. Specifically, utilising canopy intercept over a 100 m transect. • Perennial vegetation cover: assessed as per *BioCondition Assessment Manual (V2.2)* native perennial grass cover method. Specifically, average of five 1 x 1 m quadrats assessed at 10m intervals on alternating sides of a 50m transect. • Native plant species richness: random meander throughout patch to quantify number of native ground layer species.
Category A2. A large patch with low perennial weeds and diverse native understorey	The crown cover of canopy trees in the patch is ≥10% AND ≥70% of perennial vegetation cover in the ground layer** is native AND ≥ 30 native plant spp. per patch in the ground layer	≥ 5 ha	
Class B Good Quality			
Category B. A large patch with good quality native understorey or with mature trees	The crown cover of canopy trees in the patch is ≥10% AND ≥ 50% of perennial vegetation cover in ground layer** is native AND EITHER ≥ 20 perennial native plant species per patch in the ground layer OR ≥ 10 mature trees+ per ha with ≥ 30cm dbh*** (and/or hollows)	≥ 5 ha	• Patch size: As above. • Crown cover: As above. • Perennial vegetation cover: As above. • Native plant species richness: As above. • Mature trees / hollows: assessed as per *BioCondition Assessment Manual (V2.2)* large tree method. Specifically, number of trees ≥ 30cm dbh and/or containing hollows was quantified across a 100 x 50m (0.5 ha) plot and multiplied to 1ha.

Category and Rationale	Native Cover and Diversity Thresholds	Minimum Patch Size Thresholds*	TEC Assessment Methodology
Class C Moderate Quality			
Category C A large patch with low native cover but retains good native understorey diversity and habitat features of mature trees	The crown cover of canopy trees in the patch is ≥10% AND If < 50% of perennial vegetation cover in ground layer** is native, then the patch must have: ≥ 20 native plant spp. per patch in the ground layer AND ≥ 10 mature trees+ per ha with ≥ 30cm dbh*** (and/or hollows) AND smaller trees+, saplings or seedlings suggestive of periodic recruitment	≥ 5 ha	• Patch size: As above. • Crown cover: As above. • Perennial vegetation cover: As above. • Native plant species richness: As above. • Mature trees / hollows: As above. • Smaller trees (recruitment): assessed as per *BioCondition Assessment Manual (V2.2)* recruitment method. Specifically, presence of *Eucalyptus populnea* saplings <5cm dbh was assessed across a 100 x 50m (0.5 ha) plot.

* **Minimum patch size thresholds** apply to patches of various shapes but, a minimum patch width threshold applies to linear remnants, such as along roadsides or former travelling stock routes. These are explained in the next section on 'Defining a patch'.

** **Perennial native vegetation cover in the ground layer** (i.e. below the tree canopy) includes vascular plant species of the ground layer with a life-cycle of more than two growing seasons. The ground layer includes grasses and herbs (i.e. forbs) and some low shrubs (woody plants ≤ 1 m high). Measurement of perennial ground layer vegetation cover excludes annuals, cryptogams (i.e. mosses, lichens and related flora), leaf litter or exposed soil.

*** **dbh** (diameter at breast height) refers to the tree diameter measured at 1.3 m above the ground.

+ **Trees -** Refers to *Eucalyptus populnea* (Poplar box) and/or hybrids of Poplar box with other Eucalyptus species (for instance Coolabah).

3.2.2.3 Threatened flora

Based on desktop assessment outputs (ALA, PMST, WildNet) (ALA, 2025; DCCEEW, 2025a; DETSI, 2025a) and RE mapping, threatened flora species were identified as possibly occurring within the Study Area and were specifically targeted during field surveys (Table 6). The random meander technique (refer to (Cropper, 1993)) was used to survey the potentially occurring threatened flora throughout the Study Area (Figure 6). The random meander technique involves traversing potential habitat within the Study Area and searching for flora species that may not have been located using more structured search methods. This technique is particularly suitable for locating species that typically occur at very low densities or that may be distributed in isolated clumps. Targeted surveys for threatened species using the Cropper (1993) random survey technique were undertaken for possibly occurring species identified from the desktop assessment where potential habitat was identified within the Study Area.

Though a count of individuals is usually an appropriate survey metric, in the case of two of the threatened target *Solanum* species, it was not suitable due to the nature with which these plants grow. *Solanum elachophyllum* and *S. dissectum* have been shown to form underground suckers that connect stems together, thereby making it difficult to determine the number of individuals within a given area (Fensham et al., 2019). For these species a stem count method was utilised, consistent with the approach taken by Fensham et al. (2019).

Across the Study Area 32 random meanders covering approximately 20.54 km were conducted targeting threatened plants. Additionally, six plots were undertaken to estimate population of recorded threatened flora within the Study Area.

Table 6: Flora species targeted during meander flora surveys

Species	NC Status	EPBC Status
Bertya opponens	Least concern	Vulnerable
Solanum adenophorum	Endangered	Not listed
Solanum dissectum	Endangered	Endangered
Solanum elachophyllum	Endangered	Not listed

3.2.2.4 Pest flora

The presence of pest flora species were recorded within the Study Area as part of tertiary and quaternary assessments, BioCondition surveys and while undertaking foot traverses. Pest flora species recorded include those listed under the Biosecurity Act (Department of Agriculture and Fisheries (DAF), 2023) as restricted or prohibited invasive plants, triggering General Biosecurity Obligation for landholders and proponents to manage and prevent their spread. In addition, other species not listed under the Biosecurity Act, but in which may negatively affect native plant communities were recorded. This includes species listed as WoNS (Centre for Invasive Species Solutions, 2025) requiring priority management due to their invasive nature and ecological impacts.

3.2.2.5 Opportunistic observations

Flora species observed that were not recorded via other survey methods, were also collected as opportunistic observations. This included those species observed while driving or walking between survey sites.

3.2.3 Fauna surveys

Fauna surveys involved a combination of targeted surveys and habitat suitability assessments (Figure 7) to determine likely presence/absence of target species. Fauna survey techniques undertaken during field surveys are detailed in the following sections and based on the following guidelines:

- Survey guidelines for Australia's threatened birds (DEWHA, 2010a);
- Survey guidelines for Australia's threatened bats (DEWHA, 2010b);
- Survey guidelines for Australia's threatened reptiles (DSEWPaC, 2011a);
- Survey guidelines for Australia's threatened mammals (DSEWPaC, 2011b);
- Terrestrial vertebrate fauna survey guidelines for Queensland (Eyre et al., 2022); and
- Conservation Advice and Recovery Plants for listed threatened species under the EPBC Act, where relevant.

3.2.3.1 Habitat suitability assessments

Habitat suitability assessments were undertaken throughout the Study Area to identify the presence of habitat features that may support target fauna. Specifically, the following features were assessed:

- the presence and condition of watercourses, wetlands, or artificial waterbodies (e.g., dams), including relative permanency of water;
- abundance of Locally Important Koala Tree (LIKTs) species and ancillary shelter species as identified by Youngentob et al. (2021);
- presence and abundance of feed tree species (e.g. known feed tree species for Greater glider);
- presence and abundance of native grasses and forbs;
- abundance of hollow bearing trees and logs;
- abundance of coarse woody debris and leaf litter;
- soil crack abundance and depth; and
- evidence of existing threats, including:

- presence and abundance of feral species (i.e. wild dogs, feral cats, European foxes etc.);
- woody weed encroachment;
- presence and abundance of barbed wire fencing;
- presence and abundance of cattle;
- extent and severity of habitat fragmentation; and
- bushfire risk (i.e. high fuel loads, fire-prone species).

Habitat suitability assessments were completed at 48 sites across the Study Area (Figure 7). The outcomes of these habitat assessments were used to map species habitat and direct targeted fauna survey effort for threatened fauna. Habitat quality surveys are described in Section 3.2.5.

3.2.3.2 Motion detection cameras

A combination of baited and non-baited camera traps were deployed to assist with the detection of target fauna (e.g. Squatter pigeon (southern) and Australian painted snipe) and pest fauna species that may pose a threat to native species (e.g. wild dogs, feral cats and foxes). Camera traps were deployed at six locations for a minimum of five nights within the Study Area during the wet season survey, totalling 32 nights, and at four locations for a minimum of ten consecutive nights during the dry season survey (Figure 7). As described in Section 2.8, the Squatter pigeon (southern) and Australian painted snipe are known to be present.

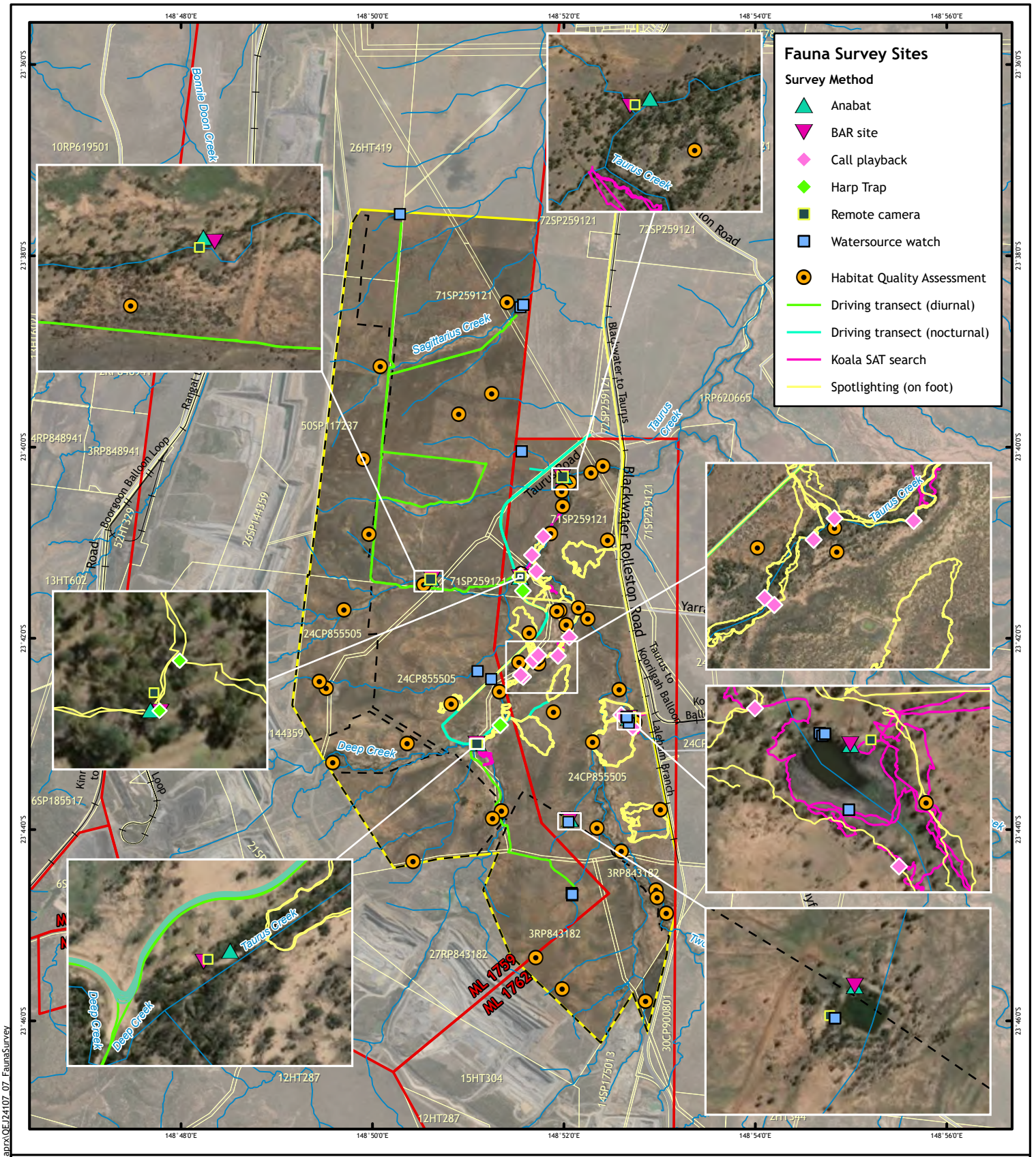
3.2.3.3 Harp trapping

Harp trapping was undertaken during the late wet season to target Corben's long-eared bat (*Nyctophilus corbeni*) in accordance with the *Survey guidelines for Australia's threatened bats* (DEWHA, 2010b). Harp traps were set at locations considered likely to be used by the species (e.g. flyways and water sources) and all bat species caught were identified and recorded. Traps were set at four locations over a minimum of four consecutive nights, totalling 16 trap nights during the wet season survey at four locations. Survey locations are depicted in Figure 7.

3.2.3.4 Ultrasonic recorders

Ultrasonic recorders (Anabats) were deployed within the Study Area, to detect potential presence of threatened microbats. Similarly to harp traps, Anabats were deployed in areas likely to contain microbats (e.g. flyways and water sources). Devices were set at six locations over a minimum of five consecutive nights, totalling 32 trap nights during the wet season survey (Sites BAT fl 1, BAT fl 2, E2M022, E2M023, E2M024 and E2M025), and three locations over a minimum of ten consecutive nights (Sites E2M09, E2M010 and E2M012), totalling 30 trap nights during the dry season survey at the locations depicted in Figure 7.

Anabat detector data was first analysed by E2M (Eamon Amsters) with any possible detections of potentially occurring target fauna (i.e. *Nyctophilus corbeni* and *Chalinolobus dwyeri*) vetted by Greg Ford (Balance! Environmental).



Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre

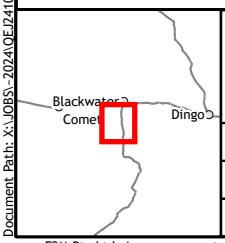
N

Scale 1:100,000 (A4)

0 2.5 5

Kilometres

Coordinate System: GDA2020



Notes:
Topographic: © ESRI 2025
Cadastre: © DNRMMRRD 2025
Ordered Drainage: © DNRMMRRD 2025
Mining Lease: © DNRMMRRD 2025

Rev	Description	Drawn	Approved	Date
1	Issued for Use	PR	CO	02/04/2026

FIGURE 7: FAUNA SURVEY SITES

Blackwater North Ecological Assessment
Whitehaven Coal

Map Number	Job Number	Rev
1 of 1	QEJ24107	1

Document Path: X:\JOBS\-2024\QEJ24107\GIS\PRO\QEJ24107_EA.aprx\QEJ24107_07_FaunaSurvey

E2M Pty Ltd gives no warranty in relation to the data (including accuracy, reliability, completeness or suitability) and accepts no liability for any loss, damage or costs (including consequential damage) relating to any use of the data in this map.

3.2.3.5 Nocturnal spotlighting

Nocturnal spotlighting surveys targeting Ornamental snake, Greater glider (southern) and Koala were undertaken within suitable habitat by two ecologists equipped with a handheld torch/spotlight and head torches. Nocturnal spotlighting surveys were conducted for a minimum of 3 hours per night, traversing areas of suitable habitat on foot. Call playback targeting the key threatened species was undertaken during these surveys. Spotlighting surveys were undertaken across four nights during the wet season survey and four nights during the dry season survey, totalling 17 person hours. Location of spotlighting transects are depicted in Figure 7 .

3.2.3.6 Diurnal water source watches

Water source watches including flushing surveys were conducted at suitable water sources across the Study Area. Surveys involved either stationary visual assessments or flushing surveys for a minimum of 30 minutes either early morning or late afternoon. Water source watches were undertaken during the wet season totalling 16 person hours (across nine sites) and 22.25 person hours during the dry season (across seven sites), totalling 38.25 person hours of water source watches. Location of water source watches are depicted in Figure 7.

3.2.3.7 Koala spot assessment technique and scratch surveys

The Koala spot assessment technique (SAT) (Phillips & Callaghan, 2011) involves systematically search for Koala scats under trees of preferred Koala food species and an appropriate size (at least 10 centimetres (cm) diameter at breast height) in a given area. More specifically, scats are searched for within a 1 m radius of the base of a central tree and its nearest 29 neighbouring trees. SAT surveys were combined with bark scratch surveys and were undertaken at 14 locations, ten during the wet season and four during the dry season (Figure 7). The bark scratch surveys involved inspecting the lower trunks (0-2 m height) of preferred and secondary food trees for evidence of claw marks consistent with Koala use. Trees were examined for vertical scratches with fresh or weathered characteristics. These surveys were conducted within potential Koala habitat and areas of preferred Eucalypt species.

3.2.4 Threatened species habitat mapping

Habitat for each relevant threatened species was mapped based on using a combination of desktop analysis and field validation. The initial desktop assessment utilised species distribution data from the EPBC PMST, Queensland Wildlife Online, RE mapping, topography, and known habitat preferences as outlined in the species profiles and conservation advice (EPBC Listing Advice, Recovery Plans, Species Profile and Threats Database (SPRAT) profiles).

Potential habitat was then refined during field surveys by ground-truthing vegetation communities, verifying the presence of key habitat features, and assessing condition and connectivity. Species-specific criteria such as presence of suitable food sources, breeding habitat, and microclimate were considered for each species. Only those areas meeting the known ecological requirements of each species were mapped as potential suitable habitat. Areas that were too degraded, fragmented, or lacked essential habitat components were excluded.

The results and mapped habitat extents for each relevant threatened species are summarised in Section 4.2.3. Species-specific mapping rationale, likelihood of occurrence, and supporting field observations are also discussed.

3.2.5 Habitat quality surveys

Habitat quality was calculated differently for MNES and MSES matters. Specifically, MSES habitat quality was undertaken in accordance with the *Guide to determining terrestrial habitat quality: Methods for assessing habitat quality (version 1.3)* (Department of Environment and Science [DES], 2020), while MNES and dual-listed (both MNES and MSES) Prescribed Environmental Matters (PEMs) were assessed in accordance with the Commonwealth Government *Modified Habitat Quality Assessment (MHQA)* method, which uses methods detailed within the *Guide to determining terrestrial habitat quality* (Version 1.2) (DEHP, 2017) (habitat quality guide). The MHQA method assesses key requirements in accordance with the EPBC *Act Environmental Offsets Policy 2022* (EO Policy). The MHQA method involves the collection of data relating to three key attributes, namely:

- Site condition;
- Site context; and
- Specie stocking rate.

In determining habitat quality scores, habitat areas were first delineated into Assessment Units (AUs). An AU refers to an area or a group of areas within the matter area (i.e. the Offset Area or Impact Area) that is homogenous in vegetation community classification (i.e. RE) and broad condition state (i.e. remnant, regrowth, non-remnant). Each AU reflects a particular community with similar structure, function and quality of habitat. Sampling sites were then selected for each AU and relevant attribute data was collected at each sampling site.

A Trimble TDC600 Global Positioning System device was used to record the location of mid-point (50 m mark) of each assessment site. Further detail regarding data collected for each of the three attributes is provided in the following sections.

Detailed description of habitat quality scoring methodology is presented in Section 3.3.

3.2.6 Survey effort

The following section summarises the ecological survey effort that has occurred within the Study Area during the E2M 2025 surveys (refer to Table 7). The timing and survey effort undertaken during these surveys was designed with reference to the:

- Nature of the target species (e.g. home range size, population density);
- Conditions within the Study Area (e.g. habitat availability); and
- Recommended survey effort guidelines prescribed by the relevant Commonwealth and/or Queensland government guidelines.

Survey effort completed as part of E2M 2025 surveys and previous surveys undertaken by EMM in 2019-2020, were assessed against relevant Commonwealth and State survey guidelines (refer to Table 8).

Table 7: E2M 2025 Survey effort summary

Survey Technique	Effort Unit	Survey Effort		
		Wet Season / Late Wet Season	Dry Season	Total
Flora				
Tertiary assessment	Number of sites	9	-	9
Quaternary assessment	Number of sites	136	6	142
TEC assessment	Number of sites	27	2	29
Threatened flora meander searches	Number of meanders / km	18 / 9.49 km	14 / 11.05 km	32 / 20.54 km
Fauna				
Ultrasonic recorders	Recorder nights	32	30	62
Harp traps	Trap nights	16	-	16
Bioacoustics recorders	Recorder days/nights	32	40	72
Motion cameras	Recorder days/nights	32	40	72
Water source watches	Person hours	16	22.25	38.25
Diurnal SAT searches	Person hours	8	8.5	16.5
Diurnal driving transects	Person hours	12	6	18
Nocturnal spotlighting	Person hours	32	17	49

Table 8: Survey effort against survey guidelines

Survey Requirement	Optimal Survey Timing	Survey Effort Consideration	Survey Effort Undertaken to Date		Status in Meeting Survey Guideline Requirements
			EMM 2019-2020	E2M 2025	
Threatened flora – excluding species considered unlikely to occur based on desktop assessment					
Bertya opponens	No specific survey guidelines are prescribed.	No specific survey guidelines are prescribed for *Bertya opponens*.	During suitable conditions, two timed meanders were undertaken within high-risk area on flora survey trigger map as per Flora Survey Guidelines methodology, covering an approximate area of 58 ha. Broader EVNT flora species surveys were undertaken outside high-risk areas while completing other flora surveys across the Study Area.	A total of 32 threatened flora meander searches totalling 20.54 km were undertaken during wet season (March-May) and dry season (September) field surveys targeting threatened flora. During this time *Solanum elachophyllum* were found to be readily identifiable from vegetative matter (i.e. not requiring flowers or fruit). Opportunistic searches were undertaken while traversing the Study Area.	Survey effort includes: • 34 combined threatened flora meander searches (EMM - 58 ha, E2M – 20.54 km); and • opportunistic searches while traversing the Study Area. No specific survey guidelines are prescribed for threatened flora in the Study Area. The Disturbance Footprint has been extensively searched during the field surveys completed to date and known habitat quantified.
Solanum adenophorum	The species has been recorded flowering in October and fruiting in May, September and October (Bean, 2004).	No specific survey guidelines are prescribed for this *Solanum* species.			
Solanum dissectum	The species has been reported as flowering between July and November and fruiting between March and July (DotE, 2015a).	No specific survey guidelines are prescribed for this *Solanum* species.			

Survey Requirement	Optimal Survey Timing	Survey Effort Consideration	Survey Effort Undertaken to Date		Status in Meeting Survey Guideline Requirements
			EMM 2019-2020	E2M 2025	
Solanum elachophyllum	February to September (DES, 2023).	No specific survey guidelines are prescribed for this *Solanum* species.			
Fauna – excluding species considered unlikely to occur based on desktop assessment					
Reptiles					
Ornamental snake (*Denisonia maculata)*	Late-September to late-March (DSEWPC, 2011b)	The *Draft Referral Guidelines for Nationally Listed Brigalow Belt Reptiles* (DSEWPC, 2011b) recommend 1.5 hours of spotlighting per hectare of suitable Ornamental snake habitat, which equates to 744 hours of spotlighting effort. The guideline document also recommends the use of funnel traps across a period of four	**Wet season:** • 16.5 person hours of active diurnal searches of gilgai and trap sites • pitfall and funnel trapping comprising four trap nights at four sites, totalling 64 pitfall trap nights and 96 funnel trap nights; and • 24 person hours over four consecutive nights and 60 hours over three consecutive nights of	**Wet season:** • 8 person hours of active diurnal searches in suitable habitat; and • 32 person hours of nocturnal spotlighting searches across six nights. **Dry season:** • 8.5 person hours of active diurnal searches in suitable habitat; and • 17 person hours of nocturnal spotlighting searches across four nights. **TOTAL:**	Survey effort includes: • 37 person hours of active diurnal searches in suitable habitat • 128 pitfall trapping nights • 196 funnel trapping nights; and • 182.5 person hours of nocturnal spotlighting searches across 22 nights. The funnel trapping survey effort meets the survey guideline requirements. Spotlighting at the density required to cover all potential Ornamental snake habitat within the

Survey Requirement	Optimal Survey Timing	Survey Effort Consideration	Survey Effort Undertaken to Date		Status in Meeting Survey Guideline Requirements
			EMM 2019-2020	E2M 2025	
		days (DSEWPC, 2011b). Survey guidelines for Ornamental snake, released in November 2025 recommends 240 minutes of spotlight searches per 5 ha of suitable habitat(DCCEEW, 2025m). This amounts to 398 hours of spotlighting effort.	nocturnal spotlighting searches. **Dry season:** • four person hours of diurnal active searches at trap sites for 30 minutes • four trap nights at four trap sites, totalling 64 pitfall trap nights and 100 funnel trap nights; and • 49.5 person hours of nocturnal spotlighting across five consecutive nights. **TOTAL:** • 20.5 person hours active diurnal searches of gilgai and trap site quadrants	• 16.5 person hours of diurnal active searches in suitable habitat; and • 49 person hours of nocturnal spotlighting searches across ten nights.	Study Area at the recommended survey effort would be prohibitive. Although the total spotlighting effort undertaken was 182.5 person-hours, which is below the levels recommended in both the 2011 (744 hrs) and 2025 (398 hrs) survey guidelines, the effort conducted by EMM and E2M across the Study Area is considered sufficient. The level of survey effort resulted in the detection of Ornamental snake within the Study Area.

Survey Requirement	Optimal Survey Timing	Survey Effort Consideration	Survey Effort Undertaken to Date		Status in Meeting Survey Guideline Requirements
			EMM 2019-2020	E2M 2025	
			• 128 pitfall trap nights • 196 funnel trap nights; and • 133.5 person hours over four of spotlighting.		
Birds					
Australian painted snipe (*Rostratula australis*)	No optimal survey period specified	Targeted stationary observations at suitable wetlands for ten hours over five days are recommended (DEWHA, 2010b).	**Wet season:** • 18.5 person hours of diurnal bird surveys (including water source watches) • 79 person hours of nocturnal spotlighting; and • 10 motion detection camera trap nights. **Dry season:** • 10 person hours of diurnal bird surveys (including	**Wet season:** • 16 person hours of diurnal bird surveys (including water source watches) • 32 person hours of nocturnal spotlighting across six nights; and • 32 motion detection camera trap nights. **Dry season:** • 22.25 person hours of diurnal bird surveys (including water source watches);	Survey effort includes: • 66.75 person hours of diurnal bird surveys (including water source watches) • 175.5 person hours of spotlighting; and • 93 motion detection camera trap nights. Survey effort meets the survey guideline requirements.

Survey Requirement	Optimal Survey Timing	Survey Effort Consideration	Survey Effort Undertaken to Date		Status in Meeting Survey Guideline Requirements
			EMM 2019-2020	E2M 2025	
			water source watches) • 47.5 person hours of nocturnal spotlighting across 5 nights; and • 11 motion detection camera trap nights. **TOTAL:** • 28.5 person hours of diurnal bird surveys • 126.5 person hours of spotlighting; and • 21 motion detection camera trap nights.	• 17 person hours of nocturnal spotlighting across four nights; and • 40 motion detection camera trap nights. **TOTAL:** • 38.25 person hours of diurnal bird surveys (including water source watches) • 49 person hours of nocturnal spotlighting across ten nights; and • 72 motion detection camera trap nights.	
Latham's snipe (*Gallinago hardwickii*)	October to February (DCCEEW, 2025e)	No specific survey guidelines are prescribed for the species.	No targeted surveys undertaken. However, other habitat preferences similar to Australian painted snipe which	**Wet season:** • 16 person hours of diurnal bird surveys (including water source watches)	Survey effort includes: • 66.75 person hours of diurnal bird surveys (including water source watches)

Survey Requirement	Optimal Survey Timing	Survey Effort Consideration	Survey Effort Undertaken to Date		Status in Meeting Survey Guideline Requirements
			EMM 2019-2020	E2M 2025	
			was targeted during surveys (as below). **Wet season:** • 18.5 person hours of diurnal bird surveys (including water source watches) • 79 person hours of nocturnal spotlighting; and • 10 motion detection camera trap nights. **Dry season:** • 10 person hours of diurnal bird surveys (including water source watches) • 47.5 person hours of nocturnal spotlighting across 5 nights; and	• 32 person hours of nocturnal spotlighting across six nights; and • 32 motion detection camera trap nights. **Dry season:** • 22.25 person hours of diurnal bird surveys (including water source watches) • 17 person hours of nocturnal spotlighting across four nights; and • 40 motion detection camera trap nights. **TOTAL:** • 38.25 person hours of diurnal bird surveys (including water source watches) • 49 person hours of nocturnal spotlighting across ten nights; and	• 175.5 person hours of spotlighting; and • 93 motion detection camera trap nights. Survey effort meets the survey guideline requirements.

Survey Requirement	Optimal Survey Timing	Survey Effort Consideration	Survey Effort Undertaken to Date		Status in Meeting Survey Guideline Requirements
			EMM 2019-2020	E2M 2025	
			• 11 motion detection camera trap nights. **TOTAL:** • 28.5 person hours of diurnal bird surveys • 126.5 person hours of spotlighting; and • 21 motion detection camera trap nights.	• 72 motion detection camera trap nights.	
Squatter pigeon (southern subspecies) (*Geophaps scripta scripta*)	May to October (DCCEEW, 2023g)	The *Survey Guidelines for Australia's Threatened Birds* (DEWHA, 2010b) recommends 15 hours of survey effort for the species over three days for areas less than 50 ha. Additional recommended survey methods include slow	**Wet season:** • 370 person hours of dedicated bird surveys (on foot or driving) over 19 days, • 42 motion detection camera trap nights; and • approximately 125 person hours spent opportunistically	**Wet season:** • 16 person hours of diurnal bird surveys (incl. water source watches), • 32 bioacoustic recorder deployment days, • 32 motion detection camera trap nights; and	Survey effort includes: • 551.25 person hours of diurnal bird surveys (incl. walking transects, driving transects and water source watches) • 144 motion detection camera trap nights • 70 bioacoustic recorder deployment days; and

Survey Requirement	Optimal Survey Timing	Survey Effort Consideration	Survey Effort Undertaken to Date		Status in Meeting Survey Guideline Requirements
			EMM 2019-2020	E2M 2025	
		drive transects and diurnal stationary observations at water sources (DCCEEW, 2023g)	across the Study Area. **Dry season:** • 125 person hours of dedicated bird surveys (on foot or driving) over seven days, • 30 camera trap nights; and • approximately 370 person hours spent opportunistically across the Study Area. **TOTAL:** • 495 person hours of dedicated bird surveys (on foot or driving) over 26 days • 72 camera trap nights • Approximately 495 person hours spent	• 12 person hours of diurnal driving transects; and • approximately 252 person hours spent opportunistically searching across the Study Area. **Dry season:** • 22.25 person hours of diurnal bird surveys (incl. water source watches) • 38 bioacoustic recorder deployment days, • 40 motion detection camera trap nights, • 6 person hours of diurnal driving transects; and • approximately 72 person hours spent opportunistically searching across the Study Area.	• 819 person hours of opportunistically across 61 days. Survey effort meets the survey guideline requirements.

Survey Requirement	Optimal Survey Timing	Survey Effort Consideration	Survey Effort Undertaken to Date		Status in Meeting Survey Guideline Requirements
			EMM 2019-2020	E2M 2025	
			opportunistically searching across the Study Area over 42 days in total.	**TOTAL:** • 38.25 person hours of diurnal bird surveys (incl. water source watches), • 70 bioacoustic recorder deployment days, • 72 motion detection camera trap nights, • 18 person hours of diurnal driving transects; and • approximately 324 person hours spent opportunistically searching across the Study Area over 19 days.	
White-throated needletail (*Hirundapus caudacutus*)	October to April (TSSC, 2019)	No specific survey guidelines are prescribed for this species; however, general diurnal bird survey methods are appropriate	**Wet Season** • 26.6 person hours of diurnal bird surveys (transect surveys and water source watches); and	**Wet season:** • 16 person hours of diurnal bird surveys (incl. water source watches); and • approximately 252 person hours spent	Survey effort includes: • 91.35 person hours of diurnal bird surveys (transect surveys and water source watches); and

Survey Requirement	Optimal Survey Timing	Survey Effort Consideration	Survey Effort Undertaken to Date		Status in Meeting Survey Guideline Requirements
			EMM 2019-2020	E2M 2025	
		(DEWHA, 2010b; Eyre et al., 2018).	• approximately 125 person hours spent opportunistically across the Study Area. **Dry season** • 26.5 person hours of diurnal bird surveys (transect surveys and water source watches); and • Approximately 370 person hours spent opportunistically across the Study Area. **TOTAL** • 53.1 person hours of diurnal bird surveys; and • approximately 495 person hours spent opportunistically searching across	opportunistically searching across the Study Area. **Dry season:** • 22.25 person hours of diurnal bird surveys (incl. water source watches); and • Approximately 72 person hours spent opportunistically searches across the Study Area. **TOTAL:** • water source watches totalling 38.25 person hours; and • approximately 324 person hours spent opportunistically searching across the Study Area over 19 days	• 819 person hours of opportunistically across 61 days. Survey effort meets the survey guideline requirements.

Survey Requirement	Optimal Survey Timing	Survey Effort Consideration	Survey Effort Undertaken to Date		Status in Meeting Survey Guideline Requirements
			EMM 2019-2020	E2M 2025	
			the Study Area over 42 days in total.		
Sharp-tailed sandpiper (*Calidris acuminata*)	August to April (DCCEEW, 2025c)	No specific survey guidelines for species. Guidelines listed in Australia painted snipe used as a surrogate.	No targeted surveys undertaken. However, other habitat preferences similar to Australian painted snipe which was targeted during surveys (as below). **Wet season:** • 18.5 person hours of diurnal bird surveys (including water source watches); and • 10 motion detection camera trap nights. **Dry season:** • 10 person hours of diurnal bird surveys (including water source watches); and	**Wet season:** • 16 person hours of diurnal bird surveys (including water source watches); and • 32 motion detection camera trap nights. **Dry season:** • 22.25 person hours of diurnal bird surveys (including water source watches); and • 40 motion detection camera trap nights. **TOTAL:** • 38.25 person hours of diurnal bird surveys; and • 72 motion detection camera trap nights.	Survey effort includes: • 66.75 person hours of diurnal bird surveys (including water source watches) • 93 motion detection camera trap nights.; and • Survey effort meets the survey guideline requirements.

Survey Requirement	Optimal Survey Timing	Survey Effort Consideration	Survey Effort Undertaken to Date		Status in Meeting Survey Guideline Requirements
			EMM 2019-2020	E2M 2025	
			• 11 motion detection camera trap nights. **TOTAL:** • 28.5 person hours of diurnal bird surveys; and • 21 motion detection camera trap nights.		
South-eastern Glossy black-cockatoo (*Calyptorhynchus lathami lathami*)	No optimal survey timing	Diurnal bird surveys for 5 hours over 1 day per 50 ha of project area. A search for foraging and nesting signs for 20 hours over 4 days per 50 ha of project area (Hourigan, 2012b).	**Wet Season** • 26.6 person hours of diurnal bird surveys (transect surveys and water source watches); and • approximately 125 person hours spent opportunistically across the Study Area. **Dry season** • 26.5 person hours of diurnal bird	**Wet season:** • 16 person hours of diurnal bird surveys (incl. water source watches) • 32 bioacoustic recorder deployment days; and • approximately 252 person hours spent opportunistically searching across the Study Area. **Dry season:** • 22.25 person hours of diurnal bird surveys	Survey effort includes: • 91.35 person hours of diurnal bird surveys (transect surveys and water source watches) • 70 bioacoustic recorder deployment days; and • 819 person hours of opportunistically across 61 days. Survey effort meets the survey guideline requirements.

Survey Requirement	Optimal Survey Timing	Survey Effort Consideration	Survey Effort Undertaken to Date		Status in Meeting Survey Guideline Requirements
			EMM 2019-2020	E2M 2025	
			surveys (transect surveys and water source watches); and • Approximately 370 person hours spent opportunistically across the Study Area. **TOTAL** • 53.1 person hours of diurnal bird surveys; and • approximately 495 person hours spent opportunistically searching across the Study Area over 42 days in total.	(incl. water source watches) • 38 bioacoustic recorder deployment days; and • Approximately 72 person hours spent opportunistically searches across the Study Area. **TOTAL:** • 38.25 person hours of diurnal bird surveys (incl. water source watches) • 70 bioacoustic recorder deployment days; and • approximately 324 person hours spent opportunistically searching across the Study Area over 19 days	
Painted honeyeater (*Grantiella picta*)	Early spring to late summer	Per 50 ha of suitable habitat, 4 hours of area	**Wet Season**	**Wet season:**	Survey effort includes:

Survey Requirement	Optimal Survey Timing	Survey Effort Consideration	Survey Effort Undertaken to Date		Status in Meeting Survey Guideline Requirements
			EMM 2019-2020	E2M 2025	
	(Rowland, 2012)	searches are recommended for a minimum of 4 days (Rowland, 2012).	• 26.6 person hours of diurnal bird surveys (transect surveys and water source watches); and • approximately 125 person hours spent opportunistically across the Study Area. **Dry season** • 26.5 person hours of diurnal bird surveys (transect surveys and water source watches); and • Approximately 370 person hours spent opportunistically across the Study Area. **TOTAL**	• 16 person hours of diurnal bird surveys (incl. water source watches) • 32 bioacoustic recorder deployment days; and • approximately 252 person hours spent opportunistically searching across the Study Area. **Dry season:** • 22.25 person hours of diurnal bird surveys (incl. water source watches) • 38 bioacoustic recorder deployment days; and • Approximately 72 person hours spent opportunistically searches across the Study Area. **TOTAL:**	• 91.35 person hours of diurnal bird surveys (transect surveys and water source watches) • 70 bioacoustic recorder deployment days; and • 819 person hours of opportunistically across 61 days. Survey effort meets the survey guideline requirements.

Survey Requirement	Optimal Survey Timing	Survey Effort Consideration	Survey Effort Undertaken to Date		Status in Meeting Survey Guideline Requirements
			EMM 2019-2020	E2M 2025	
			• 53.1 person hours of diurnal bird surveys; and • approximately 495 person hours spent opportunistically searching across the Study Area over 42 days in total.	• 38.25 person hours of diurnal bird surveys (incl. water source watches) • 70 bioacoustic recorder deployment days; and • approximately 324 person hours spent opportunistically searching across the Study Area over 19 days	
Fork-tailed swift (*Apus pacificus*)	September to April (DCCEEW, 2025b)	No formal survey guidelines are prescribed for this species; however, general guidance is provided in the *Draft referral guideline for 14 birds listed migratory under the EPBC Act* (DotE, 2015c) which states that observations should be made	**Wet Season** • 26.6 person hours of diurnal bird surveys (transect surveys and water source watches); and • approximately 125 person hours spent opportunistically across the Study Area. **Dry season**	**Wet season:** • 16 person hours of diurnal bird surveys (incl. water source watches); and • approximately 252 person hours spent opportunistically searching across the Study Area. **Dry season:** • 22.25 person hours of diurnal bird surveys	Survey effort includes: • 91.35 person hours of diurnal bird surveys (transect surveys and water source watches); and • 819 person hours of opportunistically across 61 days. Survey effort meets the survey guideline requirements.

Survey Requirement	Optimal Survey Timing	Survey Effort Consideration	Survey Effort Undertaken to Date		Status in Meeting Survey Guideline Requirements
			EMM 2019-2020	E2M 2025	
		from elevated viewpoints, in the late afternoon, near tall trees.	• 26.5 person hours of diurnal bird surveys (transect surveys and water source watches); and • Approximately 370 person hours spent opportunistically across the Study Area. **TOTAL** • 53.1 person hours of diurnal bird surveys; and • approximately 495 person hours spent opportunistically searching across the Study Area over 42 days in total.	(incl. water source watches); and • Approximately 72 person hours spent opportunistically searches across the Study Area. **TOTAL:** • 38.25 person hours of diurnal bird surveys (incl. water source watches); and • approximately 324 person hours spent opportunistically searching across the Study Area over 19 days	
Glossy ibis (*Plegadis falcinellus*)	March to August (DCCEEW, 2025l)	No formal survey guidelines are prescribed for this species.	No targeted surveys undertaken. However, other habitat preferences	**Wet season:** • 16 person hours of diurnal bird surveys	Survey effort includes: • 66.75 person hours of diurnal bird surveys

Survey Requirement	Optimal Survey Timing	Survey Effort Consideration	Survey Effort Undertaken to Date		Status in Meeting Survey Guideline Requirements
			EMM 2019-2020	E2M 2025	
			similar to Australian painted snipe which was targeted during surveys (as below). **Wet season:** • 18.5 person hours of diurnal bird surveys (including water source watches); and • 10 motion detection camera trap nights. **Dry season:** • 10 person hours of diurnal bird surveys (including water source watches); and • 11 motion detection camera trap nights. **TOTAL:** • 28.5 person hours of diurnal bird surveys; and	(including water source watches); and • 32 motion detection camera trap nights. **Dry season:** • 22.25 person hours of diurnal bird surveys (including water source watches); and • 40 motion detection camera trap nights. **TOTAL:** • 38.25 person hours of diurnal bird surveys; and • 72 motion detection camera trap nights.	(including water source watches); and • 93 motion detection camera trap nights. Survey effort meets the survey guideline requirements.

Survey Requirement	Optimal Survey Timing	Survey Effort Consideration	Survey Effort Undertaken to Date		Status in Meeting Survey Guideline Requirements
			EMM 2019-2020	E2M 2025	
			• 21 motion detection camera trap nights.		
Mammals					
Koala (*Phascolarctos cinereus*)	No optimal survey period specified	Survey effort is not prescribed but established survey methods include: • Nocturnal spotlighting; and • Spot Assessment Technique surveys (Eyre et al., 2018; Phillips & Callaghan, 2011).	**Wet season:** • 4 SAT surveys totalling 3.65 km of diurnal transects • 1.5 km spotlighting transects; and • additional nocturnal spotlighting around two trap sites. **Dry season:** • 2 SAT surveys totalling 4.2 km of diurnal transects • 7 km of nocturnal spotlighting transects	**Wet season:** • diurnal SAT searches totalling eight person hours • 32 person hours of nocturnal spotlighting across six nights; and • six bioacoustics recorders over five-six nights totalling 32 trap nights. **Dry season:** • 8.5 person hours of SAT searches, • 17 person hours of nocturnal spotlighting; and • 10 bioacoustics recorders totalling 38 trap nights.	No specific survey guidelines are available for the species; however, general arboreal mammal surveys methods and SAT searches have been applied. Extensive field surveys have been completed to date, including: • 6 SAT surveys totalling 7.85 km of diurnal transects (EMM) • 16.5 person hours of SAT searches (E2M) • 8.5 km of nocturnal spotlighting transects (EMM) • 49 person hours of nocturnal spotlighting (E2M)

Survey Requirement	Optimal Survey Timing	Survey Effort Consideration	Survey Effort Undertaken to Date		Status in Meeting Survey Guideline Requirements
			EMM 2019-2020	E2M 2025	
			• additional nocturnal spotlighting around two trap sites; and • call playback. **TOTAL:** • 6 SAT surveys totalling 7.85 km of diurnal transects, • 8.5 km spotlighting transects; and • call playback.	**TOTAL:** • 16.5 person hours of SAT searches, • 49 person hours of nocturnal spotlighting; and • 16 bioacoustics recorders totalling 70 trap nights.	• 16 bioacoustics recorders totalling 70 trap nights; and • additional nocturnal spotlighting around two trap sites (EMM).
Short-beaked echidna (*Tachyglossus aculeatus*)	No optimal survey period specified	No specific survey guidelines are prescribed for the species.	No targeted surveys undertaken. However, other general mammal surveys undertaken, including: **Wet season:** • 16.5 person hours of active diurnal searches • 24 person hours of nocturnal	**Wet season:** • 8 person hours of active diurnal searches • 32 person hours of nocturnal spotlighting searches • 32 motion detection camera trap nights; and	Extensive survey effort has been completed across the Study Area, including: • 36.5 person hours of active diurnal searches have been completed • 49 person hours of nocturnal spotlighting (E2M)

Survey Requirement	Optimal Survey Timing	Survey Effort Consideration	Survey Effort Undertaken to Date		Status in Meeting Survey Guideline Requirements
			EMM 2019-2020	E2M 2025	
			spotlighting searches • 42 motion detection camera trap nights; and • approximately 125 person hours spent opportunistically across the Study Area **Dry season:** • 4 person hours of active diurnal searches • 49.5 person hours of nocturnal spotlighting searches • 30 camera trap nights; and • approximately 370 person hours spent opportunistically across the Study Area.	• approximately 252 person hours spent opportunistically **Dry season:** • 8.5 person hours of active diurnal searches in suitable habitat • 17 person hours of nocturnal spotlighting searches across four nights • 40 motion detection camera trap nights; and • approximately 72 person hours spent opportunistically **TOTAL:** • 16.5 person hours of diurnal active searches in suitable habitat • 49 person hours of nocturnal	• 144 camera traps nights; and • approximately 819 person hours spent opportunistically • .

Survey Requirement	Optimal Survey Timing	Survey Effort Consideration	Survey Effort Undertaken to Date		Status in Meeting Survey Guideline Requirements
			EMM 2019-2020	E2M 2025	
			Total: • 20.5 person hours of active diurnal searches • 133.5 person hours of nocturnal spotlighting searches • 72 camera trap nights; and • approximately 495 person hours spent opportunistically across the Study Area.	spotlighting searches across ten nights • 72 motion detection camera trap nights; and • approximately 324 person hours spent opportunistically.	

3.3 Habitat quality scoring

The Offset assessment guide (OAG) (DCCEEW, 2023f) and *How to use the Offsets Assessment Guide* (DCCEEW, 2023d) provides guidance on the assessment offset requirements and suitability. This framework provides key concepts and guiding principles, however, there is no stipulated Commonwealth method for assessing habitat quality outlined within the offset framework. The DCCEEW *Modified Habitat Quality Assessment* is an unpublished method that provides guidance on habitat quality determination for MNES and is based on the *Guide to determining terrestrial habitat quality (version 1.2)* (Department of Environment and Heritage Protection, 2017).

The habitat quality score is assessed using three indicators; site condition, site context, and species stocking rate, with the default ratios being 30%, 30% and 40%, respectively (Department of Environment and Heritage Protection, 2017). These default ratios were utilised for all assessed MNES.

3.3.1 Site condition

Site condition data was collected within 100 m x 50 m areas (including various sub-plots) for each AU, weighted in accordance with the terrestrial habitat quality guide and compared to BioCondition benchmark values for the relevant RE benchmark (Queensland Herbarium, 2025a). Quality and availability of food, foraging habitat and shelter were also incorporated into the assessment of site condition.

A summary of site condition data collected (i.e. habitat quality sites), plot area and associated maximum scores, based on the default weightings, is summarised in Table 9. These default ratios were utilised for all assessed MNES.

Table 9: Site-based attributes assessment criteria

Attribute	Description	Assessment plot	Maximum score
Large trees	Number of large trees per hectare, as determined by existing BioCondition benchmarks for the associated RE.	100 m x 50 m	15
Tree canopy height	Median canopy height in metres of the ecologically dominant layer.	100 m x 50 m	5
Recruitment (%)	The proportion of overstorey species present at a site that are regenerating (<5 cm diameter at breast height [DBH]).	100 m x 50 m	5
Tree canopy cover (%)	Vertical projection of the tree canopy crown cover along a transect.	100 m transect	5
Shrub layer cover (%)	Vertical projection of the shrub layer cover of native shrubs.	100 m transect	5[†]
Coarse woody debris	The length of fallen woody logs and other coarse woody debris (>10 cm diameter and >0.5 m in length) per ha.	50 m x 20 m	5
Native plant species richness	Native plant species richness, comprising all life forms (i.e. trees, shrubs, grasses and forbs/other).	100 m x 50 m (trees) 50 m x 10 m (shrubs, grasses, forbs/other)	5 each (20 total)

Attribute	Description	Assessment plot	Maximum score
Non-native plant cover (%)	Percentage cover of non-native/weed plant species.	50 m x 10 m	10
Native perennial grass cover (%)	Average percentage cover of native perennial grass species.	Five 1 m x 1 m	5
Organic litter cover	The average percentage cover of organic material such as fallen leaves, twigs, and branches <10 cm diameter.	Five 1 m x 1 m	5
		BioCondition values (sub-total)	**80**
Quality and availability of food and foraging habitat	Consider these parameters relative to the essential habitat requirements for the species. These attributes should realistically reflect how much of a sustainable population of a species could be supported. This component was determined using the criteria detailed within DES *Guide to determining terrestrial habitat quality (version 1.2)* (Department of Environment and Heritage Protection, 2017).	100 m x 50 m	10
Quality and availability of shelter habitat	An assessment of a species' shelter requirements must take into account the relative abundance and condition of habitat features that could be used within a site. The site's shelter habitat is necessarily species specific and includes microhabitat requirements (e.g. hollows, logs, cracking clays, large trees, leaf litter, caves etc.). This component was determined using the criteria detailed within DES *Guide to determining terrestrial habitat quality (version 1.2)* (Department of Environment and Heritage Protection, 2017).	100 m x 50 m	10
		Total (maximum score)	**100**

† Denotes site-based attributes which does not apply for some REs where no shrub layer was identified by the associated benchmarks.

3.3.2 Site context

Landscape context assessments provide a quantitative assessment of the landscape values of the Impact or Offset Areas and are used to determine the site context component of the habitat quality score for the proposed action (Table 10). When calculating context, a 20 km buffer was utilised for each of the MNES species.

The site context component of the habitat quality score is weighted based on the species-specific habitat quality Indicator ratios provided in Table 10.

Table 10: Site context criteria and scoring

Criterion	Description	Maximum score
Size of patch	Size of the patch containing the habitat quality site and any directly connecting suitable habitat.	10
Connectedness	The proportion of the polygon boundary containing the habitat quality site which is connected to suitable habitat.	5
Context	The percentage of habitat within a suitable buffer around the site (species dependent).	5
Ecological corridors	The proximity of the site to the Department of Environment, Science and Innovation (DESI) mapped state, bioregional, regional or sub-regional corridors.	6
Role of the site location to species overall population in the State	The role of the site in relation to the overall population of the species in Queensland. This takes into account the species' use of the site, such as whether it is used for feeding and/or nesting and the effect that damage to or removal of the site would have to the likelihood of the species' overall population survival.	5
Threats to Species	Each individual threat was scored in accordance with Guide to determining terrestrial habitat quality *version* 1.2, where threats are categorised as: - Low level of threat = 1 - Moderate level of threat = 7 - High level of threat = 15 Each threat was then weighted based on relevant risk ratings and summed to provide an overall threat score out of 15.	15
Species mobility capacity	Consideration of the presence and severity of factors that would contribute to a reduction in the mobility of the species (e.g. barriers to movement). This component was determined using the criteria detailed within DES *Guide to determining terrestrial habitat quality (version 1.2)* (Department of Environment and Heritage Protection, 2017).	10
Total (max. score)		**56**

3.3.3 Species stocking rate

Species stocking rate is determined based on the outcomes of surveys using best-practice methods aimed at maximising detectability of the target species. This includes undertaking surveys during appropriate timing and applying suitable search effort, preferentially over numerous monitoring periods. Attributes for species stocking rate and their respective scoring are summarised in Table 11.

For species with sufficient population data, approximate density ranges can be calculated based on local survey records/sightings; or if comprehensive targeted surveys have been done within the impact and offset sites, ranges may be devised based on the survey results. For cryptic species and data-deficient species, calculating density may not be possible, meaning an increase in stocking rate is not feasible.

Table 11: Species stocking rate scoring

Attribute	Description	Maximum score
Presence detected on or adjacent to the site	Scored based on the target species being recorded within or adjacent (neighbouring property) to the site. The associated score is based on the following categories: • Yes – on site = 10 • Yes – adjacent to site = 5; and • No = 0.	10
Species usage on the site	Scored based on the target species habitat utilisation type within the site. The associated score is based on the following categories: • Dispersal = 5 • Foraging = 10; and • Breeding = 15.	15
Approximate density (per ha)	Estimated density of the target species based on local survey records and available literature. Due to the limited available data for the Impact Area and surrounding landscape, the approximate densities for each species were categorised into four broad categories: • Absent = 0 • Low = 10 • Moderate = 20; and • High = 30. The density of each species was then scored based on survey effort, detectability and number of detections.	30
Role/importance of species population on site*	Score is based on the supplementary scoring matrix (refer to Table 12*). Overall score is determined based on the following categories: • 0 = 0 • 5 to 15 = 5 • 20 to 35 = 10; and • 40 to 45 = 15.	15
	Total (maximum score)	**70**

* Attribute calculated based on supplementary scoring matrix provided in Table 12.

Table 12: Supplementary scoring matrix for role of importance of species population

Attribute	Categories	Maximum score
Key source population for breeding	• Yes/Possibly = 10; and • No = 0.	10
Key source population for dispersal	• Yes/Possibly = 5; and • No = 0.	5
Necessary for maintaining genetic diversity	• Yes/Possibly = 15; and • No = 0.	15
Near the limit of the species range	• Yes = 15; and • No = 0.	15

3.4 Likelihood of occurrence

A likelihood of occurrence assessment evaluates the qualitative probability that a flora or fauna species, can physically occupy the Study Area during all or part (e.g. breeding season, migration) of its life cycle. The assessment evaluates:

- species-specific ecological and physiological requirements
- recorded species observations including during field surveys and existing records
- the resources and constraints present in the Study Area informed by the desktop assessment; and
- the resources and constraints present in the Study Area informed by the field surveys.

During the desktop assessment, the outcome of the likelihood of occurrence assessment is used to guide the field design and planning phase. Threatened species that are known, likely or possibly occurring in the Study Area were targeted during the field surveys (i.e. target species). Following the field surveys, the likelihood of occurrence assessment was re-evaluated using the field data to modulate the target species list prior to further assessment.

The likelihood of occurrence assessment criteria are detailed in Table 13 and the complete likelihood of occurrence assessment is included in Appendix B.

Table 13: Likelihood of threatened and migratory species to occur in the Study Area

Assessment Outcome	Criteria
Known to occur	The species or population has been observed within the Study Area.
Likely to occur	Suitable habitat for a species or population occurs within the Study Area and nearby records are present.
Possibly occurring	Suitable habitat for a species or population occurs within the Study Area but it is degraded or of limited extent, the species has never been recorded in the local area and/or habitat only supports a portion of the species' life cycle.
Unlikely to occur	A low to very low probability that a species or population uses/occurs within the Study Area due to the lack of potential habitat or the Study Area is outside the species known range.

4 Results

4.1 Flora

A desktop assessment was undertaken to determine the potential presence of flora species within the disturbance footprint and the overall Study Area. Record searches included ALA, Wildlife Online, and PMST. A likelihood of occurrence assessment was then undertaken to determine the likelihood of the species presence. Previous records produced by EMM surveys were included within this assessment.

The desktop assessment identified 22 threatened flora species potentially occurring within the 20 km buffer of the Study Area based on data from the ALA, PMST and WildNet records (ALA, 2025; DCCEEW, 2025i; DETSI, 2025c). The assessment concluded the only threatened flora species with historical records occurring within the disturbance footprint was the *Solanum elachophyllum*, with four historical records occurring within the Study Area (ALA, 2025). An additional 13 historical records occurred within the 20 km buffer area (PMST, Wildnet) (DCCEEW, 2025i; DETSI, 2025c). Further, a substantial population totalling more than 1,200 individuals of *S. elachophyllum* had also been recorded by EMM (EMM, 2020b) within the Study Area.

E2M recorded 112 species of flora through systematic and opportunistic surveying effort. This included:

- 88 native species; and
- 24 introduced species.

A detailed list of species recorded is provided in Appendix C.

4.1.1 Ground-truthed vegetation communities

A total of seven REs were ground-truthed across the Study Area, including 203.11 ha of remnant vegetation and 83.77 ha of high value regrowth vegetation. A further 6,597.09 ha of the Study Area was mapped as non-remnant, consisting of cleared pasture, young regrowth and scattered mature trees. These non-remnant areas had been subject to modification, historical clearing processes and introduction of exotic species. The remaining 23.52 ha within the Study Area consisted of farm dams and wetlands.

State mapped REs within the Study Area include only small patches of heterogenous remnant and regrowth RE 11.3.2, 11.3.25 and 11.3.1 along the central portion of Taurus Creek (DNRMMRRD, 2025d). Ground-truthed vegetation suggests that vegetation composition throughout the Study Area is more complex and contains an additional six REs. Additionally, RE 11.3.25 was not ground-truthed during field surveys. Heterogenous polygons originally mapped by EMM (EMM, 2020b) were delineated into homogenous polygons by using quaternary and tertiary ground truthed RE surveys (Neldner et al., 2025).

Vegetation in the Disturbance Footprint mainly comprise of non-remnant areas. Small areas of remnant RE 11.3.6 and 11.3.1 and high value regrowth RE 11.3.1 and 11.9.5 are located in the central and southern extents of the Disturbance Footprint. Large well-connected areas of remnant *Eucalyptus* sp. woodland (RE 11.3.2, 11.3.3 and 11.3.27) and remnant brigalow woodland (RE 11.3.1) are predominately confined to Taurus Creek and Two Mile Gully and are outside of the Disturbance Footprint, as depicted in Figure 8.

The ground-truthed extent of vegetation communities within the Study Area and Disturbance Footprint are summarised within Table 14 and depicted within Figure 8, with further detailed descriptions provided in Appendix F.

Table 14: Ground-truthed regional ecosystems within the Study Area and Disturbance Footprint

RE	VM Act status[1]	Biodiversity status[1]	Broad vegetation group	RE Description	Condition type	Extent within the Study Area (ha)	Extent within the Disturbance Footprint (ha)
11.3.1	E	E	25a	**Description** Remnant and high value regrowth areas consisted of open forest to woodland dominated by *Acacia harpophylla* on Cainozoic alluvial clays forming plains and low undulating plains, with associated *Eucalyptus coolabah* and *Lysiphyllum carronii*. The sub-canopy consists primarily of *L. carronii* and *Terminalia oblongata,* with scattered occurrences of *A. excelsa*, *Erythroxylum australe* and *Brachychiton rupestris*. The shrub layer contained juvenile sub-canopy species as well as *Citrus glauca* and *Notelaea macrocarpa*. The ground layer was generally dense (50-90% cover) consisting of a mixture of native and exotic grasses and forbs, including *Dichanthium sericeum, Aristida calycina, Cenchrus ciliaris*, Megathyrsus maximus*, Atriplex muelleri* and *Enchylaena tomentosa*. Some remnant areas have been subject to historical disturbance (i.e. clearing/thinning) which has altered the species composition of these areas. However, they still meet the height and cover requirements of the associated remnant RE, though provide fauna habitat resources more closely aligned with areas of high-value regrowth (refer to Section 4.2.2). **Distribution** Areas of this RE are confined to the central and southern portions of the Study Area, restricted to Taurus Creek, Two Mile Gully, Deep Creek and associated tributaries.	Remnant	99.73	1.21
					High value regrowth	40.99	18.35

RE	VM Act status[1]	Biodiversity status[1]	Broad vegetation group	RE Description	Condition type	Extent within the Study Area (ha)	Extent within the Disturbance Footprint (ha)
11.3.2	OC	OC	17a	**Description** Remnant areas consisted of *Eucalyptus populnea* dominated low open woodland on alluvial plains. The subcanopy layer consisted of *Acacia salicina*, and *Terminalia oblongata*. The shrub layer included *Lysiphyllum hookeri, Cassia brewsteri, Capparis lasiantha, Carissa ovata, Acacia excelsa, Citrus glauca, Owenia acidula,* and *Acacia saligna.* The ground layer was generally very dense (86-95% cover) consisting of a mixture of native and exotic grasses and forbs, including *Dichanthium sericeum, Chloris divaricata, Bothriochloa ewartiana, Bothriochloa pertusa*, Enneapogon polyphyllus, Enteropogon ramosus, Aristida ramosa, Themeda triandra, Cenchrus ciliaris*, Megathyrsus maximus*, Urochloa mosambicensis*, Parthenium hysterophorus*, Bryophyllum delagoense*, Harrisia cactus*, Opuntia tomentosa** and *Opuntia stricta**. **Distribution** Areas of this RE are confined to the southeastern portion of the Study Area, restricted to Taurus Creek, Two Mile Gully, Deep Creek and associated tributaries.	Remnant	11.07	0.0

RE	VM Act status[1]	Biodiversity status[1]	Broad vegetation group	RE Description	Condition type	Extent within the Study Area (ha)	Extent within the Disturbance Footprint (ha)
11.3.3	OC	OC	16c	**Description** Remnant areas consisted of *Eucalyptus* coolabah open forest woodland on alluvial plains. The subcanopy layer consisted of *Lysiphyllum carronii, Alstonia constricta, Eucalyptus melanophloia, Brachychiton rupestris,* and *Erythroxylum australe*. The shrub layer included *Acacia harpophylla, Lysiphyllum carronii, Atalaya hemiglauca (Whitewood) and Erythroxylum australe*. The ground layer was generally dense (66-70%) and was dominated by mostly introduced species with occasional native species, including *Dichanthium sericeum, Megathyrsus maximus*, Bothriochloa pertusa*, Cenchrus ciliaris*, Cyperus sp., Malvastrum americanum*, Vittadinia triloba, Amyema preissii, Cryptostegia grandiflora*, Parthenium hysterophorus** and *Bryophyllum delagoense**. **Distribution** Areas of this RE are confined to the eastern portion of the Study Area, restricted to the upper streams of Taurus Creek.	Remnant	38.28	0.0

RE	VM Act status[1]	Biodiversity status[1]	Broad vegetation group	RE Description	Condition type	Extent within the Study Area (ha)	Extent within the Disturbance Footprint (ha)
11.3.6	LC	OC	17b	**Description** Remnant areas consisted of *Eucalyptus melanophloia* dominant woodland on an alluvial plain. Subcanopy species consisted of *Lysiphyllum hookeri, Terminalia oblongata, Acacia harpophylla* and *Alectryon diversifolius*. Shrub species consisted of *Lysiphyllum hookeri, Terminalia oblongata, Carissa ovata, A. harpophylla, Alstonia constricta, Atalaya hemiglauca* and *A. salicina*. The ground layer was generally dense (56-90%) and consisted of a mixture of native and introduced species such as *Bothriochloa bladhii*, Chloris sp., Sporobolus caroli, Dichanthium sericeum, Chrysopogon fallax, Enteropogon acicularis, Cynodon dactylon*, Aristida calycina, Megathyrsus maximus*, Urochloa mosambicensis*, Cenchrus ciliaris** and *Enchylaena tomentosa*. Some remnant areas have been subject to historical disturbance (i.e. clearing/thinning) which has altered the species composition of these areas. However, they still meet the height and cover requirements of the associated remnant RE, though provide fauna habitat resources more closely aligned with areas of high-value regrowth (refer to Section 4.2.2). **Distribution** Areas of this RE are confined to the central and southern portions of the Study Area, restricted to Taurus Creek, Two Mile Gully, Deep Creek and associated tributaries.	Remnant	45.32	2.72

RE	VM Act status[1]	Biodiversity status[1]	Broad vegetation group	RE Description	Condition type	Extent within the Study Area (ha)	Extent within the Disturbance Footprint (ha)
11.3.27	LC	OC	34d	**Description** Remnant areas of this RE consisted of *Eucalyptus camaldulensis* open forest fringing watercourses. The subcanopy consisted of *Acacia harpophylla, Eremophila mitchellii* (False sandalwood), *Atalaya hemiglauca, Grevillea parvifolia, Lysiphyllum carronii, Owenia acidula* and *Terminalia oblongata*. Groundcover species consisted of a mixture of native and introduced species such as *Bothriochloa ewartiana, Enchylaena tomentosa, Megathyrsus maximus*, Cenchrus ciliaris** and varied throughout the assessment units in density (6-75%). **Distribution** Remnant areas of this RE are confined to the eastern portion of the Study Area, restricted to Taurus Creek and Two Mile Gully.	Remnant	8.71	0.0

RE	VM Act status[1]	Biodiversity status[1]	Broad vegetation group	RE Description	Condition type	Extent within the Study Area (ha)	Extent within the Disturbance Footprint (ha)
11.4.9	E	E	25a	**Description** High value regrowth areas of this RE consisted of *Acacia harpophylla* open low woodland. The subcanopy layer consisted of *A. salicina, Atalaya hemiglauca* and *Lysiphyllum hookeri*. The shrub layer included *Carissa ovata, Lysiphyllum carronii, Acacia harpophylla, Citrus glauca, Terminalia oblongata* and *A. salicina*. The ground layer was generally dense (76-80%) and was dominated by mostly introduced species with occasional native species, including *Cenchrus ciliaris*, Megathyrsus maximus*, Harrisia martini*, Aristida ramosa, Sporobolus caroli, Panicum decompositum, S. actinocladus, Trianthema triquetra, Salsola australis, Enchylaena tomentosa, Solanum elachophyllum, Enneapogon sp.* and *Sida sp.* **Distribution** High value regrowth areas of this RE are confined to the southeastern portions of the Study Area.	High value regrowth	32.16	17.66

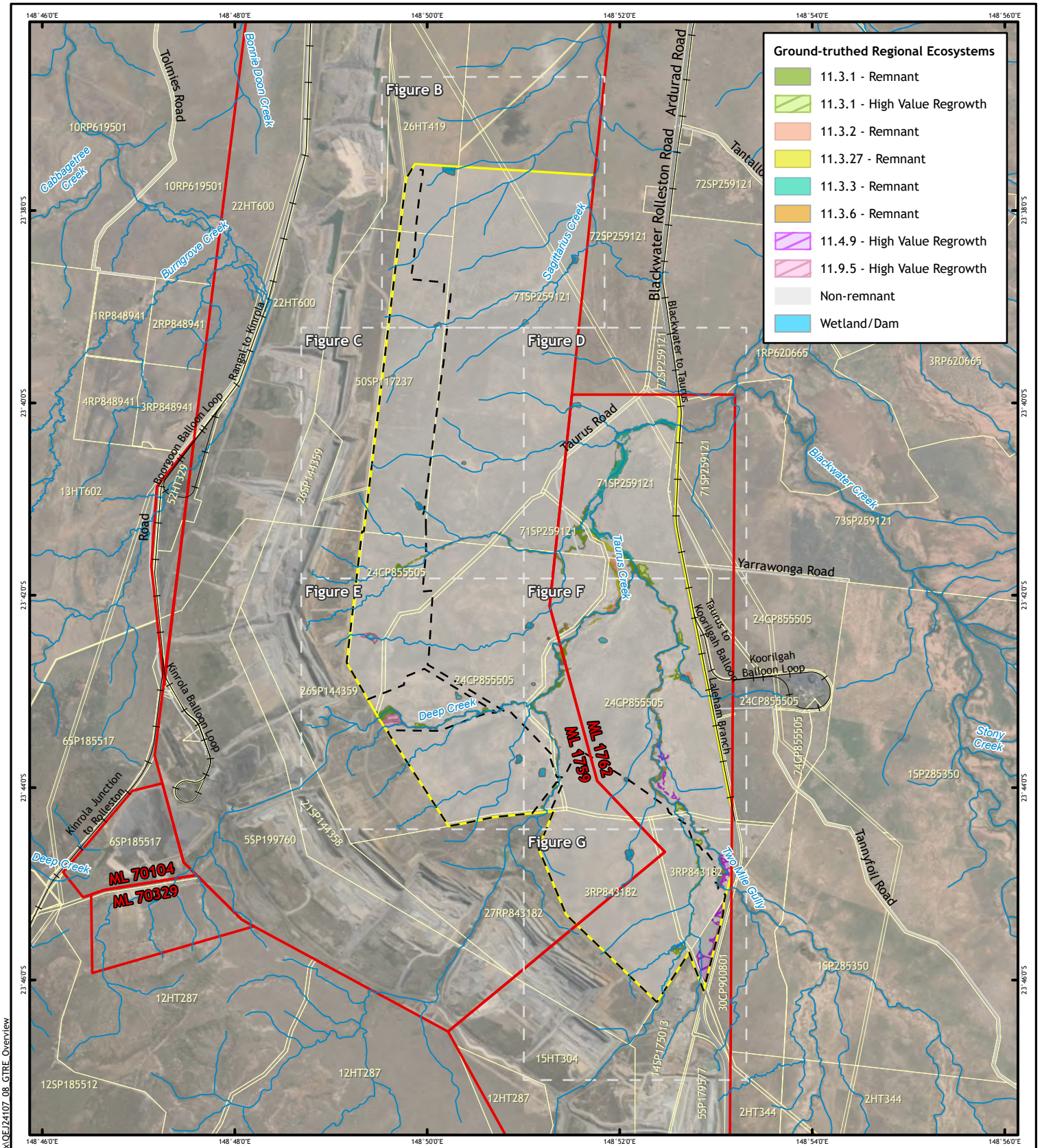
RE	VM Act status[1]	Biodiversity status[1]	Broad vegetation group	RE Description	Condition type	Extent within the Study Area (ha)	Extent within the Disturbance Footprint (ha)
11.9.5	E	E	25a	**Description** High value regrowth areas consisted of *Acacia harpophylla* open woodland on gently undulating plains. The subcanopy layer included *Lysiphyllum carronii, Atalaya hemiglauca and Terminalia oblongata. Erythroxylum australe, Citrus glauca, Eremophila mitchellii, Santalum lanceolatum, Grewia latifolia, Alstonia constricta, Jasminum didymum subsp. lineare, and Capparis* spp. comprised the majority of the shrub layer. The ground layer was generally very sparse (95%) and comprised both native and introduced species. Species included *Dactyloctenium radulans, Enneapogon sp., Sporobolus actinocladus, S. caroli, Enteropogon ramosus, Chloris divaricata, Aristida latifolia, A. ramosa, Malvastrum americanum*, Harrisia martinii*, Opuntia tomentosa*, Cenchrus ciliaris*, Bothriochloa pertusa** and *Portulaca oleracea**. **Distribution** Patches of high value regrowth RE 11.9.5 are scattered throughout the Study Area.	High value regrowth	10.62	3.77

RE	VM Act status[1]	Biodiversity status[1]	Broad vegetation group	RE Description	Condition type	Extent within the Study Area (ha)	Extent within the Disturbance Footprint (ha)
Non-remnant	N/A	N/A	N/A	**Description** Non-remnant areas in the Study Area comprised a mixture of cleared areas with improved pasture species, scattered young regrowth and mature trees. Isolated mature trees consisted of *Acacia harpophylla*, *Eucalyptus populnea* and *Lysiphyllum carronii*. Improved pasture species included the following *Cenchrus ciliaris*, Bothriochloa pertusa*, Urochloa mosambicensis*, Megathyrsus maximus*, Chloris gayana**. **Distribution** Non-remnant areas with improved pasture species and young woody regrowth are present throughout the Study Area and dominates most of the landscape outside of remnant and high value regrowth woodlands and open forests which are restricted to watercourses.	Non-remnant	6,597.09^	2,262.07^

[1] LC = Least concern, NC = No concern at present, Of concern = OC, Endangered = E

* - denotes non-native species

^ - excludes wetland and dam areas



Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre
- Figure Extent

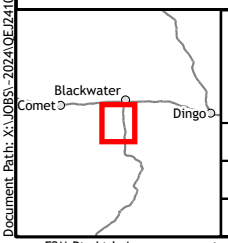
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Kilometres

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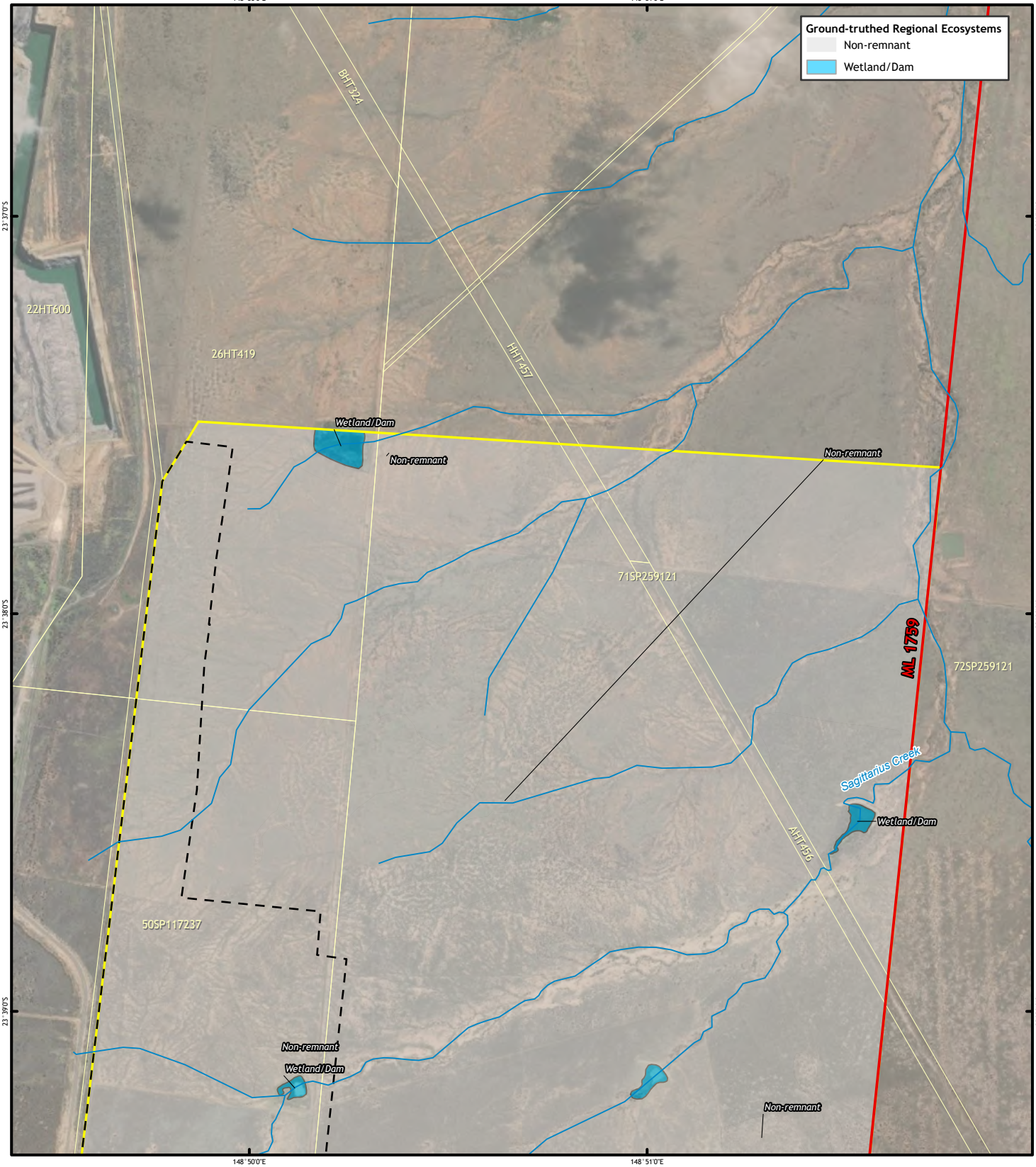
FIGURE 8A: GROUND-TRUTHED VEGETATION COMMUNITIES WITHIN THE STUDY AREA - OVERVIEW

Blackwater North Ecological Assessment
Whitehaven Coal

Map Number	Job Number	Rev
1 of 7	QEJ24107	1

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Legend

- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre

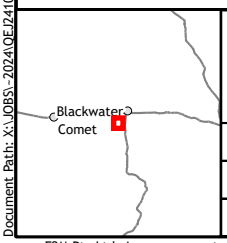
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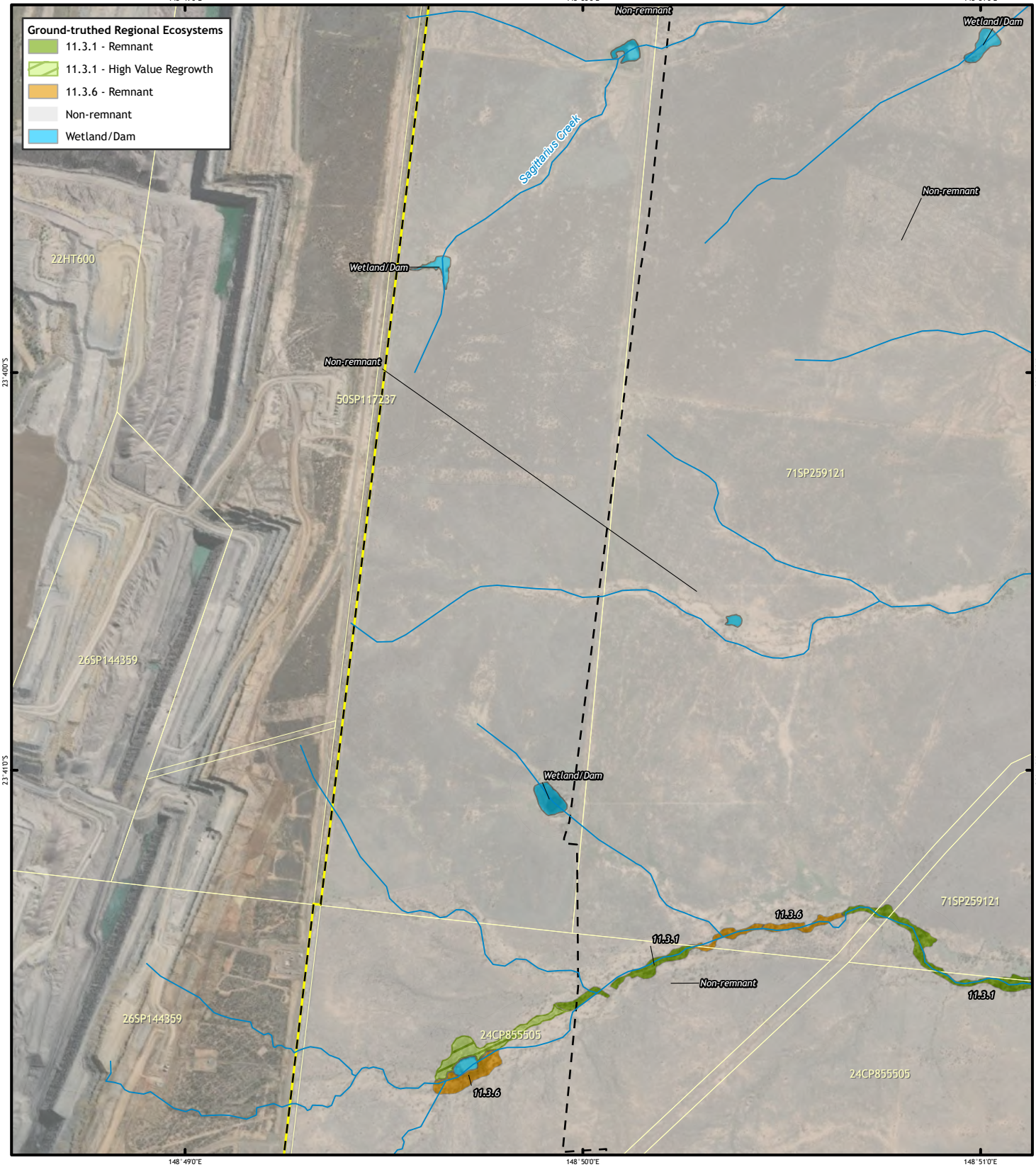
FIGURE 8B: GROUND-TRUTHED VEGETATION COMMUNITIES WITHIN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

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Legend

- Watercourse
- Study Area
- Disturbance Footprint
- Cadastre

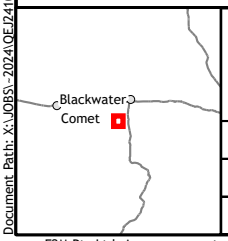
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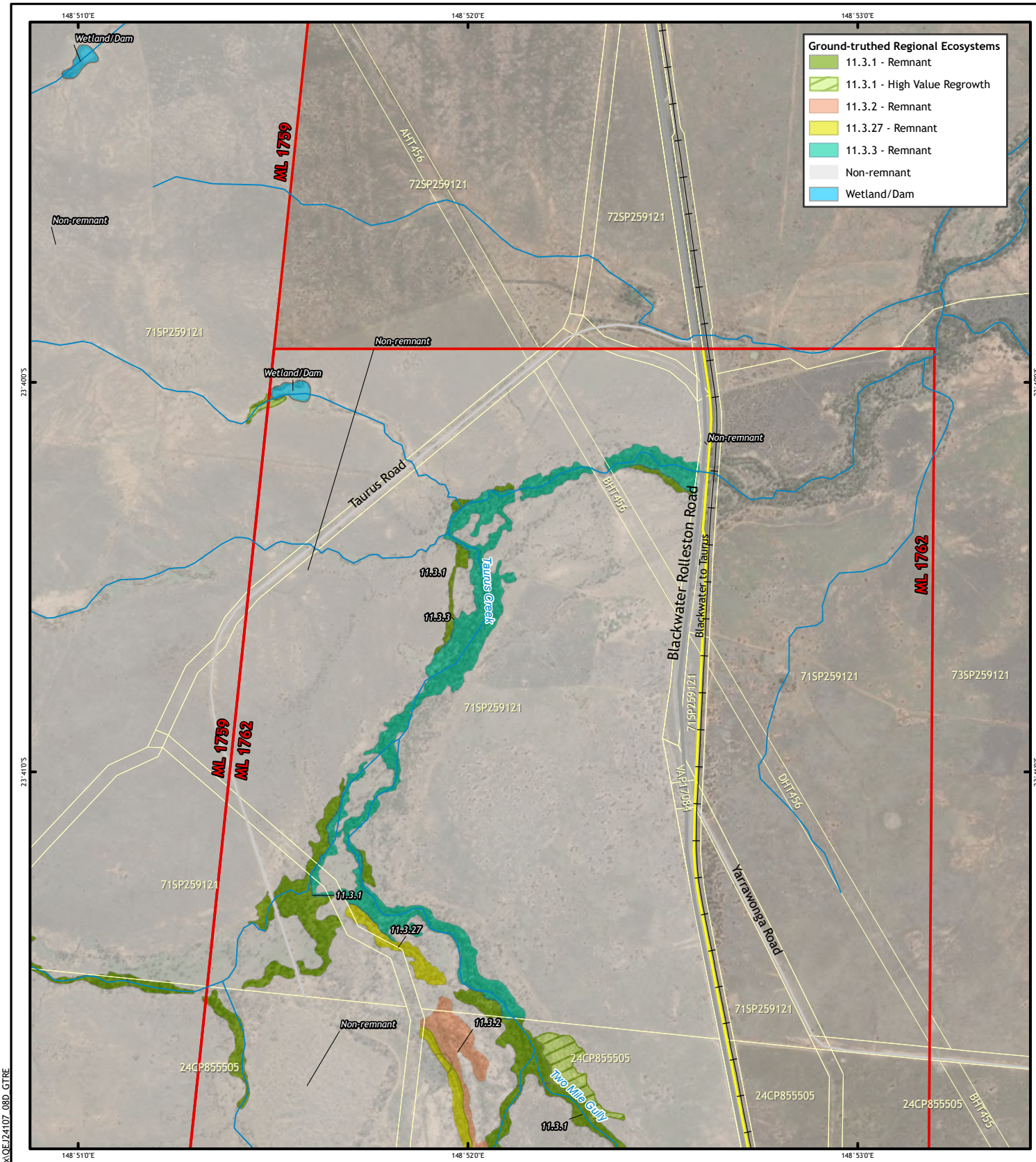
FIGURE 8C: GROUND-TRUTHED VEGETATION COMMUNITIES WITHIN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

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Legend

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- Secondary Road
- Property Access
- Watercourse
- Study Area
- Blackwater Mining Lease
- Cadastre

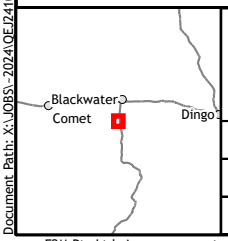
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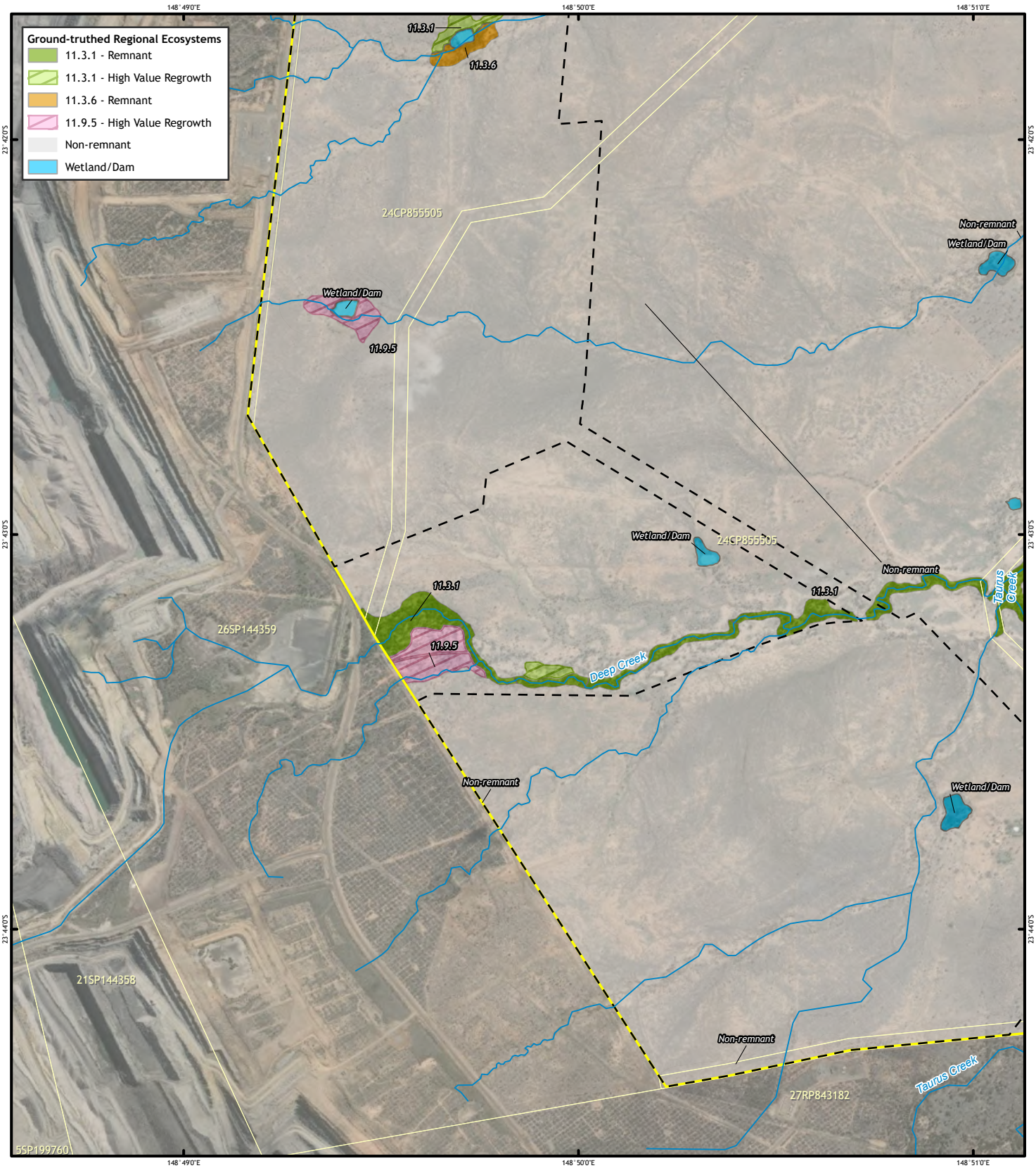
FIGURE 8D: GROUND-TRUTHED VEGETATION COMMUNITIES WITHIN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

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Legend

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- Study Area
- Disturbance Footprint
- Cadastre

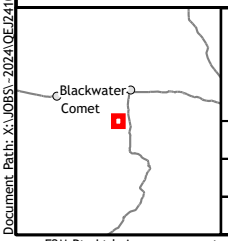
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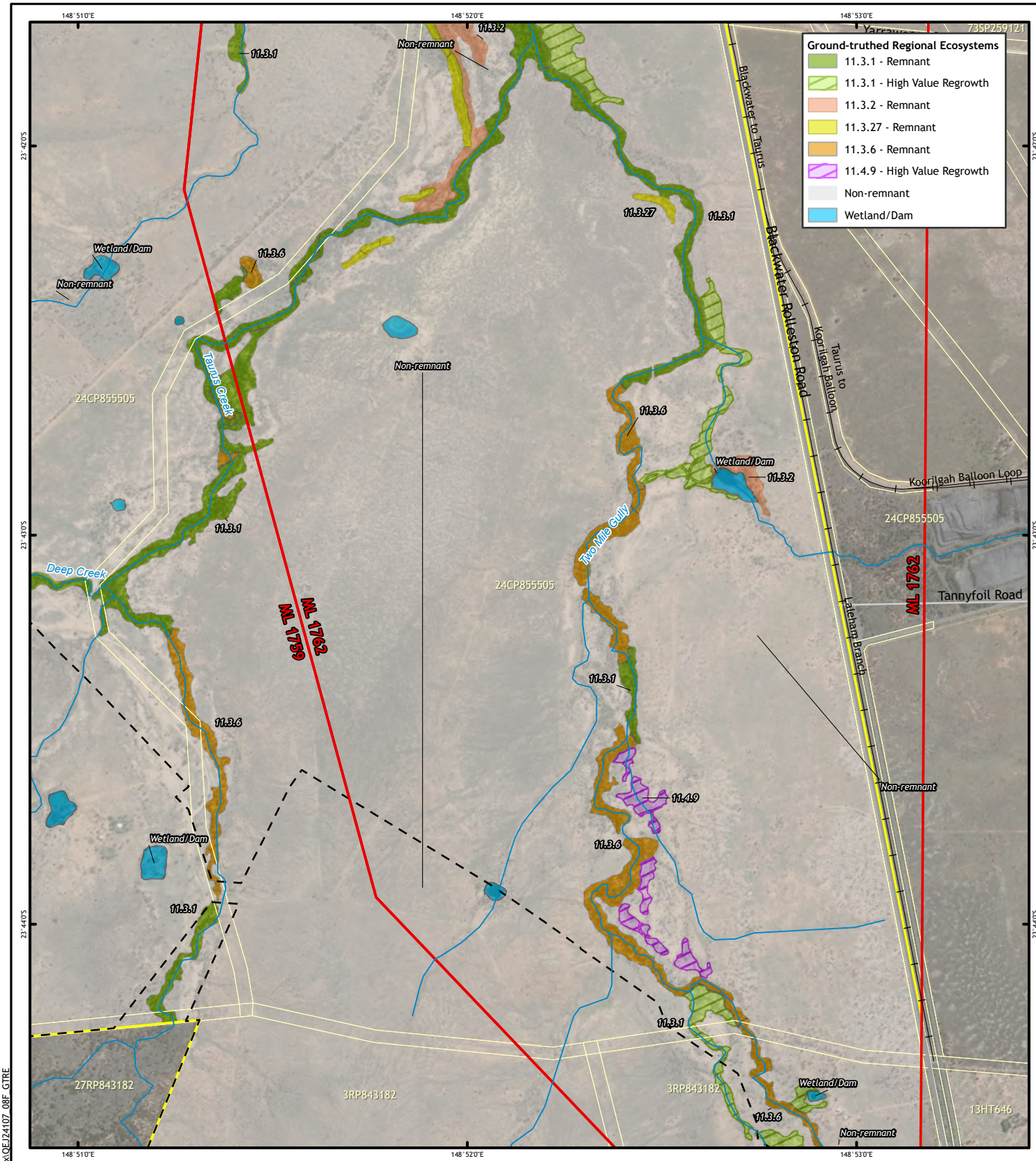
FIGURE 8E: GROUND-TRUTHED VEGETATION COMMUNITIES WITHIN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

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Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre

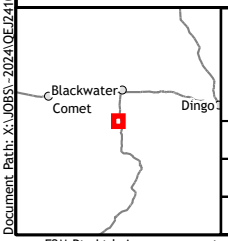
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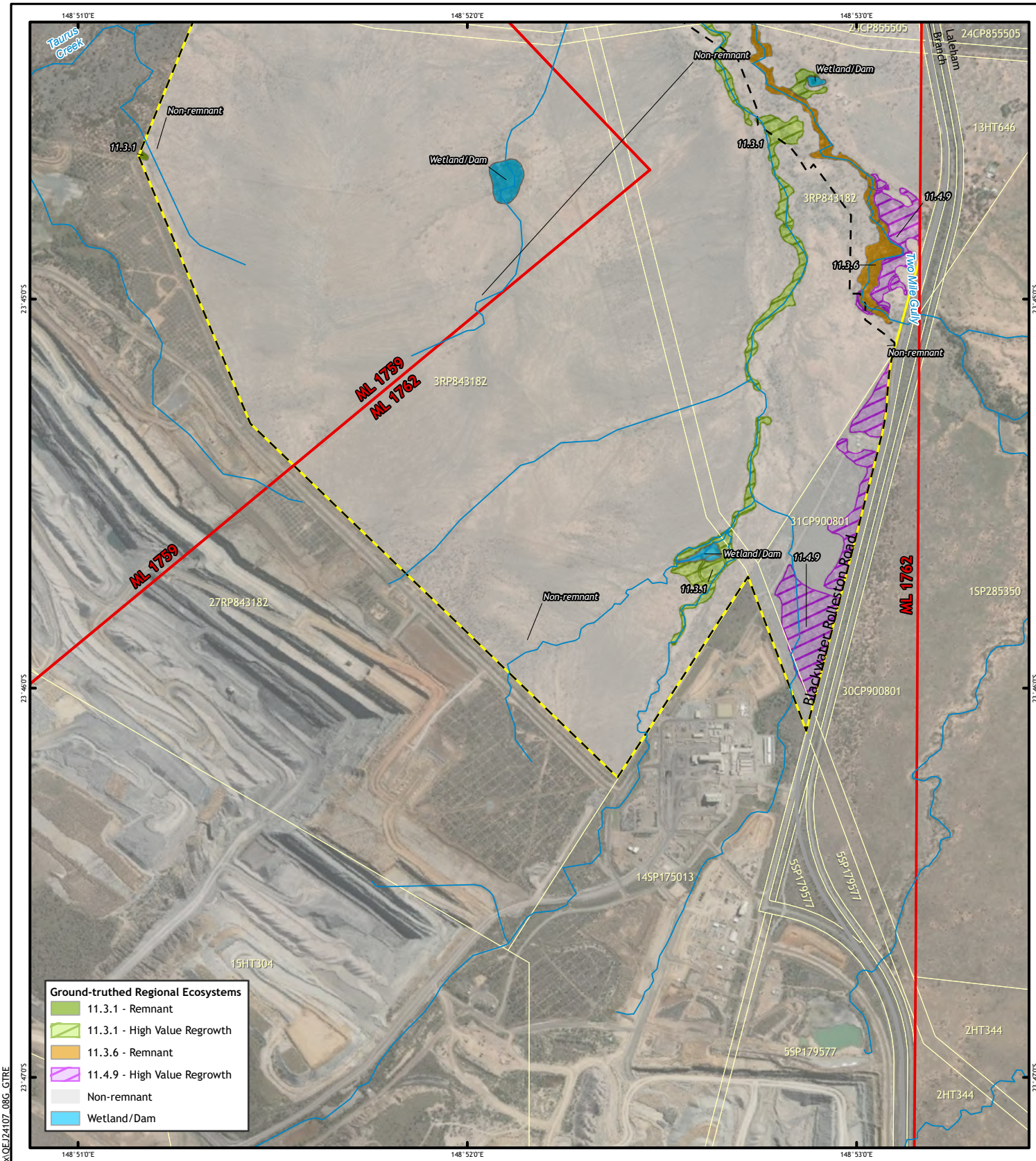
FIGURE 8F: GROUND-TRUTHED VEGETATION COMMUNITIES WITHIN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

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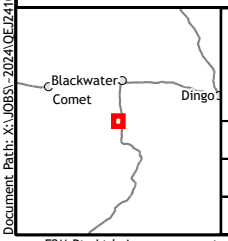
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FIGURE 8G: GROUND-TRUTHED VEGETATION COMMUNITIES WITHIN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

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4.1.2 Threatened Ecological Communities

A desktop assessment was undertaken to identify the potential presence of TECs listed under the EPBC Act within the Study Area. This included a review of PMST, existing RE mapping, and soil/land information to determine where known TEC-aligned REs may occur.

The desktop assessment identified six TECs that were potentially occurring within the Study Area (Appendix A). This included:

- Brigalow (*Acacia harpohylla* dominant and co-dominant) (Brigalow TEC)
- Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions (Coolibah TEC)
- Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin (Natural grasslands TEC)
- Poplar box grassy woodland on alluvial plains (Poplar box TEC)
- Semi Evergreen Vine Thicket Threatened Ecological Community of the Brigalow Belt (North and South) and Nandewar Bioregions (SEVT TEC); and
- Weeping Myall Woodlands.

Mapped occurrences of analogous REs within the Study Area were further assessed during field surveys to determine whether they met the key criteria and condition thresholds in the listing advice. Field verification confirmed the presence of the Brigalow TEC within the Study Area, in association with both remnant and high value regrowth vegetation. The TEC was recorded within areas mapped as RE 11.3.1, 11.4.9 and 11.9.5 where *Acacia harpophylla* was dominant or co-dominant. This is consistent with the ecological character of Brigalow communities described within the EPBC Act conservation advice (DotE, 2013a). Table 15 provides a summary of the TECs potentially occurring within the Study Area and their field-verified presence outcomes.

Table 15: Summary of potentially occurring TECs occurring in the Study Area

TEC	EPBC Act status	Presence within the Study Area
Brigalow (*Acacia harpohylla* dominant and co-dominant) (Brigalow TEC)	Endangered	**Confirmed present** A total of 148.88 ha of Brigalow TEC was mapped within the Study Area in association with remnant and high value regrowth areas of RE 11.3.1 and high value regrowth RE 11.4.9 and 11.9.5 where *Acacia harpophylla* was dominant or codominant (DotE, 2013a) (Section 4.1.2.1). Brigalow TEC mapped in the Disturbance Footprint totalled 40.29 ha.
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions (Coolibah TEC)	Endangered	**Not present** Mapped areas of RE 11.3.3, which is analogous with the TEC, were identified within the Study Area, however, the Study Area is located outside of the Brigalow Belt southern bioregion in which this TEC is located (DSEWPaC, 2011a).
Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin (Natural grasslands TEC)	Endangered	**Not present** No REs analogous with TEC were identified within the Study Area.

TEC	EPBC Act status	Presence within the Study Area
Poplar box grassy woodland on alluvial plains (Poplar box TEC)	Endangered	**Not present** Mapped areas of RE 11.3.2, which is analogous with the TEC, were identified within the Study Area, however, these patches did not meet the minimum condition thresholds (Section 4.1.2.2).
Semi Evergreen Vine Thicket Threatened Ecological Community of the Brigalow Belt (North and South) and Nandewar Bioregions (SEVT TEC)	Endangered	**Not present** No REs analogous with TEC were identified within the Study Area.
Weeping myall woodlands	Endangered	**Not present** While RE 11.3.2 was observed within the Study Area, the eponymous weeping myall (*Acacia pendula*) was not recorded (DEWHA, 2009).

4.1.2.1 Brigalow (*Acacia harpophylla* dominant and co-dominant) TEC

The Brigalow TEC is listed as Endangered under the EPBC Act. The Brigalow TEC includes 16 REs within Queensland (DCCEEW, 2025j) and typically occurs on fertile soils associated with land zones 4 and 9. The TEC is characterised by the dominance or co-dominance of *A. harpophylla* (brigalow) in the canopy, often in association with species such as *Casuarina cristata*, *Eremophila mitchellii*, or *Geijera parviflora* (Wilga). The community can exist as open woodland to closed forest and may occur as remnant or regrowth vegetation. To be considered a TEC under the EPBC Act, a patch must meet minimum threshold conditions pertaining to patch size and weed encroachment as detailed in Section 3.2.2.2.1.

The initial desktop assessment determined that the Study Area includes REs 11.3.1, 11.4.9 and 11.9.5. The field assessment verified a total of 148.88 ha of Brigalow TEC identified within the Study Area, associated with high value regrowth and remnant areas of RE 11.3.1, 11.4.9 and 11.9.5 where *A. harpophylla* was dominant or codominant (Plate 1).

An additional 18 patches, totalling 93.33 ha, analogous to these REs were not considered to meet the requirements of Brigalow TEC due to small patch size (less than 0.5 ha), the ecologically dominant layer not being dominant or codominant by *A. harpophylla,* exotic perennial plants have more than 50% cover or vegetation that has been comprehensively cleared (not just thinned) within the last 15 years.

Brigalow TEC mapped in the Disturbance Footprint totalled 40.29 ha. Areas analogous with these three REs which were considered the TEC all exceeded the 0.5 ha patch size and total vegetation cover consisted of less than 50% perennial exotics. While some patches contained high exotic cover within the ground layer, including *Cenchrus ciliaris* (Buffel grass) and *Harrisia martinii* (Harrisia cactus), non-native encroachment was limited within the other structural layers of the community, keeping the overall perennial exotic cover below 50%. Brigalow TEC habitat within the Study Area is illustrated in Figure 9.

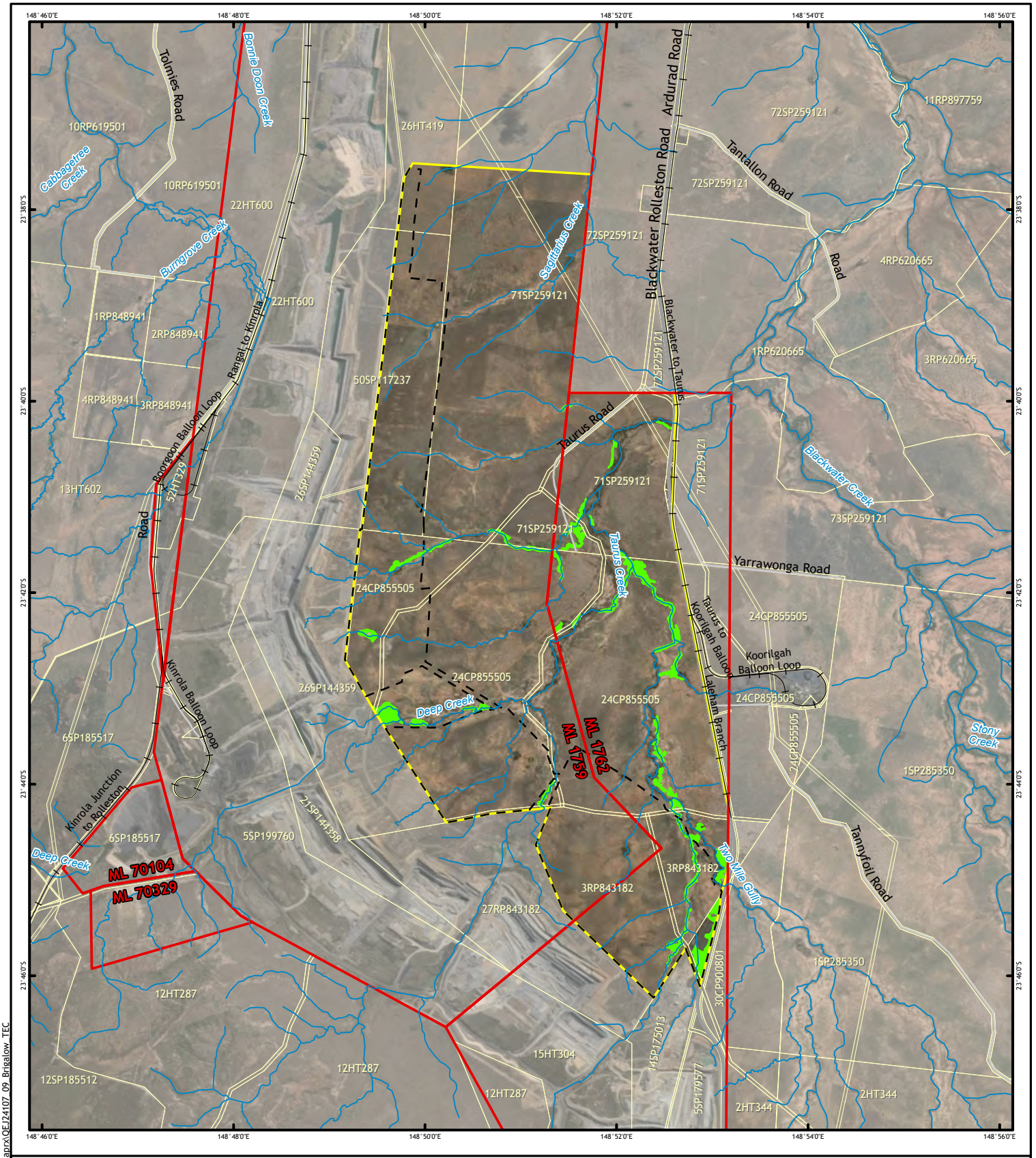


Plate 1: Remnant Brigalow TEC within the Study Area



Plate 2: Young regrowth areas not consistent with Brigalow TEC within the Study Area

Young regrowth (i.e. non-remnant areas) (Plate 2) associated with REs 11.3.1, 11.4.9 and 11.9.5 were dominated by *A. harpophylla* and commonly associated with *Lysiphyllum carronii* (Ebony tree) and *Atalaya hemiglauca* (Whitewood) with a median height of 3 m. However, these areas were deemed to not meet the structural elements broadly typical of the associated REs with clearing occurring within the last 15 years.



Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Disturbance Footprint
- Brigalow TEC
- Blackwater Mining Lease
- Cadastre

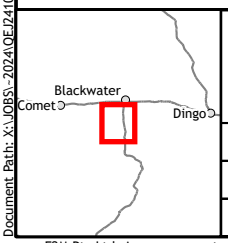
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Kilometres

Coordinate System: GDA2020



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FIGURE 9: BRIGALOW THREATENED ECOLOGICAL COMMUNITY HABITAT WITHIN THE STUDY AREA

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4.1.2.2 Poplar box grassy woodland on alluvial plains TEC

The Poplar box grassy woodland on alluvial plans is listed as a TEC under the EPBC Act and is primarily associated with *Eucalyptus populnea* (Poplar box) as the dominant or co-dominant species. The Poplar box TEC typically occurs on alluvial plains and fine-textured soils across Queensland and northern New South Wales.

The Poplar box TEC includes five REs within Queensland (DCCEEW, 2025j), with 11.3.2 the only analogous RE identified within the Study Area. To qualify as the Poplar box TEC, the remnant or high value regrowth vegetation community must meet minimum threshold conditions pertaining to patch size, crown cover, species composition, diversity, and weed encroachment as detailed in Section 3.2.2.2.2.

Two patches of RE 11.3.2 were assessed within the Study Area to determine whether they met the Poplar box TEC key diagnostic and condition thresholds requirements. While both patches met the key diagnostic requirements of the TEC, neither patch met the moderate or high condition thresholds to be considered the TEC. Both patches were less than 5 ha in size meaning they would need to meet the Class A1 condition to be considered the Poplar box TEC. However, assessment of perennial vegetation cover in the ground layer identified both patches contained over 50% non-native cover, dominated by Buffel grass (Plate 3), far in exceedance of the 10% requirement to be considered Class A1.



Plate 3: Non-native grasses dominating remnant area of RE 11.3.2

4.1.3 Threatened flora

The desktop assessment identified 22 threatened flora species potentially occurring within the 20 km buffer of the Study Area based on data from the ALA, PMST and WildNet records (ALA, 2025; DCCEEW, 2025i; DETSI, 2025c). The assessment concluded that only three species were considered known, likely or possible occurrences within the Study Area, including:

- *Bertya opponens* - Study Area is unlikely to contain suitable habitat but species has been previously recorded within close proximity to the Study Area
- *Solanum dissectum* - Study Area contains suitable habitat and the species has previously been recorded in close proximity to the Study Area; and
- *Solanum elachophyllum* - the species was previously recorded within the Study Area during EMM surveys including identification of approximately 1,200 stems[2].

[2] Fensham *et al*. (2019) found that *S. elachophyllum* have lateral underground stems that generate clonal shoots from rhizomes. As such, population estimates were calculated for stems instead of individuals.

Extensive field surveys targeting potential habitat for these three threatened flora species, re-confirmed presence of *S. elachophyllum* but failed to identify the presence of either *Bertya opponens* or *Solanum dissectum*. Therefore, given the neither species has been detected during extensive flora surveys and the lack of suitable habitat, specifically for *Bertya opponens*, neither species is considered likely to occur within the Study Area. Description of *S. elachophyllum* habitat and records within the Study Area is provided in the following section with likelihood of occurrence assessment for all other threatened flora species provided in Appendix B.

4.1.3.1 Solanum elachophyllum

Solanum elachophyllum, is listed as Endangered under the NC Act (not listed under the EPBC Act), and is found primarily on fertile cracking-clay soils in open forest of *E. thozetiana* (Lapunyah) *A. harpophylla*, with understorey of *Geijera parviflora*, *Casuarina cristata*, *Macropteranthes leichhardtii* (Bonewood), *E. cambageana*, or woodland of *E. crebra* and *E. tenuipes* (Bean, 2004). This species grows in vegetation communities in which fire is normally absent (Bean, 2004). The species is a shrub growing 0.1 m to 0.4 m height, on fertile cracking soils between Middlemount and Theodore.

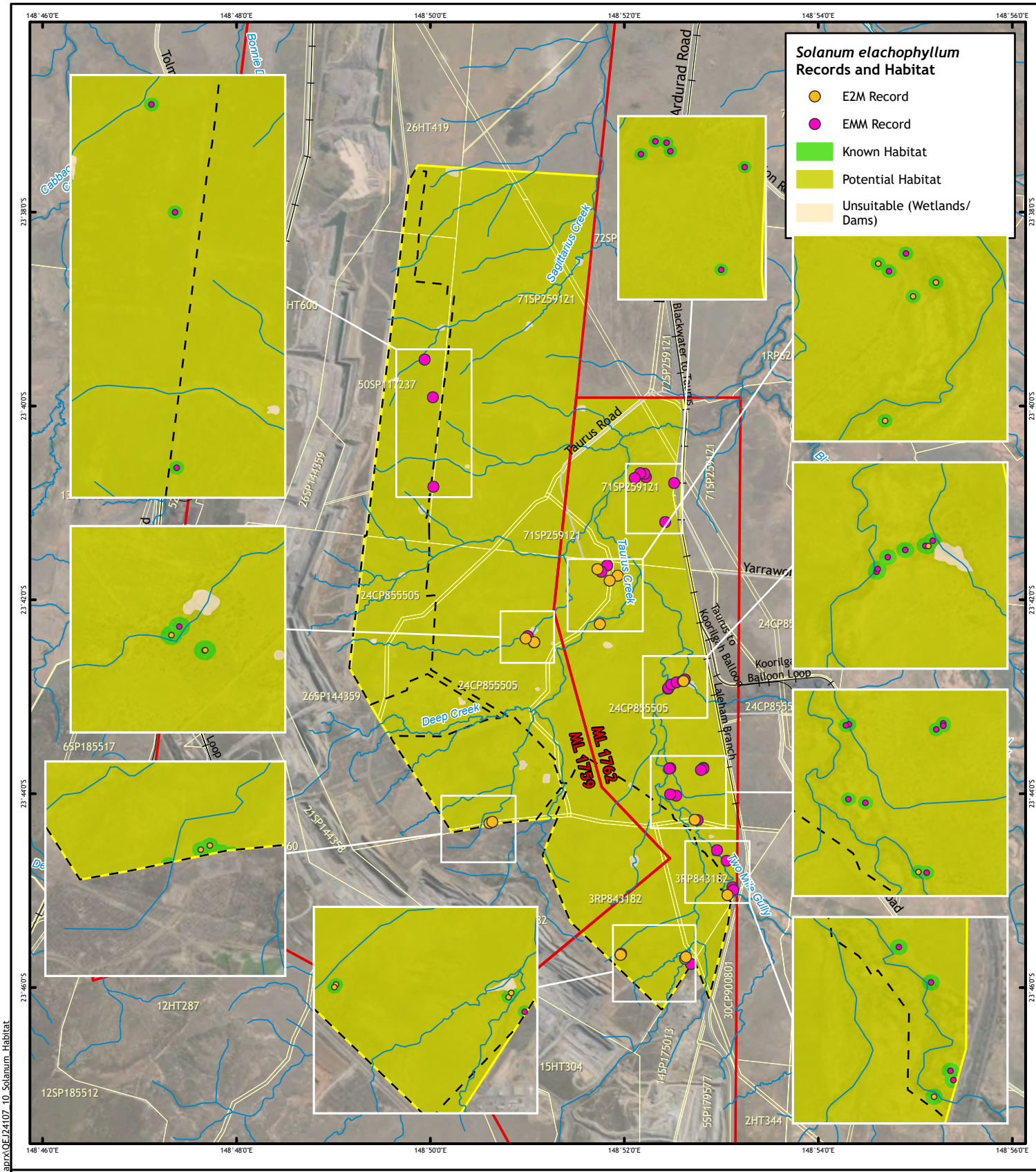
The species was primarily recorded on cracking clay soils in vegetation communities containing or previously dominated by *A. harpophylla*. Suitable habitat for *S. elachophyllum* within the Study Area, comprises:

- **Known habitat:** consists of suitable habitat within 50 m of known records of the species including REs 11.3.1, 11.3.2, 11.3.27, 11.3.6, 11.4.9, 11.9.5 and non-remnant vegetation.
- **Potential habitat:** consists of suitable habitat outside areas of known habitat including the REs listed above with the addition of RE 11.3.3.

Specifically, suitable habitat for *S. elachophyllum*, within the Study Area consists of remnant, high value regrowth and non-remnant vegetation associated with REs 11.3.1, 11.3.6, 11.4.9 and 11.9.5. In total 6,883.97 ha of habitat was identified within the Study Area, including 30.32 ha of known habitat and 6,853.65 ha of potential habitat. Approximately 2,305.60 ha of habitat was identified in the Disturbance Footprint, including 6.00 ha of known habitat and 2,299.78 ha of potential habitat. Threatened flora meanders conducted by both EMM and e2m within the Disturbance Footprint identified approximately 123 stems (Figure 10). S. *elachophyllum* observed within the Study Area is presented in Plate 4.



Plate 4: *Solanum elachophyllum* observed within the Study Area



Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre

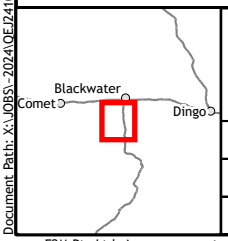
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Kilometres

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FIGURE 10: *SOLANUM ELACHOPHYLLUM* HABITAT AND RECORDS WITHIN THE STUDY AREA

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4.1.4 Pest flora

Eight weed species listed as Weeds of National Significance (WoNS) or restricted matter under the Biosecurity Act 2014 (Biosecurity Act) were recorded within the Study Area (Table 16). This correlates with EMM's findings (EMM, 2020b) where they observed pest flora to be widespread across the Study Area and included all species observed by E2M. *Opuntia* spp. (Prickly pears) were commonly observed within Brigalow communities, *Bryophyllum delagoense* (Mother of Millions) and *Parthenium hysterophorus* (Parthenium) amongst floodplains, and *Harrisia martinii* (Harrisia cactus) often in areas of regrowth vegetation and pasture (Plate 5). EMM observed *Cryptostegia grandiflora* (Rubber Vine) mostly within sections of stream banks, encroaching trees and forming thickets (EMM, 2020b), whilst during E2M surveys the species was commonly observed throughout Taurus Creek (Plate 6). Both EMM and E2M observed *Parkinsonia aculeata* (Parkinsonia weed) at some dam and wetland sites, although it was noted that it was relatively rare across the full Study Area (EMM, 2020b).



Plate 5 A dense patch of pest flora species *Bryophyllum delagoense* (Mother of millions), *Harrisia martinii* (Harrisia cactus), and *Parthenium hysterophorus*



Plate 6: Rubber vine *Cryptostegia grandiflora* encroachment

The extent categories used to describe flora species presence in Table 16, such as common, scattered and high density, reflect varying patterns of presence across the landscape. Scattered indicates irregular and isolated occurrences; common suggests regular but moderate presence; and high density refers to areas where the species occurs in large numbers or concentrations.

Table 16: Pest flora within the Study Area

Scientific name	Common name	WoNS	Biosecurity Act status	Extent within Study Area
Bryophyllum delagoense	Mother of millions	-	Category 3	Common throughout Study Area
Cryptostegia grandiflora	Rubber vine	WoNS	Category 3	Common throughout Taurus Creek
Harrisia martinii	Harrisia cactus	-	Category 3	Common throughout Study Area

Scientific name	Common name	WoNS	Biosecurity Act status	Extent within Study Area
Opuntia streptacantha	White-spined pear	WoNS	Category 3	Scattered throughout Study Area
Opuntia stricta	Common prickly pear	WoNS	Category 3	Scattered throughout Study Area
Opuntia tomentosa	Velvet tree pear	WoNS	Category 3	Scattered throughout Study Area
Parkinsonia aculeata	Parkinsonia	WoNS	Category 3	Scattered throughout Study Area
Parthenium hysterophorus	Parthenium	WoNS	Category 3	High density throughout the Study Area

4.1.5 Groundwater Dependent Ecosystems

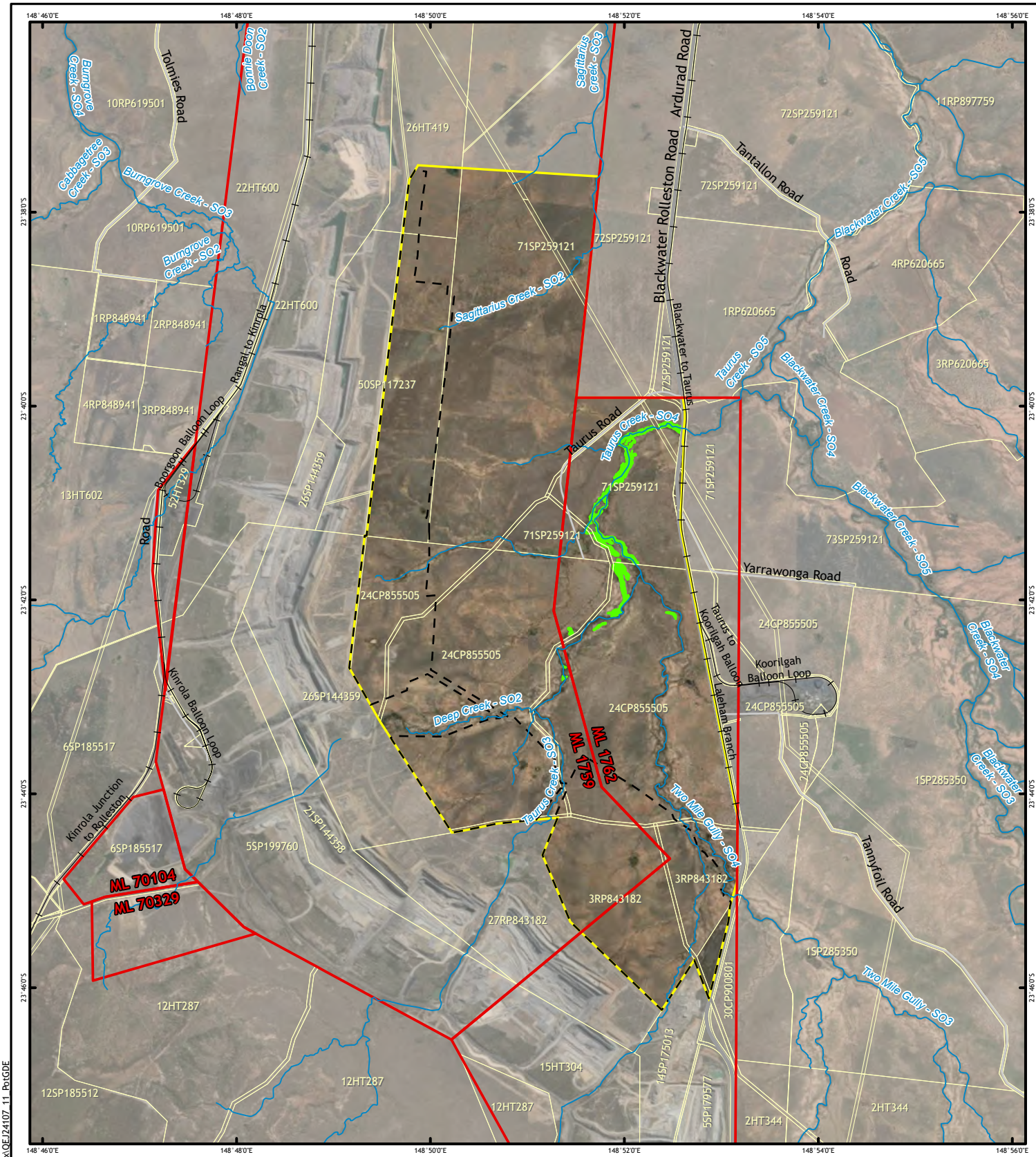
Groundwater Dependent Ecosystems (GDEs) are identified as 'water resources' under the Commonwealth *Water Act 2007* and require assessment under the EPBC Act in relation to coal seam gas and large coal mining developments. GDEs are ecosystems that require access to groundwater to meet all or some of their water requirements on a permanent or intermittent basis for maintenance of the ecosystem (Richardson et al., 2011). GDEs are classified by Doody et al. (2019) into three broad types, including:

- aquifer/cave ecosystems, occupied by stygofauna (subterranean GDEs);
- ecosystems dependant on the surface availability (discharge) of groundwater, which are characterised by permanent provision of surface water (aquatic GDEs); and
- ecosystems dependent on access to subsurface groundwater, which includes many riparian communities (terrestrial GDEs).

Assessment of subterranean and aquatic GDEs are not included within this report, and so only terrestrial GDEs will be discussed further. Desktop assessments identified a potential terrestrial GDEs in the central extent of the Study Area around Taurus Creek (BoM, 2026). A field assessment of potential GDEs determined that upstream and downstream extents of terrestrial GDEs within the Study Area have not been delineated, but likely correspond with RE 11.3.2, 11.3.25, 11.3.27, 11.3.3 and 11.3.6 on Taurus Creek (DPM, 2026).

Based on the species composition of these communities, areas of these REs potentially access groundwater during dry periods, given the presence of *E. coolabah and E. populnea*, which can be facultative groundwater dependent species (Eamus et al., 2006; Kath et al., 2014; Roberts & Marston, 2000).Remnant vegetation on Two Mile Gully and further upstream on Taurus Creek is unlikely to constitute terrestrial GDEs as they generally contained species that do not represent ground-water dependent vegetation such as *Acacia harpophylla* and *Terminalia oblongata*. These species typically have a horizontal root system and are considered unlikely to be dependent on access to groundwater for long-term survival (DES, 2017).

Areas of terrestrial GDEs identified in the Study Area are depicted in Figure 11 (DPM, 2026).



Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Potential GDE
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre

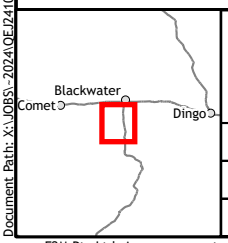
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Potential GDE: © DPM Enviroscienses 2026

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FIGURE 11: POTENTIAL GROUNDWATER DEPENDENT ECOSYSTEMS

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4.2 Fauna

Fauna surveys were undertaken within the Study Area in accordance with the relevant guidelines outlined in Section 3.2.3.

4.2.1 Fauna diversity

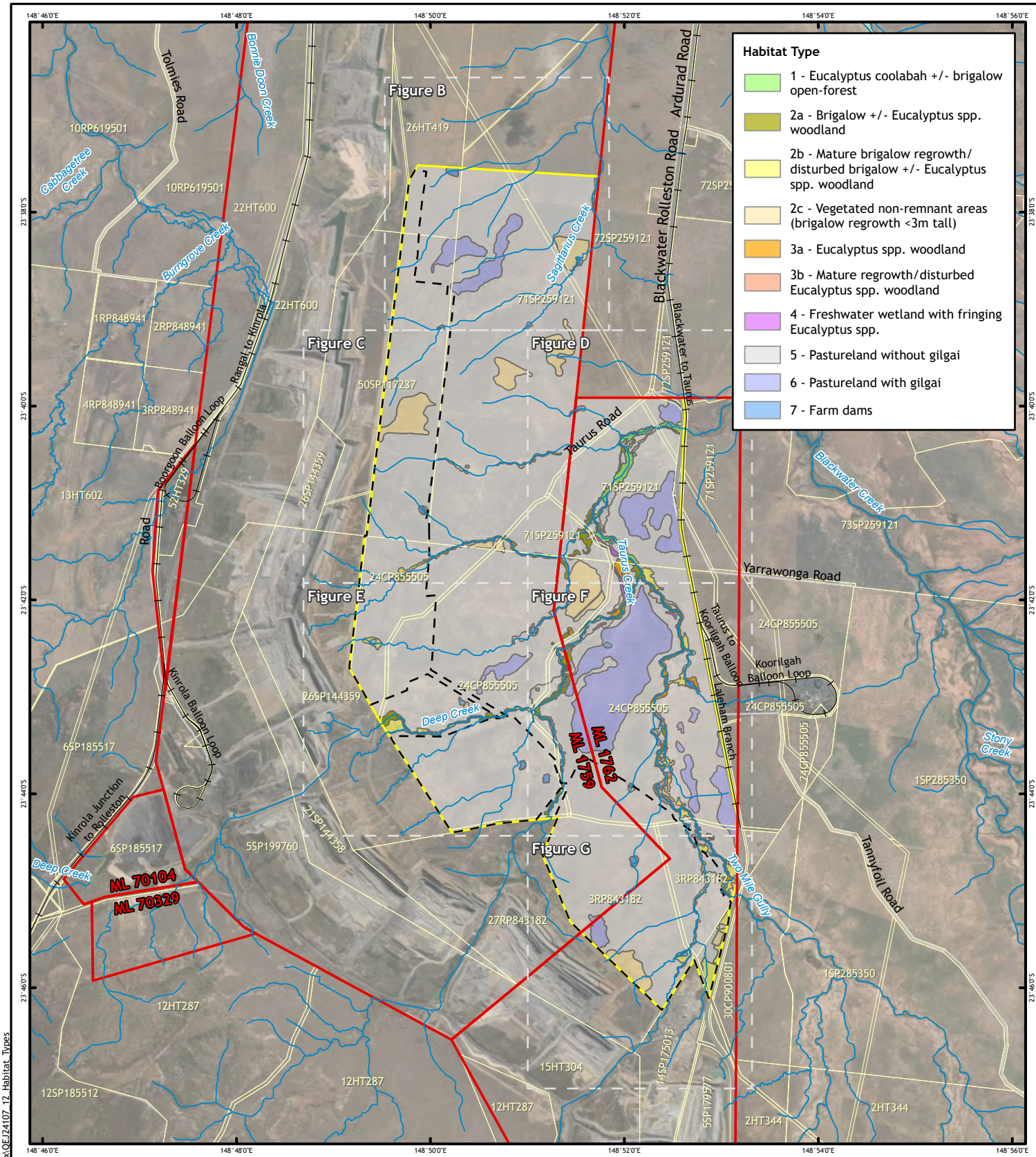
During the field surveys, E2M recorded 81 species of terrestrial fauna within the Study Area, including 74 native species and seven pest/introduced species. Birds accounted for 81.48% of the recorded fauna species, whilst mammals, reptiles and amphibians composed 8.64%, 2.47% and 7.41% of records, respectively. Refer to Appendix C for a full fauna species list.

4.2.2 Fauna habitat types

The Study Area can be delineated into ten broad habitat types based largely on vegetation type and structure (Table 17). The description of each fauna habitat type is presented from Section 4.2.2.1 to 4.2.2.10. Fauna habitat types within the Study Area are illustrated in Figure 12.

Table 17: Broad fauna habitat and their associated REs

Broad fauna habitat type	Broad fauna habitat type description	Associated RE	Location
Habitat 1	*Eucalyptus coolabah* +/ - brigalow open-forest	Remnant 11.3.3	Outside Disturbance Footprint
Habitat 2a	Brigalow +/- *Eucalyptus spp.* woodland	Remnant 11.3.1, 11.4.9, 11.9.5	Inside Disturbance Footprint
Habitat 2b	Mature brigalow regrowth / disturbed brigalow +/- *Eucalyptus* spp. woodland	High value regrowth/disturbed remnant 11.3.1, 11.4.9, 11.9.5	Inside Disturbance Footprint
Habitat 2c	Vegetated non-remnant areas (brigalow regrowth <3m tall)	Vegetated non-remnant areas associated with REs 11.3.1, 11.4.9, 11.9.5	Inside Disturbance Footprint
Habitat 3a	*Eucalyptus spp.* woodland	Remnant 11.3.2, 11.3.6	Inside Disturbance Footprint
Habitat 3b	High value regrowth / disturbed Eucalyptus spp. woodland	High value regrowth/disturbed remnant areas 11.3.2, 11.3.6	Inside Disturbance Footprint
Habitat 4	Freshwater wetland with fringing *Eucalyptus* spp.	Remnant 11.3.27	Outside Disturbance Footprint
Habitat 5	Pastureland without gilgai	N/A	Inside Disturbance Footprint
Habitat 6	Pastureland with gilgai	N/A	Inside Disturbance Footprint
Habitat 7	Dams	N/A	Inside Disturbance Footprint



Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre
- Figure Extent

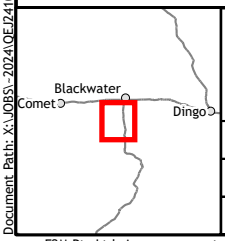
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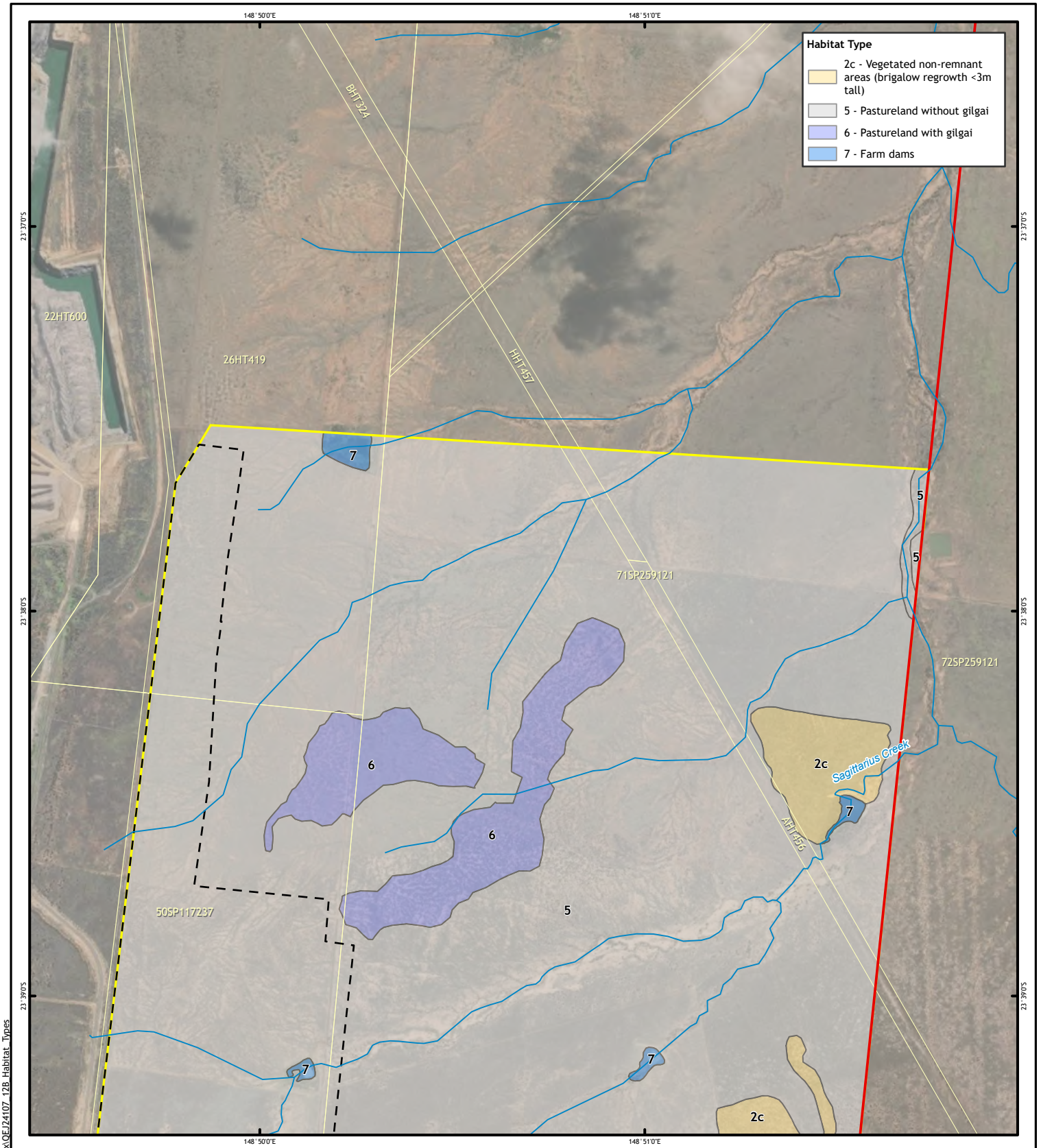
FIGURE 12A: FAUNA HABITAT TYPES IN THE STUDY AREA - OVERVIEW

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Whitehaven Coal

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Legend

- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre

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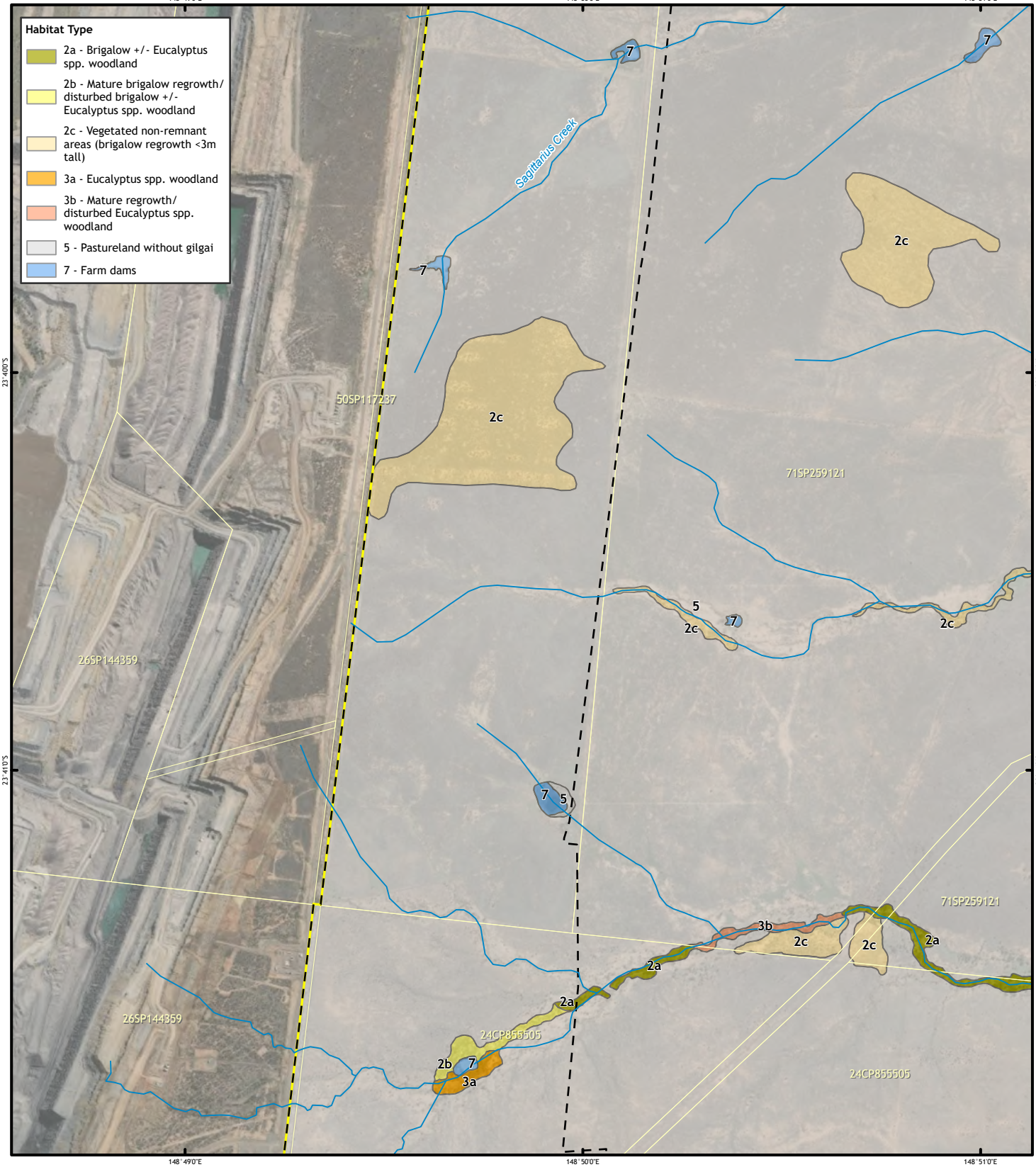
FIGURE 12B: FAUNA HABITAT TYPES IN THE STUDY AREA

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Whitehaven Coal

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Legend

- Watercourse
- Study Area
- Disturbance Footprint
- Cadastre

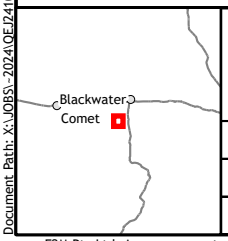
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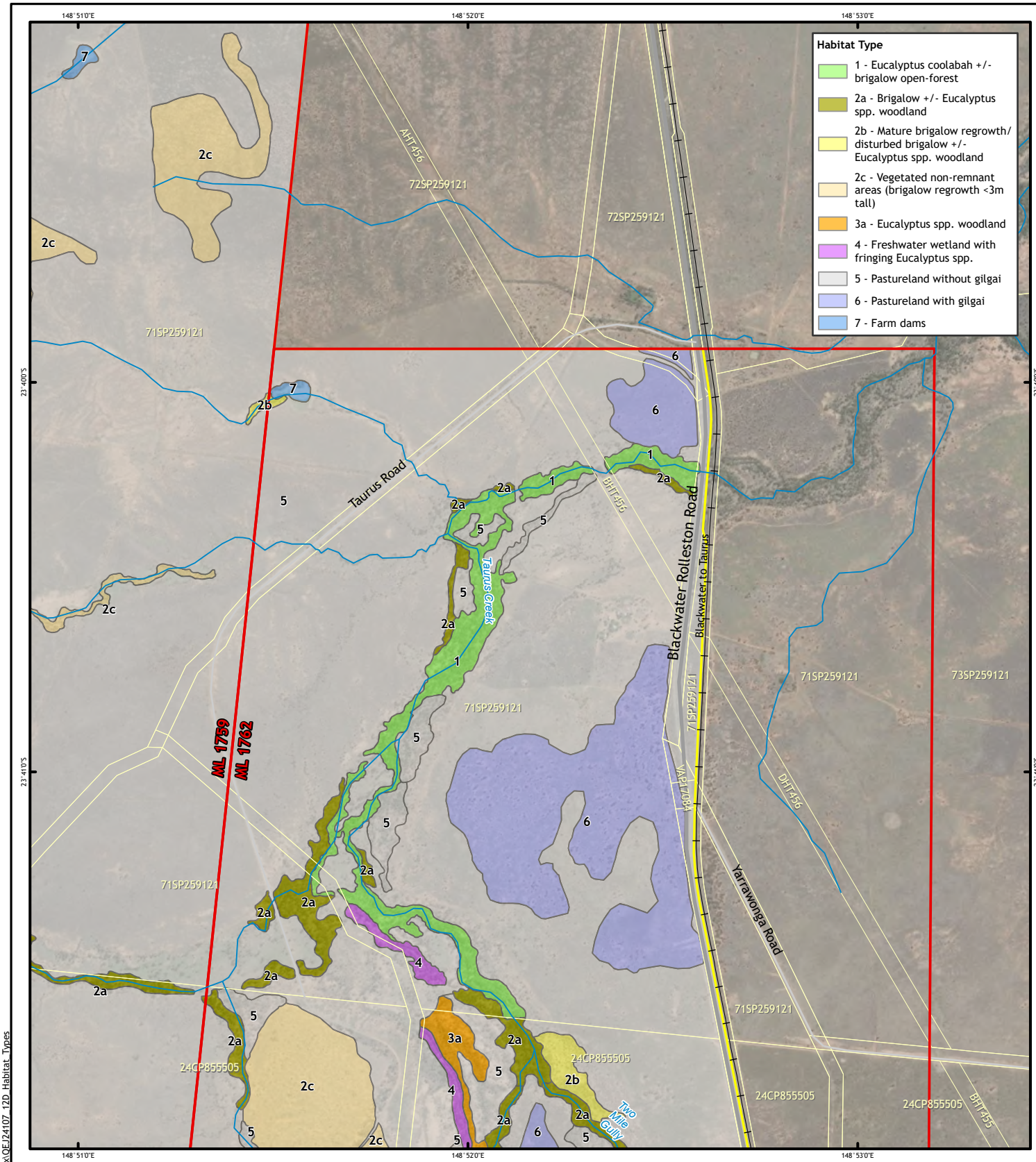
FIGURE 12C: FAUNA HABITAT TYPES IN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

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Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Blackwater Mining Lease
- Cadastre

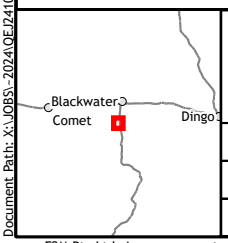
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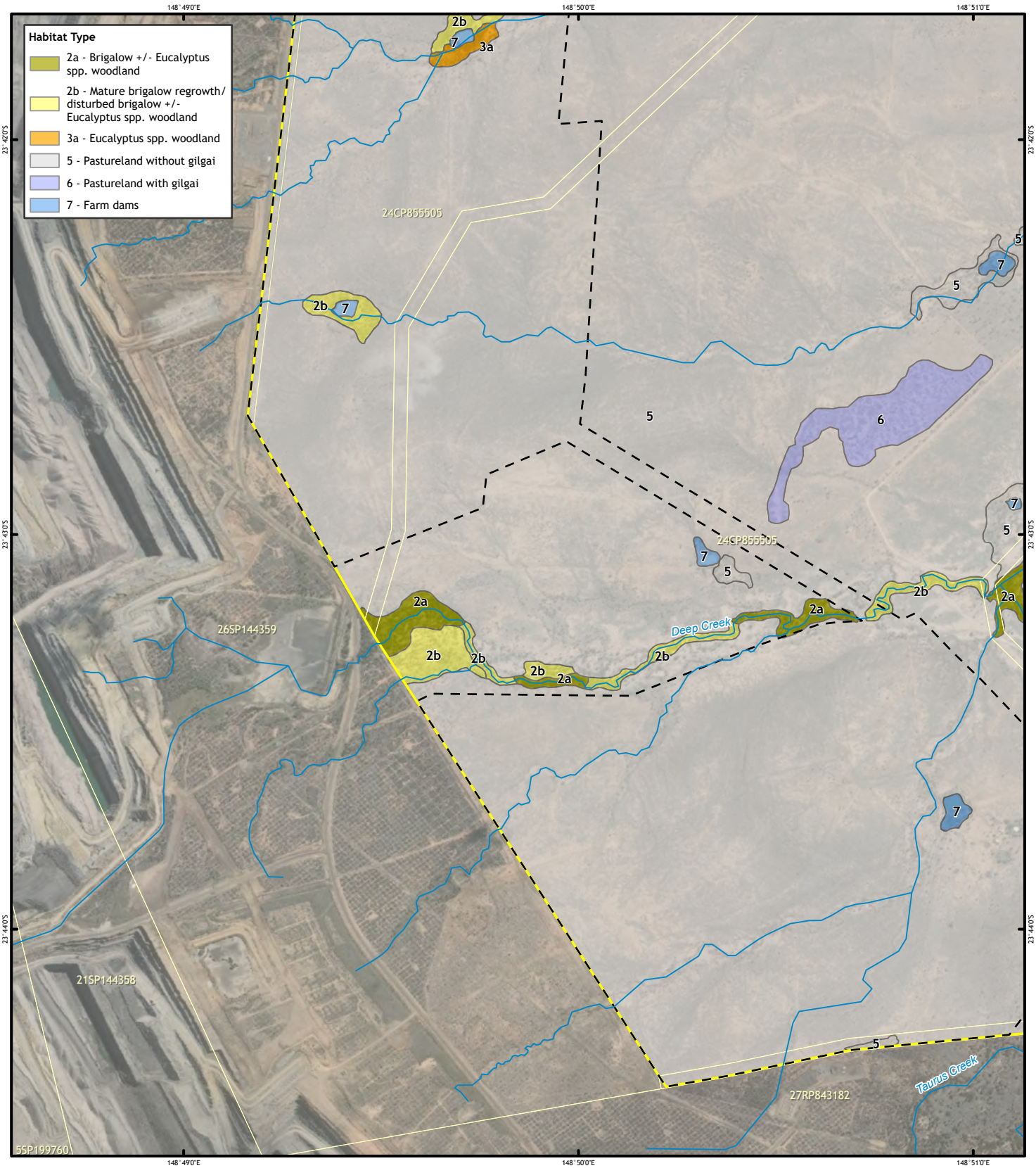
FIGURE 12D: FAUNA HABITAT TYPES IN THE STUDY AREA

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- Disturbance Footprint
- Cadastre

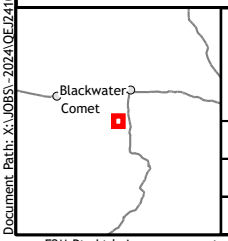
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Kilometres

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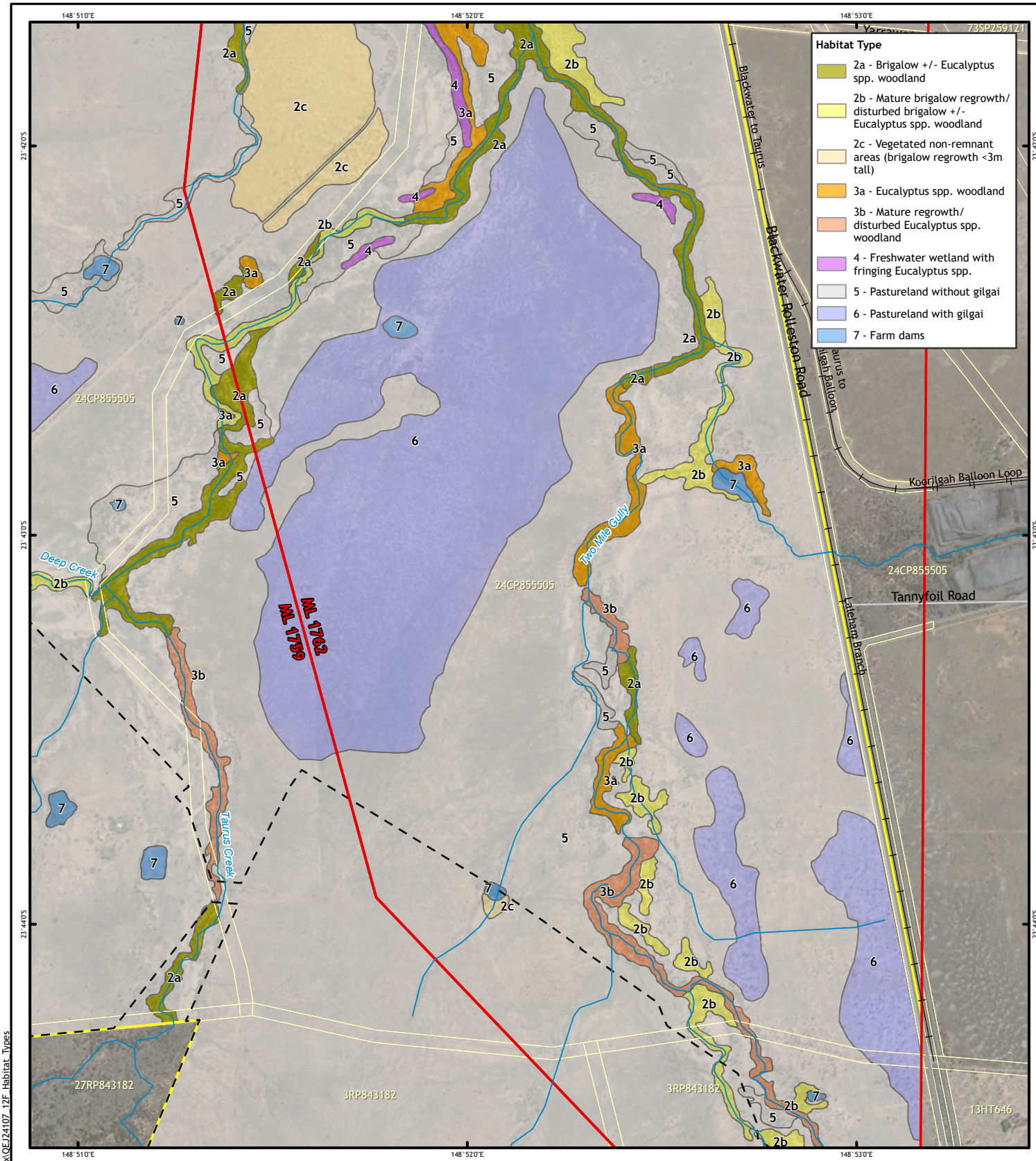
FIGURE 12E: FAUNA HABITAT TYPES IN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

Map Number	Job Number	Rev
5 of 7	QEJ24107	1

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Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre

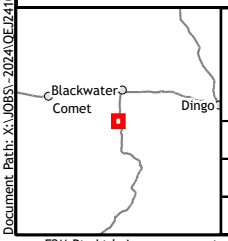
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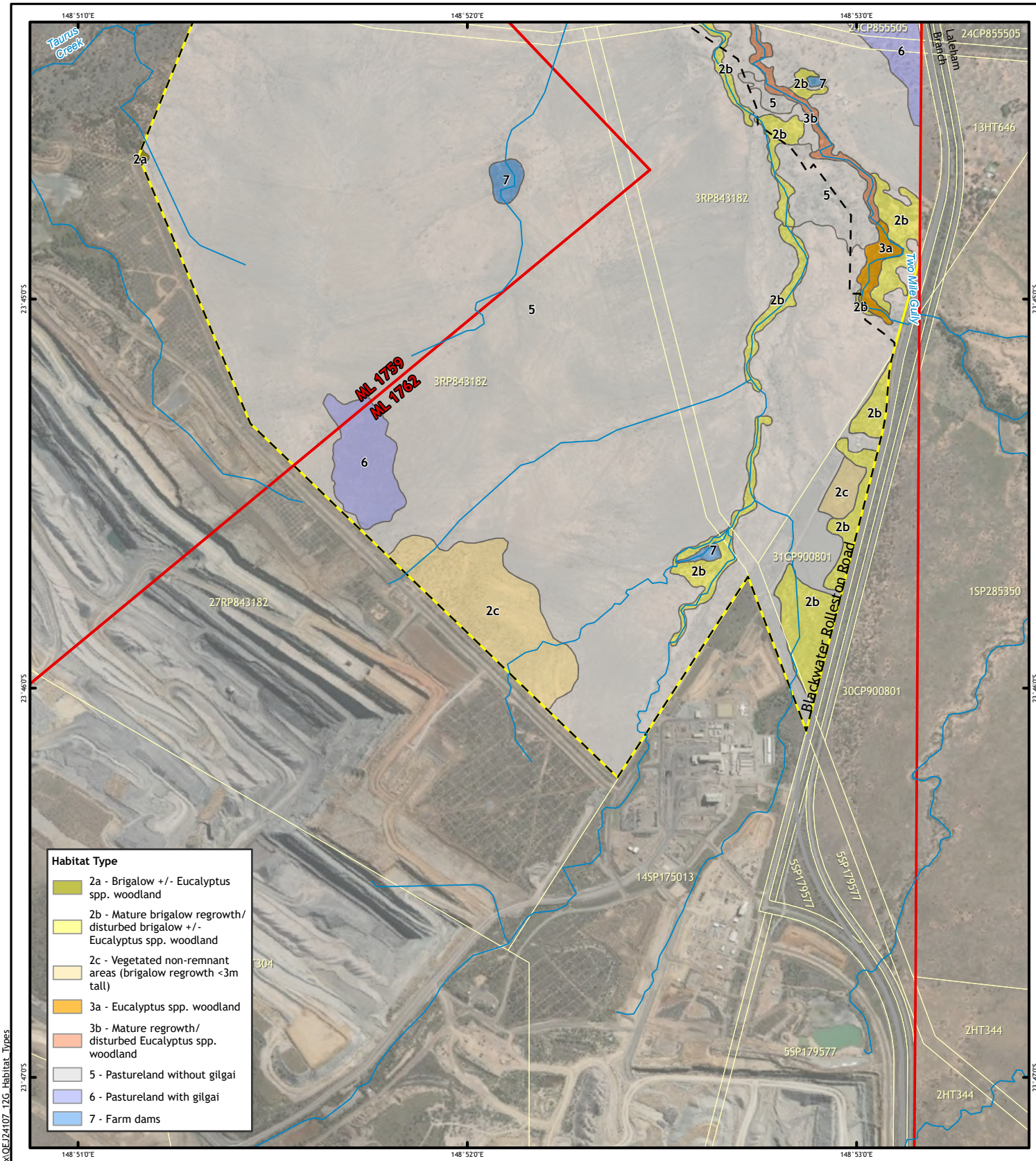
FIGURE 12F: FAUNA HABITAT TYPES IN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

Map Number	Job Number	Rev
6 of 7	QEJ24107	1

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Legend

- Railway
- Secondary Road
- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre

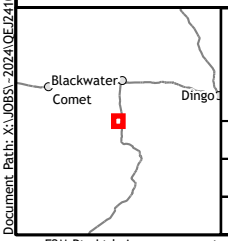
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FIGURE 12G: FAUNA HABITAT TYPES IN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

Map Number	Job Number	Rev
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4.2.2.1 Habitat 1: *Eucalyptus coolabah* +/- brigalow open-forest

This habitat type occurs outside of the Disturbance Footprint. The habitat is characterised by an open forest dominated by *Eucalyptus coolabah*, with *Acacia harpophylla* forming a prominent sub-canopy. The canopy structure provides nesting and roosting opportunities for arboreal mammals and birds, though lacks high abundances to support hollow dependent fauna (e.g. Greater gliders). A dense shrub layer, primarily comprising *Lysiphyllum carronii* and *Erythroxylum australe,* offers additional shelter and nesting sites for ground-dwelling birds and small mammals.

The ground layer, composed of native grasses and forbs, supports seed-eating birds, small mammals and invertebrates. An abundance of fallen logs and leaf litter is present, providing shelter and foraging substrate for reptiles, amphibians and invertebrates, and nesting materials for small mammals and birds. There is evidence of canopy species recruitment, indicating habitat resilience and long-term suitability for fauna dependent on mature vegetation. Despite this, a high presence of non-native species, such as *Megathyrsus maximus* and *Parthenium hysterophorus*, suggests reduced habitat quality.

This habitat type is equivalent to RE 11.3.3 (*Eucalyptus coolabah* woodland on alluvial plains), and representative photographs of this habitat type is provided in Plate 7.



Plate 7: Habitat 1: *Eucalyptus coolabah* +/- brigalow open-forest

4.2.2.2 Habitat 2a: Brigalow +/- *Eucalyptus* spp. woodland

This habitat occurs within the Disturbance Footprint and is generally comprised of an open forest dominated by *A. harpophylla* and scattered trees of *Eucalyptus coolabah, Brachychiton rupestris,* and *L. carronii*. The shrub layer provides shelter, nesting sites, and foraging opportunities for small mammals, birds and reptiles, with species such as *L. carronii* and *Erythroxylum australe* known to support insect life and offer structural diversity. Grass species diversity is low across the sites for this habitat, with species such as *Dichanthium sericeum* and *Sporobolus* spp. common, although some sites completely lack the presence of native grass species. This low diversity may limit habitat quality across some areas.

The habitat is heavily invaded by non-native species such as *Parthenium hysterophorus* and *Bryophyllum delagoense*, which may suppress native flora and alter fauna dynamics. Coarse woody debris was observed in great accumulations across all sites and is likely to enhance shelter and foraging availability for fauna species.

REs within the Study Area associated with this habitat type include 11.3.1, 11.4.9, and 11.9.5 and is depicted in Plate 8.



Plate 8: Habitat 2a: Brigalow +/- *Eucalyptus* spp. woodland

4.2.2.3 Habitat 2b: Mature brigalow regrowth/disturbed brigalow +/- *Eucalyptus* spp. woodland

This habitat occurs within the Disturbance Footprint. It is a mix of structurally open forests and shrubland with a moderate canopy layer dominated by *A. harpophylla*. The canopy cover ranges from moderate to high, while shrub layers are consistently sparse. Tree diversity is high with species such as *Eucalyptus coolabah*, *Terminalia oblongata*, and *Geijera parviflora*. Native ground cover is low or absent on some sites, with exotic species such as *Megathyrsus maximus, Cenchrus ciliaris* and *Parthenium sp*. dominating the ground layer, which significantly reduces the suitability for ground-dwelling and herbivorous fauna.

Sites within this habitat that are located on watercourses generally appear to offer higher ecological value compared to those on alluvial plains or with exotic understoreys. These watercourse-associated sites are likely to support a more diverse tree community, maintain better canopy structure and exhibit lower exotic species cover and a slightly higher native ground layer diversity. While they still are impacted by degradation, their structural complexity and species richness make them more suitable for a broader range of native fauna, particularly arboreal and shrub-dwelling species. This suggests that riparian or watercourse-associated vegetation may serve as important ecological refuges in otherwise modified landscapes.

REs within the Study Area associated with this habitat type include high value regrowth/disturbed remnant 11.3.1, 11.4.9, and 11.9.5 and is depicted in Plate 9.



Plate 9: Habitat 2b: Mature brigalow regrowth/disturbed brigalow +/- *Eucalyptus* spp. woodland

4.2.2.4 Habitat 2c: Vegetated non-remnant areas (brigalow regrowth <3m tall)

This habitat occurs within the Disturbance Footprint. The habitat represents non-remnant regrowth of *A. harpophylla* (<3m tall), forming sparse low woodlands. Canopy structure is underdeveloped, reflecting early successional growth following historical clearing. *A. harpophylla* is consistently dominant, though associated species such as *T. oblongata*, *L. carronii* and *A. hemiglauca* may be present in low numbers. Emergent and subcanopy layers are largely absent and tree diversity is low to moderate.

Shrub layers are sparse and composed of regenerating woody species such as *Carissa ovata*, *Capparis lasiantha*, and *Dodonaea* spp., while ground cover is a mix of native and introduced grasses including *Aristida ramosa*, *Panicum decompositum*, and *Cenchrus ciliaris*, with exotic species cover often exceeding 50%. Forbs are present but include many disturbance-tolerant and non-native taxa such as *Parthenium hysterophorus*, *Melinis repens*, and *Salsola australis*. Litter cover is patchy, with some areas showing high bare ground percentages.

This early regrowth habitat is structurally simple, with limited vertical complexity, moderate canopy cover (~20-30%), and often a high dominance of pasture species. As a result, it provides low habitat suitability for arboreal or ground-dwelling fauna, although it may support some shrub and disturbance-adapted species.

REs within the Study Area associated with this habitat type include non-remnant brigalow regrowth (<3 m tall) associated with previously cleared REs 11.3.1, 11.4.9, 11.9.5 and is depicted in Plate 10.



Plate 10: Habitat 2c: Vegetated non-remnant areas (brigalow regrowth <3m tall)

4.2.2.5 Habitat 3a: *Eucalyptus* spp. woodland

This habitat occurs within the Disturbance Footprint and is an open woodland dominated by species such as *Eucalyptus populnea, Eucalyptus melanophloia*, *Eucalyptus camaldulensis, T. oblongata* and *A. harpophylla*. The canopy cover ranges from sparse to moderately dense and is rich in diversity in some sites (up to 8 tree species). Sites with mixed species composition and higher canopy cover is likely to prove more ecological niches and support higher biodiversity, particularly arboreal fauna, though lack of hollows reduces suitability. The shrub layer is generally sparse across most sites and includes species such as *Lysiphyllum hookeri*, *Carissa ovata*, and *Citrus glauca*. The ground layer is highly variable and often degraded. Native grasses such as *Dichanthium sericeum, Enteropogon ramosus,* and *Sporobolus caroli* were present in some site although exotic species such as *Cenchrus ciliaris*, *Megathyrsus maximus* and *Urochloa mosambicensis* dominated in most.

Sites with high exotic cover (up to 70%) and low native grass diversity offer poor habitat for groundforaging fauna and herbivores. Coarse woody debris is moderate to high across most sites and are likely to support a richer and more diverse fauna community, particularly those depended on ground-level habitat features such as reptiles, amphibians and small mammals.

REs within the Study Area associated with this habitat type include Remnant 11.3.2, 11.3.6 and is depicted in Plate 11.



Plate 11: Habitat 3a: *Eucalyptus* spp. woodland

4.2.2.6 Habitat 3b: High value regrowth/disturbed *Eucalyptus* spp. woodland

The habitat type occurs within the Disturbance Footprint. It is characterised as a disturbed open forest and woodland habitat, primarily dominated by *Eucalyptus populnea*, *Eucalyptus melanophloia* and associated species such as *T. oblongata*, *Lysiphyllum hookeri*, and *A. harpophylla*. The canopy is variable in density, ranging from sparse to moderately closed. The presence of mature Eucalypt species provides vertical structure and potential nesting and foraging opportunities for arboreal fauna, though generally lacks hollows.

The shrub layer is patchy and inconsistent, with one site supporting a well-developed shrub layer whilst others are nearly devoid of mid-strata vegetation. This likely affects habitat suitability for small mammals, reptiles and birds that rely on shrub cover for shelter and movement. The ground layer is mostly degraded with a high exotic species cover (50-70%) including species such as *Cenchrus ciliaris*, *Megathyrsus maximus*, *Parthenium* spp. and *Opuntia* spp. Native grass and forb diversity is limited. Coarse woody debris is moderate to high, offering important microhabitats for invertebrates, reptiles and small mammals.

REs within the Study Area associated with this habitat type include high value regrowth/disturbed remnant areas 11.3.2 and 11.3.6 and is depicted in Plate 12.



Plate 12: Habitat 3b: High value regrowth/disturbed *Eucalyptus* spp. woodland

4.2.2.7 Habitat 4: Freshwater wetland with fringing *Eucalyptus* spp.

The habitat type occurs outside the Disturbance Footprint. The habitat is characterised as a riparian open forest dominated by *Eucalyptus camaldulensis* (River red gum), occurring adjacent to a backwater wetland. It features diverse tree assemblage and moderate to high canopy, providing strong vertical structure and habitat for arboreal fauna such as birds and possums. The shrub layer is sparse (2.4%) with species such as *L. carronii* and *Acacia saligna*. This limited mid-stratum vegetation is likely to reduce shelter and foraging opportunities for small mammals and birds.

Amongst the ground layer, native grass is limited with only *Bothriochloa ewartiana* recorded and forbs demonstrate low diversity with just three species recorded. Exotic cover is high (70%) and is dominated by *Megathyrsus maximus* and *Cenchrus ciliaris*, likely suppressing native regeneration and reducing habitat quality. There is moderate coarse woody debris presence, contributing to ground-level habitat complexity and supporting reptiles, invertebrates and decomposers.

Presence of permanent to semi-permanent water in these areas likely provide foraging opportunities for wetlands bird species.

REs within this Study Area associated with this habitat type include Remnant 11.3.27 and is depicted in Plate 13.



Plate 13: Habitat 4: Freshwater wetland with fringing *Eucalyptus* spp.

4.2.2.8 Habitat 5: Pastureland without gilgai

This habitat, located within the Disturbance Footprint, comprises cleared paddocks with scattered regrowth and improved pasture species. The overstorey is very sparse and contains only scattered individuals such as *A. harpophylla*, *L. carronii*, and *Acacia saligna*, with emergent heights reaching up to 12 m in some areas. Canopy and subcanopy cover are minimal (0-2.2%), offering limited vertical structure and habitat for arboreal fauna.

The shrub layer is variable with some sites supporting a moderate diversity of species including *Carrisa ovata, Capparis lasiantha, Dodonaea sp.*, and *Grewia latifolia*, though overall shrub cover remains low. This patchiness likely limits shelter and foraging opportunities for small mammals and understorey birds. The ground layer is dominated by exotic pasture grasses and forbs, with non-native cover ranging from 65% to 90%. Invasive species such as *Cenchrus ciliaris, Bothriochloa pertusa, Megathyrsus maximus*, and *Stylosanthes scabra* are widespread and likely suppress native regeneration. Native grasses such as *Themeda triandra, Aristida ramosa*, and *Sporobolus actinocladus* are present but patchy. Forb diversity is moderate, with a mix of native and exotic species including *Enchylaena tomentosa*, *Trianthema triquetra* and *Portulaca oleracea*.

Ground condition is variable, with litter cover ranging from 5% to 90% and bare ground from 0% to 25%, indicating inconsistent surface stability and microhabitat availability. Coarse woody debris is largely absent, further reducing structural complexity at ground level. This habitat type is depicted in Plate 14.



Plate 14: Habitat 5: Pastureland without gilgai

4.2.2.9 Habitat 6: Pastureland with gilgai

This habitat, located within the Disturbance Footprint, comprises cleared paddocks with scattered regrowth and improved pasture species on Cainozoic clay plains with gilgai microrelief. This habitat is characterised as a disturbed open woodland on improved pasture, dominated by *A. harpophylla*, *L. carronii*, and associated species such as *Apophyllum anomalum* and *A. hemiglauca*. Vertical structure is limited, with emergent heights ranging from 1.8 to 5 m and very sparse canopy development. Canopy and subcanopy are generally low, offering limited arboreal habitat value.

The shrub layer is patchy and species-rich in some areas, with taxa such *as Dodonaea sp., Capparis lasiantha* and *Sesbania cannabina*, but overall shrub cover remains minimal. This likely reduces shelter and foraging opportunities for small mammals and understorey birds. The ground layer is dominated by exotic grasses, with non-native cover averaging 80-90%. Invasive species such as *Cenchrus ciliaris, Bothriochloa pertusa*, and *Chloris gayana* are prevalent, likely suppressing native regeneration. Native grasses are present but limited, including *Eragrostis parviflora* and *Dichanthium sericeum*. Forb diversity is moderate, with a mix of native and exotic species.

Coarse woody debris is present in some areas, contributing to microhabitat complexity for reptiles, invertebrates and decomposers. However, high bare ground and litter variability across the sites suggest inconsistent ground-level habitat quality. Importantly, the presence of gilgai microtopography and cracking clays soils enhances habit heterogeneity by creating small seasonal refuge and breeding sites for amphibians, invertebrates and reptiles, while ephemeral water presence provides seasonal foraging opportunities for birds including herons and snipes. This habitat type is depicted in Plate 15.



Plate 15: Habitat 6: Pastureland with gilgai

4.2.2.10 Habitat 7: Dams

This habitat is located within the Disturbance Footprint and includes artificial waterbodies constructed primarily for agricultural purposes, such as livestock watering or irrigation. They can provide important aquatic and semi-aquatic habitat on otherwise dry landscapes. This habitat often supports a range of fauna, such as providing breeding habitat for amphibians, providing drinking, foraging and nesting opportunities for terrestrial and waterbirds, providing a water source for mammals, basking, shelter and foraging habitat for reptiles, and supporting a wide range of aquatic and semi-aquatic invertebrates.

Vegetation surrounding dams typically include emergent aquatic plants, sedges and grasses with occasional regrowth of native shrubs. However, the surrounding ground layer is often dominated by exotic pasture species and may show signs of trampling or erosion due to livestock access.

Water quality and ecological value vary widely depending on management practices, including well-maintained dams with fenced margins and native vegetation buffers and other degraded or heavily grazed dams may offer limited ecological function. This habitat type is depicted in Plate 16.



Plate 16: Habitat 7: Dams

4.2.3 Threatened fauna

The desktop assessment identified 39 fauna species listed under both the EPBC Act and NC Act as potentially occurring within the Study Area, including 36 EPBC Act listed species, and 37 NC Act listed species. Prior to field surveys, an assessment of the likelihood of occurrence for threatened fauna species was conducted based on species habitat suitability, species distribution ranges and historical occurrence records. Desktop assessments results identified 12 species as known, likely or possibly occurring within the Study Area, including:

- Known to occur (previously recorded within the Study Area during EMM surveys (EMM, 2023a, 2023b)):
  - **Koala**: indirect evidence (Koala scratches) was recorded along Taurus Creek (2.11 km northeast of the Disturbance Footprint)
  - **Australian painted snipe**: observed on three occasions within the Study Area
  - **Squatter pigeon (southern)**: recorded on two occasions in the vicinity of dams near Taurus Road
  - **Ornamental snake**: recorded in gilgai areas between Taurus Creek and the Blackwater-Rolleston Road
  - **Latham's snipe**: was recorded at three locations across the Study Area in ephemeral gilgai habitat
- Likely to occur:
  - **White-throated needletail:** the species occurs widely across Queensland and forages aerially above all most habitat types including cleared pasture. The species has been recorded on multiple occasions within the desktop search extent and foraging habitat occurs above the entire Study Area.
  - **Short-beaked echidna:** the species occurs in a wide range of habitats across Australia including grasslands and open-woodlands which occur throughout the Study Area. The species has also been recorded multiple occasions within desktop search extent.
- Possibly occurring:
  - **Corben's long-eared bat:** the Study Area occurs at the edge of the species potential distribution and may contain suitable habitat
  - **Greater glider (southern and central):** the species has been previously recorded within the desktop search extent and suitable habitat may occur within the Study Area
  - **South-eastern Glossy black-cockatoo:** numerous records occur within the desktop search extent, and the Study Area may contain suitable habitat
  - **Painted honeyeater:** numerous records occur within the desktop search extent, and the Study Area may contain suitable habitat
  - **Sharp-tailed sandpiper:** the species has been previously recorded within the desktop search extent and suitable habitat may occur within the Study Area

These species formed the basis of targeted surveys and habitat assessments undertaken by E2M with the aim of refining species likelihood of occurrence based on field verified results.

While no additional threatened fauna species were identified during field surveys, potential suitable habitat was confirmed for both likely occurring threatened species, whilst the five possibly occurring species were downgraded to unlikely to occur based on the species not being detected during targeted surveys and the lack of suitable habitat within the Study Area. Full likelihood of occurrence results for all species identified during the desktop assessment are provided in (Appendix B).

The characteristics of habitat mapped for known or likely to occur species are summarised in Table 18 and described in further detail in Sections 4.2.1 to 4.2.3.7.

Table 18: Summary of threatened fauna habitat within the Study Area and Disturbance Footprint

Species	Habitat summary	Habitat with Study Area (ha)	Habitat within Disturbance Footprint (ha)
Reptiles			
Ornamental snake (*Denisonia maculata*)	Breeding and foraging - remnant, high value regrowth and non-remnant areas with suitable gilgai microrelief and soil cracks	497.52	0.0
Birds			
Australian painted snipe *(Rostratula australis)*	Intermittent foraging – consisting of all remnant, high value regrowth or non-remnant areas with gilgai microrelief	593.55	14.45
	Permanent foraging - consisting of dams/wetlands with shallow sloping margins and dense fringing vegetation (e.g. reeds and sedges)	16.45	6.41
Latham's snipe *(Gallinago hardwickii)*	Intermittent foraging – consisting of all remnant, high value regrowth or non-remnant areas with gilgai microrelief	593.55	14.45
	Permanent foraging - consisting of dams/wetlands with shallow sloping margins and dense fringing vegetation (e.g. reeds and sedges)	16.45	6.41
Squatter pigeon (southern) *(Geophaps scripta scripta)*	Breeding and foraging – remnant, high value regrowth and young regrowth communities on well-draining soils (i.e. land zones 3, 5, 7 and 9) within 1 km of a semi-permanent or permanent waterbody	239.01	26.05
	Foraging - remnant, high value regrowth and young regrowth communities on well-draining soils (i.e. land zones 3, 5, 7 and 9) between 1 km to 3 km of a seasonal or permanent waterbody	30.46	6.41
	Dispersal – all other remnant, high value regrowth and young regrowth communities which links areas of suitable breeding and foraging habitat, as well as non-remnant areas less than 100 m wide which join breeding and foraging habitat	990.75	262.34
White-throated needletail *(Hirundapus caudacutus)*	Aerial foraging – all remnant, high value regrowth, young regrowth and non-remnant habitat	6,907.49	2,316.58

Species	Habitat summary	Habitat with Study Area (ha)	Habitat within Disturbance Footprint (ha)
Mammals			
Koala (*Phascolarctos cinereus*)	Breeding and foraging – all remnant and high value regrowth vegetation dominated or co-dominated LIKTs, including RE 11.3.2, 11.3.3, 11.3.6 and 11.3.27.	103.38	2.72
	Dispersal – all remnant and high value regrowth areas associated with REs dominated or co-dominated by containing ancillary species (i.e. REs 11.3.1, 11.4.9 and 11.9.5) OR non-remnant areas with scattered LIKTs which provide connectivity between areas of breeding and foraging habitat.	209.24	48.29
Short-beaked echidna (*Tachyglossus aculeatus*)	Breeding and foraging: All remnant, high value regrowth and young regrowth communities.	501.13	122.11

4.2.3.1 Ornamental snake (*Denisonia maculata*)

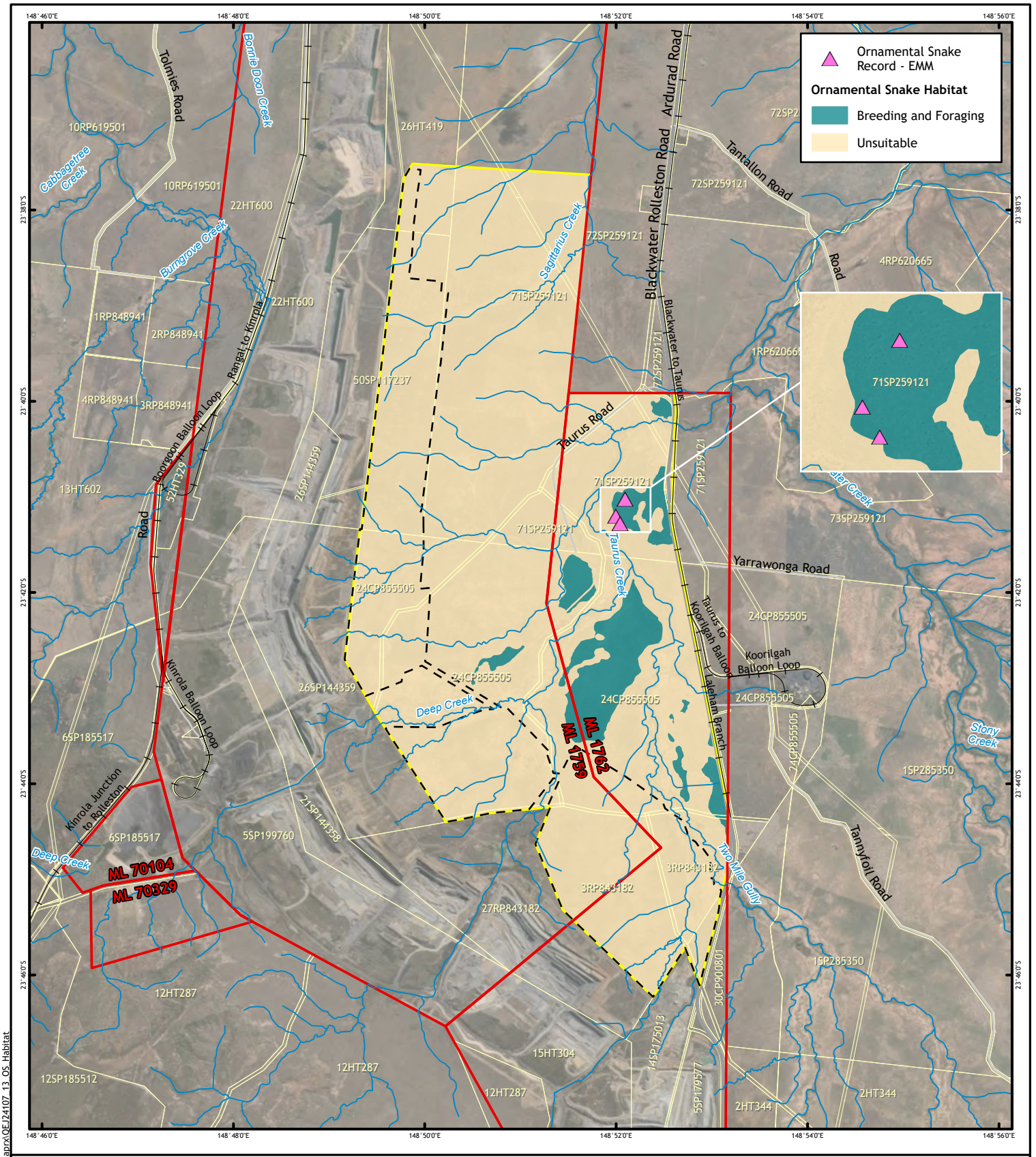
Ornamental snake is listed as vulnerable under the EPBC Act and NC Act, and is a habitat specialist, closely dependent on gilgai for foraging and refuge (Brigalow Belt Reptiles Workshop, 2010). When flooded, gilgai provide habitat for prey species such as Green tree frogs (*Litoria caerulea)*, Striped burrowing frogs (*Cyclorana alboguttata)*, Salmon-striped frogs (*Limnodynastes salmini*) and Broad-palmed frog (*Litoria latopalmata*) (Veary, 2011). As the water ebbs and the gilgai dries, deep cracks within the clay soil provide shelter for Ornamental snake. Gilgai are associated with Brigalow (*A. harpophylla*), Gidgee (*A. cambagei*), Blackwood (*A. argyrodendron*) and/or Coolabah (*Eucalyptus coolabah*) dominant vegetation communities (DCCEEW, 2025d).

While not recorded during E2M surveys, Ornamental snake was recorded during previous field surveys within the Study Area (see Section 2.8). The species was recorded on three separate occasions, in close proximity to each other, within non-remnant gilgai habitat (Figure 13). Given the highly disturbed and degraded nature of the Study Area, suitable habitat for Ornamental snake was categorised based primarily on the availability of suitable gilgai microrelief with deep cracking clay soils. Specifically, Ornamental snake habitat with the Study Area was categorised into the following:

- **497.52 ha of breeding and foraging habitat:** remnant, high value regrowth and non-remnant areas with suitable gilgai microrelief and soil cracks (Plate 17).

Note: Some areas containing gilgai microrelief were excluded as suitable habitat for Ornamental snake based on them being shallow and lacking sufficient soil cracks and microhabitat (i.e. woody debris) to support the species (Plate 18). Brigalow TEC within the Disturbance Footprint is not considered as Ornamental snake habitat due to the absence of these key microhabitat features.

A total of 497.52 ha of breeding and foraging habitat was identified in the Study Area. No areas of Ornamental snake habitat were identified in the Disturbance Footprint (Figure 13).



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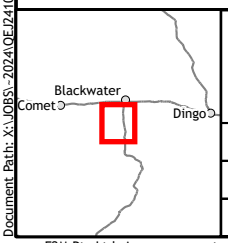
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FIGURE 13: ORNAMENTAL SNAKE HABITAT AND RECORDS WITHIN THE STUDY AREA

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Map Number	Job Number	Rev
1 of 1	QEJ24107	1

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Plate 17: Well developed gilgai within suitable Ornamental snake habitat



Plate 18: Shallow gilgai with limited soil cracks

4.2.3.2 Australian painted snipe (*Rostratula australis*)

Australian painted snipe is listed as endangered under the EPBC Act and NC Act, and generally forages in a variety of shallow wetlands yet breeding habitat requires specific microhabitat features such as exposed mud, dense low vegetation cover, on or near a small islands within a shallow, freshwater wetland (Rogers, et al., 2005). Breeding habitat for the species is very specific and includes shallow wetlands with areas of bare wet mud with canopy cover nearby. Nests are almost always recorded on or near small islands in freshwater wetlands, which provide a combination of water, exposed mud, dense low cover and sometimes dense canopy cover (Rogers et al., 2005).

While not recorded during E2M surveys, Australian painted snipe has been detected at two separate locations across the Study Area during previous ecological surveys, once within permanent foraging habitat and once within the intermittent foraging habitat (see Section 2.8) (Figure 14). The species was observed within dams and non-remnant gilgai habitat, which provide suitable foraging opportunities. No suitable breeding habitat was identified within the Study Area. Specifically, within the Study Area, suitable habitat for Australian painted snipe comprises:

- **610.00 ha of foraging habitat, including (Figure 14):**
  - 593.55 ha within which there is intermittent foraging habitat in the form of gilgai microrelief with remnant, high value regrowth or non-remnant areas (Plate 19); and
  - 16.45 ha of permanent foraging habitat in the form of farm dams [man-made] with shallow sloping margins and dense fringing vegetation (e.g. reeds and sedges) (Plate 20).

'Gilgai' are characterised by repeating mounds and depressions formed on shrink–swell cracking clay soils. Seasonal ponding occurs in depressions over only a small subset of the total intermittent foraging habitat mapped and the location of gilgal depressions change over time. For this reason, gilgai depressions associated with this soil type can provide intermittent foraging habitat for the Australian painted snipe.

DPM (2026) describe that the lacustrine wetlands (hydrologically modified or artificial) within the Study Area are either farm dams with constructed earthen walls on the downstream side or are constructed mine water dams. Some dams identified within the Study Area were not considered suitable habitat as they contained unvegetated steep bank margins. As this species requires dense low vegetation for cover (Department of the Environment and Energy, 2019), these areas were excluded from habitat. Additionally, some gilgai microrelief lacked suitable native aquatic vegetation, were extremely shallow and lacked the capability to hold water for prolonged periods (Rogers et al., 2005).

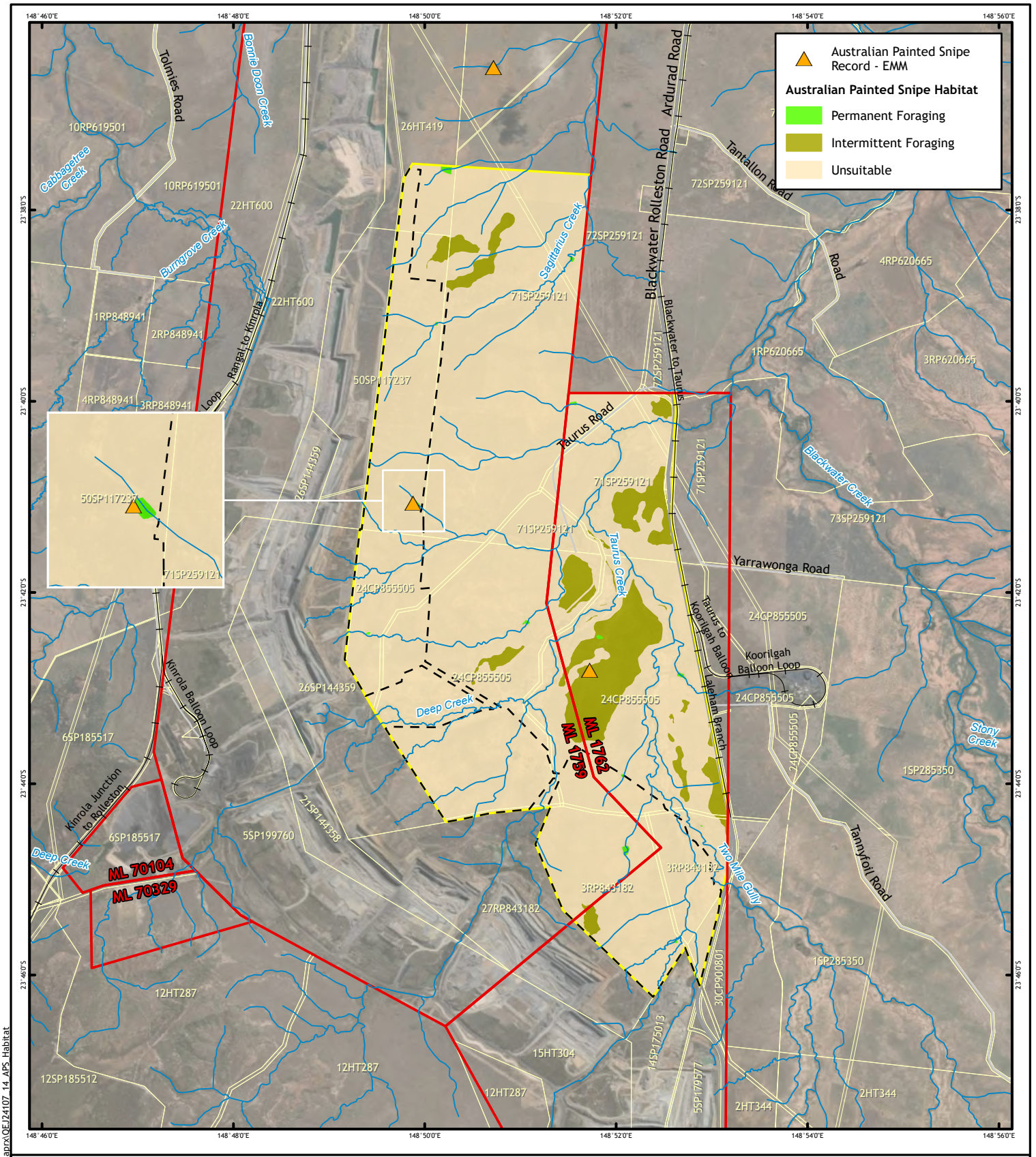
A total of 610.00 ha of foraging habitat for Australian painted snipe was identified in the Study Area, of which only 14.45 ha of intermittent foraging habitat and 6.41 ha of permanent foraging habitat (i.e. man-made farm dams) occurs within the Disturbance Footprint (Figure 14). As described above, not all of the intermittent foraging habitat contains gilgai depressions suitable for the species.



Plate 19: Well developed gilgai within suitable Australian painted snipe foraging habitat



Plate 20: Dam providing suitable foraging habitat



Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre

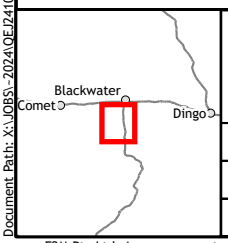
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Kilometres

Coordinate System: GDA2020



Notes:
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FIGURE 14: AUSTRALIAN PAINTED SNIPE HABITAT AND RECORDS WITHIN THE STUDY AREA

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Whitehaven Coal

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4.2.3.3 Latham's snipe (*Gallinago hardwickii*)

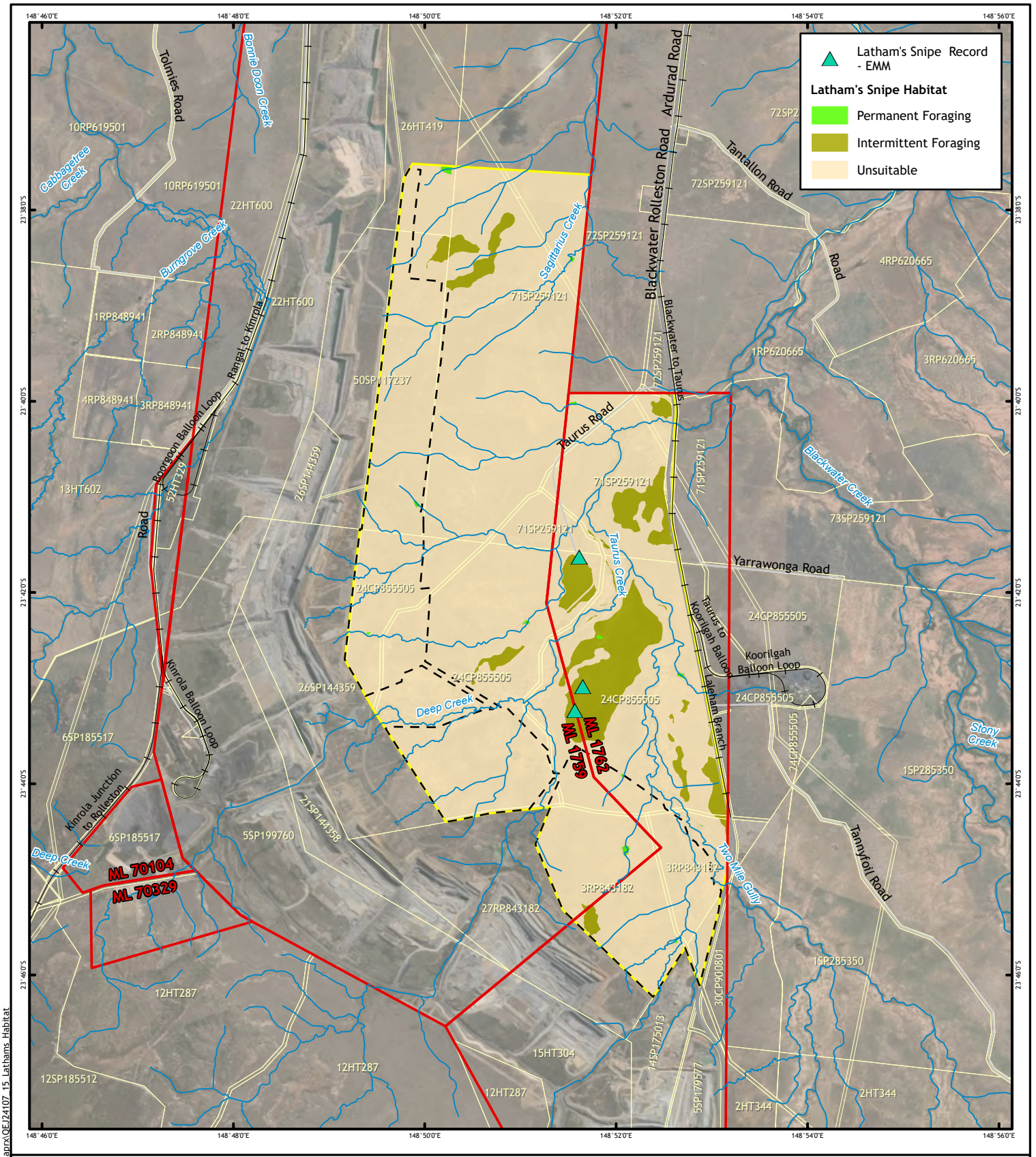
The Latham's snipe is listed as vulnerable under the EPBC Act and NC Act, and typically occurs in permanent and ephemeral wetlands up to 2,000 m above sea-level (DCCEEW, 2025e). They usually inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies) (DCCEEW, 2025e). However, they can also occur in habitats with saline or brackish water, in modified or artificial habitats, and in habitats located close to humans or human activity (DCCEEW, 2025e). Various other freshwater habitats can be used including bogs, waterholes, billabongs, lagoons, lakes, creek or river margins, river pools and floodplains (DCCEEW, 2025e).

While not recorded during E2M surveys, Latham's snipe was recorded during previous field surveys within the Study Area (see Section 2.8). The species was recorded on three separate occasions within non-remnant gilgai habitat, which provide suitable foraging opportunities (Figure 15). Specifically, within the Study Area, suitable habitat for Latham's snipe comprises:

- **610.00 ha of foraging habitat, including:**
  - 593.55 ha of intermittent foraging habitat in the form of all remnant, high value regrowth or non-remnant areas with gilgai microrelief (Plate 19); and
  - 16.45 ha of permanent foraging habitat in the form of dams/wetlands with shallow sloping margins and dense fringing vegetation (e.g. reeds and sedges) (Plate 20).

Note: Some dams/wetlands and areas of gilgai microrelief identified within the Study Area were not considered suitable habitat based on dams having unvegetated steep banks or gilgai areas being extremely shallow and lacking aquatic vegetation.

A total of 610.00 ha of foraging habitat for Latham's snipe was identified in the Study Area, including 14.45 ha of intermittent foraging habitat and 6.41 ha of permanent foraging habitat within the Disturbance Footprint (Figure 15).



Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre

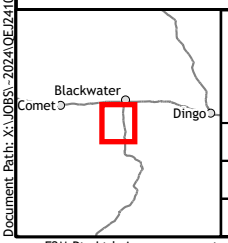
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Scale 1:100,000 (A4)

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Kilometres

Coordinate System: GDA2020



Notes:
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FIGURE 15: LATHAM'S SNIPE HABITAT AND RECORDS WITHIN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

Map Number	Job Number	Rev
1 of 1	QEJ24107	1

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4.2.3.4 Squatter pigeon (southern subspecies) (*Geophaps scripta scripta*)

Squatter pigeon (southern) is listed as vulnerable under the EPBC Act and NC Act, and is a ground dwelling species whose habitat occurs in tropical, open, dry sclerophyll woodlands and savannahs of north-east Australia (DCCEEW, 2025g). The species is generally found in areas mostly dominated in the overstorey by *Eucalyptus, Acacia* and *Callitris* species, in remnant, regrowth or partly modified vegetated communities and within 3 km of water bodies or water courses (DCCEEW, 2025g). Water bodies suitable for the species include permanent or seasonal rivers, creeks, lakes, ponds and waterholes (TSSC, 2015). The species drinks daily and prefers to drink where there is gently sloping, bare ground on which to approach and stand at the water's edge. A small patch (less than a square metre) of bare ground at the water's edge is what the bird requires (DCCEEW, 2025g).

While not recorded during E2M surveys in 2025, Squatter pigeon (southern) was recorded during previous field surveys within the Study Area (see Section 2.8). The species was recorded on two separate occasions, in close proximity to each other, within the vicinity of two dams. Within the Study Area, Squatter pigeon (southern) habitat was generally in poor condition due to exotic pasture species dominating the ground-layer (Plate 21), resulting in high ground-layer cover and low native foraging species diversity. Suitable habitat within the Study Area consisted off:

- **239.01 ha of breeding and foraging habitat:** remnant, high value regrowth and vegetated non-remnant communities on well-draining soils (i.e. land zones 3, 5, 7 and 9) within 1 km of a semi-permanent or permanent waterbody (i.e. dams, wetlands (RE 11.3.27) and SO 4 or greater watercourses) (Plate 22).
- **30.46 ha foraging habitat:** remnant, high value regrowth and vegetated non-remnant communities on well-draining soils (i.e. land zones 3, 5, 7 and 9) between 1 km to 3 km of a semi-permanent or permanent waterbody (i.e. dams, wetlands (RE 11.3.27) and SO 4 or greater watercourses).
- **990.75 ha of dispersal habitat:** all other remnant, high value regrowth and vegetated non-remnant communities which links areas of suitable breeding and foraging habitat, as well as non-remnant areas less than 100 m wide which join breeding and foraging habitat.

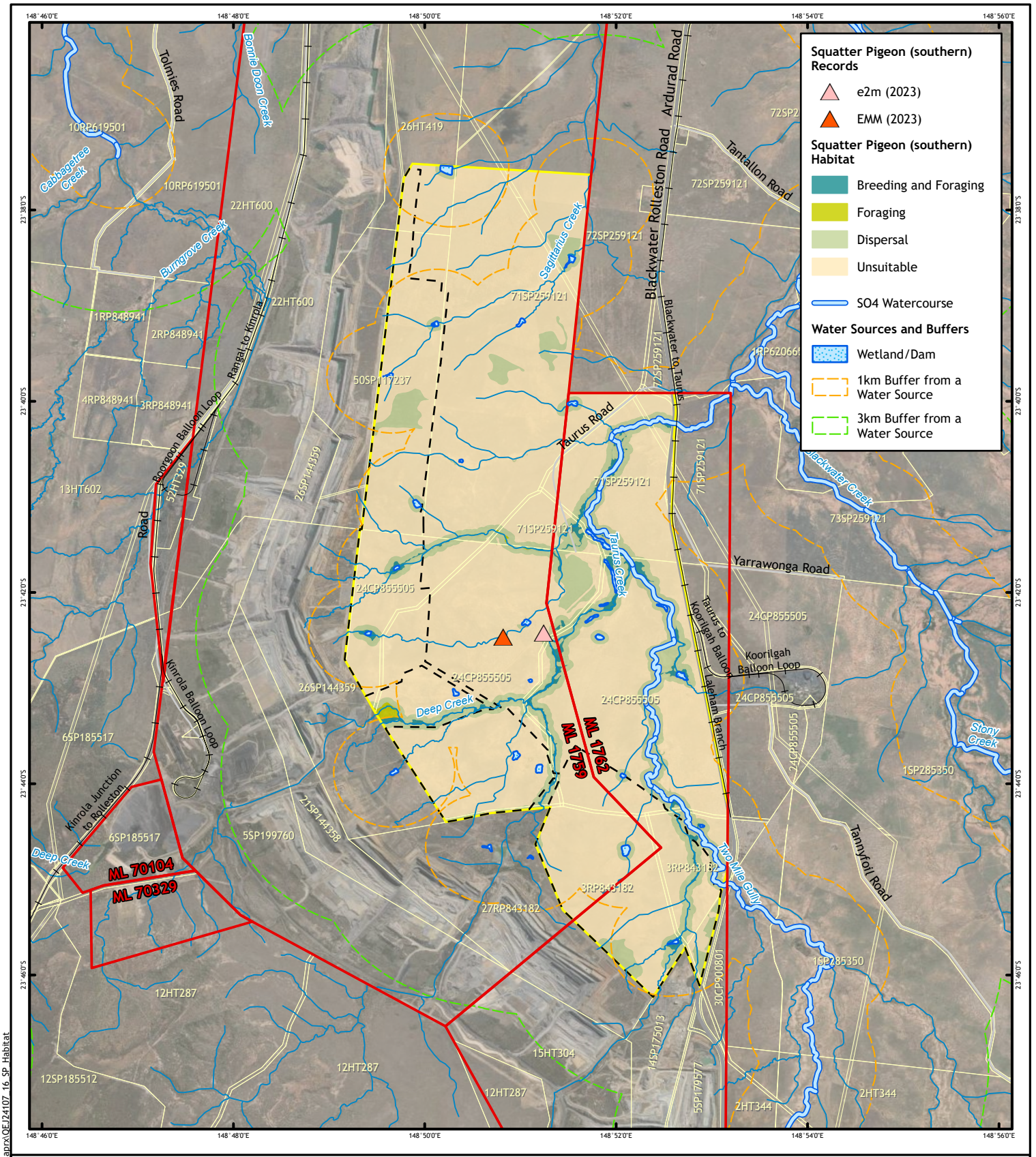
A total of 239.01 ha breeding and foraging, 30.46 ha of foraging, and 990.75 ha of dispersal habitat was identified in the Study Area. Additionally potential habitat within the Disturbance Footprint for Squatter pigeon (southern) includes 26.05 ha of breeding and foraging, 6.41 ha of foraging, and 262.34 ha of dispersal habitat (Figure 16).



Plate 21: Remnant eucalypt woodland with high cover of exotic pasture species



Plate 22: Semi-permanent water available within RE 11.3.27



Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre

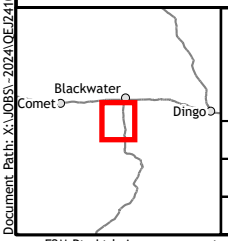
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Scale 1:100,000 (A4)

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Kilometres

Coordinate System: GDA2020



Notes:
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FIGURE 16: SQUATTER PIGEON (SOUTHERN) HABITAT AND RECORDS WITHIN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

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1 of 1	QEJ24107	1

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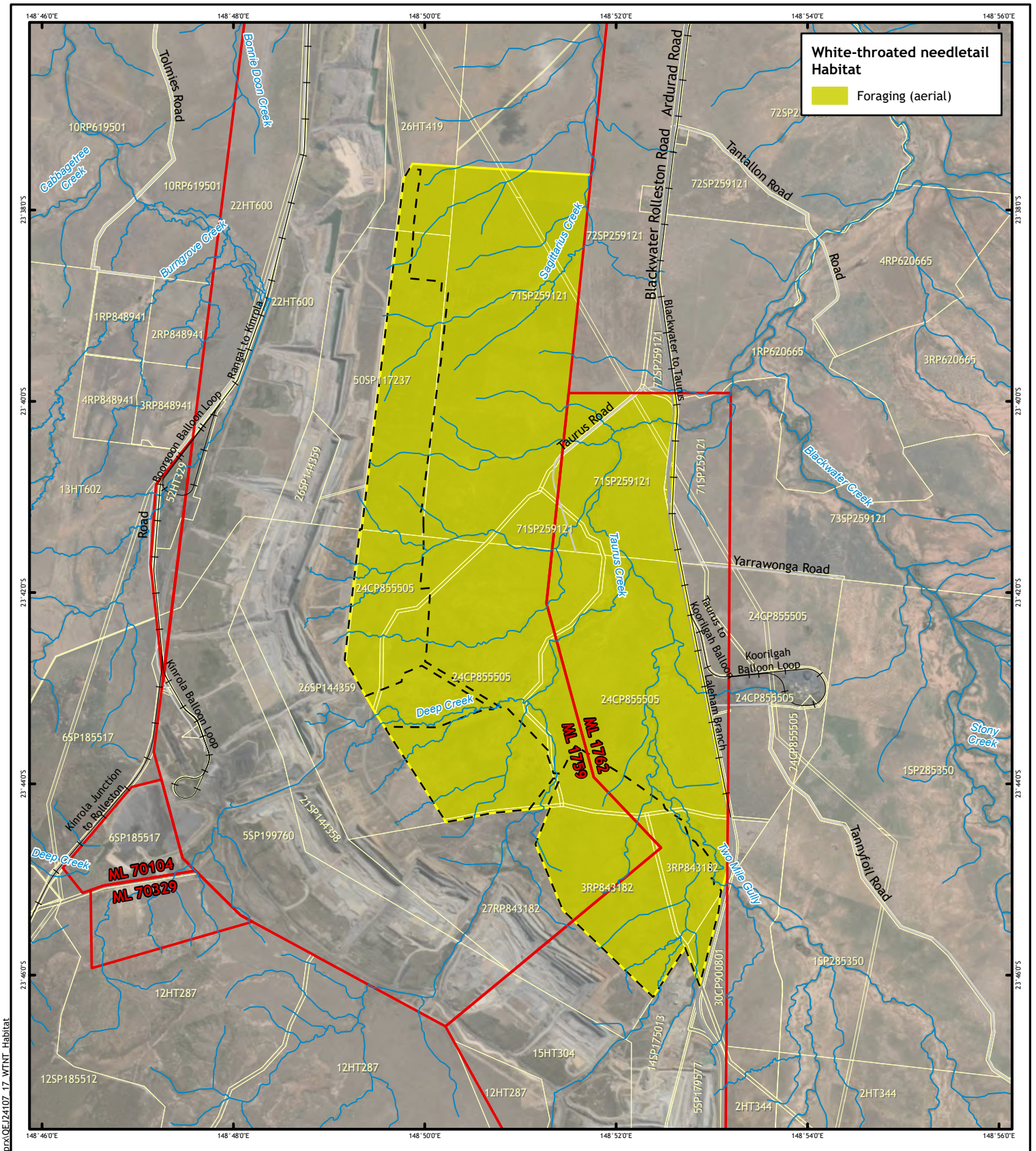
4.2.3.5 White-throated needletail (*Hirundapus caudacutus*)

The White-throated needletail listed as vulnerable under the EPBC Act and NC Act, as is widespread across eastern and south-eastern Australia (DCCEEW, 2025j). In Queensland it occurs in all coastal regions including inland to the western slopes of the Great Dividing Range and occasionally onto the adjacent inland plains (DCCEEW, 2025j). In Australia, the species is primarily aerial, from heights of 1 m up to 1000 m above the ground. They are known to roost in tall trees bordering clearings, both natural and man-made. While they do occur over most habitat types, they are predominately recorded above wooded areas (DCCEEW, 2025j). The species does not breed in Australia, with their local habitat restricted to foraging during their non-breeding season (DCCEEW, 2025j).

White-throated needletail has not been recorded during any surveys; however, the species is considered likely to occur based on habitat availability and previous records within the vicinity of the Study Area (see Section 2.8). Given the species does not breed in Australia, is highly nomadic and is primarily aerial, suitable habitat within the Study Area, includes:

- **6,907.49 ha of foraging habitat**: aerially above the entirety of the Study Area.

A total of 6,907.49 ha of potential foraging habitat was identified in the Study Area and 2,316.58 ha of foraging habitat within the Disturbance Footprint for the White-throated needletail (Figure 17).



Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre

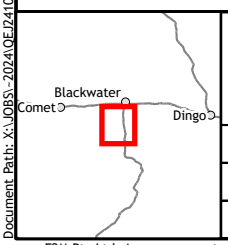
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Kilometres

Coordinate System: GDA2020



Notes:
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FIGURE 17: WHITE-THROATED NEEDLETAIL HABITAT AND RECORDS WITHIN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

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4.2.3.6 Koala (*Phascolarctos cinereus*)

The Koala is listed as endangered under the EPBC Act and NC Act, and are widespread across Queensland, however they generally occur in patchy and often low-density populations in different bioregions (DAWE, 2022). At a local scale, Koala habitat is defined by several factors including the availability and nutritional quality of food trees, presence of suitable resting trees and microclimates, age structure of vegetation, history and impediments to dispersal. These differ regionally because they are strongly influenced by local climatic conditions and landform attributes (DAWE, 2022d).

A variety of food tree species are utilised by Koalas, from genera including *Eucalyptus*, *Corymbia* and *Lophostemon*. In a particular region or site, only a few species may constitute preferred feed trees. Non-food trees are also an important resource for Koalas and may be used for thermoregulation, shelter, and predator avoidance. Non-food trees include species from genera such as *Acacia*, *Callitris* and *Melaleuca* (DAWE, 2022d). Stream fringing eucalypts (*Eucalyptus camaldulensis* and *Eucalyptus tereticornis*) have the highest leaf moisture content, and as Koalas largely rely on diet to meet their water intake requirements, the presence of eucalypts with a high leaf moisture content is likely to positively influence habitat suitability, particularly during times of drought (Wu et al., 2012). Koala are known to utilise all types of eucalypt woodland across its range where Locally Important Koala Trees (LIKTs) are abundant (Youngentob et al., 2021).

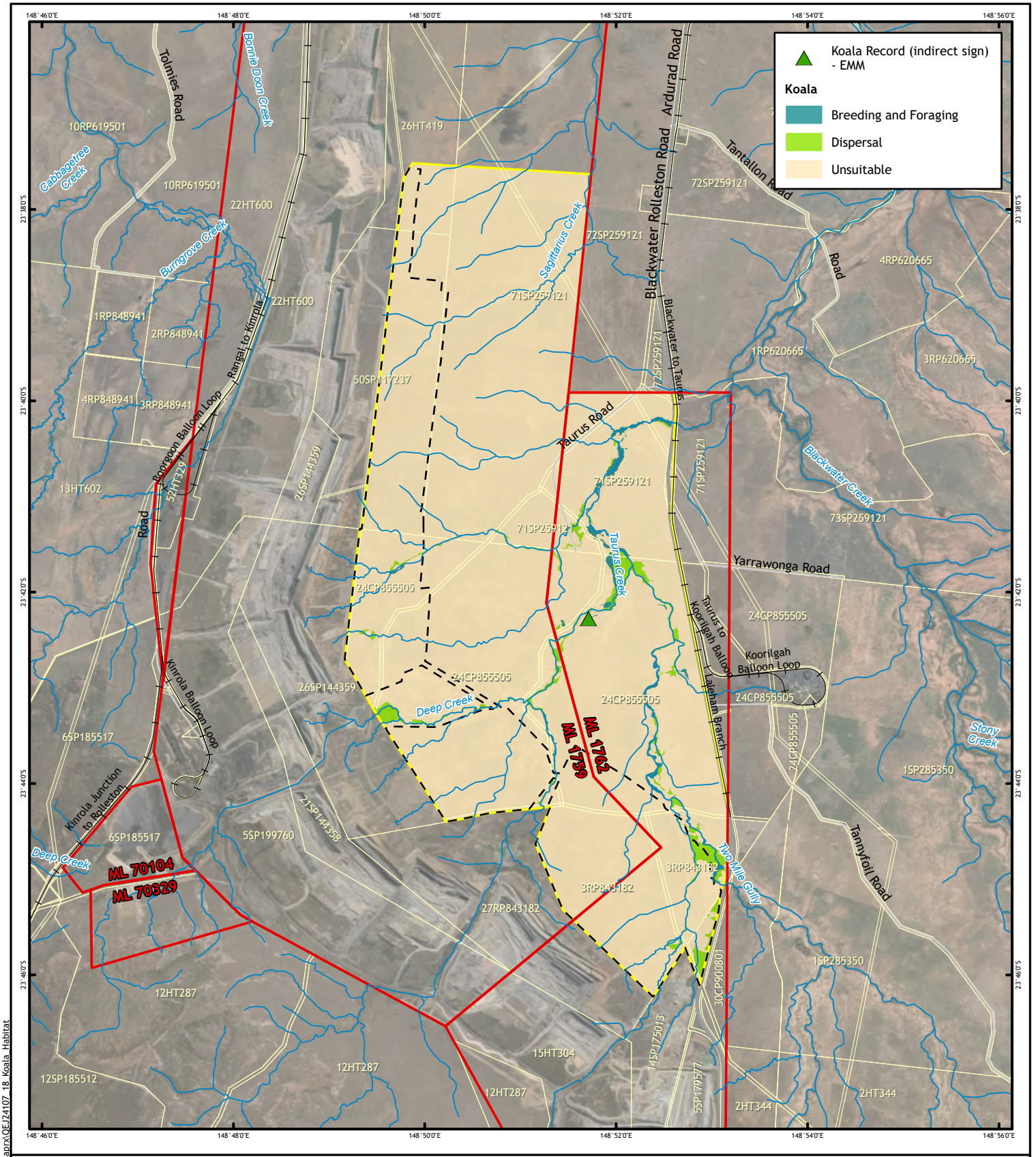
Previous ecological assessments undertaken by EMM recorded evidence of Koala activity (i.e. tree scratch marks and scat) within the Study Area (EMM, 2020), suggesting historical use of the site by the species. To verify current presence, ground-truthing was undertaken during this assessment that included systematic searches across both remnant and non-remnant vegetation for Koala scats, scratch marks, vocalisations, and visual sightings during diurnal fauna surveys. However, no evidence of Koala activity was recorded during these assessments.

Suitable habitat for Koala within the Study Area is highly degraded due to historical land clearing, with the majority of potential habitat now limited to retained mature vegetation associated with watercourses and drainage lines. Non-remnant areas where scattered LIKTs or ancillary species are still retained and provided connectivity between areas of suitable mature vegetation were also assessed as providing habitat for Koala. Within the Study Area, suitable habitat was categorised into two types based on the presence and abundance of LIKTs and ancillary species, including:

- **103.38 ha of breeding and foraging habitat:** consisting of remnant and high value regrowth areas associated with REs dominated or co-dominated by LIKTs, including REs 11.3.2, 11.3.3, 11.3.6 and 11.3.27.
- **209.24 ha of dispersal habitat:** consisting of remnant and high value regrowth areas associated with REs dominated or co-dominated by containing ancillary species (i.e. REs 11.3.1, 11.4.9 and 11.9.5) or non-remnant areas with scattered LIKTs which provide connectivity between areas of breeding and foraging habitat.

Note: Small areas of potential suitable habitat which are fragmented from other areas of suitable habitat were not considered suitable habitat due to their inaccessibility and unlikely utilisation by the species.

A total of 103.38 ha of breeding and foraging habitat and 209.24 ha of dispersal habitat was identified in the Study Area. Additionally, 2.72 ha of breeding and foraging habitat and 48.29 of dispersal habitat was identified within the Disturbance Footprint for the Koala (Figure 18).



Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre

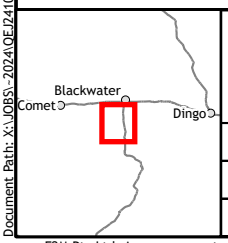
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Kilometres

Coordinate System: GDA2020



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FIGURE 18: KOALA HABITAT AND RECORDS WITHIN THE STUDY AREA

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Whitehaven Coal

Map Number	Job Number	Rev
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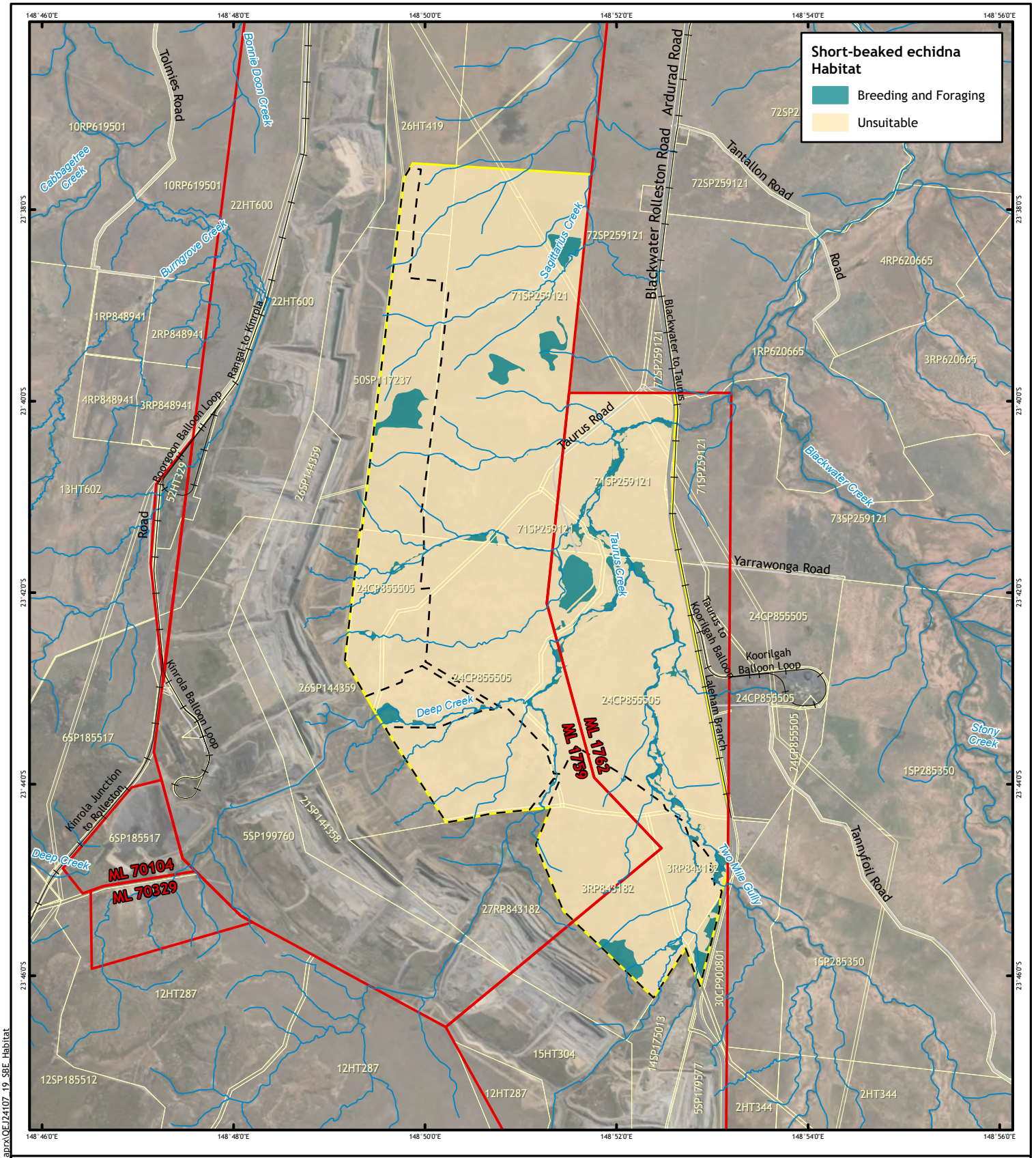
4.2.3.7 Short-beaked echidna (*Tachyglossus aculeatus*)

Short-beaked echidna is listed as special least concern under the NC Act. This species occurs throughout Australia in a wide variety of habitats including mountains, tropics, open woodlands, grasslands, arid zones and coastal environments; wherever there is a supply of ants and termites, upon which it feeds. They prefer to inhabit areas with vegetation that provides cover such as gaps under rocks, hollow logs, hollows at the base of trees, piles of leaves or bunched grasses (Nicol et al., 2011). The species also enters a period of torpor or deep hibernation during autumn and winter, during which time it also requires these forms of cover (ALA, 2025).

Short-beaked echidna has not been recorded during any surveys within the Study Area with degraded nature of the Study Area limiting availability of suitable shelter microhabitat (e.g. hollow logs and termite mounds). However, given the species is widespread and utilises a range of habitats, suitable habitat within the Study Area, includes:

- **501.13 ha of breeding and foraging habitat:** all remnant, high value regrowth and vegetated non-remnant communities within the Study Area.

A total of 501.13 ha of potential breeding and foraging habitat was identified in the Study Area and 122.11 ha of breeding and foraging habitat within the Disturbance Footprint for the Short-beaked echidna (Figure 19).



Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre

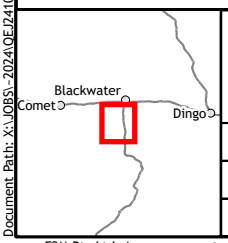
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Kilometres

Coordinate System: GDA2020



Notes:
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FIGURE 19: SHORT-BEAKED ECHIDNA HABITAT WITHIN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

Map Number	Job Number	Rev
1 of 1	QEJ24107	1

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4.2.4 Migratory fauna

The desktop assessment identified twelve migratory fauna species listed under both the EPBC Act and as potentially occurring within the Study Area. Prior to field surveys, an assessment of the likelihood of occurrence for migratory fauna species was conducted based on species habitat suitability, species distribution ranges and historical occurrence records. Desktop assessments results identified five species as known, likely or possibly occurring within the Study Area, including:

- Known to occur (previously recorded within the Study Area during EMM surveys (EMM, 2023a, 2023b)):
  - **Fork-tailed swift:** was recorded at one location in the Study Area in the vicinity of Taurus Creek
  - **Latham's snipe**: was recorded at three locations across the Study Area in ephemeral gilgai habitat.
- Likely to occur:
  - **White-throated needletail:** the species occurs widely across QLD and forages aerially above all most habitat types including cleared pasture. The species has been recorded on multiple occasions within the desktop search extent and foraging habitat occurs above the entire Study Area.
  - **Glossy ibis:** was recorded at one location in the northern extent of the Study Area in ephemeral gilgai habitat.
- Possibly occurring:
  - **Sharp-tailed sandpiper:** the species has been previously recorded within the desktop search extent and suitable habitat may occur within the Study Area.

These species formed the basis of targeted surveys and habitat assessments undertaken by E2M with the aim of refining species likelihood of occurrence based on field verified results.

One migratory species was identified during E2M surveys within the Study Area:

- Fork-tailed swift (*Apus pacificus*) – Migratory under the EPBC Act.

Following an evaluation against the likelihood of occurrence assessment criteria and the results of the field surveys, two species are considered likely to occur:

- White-throated needletail (*Hirundapus caudacutus*) - vulnerable and migratory under the EPBC Act; and
- Glossy ibis (*Plegadis falcinellus*) – migratory under the EPBC Act.

Suitable habitat was confirmed for two known occurring and two likely occurring migratory species, whilst one possibly occurring species, namely Sharp-tailed sandpiper, was downgraded to unlikely to occur based on the species not being detected during targeted surveys and the Study Area only containing marginal habitat. Full likelihood of occurrence results for all species identified during the desktop assessment are provided in Appendix B.

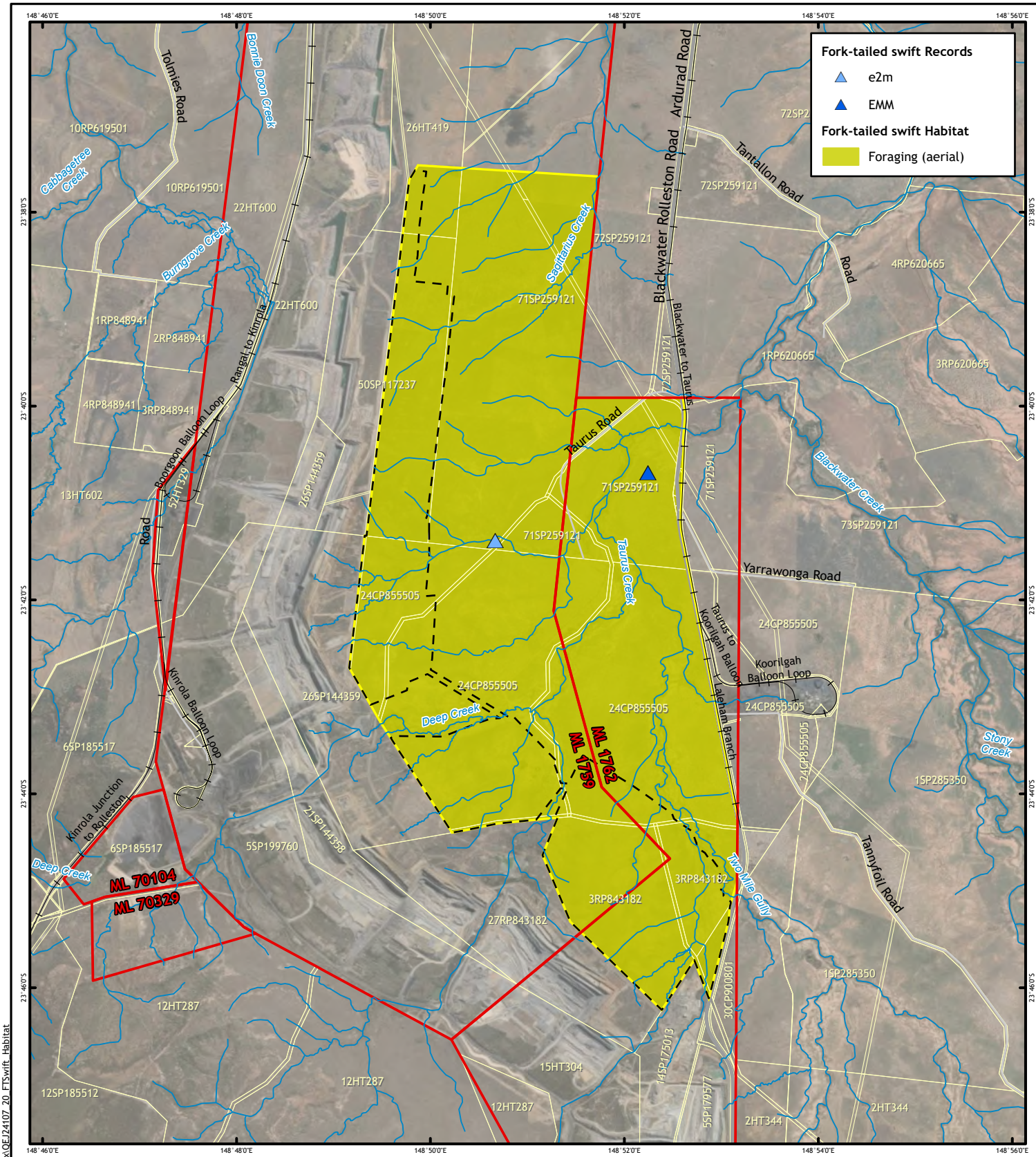
4.2.4.1 Fork-tailed swift

Fork-tailed swift is a non-breeding visitor leaving its breeding grounds in Siberia from August to September and arrives in Australia around October. Although the species mostly occurs over dry open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh, it also is found in treeless grassland, open farmland and coastal sand-dunes (DCCEEW, 2025a).

This species has been observed on a single occasion during surveys above the Study Area, during the 2025 wet season survey. Given the species may occur above any habitats across the Study Area, suitable habitat includes:

- **6,907.49 ha of foraging habitat:** aerially above the entirety of the Study Area.

A total of 6,907.49 ha of foraging habitat was identified in the Study Area and 2,316.58 ha of foraging habitat within the Disturbance Footprint for the Fork-tailed swift (Figure 20).



Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre

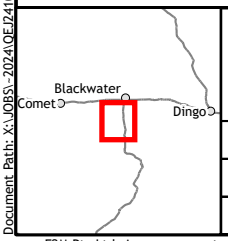
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Scale 1:100,000 (A4)

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Kilometres

Coordinate System: GDA2020



Notes:
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FIGURE 20: FORK-TAILED SWIFT HABITAT AND RECORDS WITHIN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

Map Number	Job Number	Rev
1 of 1	QEJ24107	1

Document Path: X:\JOBS\-2024\QEJ24107\GIS\PRO\QEJ24107\QEJ24107_EA.aprx\QEJ24107_20_FTSwift_Habitat

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4.2.4.2 Glossy ibis (*Plegadis falcinellus*)

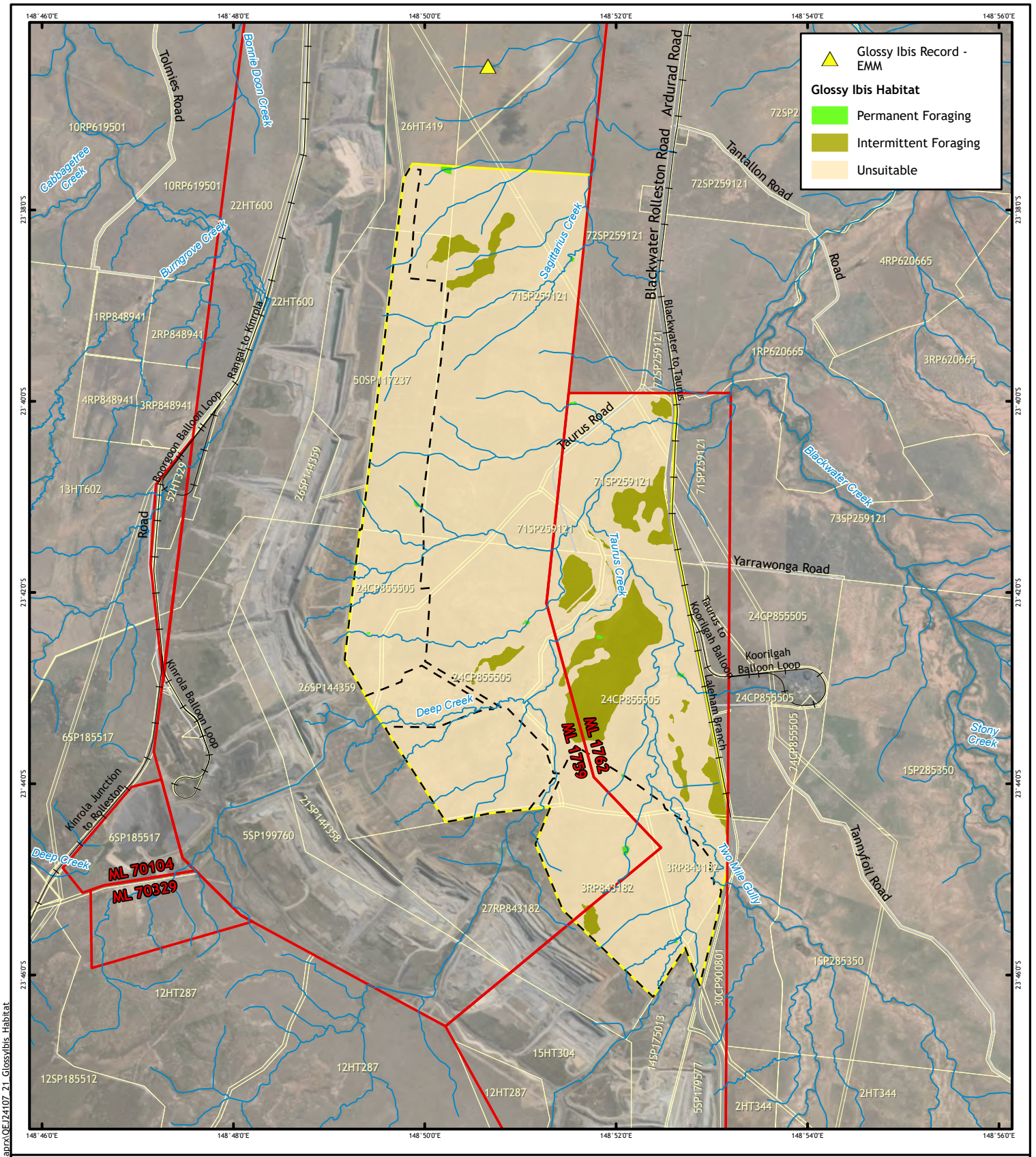
Glossy ibis generally occurs singly, in pairs or small flocks foraging in freshwater marshes at the edges of lakes and rivers, lagoons, floodplains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation (DCCEEW, 2025l). Glossy ibis has been recorded breeding at a limited number of locations within its Australian distribution, with core breeding areas occurring within the Murray-Darling Basin region of New South Wales and Victoria, the Macquarie Marshes in New South Wales, and in southern Queensland (DCCEEW, 2025l). Within Australia, Glossy ibis move north in Autumn, then south to the main breeding areas in Spring and Summer (DCCEEW, 2025l).

While not recorded during E2M surveys, Glossy ibis has been detected on a single location during previous EMM ecological surveys (Section 2.8), approximately 2 km north of the current Study Area. The species was observed within a dam, which provides suitable foraging opportunities. Given the species breeds primarily within distinct locations within Australia, no suitable breeding habitat was mapped within the Study Area. Specifically, within the Study Area, suitable habitat for Glossy ibis comprises:

- 593.55 ha of potential intermittent foraging habitat in the form of all remnant, high value regrowth or non-remnant areas with gilgai microrelief (Plate 19); and
- 16.45 ha of permanent foraging habitat in the form of dams/wetlands with shallow sloping margins and dense fringing vegetation (e.g. reeds and sedges) (Plate 20).

Note: Some dams/wetlands and areas of gilgai microrelief identified within the Study Area were not considered suitable habitat based on dams having unvegetated steep banks or gilgai areas being extremely shallow and lacking aquatic vegetation.

A total of 610.00 ha of foraging habitat for Glossy ibis was identified in the Study Area, including 14.45 ha of potential intermittent foraging habitat and 6.41 ha of permanent foraging habitat within the Disturbance Footprint (Figure 21).



Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre

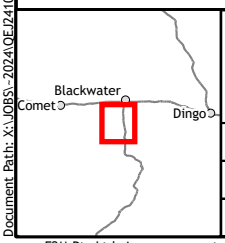
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Kilometres

Coordinate System: GDA2020



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FIGURE 21: GLOSSY IBIS HABITAT WITHIN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

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Document Path: X:\JOBS\-2024\QEJ24107\GIS\PRO\QEJ24107_EA.aprx\QEJ24107_21 Glossyibis Habitat

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4.2.4.3 Latham's snipe (*Gallinago hardwickii)*

Refer to Section 4.2.3.3.

4.2.4.4 White-throated needletail (*Hirundapus caudacutus*)

Refer to Section 4.2.3.5.

4.2.5 Pest fauna

Pest fauna species have varying adverse impacts on the environment ranging from competition for resources to predation on native species. Eight pest fauna species were recorded within the Study Area during the field assessments (Table 19). The extent categories used to describe fauna species presence, such as common, scattered and high density, reflect varying patterns of presence across the landscape. Scattered indicates irregular and isolated occurrences; common suggests regular but moderate presence; and high density refers to areas where the species occurs in large numbers or concentrations.

Table 19: Pest fauna within the Study Area

Scientific name	Common name	Biosecurity Act status	Extent within Study Area
Acridotheres tristis	Common myna	-	Common throughout Study Area
Canis lupus dingo	Dingo	Category 3, 4, 5 and 6	Scattered throughout Study Area
Canis lupus familiaris	Wild dog	Category 3, 4 and 6	Scattered throughout Study Area
Felis catus	Feral cat	Category 3, 4 and 6	Scattered throughout Study Area
Lepus europaeus	European hare	-	Scattered throughout Study Area
Oryctolagus cuniculus	European rabbit	Category 3, 4, 5 and 6	Scattered throughout Study Area
Rhinella marina	Cane toad	-	High density throughout the Study Area
Sus scrofa	Feral pig	Category 3, 4 and 6	Scattered throughout Study Area

Feral cats are efficient predators and are likely to prey upon snakes, birds and amphibians (Doherty et al., 2017), including the target MNES (namely Ornamental snake). Herbivorous pest species including Rabbit, Hare and Feral pig compete with native wildlife for resources, degrade the land (Plate 23) and damage vegetation (DSEWPaC, 2011c). Cane toads were observed in high abundance throughout the Study Area (Plate 24) including within the gilgai and cracking clay soil habitats where they co-exist with Ornamental snake. As a specialist predator of amphibians, the Ornamental snake is likely to predate small Cane toads, potentially resulting in the snake's mortality (Veary, 2011).



Plate 23: Feral pig (*Sus scrofa*) wallow



Plate 24: Cane toad (*Rhinella marina*) identified on remote camera

Wild dog and Dingo tracks were observed scattered throughout the Study Area (Plate 25). Wild dogs (*Canis lupus familiaris*) have been identified as one of the most significant threats to Koala populations (Beyer et al., 2018; DAWE, 2022b). Recent research highlights that although threats such as vehicle collisions and disease remain substantial, predation by wild dogs can be the leading cause of mortality in some Koala populations (Beyer et al., 2018). In addition to ecological impacts, wild dogs and Dingos also pose biosecurity risks through disease transmission and can threaten human safety and livestock (Queensland Government, 2024).



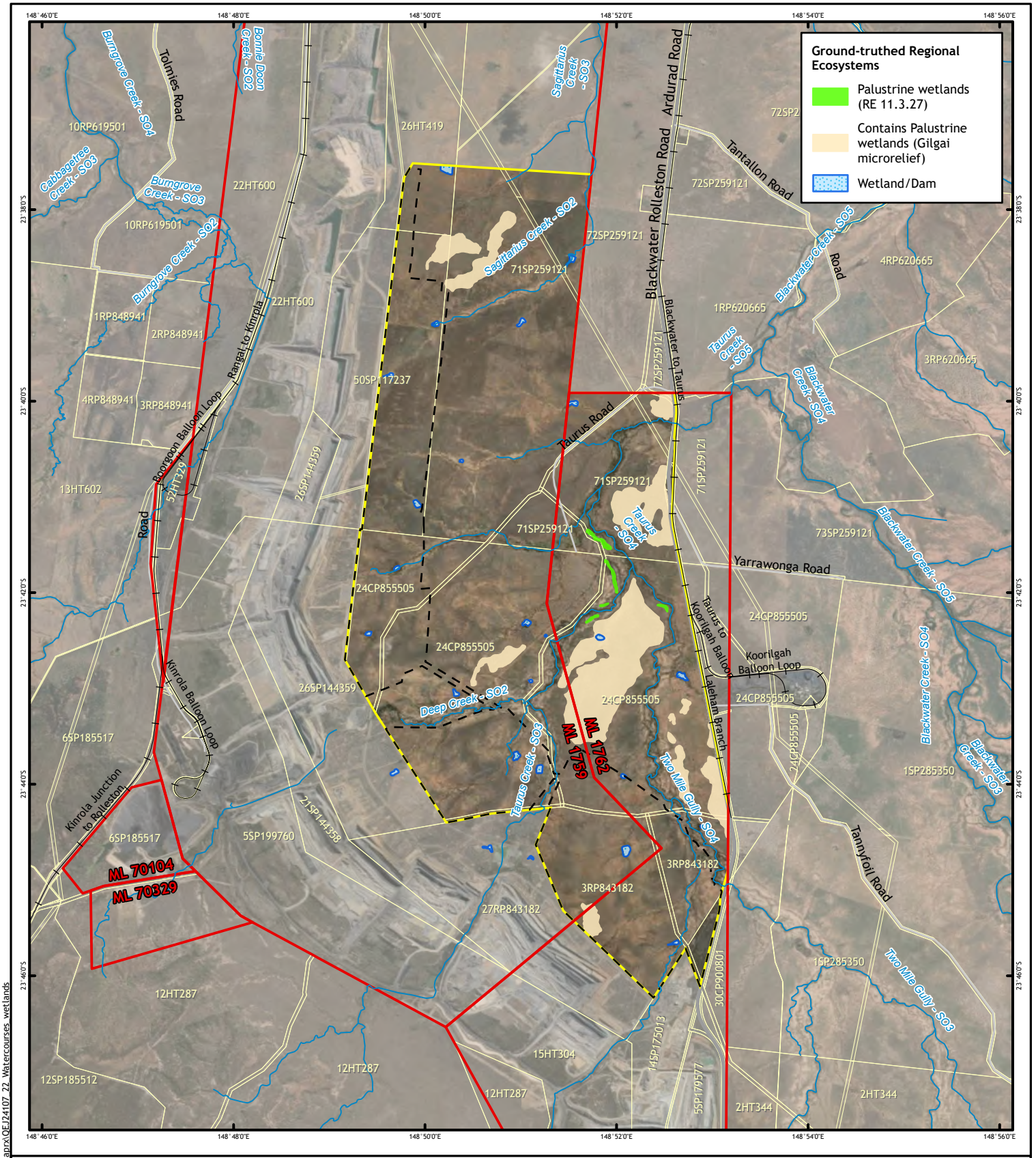
Plate 25: Wild dog (*Canis lupus familiaris*) tracks

4.3 Ecological function

4.3.1 Watercourses and wetlands

Several unnamed tributaries traverse the Study Area (Figure 22), predominantly in the SO of 1 to 3. These minor watercourses are predominantly ephemeral, remaining dry for most of the year and lack substantial riparian vegetation. These tributaries then contribute to watercourses of higher SOs, including Sagittarius Creek (SO 2) to the north, Taurus Creek (SO 4) to the east and Two Mile Gully (SO 4) to the south. Although these larger watercourses are also ephemeral, some fragmented riparian vegetation is present along their margins. However, the lack of vegetation across the remainder of the Study Area is attributed to the historic broadscale clearing and cattle grazing. Watercourses within the Study Area have also been impacted by weed invasion, pest fauna species presence (i.e. feral pig uprooting), and altered hydrology resulting from existing mining activity.

No wetlands of high ecological significance (HES) or high ecological value (HEV) under the EP Act, or wetlands under the VM Act occur within the Study Area.



Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre

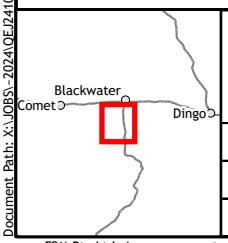
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Kilometres

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FIGURE 22: WATERCOURSES AND WETLANDS WITHIN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

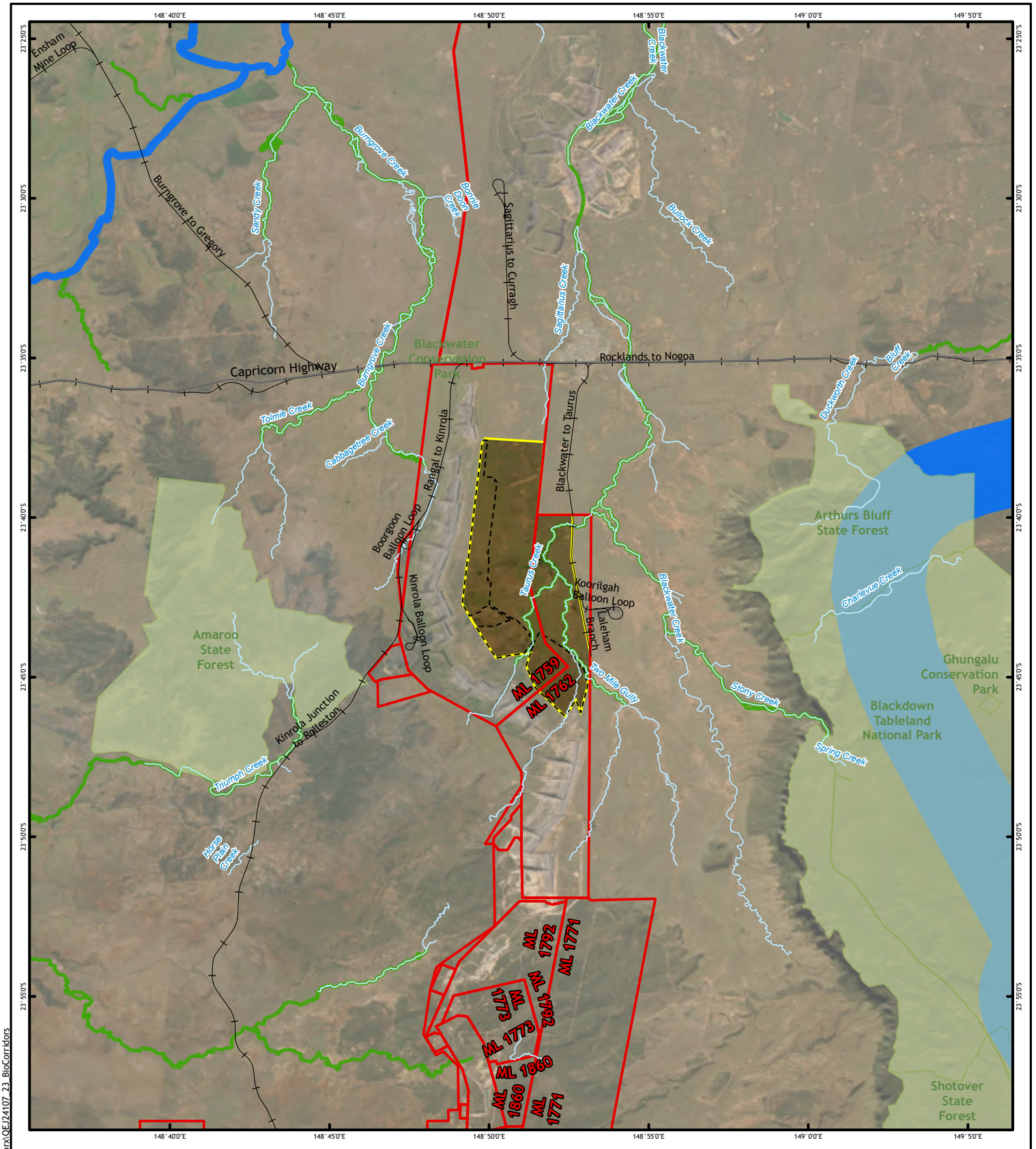
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4.3.2 Corridors and connectivity

Taurus Creek and Two Mile Gully in the eastern part of the Study Area are mapped as a regional riparian biodiversity corridors (DETSI, 2024) (Figure 23). However, due to the historic and extensive cattle grazing activities not only within the Study Area, but surrounding, the landscape is highly fragmented and disconnected. This is particularly evident regarding the largely disturbed, non-remnant vegetation within the Study Area that restricts dispersal opportunities between the remnant, intact Blackdown Tableland National Park, situated less than 10 km to the east (Figure 23). As vegetation is primarily restricted to riparian zones within the Study Area, opportunities for fauna dispersal are expected to be highly limited and restricted to species with large dispersal abilities.



Legend

- Railway
- Watercourse
- Road
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Protected Area

Statewide Corridors v1.6 - significance

- Regional
- State

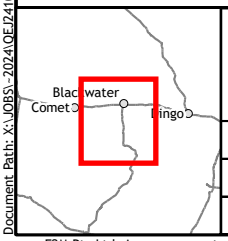
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Kilometres

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FIGURE 23: STATE AND REGIONAL BIODIVERSITY CORRIDORS

Blackwater North Ecological Assessment
Whitehaven Coal

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4.4 Habitat quality assessments

A total of 13 AUs were identified within the Study Area. A total of 53 habitat quality assessment sites were undertaken to meet the survey requirements of the Commonwealth Government *Modified Habitat Quality Assessment* method (Table 20).

Data from these sites was used to determine the habitat quality and offset requirements for MNES and MSES that are likely significantly impacted by the Project (refer to Section 8.1 and Section 8.2).

Table 20: Survey effort per assessment unit for habitat quality assessment sites

BVGs	RE	Condition	AU	Extent within the Study Area (ha)	No. of survey sites	Assessment against the habitat quality guideline requirements[1]
25a	11.3.1, 11.4.9, 11.9.5	Non-remnant	1a	62.07	8	Survey guideline sampling units achieved
		Vegetated non-remnant (regrowth <3m tall)	1b	214.22	4	Survey guideline sampling units achieved
		High value regrowth	1c	83.77	8	Survey guideline sampling units achieved
		Remnant	1d	99.73	7	Survey guideline sampling units achieved
17a	11.3.2	Non-remnant	2a	25.74	2	Survey guideline sampling units achieved
		Remnant	2b	11.07	2	Survey guideline sampling units achieved
16c	11.3.3	Remnant	3	38.28	2	Survey guideline sampling units achieved
17b	11.3.6	Disturbed remnant	4b	26.71	3	Survey guideline sampling units achieved
		Remnant	4c	18.61	2	Survey guideline sampling units achieved
34a	11.3.27	Remnant	5	8.71	2	Survey guideline sampling units achieved
17b	11.9.2	Non-remnant	6	1.34	1	Survey guideline sampling units achieved as there is only enough area to allow for one sampling unit
-	-	Non-remnant (cleared) with gilgai	7a	534.65	5	Survey guideline sampling units achieved
-	-	Non-remnant (cleared) without gilgai	7b	5,759.07	7	Survey guideline sampling units achieved

5 Environmentally sensitive areas

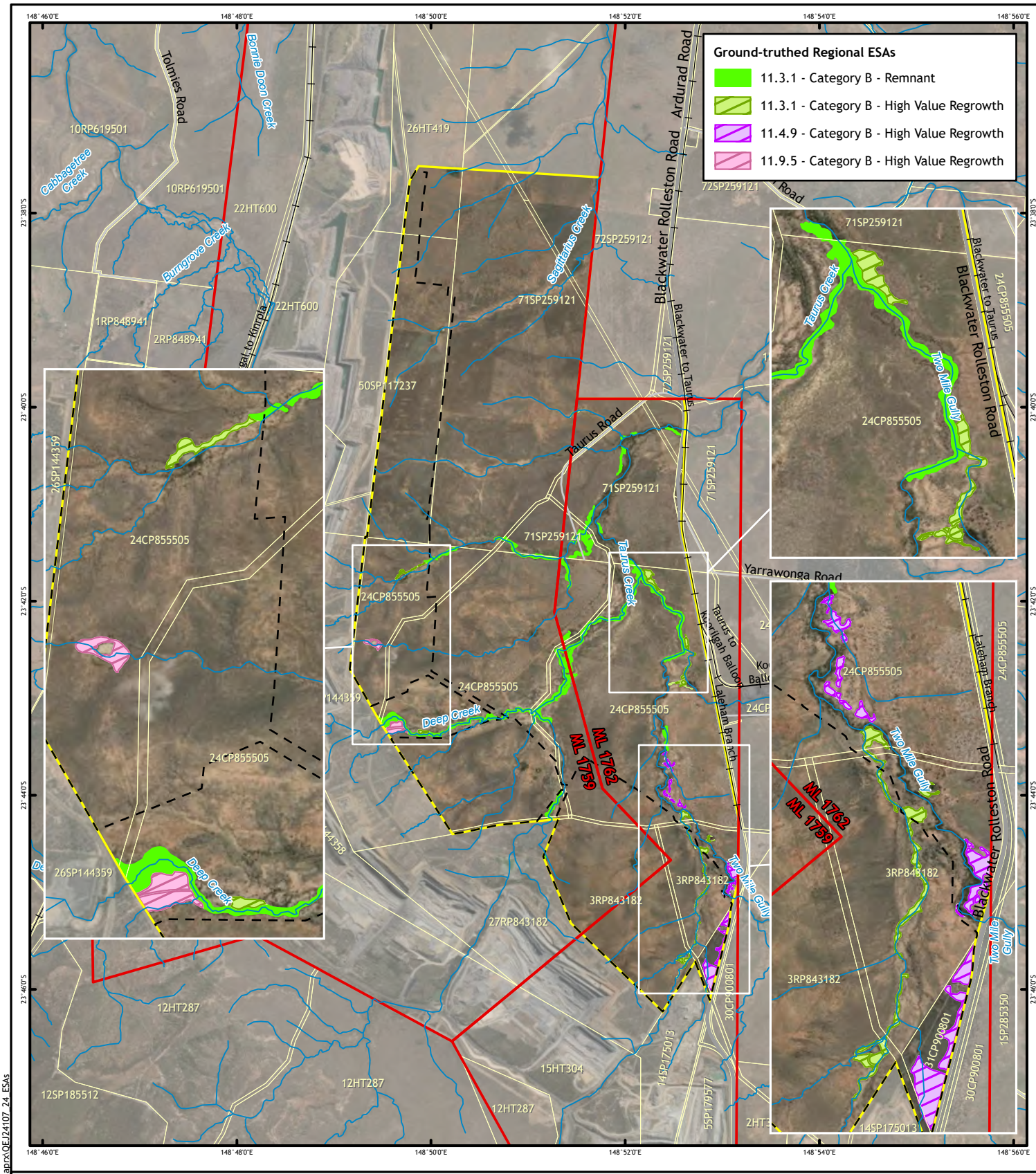
ESAs are defined by the Queensland *Environmental Protection Regulation 2019* (EP Regulation). ESAs include national parks, state forests, world heritage areas, Ramsar wetlands and nationally important wetlands. In addition, they feature areas of elevated natural and cultural value such as habitat for conservation significant flora and fauna and places of Aboriginal and European cultural heritage.

No Category A ESAs were identified within or in proximity to the Study Area.

Category B ESAs were identified within the Study Area during the desktop assessment and were associated with VM Act mapped REs listed as endangered under the biodiversity status framework. This included endangered remnant and high-value regrowth RE 11.3.1. Field assessment confirmed the presence of RE 11.3.1 within the Study Area along with an additional two endangered REs (RE 11.4.9 and RE 11.9.5). These are listed in Table 21 below and depicted in Figure 24.

Table 21: Ground-truthed Category B ESAs within the Study Area

RE	Short description	Condition type	Extent within Study Area (ha)	Extent within Disturbance Footprint (ha)
11.3.1	*Acacia harpophylla* open woodland on alluvial plains	Remnant	99.73	1.21
		High value regrowth	40.99	18.35
11.4.9	*Acacia harpophylla* shrubby open forest to woodland; *Terminalia oblongata* on Cainozoic clay plains	High value regrowth	32.16	17.66
11.9.5	*Acacia harpophylla* and/or *Casuarina cristata* open forest to woodland on fine-grained sedimentary rocks	High value regrowth	10.62	3.77



Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre

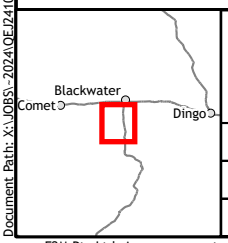
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Kilometres

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FIGURE 24: ENVIRONMENTALLY SENSITIVE AREAS (ESAs)

Blackwater North Ecological Assessment
Whitehaven Coal

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6 MNES and MSES summary

6.1 Summary of MNES

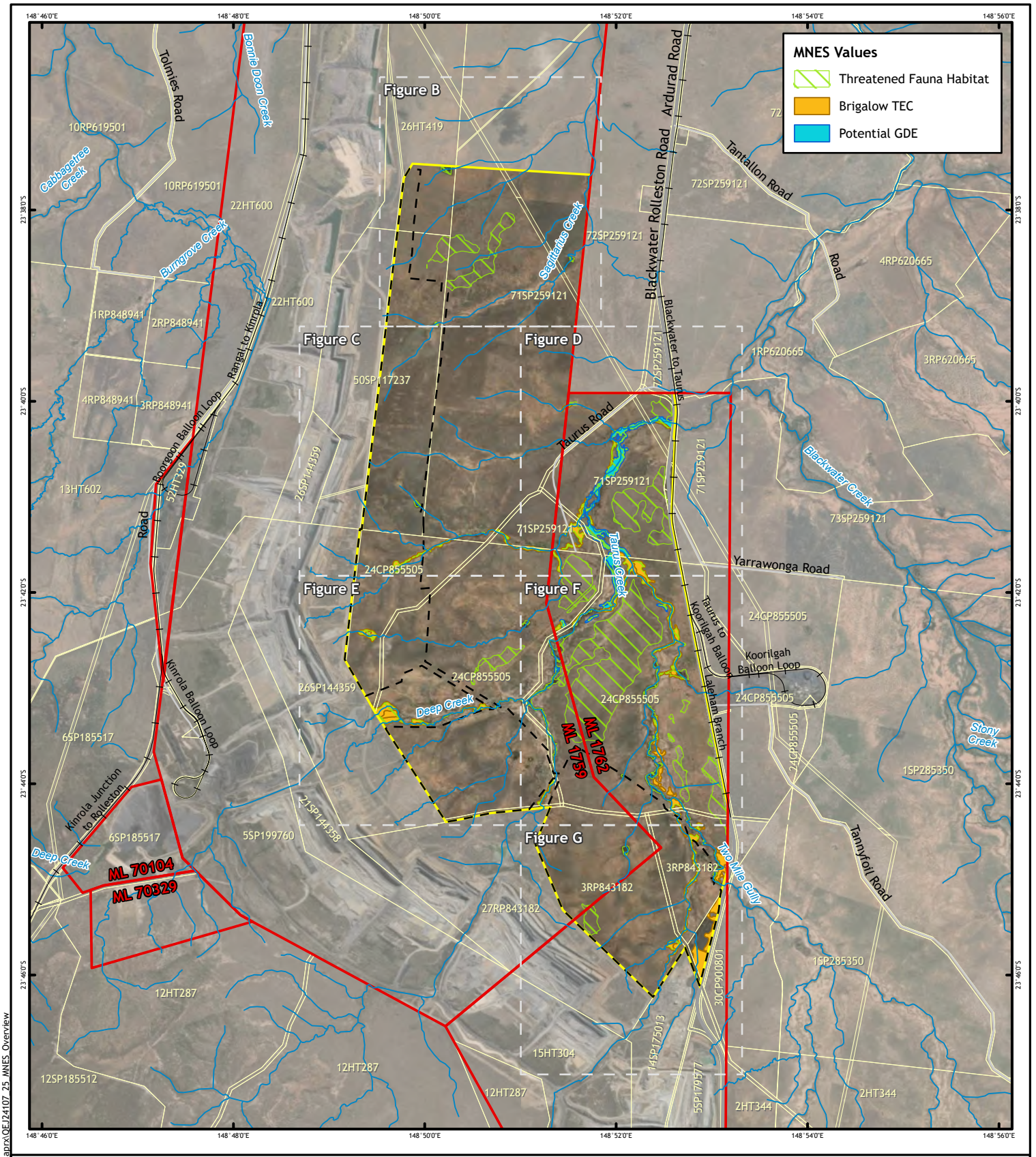
A summary of the MNES as defined in the EPBC Act EO Policy (DSEWPC, 2012) that were identified as known or likely to occur within the Study Area and Disturbance Footprint is provided in Table 22 and depicted in Figure 25.

Table 22: MNES identified within the Study Area

MNES	NC Act status[1]	EPBC Act status[1]	Area within Study Area (ha)[2]	Area within Disturbance Footprint (ha)[2]	Likelihood of occurrence within the Disturbance Footprint	Relevant section
Threatened ecological communities						
Brigalow (*Acacia harpophylla* dominant and co-dominant)	-	E	148.88	40.29	Known to occur	Section 4.1.2.1
Threatened fauna species						
Ornamental snake	V	V	Breeding and foraging t: 497.52	Breeding and foraging: 0	Unlikely to occur	Section 4.2.3.1
Australian painted snipe	E	E	Permanent Foraging: 16.45 Intermittent Foraging: 593.55	Permanent Foraging: 6.41 Intermittent Foraging: 14.45	Known to occur	Section 4.2.3.2
Latham's snipe	V	V, M	Permanent Foraging: 16.45 Intermittent Foraging: 593.55	Permanent Foraging: 6.41 Intermittent Foraging: 14.45	Likely to occur	Section 4.2.3.3
Squatter pigeon (southern subspecies)	V	V	Breeding and foraging: 239.01 Foraging: 30.46 Dispersal: 990.75	Breeding and foraging: 26.05 Foraging: 6.41 Dispersal: 262.34	Likely to occur	Section 4.2.3.4
White-throated needletail	V	V, M	Foraging (aerial): 6,907.49	Foraging (aerial): 2,316.58	Likely to occur as a flyover	Section 4.2.3.5

MNES	NC Act status[1]	EPBC Act status[1]	Area within Study Area (ha)[2]	Area within Disturbance Footprint (ha)[2]	Likelihood of occurrence within the Disturbance Footprint	Relevant section
Koala	E	E	Breeding and foraging: 103.38 Dispersal: 209.24	Breeding and foraging: 2.72 Dispersal: 48.29	Likely to occur	Section 4.2.3.6
Migratory (only) species						
Fork-tailed swift	SLC	M	Foraging (aerial): 6,907.49	Foraging (aerial): 2,316.58	Likely to occur as a flyover	Section 4.2.4.1
Glossy ibis	LC	M	Permanent Foraging: 16.45 Intermittent Foraging: 593.55	Permanent Foraging: 6.41 Intermittent Foraging: 14.45	Likely to occur	Section 4.2.4.2

[1] E = Endangered, V = Vulnerable, M = Migratory, SLC = Special Least Concern, LC = Least Concern
[2] Breeding = Breeding and foraging habitat, Foraging = Foraging habitat, Dispersal = Dispersal habitat



Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre
- Figure Extent

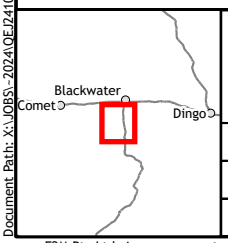
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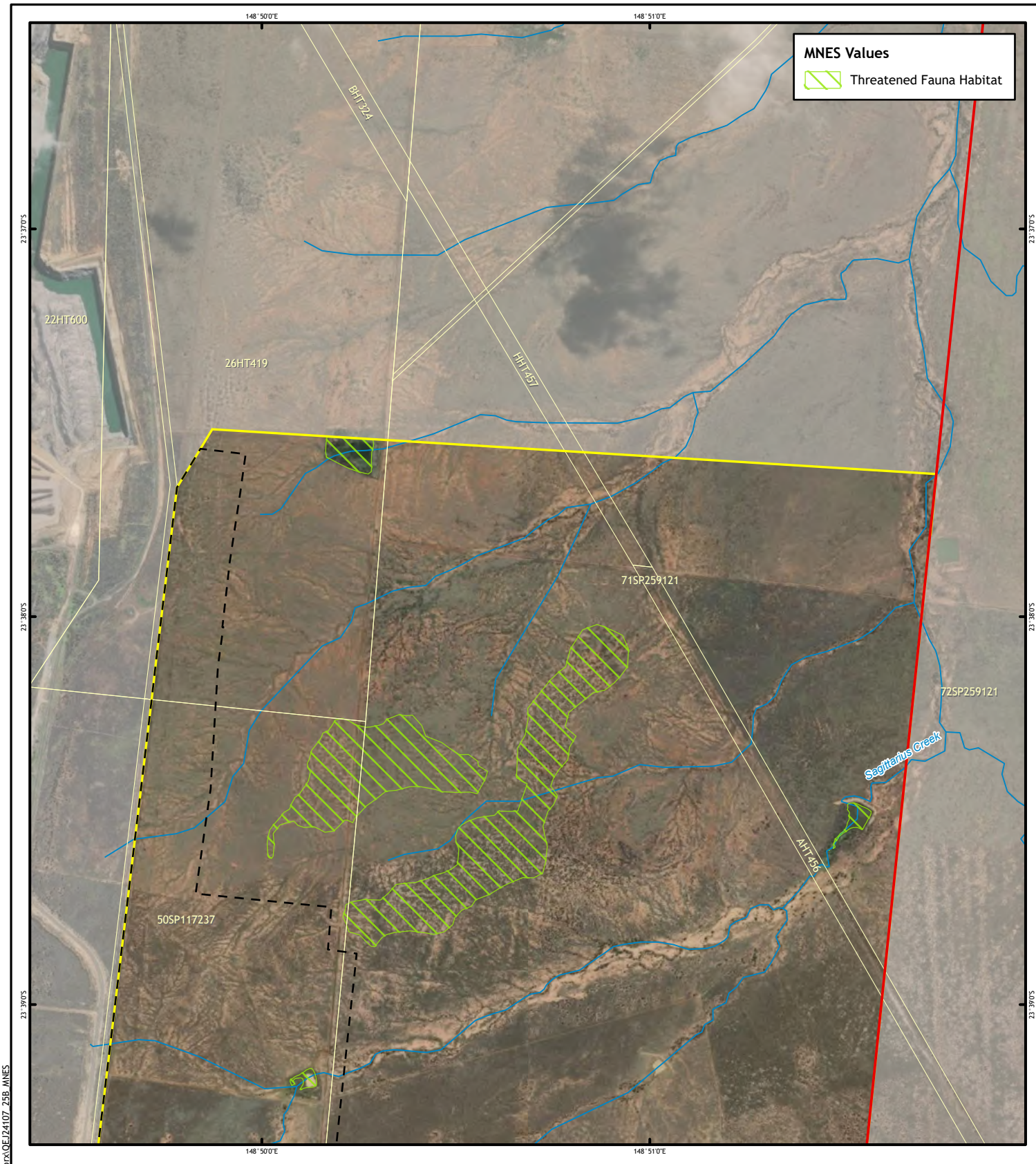
FIGURE 25A: FIELD VERIFIED MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE WITHIN THE STUDY AREA - OVERVIEW

Blackwater North Ecological Assessment
Whitehaven Coal

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Legend

- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre

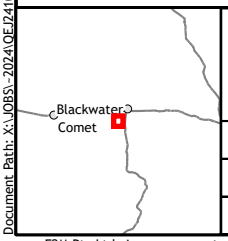
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Coordinate System: GDA2020



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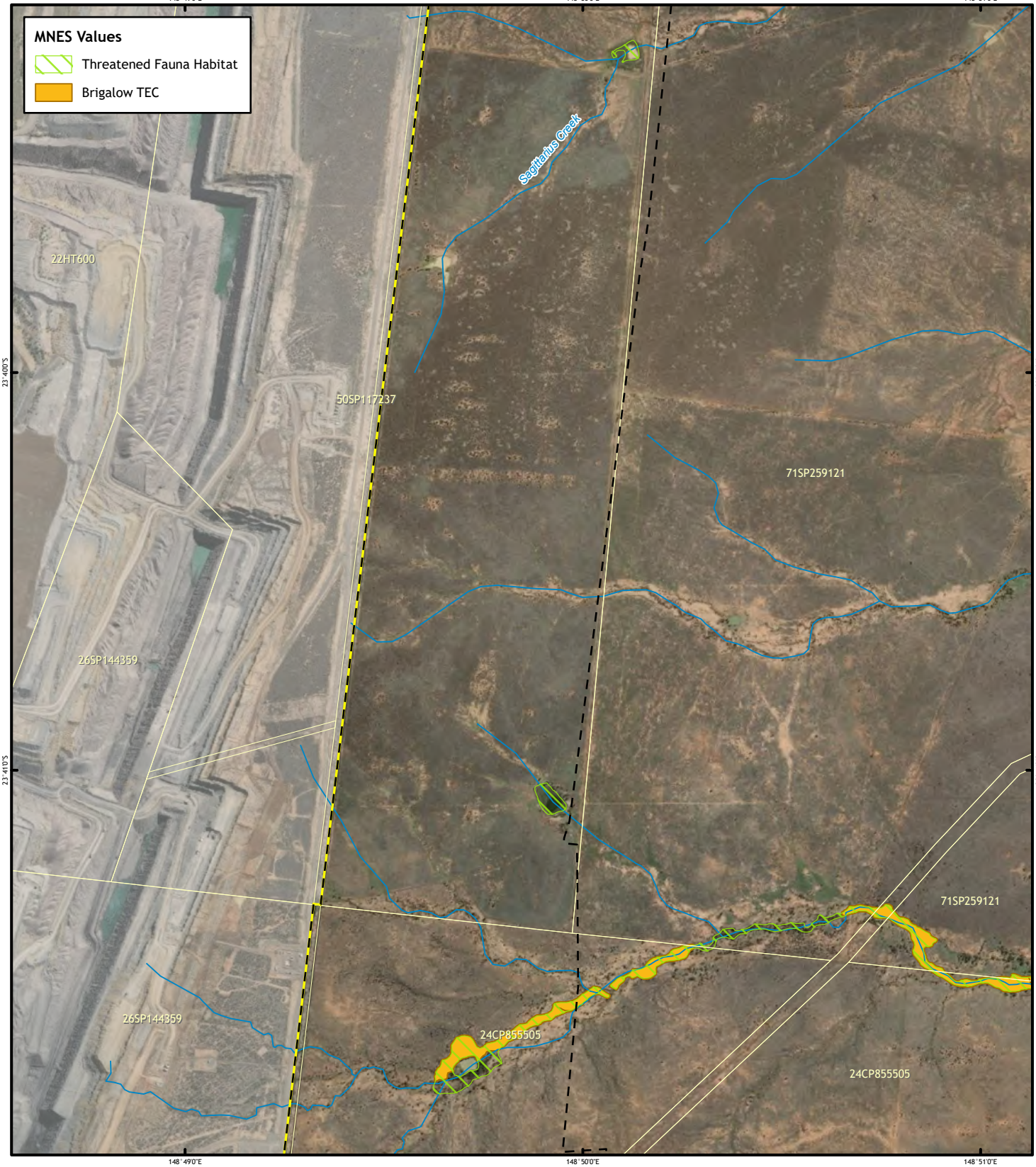
FIGURE 25B: FIELD VERIFIED MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE WITHIN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

Map Number	Job Number	Rev
2 of 7	QEJ24107	1

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Legend

- Watercourse
- Study Area
- Disturbance Footprint
- Cadastre

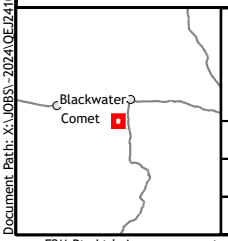
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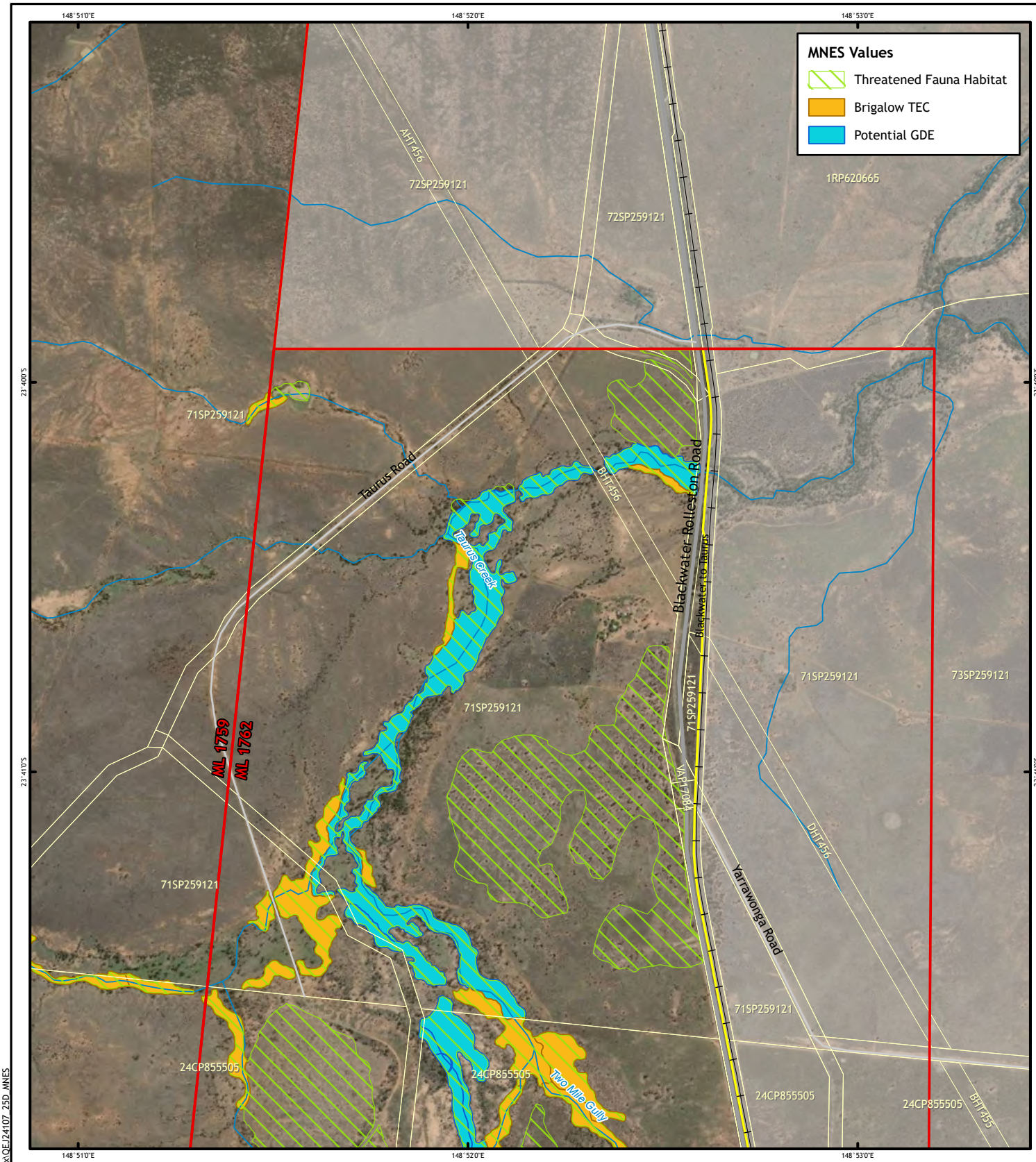
FIGURE 25C: FIELD VERIFIED MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE WITHIN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

Map Number	Job Number	Rev
3 of 7	QEJ24107	1

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Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Blackwater Mining Lease
- Cadastre

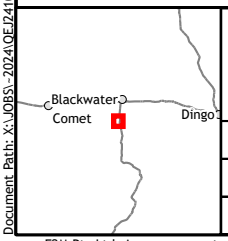
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Scale 1:25,000 (A4)

0 1

Kilometres

Coordinate System: GDA2020



Notes:
Topographic: © ESRI 2025
Cadastre: © DNRMMRRD 2025
Ordered Drainage: © DNRMMRRD 2025
Mining Lease: © DNRMMRRD 2025

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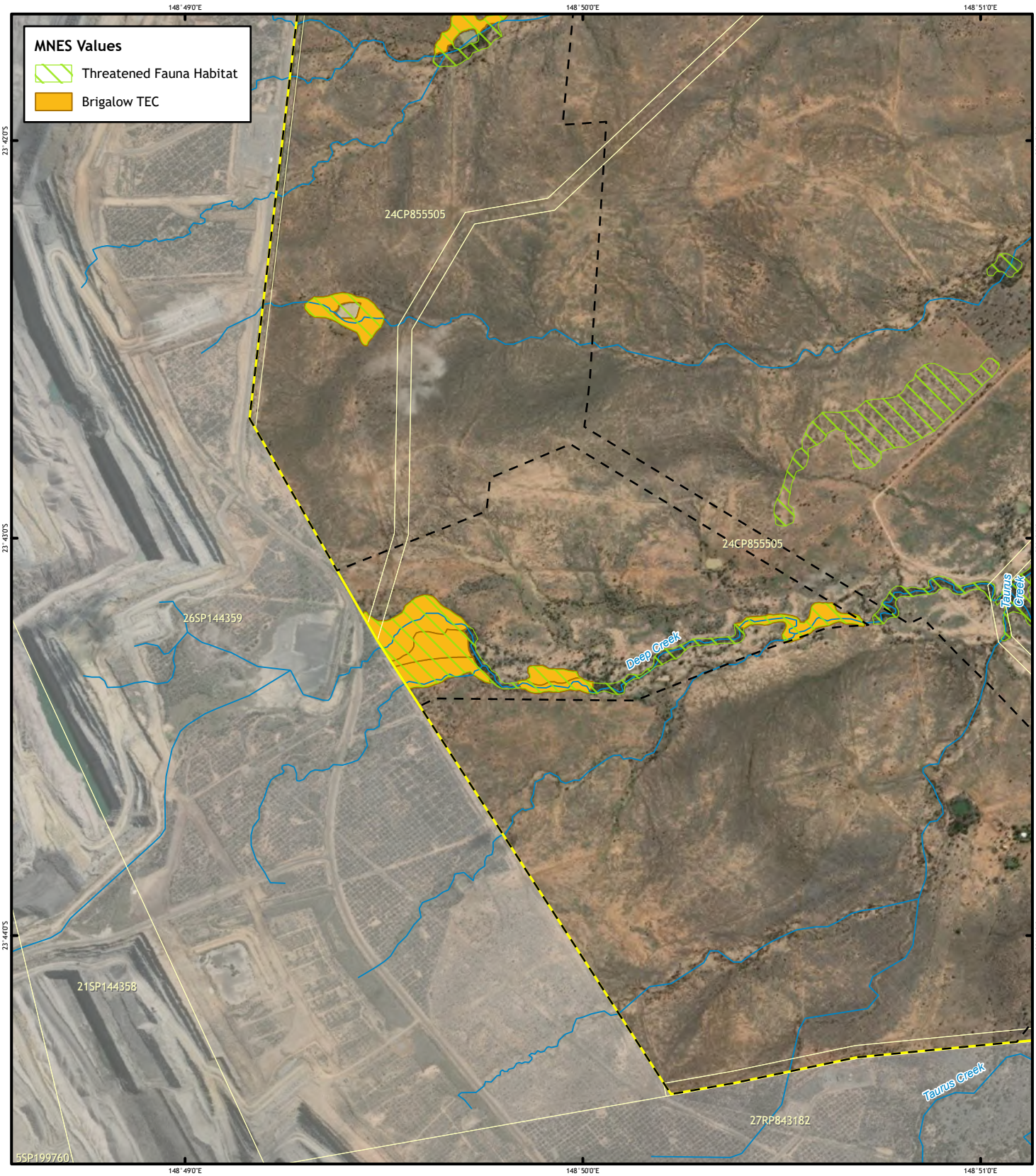
FIGURE 25D: FIELD VERIFIED MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE WITHIN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

Map Number	Job Number	Rev
4 of 7	QEJ24107	1

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Legend

- Watercourse
- Study Area
- Disturbance Footprint
- Cadastre

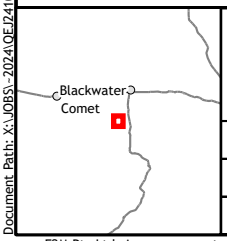
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Scale 1:25,000 (A4)

0 1

Kilometres

Coordinate System: GDA2020



Notes:
Topographic: © ESRI 2025
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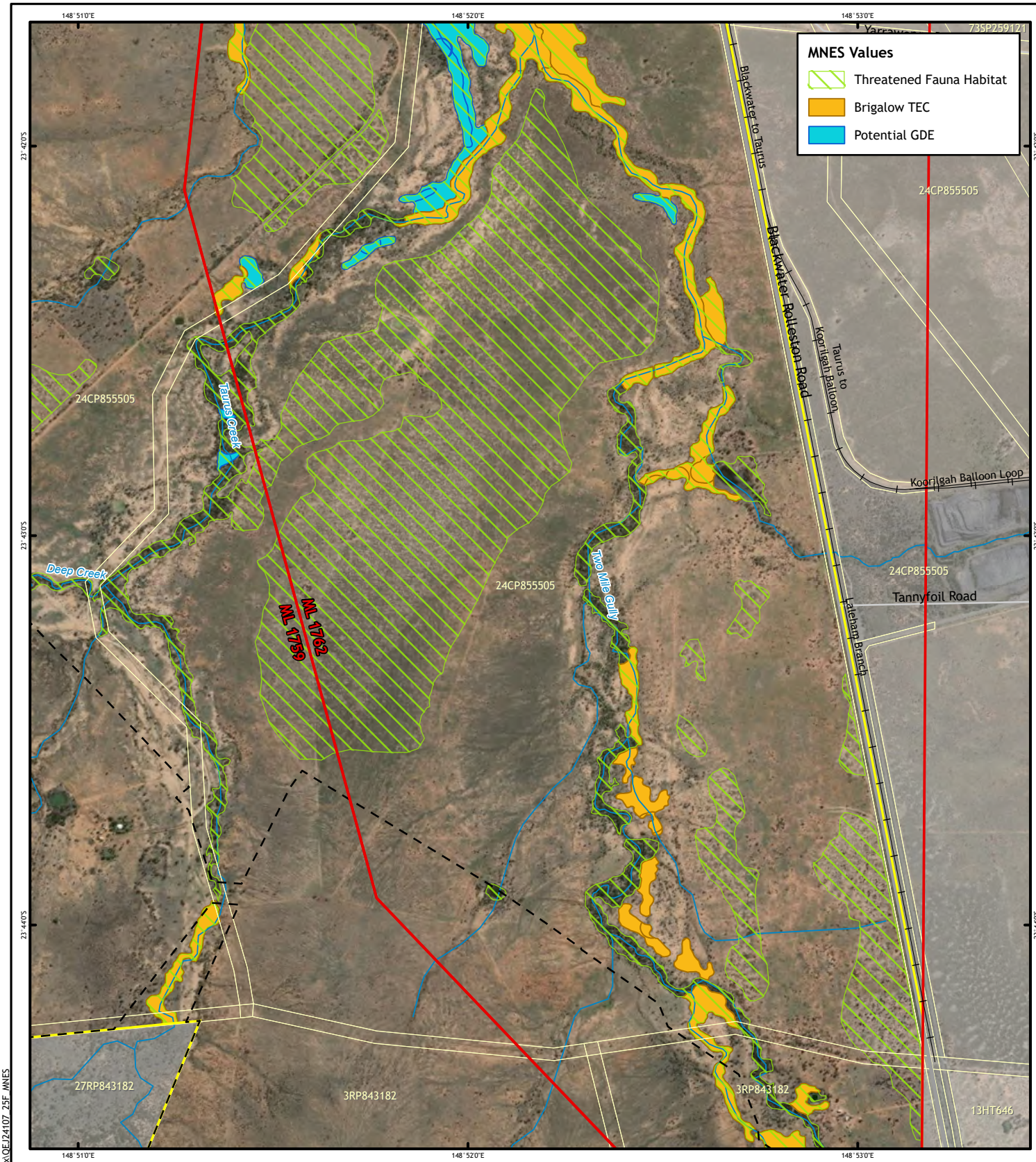
FIGURE 25E: FIELD VERIFIED MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE WITHIN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

Map Number	Job Number	Rev
5 of 7	QEJ24107	1

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Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre

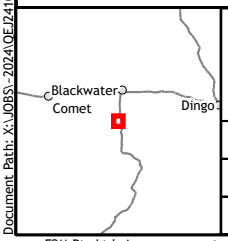
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Scale 1:25,000 (A4)

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Kilometres

Coordinate System: GDA2020



Notes:
Topographic: © ESRI 2025
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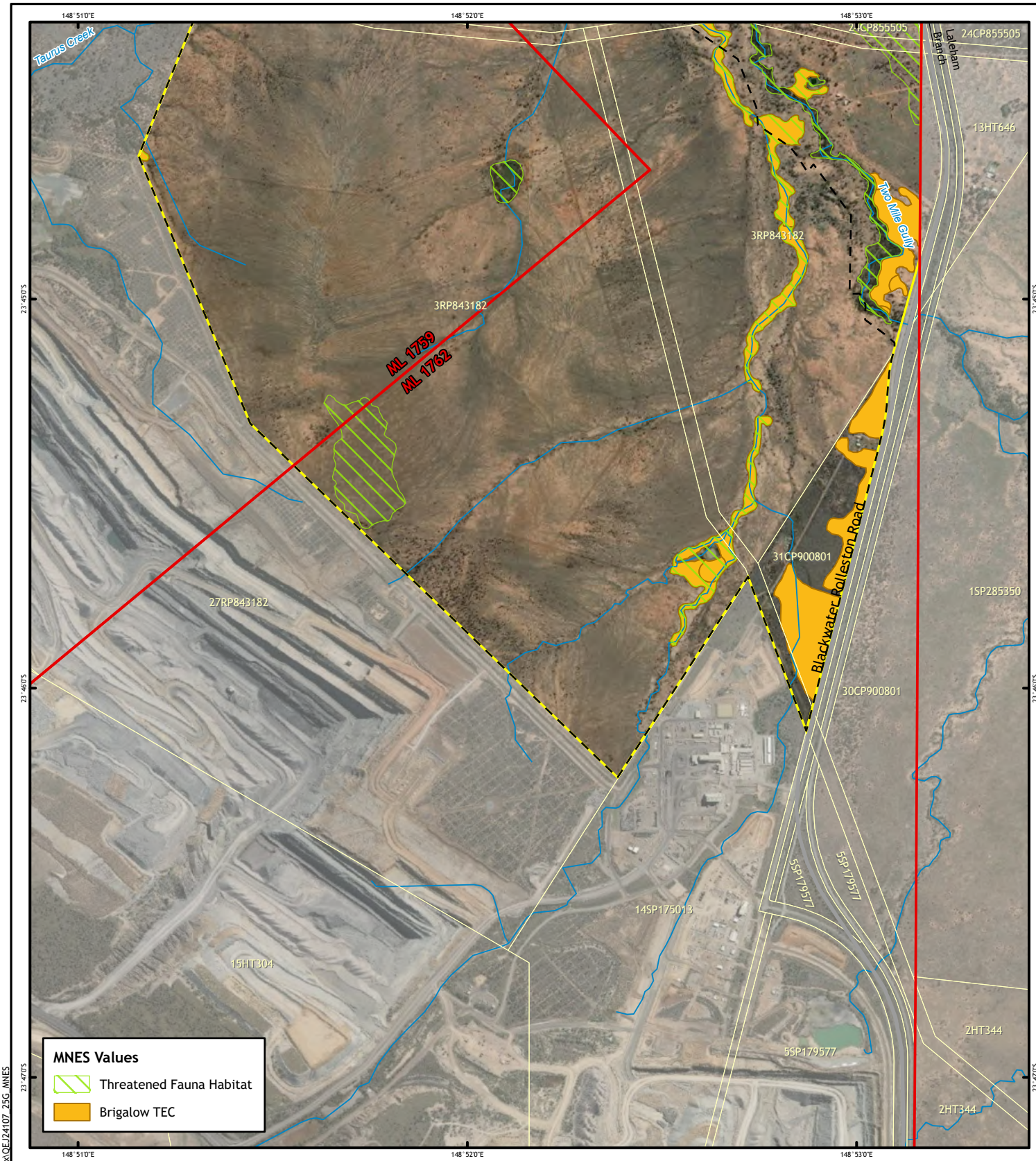
FIGURE 25F: FIELD VERIFIED MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE WITHIN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

Map Number	Job Number	Rev
6 of 7	QEJ24107	1

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Legend

- Railway
- Secondary Road
- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre

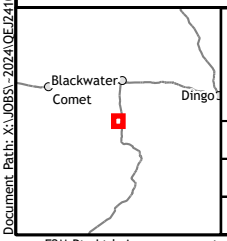
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Scale 1:25,000 (A4)

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Kilometres

Coordinate System: GDA2020



Notes:
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FIGURE 25G: FIELD VERIFIED MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE WITHIN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

Map Number	Job Number	Rev
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6.2 Summary of MSES

The following MSES as defined in the Queensland *Environmental Offsets Regulation 2014* (EO Regulation) were identified within the Study Area:

- regulated vegetation
- connectivity areas; and
- protected wildlife habitat.

A summary of the MSES within the Study Area is provided in Table 23 and Table 24.

Table 23: MSES ground-truthed regulated vegetation

MSES	VM Act status	Broad vegetation group	Structure category	Area within Study Area (ha)	Area within Disturbance Footprint (ha)
Endangered and of concern REs					
11.3.1	Endangered	25a	Mid-dense	99.73	1.21
11.3.2	Of concern	17a	Sparse	11.07	0.0
REs within the defined distance of a Vegetation Management watercourse					
11.3.1	Endangered	25a	Mid-dense	10.99	0.06
11.3.2	Of concern	17a	Sparse	0.02	0.0
11.3.3	Of concern	16c	Sparse	4.21	0.0
11.3.6	Least concern	17b	Sparse	7.40	0.18
11.3.27	Least concern	34d	Sparse	0.0	0.0

Table 24: MSES protected wildlife habitat within the Study Area

Species	EPBC Act Status	NC Act status	Area within Study Area (ha)	Area within Disturbance Footprint (ha)	Relevant section
Flora					
Solanum elachophyllum	Least concern	Endangered	Known: 30.32 Potential: 6,853.65	Known: 6.00 Potential: 2,299.78	Section 4.1.3.1
Fauna					
Ornamental snake (*Denisonia maculata*)	Vulnerable	Vulnerable	Breeding and foraging: 497.52	Breeding and foraging: 0.0	Section 4.2.3.1
Australian painted snipe (*Rostratula australis*)	Endangered	Endangered	Permanent Foraging: 16.45 Intermittent Foraging: 593.55	Permanent Foraging: 6.41 Intermittent Foraging: 14.45	Section 4.2.3.2
Latham's snipe *(Gallinago hardwickii)*	Vulnerable	Vulnerable	Permanent Foraging: 16.45 Intermittent Foraging: 593.55	Permanent Foraging: 6.41 Intermittent Foraging: 14.45	Section 4.2.3.3
Squatter pigeon (southern) (*Geophaps scripta scripta)*	Vulnerable	Vulnerable	Breeding and foraging: 239.01 Foraging: 30.46 Dispersal: 990.75	Breeding and foraging: 26.05 Foraging: 6.41 Dispersal: 262.34	Section 4.2.3.4
White-throated needletail *(Hirundapus caudacutus)*	Vulnerable	Vulnerable	Foraging (aerial): 6,907.49	Foraging (aerial): 2,316.58	Section 4.2.3.5
Koala (*Phascolarctos cinereus*)	Endangered	Endangered	Breeding and foraging: 103.38 Dispersal: 209.24	Breeding and foraging: 2.72 Dispersal: 48.29	Section 4.2.3.6
Short-beaked echidna (*Tachyglossus aculeatus*)	Least concern	Special least concern	Breeding and foraging: 501.13	Breeding and foraging: 122.11	Section 4.2.3.7

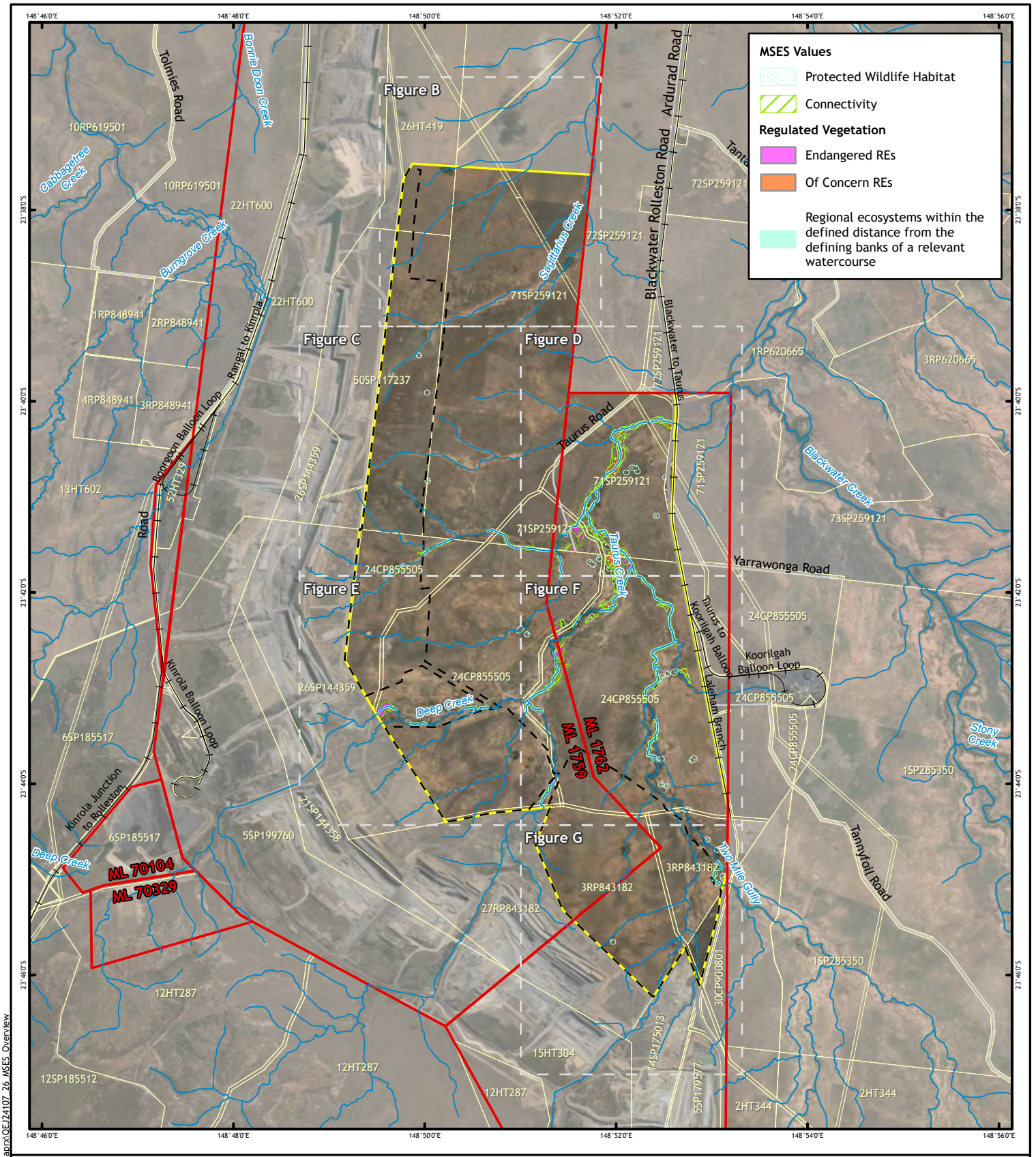
6.2.1 Regulated vegetation

MSES regulated vegetation under the EO Regulation includes prescribed REs containing remnant vegetation. MSES regulated vegetation within the Study Area was assessed using a combination of Queensland Government supplied mapping and RE ground-truthing. The specific methods to map regulated vegetation within the Study Area include:

- REs listed as endangered or of concern under the VM Act, using E2M ground-truthed remnant REs.
- REs located within the defined distance from the defining banks of Vegetation Management watercourse were mapped by buffering DNRMMRR mapped VM Act watercourses and drainage features by a defined distance[3] to estimate the defining banks (DNRMMRRD, 2025d). The size of the buffer was determined by the SO; a 2.5m buffer was applied to SO 1 and 2, a 5 m buffer was applied to SO 3 and 4, and SO 5 or greater were buffered by 10 m. E2M ground-truthed remnant REs within these defined distances and were included as MSES regulated vegetation.

Essential habitat for Ornamental snake (*Denisonia maculata*) occurs within the Study Area however it has not been included as it is assessed and offset as Protected Wildlife habitat for resource projects (Department of the Environment, Tourism, Science (DETSI), 2025). MSES regulated vegetation within the Study Area is depicted in Figure 26.

[3] *defined distance*, for a RE, means a distance identified in the EO Policy as the relevant distance from the defining banks of a relevant watercourse or relevant drainage feature.



Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Disturbance Footprint
- Blackwater Mining Lease
- Cadastre

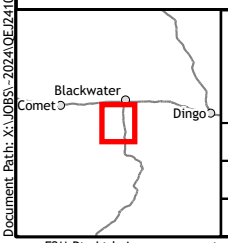
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0 2.5 5

Kilometres

Coordinate System: GDA2020



Notes:
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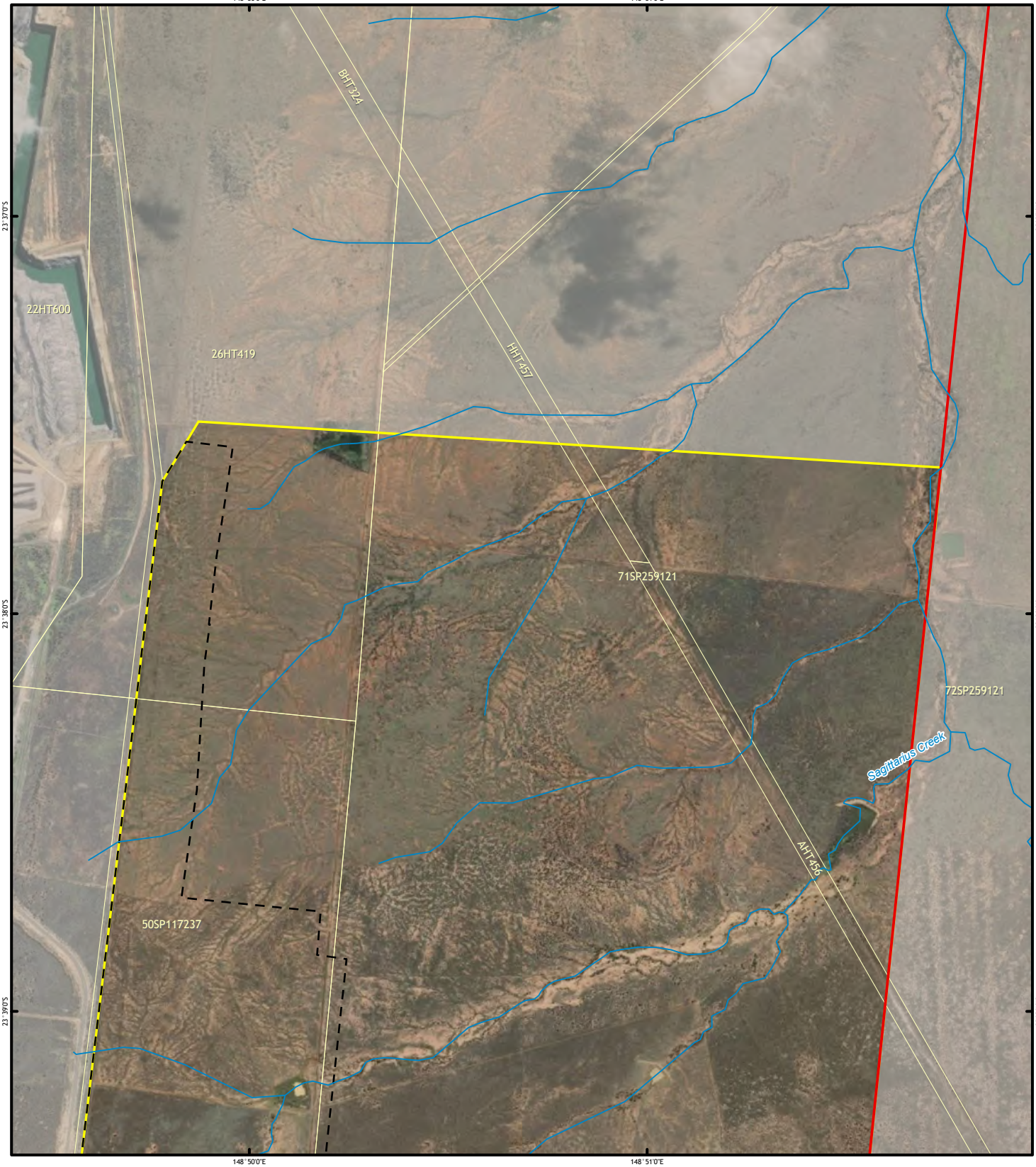
FIGURE 26A: FIELD VERIFIED MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE WITHIN THE STUDY AREA - OVERVIEW

Blackwater North Ecological Assessment
Whitehaven Coal

Map Number	Job Number	Rev
1 of 7	QEJ24107	1

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Legend

- Watercourse
- Study Area
- Blackwater Mining Lease
- Disturbance Footprint
- Cadastre

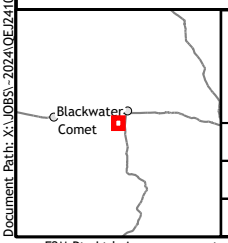
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Scale 1:25,000 (A4)

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Kilometres

Coordinate System: GDA2020



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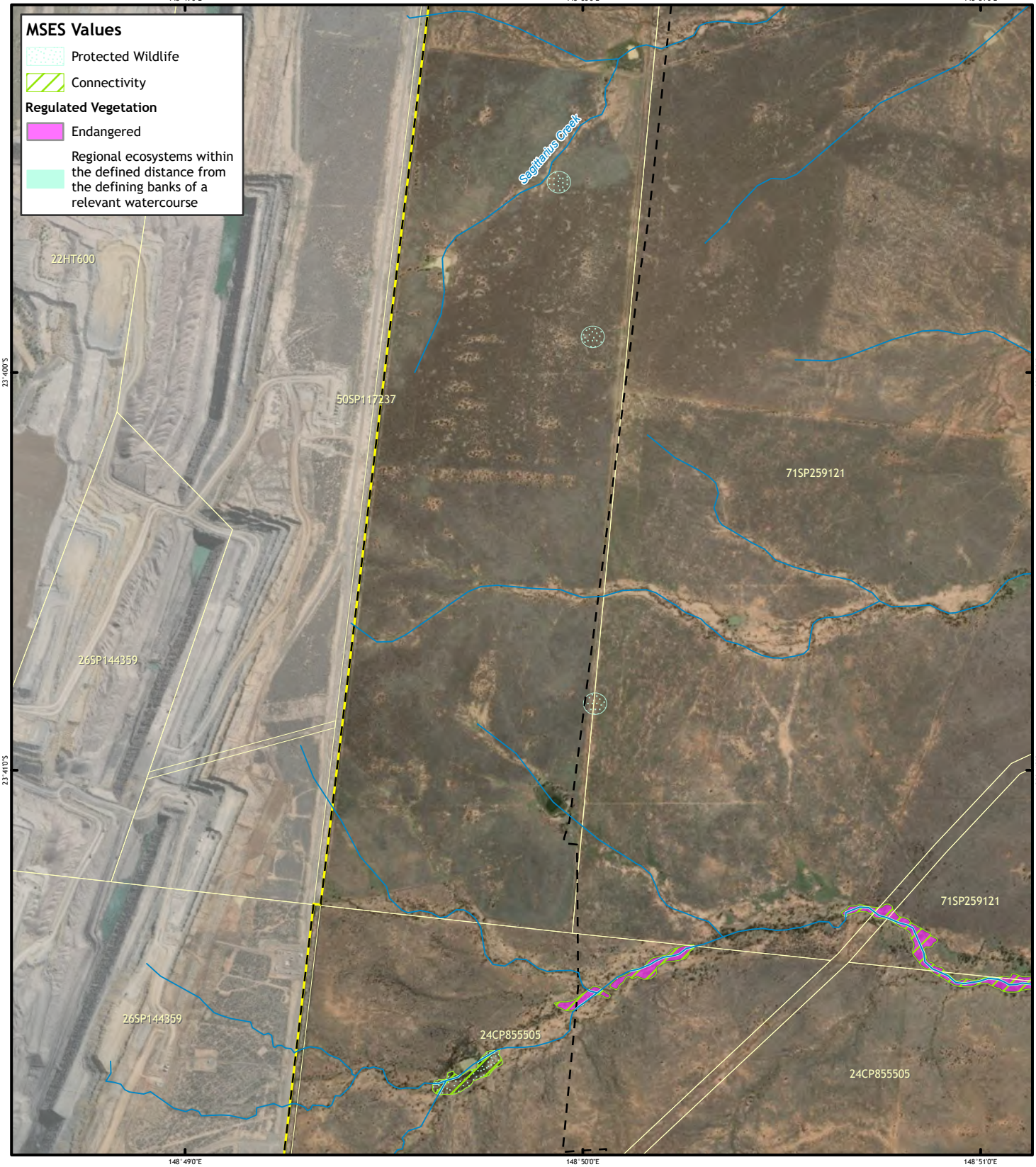
FIGURE 26B: FIELD VERIFIED MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE WITHIN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

Map Number	Job Number	Rev
2 of 7	QEJ24107	1

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Legend

- Watercourse
- Study Area
- Disturbance Footprint
- Cadastre

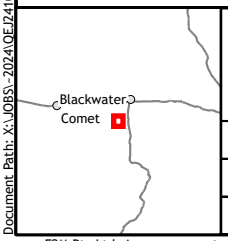
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Scale 1:25,000 (A4)

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Kilometres

Coordinate System: GDA2020



Notes:
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Mining Lease: © DNRMMRRD 2025

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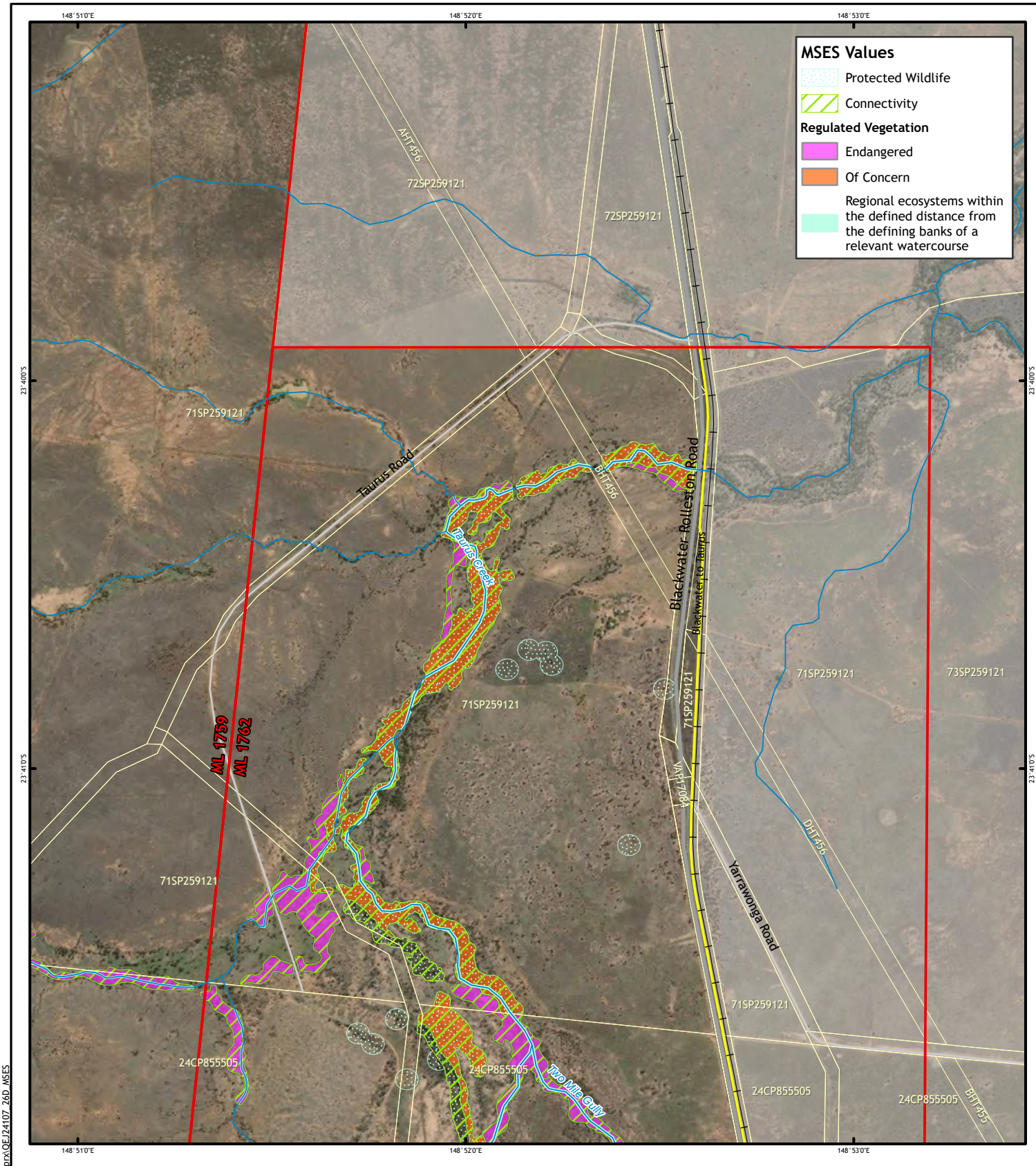
FIGURE 26C: FIELD VERIFIED MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE WITHIN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

Map Number	Job Number	Rev
3 of 7	QEJ24107	1

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Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Blackwater Mining Lease
- Cadastre

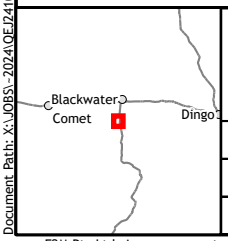
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Kilometres

Coordinate System: GDA2020



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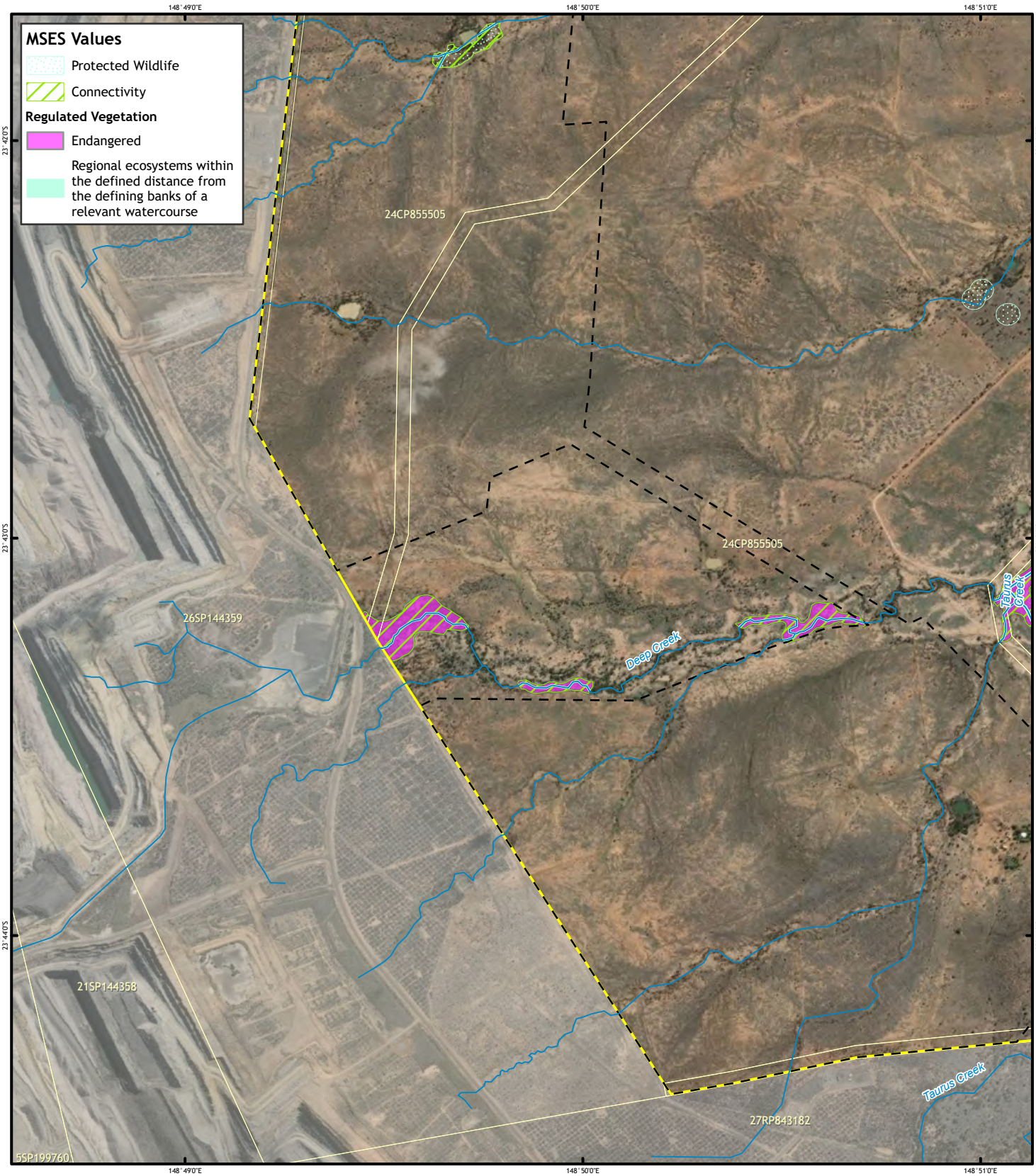
FIGURE 26D: FIELD VERIFIED MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE WITHIN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

Map Number	Job Number	Rev
4 of 7	QEJ24107	1

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Legend

- Watercourse
- Study Area
- Disturbance Footprint
- Cadastre

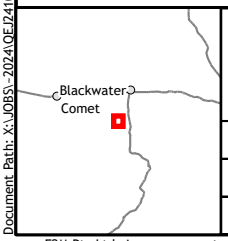
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Scale 1:25,000 (A4)

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Kilometres

Coordinate System: GDA2020



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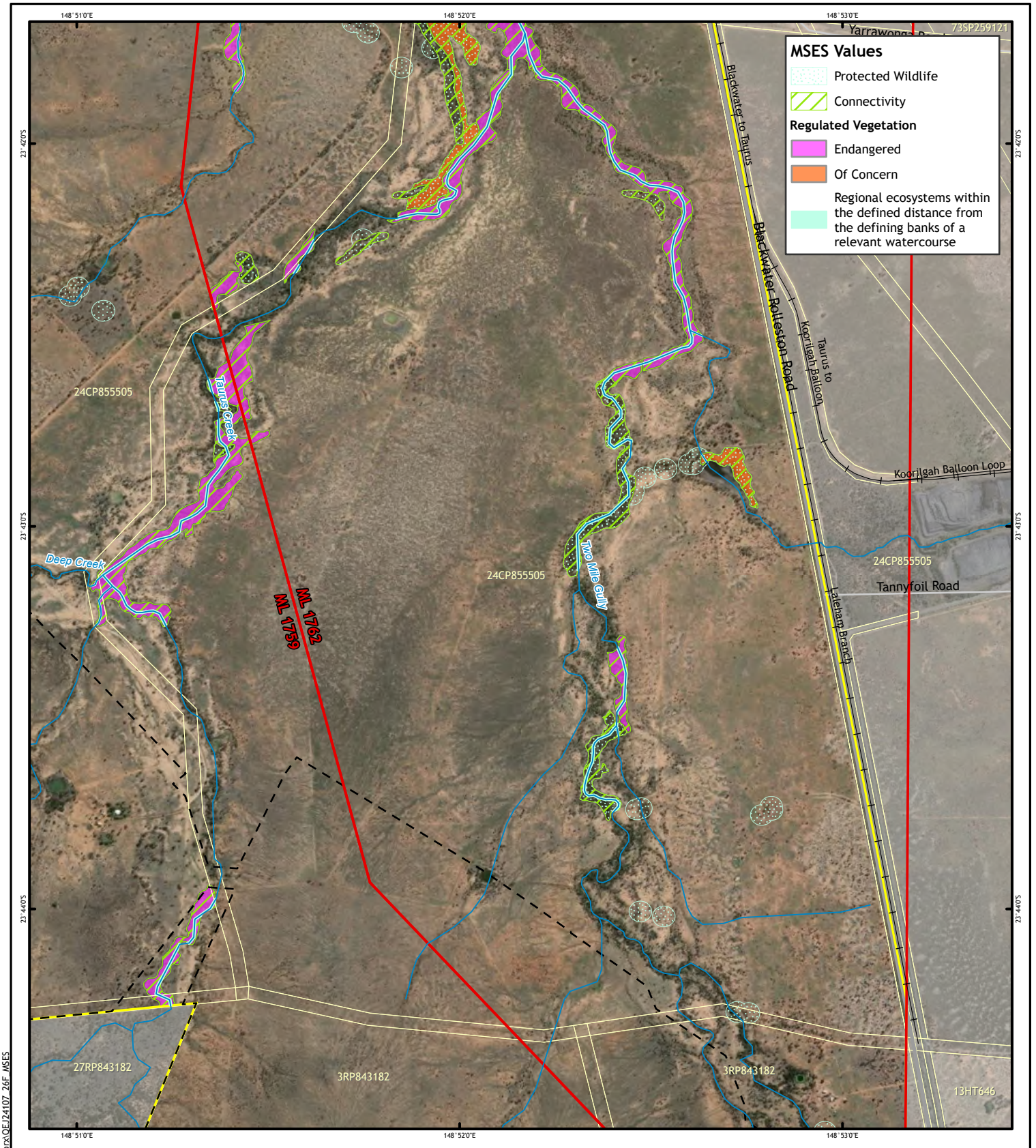
FIGURE 26E: FIELD VERIFIED MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE WITHIN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

Map Number	Job Number	Rev
5 of 7	QEJ24107	1

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Legend

- Railway
- Secondary Road
- Property Access
- Watercourse
- Study Area
- Blackwater Mining Lease
- Disturbance Footprint
- Cadastre

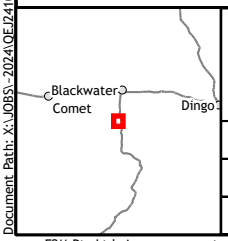
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Scale 1:25,000 (A4)

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Kilometres

Coordinate System: GDA2020



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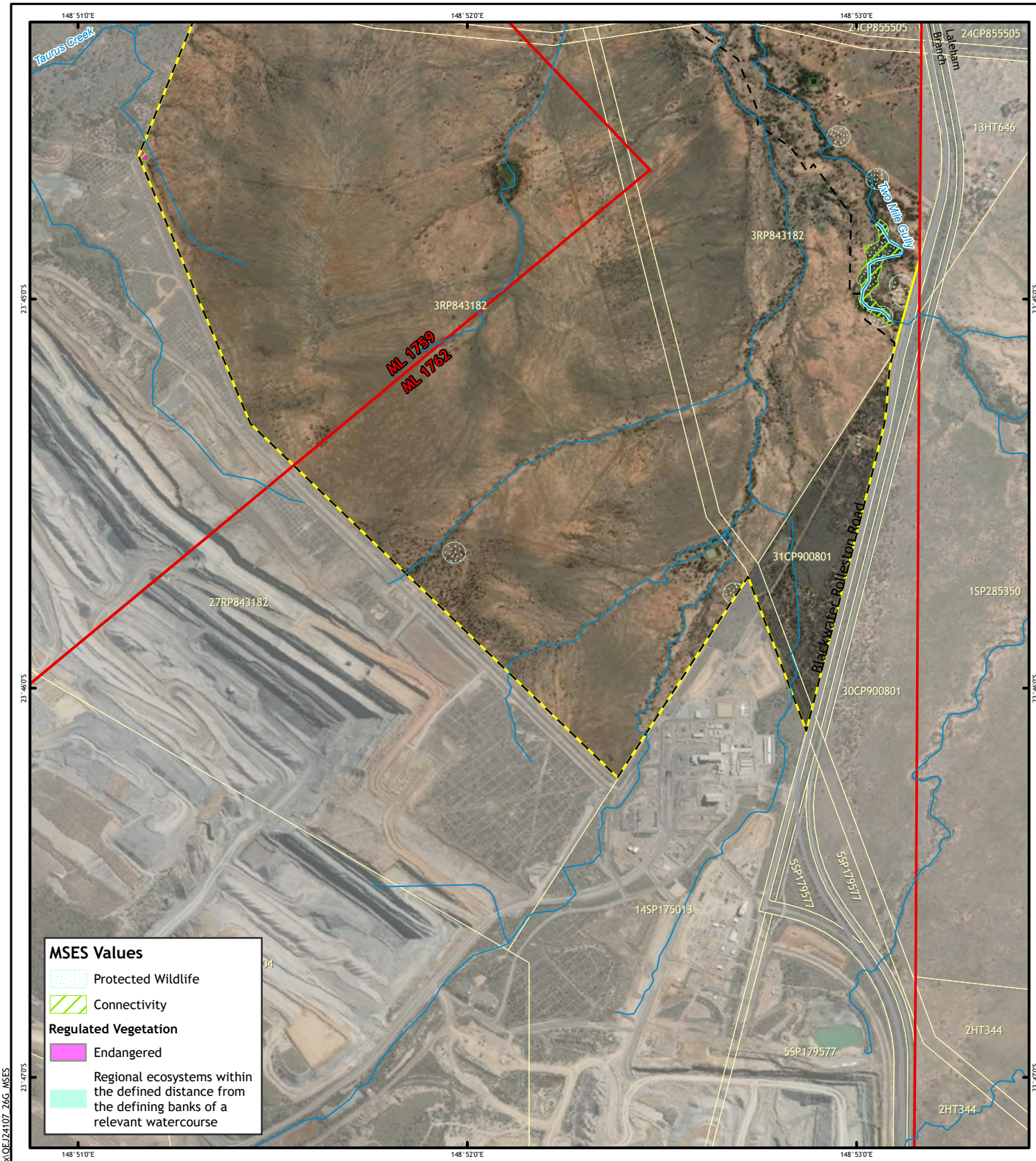
FIGURE 26F: FIELD VERIFIED MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE WITHIN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

Map Number	Job Number	Rev
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Legend

- Railway
- Secondary Road
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- Cadastre

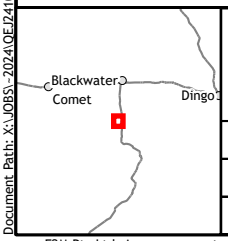
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Kilometres

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FIGURE 26G: FIELD VERIFIED MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE WITHIN THE STUDY AREA

Blackwater North Ecological Assessment
Whitehaven Coal

Map Number	Job Number	Rev
7 of 7	QEJ24107	1

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6.2.2 Connectivity areas

Connectivity areas are defined under the EO Regulation as prescribed REs that contain remnant vegetation and an area of land that is required for ecosystem functioning. Therefore, all ground-truthed remnant vegetation within the Study Area and Disturbance Footprint is considered to potentially contain connectivity values. The Study Area contains approximately 203.11 ha of remnant vegetation/connectivity areas and the Disturbance Footprint contains 3.93 ha of remnant vegetation/connectivity areas.

6.2.3 Protected wildlife habitat

Protected wildlife habitat is defined in the EO Regulation as:

- an area that contains flora that are listed as critically endangered, endangered or vulnerable; and
- an area that contains fauna that are listed as critically endangered, endangered, vulnerable or special least concern (non-migratory).

The EO Policy: *Significant Residual Impact Guideline* (DEHP, 2014) (SRI Guideline) defines habitat as '*the area occupied, or periodically or occasionally occupied, by any species, population or ecological community and includes all the different aspects (both biotic and abiotic) used by species during the different stages of their life cycles*'.

The MSES protected wildlife habitat summarised in Section 6.2 comprises those species that were identified as known or likely to occur within the Study Area.

7 Impacts and mitigation

7.1 Native vegetation clearing

7.1.1 Impact

The overall extent of surface disturbance associated with the Project is approximately 2,316.58 ha. The majority of this disturbance (97.65%, 2,262.07 ha) comprises non-remnant areas that have historically been cleared for livestock grazing and agriculture. The remnant and high value regrowth vegetation that would require removal for the Project totals 43.71 ha and is detailed in Table 25.

Table 25: Summary of direct impact to ground-truthed vegetation communities

RE	VM Act class	Area within Study Area (ha)	Area within Disturbance Footprint (ha) Ground-truthed Regional Ecosystem (GTRE)	RE mapped area within Isaac Comet Downs	Percent of disturbance within Isaac Comet Downs (%)
Remnant					
11.3.1	Endangered	99.73	1.21	21,832.42	0.0055
11.3.2	Of concern	11.07	0.0	34,854.35	0.0
11.3.3	Of concern	38.28	0.0	41,098.88	0.0
11.3.6	Least concern	45.32	2.72	1,315.35	0.21
11.3.27	Least concern	8.71	0.0	1,142.78	0.0
Sub-total		203.11	3.93	100,243.78	0.0039
High Value Regrowth					
11.3.1	Endangered	40.99	18.35	3,917.28	0.47
11.4.9	Endangered	32.16	17.66	3,826.97	0.46
11.9.5	Endangered	10.62	3.77	754.60	0.49
Sub-total		83.77	39.78	8,498.85	0.46

Clearance of remnant vegetation within the Disturbance Footprint is unavoidable due to the fixed location of the mining pits and the requirement to position supporting infrastructure around these operational areas. As a result, the project will necessitate the removal of approximately 3.93 ha of remnant vegetation for mining activities and associated infrastructure. The layout has been refined where possible to minimise impacts; however, complete avoidance is not feasible given operational, safety and engineering constraints.

The final landform concept incorporates a multifunctional landscape that will support a mix of pastoral, agricultural, ecological, and hydrological land uses. Key landform elements include areas rehabilitated for cattle grazing and suitable for dryland cropping as well as woodland habitat to provide ecological connectivity. The land will also provide dedicated water storage features to support agricultural use and ecological function, and a stabilised watercourses that maintain natural drainage patterns.

Vegetation clearing for the Project would result in disturbance of habitat for threatened flora species and TECs. Within the Disturbance Footprint, 40.29 ha of Brigalow TEC habitat, and 6.00 ha of known and 2,299.78 ha of potential *Solanum elachophyllum* habitat, will be affected. These impacts are unavoidable due to the reasons discussed above. Table 26 summarises these impacts and significant impact assessments are detailed in Appendix D.1 and E.3.

Table 26: Threatened flora and TECs impacted by the Project

Species	EPBC Act status	NC Act status	Area within Study Area (ha)	Area within Disturbance Footprint (ha)	Percentage impacted (%)
Threatened ecological communities					
Brigalow TEC	Endangered	-	148.88	40.29	27.06
Threatened flora					
Solanum elachophyllum	-	Endangered	Known: 30.32 Potential: 6,853.65	Known: 6.00 Potential: 2,299.78	Known: 19.80 Potential: 33.56

7.1.2 Avoidance Measures

Field surveys were undertaken early in the design process such that ecological constraints could be considered as part of design and direct impacts to native vegetation could be minimised. The Disturbance Footprint has been designed to avoid impacting areas of vegetation where possible, including avoiding Taurus Creek and the ecological values along its riparian corridor.

7.1.3 Mitigation

While the Project would result in unavoidable impacts on native vegetation, a range of vegetation clearing measures would be implemented during both the construction and operation phases of the Project. These include the following:

- Vegetation clearing extents would be kept to the minimum area necessary for construction to minimise the removal of S. *elachophyllum* habitat and Brigalow TEC.
- Areas that must not be cleared or damaged outside of the Disturbance Area would be clearly identified on construction plans. Where necessary, signage, flagging and/or barricade fencing will be used to demarcate areas not to be cleared and this information clearly communicated to all necessary construction personnel.
- Implementation of weed hygiene protocols (e.g. wash-down, weed hygiene certification) for all vehicles, equipment and materials to be used in areas of native vegetation. This will help reduce the indirect impacts on the remaining Brigalow TEC in the Study Area by minimising further increases in weed density.

- Development of a Rehabilitation Management Plan, including a specification that rehabilitation commence as soon as practicable for all areas containing temporary infrastructure and cleared areas which are no longer required.
- Re-spread cleared vegetation and vegetation mulch on rehabilitated land to suppress weeds and assist in regrowth of S. *elachophyllum* and Brigalow community species.

7.2 Fauna habitat removal

7.2.1 Impact

7.2.1.1 Habitat removal

Habitat for eight conservation significant fauna species will be disturbed due to clearing within the Disturbance Footprint, including disturbance or removal of animal breeding places as well as foraging and dispersal habitat. This is summarised in Table 27. The Project's Disturbance Footprint encompasses areas of remnant Brigalow and Eucalypt woodland, as well as both mature and young Brigalow regrowth, which serve as habitats for a range of species. It will also impact extensive sections of non-remnant vegetation (with and without gilgai), however, the gilgai present within the Disturbance Footprint does not provide suitable habitat for the Ornamental snake. In addition, several wetlands and dams are present within the Disturbance Footprint which support various bird species.

Clearance of fauna habitat within the Disturbance Footprint is unavoidable due to the fixed location of the mining pits and the requirement to position supporting infrastructure around these operational areas. The layout has been refined where possible to minimise impacts; however, complete avoidance is not feasible given operational, safety and engineering constraints.

Table 27: Threatened and migratory fauna habitat impacted by the Project

Species	EPBC Act status	NC Act status	Area within Study Area (ha)	Area within Disturbance Footprint (ha)	Percentage impacted (%)
Australian painted snipe (*Rostratula australis)*	Endangered	Endangered	Permanent Foraging: 16.45 Intermittent Foraging: 593.55	Permanent Foraging: 6.41 Intermittent Foraging: 14.45	Permanent Foraging: 38.97 Intermittent Foraging: 2.43
Koala (*Phascolarctos cinereus*)	Endangered	Endangered	Breeding and foraging: 103.38 Dispersal: 209.24	Breeding and foraging: 2.72 Dispersal: 48.29	Breeding and foraging: 2.63 Dispersal: 23.08
Latham's snipe *(Gallinago hardwickii)*	Vulnerable, migratory	Vulnerable	Permanent Foraging: 16.45 Intermittent Foraging: 593.55	Permanent Foraging: 6.41 Intermittent Foraging: 14.45	Permanent Foraging: 38.97 Intermittent Foraging: 2.43
Ornamental snake (*Denisonia maculata*)	Vulnerable	Vulnerable	Breeding and foraging: 497.52	Breeding and foraging: 0	Breeding and foraging: 0

Species	EPBC Act status	NC Act status	Area within Study Area (ha)	Area within Disturbance Footprint (ha)	Percentage impacted (%)
Squatter pigeon (southern subspecies) (*Geophaps scripta scripta)*	Vulnerable	Vulnerable	Breeding and foraging: 239.01 Foraging: 30.46 Dispersal: 990.75	Breeding and foraging: 26.05 Foraging: 6.41 Dispersal: 262.34	Breeding and foraging: 10.90 Foraging: 21.04 Dispersal: 26.48
White-throated needletail *(Hirundapus caudacutus)*	Vulnerable, migratory	Vulnerable	Foraging (aerial): 6,907.48	Foraging (aerial): 2,316.58	Foraging (aerial): 33.54
Short-beaked echidna (*Tachyglossus aculeatus*)	-	Special least concern	Breeding and foraging: 501.13	Breeding and foraging: 122.11	Breeding and foraging: 24.37
Glossy ibis (*Plegadis falcinellus*)	Migratory	-	Permanent Foraging: 16.45 Intermittent Foraging: 593.55	Permanent Foraging: 6.41 Intermittent Foraging: 14.45	Permanent Foraging: 38.97 Intermittent Foraging: 2.43
Fork-tailed swift (*Apus pacificus*)	Migratory	-	Foraging (aerial): 6,907.48	Foraging (aerial): 2,316.58	Foraging (aerial): 33.54

7.2.1.2 Habitat degradation and edge effects

In general, construction activities and vegetation removal have the potential to indirectly degrade adjacent fauna habitat through edge effects. These occur where newly created habitat boundaries are subject to altered microclimate, vegetation structure and resource availability, leading to changes in habitat quality (Laurance & Yensen, 1991). For fauna, edge effects can increase exposure to weeds, noise, light, dust, as well as reduced foraging resources and shifts in species assemblages (Laurance & Yensen, 1991). Prolonged exposure to edge effects can degrade or reduce the quality of habitat, potentially impacting the abundance, richness and diversity of fauna species.

Habitat surrounding the Disturbance Footprint is largely fragmented from agricultural development and the existing mine area. Edge effects are not likely to be present in non-remnant or regrowth areas as the land is already disturbed with reduced foraging resources and altered vegetation structures. Edge effects are likely to be present within remnant vegetation as these communities have not previously been disturbed. However, remnant areas along Taurus creek adjacent to the Disturbance Footprint are very narrow and impact to this vegetation is not likely to cause a significant increase in edge effects within the greater landscape.

7.2.1.3 Habitat connectivity and fragmentation

Habitat connectivity within the Study Area (i.e. physical linkages between remnant and regrowth areas) is limited, attributed largely to the disturbance and fragmentation associated with historical and ongoing agricultural development and land use practices. Landscape connectivity values have largely been avoided for the Project with clearing of 3.93 ha of remnant connectivity areas being removed within the

Disturbance Footprint (Section 6.2.2). In particular, the remnant riparian vegetation associated with Taurus Creek and Two Mile Gully have largely been avoided.

Clearance of connectivity areas within the Disturbance Footprint is unavoidable due to the fixed location of the mining pits and the requirement to position supporting infrastructure around these operational areas. The layout has been refined where possible to minimise impacts; however, complete avoidance is not feasible given operational, safety and engineering constraints.

7.2.1.4 Fauna mortality and injury

Construction and operation activities associated with the Project have the potential to result in fauna injury or mortality. Vehicles and machinery operating within the Disturbance Footprint may inadvertently strike fauna residing in these areas, leading to direct harm. Similarly, fauna that are unable to disperse away from areas under active clearing are also particularly susceptible to injury or mortality, which may include threated species present in the area, such as Koala, Ornamental snake and Short-beaked echidna. Other potential causes of injury or mortality include animals becoming trapped in excavations/trenches. Additionally, following the completion of construction works, fauna that remain within the Study Area may face an elevated risk of being struck by vehicles or machinery operating adjacent to the Disturbance Footprint.

Impact avoidance measures currently being practiced to avoid fauna mortality during disturbance include (Whitehaven, 2020):

- Consideration of restrictions in relation to the presence of critical habitat for listed threatened species or ecological communities, triggering the referral process as per EPBC Act.
- Presence of a fauna spotter/catcher during clearing of vegetation or fauna habitat.

7.2.2 Avoidance Measures

Field surveys were undertaken early in the design process such that ecological constraints could be considered as part of design and the direct impact to native vegetation could be minimised. The disturbance footprint for the Project has been defined to avoid impacting areas of fauna habitat where possible.

7.2.3 Mitigation

In order to mitigate unavoidable impacts on fauna habitat values associated with the Project, a range of vegetation clearing measures will be implemented over the course of the Project. Measures associated with the spread of environmental weeds, noise, light and dust are discussed in Sections 7.3.2. Mitigation measures include the following:

- Vegetation clearing would be carried out sequentially over the life of the Project to allow fauna species the opportunity to disperse away from clearing areas.
- Directional clearing towards habitat to be retained to prevent fauna from becoming trapped in the clearing front.
- Identified fauna would be left in place with dispersal routes and connecting trees available until the individual has moved on without interference.
- Pre-clearance fauna surveys would be undertaken by suitably experienced and qualified persons to identify individual fauna at direct risk from clearing activities and provide advice to avoid/minimise the impacts.

- A suitably experienced and qualified fauna spotter/catcher would be present during the clearing of any habitat features (e.g trees, woody debris, logs and rocks) that may serve as habitat or refugia for animals, particularly in remnant and regrowth habitat areas.
- Prior to removal, all hollow-bearing trees would be thoroughly checked for large hollow-dwelling fauna prior to felling. If presence is identified, it is recommended that the tree be left overnight to allow for self-dispersal.
- Management of fauna identified during clearing would include relocating individuals to adjacent habitat or treating injuries.
- Select habitat features (e.g. hollow bearing trees, woody debris, logs and rocks) would be salvaged for re-use in rehabilitation areas.

The existing Blackwater Mine Land and Biodiversity Management Plan (Whitehaven Coal Pty Ltd, 2020) will be updated to include both the mitigation measures above as well as species-specific management measures for relevant MNES and MSES species, including:

- Australian painted snipe
- Koala
- Latham's snipe
- Squatter pigeon (southern)
- White-throated needletail; and
- Short-beaked echidna.

7.3 Introduction and spread of weeds and pests

7.3.1 Impacts

Introduced flora species disrupt ecosystems by outcompeting and replacing native species, resulting in altered ecosystem diversity and function. Proliferation and spread of environmental weeds and pests may occur with vegetation clearing, soil disturbance and increased movement of heavy machinery and vehicles. Seven weed species listed as WoNS and/or restricted matters under the Biosecurity Act were recorded within the Study Area as scattered individuals and groups:

- *Bryophyllum delagoense;*
- *Cryptostegia grandiflora;*
- *Harrisia martinii;*
- *Opuntia streptacantha;*
- *Opuntia stricta;*
- *Opuntia tomentosa;*
- *Parkinsonia aculeata;* and
- *Parthenium hysterophorus*.

Weed seeds can be transported in contaminated landfill, and as seed and material on machinery, vehicles or personnel. Construction activities have the potential to spread or introduce weeds throughout adjacent areas, resulting in a degradation of vegetation/habitat quality and native species assemblages.

The Project may also result in an increase in the presence and abundance of feral animals due to increased permanency of water sources (e.g. dams and troughs). These pests can result in adverse impacts to native fauna through increased habitat degradation, predation pressure and competition for resources. Environmental pests recorded in the Study Area during the field survey are:

- Cane toad (*Rhinella marina*);
- Wild dog (*Canis lupus familiaris*);
- Feral cat (*Felis catus*);
- Common myna (*Acridotheres tristis*);
- Rabbit (*Oryctolagus cuniculus*); and
- Feral pig (*Sus scrofa*).

7.3.2 Mitigation

Management and control of environmental weeds and pests will be required during the construction and operational phases of the Project. Associated management measures will include:

- Prior to vegetation clearing activities, a pre-clearance survey would be undertaken to identify and map infestations of WoNS and biosecurity matters to minimise spread during clearing works and the operational phase.
- Monitor and respond early with regular inspections, mapping, and rapid treatment of new outbreaks
- Treat established weeds using appropriate manual, mechanical, chemical, or biological methods
- Implementation of weed hygiene protocols (e.g. wash-down, weed hygiene certification) for all vehicles, equipment and materials to be used in areas of native vegetation.
- Weeds or soil removed as a result of construction activities would be removed from the area to minimise potential spread and proliferation of weed species.
- Continuation of waste management measures described in the Blackwater Mine Waste Management Plan (Whitehaven Coal, 2021). Waste management measures would be identified and enacted to minimise occurrences of pest fauna. Food scraps, which attract pest fauna, would be disposed of in designated bins. The contents of the bins would be transferred to the industrial bins which are then emptied by the designated contractor directly to the designated landfill onsite.
- Control feral animals through monitored programs (trapping and 1080 baiting) when thresholds are me
- Educate and report via toolbox talks, training, record-keeping, and landholder notification

An existing Weed and Feral Animal Management Plan (Whitehaven Coal, 2022a) has been developed to monitor the distribution and density of listed invasive flora and fauna. This plan oversees the implementation of the mitigation methods described above, ensuring that all recommended actions are carried out effectively.

7.4 Modification of hydrology

7.4.1 Impacts

7.4.1.1 Surface water quality

Changes in the surface water quality and quantity may impact terrestrial ecosystems downstream of disturbance associated with the Project. Sedimentation and chemicals can enter downstream environments resulting from overland flow patterns (Evans, 2000). Based on the water level data collected to date, groundwater interaction with ephemeral creeks is considered to be unlikely (SLR, 2026).

7.4.1.2 Groundwater drawdown

Changes to groundwater quality and quantity can have an indirect impact on ecosystems surrounding the Study Area, including ecosystems that are dependant or partially dependent on groundwater (terrestrial GDEs). The process of mining reduces water levels in the surrounding groundwater units. The extent of the zone affected is dependent on the properties of the aquifers/aquitards and is referred to as the zone of drawdown. The potential impacts to groundwater have been assessed in accordance with the Blackwater Mine - North Extension Project Groundwater Impact Assessment (SLR, 2026). Groundwater will not leave the mine lease permanently and the final voids anticipated to act as a groundwater sink, capturing water associated with in-pit rejects (SLR, 2026).

7.4.2 Mitigation

Mitigation measures to minimise potential impacts to hydrology associated with the Project include:

- A Groundwater Monitoring and Management Program (GMMP) exists for the BWM (WSP, 2024). The purpose of the GMMP is to monitor the scale and distribution of shifts to groundwater resources due to existing operations at BWM and to provide early detection of any unforeseen impacts to groundwater levels or groundwater quality.
- Groundwater inflows to the open cut pits during mining operations would be pumped out (along with any surface water) via in-pit sumps if the groundwater doesn't passively evaporate on the pit face or from the pit floor (SLR, 2026). The groundwater inflows would be collected and contained within the mine water management system (SLR, 2026).
- Erosion and sediment control monitoring would be implemented to reduce the amount of sediment laden run-off entering downstream waterways. The following general principles should apply to the erosion and sediment controls:
  - minimise the surface disturbance areas
  - where possible, apply local temporary erosion control measures
  - intercept run-off from undisturbed areas and divert around surface disturbance areas, through the use of up-catchment diversions; and
  - where temporary measures are likely to be ineffective, direct surface water run-off from surface disturbance areas to sediment dams prior to release from the Project area.
- Active haul roads are to be regularly watered (or applied with dust suppressants) to minimise dust generation potential.

- Bunding and appropriate storage of fuels and other hazardous and flammable materials will be undertaken in accordance with Australian Standard (AS)1940:2004, and where practical, will be located away from any waterbodies.
- Oil spill recovery equipment will be available when working adjacent to drainage channels with the ability to discharge off site. Spill kits will be located with construction crews conducting activities with the potential for significant spills.
- As soon as practical, disturbed areas will be rehabilitated to reduce the amount of exposed soils.

7.5 Proliferation of noise, light and dust

7.5.1 Impacts

Construction and operation activities can disrupt local fauna roosting, breeding and foraging activities as a result of increased exposure to artificial lighting, noise and vibration. Artificial lighting poses risks to fauna, as increased light allows predators to locate prey more easily. In particular, threatened fauna within the Study Area may be at increased risk of predation, such as Ornamental Snake, Australian painted snipe, Latham's snipe, Squatter pigeon and Short-beaked echidna. As the Project brings operational areas closer to the more heavily vegetated sections of Taurus Creek, these impacts may affect the fauna species that inhabit and utilise this watercourse.

7.5.2 Mitigation

To minimise potential impacts associated with proliferation of dust the following management measures would be implemented:

- Dust suppression activities are to be carried out where required and managed in accordance with the limits and risk levels identified within the Blackwater *Air Emissions Management Plan*. The Project would continue to implement the measures described in the Blackwater Air Emissions Management Plan (Whitehaven Coal, 2022b), including:
  - Availability of water trucks to provide dust suppression on haul and light vehicle roads
  - Water sprays on stacker/reclaimer unites; and
  - Train loadout to incorporate veneering.
- Topsoil stockpiles are to be kept to a maximum height of 3 m and side slopes profiled to 3H:1V to decrease wind impact.
- Active mining areas and haul roads are to be maintained in good condition to minimise emissions.
- Blasting operations are to be monitored in relation to wind speed and direction to ensure that emissions do not adversely impact on sensitive receivers.
- Completed mining areas and any other cleared areas would be rehabilitated as soon as possible after use.
- Other controls listed in the Blackwater Air Emissions Management Plan include (Whitehaven Coal, 2022b):
  - minimising the area of disturbance;
  - progressive backfilling of overburden and rejects to in pit spoil dumps;
  - ongoing implementation of the WHC-QLD-PRO Permit to Disturb; and
  - avoid burning cleared vegetation.

To minimise potential impacts associated with proliferation of noise and light the following management measures would be implemented:

- Where artificial lighting is required, directional lighting would be implemented in a way to:
  - focus on disturbance/work areas
  - minimise/avoid lighting of remnant vegetation; and
  - implemented in accordance with AS including consideration of *National Light Pollution Guidelines for Wildlife* (DCCEEW, 2023).
- Regular maintenance of machinery and plant would be undertaken to minimise unnecessary noise.
- The Blackwater Air Emissions Management Plan states the following measures should be implemented during operational activities (Whitehaven Coal, 2022b):
  - upgrading silencing of mobile equipment
  - limiting speed of heavy vehicle traffic on haul roads
  - implement maintenance and operation procedures to minimise nuisance noise emissions from equipment
  - only carry out blasting during daylight hours
  - restricting blasts to favourable weather conditions; and
  - alteration of number of blast holes; stemming depth, spacing etc. of blasts.

7.6 Bushfire event

7.6.1 Impacts

Accidental ignitions in the Project area may be caused by machinery, an accident or collision, scheduled burns getting out of control, hot works, spontaneous combustion of coal or from the incorrect disposal of flammable items. These ignitions have the potential to cause uncontrollable fires that can have pronounced impacts on vegetation and habitat within and adjacent to the Project area.

The majority of vegetation surrounding the Disturbance Footprint are Brigalow dominated vegetation types, which typically do not carry fire, except where invaded by exotic species, such as Buffel grass (Butler & Fairfax, 2008).

7.6.2 Mitigation

To minimise potential impacts from a bushfire event, the following management measures would be implemented:

- Implement a Bushfire Management Plan, which includes strategies for fuel load management. The Bushfire Management Plan should include an assessment of appropriate fire strategies to maintain the ecological values of surrounding vegetation communities, some of which are sensitive to uncontrolled burns (i.e. brigalow communities).
- Any chemicals used in the Project area would be handled and disposed of in accordance with the relevant Safety Data Sheet.
- Access tracks would be constructed and maintained for ready use by Queensland Fire and Rescue Service in emergency situations. These tracks could also be used as fire breaks if appropriately maintained. The designation of fire breaks is to be specified within the Bushfire Management Plan.
- An Emergency Response Procedure would be prepared in consultation with emergency services and implemented.

7.7 Cumulative impacts

Land use in the Isaac - Comet Downs sub-bioregion consists primarily of mining, cattle grazing and grain production. The Project area comprises of patches of remnant and regrowth vegetation and agricultural land, primarily used for cattle grazing.

The Project's impact on the environment is additive to that from past and present grazing, agriculture and mining activities within the Northern Bowen Basin and Isaac - Comet Downs sub-bioregions. As such, this section focusses on evaluating the Project's impact inclusive of other local and regional disturbances, which allows a broad-scale assessment on impacts to MNES habitat.

The Isaac – Comet Downs subregion includes extensive agricultural practices and large-scale regional development comprising several existing and approved EPBC Act Referrals. Referrals within 30 km of the Project are detailed in Table 28.

Table 28: Approved EPBC Act Referrals within 30 km of the Project

EPBC Act referral title	Referral number	Distance to Blackwater North	Date of Referral	Approval status
Bowen Gas Project	2012/6377	Incorporates the northern extent of the Study Area	09/05/2012	Active Project, with condition variation being considered
Blackwater to Rolleston 132 kV transmission line	2002/880	Immediately west of the Study Area	25/11/2002	Active Project
Development and operation of a new multi-seam underground coal mine with associated on-site infrastructure	2011/5811	Immediately east of the Study Area	16/01/2011	Active Project
Blackwater to Emerald Dual Circuit 132kV Powerline, QLD	2012/6480	0.37 km	23/07/2012	Active Project
Curragh Extension Project, Blackwater, QLD	2015/7508	0.5 km	02/07/2015	Active Project
Rail track to link the proposed MIM Rolleston coal mine to existing rail network	2002/637	3.26 km	08/04/2002	Active Project
Curragh West Project	2011/6187	5.93 km	08/11/2011	Active Project
Blackwater creek diversion and coal mine	2007/3925	8.79 km	17/12/2007	Active Project
Curragh North Coal Mine	2003/1096	12.62 km	12/06/2003	Active Project
Springsure Creek 132kV powerline and switchyards	2012/6385	14.97 km	15/05/2012	Active Project
Development and operation of the Star Coal Project Bulk Sample Project	2023/09502	15.03 km	23/03/2023	Active Project
Santos GLNG Gas Field Development Project, QLD	2012/6615	19.70 km	07/11/2012	Active Project
Bluff open cut coal mine project, central Queensland	2013/7064	20.16 km	24/11/2013	Active Project

EPBC Act referral title	Referral number	Distance to Blackwater North	Date of Referral	Approval status
Blackwater System Rail Expansion	2011/6209	21.07 km	29/11/2011	Active Project
Expansion of Ensham Mine	2004/1822	24.91 km	13/10/2004	Approval decision made
Jellinbah Coal Mine-Central North Extension, QLD	2018/8139	25.25 km	02/01/2018	Approval decision made
Coal Seam Gas Field Development for Natural Gas Liquefaction Park, Curtis Island	2008/4059	26.34 km	27/02/2008	Approval decision made
Blackwater Mine South Coking Coal Project	2022/09279	26.68 km	09/06/2022	Under Assessment

The Project would result in the removal of 43.71 ha of remnant and high value regrowth vegetation.

The potential cumulative impacts on threatened species arising from the Project are minimal because of the localised nature of the Project compared to the wider distribution of the species and associated habitats and communities in the surrounding landscapes and subregions, together with the highly disturbed existing character of the habitats within the Disturbance Footprint. A total of 3.93 ha of remnant vegetation will be removed within the Disturbance Footprint, comprising 0.17% of the total disturbance.

The cumulative impact on the MNES and MSES identified within the Study Area was estimated by comparing the Project's direct impact to the area of habitat present within the Central Highlands. The available habitat for each MNES was calculated across the Isaac – Comet Downs subregion using similar habitat definitions applied on the Study Area with the exception of field-based criteria (such as species diversity, ground cover, etc) (Table 29). Species profiles and listing advice were used to identify REs and Broad Vegetation Groups (BVGs) within the subregion that provide suitable habitat for each MNES. Threatened matters habitat listed in Table 29 generally cover the entire Isaac - Comet Downs sub-bioregion, extending from Nebo in the north, to Rolleston in the south (Atlas of Living Australia (ALA), 2025; DCCEEW, 2025k).

For threatened fauna species, it was conservatively assumed that all remnant REs contains the necessary microhabitat for each species. Therefore, for species and communities that occur in regrowth areas, which are detailed in the broad habitat descriptions in the table below, this assessment is an under-estimate of available habitat in the region.

Table 29: MNES and MSES regional habitat associations

MNES and MSES	Qualifying RE/BVG[1]	Broad habitat description
Threatened ecological communities		
Brigalow TEC	11.3.1, 11.4.8, 11.4.9, 11.5.16, 11.9.1, 11.9.5	Remnant and regrowth *Acacia harpophylla* dominated woodlands and open forests
Conservation significant species		
Solanum elachophyllum	11.3.1, 11.3.6, 11.4.9 and 11.5.16	Remnant and regrowth *Eucalyptus thozetiana*, *Acacia harpophylla* open forests or *E. crebra and E. tenuipes* woodland.
Ornamental snake *Denisonia maculata*	11.4.3, 11.4.6, 11.4.8, 11.4.9, 11.3.3 and 11.5.16	Remnant and regrowth *Acacia harpophylla* and/or *Casuarina cristata* dominated vegetation where gilgai occur
Australian painted snipe *Rostratula australis*	11.2.4, 11.2.5, 11.3.2, 11.3.12, 11.3.15, 11.3.22, 11.3.23, 11.3.24, 11.3.27, 11.3.37, 11.3.40, 11.4.3, 11.4.8, 11.4.9, 11.5.16, 11.5.17 and 11.10.14	Remnant and regrowth REs providing palustrine or lacustrine wetland habitat in the brigalow belt bioregion
Latham's snipe *Gallinago hardwickii*	11.2.4, 11.2.5, 11.3.2, 11.3.12, 11.3.15, 11.3.22, 11.3.23, 11.3.24, 11.3.27, 11.3.37, 11.3.40, 11.4.3, 11.4.8, 11.4.9, 11.5.16, 11.5.17 and 11.10.14	Remnant and regrowth REs providing palustrine or lacustrine wetland habitat in the brigalow belt bioregion
Squatter pigeon (southern) *Geophaps scripta scripta*	11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.6, 11.3.7, 11.3.11, 11.3.17, 11.3.18, 11.3.19, 11.3.21, 11.3.25, 11.3.26, 11.3.27, 11.3.37, 11.3.39, 11.5.1, 11.5.10, 11.5.12, 11.5.16, 11.5.17, 11.5.2, 11.5.20, 11.5.2a, 11.5.3, 11.5.3b, 11.5.5c, 11.5.8c, 11.5.9, 11.5.9a, 11.5.9b, 11.5.9c, 11.7.1, 11.7.2, 11.7.3 and 11.7.4	Remnant and regrowth eucalypt woodland
White-throated needletail *Hirundapus caudacutus*	-	All remnant and regrowth woodland where the species forages in airspace above
Koala *Phascolarctos cinereus*	8a, 9e, 10a, 11a, 12a, 13c, 13d, 16a, 16c, 17a, 17b, 18b, 19d and 34d	Remnant and regrowth eucalypt dominated woodland
Fork-tailed swift *Apus pacificus*	-	All remnant and regrowth woodland where the species forages in airspace above

MNES and MSES	Qualifying RE/BVG[1]	Broad habitat description
Glossy Ibis *Plegadis falcinellus*	11.2.4, 11.2.5, 11.3.2, 11.3.12, 11.3.15, 11.3.22, 11.3.23, 11.3.24, 11.3.27, 11.3.37, 11.3.40, 11.4.3, 11.4.8, 11.4.9, 11.5.16, 11.5.17 and 11.10.14	Remnant and regrowth REs providing palustrine or lacustrine wetland habitat in the brigalow belt bioregion
Short-beaked echidna *Tachyglossus aculeata*	-	All remnant and regrowth vegetation

[1] BVGs used as surrogate habitat values, when applicable

Based on the analysis of Project-related disturbance, approved disturbance from nearby major resource projects (Table 30) and the available habitat/area in the region, the Project is predicted to have minor increase on cumulative impacts on threatened matters.

Table 30: Proportion of regional habitat to be affected by cumulative impacts

Species	Estimate of remnant habitat available within 30km of the Project (ha)[1]	Total habitat impacted within EPBC Projects in Table 28 (ha)	Total habitat removed for the Project (ha)	Project percentage affected (%)	Cumulative impacts percentage affected (%)[2]
TECs					
Brigalow TEC	6,339	1,480.01	40.29	0.64	19.44
Conservation significant species					
Solanum elachophyllum	6,520	2,328.19	6.00 (known habitat)	0.06	26.38
Ornamental snake *Denisonia maculata*	4,550	1,580.61	0.0	0.0	25.78
Australian painted snipe *Rostratula australis*	6,969	267.9	20.86	0.28	3.99
Latham's snipe *Gallinago hardwickii*	6,969	0	20.86	0.30	0.3
Squatter pigeon (southern) *Geophaps scripta scripta*	69,942	7,584	32.46 (breeding and foraging)	0.05	9.82
White-throated needletail *Hirundapus caudacutus*	130,359	0	2,316.58	1.77	1.77
Koala *Phascolarctos cinereus*	81,344	13,333	2.72 (breeding and foraging)	0.003	14.09

Species	Estimate of remnant habitat available within 30km of the Project (ha)[1]	Total habitat impacted within EPBC Projects in Table 28 (ha)	Total habitat removed for the Project (ha)	Project percentage affected (%)	Cumulative impacts percentage affected (%)[2]
Fork-tailed swift *Apus pacificus*	130,359	0	2,316.58	1.77	1.77
Glossy Ibis *Plegadis falcinellus*	6,969	168	20.86	0.29	2.65
Short beaked echidna *Tachyglossus aculeatus*	125,589	0	122.11	0.1	0.1

[1] Habitat for threatened matters are an estimate only. On ground surveys would be required to verify the extent of available habitat.

[2] Cumulative impact percentages are calculated by adding the estimate of remnant habitat within 30 km, with total habitat impacted by EPBC projects, and dividing by the total of cumulative impacts and Project impacts.

8 Significant impact assessments

8.1 MNES significant impact assessment

The field surveys identified that the Study Area contains one TEC and affords habitat for six threatened fauna and two migratory species listed under the EPBC Act. The Australian Government has produced the EPBC Act *Matters of Environmental Significance: Significant Impact Guidelines 1.1* (DotE, 2013b) (MNES SIA Guidelines) to assist in determining if significant impacts associated with a Project require referral to the DCCEEW and associated offsetting. Self-assessments against the MNES SIA Guidelines are provided in Appendix D. An assessment against the MNES SIA Guidelines determined that the Project is likely to result in a significant impact on one MNES. A significant impact was considered likely to occur on Brigalow TEC.

The remaining eight MNES considered known or likely to occur within the Study Area were considered unlikely to be significantly impacted by the Project, as below:

- Australian painted snipe (*Rostratula australis*);
- Latham's snipe (*Gallinago hardwickii*);
- Koala (*Phascolarctos cinereus*);
- Ornamental snake (*Denisonia maculata*);
- Squatter Pigeon (southern) (*Geophaps scripta scripta*);
- White-throated needletail (*Hirundapus caudacutus*);
- Fork-tailed swift (*Apus pacificus*); and
- Glossy ibis (*Plegadis falcinellus*).

8.2 MSES significant residual impact assessment

Field surveys identified that the Study Area contains three MSES (i.e. Regulated vegetation, protected wildlife habitat and connectivity areas) identified under the Queensland *Environmental Offsets Act 2014* (EO Act). The Queensland Government has produced the *Queensland Environmental Offsets Policy - Significant Residual Impact Guideline* (DEHP, 2014) (MSES SRI Guideline) to assist in determining if significant residual impacts associated with a Project would require offsetting. Self-assessments against the MSES SRI Guideline are provided in Appendix E. An assessment against the MSES SRI Guideline determined that the Project is likely to result in a significant residual impact on:

- Regulated vegetation, comprising:
    - Endangered prescribed REs (RE 11.3.1)
- Protected wildlife habitat, comprising:
    - *Solanum elachophyllum*

The remaining MSES identified within the Study Area were considered unlikely to result a significant residual impact from the Project. It was determined that a significant residual impact was unlikely for:

- Regulated vegetation, comprising:
    - Of Concern prescribed RE 11.3.2

- Of Concern prescribed RE 11.3.3
- Prescribed REs within the defined distance of the defining banks of a relevant watercourse or drainage feature:
  - RE 11.3.1;
  - RE 11.3.2;
  - RE 11.3.3;
  - RE 11.3.6; and
  - RE 11.3.27.

- Protected wildlife habitat, comprising:
  - Australian painted snipe (*Rostratula australis*)
  - Koala *(Phascolarctos cinereus*)
  - Latham's snipe (*Gallinago hardwickii*)
  - Ornamental snake (*Denisonia maculata*)
  - Squatter pigeon (southern) (*Geophaps scripta scripta*)
  - White-throated needletail (*Hirundapus caudacutus*); and
  - Short-beaked echidna (*Tachyglossus aculeatus*).
- Connectivity areas

9 Biodiversity offsets

An environmental offset is required to address the significant residual impacts on MNES and MSES that are likely as a result of the Project. The offset requirements are considerate of the residual impact to each MNES and MSES, as well as their habitat quality.

The overall environmental offset requirements include the total disturbance area for each matter and the habitat quality scores for these matters in the impact area (Table 31).

A number of offsetable matters relevant to the Project are protected under both Commonwealth and State legislation. As per Section 15 of the EO Act, an administering agency may impose an offset condition on an authority only if:

- the same, or substantially the same, impact has not been assessed under a relevant Commonwealth Act; and
- the same, or substantially the same, prescribed environmental matters has not been assessed under a relevant Commonwealth Act.

As such, MSES that are also a MNES are unlikely to require any additional offsets under the EO Act for impacts on MSES, if the Commonwealth Government has assessed impacts for the same values under the EPBC Act. These matters have been included in the MNES offset requirements only, to avoid duplication of offsets at the State level.

Habitat quality scores derived for MNES and MSES likely to be significantly impacted by the Project (refer to Section 8) using the Commonwealth Government *Modified Habitat Quality Assessment* method, as detailed in Section 3.2.5.

Table 31: Summary of habitat quality for MNES and MSES likely to have a significant residual impact

Environmental matter	Assessment unit (AU)	AU description	Disturbance Footprint area (ha)	Weighted habitat quality score	Overall habitat quality score (/10)
Matters of National Environmental Significance					
Threatened Ecological Communities					
Brigalow TEC	1c	High value regrowth RE 11.3.1, 11.4.9 and 11.9.5	39.60	4.08	4.17
	1d	Remnant RE 11.3.1, 11.4.9 and 11.9.5	0.69	0.08	
Matters of State Environmental Significance					
Protected wildlife habitat					
Solanum elachophyllum	1b	Young regrowth RE 11.3.1, 11.4.9 and 11.9.5	0.88	0.52	3.18

Environmental matter	Assessment unit (AU)	AU description	Disturbance Footprint area (ha)	Weighted habitat quality score	Overall habitat quality score (/10)
	1c	High value regrowth RE 11.3.1, 11.4.9 and 11.9.5	0.98	0.71	
	7b	Non-remnant	4.14	1.95	
Regulated vegetation					
Endangered RE 11.3.1	1d	Remnant RE 11.3.1	1.21	4.40	4.40

10 Conclusion

Whitehaven Blackwater is proposing to expand the current BWM, to extent the current open cut mining development at the BWM to within SA 7 on ML 1762 and SA 10 on ML 1759. This report presents the terrestrial ecological assessment conducted to support a submission for a major EA amendment.

The Disturbance Footprint covers approximately 2,316.58 ha (rounded to 2,317 ha). The majority (97.65%, 2,262.07 ha) comprises non-remnant areas that have historically been cleared, primarily for agricultural use. This includes non-remnant areas with gilgai's. A further 39.78 ha (1.72%) comprises vegetation ground-truthed as high value regrowth. The remaining disturbance comprises 10.80 ha (0.47%) wetlands and dams and 3.93 ha (0.17%) remnant vegetation.

While the Project would avoid, mitigate, and manage environmental impacts associated with construction and operation, residual impacts on conservation significant matters will still occur. Assessment of residual impacts against relevant guidelines determine the Project is likely to result in a significant impact on:

- One MNES: Brigalow TEC
- Two MSES, including:
  - Regulated vegetation, comprising endangered RE 11.3.1; and
  - Protected wildlife habitat for *Solanum elachophyllum*.

Habitat quality scoring has been undertaken for those MNES and MSES matters that are likely to significantly impacted by the Project in line with the State and Commonwealth guidelines. Residual impacts on these matters would be offset in accordance the EPBC Act Environmental Offsets Policy and Queensland Environmental Offsets Policy.

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Appendix A Desktop search 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: 17-Feb-2025

Summary

Details

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

Caveat

Acknowledgements

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	6
Listed Threatened Species:	41
Listed Migratory Species:	10

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:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	19
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	3
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	24
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

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

Community Name	Threatened Category	Presence Text	Buffer Status
Brigalow (Acacia harpophylla dominant and co-dominant)	Endangered	Community known to occur within area	In feature area
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Endangered	Community may occur within area	In buffer area only
Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin	Endangered	Community likely to occur within area	In feature area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community likely to 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
Weeping Myall Woodlands	Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
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 may occur within area	In feature area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat known to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	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 buffer area only
Neochmia ruficauda ruficauda Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area	In feature area
Poephila cincta cincta Southern Black-throated Finch [64447]	Endangered	Species or species habitat may occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat may occur within area	In feature area
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
MAMMAL			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat may occur within area	In buffer area only
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area	In feature area
Macroderma gigas Ghost Bat [174]	Vulnerable	Species or species habitat may occur within area	In feature area
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area	In feature area
Onychogalea fraenata Bridled Nail-tail Wallaby, Bridled Nailtail Wallaby [239]	Endangered	Species or species habitat may occur within area	In buffer area only
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat likely to occur within area	In feature area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat likely to occur within area	In feature area
PLANT			
Aristida annua [17906]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Arthraxon hispidus Hairy-joint Grass [9338]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Bertya opponens [13792]	Vulnerable	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Cadellia pentastylis Ooline [9828]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Daviesia discolor [3567]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Dichanthium queenslandicum King Blue-grass [5481]	Endangered	Species or species habitat may occur within area	In feature area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Eucalyptus raveretiana Black Ironbox [16344]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Homoranthus decumbens a shrub [55186]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Logania diffusa [24159]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Macrozamia platyrhachis cycad [3412]	Endangered	Species or species habitat known to occur within area	In buffer area only
Polianthion minutiflorum [82772]	Vulnerable	Species or species habitat known to occur within area	In feature area
Solanum dissectum [75720]	Endangered	Species or species habitat known to occur within area	In buffer area only
REPTILE			
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Denisonia maculata Ornamental Snake [1193]	Vulnerable	Species or species habitat known to occur within area	In feature area
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat known to occur within area	In feature area
Elseya albagula Southern Snapping Turtle, White-throated Snapping Turtle [81648]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Furina dunmalli Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Hemiaspis damelii Grey Snake [1179]	Endangered	Species or species habitat may occur within area	In feature area
Rheodytes leukops Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle, White-eyed River Diver [1761]	Endangered	Species or species habitat known to occur within area	In feature area

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		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 buffer area only
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Gallinago hardwickii			
Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area
Pandion haliaetus			
Osprey [952]		Species or species habitat likely to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Defence		
Defence - BLACKWATER TRAINING DEPOT [30270]	QLD	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[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
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may 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
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
[Haliaeetus leucogaster](#) White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
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 likely to occur within area overfly marine area	In buffer area only
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 may occur within area overfly marine area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area	In buffer area only
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat may occur within area overfly marine area	In buffer area only
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat may occur within area overfly marine area	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Blackdown Tableland	National Park	QLD	In buffer area only
Blackwater	Conservation Park	QLD	In buffer area only

Protected Area Name	Reserve Type	State	Buffer Status
Kenmare	Nature Refuge	QLD	In buffer area only

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Blackwater Mine ? North Extension Project	2023/09723		Assessment	In feature area
Comet Ridge Coal Mine, Comet, QLD	2015/7507		Post-Approval	In buffer area only
Development and operation of the Star Coal Project Bulk Sample Project	2023/09502		Completed	In buffer area only
rail track to link the proposed MIM Rolleston coal mine to existing rail network	2002/637		Post-Approval	In buffer area only
Walton Coal Project, Bowen Basin, Qld	2017/8077		Post-Approval	In buffer area only
Controlled action				
Blackwater creek diversion and coal mine	2007/3925	Controlled Action	Post-Approval	In buffer area only
Blackwater to Gladstone Gas Pipeline Project	2011/6034	Controlled Action	Completed	In buffer area only
Bluff open cut coal mine project, central Queensland	2013/7064	Controlled Action	Post-Approval	In buffer area only
Bowen Gas Project	2012/6377	Controlled Action	Post-Approval	In feature area
Construct and operate a coal gasification plant and carbon dioxide capture and storage	2006/3040	Controlled Action	Completed	In feature area
Curragh Extension Project, Blackwater, QLD	2015/7508	Controlled Action	Post-Approval	In feature area
Curragh North Coal Mine	2003/1096	Controlled Action	Post-Approval	In buffer area only
Norwich Park & Blackwater CSG Fields & supporting infrastructure Bowen Basin	2011/6032	Controlled Action	Completed	In feature area
Norwich Park to Blackwater Gas Pipeline	2011/6031	Controlled Action	Completed	In buffer area only
Santos GLNG Gas Field Development Project, QLD	2012/6615	Controlled Action	Post-Approval	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Washpool Coal Mine Project	2009/5240	Controlled Action	Completed	In buffer area only
ZeroGen Integrated Gasification Combined Cycle Power Plant and CO2 Capture, Transport and Storage	2009/5195	Controlled Action	Completed	In feature area
Not controlled action				
Blackwater to Emerald Dual Circuit 132kV Powerline, QLD	2012/6480	Not Controlled Action	Completed	In feature area
Development and operation of a new multi-seam underground coal mine with associated on-site infrastr	2011/5811	Not Controlled Action	Completed	In feature area
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Springsure Creek 132kV powerline and switchyards	2012/6385	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
Blackwater to Rolleston 132 kV transmission line	2002/880	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Curragh West Project	2011/6187	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Referral decision				
Proposal for open cut coal mining operation, central QLD	2013/6946	Referral Decision	Completed	In buffer area only

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

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

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

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

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

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

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

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Queensland Government

WildNet species list

Search Criteria: Species List for a Specified Point
Species: All
Type: All
Queensland status: All
Records: All
Date: Since 1980
Latitude: -23.6759
Longitude: 148.8496
Distance: 20
Email: kaylee.pitt@e2m.com.au
Date submitted: Tuesday 18 Feb 2025 09:52:01
Date extracted: Tuesday 18 Feb 2025 10:00:03

The number of records retrieved = 867

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Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Bufonidae	*Rhinella marina*	cane toad	Y			9
animals	amphibians	Hylidae	*Cyclorana alboguttata*	greenstripe frog		C		4
animals	amphibians	Hylidae	*Cyclorana cultripes*	grassland collared frog		C		3/3
animals	amphibians	Hylidae	*Cyclorana novaehollandiae*	eastern snapping frog		C		2
animals	amphibians	Hylidae	*Litoria caerulea*	common green treefrog		C		4
animals	amphibians	Hylidae	*Litoria fallax*	eastern sedgefrog		C		1
animals	amphibians	Hylidae	*Litoria inermis*	bumpy rocketfrog		C		2
animals	amphibians	Hylidae	*Litoria latopalmata*	broad palmed rocketfrog		C		7
animals	amphibians	Hylidae	*Litoria peronii*	emerald spotted treefrog		C		1
animals	amphibians	Hylidae	*Litoria rubella*	ruddy treefrog		C		2
animals	amphibians	Hylidae	*Litoria wilcoxii*	eastern stony creek frog		C		1
animals	amphibians	Limnodynastidae	*Limnodynastes salmini*	salmon striped frog		C		3
animals	amphibians	Limnodynastidae	*Limnodynastes tasmaniensis*	spotted grassfrog		C		2
animals	amphibians	Limnodynastidae	*Limnodynastes terraereginae*	scarlet sided pobblebonk		C		1
animals	amphibians	Limnodynastidae	*Platyplectrum ornatum*	ornate burrowing frog		C		1
animals	amphibians	Myobatrachidae	*Crinia signifera*	clicking froglet		C		1
animals	amphibians	Myobatrachidae	*Pseudophryne major*	great brown broodfrog		C		1
animals	amphibians	Myobatrachidae	*Uperoleia laevigata*	eastern gungan		C		1
animals	amphibians	Myobatrachidae	*Uperoleia rugosa*	chubby gungan		C		3
animals	birds	Acanthizidae	*Acanthiza apicalis*	inland thornbill		C		5
animals	birds	Acanthizidae	*Acanthiza chrysorrhoa*	yellow-rumped thornbill		C		3
animals	birds	Acanthizidae	*Acanthiza nana*	yellow thornbill		C		3
animals	birds	Acanthizidae	*Acanthiza reguloides*	buff-rumped thornbill		C		8
animals	birds	Acanthizidae	*Gerygone olivacea*	white-throated gerygone		C		15
animals	birds	Acanthizidae	*Pyrrholaemus sagittatus*	speckled warbler		C		4
animals	birds	Acanthizidae	*Sericornis frontalis*	white-browed scrubwren		C		1
animals	birds	Acanthizidae	*Smicrornis brevirostris*	weebill		C		8
animals	birds	Accipitridae	*Accipiter cirrocephalus*	collared sparrowhawk		C		1
animals	birds	Accipitridae	*Accipiter fasciatus*	brown goshawk		C		3
animals	birds	Accipitridae	*Aquila audax*	wedge-tailed eagle		C		3
animals	birds	Accipitridae	*Aviceda subcristata*	Pacific baza		C		1
animals	birds	Accipitridae	*Elanus axillaris*	black-shouldered kite		C		1
animals	birds	Accipitridae	*Haliaeetus leucogaster*	white-bellied sea-eagle		C		1
animals	birds	Accipitridae	*Haliastur sphenurus*	whistling kite		C		5
animals	birds	Accipitridae	*Hieraaetus morphnoides*	little eagle		C		2
animals	birds	Accipitridae	*Milvus migrans*	black kite		C		5
animals	birds	Acrocephalidae	*Acrocephalus australis*	Australian reed-warbler		C		3
animals	birds	Aegothelidae	*Aegotheles cristatus*	Australian owlet-nightjar		C		8
animals	birds	Alaudidae	*Mirafra javanica*	Horsfield's bushlark		C		4
animals	birds	Alcedinidae	*Dacelo leachii*	blue-winged kookaburra		C		10
animals	birds	Alcedinidae	*Dacelo novaeguineae*	laughing kookaburra		C		23
animals	birds	Alcedinidae	*Todiramphus macleayii*	forest kingfisher		C		6
animals	birds	Alcedinidae	*Todiramphus sanctus*	sacred kingfisher		C		3
animals	birds	Anatidae	*Anas gracilis*	grey teal		C		1
animals	birds	Anatidae	*Anas superciliosa*	Pacific black duck		C		4
animals	birds	Anatidae	*Aythya australis*	hardhead		C		1

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Anatidae	*Chenonetta jubata*	Australian wood duck		C		1
animals	birds	Anatidae	*Cygnus atratus*	black swan		C		1
animals	birds	Anatidae	*Dendrocygna eytoni*	plumed whistling-duck		C		1
animals	birds	Anatidae	*Nettapus coromandelianus*	cotton pygmy-goose		C		1
animals	birds	Anhingidae	*Anhinga novaehollandiae*	Australasian darter		C		1
animals	birds	Ardeidae	*Ardea alba modesta*	eastern great egret		C		2
animals	birds	Ardeidae	*Ardea pacifica*	white-necked heron		C		2
animals	birds	Ardeidae	*Egretta novaehollandiae*	white-faced heron		C		3
animals	birds	Ardeidae	*Ixobrychus flavicollis*	black bittern		C		1
animals	birds	Artamidae	*Artamus cinereus inkermani*	black-faced woodswallow (east-central Queensland)		C		1
animals	birds	Artamidae	*Artamus leucorynchus*	white-breasted woodswallow		C		3
animals	birds	Artamidae	*Artamus personatus*	masked woodswallow		C		1
animals	birds	Artamidae	*Artamus superciliosus*	white-browed woodswallow		C		2
animals	birds	Artamidae	*Cracticus nigrogularis*	pied butcherbird		C		12
animals	birds	Artamidae	*Cracticus torquatus*	grey butcherbird		C		12
animals	birds	Artamidae	*Gymnorhina tibicen*	Australian magpie		C		17
animals	birds	Artamidae	*Strepera graculina*	pied currawong		C		19/3
animals	birds	Burhinidae	*Burhinus grallarius*	bush stone-curlew		C		2
animals	birds	Cacatuidae	*Cacatua galerita*	sulphur-crested cockatoo		C		24
animals	birds	Cacatuidae	*Cacatua sanguinea*	little corella		C		3
animals	birds	Cacatuidae	*Calyptorhynchus banksii banksii*	red-tailed black-cockatoo (Cape York & Eastern Aust)		C		1
animals	birds	Cacatuidae	*Eolophus roseicapilla*	galah		C		6
animals	birds	Cacatuidae	*Nymphicus hollandicus*	cockatiel		C		2
animals	birds	Campephagidae	*Coracina maxima*	ground cuckoo-shrike		C		1
animals	birds	Campephagidae	*Coracina novaehollandiae*	black-faced cuckoo-shrike		C		14
animals	birds	Campephagidae	*Coracina papuensis*	white-bellied cuckoo-shrike		C		2
animals	birds	Campephagidae	*Edolisoma tenuirostre*	common cicadabird		C		6
animals	birds	Campephagidae	*Lalage tricolor*	white-winged triller		C		9
animals	birds	Casuariidae	*Dromaius novaehollandiae*	emu		C		3
animals	birds	Charadriidae	*Elseyornis melanops*	black-fronted dotterel		C		1
animals	birds	Charadriidae	*Vanellus miles*	masked lapwing		C		3
animals	birds	Charadriidae	*Vanellus miles novaehollandiae*	masked lapwing (southern subspecies)		C		1
animals	birds	Cinclosomatidae	*Cinclosoma punctatum*	spotted quail-thrush		C		2
animals	birds	Cisticolidae	*Cisticola exilis*	golden-headed cisticola		C		2
animals	birds	Climacteridae	*Climacteris picumnus*	brown treecreeper		C		1
animals	birds	Climacteridae	*Cormobates leucophaea metastasis*	white-throated treecreeper (southern)		C		3
animals	birds	Columbidae	*Geopelia cuneata*	diamond dove		C		1
animals	birds	Columbidae	*Geopelia humeralis*	bar-shouldered dove		C		6
animals	birds	Columbidae	*Geopelia placida*	peaceful dove		C		10
animals	birds	Columbidae	*Geophaps scripta scripta*	squatter pigeon (southern subspecies)		V	V	1
animals	birds	Columbidae	*Ocyphaps lophotes*	crested pigeon		C		6
animals	birds	Columbidae	*Phaps chalcoptera*	common bronzewing		C		1
animals	birds	Coraciidae	*Eurystomus orientalis*	dollarbird		C		17
animals	birds	Corcoracidae	*Corcorax melanorhamphos*	white-winged chough		C		8

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animals	birds	Corcoracidae	*Struthidea cinerea*	apostlebird		C		13
animals	birds	Corvidae	*Corvus coronoides*	Australian raven		C		8
animals	birds	Corvidae	*Corvus orru*	Torresian crow		C		30
animals	birds	Corvidae	*Corvus sp.*			C		2
animals	birds	Cuculidae	*Cacomantis flabelliformis*	fan-tailed cuckoo		C		1
animals	birds	Cuculidae	*Cacomantis pallidus*	pallid cuckoo		C		7
animals	birds	Cuculidae	*Centropus phasianinus*	pheasant coucal		C		4
animals	birds	Cuculidae	*Chalcites basalis*	Horsfield's bronze-cuckoo		C		5
animals	birds	Cuculidae	*Chalcites lucidus*	shining bronze-cuckoo		C		3
animals	birds	Cuculidae	*Chalcites minutillus barnardi*	Eastern little bronze-cuckoo		C		4
animals	birds	Cuculidae	*Eudynamys orientalis*	eastern koel		C		1
animals	birds	Cuculidae	*Scythrops novaehollandiae*	channel-billed cuckoo		C		7
animals	birds	Dicaeidae	*Dicaeum hirundinaceum*	mistletoebird		C		13
animals	birds	Dicruridae	*Dicrurus bracteatus*	spangled drongo		C		1
animals	birds	Dicruridae	*Dicrurus bracteatus bracteatus*	spangled drongo (eastern Australia)		C		2
animals	birds	Estrildidae	*Lonchura castaneothorax*	chestnut-breasted mannikin		C		2
animals	birds	Estrildidae	*Neochmia modesta*	plum-headed finch		C		1
animals	birds	Estrildidae	*Neochmia temporalis*	red-browed finch		C		1
animals	birds	Estrildidae	*Taeniopygia bichenovii*	double-barred finch		C		12
animals	birds	Estrildidae	*Taeniopygia guttata*	zebra finch		C		2
animals	birds	Eurostopodidae	*Eurostopodus argus*	spotted nightjar		C		1
animals	birds	Eurostopodidae	*Eurostopodus mystacalis*	white-throated nightjar		C		2
animals	birds	Falconidae	*Falco berigora*	brown falcon		C		4
animals	birds	Falconidae	*Falco cenchroides*	nankeen kestrel		C		5
animals	birds	Falconidae	*Falco longipennis*	Australian hobby		C		4
animals	birds	Falconidae	*Falco peregrinus macropus*	Australian peregrine falcon		C		3
animals	birds	Falconidae	*Falco subniger*	black falcon		C		1
animals	birds	Gruidae	*Antigone rubicunda*	brolga		C		1
animals	birds	Hirundinidae	*Hirundo neoxena*	welcome swallow		C		7
animals	birds	Hirundinidae	*Petrochelidon ariel*	fairy martin		C		4
animals	birds	Hirundinidae	*Petrochelidon nigricans*	tree martin		C		1
animals	birds	Jacanidae	*Irediparra gallinacea*	comb-crested jacana		C		1
animals	birds	Laridae	*Hydroprogne caspia*	Caspian tern		SL		1
animals	birds	Locustellidae	*Cincloramphus cruralis*	brown songlark		C		2
animals	birds	Locustellidae	*Cincloramphus mathewsi*	rufous songlark		C		3
animals	birds	Locustellidae	*Cincloramphus timoriensis*	tawny grassbird		C		1
animals	birds	Maluridae	*Malurus assimilis*	purple-backed fairy-wren		C		4
animals	birds	Maluridae	*Malurus cyaneus*	superb fairy-wren		C		1
animals	birds	Maluridae	*Malurus melanocephalus*	red-backed fairy-wren		C		11
animals	birds	Meliphagidae	*Acanthagenys rufogularis*	spiny-cheeked honeyeater		C		2
animals	birds	Meliphagidae	*Caligavis chrysops*	yellow-faced honeyeater		C		2
animals	birds	Meliphagidae	*Entomyzon cyanotis*	blue-faced honeyeater		C		17
animals	birds	Meliphagidae	*Gavicalis virescens*	singing honeyeater		C		10
animals	birds	Meliphagidae	*Grantiella picta*	painted honeyeater		V	V	2
animals	birds	Meliphagidae	*Lichmera indistincta*	brown honeyeater		C		11
animals	birds	Meliphagidae	*Manorina flavigula*	yellow-throated miner		C		3

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animals	birds	Meliphagidae	*Manorina melanocephala*	noisy miner		C		19
animals	birds	Meliphagidae	*Meliphaga lewinii*	Lewin's honeyeater		C		4
animals	birds	Meliphagidae	*Melithreptus albogularis*	white-throated honeyeater		C		9
animals	birds	Meliphagidae	*Melithreptus brevirostris*	brown-headed honeyeater		C		4
animals	birds	Meliphagidae	*Melithreptus gularis gularis*	black-chinned honeyeater (eastern)		C		1
animals	birds	Meliphagidae	*Melithreptus lunatus*	white-naped honeyeater		C		1
animals	birds	Meliphagidae	*Myzomela sanguinolenta*	scarlet honeyeater		C		1
animals	birds	Meliphagidae	*Nesoptilotis leucotis*	white-eared honeyeater		C		2
animals	birds	Meliphagidae	*Philemon citreogularis*	little friarbird		C		8
animals	birds	Meliphagidae	*Philemon corniculatus*	noisy friarbird		C		21
animals	birds	Meliphagidae	*Plectorhyncha lanceolata*	striped honeyeater		C		9
animals	birds	Meliphagidae	*Ptilotula fusca*	fuscous honeyeater		C		1
animals	birds	Meliphagidae	*Ptilotula penicillata*	white-plumed honeyeater		C		1
animals	birds	Meropidae	*Merops ornatus*	rainbow bee-eater		C		6
animals	birds	Monarchidae	*Grallina cyanoleuca*	magpie-lark		C		11
animals	birds	Monarchidae	*Monarcha melanopsis*	black-faced monarch		C		2
animals	birds	Monarchidae	*Myiagra inquieta*	restless flycatcher		C		1
animals	birds	Monarchidae	*Myiagra rubecula*	leaden flycatcher		C		17
animals	birds	Motacillidae	*Anthus novaeseelandiae*	Australasian pipit		C		3
animals	birds	Neosittidae	*Daphoenositta chrysoptera*	varied sittella		C		1
animals	birds	Oriolidae	*Oriolus sagittatus*	olive-backed oriole		C		6
animals	birds	Oriolidae	*Sphecotheres vieilloti*	Australasian figbird		C		2
animals	birds	Otididae	*Ardeotis australis*	Australian bustard		C		3
animals	birds	Pachycephalidae	*Colluricincla harmonica*	grey shrike-thrush		C		12
animals	birds	Pachycephalidae	*Pachycephala rufiventris*	rufous whistler		C		9
animals	birds	Pandionidae	*Pandion haliaetus cristatus*	eastern osprey		SL		1
animals	birds	Pardalotidae	*Pardalotus punctatus*	spotted pardalote		C		1
animals	birds	Pardalotidae	*Pardalotus striatus*	striated pardalote		C		18
animals	birds	Passeridae	*Passer domesticus*	house sparrow	Y			3
animals	birds	Pelecanidae	*Pelecanus conspicillatus*	Australian pelican		C		1
animals	birds	Petroicidae	*Microeca fascinans*	jacky winter		C		3
animals	birds	Petroicidae	*Petroica goodenovii*	red-capped robin		C		1
animals	birds	Phalacrocoracidae	*Microcarbo melanoleucos*	little pied cormorant		C		1
animals	birds	Phalacrocoracidae	*Phalacrocorax carbo*	great cormorant		C		1
animals	birds	Phalacrocoracidae	*Phalacrocorax sulcirostris*	little black cormorant		C		2
animals	birds	Phalacrocoracidae	*Phalacrocorax varius*	pied cormorant		C		1
animals	birds	Phasianidae	*Synoicus ypsilophorus*	brown quail		C		5
animals	birds	Podargidae	*Podargus strigoides*	tawny frogmouth		C		7
animals	birds	Podicipedidae	*Tachybaptus novaehollandiae*	Australasian grebe		C		2
animals	birds	Pomatostomidae	*Pomatostomus temporalis*	grey-crowned babbler		C		8
animals	birds	Pomatostomidae	*Pomatostomus temporalis temporalis*	grey-crowned babbler (eastern)		C		4
animals	birds	Psittaculidae	*Alisterus scapularis*	Australian king-parrot		C		1
animals	birds	Psittaculidae	*Aprosmictus erythropterus*	red-winged parrot		C		14
animals	birds	Psittaculidae	*Melopsittacus undulatus*	budgerigar		C		2
animals	birds	Psittaculidae	*Parvipsitta pusilla*	little lorikeet		C		2
animals	birds	Psittaculidae	*Platycercus adscitus*	pale-headed rosella		C		16

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animals	birds	Psittaculidae	*Platycercus adscitus palliceps*	pale-headed rosella (southern form)		C		4
animals	birds	Psittaculidae	*Trichoglossus chlorolepidotus*	scaly-breasted lorikeet		C		7
animals	birds	Psittaculidae	*Trichoglossus moluccanus*	rainbow lorikeet		C		19
animals	birds	Ptilonorhynchidae	*Chlamydera maculata*	spotted bowerbird		C		1
animals	birds	Rallidae	*Fulica atra*	Eurasian coot		C		1
animals	birds	Rallidae	*Gallinula tenebrosa*	dusky moorhen		C		2
animals	birds	Rallidae	*Porphyrio melanotus*	purple swamphen		C		1
animals	birds	Rallidae	*Tribonyx ventralis*	black-tailed native-hen		C		1
animals	birds	Recurvirostridae	*Himantopus leucocephalus*	pied stilt		C		1
animals	birds	Rhipiduridae	*Rhipidura albiscapa*	grey fantail		C		4
animals	birds	Rhipiduridae	*Rhipidura leucophrys*	willie wagtail		C		7
animals	birds	Rhipiduridae	*Rhipidura leucophrys leucophrys*	willie wagtail (southern)		C		4
animals	birds	Strigidae	*Ninox boobook*	southern boobook		C		5
animals	birds	Threskiornithidae	*Platalea flavipes*	yellow-billed spoonbill		C		1
animals	birds	Threskiornithidae	*Platalea regia*	royal spoonbill		C		1
animals	birds	Threskiornithidae	*Plegadis falcinellus*	glossy ibis		SL		1
animals	birds	Threskiornithidae	*Threskiornis molucca*	Australian white ibis		C		1
animals	birds	Threskiornithidae	*Threskiornis spinicollis*	straw-necked ibis		C		2
animals	birds	Turnicidae	*Turnix varius*	painted button-quail		C		1
animals	birds	Tytonidae	*Tyto javanica*	eastern barn owl		C		2
animals	birds	Zosteropidae	*Zosterops lateralis*	silvereye		C		4
animals	birds	Zosteropidae	*Zosterops lateralis cornwalli*	silvereye (eastern)		C		1
animals	mammals	Bovidae	*Bos taurus*	European cattle	Y			3
animals	mammals	Canidae	*Canis familiaris*	dog	Y			6
animals	mammals	Canidae	*Canis familiaris (dingo)*	dingo				1
animals	mammals	Dasyuridae	*Antechinus flavipes flavipes*	yellow-footed antechinus (south-east Queensland)		C		2
animals	mammals	Emballonuridae	*Saccolaimus flaviventris*	yellow-bellied sheathtail bat		C		3
animals	mammals	Equidae	*Equus caballus*	horse	Y			1
animals	mammals	Felidae	*Felis catus*	cat	Y			4
animals	mammals	Leporidae	*Lepus europaeus*	European brown hare	Y			4
animals	mammals	Leporidae	*Oryctolagus cuniculus*	rabbit	Y			5
animals	mammals	Macropodidae	*Macropus giganteus*	eastern grey kangaroo		C		9
animals	mammals	Macropodidae	*Notamacropus parryi*	whiptail wallaby		C		2
animals	mammals	Macropodidae	*Osphranter robustus*	common wallaroo		C		4
animals	mammals	Macropodidae	*Petrogale herberti*	Herbert's rock-wallaby		C		3/3
animals	mammals	Macropodidae	*Petrogale inornata*	unadorned rock-wallaby		C		4
animals	mammals	Macropodidae	*Wallabia bicolor*	swamp wallaby		C		2
animals	mammals	Miniopteridae	*Miniopterus orianae oceanensis*	eastern bent-wing bat		C		2
animals	mammals	Molossidae	*Mormopterus petersi*	inland free-tailed bat		C		1
animals	mammals	Muridae	*Hydromys chrysogaster*	water rat		C		1
animals	mammals	Muridae	*Melomys cervinipes*	fawn-footed melomys		C		3
animals	mammals	Muridae	*Mus musculus*	house mouse	Y			2
animals	mammals	Muridae	*Pseudomys patrius*	eastern pebble-mound mouse		C		2
animals	mammals	Muridae	*Pseudomys sp.*			C		1/1
animals	mammals	Petauridae	*Petaurus australis australis*	yellow-bellied glider (southern subspecies)		V	V	1

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animals	mammals	Petauridae	*Petaurus norfolcensis*	squirrel glider		C		1
animals	mammals	Petauridae	*Petaurus notatus*	Krefft's glider		C		2
animals	mammals	Phalangeridae	*Trichosurus vulpecula*	common brushtail possum		C		1
animals	mammals	Potoroidae	*Aepyprymnus rufescens*	rufous bettong		C		4
animals	mammals	Pseudocheiridae	*Petauroides volans volans*	southern greater glider		E	E	2
animals	mammals	Pteropodidae	*Pteropus scapulatus*	little red flying-fox		C		1
animals	mammals	Suidae	*Sus scrofa*	pig	Y			1
animals	mammals	Tachyglossidae	*Tachyglossus aculeatus*	short-beaked echidna		SL		9
animals	mammals	Vespertilionidae	*Chalinolobus dwyeri*	large-eared pied bat		E	E	1
animals	mammals	Vespertilionidae	*Chalinolobus gouldii*	Gould's wattled bat		C		3
animals	mammals	Vespertilionidae	*Chalinolobus morio*	chocolate wattled bat		C		4
animals	mammals	Vespertilionidae	*Chalinolobus picatus*	little pied bat		C		3
animals	mammals	Vespertilionidae	*Nyctophilus geoffroyi*	lesser long-eared bat		C		1
animals	mammals	Vespertilionidae	*Nyctophilus gouldi*	Gould's long-eared bat		C		4
animals	mammals	Vespertilionidae	*Scotorepens balstoni*	inland broad-nosed bat		C		1
animals	mammals	Vespertilionidae	*Scotorepens greyii*	little broad-nosed bat		C		5
animals	mammals	Vespertilionidae	*Vespadelus pumilus*	eastern forest bat		C		1
animals	mammals	Vespertilionidae	*Vespadelus sp.*			C		1
animals	ray-finned fishes	Ambassidae	*Ambassis agassizii*	Agassiz's glassfish				5
animals	ray-finned fishes	Atherinidae	*Craterocephalus stercusmuscarum*	flyspecked hardyhead				1
animals	ray-finned fishes	Clupeidae	*Nematalosa erebi*	bony bream				2
animals	ray-finned fishes	Eleotridae	*Hypseleotris klunzingeri*	western carp gudgeon				2
animals	ray-finned fishes	Eleotridae	*Hypseleotris sp.*					4
animals	ray-finned fishes	Eleotridae	*Mogurnda adspersa*	southern purplespotted gudgeon				5
animals	ray-finned fishes	Melanotaeniidae	*Melanotaenia splendida splendida*	eastern rainbowfish				5
animals	ray-finned fishes	Plotosidae	*Neosilurus hyrtlii*	Hyrtl's catfish				4
animals	ray-finned fishes	Poeciliidae	*Gambusia holbrooki*	mosquitofish	Y			2
animals	ray-finned fishes	Terapontidae	*Leiopotherapon unicolor*	spangled perch				5
animals	reptiles	Agamidae	*Diporiphora nobbi*	nobbi		C		5
animals	reptiles	Agamidae	*Pogona barbata*	bearded dragon		C		1
animals	reptiles	Boidae	*Antaresia maculosa*	spotted python		C		1
animals	reptiles	Boidae	*Aspidites melanocephalus*	black-headed python		C		1
animals	reptiles	Boidae	*Morelia spilota*	carpet python		C		1
animals	reptiles	Carphodactylidae	*Nephrurus asper*	spiny knob-tailed gecko		C		3
animals	reptiles	Carphodactylidae	*Saltuarius salebrosus*	rough-throated leaf-tailed gecko		C		1
animals	reptiles	Carphodactylidae	*Underwoodisaurus milii*	thick-tailed gecko		C		1
animals	reptiles	Chelidae	*Emydura macquarii krefftii*	Krefft's river turtle		C		2
animals	reptiles	Chelidae	*Wollumbinia latisternum*	saw-shelled turtle		C		1
animals	reptiles	Colubridae	*Boiga irregularis*	brown tree snake		C		1
animals	reptiles	Colubridae	*Dendrelaphis punctulatus*	green tree snake		C		1
animals	reptiles	Colubridae	*Tropidonophis mairii*	freshwater snake		C		2
animals	reptiles	Diplodactylidae	*Diplodactylus platyurus*	eastern fat-tailed gecko		C		4/1
animals	reptiles	Diplodactylidae	*Diplodactylus vittatus*	wood gecko		C		2
animals	reptiles	Diplodactylidae	*Lucasium steindachneri*	Steindachner's gecko		C		2/1
animals	reptiles	Diplodactylidae	*Oedura monilis sensu lato*	ocellated velvet gecko		C		6/1
animals	reptiles	Elapidae	*Furina diadema*	red-naped snake		C		1

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animals	reptiles	Elapidae	*Furina ornata*	orange-naped snake		C		1
animals	reptiles	Elapidae	*Suta suta*	myall snake		C		1
animals	reptiles	Elapidae	*Vermicella annulata*	bandy-bandy		C		1
animals	reptiles	Gekkonidae	*Gehyra catenata*	chain-backed dtella		C		5
animals	reptiles	Gekkonidae	*Gehyra dubia*	dubious dtella		C		11/1
animals	reptiles	Gekkonidae	*Heteronotia binoei*	Bynoe's gecko		C		21/1
animals	reptiles	Pygopodidae	*Lialis burtonis*	Burton's legless lizard		C		1
animals	reptiles	Pygopodidae	*Paradelma orientalis*	brigalow scaly-foot		C		1
animals	reptiles	Scincidae	*Carlia pectoralis*	open-litter rainbow skink		C		6
animals	reptiles	Scincidae	*Carlia pectoralis sensu lato*			C		15
animals	reptiles	Scincidae	*Carlia schmeltzii*	robust rainbow-skink		C		7/2
animals	reptiles	Scincidae	*Concinnia sokosoma*	stout bar-sided skink		C		1
animals	reptiles	Scincidae	*Concinnia tenuis*	bar-sided skink		C		3/1
animals	reptiles	Scincidae	*Cryptoblepharus pulcher pulcher*	elegant snake-eyed skink		C		1
animals	reptiles	Scincidae	*Cryptoblepharus sp.*			C		1
animals	reptiles	Scincidae	*Cryptoblepharus virgatus sensu lato*			C		8
animals	reptiles	Scincidae	*Ctenotus ingrami*	unspotted yellow-sided ctenotus		C		1
animals	reptiles	Scincidae	*Ctenotus taeniolatus*	copper-tailed skink		C		18/1
animals	reptiles	Scincidae	*Eulamprus sp.*			C		2/1
animals	reptiles	Scincidae	*Lampropholis delicata*	dark-flecked garden sunskink		C		1/1
animals	reptiles	Scincidae	*Lerista fragilis*	eastern mulch slider		C		3
animals	reptiles	Scincidae	*Lygisaurus foliorum*	tree-base litter-skink		C		3
animals	reptiles	Scincidae	*Menetia greyii*	common dwarf skink		C		1
animals	reptiles	Scincidae	*Morethia boulengeri*	south-eastern morethia skink		C		1
animals	reptiles	Scincidae	*Morethia taeniopleura*	fire-tailed skink		C		8/2
animals	reptiles	Typhlopidae	*Anilios nigrescens*	blackish blind snake		C		1/1
animals	reptiles	Varanidae	*Varanus tristis*	black-tailed monitor		C		1
plants	land plants	Acanthaceae	*Brunoniella australis*	blue trumpet		C		3
plants	land plants	Acanthaceae	*Dipteracanthus australasicus*			C		1
plants	land plants	Acanthaceae	*Dipteracanthus australasicus subsp. corynothecus*			C		3/1
plants	land plants	Acanthaceae	*Pseuderanthemum variabile*	pastel flower		C		3/1
plants	land plants	Acanthaceae	*Rostellularia adscendens*			C		6/1
plants	land plants	Acanthaceae	*Rostellularia adscendens var. adscendens*			C		1
plants	land plants	Acanthaceae	*Ruellia simplex*		Y			1/1
plants	land plants	Agavaceae	*Agave americana var. americana*		Y			1
plants	land plants	Aizoaceae	*Trianthema portulacastrum*	black pigweed	Y			6
plants	land plants	Aizoaceae	*Trianthema triquetrum*	red spinach		C		3
plants	land plants	Aizoaceae	*Zaleya galericulata subsp. galericulata*			C		1
plants	land plants	Alismataceae	*Caldesia oligococca*			SL		1
plants	land plants	Amaranthaceae	*Achyranthes aspera*			C		4/1
plants	land plants	Amaranthaceae	*Alternanthera denticulata*	lesser joyweed		C		6
plants	land plants	Amaranthaceae	*Alternanthera nana*	hairy joyweed		C		4
plants	land plants	Amaranthaceae	*Alternanthera nodiflora*	joyweed		C		1
plants	land plants	Amaranthaceae	*Amaranthus viridis*	green amaranth	Y			1
plants	land plants	Amaranthaceae	*Gomphrena celosioides*	gomphrena weed	Y			3
plants	land plants	Amaranthaceae	*Nyssanthes erecta*			C		2/2

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plants	land plants	Amaranthaceae	*Ptilotus*					1
plants	land plants	Amaranthaceae	*Ptilotus semilanatus*			C		1/1
plants	land plants	Amaryllidaceae	*Crinum*					1
plants	land plants	Amaryllidaceae	*Crinum flaccidum*	Murray lily		SL		3
plants	land plants	Anacardiaceae	*Schinus terebinthifolius*		Y			1/1
plants	land plants	Annonaceae	*Melodorum leichhardtii*			C		1/1
plants	land plants	Apiaceae	*Centella asiatica*			C		1/1
plants	land plants	Apiaceae	*Platysace ericoides*	heath platysace		C		1/1
plants	land plants	Apocynaceae	*Alstonia constricta*	bitterbark		C		7
plants	land plants	Apocynaceae	*Asclepias curassavica*	red-head cottonbush	Y			2/1
plants	land plants	Apocynaceae	*Carissa ovata*	currantbush		C		21/1
plants	land plants	Apocynaceae	*Cerbera dumicola*			NT		2/2
plants	land plants	Apocynaceae	*Cryptostegia grandiflora*	rubber vine	Y			1
plants	land plants	Apocynaceae	*Cynanchum viminale*			C		1
plants	land plants	Apocynaceae	*Cynanchum viminale subsp. brunonianum*			C		1/1
plants	land plants	Apocynaceae	*Hoya australis subsp. australis*			C		3/3
plants	land plants	Apocynaceae	*Leichhardtia microlepis*			C		1/1
plants	land plants	Apocynaceae	*Leichhardtia viridiflora subsp. viridiflora*			C		3/1
plants	land plants	Apocynaceae	*Parsonsia eucalyptophylla*	gargaloo		C		1
plants	land plants	Apocynaceae	*Parsonsia lanceolata*	northern silkpod		C		1
plants	land plants	Aristolochiaceae	*Aristolochia meridionalis subsp. centralis*			C		2/2
plants	land plants	Asteraceae	*Acmella grandiflora var. brachyglossa*			C		1
plants	land plants	Asteraceae	*Bidens bipinnata*	bipinnate beggar's ticks	Y			2
plants	land plants	Asteraceae	*Bidens pilosa*		Y			1
plants	land plants	Asteraceae	*Brachyscome*					1
plants	land plants	Asteraceae	*Brachyscome dalbyensis*			C		1
plants	land plants	Asteraceae	*Calotis cuneata*			C		1
plants	land plants	Asteraceae	*Calotis dentex*	white burr daisy		C		3/3
plants	land plants	Asteraceae	*Calyptocarpus vialis*	creeping cinderella weed	Y			1
plants	land plants	Asteraceae	*Centipeda minima*			C		1
plants	land plants	Asteraceae	*Centipeda minima subsp. minima*			C		3/2
plants	land plants	Asteraceae	*Cyanthillium cinereum*			C		3/3
plants	land plants	Asteraceae	*Euchiton sphaericus*			C		1
plants	land plants	Asteraceae	*Flaveria trinervia*		Y			1
plants	land plants	Asteraceae	*Gynura drymophila var. drymophila*			C		1/1
plants	land plants	Asteraceae	*Lactuca serriola forma serriola*		Y			1/1
plants	land plants	Asteraceae	*Minuria integerrima*	smooth minuria		C		2/1
plants	land plants	Asteraceae	*Parthenium hysterophorus*	parthenium weed	Y			9
plants	land plants	Asteraceae	*Pluchea xanthina*			C		1/1
plants	land plants	Asteraceae	*Pterocaulon serrulatum var. serrulatum*			C		1/1
plants	land plants	Asteraceae	*Senecio*					1
plants	land plants	Asteraceae	*Sonchus asper*	rough sowthistle	Y			1
plants	land plants	Asteraceae	*Sphaeromorphaea australis*			C		1/1
plants	land plants	Asteraceae	*Sphaeromorphaea subintegra*			C		1
plants	land plants	Asteraceae	*Tagetes minuta*	stinking roger	Y			1/1
plants	land plants	Asteraceae	*Verbesina encelioides var. encelioides*		Y			1/1

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plants	land plants	Asteraceae	*Vittadinia pustulata*			C		1
plants	land plants	Asteraceae	*Vittadinia sulcata*	native daisy		C		1
plants	land plants	Asteraceae	*Xanthium occidentale*		Y			5/2
plants	land plants	Bignoniaceae	*Pandorea pandorana*	wonga vine		C		1/1
plants	land plants	Boraginaceae	*Ehretia membranifolia*	weeping koda		C		5
plants	land plants	Boraginaceae	*Heliotropium indicum*		Y			1
plants	land plants	Byttneriaceae	*Hannafordia shanesii*			C		1/1
plants	land plants	Byttneriaceae	*Melochia pyramidata*		Y			1
plants	land plants	Byttneriaceae	*Seringia collina*			C		1/1
plants	land plants	Byttneriaceae	*Seringia corollata*			C		1/1
plants	land plants	Byttneriaceae	*Seringia hookeriana*			C		1/1
plants	land plants	Byttneriaceae	*Waltheria indica*			C		2
plants	land plants	Cactaceae	*Harrisia*					1
plants	land plants	Cactaceae	*Harrisia martinii*		Y			10
plants	land plants	Cactaceae	*Opuntia*					1
plants	land plants	Cactaceae	*Opuntia stricta*		Y			2
plants	land plants	Cactaceae	*Opuntia tomentosa*	velvety tree pear	Y			9
plants	land plants	Campanulaceae	*Lobelia concolor*			SL		1
plants	land plants	Campanulaceae	*Wahlenbergia gracilis*	sprawling bluebell		SL		2
plants	land plants	Capparaceae	*Capparis anomala*			C		5
plants	land plants	Capparaceae	*Capparis canescens*			C		1/1
plants	land plants	Capparaceae	*Capparis lasiantha*	nipan		C		7/1
plants	land plants	Capparaceae	*Capparis loranthifolia*			C		7
plants	land plants	Capparaceae	*Capparis loranthifolia var. bancroftii*			C		1/1
plants	land plants	Capparaceae	*Capparis loranthifolia var. loranthifolia*			C		2/2
plants	land plants	Capparaceae	*Capparis mitchellii*			C		4
plants	land plants	Caryophyllaceae	*Cerastium glomeratum*	mouse ear chickweed	Y			1
plants	land plants	Casuarinaceae	*Allocasuarina torulosa*			C		1/1
plants	land plants	Casuarinaceae	*Casuarina cristata*	belah		C		2/1
plants	land plants	Celastraceae	*Denhamia cunninghamii*			C		2/1
plants	land plants	Celastraceae	*Denhamia disperma*			C		2
plants	land plants	Celastraceae	*Denhamia oleaster*			C		4
plants	land plants	Celastraceae	*Elaeodendron australe*			C		4
plants	land plants	Celastraceae	*Elaeodendron australe var. integrifolium*			C		1/1
plants	land plants	Chenopodiaceae	*Atriplex elachophylla*			C		1
plants	land plants	Chenopodiaceae	*Atriplex muelleri*	lagoon saltbush		C		4
plants	land plants	Chenopodiaceae	*Atriplex semibaccata*	creeping saltbush		C		3
plants	land plants	Chenopodiaceae	*Chenopodium desertorum subsp. anidiophyllum*			C		1
plants	land plants	Chenopodiaceae	*Dysphania carinata*			C		2/1
plants	land plants	Chenopodiaceae	*Dysphania glomulifera subsp. glomulifera*			C		2/2
plants	land plants	Chenopodiaceae	*Einadia nutans*			C		4
plants	land plants	Chenopodiaceae	*Einadia nutans subsp. linifolia*			C		1/1
plants	land plants	Chenopodiaceae	*Einadia polygonoides*	knotweed goosefoot		C		4
plants	land plants	Chenopodiaceae	*Enchylaena tomentosa*			C		9
plants	land plants	Chenopodiaceae	*Maireana microphylla*			C		1
plants	land plants	Chenopodiaceae	*Rhagodia spinescens*	thorny saltbush		C		1

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plants	land plants	Chenopodiaceae	*Salsola australis*			C		11
plants	land plants	Chenopodiaceae	*Sclerolaena anisacanthoides*	yellow burr		C		1
plants	land plants	Chenopodiaceae	*Sclerolaena bicornis var. horrida*			C		3
plants	land plants	Chenopodiaceae	*Sclerolaena muricata*			C		1
plants	land plants	Cleomaceae	*Arivela viscosa*			C		1
plants	land plants	Combretaceae	*Terminalia oblongata*			C		11
plants	land plants	Combretaceae	*Terminalia oblongata subsp. oblongata*			C		11
plants	land plants	Commelinaceae	*Commelina ensifolia*	scurvy grass		C		1
plants	land plants	Convolvulaceae	*Convolvulus arvensis*		Y			1
plants	land plants	Convolvulaceae	*Evolvulus alsinoides*			C		5
plants	land plants	Convolvulaceae	*Ipomoea calobra*			C		1/1
plants	land plants	Convolvulaceae	*Ipomoea plebeia*	bellvine		C		5
plants	land plants	Convolvulaceae	*Polymeria pusilla*			C		3
plants	land plants	Crassulaceae	*Bryophyllum delagoense*		Y			8/1
plants	land plants	Crassulaceae	*Bryophyllum x houghtonii*		Y			1/1
plants	land plants	Crassulaceae	*Crassula tetramera*			C		1/1
plants	land plants	Cyperaceae	*Caustis sp. (Robinson Gorge P.I.Forster+ PIF11256)*			C		1/1
plants	land plants	Cyperaceae	*Cyperus betchei*			C		6
plants	land plants	Cyperaceae	*Cyperus concinnus*			C		2
plants	land plants	Cyperaceae	*Cyperus difformis*	rice sedge		C		1
plants	land plants	Cyperaceae	*Cyperus exaltatus*	tall flatsedge		C		1
plants	land plants	Cyperaceae	*Cyperus fulvus*			C		2/1
plants	land plants	Cyperaceae	*Cyperus gracilis*			C		3
plants	land plants	Cyperaceae	*Cyperus gymnocaulos*	spiny flatsedge		C		1
plants	land plants	Cyperaceae	*Cyperus haspan*			C		1
plants	land plants	Cyperaceae	*Cyperus involucratus*		Y			1/1
plants	land plants	Cyperaceae	*Cyperus iria*			C		4
plants	land plants	Cyperaceae	*Cyperus isabellinus*			C		1/1
plants	land plants	Cyperaceae	*Cyperus rigidellus*			C		1
plants	land plants	Cyperaceae	*Eleocharis plana*	ribbed spikerush		C		1
plants	land plants	Cyperaceae	*Fimbristylis dichotoma*	common fringe-rush		C		2/2
plants	land plants	Cyperaceae	*Schoenus kennyi*			C		4/4
plants	land plants	Cyperaceae	*Scleria sphacelata*			C		1/1
plants	land plants	Dilleniaceae	*Hibbertia ferox*			C		2/2
plants	land plants	Ebenaceae	*Diospyros humilis*	small-leaved ebony		C		9/1
plants	land plants	Elatinaceae	*Elatine gratioloides*	waterwort		C		1
plants	land plants	Ericaceae	*Melichrus sp. (Isla Gorge P.Sharpe+ 601)*			C		1/1
plants	land plants	Ericaceae	*Styphelia mitchellii*			C		1/1
plants	land plants	Erythroxylaceae	*Erythroxylum australe*	cocaine tree		C		7/2
plants	land plants	Euphorbiaceae	*Acalypha capillipes*	small-leaved acalypha		C		6
plants	land plants	Euphorbiaceae	*Acalypha eremorum*	soft acalypha		C		5/2
plants	land plants	Euphorbiaceae	*Bertya opponens*			C	V	1/1
plants	land plants	Euphorbiaceae	*Croton insularis*	Queensland cascarilla		C		3/2
plants	land plants	Euphorbiaceae	*Croton phebalioides*	narrow-leaved croton		C		6/2
plants	land plants	Euphorbiaceae	*Euphorbia*					3
plants	land plants	Euphorbiaceae	*Euphorbia drummondii*			C		1

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plants	land plants	Euphorbiaceae	*Euphorbia hyssopifolia*		Y			1/1
plants	land plants	Euphorbiaceae	*Euphorbia tannensis subsp. eremophila*			C		2/1
plants	land plants	Euphorbiaceae	*Euphorbia tannensis subsp. tannensis*			C		1
plants	land plants	Euphorbiaceae	*Ricinocarpos linearifolius*			C		2/2
plants	land plants	Goodeniaceae	*Brunonia australis*	blue pincushion		SL		1
plants	land plants	Goodeniaceae	*Dampiera adpressa*			C		2/2
plants	land plants	Goodeniaceae	*Goodenia glabra*			C		1/1
plants	land plants	Goodeniaceae	*Goodenia grandiflora*			C		3/3
plants	land plants	Goodeniaceae	*Goodenia rotundifolia*			C		1/1
plants	land plants	Gyrostemonaceae	*Codonocarpus attenuatus*			C		1
plants	land plants	Gyrostemonaceae	*Codonocarpus cotinifolius*			C		1
plants	land plants	Haloragaceae	*Gonocarpus elatus*			C		1/1
plants	land plants	Haloragaceae	*Haloragis stricta*			C		1
plants	land plants	Hemerocallidaceae	*Dianella longifolia*			C		1
plants	land plants	Hemerocallidaceae	*Geitonoplesium cymosum*	scrambling lily		C		1
plants	land plants	Hemerocallidaceae	*Tricoryne muricata*			C		1/1
plants	land plants	Hydrocharitaceae	*Ottelia ovalifolia*	swamp lily		SL		1
plants	land plants	Juncaceae	*Juncus*					1
plants	land plants	Juncaceae	*Juncus aridicola*	tussock rush		C		2
plants	land plants	Lamiaceae	*Basilicum polystachyon*			C		1
plants	land plants	Lamiaceae	*Chloanthes parviflora*			C		1/1
plants	land plants	Lamiaceae	*Clerodendrum floribundum*			C		2
plants	land plants	Lamiaceae	*Coleus australis*			C		1
plants	land plants	Lamiaceae	*Coleus blakei*			NT		3/3
plants	land plants	Lamiaceae	*Ocimum*					1
plants	land plants	Lamiaceae	*Ocimum tenuiflorum*			C		4
plants	land plants	Lamiaceae	*Prostanthera collina*			C		2/2
plants	land plants	Lamiaceae	*Prostanthera cryptandroides subsp. euphrasioides*			C		2/2
plants	land plants	Lamiaceae	*Prostanthera parvifolia*			C		2/2
plants	land plants	Lamiaceae	*Prostanthera suborbicularis*			C		1/1
plants	land plants	Lamiaceae	*Teucrium puberulum*			C		1/1
plants	land plants	Lauraceae	*Cassytha pubescens*	downy devil's twine		C		1
plants	land plants	Laxmanniaceae	*Eustrephus latifolius*	wombat berry		C		3
plants	land plants	Laxmanniaceae	*Lomandra confertifolia subsp. pallida*			C		1/1
plants	land plants	Laxmanniaceae	*Lomandra longifolia*			C		5
plants	land plants	Laxmanniaceae	*Lomandra multiflora subsp. multiflora*			C		1/1
plants	land plants	Leguminosae	*Acacia burrowii*			C		1/1
plants	land plants	Leguminosae	*Acacia caroleae*			C		1
plants	land plants	Leguminosae	*Acacia catenulata*	bendee		C		7
plants	land plants	Leguminosae	*Acacia cretata*			C		5/3
plants	land plants	Leguminosae	*Acacia cretata x Acacia fodinalis*			C		2/2
plants	land plants	Leguminosae	*Acacia everistii*			C		1/1
plants	land plants	Leguminosae	*Acacia excelsa*			C		6
plants	land plants	Leguminosae	*Acacia gittinsii*			C		1/1
plants	land plants	Leguminosae	*Acacia harpophylla*	brigalow		C		21
plants	land plants	Leguminosae	*Acacia juncifolia*			C		1/1

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plants	land plants	Leguminosae	*Acacia leichhardtii*			C		1/1
plants	land plants	Leguminosae	*Acacia leptostachya*	Townsville wattle		C		1/1
plants	land plants	Leguminosae	*Acacia macradenia*	zig-zag wattle		C		1/1
plants	land plants	Leguminosae	*Acacia melanoxylon*	blackwood		C		1
plants	land plants	Leguminosae	*Acacia neriifolia*	pechey wattle		C		1/1
plants	land plants	Leguminosae	*Acacia oswaldii*	miljee		C		3
plants	land plants	Leguminosae	*Acacia pendula*	myall		C		1
plants	land plants	Leguminosae	*Acacia rhodoxylon*	ringy rosewood		C		1
plants	land plants	Leguminosae	*Acacia salicina*	doolan		C		11
plants	land plants	Leguminosae	*Acacia shirleyi*	lancewood		C		3
plants	land plants	Leguminosae	*Acacia sp. (Comet L.Pedley 4091)*			C		1/1
plants	land plants	Leguminosae	*Acacia storyi*			NT		1/1
plants	land plants	Leguminosae	*Acacia triptera*			C		1/1
plants	land plants	Leguminosae	*Acacia venulosa*	veined wattle		C		1/1
plants	land plants	Leguminosae	*Aeschynomene indica*	budda pea		C		2
plants	land plants	Leguminosae	*Albizia lebbeck*	Indian siris		C		1
plants	land plants	Leguminosae	*Bossiaea carinalis*			C		1/1
plants	land plants	Leguminosae	*Canavalia papuana*	wild jack bean		C		2/1
plants	land plants	Leguminosae	*Cassia brewsteri*			C		11/3
plants	land plants	Leguminosae	*Cassia queenslandica*			C		2
plants	land plants	Leguminosae	*Clitoria ternatea*	butterfly pea	Y			1
plants	land plants	Leguminosae	*Crotalaria dissitiflora subsp. dissitiflora*			C		1
plants	land plants	Leguminosae	*Crotalaria incana subsp. incana*		Y			2/1
plants	land plants	Leguminosae	*Cullen tenax*	emu-foot		C		1
plants	land plants	Leguminosae	*Delonix regia*	poinciana	Y			1/1
plants	land plants	Leguminosae	*Desmodium campylocaulon*			C		1
plants	land plants	Leguminosae	*Dillwynia phylicoides*			C		1/1
plants	land plants	Leguminosae	*Glycine clandestina var. clandestina*			C		1
plants	land plants	Leguminosae	*Glycine clandestina var. sericea*			C		1/1
plants	land plants	Leguminosae	*Glycine falcata*			C		1
plants	land plants	Leguminosae	*Glycine tabacina*	glycine pea		C		1
plants	land plants	Leguminosae	*Glycine tomentella*	woolly glycine		C		5/2
plants	land plants	Leguminosae	*Hardenbergia perbrevidens*			C		1/1
plants	land plants	Leguminosae	*Heliodendron basalticum*			C		4
plants	land plants	Leguminosae	*Hovea linearis x Hovea planifolia*			C		1/1
plants	land plants	Leguminosae	*Hovea longipes*	brush hovea		C		2/1
plants	land plants	Leguminosae	*Hovea tholiformis*			C		1/1
plants	land plants	Leguminosae	*Indigofera australis*			C		2
plants	land plants	Leguminosae	*Indigofera brevidens*			C		3/2
plants	land plants	Leguminosae	*Indigofera colutea*	sticky indigo		C		1/1
plants	land plants	Leguminosae	*Indigofera linifolia*			C		2
plants	land plants	Leguminosae	*Indigofera pratensis*			C		1
plants	land plants	Leguminosae	*Kennedia sp. (Blackdown Tableland R.J.Henderson+ H747)*			C		1/1
plants	land plants	Leguminosae	*Leucaena leucocephala*		Y			1
plants	land plants	Leguminosae	*Leucaena leucocephala subsp. glabrata*		Y			1/1

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plants	land plants	Leguminosae	*Leucaena leucocephala subsp. leucocephala*		Y			1/1
plants	land plants	Leguminosae	*Lotus australis*	Australian trefoil		C		1
plants	land plants	Leguminosae	*Lysiphyllum*					1
plants	land plants	Leguminosae	*Lysiphyllum carronii*	ebony tree		C		12/1
plants	land plants	Leguminosae	*Lysiphyllum hookeri*	Queensland ebony		C		14/3
plants	land plants	Leguminosae	*Macroptilium atropurpureum*	siratro	Y			1
plants	land plants	Leguminosae	*Mirbelia pungens*			C		1/1
plants	land plants	Leguminosae	*Mirbelia speciosa subsp. ringrosei*			C		1/1
plants	land plants	Leguminosae	*Neptunia gracilis*			C		1
plants	land plants	Leguminosae	*Neptunia gracilis forma gracilis*			C		2
plants	land plants	Leguminosae	*Parkinsonia aculeata*	parkinsonia	Y			9/5
plants	land plants	Leguminosae	*Petalostylis labicheoides*			C		1/1
plants	land plants	Leguminosae	*Pultenaea cunninghamii*	prickly pea		C		2/2
plants	land plants	Leguminosae	*Pultenaea petiolaris*			C		1/1
plants	land plants	Leguminosae	*Rhynchosia minima var. minima*			C		1
plants	land plants	Leguminosae	*Senna aciphylla*	Australian senna		C		1/1
plants	land plants	Leguminosae	*Senna artemisioides subsp. coriacea*			C		1
plants	land plants	Leguminosae	*Senna barclayana*			C		1/1
plants	land plants	Leguminosae	*Senna circinnata*			C		1
plants	land plants	Leguminosae	*Senna occidentalis*	coffee senna	Y			1/1
plants	land plants	Leguminosae	*Sesbania cannabina*			C		1
plants	land plants	Leguminosae	*Sesbania cannabina var. cannabina*			C		1
plants	land plants	Leguminosae	*Stylosanthes scabra*		Y			4
plants	land plants	Leguminosae	*Tephrosia brachyodon*			C		1
plants	land plants	Leguminosae	*Tephrosia filipes subsp. filipes*			C		1/1
plants	land plants	Leguminosae	*Vachellia farnesiana*		Y			2
plants	land plants	Leguminosae	*Zornia muriculata subsp. angustata*			C		1/1
plants	land plants	Loganiaceae	*Mitrasacme paludosa*			C		1/1
plants	land plants	Loranthaceae	*Amyema quandang var. bancroftii*	broad-leaved grey mistletoe		C		2
plants	land plants	Loranthaceae	*Amyema quandang var. quandang*			C		1
plants	land plants	Loranthaceae	*Lysiana filifolia*			C		1/1
plants	land plants	Loranthaceae	*Lysiana subfalcata*			C		5
plants	land plants	Lythraceae	*Lythrum paradoxum*			C		1
plants	land plants	Lythraceae	*Rotala*			C		1
plants	land plants	Macarthuriaceae	*Macarthuria ephedroides*			C		1/1
plants	land plants	Malvaceae	*Abutilon auritum*	Chinese lantern		C		1
plants	land plants	Malvaceae	*Abutilon fraseri*	dwarf lantern flower		C		1
plants	land plants	Malvaceae	*Abutilon fraseri subsp. fraseri*			C		1
plants	land plants	Malvaceae	*Abutilon malvifolium*	bastard marshmallow		C		2
plants	land plants	Malvaceae	*Abutilon nobile*			C		1/1
plants	land plants	Malvaceae	*Abutilon otocarpum*			C		1
plants	land plants	Malvaceae	*Abutilon oxycarpum*			C		1
plants	land plants	Malvaceae	*Abutilon oxycarpum var. oxycarpum*			C		1
plants	land plants	Malvaceae	*Abutilon oxycarpum var. subsagittatum*			C		2
plants	land plants	Malvaceae	*Gossypium australe*			C		2/1
plants	land plants	Malvaceae	*Hibiscus*					3

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
plants	land plants	Malvaceae	*Hibiscus brachysiphonius*			C		2/1
plants	land plants	Malvaceae	*Hibiscus divaricatus*			C		1/1
plants	land plants	Malvaceae	*Hibiscus heterophyllus*			C		1
plants	land plants	Malvaceae	*Hibiscus krichauffianus*			C		1/1
plants	land plants	Malvaceae	*Hibiscus sp. (Emerald S.L.Everist 2124)*			C		1/1
plants	land plants	Malvaceae	*Hibiscus sturtii*			C		3/1
plants	land plants	Malvaceae	*Hibiscus sturtii var. sturtii*			C		3/1
plants	land plants	Malvaceae	*Malvastrum americanum*		Y			6
plants	land plants	Malvaceae	*Malvastrum americanum var. americanum*		Y			1
plants	land plants	Malvaceae	*Sida aprica var. aprica*			C		2/2
plants	land plants	Malvaceae	*Sida atherophora*			C		1/1
plants	land plants	Malvaceae	*Sida cordifolia*		Y			2/1
plants	land plants	Malvaceae	*Sida corrugata*			C		2
plants	land plants	Malvaceae	*Sida corrugata var. angustifolia*			C		1
plants	land plants	Malvaceae	*Sida cunninghamii*			C		1
plants	land plants	Malvaceae	*Sida fibulifera*			C		1
plants	land plants	Malvaceae	*Sida rhombifolia*		Y			4
plants	land plants	Malvaceae	*Sida rohlenae*			C		2
plants	land plants	Malvaceae	*Sida rohlenae subsp. rohlenae*			C		1
plants	land plants	Malvaceae	*Sida sp. (Musselbrook M.B.Thomas+ MRS437)*			C		1
plants	land plants	Malvaceae	*Sida trichopoda*			C		9/1
plants	land plants	Marsileaceae	*Marsilea costulifera*	narrow-leaved nardoo		C		2
plants	land plants	Marsileaceae	*Marsilea drummondii*	common nardoo		C		1
plants	land plants	Marsileaceae	*Marsilea hirsuta*	hairy nardoo		C		2
plants	land plants	Meliaceae	*Owenia acidula*	emu apple		C		7/1
plants	land plants	Molluginaceae	*Glinus lotoides*	hairy carpet weed		C		1/1
plants	land plants	Moraceae	*Ficus opposita*			C		3
plants	land plants	Myrtaceae	*Angophora floribunda*	rough-barked apple		C		1
plants	land plants	Myrtaceae	*Blakella dallachiana*			C		6/1
plants	land plants	Myrtaceae	*Blakella leichhardtii*			C		1/1
plants	land plants	Myrtaceae	*Blakella tessellaris*			C		5
plants	land plants	Myrtaceae	*Corymbia aureola*			C		1/1
plants	land plants	Myrtaceae	*Corymbia citriodora subsp. citriodora*			C		4
plants	land plants	Myrtaceae	*Corymbia citriodora subsp. variegata*			C		1
plants	land plants	Myrtaceae	*Corymbia clarksoniana*			C		1
plants	land plants	Myrtaceae	*Corymbia hendersonii*			C		1/1
plants	land plants	Myrtaceae	*Corymbia intermedia*	pink bloodwood		C		1
plants	land plants	Myrtaceae	*Corymbia trachyphloia subsp. trachyphloia*			C		2/1
plants	land plants	Myrtaceae	*Eucalyptus acmenoides*			C		2/2
plants	land plants	Myrtaceae	*Eucalyptus camaldulensis subsp. acuta*			C		1
plants	land plants	Myrtaceae	*Eucalyptus cambageana*	Dawson gum		C		8/1
plants	land plants	Myrtaceae	*Eucalyptus coolabah*	coolabah		C		10
plants	land plants	Myrtaceae	*Eucalyptus crebra*	narrow-leaved red ironbark		C		9/2
plants	land plants	Myrtaceae	*Eucalyptus decorticans*			C		1/1
plants	land plants	Myrtaceae	*Eucalyptus exserta*	Queensland peppermint		C		3/2
plants	land plants	Myrtaceae	*Eucalyptus melanophloia*			C		11

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plants	land plants	Myrtaceae	*Eucalyptus orgadophila*	mountain coolibah		C		1
plants	land plants	Myrtaceae	*Eucalyptus populnea*	poplar box		C		10
plants	land plants	Myrtaceae	*Eucalyptus tenuipes*	narrow-leaved white mahogany		C		1/1
plants	land plants	Myrtaceae	*Eucalyptus tereticornis*			C		5
plants	land plants	Myrtaceae	*Eucalyptus tereticornis subsp. tereticornis*			C		2
plants	land plants	Myrtaceae	*Eucalyptus tholiformis*			C		1/1
plants	land plants	Myrtaceae	*Eucalyptus thozetiana*			C		7
plants	land plants	Myrtaceae	*Lophostemon suaveolens*	swamp box		C		1/1
plants	land plants	Myrtaceae	*Lysicarpus angustifolius*	budgeroo		C		1/1
plants	land plants	Myrtaceae	*Melaleuca bracteata*			C		3
plants	land plants	Myrtaceae	*Melaleuca decora*			C		1/1
plants	land plants	Myrtaceae	*Melaleuca lazaridis*			C		1/1
plants	land plants	Myrtaceae	*Melaleuca linariifolia*	snow-in summer		C		1/1
plants	land plants	Myrtaceae	*Melaleuca nodosa*			C		1/1
plants	land plants	Myrtaceae	*Melaleuca tamariscina*			C		3/3
plants	land plants	Myrtaceae	*Melaleuca trichostachya*			C		1/1
plants	land plants	Myrtaceae	*Micromyrtus capricornia*			C		5/5
plants	land plants	Myrtaceae	*Ochrosperma adpressum*			C		1/1
plants	land plants	Myrtaceae	*Triplarina paludosa*			C		1/1
plants	land plants	Nyctaginaceae	*Boerhavia burbidgeana*			C		1/1
plants	land plants	Nyctaginaceae	*Boerhavia dominii*			C		7
plants	land plants	Nyctaginaceae	*Boerhavia pubescens*			C		1
plants	land plants	Nyctaginaceae	*Boerhavia sp. (St George A.Hill AQ399299)*			C		1/1
plants	land plants	Olacaceae	*Ximenia americana*			C		1/1
plants	land plants	Oleaceae	*Jasminum didymum*			C		1
plants	land plants	Oleaceae	*Jasminum didymum subsp. lineare*			C		9
plants	land plants	Oleaceae	*Jasminum didymum subsp. racemosum*			C		2
plants	land plants	Oleaceae	*Jasminum simplicifolium subsp. australiense*			C		1/1
plants	land plants	Oleaceae	*Notelaea microcarpa*			C		3/1
plants	land plants	Onagraceae	*Ludwigia octovalvis*	willow primrose		C		2
plants	land plants	Onagraceae	*Ludwigia peploides subsp. montevidensis*			C		1
plants	land plants	Orchidaceae	*Corunastylis valida*			V		1/1
plants	land plants	Orchidaceae	*Cymbidium canaliculatum*			SL		4
plants	land plants	Oxalidaceae	*Oxalis*					1
plants	land plants	Oxalidaceae	*Oxalis corniculata*		Y			1
plants	land plants	Oxalidaceae	*Oxalis radicosa*			C		1/1
plants	land plants	Papaveraceae	*Argemone ochroleuca subsp. ochroleuca*	Mexican poppy	Y			1
plants	land plants	Passifloraceae	*Passiflora aurantia var. aurantia*			C		2/2
plants	land plants	Phyllanthaceae	*Breynia oblongifolia*			C		1/1
plants	land plants	Phyllanthaceae	*Flueggea*					1
plants	land plants	Phyllanthaceae	*Phyllanthus*					1/1
plants	land plants	Phyllanthaceae	*Phyllanthus maderaspatensis*			C		4
plants	land plants	Phyllanthaceae	*Phyllanthus maderaspatensis var. maderaspatensis*			C		1
plants	land plants	Phyllanthaceae	*Phyllanthus mitchellii*			C		1/1
plants	land plants	Phyllanthaceae	*Phyllanthus virgatus*			C		1
plants	land plants	Phyllanthaceae	*Synostemon spinosus*			C		2/2

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plants	land plants	Picrodendraceae	*Petalostigma pachyphyllum*			C		1/1
plants	land plants	Picrodendraceae	*Petalostigma pubescens*	quinine tree		C		4/1
plants	land plants	Pittosporaceae	*Pittosporum angustifolium*			C		2
plants	land plants	Pittosporaceae	*Pittosporum spinescens*			C		4/1
plants	land plants	Pittosporaceae	*Rhytidosporum diosmoides*			C		1/1
plants	land plants	Plantaginaceae	*Plantago cunninghamii*	sago weed		C		1
plants	land plants	Plantaginaceae	*Scoparia dulcis*	scoparia	Y			1
plants	land plants	Plumbaginaceae	*Plumbago zeylanica*	native plumbago		C		2
plants	land plants	Poaceae	*Alloteropsis cimicina*			C		1/1
plants	land plants	Poaceae	*Alloteropsis semialata*	cockatoo grass		C		1
plants	land plants	Poaceae	*Ancistrachne uncinulata*	hooky grass		C		4/3
plants	land plants	Poaceae	*Aristida caput-medusae*			C		6/2
plants	land plants	Poaceae	*Aristida holathera*			C		1
plants	land plants	Poaceae	*Aristida holathera var. holathera*			C		1
plants	land plants	Poaceae	*Aristida jerichoensis var. subspinulifera*			C		5
plants	land plants	Poaceae	*Aristida leptopoda*	white speargrass		C		1
plants	land plants	Poaceae	*Aristida lignosa*			C		1/1
plants	land plants	Poaceae	*Aristida polyclados*			C		3
plants	land plants	Poaceae	*Aristida queenslandica var. dissimilis*			C		2/2
plants	land plants	Poaceae	*Aristida ramosa*	purple wiregrass		C		1
plants	land plants	Poaceae	*Aristida vagans*			C		2
plants	land plants	Poaceae	*Arundinella nepalensis*	reedgrass		C		1/1
plants	land plants	Poaceae	*Astrebla lappacea*	curly mitchell grass		C		1
plants	land plants	Poaceae	*Astrebla squarrosa*	bull mitchell grass		C		3
plants	land plants	Poaceae	*Bothriochloa bladhii subsp. bladhii*			C		2
plants	land plants	Poaceae	*Bothriochloa decipiens var. decipiens*			C		1
plants	land plants	Poaceae	*Bothriochloa ewartiana*	desert bluegrass		C		6
plants	land plants	Poaceae	*Bothriochloa pertusa*		Y			3
plants	land plants	Poaceae	*Brachyachne convergens*	common native couch		C		5
plants	land plants	Poaceae	*Calyptochloa sphaerocarpa*			C		4/4
plants	land plants	Poaceae	*Cenchrus*					1
plants	land plants	Poaceae	*Cenchrus ciliaris*		Y			17
plants	land plants	Poaceae	*Chloris gayana*	rhodes grass	Y			1
plants	land plants	Poaceae	*Chloris inflata*	purpletop chloris	Y			3
plants	land plants	Poaceae	*Chloris ventricosa*	tall chloris		C		2
plants	land plants	Poaceae	*Chloris virgata*	feathertop rhodes grass	Y			1
plants	land plants	Poaceae	*Chrysopogon fallax*			C		1
plants	land plants	Poaceae	*Cleistochloa subjuncea*			C		1/1
plants	land plants	Poaceae	*Cymbopogon refractus*	barbed-wire grass		C		1
plants	land plants	Poaceae	*Cynodon dactylon*		Y			3
plants	land plants	Poaceae	*Cynodon dactylon var. dactylon*		Y			1
plants	land plants	Poaceae	*Dactyloctenium radulans*	button grass		C		8
plants	land plants	Poaceae	*Dichanthium sericeum subsp. sericeum*			C		1
plants	land plants	Poaceae	*Digitaria bicornis*			C		1
plants	land plants	Poaceae	*Digitaria brownii*			C		2
plants	land plants	Poaceae	*Digitaria diffusa*			C		1/1

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plants	land plants	Poaceae	*Dinebra decipiens var. asthenes*			C		1
plants	land plants	Poaceae	*Dinebra decipiens var. decipiens*			C		4/1
plants	land plants	Poaceae	*Diplachne fusca var. fusca*			C		2/1
plants	land plants	Poaceae	*Echinochloa colona*	awnless barnyard grass	Y			4
plants	land plants	Poaceae	*Echinochloa esculenta*	Japanese millet	Y			1
plants	land plants	Poaceae	*Enneapogon gracilis*	slender nineawn		C		5
plants	land plants	Poaceae	*Enneapogon nigricans*	niggerheads		C		2
plants	land plants	Poaceae	*Enteropogon acicularis*	curly windmill grass		C		5
plants	land plants	Poaceae	*Enteropogon ramosus*			C		1
plants	land plants	Poaceae	*Enteropogon unispiceus*			C		9/1
plants	land plants	Poaceae	*Eragrostis elongata*			C		1
plants	land plants	Poaceae	*Eragrostis lacunaria*	purple lovegrass		C		2
plants	land plants	Poaceae	*Eragrostis leptostachya*			C		1
plants	land plants	Poaceae	*Eragrostis megalosperma*			C		1
plants	land plants	Poaceae	*Eragrostis minor*	smaller stinkgrass	Y			2
plants	land plants	Poaceae	*Eriachne*					1
plants	land plants	Poaceae	*Eriochloa crebra*	spring grass		C		6
plants	land plants	Poaceae	*Heteropogon contortus*	black speargrass		C		1
plants	land plants	Poaceae	*Hyparrhenia rufa subsp. rufa*		Y			2/2
plants	land plants	Poaceae	*Iseilema vaginiflorum*	red flinders grass		C		2
plants	land plants	Poaceae	*Leptochloa digitata*			C		4
plants	land plants	Poaceae	*Megathyrsus maximus*		Y			1
plants	land plants	Poaceae	*Megathyrsus maximus var. pubiglumis*		Y			8
plants	land plants	Poaceae	*Melinis repens*	red natal grass	Y			2
plants	land plants	Poaceae	*Panicum decompositum*			C		1
plants	land plants	Poaceae	*Panicum decompositum var. tenuius*			C		2
plants	land plants	Poaceae	*Panicum effusum*			C		1/1
plants	land plants	Poaceae	*Paspalidium albovillosum*			C		1/1
plants	land plants	Poaceae	*Paspalidium caespitosum*	brigalow grass		C		8
plants	land plants	Poaceae	*Paspalidium constrictum*			C		1
plants	land plants	Poaceae	*Paspalidium distans*	shotgrass		C		1
plants	land plants	Poaceae	*Paspalidium jubiflorum*	warrego grass		C		1
plants	land plants	Poaceae	*Paspalum distichum*	water couch	Y			2
plants	land plants	Poaceae	*Paspalum longifolium*			C		1
plants	land plants	Poaceae	*Setaria paspalidioides*			C		1/1
plants	land plants	Poaceae	*Setaria surgens*			C		1/1
plants	land plants	Poaceae	*Sorghum x almum*		Y			1/1
plants	land plants	Poaceae	*Sporobolus actinocladus*	katoora grass		C		1
plants	land plants	Poaceae	*Sporobolus caroli*	fairy grass		C		8
plants	land plants	Poaceae	*Sporobolus creber*			C		1/1
plants	land plants	Poaceae	*Sporobolus elongatus*			C		2
plants	land plants	Poaceae	*Sporobolus laxus*			C		1
plants	land plants	Poaceae	*Themeda triandra*	kangaroo grass		C		2
plants	land plants	Poaceae	*Thyridolepis xerophila*			C		1/1
plants	land plants	Poaceae	*Tragus australianus*	small burr grass		C		5
plants	land plants	Poaceae	*Triodia mitchellii*	buck spinifex		C		4/3

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plants	land plants	Poaceae	*Urochloa mosambicensis*	sabi grass	Y			5
plants	land plants	Polygalaceae	*Polygala rhinanthoides*			C		1/1
plants	land plants	Polygonaceae	*Duma florulenta*			C		2
plants	land plants	Polygonaceae	*Emex*			C		1
plants	land plants	Polygonaceae	*Persicaria attenuata*			C		1
plants	land plants	Polygonaceae	*Persicaria orientalis*	princes feathers		C		1
plants	land plants	Polygonaceae	*Polygonum plebeium*	small knotweed		C		1/1
plants	land plants	Pontederiaceae	*Pontederia cyanea*			C		2
plants	land plants	Portulacaceae	*Calandrinia pickeringii*			C		2/1
plants	land plants	Portulacaceae	*Portulaca bicolor*			C		1/1
plants	land plants	Portulacaceae	*Portulaca filifolia*			C		4
plants	land plants	Portulacaceae	*Portulaca oleracea*	pigweed	Y			7
plants	land plants	Portulacaceae	*Portulaca pilosa*		Y			3
plants	land plants	Potamogetonaceae	*Potamogeton tricarinatus*	floating pondweed		SL		1
plants	land plants	Proteaceae	*Grevillea longistyla*			C		3/3
plants	land plants	Proteaceae	*Grevillea sessilis*			C		1/1
plants	land plants	Proteaceae	*Hakea*					2/2
plants	land plants	Proteaceae	*Hakea lorea*			C		1
plants	land plants	Proteaceae	*Hakea lorea subsp. lorea*			C		2/1
plants	land plants	Proteaceae	*Persoonia subtilis*			C		1/1
plants	land plants	Proteaceae	*Xylomelum cunninghamianum*			C		1
plants	land plants	Pteridaceae	*Cheilanthes sieberi subsp. sieberi*			C		2
plants	land plants	Rhamnaceae	*Alphitonia excelsa*	soap tree		C		4
plants	land plants	Rhamnaceae	*Polianthion minutiflorum*			V	V	2/2
plants	land plants	Rhamnaceae	*Ventilago viminalis*	supplejack		C		7/1
plants	land plants	Rubiaceae	*Coelospermum reticulatum*			C		1/1
plants	land plants	Rubiaceae	*Everistia vacciniifolia var. vacciniifolia*			C		2/2
plants	land plants	Rubiaceae	*Larsenaikia ochreata*			C		2/2
plants	land plants	Rubiaceae	*Opercularia diphylla*			C		1/1
plants	land plants	Rubiaceae	*Psydrax johnsonii*			C		1/1
plants	land plants	Rubiaceae	*Psydrax odorata*			C		1
plants	land plants	Rubiaceae	*Psydrax odorata forma buxifolia*			C		2
plants	land plants	Rubiaceae	*Psydrax odorata subsp. australiana*			C		1/1
plants	land plants	Rubiaceae	*Psydrax oleifolia*			C		2
plants	land plants	Rutaceae	*Acronychia pauciflora*	soft acronychia		C		1/1
plants	land plants	Rutaceae	*Boronia odorata*			C		1/1
plants	land plants	Rutaceae	*Boronia splendida*			C		1/1
plants	land plants	Rutaceae	*Citrus glauca*			C		4
plants	land plants	Rutaceae	*Cyanothamnus occidentalis*			C		3/3
plants	land plants	Rutaceae	*Flindersia dissosperma*			C		3/1
plants	land plants	Rutaceae	*Geijera parviflora*	wilga		C		9/2
plants	land plants	Rutaceae	*Phebalium glandulosum subsp. glandulosum*			C		1/1
plants	land plants	Rutaceae	*Phebalium nottii*	pink phebalium		C		3/3
plants	land plants	Rutaceae	*Philotheca difformis subsp. difformis*			C		3/3
plants	land plants	Santalaceae	*Santalum lanceolatum*			SL		3
plants	land plants	Santalaceae	*Viscum articulatum*	flat mistletoe		C		1

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plants	land plants	Sapindaceae	*Alectryon connatus*	grey birds-eye		C		2/1
plants	land plants	Sapindaceae	*Alectryon diversifolius*	scrub boonaree		C		14/2
plants	land plants	Sapindaceae	*Alectryon oleifolius subsp. elongatus*			C		4
plants	land plants	Sapindaceae	*Atalaya hemiglauca*			C		10
plants	land plants	Sapindaceae	*Dodonaea*					2/2
plants	land plants	Sapindaceae	*Dodonaea filifolia*			C		1/1
plants	land plants	Sapindaceae	*Dodonaea lanceolata var. subsessilifolia*			C		1/1
plants	land plants	Sapindaceae	*Dodonaea vestita*			C		1/1
plants	land plants	Sapindaceae	*Dodonaea viscosa subsp. viscosa*			C		1
plants	land plants	Scrophulariaceae	*Eremophila latrobei*			C		2/1
plants	land plants	Scrophulariaceae	*Eremophila latrobei subsp. glabra*			C		4/4
plants	land plants	Scrophulariaceae	*Eremophila latrobei subsp. latrobei*			C		1/1
plants	land plants	Scrophulariaceae	*Eremophila longifolia*	berrigan		C		2/1
plants	land plants	Scrophulariaceae	*Eremophila maculata*			C		1
plants	land plants	Scrophulariaceae	*Eremophila maculata subsp. maculata*			C		1/1
plants	land plants	Scrophulariaceae	*Eremophila mitchellii*			C		12/1
plants	land plants	Scrophulariaceae	*Myoporum acuminatum*	coastal boobialla		C		3
plants	land plants	Solanaceae	*Physalis lanceifolia*		Y			1
plants	land plants	Solanaceae	*Solanum*					1
plants	land plants	Solanaceae	*Solanum adenophorum*			E		1
plants	land plants	Solanaceae	*Solanum cocosoides*			C		5/5
plants	land plants	Solanaceae	*Solanum elachophyllum*			E		5/4
plants	land plants	Solanaceae	*Solanum ellipticum*	potato bush		C		5/2
plants	land plants	Solanaceae	*Solanum esuriale*	quena		C		4/1
plants	land plants	Solanaceae	*Solanum ferocissimum*			C		3/2
plants	land plants	Solanaceae	*Solanum mitchellianum*			C		2/2
plants	land plants	Solanaceae	*Solanum pusillum*			C		2/2
plants	land plants	Solanaceae	*Solanum semiarmatum*	prickly nightshade		C		1
plants	land plants	Sparrmanniaceae	*Corchorus tomentellus*			C		1/1
plants	land plants	Sparrmanniaceae	*Corchorus trilocularis*			C		1
plants	land plants	Sparrmanniaceae	*Grewia latifolia*	dysentery plant		C		2/1
plants	land plants	Sparrmanniaceae	*Grewia scabrella*			C		7/3
plants	land plants	Sterculiaceae	*Brachychiton australis*	broad-leaved bottle tree		SL		1
plants	land plants	Sterculiaceae	*Brachychiton populneus subsp. trilobus*			SL		1/1
plants	land plants	Sterculiaceae	*Brachychiton rupestris*			SL		14/1
plants	land plants	Stylidiaceae	*Stylidium eglandulosum*			SL		1/1
plants	land plants	Typhaceae	*Typha orientalis*	broad-leaved cumbungi		C		1
plants	land plants	Verbenaceae	*Lippia alba var. alba*		Y			5/5
plants	land plants	Vitaceae	*Clematicissus opaca*			C		5/1
plants	land plants	Xanthorrhoeaceae	*Xanthorrhoea johnsonii*			SL		1
plants	land plants	Zamiaceae	*Macrozamia platyrhachis*			E	E	6/6
plants	land plants	Zygophyllaceae	*Tribulus eichlerianus*	bull head		C		3
plants	uncertain	Indet.	*Indet.*			C		5

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.



Vegetation management report

For Lot: 71 Plan: SP259121
12/05/2025

nrmmrrd.qld.gov.au

Queensland Government

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Recent changes

Updated mapping

Updated vegetation mapping was released on 22 November 2023 and includes the most recent Queensland Herbarium scientific updates to the Regulated Vegetation Management Map, regional ecosystems, essential habitat, wetland and high-value regrowth mapping.

The Department of the Environment, Tourism, Science and Innovation have also updated their koala protection mapping to align with the Queensland Herbarium scientific updates.

The latest version (v10) of the Protected Plants Flora Survey Trigger Map (trigger map) was released on 6 September 2023.

Overview

Based on the lot on plan details you have supplied, this report provides the following detailed information:
Property details - information about the specified Lot on Plan, lot size, local government area, bioregion(s), subregion(s) and catchment(s);

Vegetation management framework - an explanation of the application of the framework and contact details for the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development who administer the framework;

Vegetation management framework details for the specified Lot on Plan including:

- the vegetation management categories on the property;
- the vegetation management regional ecosystems on the property;
- vegetation management watercourses or drainage features on the property;
- vegetation management wetlands on the property;
- vegetation management essential habitat on the property;
- whether any area management plans are associated with the property;
- whether the property is coastal or non-coastal; and
- whether the property is mapped as Agricultural Land Class A or B;

Protected plant framework - an explanation of the application of the framework and contact details for the Department of the Environment, Tourism, Science and Innovation who administer the framework, including:

- high risk areas on the protected plant flora survey trigger map for the property;

Koala protection framework - an explanation of the application of the framework and contact details for the Department of the Environment, Tourism, Science and Innovation who administer the framework; and

Koala protection framework details for the specified Lot on Plan including:

- the koala district the property is located in;
- koala priority areas on the property;
- core and locally refined koala habitat areas on the property;
- whether the lot is located in an identified koala broad-hectare area; and
- koala habitat regional ecosystems on the property for core koala habitat areas.

This information will assist you to determine your options for managing vegetation under:
- the vegetation management framework, which may include:

- exempt clearing work;
- accepted development vegetation clearing code;
- an area management plan;
- a development approval;

- the protected plant framework, which may include:

- the need to undertake a flora survey;
- exempt clearing;
- a protected plant clearing permit;

- the koala protection framework, which may include:

- exempted development;
- a development approval;
- the need to undertake clearing sequentially and in the presence of a koala spotter.

Other laws

The clearing of native vegetation is regulated by both Queensland and Australian legislation, and some local governments also regulate native vegetation clearing. You may need to obtain an approval or permit under another Act, such as the Commonwealth Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Section 8 of this guide provides contact details of other agencies you should confirm requirements with, before commencing vegetation clearing.

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1. Property details

1.1 Tenure and title area

All of the lot, plan, tenure and title area information associated with property Lot: 71 Plan: SP259121 are listed in Table 1.

Table 1: Lot, plan, tenure and title area information for the property

Lot	Plan	Tenure	Property title area (sq metres)
A	HT301	Easement	496,250
A	HT456	Easement	301,400
H	HT457	Easement	148,900
F	HT381	Easement	279,000
G	HT412	Easement	104,300
71	SP259121	Freehold	37,045,930
D	HT456	Easement	149,400
C	HT456	Easement	3,103
B	HT456	Easement	89,150

The tenure of the land may affect whether clearing is considered exempt clearing work or may be carried out under an accepted development vegetation clearing code.

Does the property Lot: 71 Plan: SP259121 have a freehold tenure and is in the Wet Tropics of Queensland World Heritage Area?

No, this property is not located in the Wet Tropics of Queensland World Heritage Area.

1.2 Property location

Table 2 provides a summary of the locations for property Lot: 71 Plan: SP259121, in relation to natural and administrative boundaries.

Table 2: Property location details

Local Government(s)	Catchment(s)	Bioregion(s)	Subregion(s)
Central Highlands Regional	Fitzroy	Brigalow Belt	Isaac - Comet Downs

2. Vegetation management framework (administered by the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development)

The *Vegetation Management Act 1999* (VMA), the Vegetation Management Regulation 2023, the *Planning Act 2016* and the Planning Regulation 2017, in conjunction with associated policies and codes, form the Vegetation Management Framework.

The VMA does not apply to all land tenures or vegetation types. State forests, national parks, forest reserves and some tenures under the *Forestry Act 1959* and *Nature Conservation Act 1992* are not regulated by the VMA. Managing or clearing vegetation on these tenures may require approvals under these laws.

The following native vegetation is not regulated under the VMA but may require permit(s) under other laws:

- grass or non-woody herbage;
- a plant within a grassland regional ecosystem identified in the Vegetation Management Regional Ecosystem Description Database (VM REDD) as having a grassland structure; and
- a mangrove.

2.1 Exempt clearing work

Exempt clearing work is an activity for which you do not need to notify the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development or obtain an approval under the vegetation management framework. Exempt clearing work was previously known as exemptions.

In areas that are mapped as Category X (white in colour) on the regulated vegetation management map (see section 4.1), and where the land tenure is freehold, indigenous land and leasehold land for agriculture and grazing purposes, the clearing of vegetation is considered exempt clearing work and does not require notification or development approval under the vegetation management framework. For all other land tenures, contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development before commencing clearing to ensure that the proposed activity is exempt clearing work.

A range of routine property management activities are considered exempt clearing work. A list of exempt clearing work is available at

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/exemptions/.

Exempt clearing work may be affected if the proposed clearing area is subject to development approval conditions, a covenant, an environmental offset, an exchange area, a restoration notice, or an area mapped as Category A. Exempt clearing work may require approval under other Commonwealth, State or Local Government laws, or local government planning schemes. Contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development prior to clearing in any of these areas.

2.2 Accepted development vegetation clearing codes

Some clearing activities can be undertaken under an accepted development vegetation clearing code. The codes can be downloaded at

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/codes/

If you intend to clear vegetation under an accepted development vegetation clearing code, you must notify the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development before commencing. The information in this report will assist you to complete the online notification form.

You can complete the online form at
https://vegetation-apps.dnrm.qld.gov.au

2.3 Area management plans

Area Management Plans (AMP) provide an alternative approval system for vegetation clearing under the vegetation management framework. They list the purposes and clearing conditions that have been approved for the areas covered by the plan. It is not necessary to use an AMP, even when an AMP applies to your property.

On 8 March 2020, AMPs ended for fodder harvesting, managing thickened vegetation and managing encroachment. New notifications cannot be made for these AMPs. You will need to consider options for fodder harvesting, managing thickened vegetation or encroachment under a relevant accepted development vegetation clearing code or apply for a development approval.

New notifications can be made for all other AMPs. These will continue to apply until their nominated end date.

If an Area Management Plan applies to your property for which you can make a new notification, it will be listed in Section 3.6 of this report. Before clearing under one of these AMPs, you must first notify the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development and then follow the conditions and requirements listed in the AMP.

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/area-management-plans

2.4 Development approvals

If under the vegetation management framework your proposed clearing is not exempt clearing work, or is not permitted under an accepted development vegetation clearing code, or an AMP, you may be able to apply for a development approval. Information on how to apply for a development approval is available at

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/development

2.5. Contact information for the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development

For further information on the vegetation management framework:

Phone 135VEG (135 834)

Email vegetation@resources.qld.gov.au

Visit https://www.resources.qld.gov.au/?contact=vegetation to submit an online enquiry.

3. Vegetation management framework for Lot: 71 Plan: SP259121

3.1 Vegetation categories

The vegetation categories on your property are shown on the regulated vegetation management map in section 4.1 of this report. A summary of vegetation categories on the subject lot are listed in Table 3. Descriptions for these categories are shown in Table 4.

Table 3: Vegetation categories for subject property

Vegetation category	Area (ha)
Category B	26.96
Category R	0.69
Category X	3,662.30

Table 4: Description of vegetation categories

Category	Colour on Map	Description	Requirements / options under the vegetation management framework
A	red	Compliance areas, environmental offset areas and voluntary declaration areas	Special conditions apply to Category A areas. Before clearing, contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development to confirm any requirements in a Category A area.
B	dark blue	Remnant vegetation areas	Exempt clearing work, or notification and compliance with accepted development vegetation clearing codes, area management plans or development approval.
C	light blue	High-value regrowth areas	Exempt clearing work, or notification and compliance with managing Category C regrowth vegetation accepted development vegetation clearing code.
R	yellow	Regrowth within 50m of a watercourse or drainage feature in the Great Barrier Reef catchment areas	Exempt clearing work, or notification and compliance with managing Category R regrowth accepted development vegetation clearing code or area management plans.
X	white	Clearing on freehold land, indigenous land and leasehold land for agriculture and grazing purposes is considered exempt clearing work under the vegetation management framework. Contact the Department to clarify whether a development approval is required for other State land tenures.	No permit or notification required on freehold land, indigenous land and leasehold land for agriculture and grazing. A development approval may be required for some State land tenures.

Property Map of Assessable Vegetation (PMAV)

The following Property Map of Assessable Vegetation (PMAVs) may be present on this property.
Reference number:

2007/000524

2008/008489

2009/006406

3.2 Regional ecosystems

The endangered, of concern and least concern regional ecosystems on your property are shown on the vegetation management supporting map in section 4.2 and are listed in Table 5.

A description of regional ecosystems can be accessed online at
https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/descriptions/

Table 5: Regional ecosystems present on subject property

Regional Ecosystem	VMA Status	Category	Area (Ha)	Short Description	Structure Category
11.3.1	Endangered	B	1.35	Acacia harpophylla and/or Casuarina cristata open forest on alluvial plains	Mid-dense
11.3.1	Endangered	R	0.02	Acacia harpophylla and/or Casuarina cristata open forest on alluvial plains	Mid-dense
11.3.2	Of concern	B	13.48	Eucalyptus populnea woodland on alluvial plains	Sparse
11.3.2	Of concern	R	less than 0.01	Eucalyptus populnea woodland on alluvial plains	Sparse
11.3.25	Least concern	B	12.13	Eucalyptus tereticornis or E. camaldulensis woodland fringing drainage lines	Sparse
11.3.25	Least concern	R	less than 0.01	Eucalyptus tereticornis or E. camaldulensis woodland fringing drainage lines	Sparse
11.4.9	Endangered	R	0.66	Acacia harpophylla shrubby woodland with Terminalia oblongata on Cainozoic clay plains	Sparse
non-rem	None	X	3,662.30	None	None

Please note:
1. All area and area derived figures included in this table have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.
2. If Table 5 contains a Category 'plant', please be aware that this refers to 'plantations' such as forestry, and these areas are considered non-remnant under the VMA.

The VMA status of the regional ecosystem (whether it is endangered, of concern or least concern) also determines if any of the following are applicable:

- exempt clearing work;
- accepted development vegetation clearing codes;
- performance outcomes in State Code 16 of the State Development Assessment Provisions (SDAP).

3.3 Watercourses

Vegetation management watercourses and drainage features for this property are shown on the vegetation management supporting map in section 4.2.

3.4 Wetlands

There are no vegetation management wetlands present on this property.

3.5 Essential habitat

Under the VMA, essential habitat for protected wildlife is native wildlife prescribed under the *Nature Conservation Act 1992* (NCA) as critically endangered, endangered, vulnerable or near-threatened wildlife.

Essential habitat for protected wildlife includes suitable habitat on the lot, or where a species has been known to occur up to 1.1 kilometres from a lot on which there is assessable vegetation. These important habitat areas are protected under the VMA.

Any essential habitat on this property will be shown as blue hatching on the vegetation supporting map in section 4.2.

If essential habitat is identified on the lot, information about the protected wildlife species is provided in Table 6 below. The numeric labels on the vegetation management supporting map can be cross referenced with Table 6 to outline the essential habitat factors for that particular species. There may be essential habitat for more than one species on each lot, and areas of Category A, Category B and Category C can be mapped as Essential Habitat.

Essential habitat is compiled from a combination of species habitat models and buffered species records. Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated. Essential habitat, for protected wildlife, means an area of vegetation shown on the Regulated Vegetation Management Map -

1) that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database. Essential habitat factors are comprised of - regional ecosystem (mandatory for most species), vegetation community, altitude, soils, position in landscape; or
2) in which the protected wildlife, at any stage of its life cycle, is located.

If there is no essential habitat mapping shown on the vegetation management supporting map for this lot, and there is no table in the sections below, it confirms that there is no essential habitat on the lot.

Category A and/or Category B and/or Category C

Table 6: Essential habitat in Category A and/or Category B and/or Category C

Label	Scientific Name	Common Name	NCA Status	Vegetation Community	Altitude	Soils	Position in Landscape
483	Denisonia maculata	ornamental snake	V	Riparian woodland/open forest and shrub/woodland including Brigalow Acacia harpophylla; into drier habitats in summer.	100-450m.	Cracking clay with gilgai/soil crack microrelief and sandy loam substrates.	Near freshwater waterholes/creeks and low lying poorly drained areas that are frequently inundated by freshwater.

Label	Regional Ecosystem (mandatory unless otherwise specified)
483	10.3.2, 10.3.3, 10.3.4, 10.3.7, 10.3.13, 10.3.14, 10.3.15, 10.3.16, 10.3.27, 10.3.30, 10.3.31, 10.4.1, 10.4.2, 10.4.3, 10.4.4, 10.4.5, 10.4.6, 10.4.7, 10.4.8, 10.5.5, 10.9.1. 10.9.6. 10.9.7, 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.6, 11.3.9, 11.3.10, 11.3.12, 11.3.15, 11.3.21, 11.3.23, 11.3.24, 11.3.25, 11.3.27, 11.3.28, 11.3.31, 11.3.34, 11.3.37, 11.3.38, 11.3.40, 11.4.2, 11.4.3, 11.4.4, 11.4.6, 11.4.7, 11.4.8, 11.4.9, 11.4.11, 11.5.2, 11.5.3, 11.5.16, 11.8.11, 11.9.1, 11.9.2, 11.9.3, 11.9.5, 11.9.7, 11.9.11, 11.9.12, 11.9.14, 11.11.15, 11.12.6

3.6 Area Management Plan(s)

Nil

3.7 Coastal or non-coastal

For the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP), this property is regarded as*

Non Coastal

*See also Map 4.3

3.8 Agricultural Land Class A or B

The following can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code:

Does this lot contain land that is mapped as Agricultural Land Class A or B in the State Planning Interactive Mapping System?

No Class A

No Class B

Note - This confirms Agricultural Land Classes as per the State Planning Interactive Mapping System only. This response does not include Agricultural Land Classes identified under local government planning schemes. For further information, check the Planning Scheme for your local government area.

See Map 4.4 to identify the location and extent of Class A and/or Class B Agricultural land on Lot: 71 Plan: SP259121.

4. Vegetation management framework maps

Vegetation management maps included in this report may also be requested individually at:
https://www.qld.gov.au/environment/land/management/vegetation/maps/map-request

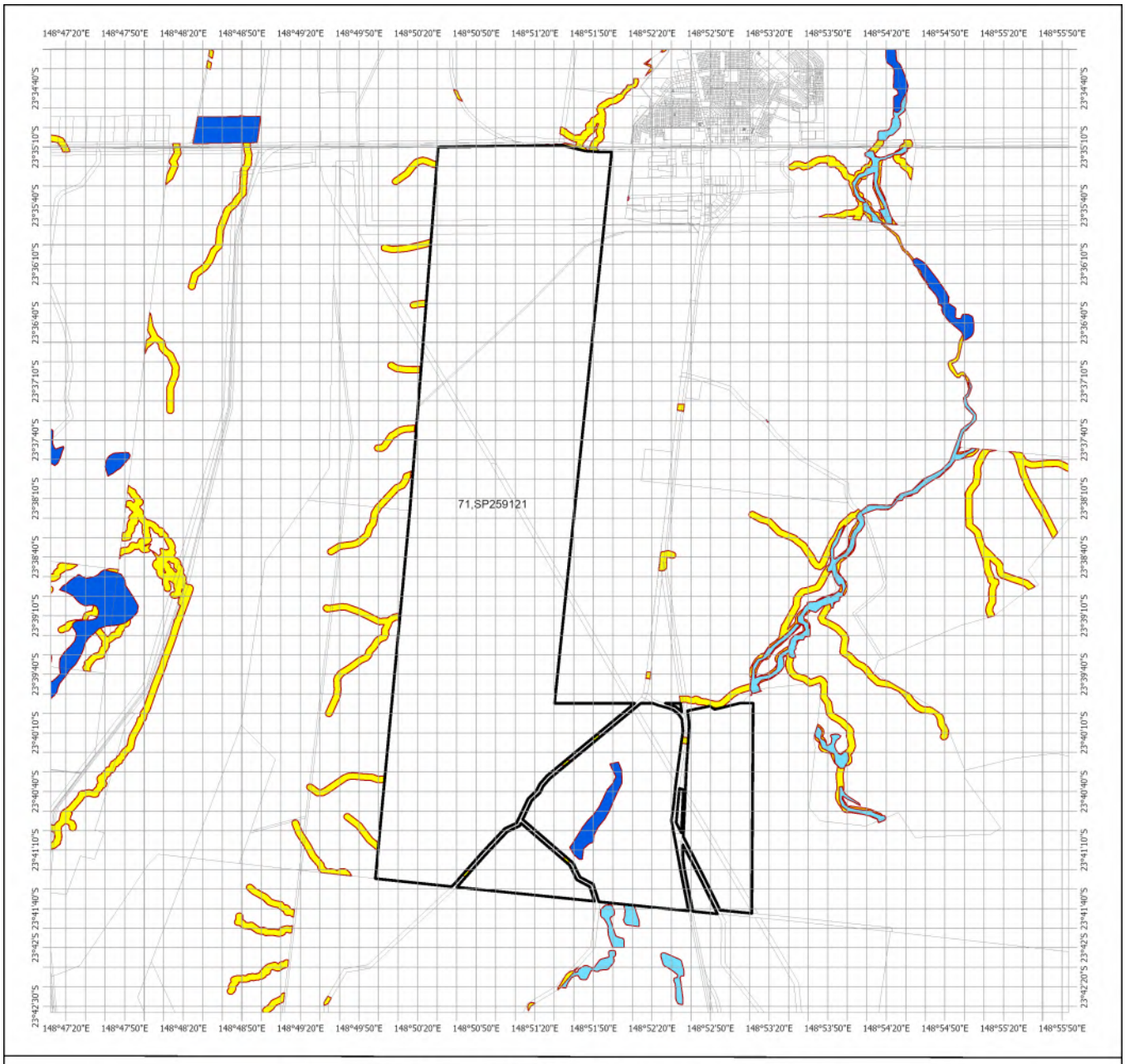
Regulated vegetation management map
The regulated vegetation management map shows vegetation categories needed to determine clearing requirements. These maps are updated monthly to show new property maps of assessable vegetation (PMAV).

Vegetation management supporting map
The vegetation management supporting map provides information on regional ecosystems, wetlands, watercourses and essential habitat.

Coastal/non-coastal map
The coastal/non-coastal map confirms whether the lot, or which parts of the lot, are considered coastal or non-coastal for the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP).

Agricultural Land Class A or B as per State Planning Policy: State Interest for Agriculture
The Agricultural Land Class map confirms the location and extent of land mapped as Agricultural Land Classes A or B as identified on the State Planning Interactive Mapping System. Please note that this map does not include areas identified as Agricultural Land Class A or B in local government planning schemes. This map can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code.

4.1 Regulated vegetation management map



Regulated Vegetation Management Map

Queensland Government

Category A area (Vegetation offsets/compliance notices/VDecs)
Category B area (Remnant vegetation)
Category C area (High-value regrowth vegetation)
Category R area (Reef regrowth watercourse vegetation)
Category X area (Exempt clearing work on Freehold, Indigenous and Leasehold land)
Water
Other land parcel boundaries
Selected Lot and Plan

LOCALITY DIAGRAM



N

0 870 1,740 2,610 3,480 4,350 m

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Additional information required for the assessment of vegetation values is provided in the accompanying "Vegetation Management Supporting map". For further information go to the web site: www.nrmmrrd.qld.gov.au or contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development.

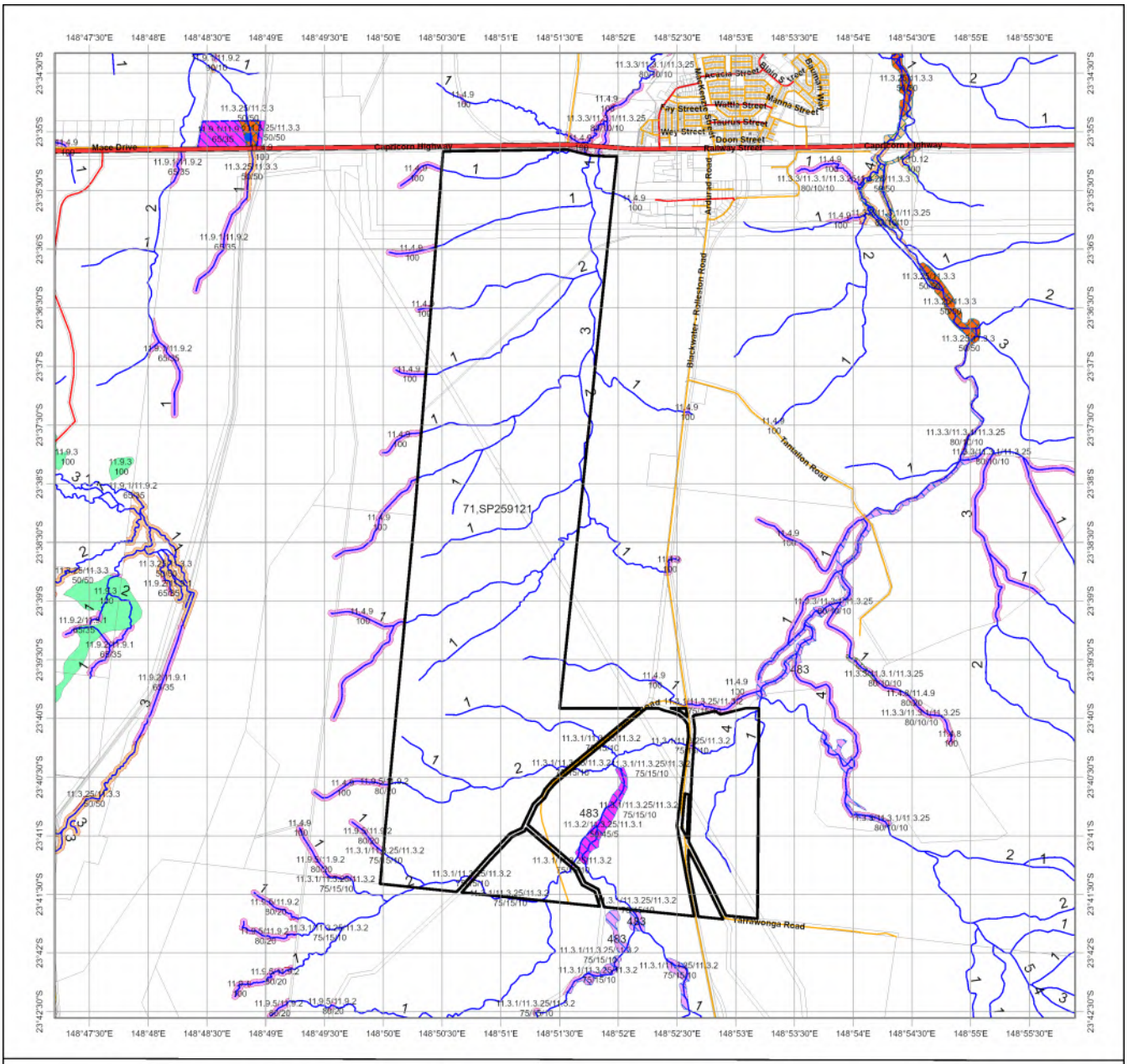
Digital data for the regulated vegetation management map is available from the Queensland Spatial Portal at http://www.spatial.information.qld.gov.au/

Land parcel boundaries are provided as locational aid only.

This map is updated on a monthly basis to ensure new PMAVs are included as they are approved.

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4.2 Vegetation management supporting map



Vegetation Management Supporting Map

- 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
- Category X area
- Water
- Wetland on the vegetation management wetlands map
- Essential habitat on the essential habitat map
- Essential habitat species record
- Watercourses and drainage features on the vegetation management watercourse and drainage features map (Stream order shown as black number against stream where available)
- Highway
- Connector
- Street/Local Road
- National Parks, State Forest and other reserves
- Other land parcel boundaries
- Selected Lot and Plan

Queensland Government

LOCALITY DIAGRAM



N

0 625 1,250 1,875 2,500 3,125 m

This product is displayed in: GDA2020

Labels for Essential Habitat are centred on the area of enquiry.

Regional ecosystem linework has been compiled at a scale of 1:100 000, except in designated areas where a compilation scale of 1:50 000 is available. Linework should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100 000 is +/- 100 metres.

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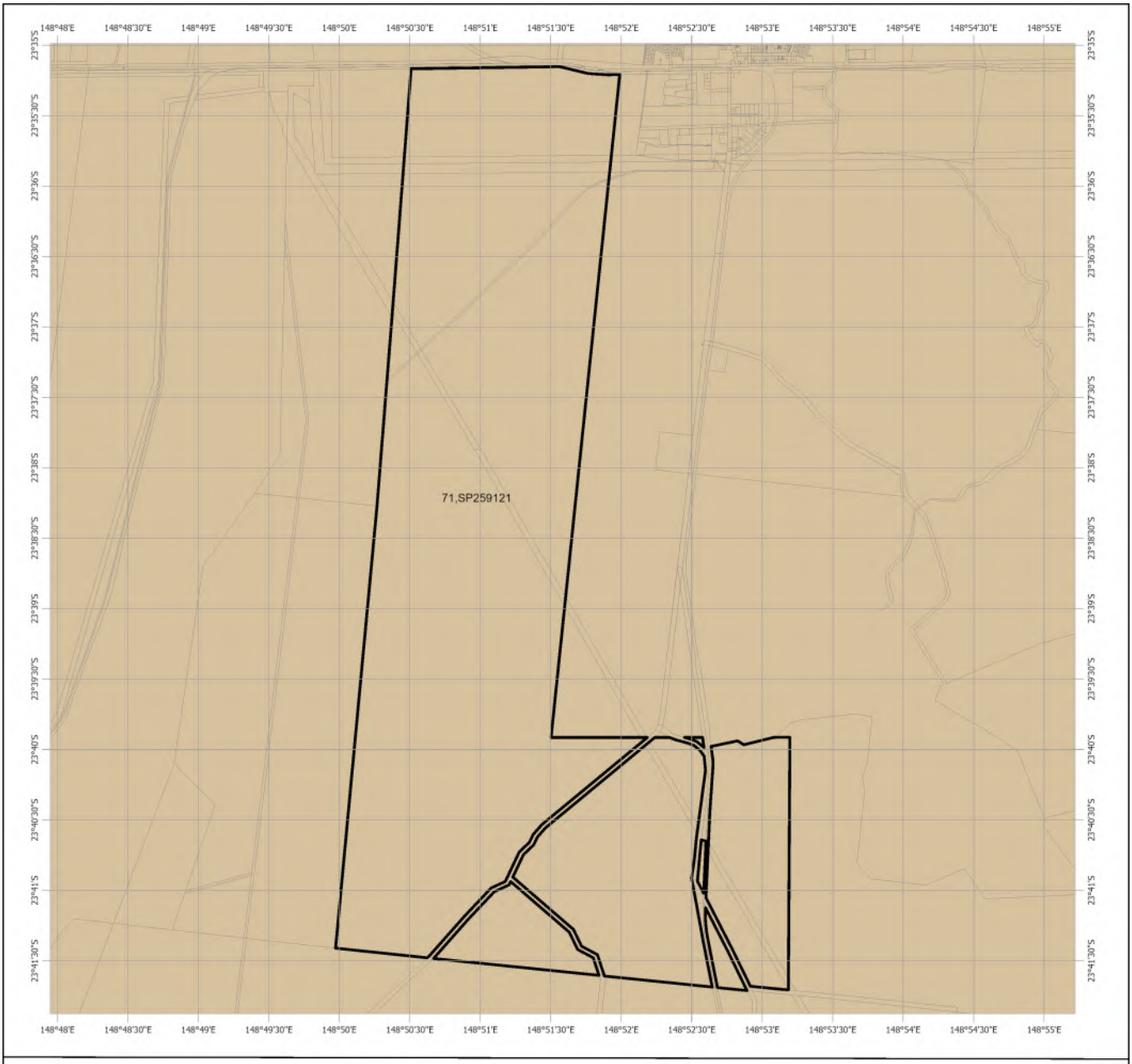
Additional information may be required for the purposes of land clearing or assessment of a regional ecosystem map or PMAV applications. For further information go to the web site: www.nrmmrrd.qld.gov.au or contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development.

Digital data for the vegetation management watercourse and drainage feature map, vegetation management wetlands map, essential habitat map and the vegetation management remnant and regional ecosystem map are available from the Queensland Spatial Portal at http://www.spatial.information.qld.gov.au/

Land parcel boundaries are provided as locational aid only.

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4.3 Coastal/non-coastal map



Coastal/Non Coastal Map

Coastal
Non Coastal
Other land parcel boundaries
Selected Lot and Plan

LOCALITY DIAGRAM



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N

0 730 1,460 2,190 2,920 3,650 m

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GDA2020

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4.4 Agricultural Land Class A or B as per State Planning Policy: State Interest for Agriculture



Agricultural Land Class A or B
as per State Planning Policy: State Interest for Agriculture

- Towns
- Rivers and creeks
- Freeways / motorways; Highways
- Secondary roads; Streets

Agricultural land class A or B

- A
- B
- Not class A or B
- Selected Lot and Plan

LOCALITY DIAGRAM



N

0 730 1460 2190 2920 3650 m

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5. Protected plants framework (administered by the Department of the Environment, Tourism, Science and Innovation (DETSI))

In Queensland, all plants that are native to Australia are protected plants under the *Nature Conservation Act 1992* (NCA). The NCA regulates the clearing of protected plants 'in the wild' (see Operational policy: When a protected plant in Queensland is considered to be 'in the wild') that are listed as critically endangered, endangered, vulnerable or near threatened under the Act.

Please note that the protected plant clearing framework applies irrespective of the classification of the vegetation under the *Vegetation Management Act 1999* and any approval or exemptions given under another Act, for example, the *Vegetation Management Act 1999* or *Planning Regulation 2017*.

5.1 Clearing in high risk areas on the flora survey trigger map

The flora survey trigger map identifies high-risk areas for threatened and near threatened plants. These are areas where threatened or near threatened plants are known to exist or are likely to exist based on the habitat present. The flora survey trigger map for this property is provided in section 5.5.

If you are proposing to clear an area shown as high risk on the flora survey trigger map, a flora survey of the clearing impact area must be undertaken by a suitably qualified person in accordance with the Flora survey guidelines. The main objective of a flora survey is to locate any threatened or near threatened plants that may be present in the clearing impact area.

If the flora survey identifies that threatened or near threatened plants are not present within the clearing impact area or clearing within 100m of Endangered, Vulnerable, Near-Threatened (EVNT) plants can be avoided, the clearing activity is exempt from a permit. An exempt clearing notification form must be submitted to the Department of the Environment, Tourism, Science and Innovation, with a copy of the flora survey report, at least one week prior to clearing.

If the flora survey identifies that threatened or near threatened plants are present in, or within 100m of, the area to be cleared, a clearing permit is required before any clearing is undertaken. The flora survey report, as well as an impact management report, must be submitted with the clearing permit application form.

5.2 Clearing outside high risk areas on the flora survey trigger map

In an area other than a high risk area, a clearing permit is only required where a person is, or becomes aware that threatened or near threatened plantsare present in, or within 100m of, the area to be cleared. You must keep a copy of the flora survey trigger map for the area subject to clearing for five years from the day the clearing starts. If you do not clear within the 12 month period that the flora survey trigger map was printed, you need to print and check a new flora survey trigger map.

5.3 Exemptions

Many activities are 'exempt' under the protected plant clearing framework, which means that clearing of native plants that are in the wild can be undertaken for these activities with no need for a flora survey or a protected plant clearing permit. The Information sheet - General exemptions for the take of protected plants provides some of these exemptions.

Some exemptions under the NCA are the same as exempt clearing work (formerly known as exemptions) under the *Vegetation Management Act 1999* (i.e. listed in Schedule 21 of the Planning Regulations 2017) while some are different.

5.4 Contact information for DETSI

For further information on the protected plants framework:
Phone 1300 130 372 (and select option four)
Email palm@des.qld.gov.au
Visit https://www.qld.gov.au/environment/plants-animals/plants/protected-plants

5.5 Protected plants flora survey trigger map

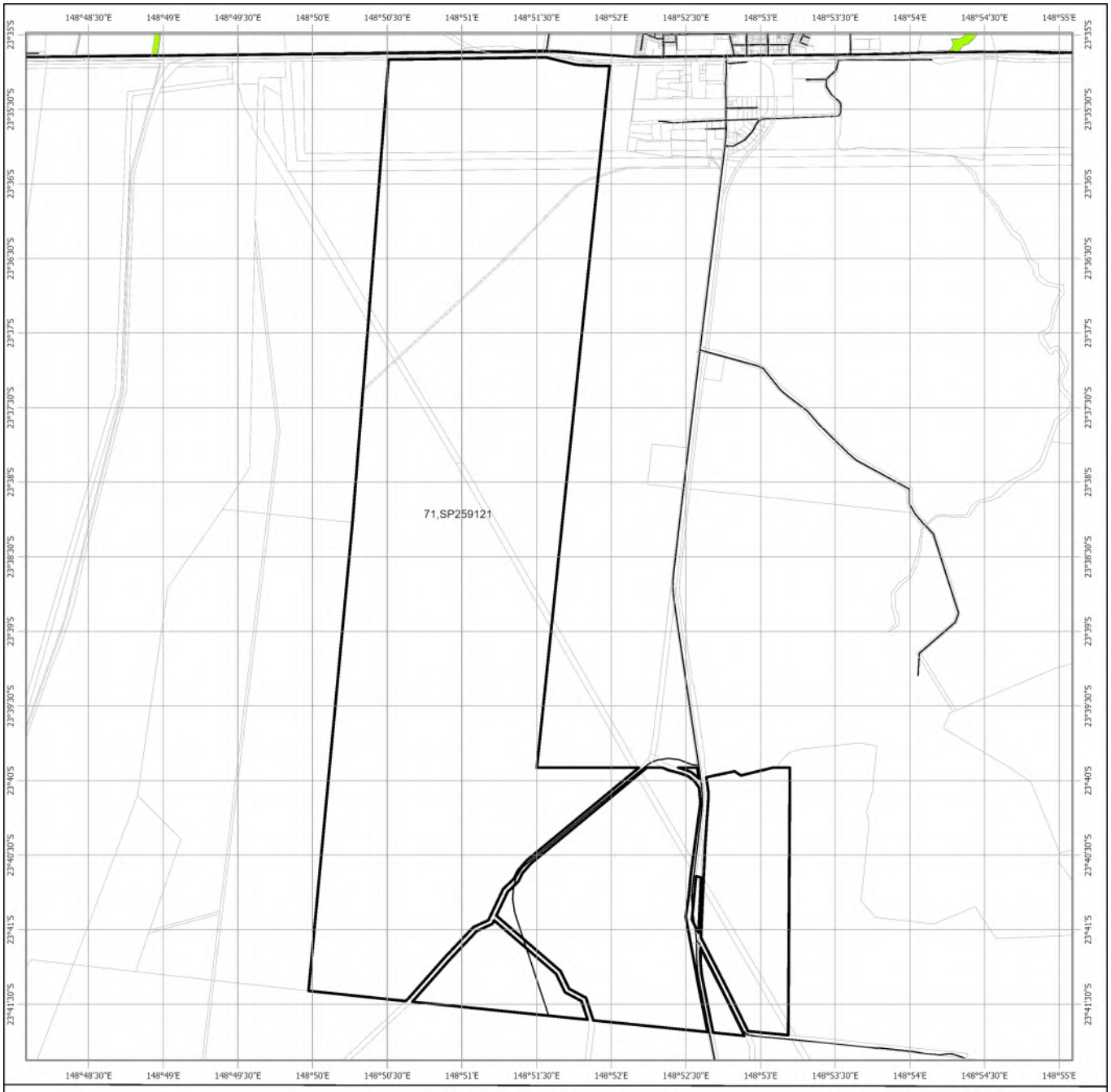
This map included may also be requested individually at: https://apps.des.qld.gov.au/map-request/flora-survey-trigger/.

Updates to the data informing the flora survey trigger map

The flora survey trigger map will be reviewed, and updated if necessary, at least every 12 months to ensure the map reflects the most up-to-date and accurate data available.

Species information

Please note that flora survey trigger maps do not identify species associated with 'high risk areas'. While some species information may be publicly available, for example via the Queensland Spatial Catalogue, the Department of the Environment, Tourism, Science and Innovation does not provide species information on request. Regardless of whether species information is available for a particular high risk area, clearing plants in a high risk area may require a flora survey and/or clearing permit. Please see the Department of the Environment, Tourism, Science and Innovation webpage on the clearing of protected plants for more information.



Protected Plants Flora Survey Trigger Map

High risk area
Other land parcel boundaries
Freeways / motorways / highways
Secondary roads / streets
Selected Lot and Plan

LOCALITY DIAGRAM



N

0 480 960 1,440 1,920 2,400 m

This product is displayed in:
GDA2020

This map shows areas where particular provisions of the Nature Conservation Act 1992 apply to the clearing of protected plants.

Land parcel boundaries are provided as locational aid only.

This map is produced at a scale relevant to the size of the area selected and should be printed as A4 size in portrait orientation.

For further information or assistance with interpretation of this product, please contact the Department of the Environment, Tourism, Science and Innovation at palm@des.qld.gov.au

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6. Koala protection framework (administered by the Department of the Environment, Tourism, Science and Innovation (DETSI))

The koala (*Phascolarctos cinereus*) is listed in Queensland as endangered by the Queensland Government under *Nature Conservation Act 1992* and by the Australian Government under the *Environment Protection and Biodiversity Conservation Act 1999*.

The Queensland Government's koala protection framework is comprised of the *Nature Conservation Act 1992*, the Nature Conservation (Animals) Regulation 2020, the Nature Conservation (Koala) Conservation Plan 2017, the *Planning Act 2016* and the Planning Regulation 2017.

6.1 Koala mapping

6.1.1 Koala districts

The parts of Queensland where koalas are known to occur has been divided into three koala districts - koala district A, koala district B and koala district C. Each koala district is made up of areas with comparable koala populations (e.g. density, extent and significance of threatening processes affecting the population) which require similar management regimes.

Section 7.1 identifies which koala district your property is located in.

6.1.2 Koala habitat areas

Koala habitat areas are areas of vegetation that have been determined to contain koala habitat that is essential for the conservation of a viable koala population in the wild based on the combination of habitat suitability and biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water). In order to protect this important koala habitat, clearing controls have been introduced into the Planning Regulation 2017 for development in koala habitat areas.

Please note that koala habitat areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley, Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

There are two different categories of koala habitat area (core koala habitat area and locally refined koala habitat), which have been determined using two different methodologies. These methodologies are described in the document Spatial modelling in South East Queensland.

Section 7.2 shows any koala habitat area that exists on your property.

Under the Nature Conservation (Koala) Conservation Plan 2017, an owner of land (or a person acting on the owner's behalf with written consent) can request to make, amend or revoke a koala habitat area determination if they believe, on reasonable grounds, that the existing determination for all or part of their property is incorrect.

More information on requests to make, amend or revoke a koala habitat area determination can be found in the document Guideline - Requests to make, amend or revoke a koala habitat area determination.

The koala habitat area map will be updated at least annually to include any koala habitat areas that have been made, amended or revoked.

Changes to the koala habitat area map which occur between annual updates because of a request to make, amend or revoke a koala habitat area determination can be viewed on the register of approved requests to make, amend or revoke a koala habitat area available at: https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/koalamaps. The register includes the lot on plan for the change, the date the decision was made and the map issued to the landholder that shows areas determined to be koala habitat areas.

6.1.3 Koala priority areas

Koala priority areas are large, connected areas that have been determined to have the highest likelihood of achieving conservation outcomes for koalas based on the combination of habitat suitability, biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water) and a koala conservation cost benefit analysis.

Conservation efforts will be prioritised in these areas to ensure the conservation of viable koala populations in the wild including a focus on management (e.g. habitat protection, habitat restoration and threat mitigation) and monitoring. This includes a prohibition on clearing in koala habitat areas that are in koala priority areas under the Planning Regulation 2017 (subject to some exemptions).

Please note that koala priority areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley, Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

Section 7.2 identifies if your property is in a koala priority area.

6.1.4 Identified koala broad-hectare areas

There are seven identified koala broad-hectare areas in SEQ. These are areas of koala habitat that are located in areas committed to meet development targets in the SEQ Regional Plan to accommodate SEQ's growing population including bring-forward Greenfield sites under the Queensland Housing Affordability Strategy and declared master planned areas under the repealed *Sustainable Planning Act 2009* and the repealed *Integrated Planning Act 1997*.

Specific assessment benchmarks apply to development applications for development proposed in identified koala broad-hectare areas to ensure koala conservation measures are incorporated into the proposed development.

Section 7.2 identifies if your property is in an identified koala broad-hectare area.

6.2 Koala habitat planning controls

On 7 February 2020, the Queensland Government introduced new planning controls to the Planning Regulation 2017 to strengthen the protection of koala habitat in South East Queensland (i.e. koala district A).

More information on these planning controls can be found here:
https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy.

As a high-level summary, the koala habitat planning controls make:

- development that involves interfering with koala habitat (defined below) in an area that is both a koala priority area and a koala habitat area, prohibited development (i.e. development for which a development application cannot be made);
- development that involves interfering with koala habitat (defined below) in an area that is a koala habitat area but is not a koala priority area, assessable development (i.e. development for which development approval is required); and
- development that is for extractive industries where the development involves interfering with koala habitat (defined below) in an area that is both a koala habitat area and a key resource area, assessable development (i.e. development for which development approval is required).

Interfering with koala habitat means:

1. Removing, cutting down, ringbarking, pushing over, poisoning or destroying in anyway, including by burning, flooding or draining native vegetation in a koala habitat area; but
2. Does not include destroying standing vegetation stock or lopping a tree.

However, these planning controls do not apply if the development is exempted development as defined in Schedule 24 of the Planning Regulation 2017. More information on exempted development can be found here:
https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy.

There are also assessment benchmarks that apply to development applications for:

- building works, operational works, material change of use or reconfiguration of a lot where:

  - the local government planning scheme makes the development assessable;
  - the premises includes an area that is both a koala priority area and a koala habitat area; and
  - the development does not involve interfering with koala habitat (defined above); and

- development in identified koala broad-hectare areas.

The Guideline - Assessment Benchmarks in relation to Koala Habitat in South East Queensland assessment benchmarks outlines these assessment benchmarks, the intent of these assessment benchmarks and advice on how proposed development may meet these assessment benchmarks.

6.3 Koala Conservation Plan clearing requirements

Section 10 and 11 of the Nature Conservation (Koala) Conservation Plan 2017 prescribes requirements that must be met when clearing koala habitat in koala district A and koala district B.

These clearing requirements are independent to the koala habitat planning controls introduced into the Planning Regulation 2017, which means they must be complied with irrespective of any approvals or exemptions offered under other legislation.

Unlike the clearing controls prescribed in the Planning Regulation 2017 that are to protect koala habitat, the clearing requirements prescribed in the Nature Conservation (Koala) Conservation Plan 2017 are in place to prevent the injury or death of koalas when koala habitat is being cleared.

6.4 Contact information for DETSI

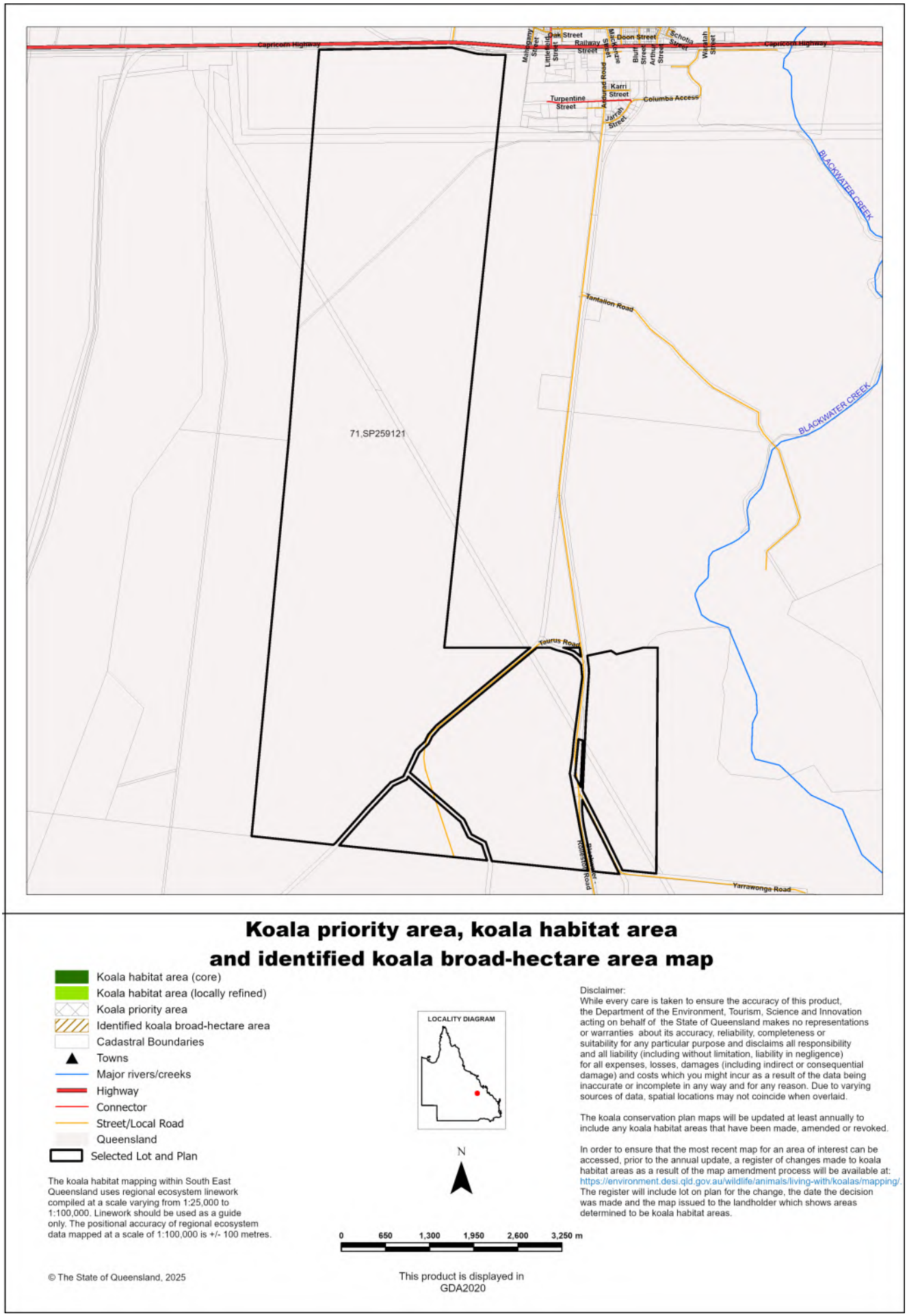
For further information on the koala protection framework:
Phone 13 QGOV (13 74 68)
Email koala.assessment@detsi.qld.gov.au
Visit https://environment.desi.qld.gov.au/wildlife/animals/living-with/koalas/mapping

7. Koala protection framework details for Lot: 71 Plan: SP259121

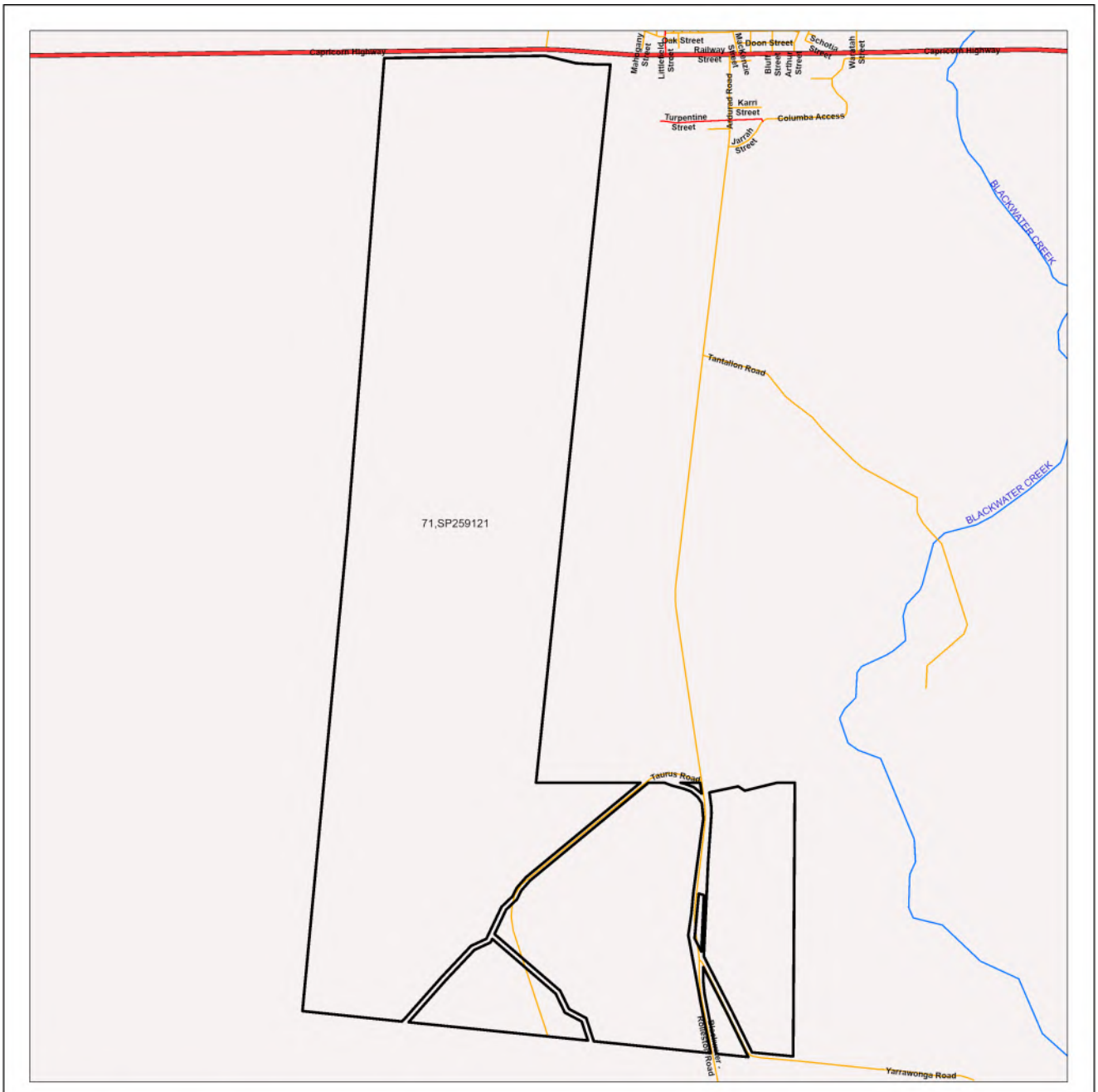
7.1 Koala districts

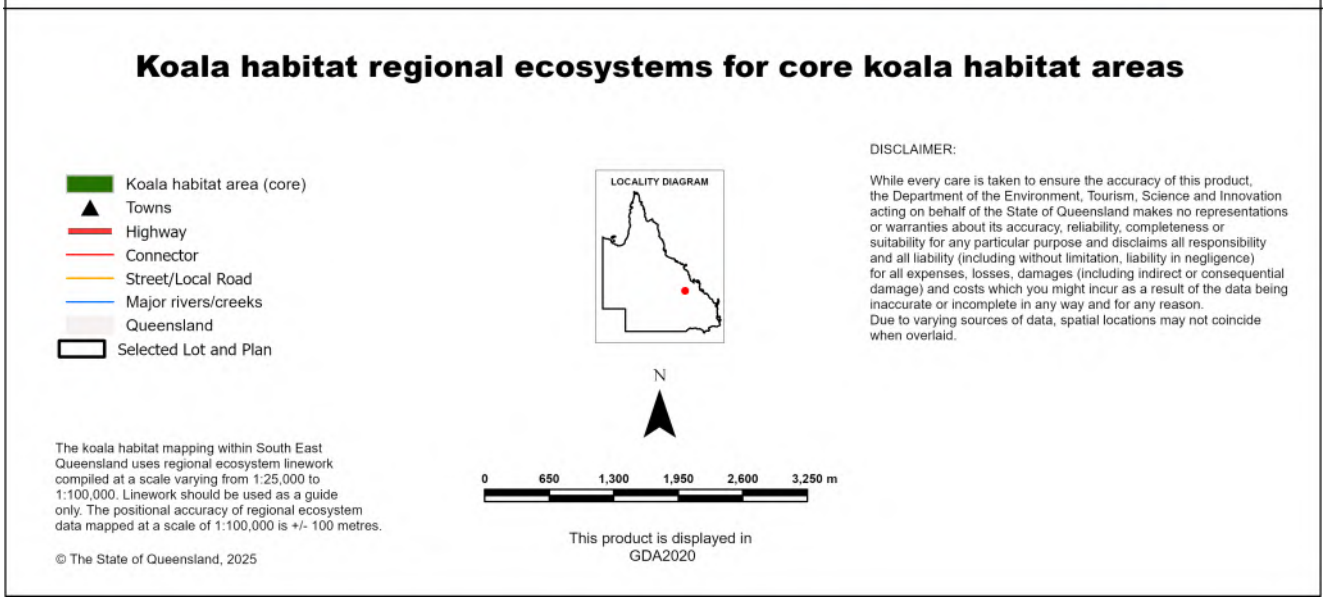
Koala District C

7.2 Koala priority area, koala habitat area and identified koala broad-hectare map



7.3 Koala habitat regional ecosystems for core koala habitat areas





8. Other relevant legislation contacts list

Activity	Legislation	Agency	Contact details
Interference with overland flow	*Water Act 2000*	Department of Local Government, Water and Volunteers	Ph: 13 QGOV (13 74 68) www.dlgwv.qld.gov.au
Earthworks, significant disturbance	*Soil Conservation Act 1986*	Queensland Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development	Ph: 13 QGOV (13 74 68) www.nrmmrrd.qld.gov.au
Fire Permits	*Fire and Emergency Services Act 1990*	Queensland Fire Department	Ph: 13 QGOV (13 74 68) www.fire.qld.gov.au
Indigenous Cultural Heritage	*Aboriginal Cultural Heritage Act 2003* *Torres Strait Islander Cultural Heritage Act 2003*	Queensland Department of Women, Aboriginal and Torres Strait Islander Partnerships and Multiculturalism	Ph: 13 QGOV (13 74 68) www.tatsipca.qld.gov.au
Mining and environmentally relevant activities Infrastructure development (coastal) Heritage issues	*Environmental Protection Act 1994* *Coastal Protection and Management Act 1995* *Queensland Heritage Act 1992*	Queensland Department of the Environment, Tourism, Science and Innovation	Ph: 13 QGOV (13 74 68) www.detsi.qld.gov.au
Protected plants and protected areas	*Nature Conservation Act 1992* *Planning Act 2016*	Queensland Department of the Environment, Tourism, Science and Innovation	Ph: 1300 130 372 (option 4) palm@detsi.qld.gov.au www.detsi.qld.gov.au
Koala mapping and regulations	*Nature Conservation Act 1992*	Queensland Department of the Environment, Tourism, Science and Innovation	Ph: 13 QGOV (13 74 68) Koala.assessment@detsi.qld.gov.au
Interference with fish passage in a watercourse, mangroves Forestry activities	*Fisheries Act 1994* *Forestry Act 1959*	Queensland Department of Primary Industries	Ph: 13 QGOV (13 74 68) www.daf.qld.gov.au
Matters of National Environmental Significance including listed threatened species and ecological communities	*Environment Protection and Biodiversity Conservation Act 1999*	Department of Climate Change, Energy, the Environment and Water (Australian Government)	Ph: 1800 803 772 www.dcceew.gov.au
Development and planning processes	*Planning Act 2016* *State Development and Public Works Organisation Act 1971*	Queensland Department of State Development, Infrastructure and Planning	Ph: 13 QGOV (13 74 68) www.planning.qld.gov.au
Coordinated projects	*Planning Act 2016* *State Development and Public Works Organisation Act 1971*	Office of the Coordinator-General	Ph: 13 QGOV (13 74 68) www.statedevelopment.qld.gov.au/coordinator-general
Wet Tropics World Heritage Area	*Wet Tropics World Heritage Protection and Management Act 1993*	Queensland Wet Tropics Management Authority	Ph: (07) 4241 0500 www.wettropics.gov.au
Requirements on State controlled road	*Transport Infrastructure Act 1994*	Queensland Department of Transport and Main Roads	Ph: 13 QGOV (13 74 68) https://www.tmr.qld.gov.au
Local government requirements	*Local Government Act 2009* *Planning Act 2016*	Your relevant local government office	Local Government Contact Directory



Vegetation management report

For Lot: 50 Plan: SP117237
11/04/2025

nrmmrrd.qld.gov.au

Queensland Government

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Recent changes

Updated mapping

Updated vegetation mapping was released on 22 November 2023 and includes the most recent Queensland Herbarium scientific updates to the Regulated Vegetation Management Map, regional ecosystems, essential habitat, wetland and high-value regrowth mapping.

The Department of the Environment, Tourism, Science and Innovation have also updated their koala protection mapping to align with the Queensland Herbarium scientific updates.

The latest version (v10) of the Protected Plants Flora Survey Trigger Map (trigger map) was released on 6 September 2023.

Overview

Based on the lot on plan details you have supplied, this report provides the following detailed information:
Property details - information about the specified Lot on Plan, lot size, local government area, bioregion(s), subregion(s) and catchment(s);

Vegetation management framework - an explanation of the application of the framework and contact details for the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development who administer the framework;

Vegetation management framework details for the specified Lot on Plan including:

- the vegetation management categories on the property;
- the vegetation management regional ecosystems on the property;
- vegetation management watercourses or drainage features on the property;
- vegetation management wetlands on the property;
- vegetation management essential habitat on the property;
- whether any area management plans are associated with the property;
- whether the property is coastal or non-coastal; and
- whether the property is mapped as Agricultural Land Class A or B;

Protected plant framework - an explanation of the application of the framework and contact details for the Department of the Environment, Tourism, Science and Innovation who administer the framework, including:

- high risk areas on the protected plant flora survey trigger map for the property;

Koala protection framework - an explanation of the application of the framework and contact details for the Department of the Environment, Tourism, Science and Innovation who administer the framework; and

Koala protection framework details for the specified Lot on Plan including:

- the koala district the property is located in;
- koala priority areas on the property;
- core and locally refined koala habitat areas on the property;
- whether the lot is located in an identified koala broad-hectare area; and
- koala habitat regional ecosystems on the property for core koala habitat areas.

This information will assist you to determine your options for managing vegetation under:
- the vegetation management framework, which may include:

- exempt clearing work;
- accepted development vegetation clearing code;
- an area management plan;
- a development approval;

- the protected plant framework, which may include:

- the need to undertake a flora survey;
- exempt clearing;
- a protected plant clearing permit;

- the koala protection framework, which may include:

- exempted development;
- a development approval;
- the need to undertake clearing sequentially and in the presence of a koala spotter.

Other laws

The clearing of native vegetation is regulated by both Queensland and Australian legislation, and some local governments also regulate native vegetation clearing. You may need to obtain an approval or permit under another Act, such as the Commonwealth Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Section 8 of this guide provides contact details of other agencies you should confirm requirements with, before commencing vegetation clearing.

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1. Property details

1.1 Tenure and title area

All of the lot, plan, tenure and title area information associated with property Lot: 50 Plan: SP117237 are listed in Table 1.

Table 1: Lot, plan, tenure and title area information for the property

Lot	Plan	Tenure	Property title area (sq metres)
50	SP117237	Freehold	11,100,000
E	HT444	Easement	109,800
B	HT443	Easement	174,000
C	RP619638	Easement	0

The tenure of the land may affect whether clearing is considered exempt clearing work or may be carried out under an accepted development vegetation clearing code.

Does the property Lot: 50 Plan: SP117237 have a freehold tenure and is in the Wet Tropics of Queensland World Heritage Area?

No, this property is not located in the Wet Tropics of Queensland World Heritage Area.

1.2 Property location

Table 2 provides a summary of the locations for property Lot: 50 Plan: SP117237, in relation to natural and administrative boundaries.

Table 2: Property location details

Local Government(s)	Catchment(s)	Bioregion(s)	Subregion(s)
Central Highlands Regional	Fitzroy	Brigalow Belt	Isaac - Comet Downs

2. Vegetation management framework (administered by the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development)

The *Vegetation Management Act 1999* (VMA), the Vegetation Management Regulation 2023, the *Planning Act 2016* and the Planning Regulation 2017, in conjunction with associated policies and codes, form the Vegetation Management Framework.

The VMA does not apply to all land tenures or vegetation types. State forests, national parks, forest reserves and some tenures under the *Forestry Act 1959* and *Nature Conservation Act 1992* are not regulated by the VMA. Managing or clearing vegetation on these tenures may require approvals under these laws.

The following native vegetation is not regulated under the VMA but may require permit(s) under other laws:

- grass or non-woody herbage;
- a plant within a grassland regional ecosystem identified in the Vegetation Management Regional Ecosystem Description Database (VM REDD) as having a grassland structure; and
- a mangrove.

2.1 Exempt clearing work

Exempt clearing work is an activity for which you do not need to notify the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development or obtain an approval under the vegetation management framework. Exempt clearing work was previously known as exemptions.

In areas that are mapped as Category X (white in colour) on the regulated vegetation management map (see section 4.1), and where the land tenure is freehold, indigenous land and leasehold land for agriculture and grazing purposes, the clearing of vegetation is considered exempt clearing work and does not require notification or development approval under the vegetation management framework. For all other land tenures, contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development before commencing clearing to ensure that the proposed activity is exempt clearing work.

A range of routine property management activities are considered exempt clearing work. A list of exempt clearing work is available at

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/exemptions/.

Exempt clearing work may be affected if the proposed clearing area is subject to development approval conditions, a covenant, an environmental offset, an exchange area, a restoration notice, or an area mapped as Category A. Exempt clearing work may require approval under other Commonwealth, State or Local Government laws, or local government planning schemes. Contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development prior to clearing in any of these areas.

2.2 Accepted development vegetation clearing codes

Some clearing activities can be undertaken under an accepted development vegetation clearing code. The codes can be downloaded at

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/codes/

If you intend to clear vegetation under an accepted development vegetation clearing code, you must notify the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development before commencing. The information in this report will assist you to complete the online notification form.

You can complete the online form at
https://vegetation-apps.dnrm.qld.gov.au

2.3 Area management plans

Area Management Plans (AMP) provide an alternative approval system for vegetation clearing under the vegetation management framework. They list the purposes and clearing conditions that have been approved for the areas covered by the plan. It is not necessary to use an AMP, even when an AMP applies to your property.

On 8 March 2020, AMPs ended for fodder harvesting, managing thickened vegetation and managing encroachment. New notifications cannot be made for these AMPs. You will need to consider options for fodder harvesting, managing thickened vegetation or encroachment under a relevant accepted development vegetation clearing code or apply for a development approval.

New notifications can be made for all other AMPs. These will continue to apply until their nominated end date.

If an Area Management Plan applies to your property for which you can make a new notification, it will be listed in Section 3.6 of this report. Before clearing under one of these AMPs, you must first notify the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development and then follow the conditions and requirements listed in the AMP.

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/area-management-plans

2.4 Development approvals

If under the vegetation management framework your proposed clearing is not exempt clearing work, or is not permitted under an accepted development vegetation clearing code, or an AMP, you may be able to apply for a development approval. Information on how to apply for a development approval is available at

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/development

2.5. Contact information for the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development

For further information on the vegetation management framework:

Phone 135VEG (135 834)

Email vegetation@resources.qld.gov.au

Visit https://www.resources.qld.gov.au/?contact=vegetation to submit an online enquiry.

3. Vegetation management framework for Lot: 50 Plan: SP117237

3.1 Vegetation categories

The vegetation categories on your property are shown on the regulated vegetation management map in section 4.1 of this report. A summary of vegetation categories on the subject lot are listed in Table 3. Descriptions for these categories are shown in Table 4.

Table 3: Vegetation categories for subject property

Vegetation category	Area (ha)
Category R	72.13
Category X	1,046.64

Table 4: Description of vegetation categories

Category	Colour on Map	Description	Requirements / options under the vegetation management framework
A	red	Compliance areas, environmental offset areas and voluntary declaration areas	Special conditions apply to Category A areas. Before clearing, contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development to confirm any requirements in a Category A area.
B	dark blue	Remnant vegetation areas	Exempt clearing work, or notification and compliance with accepted development vegetation clearing codes, area management plans or development approval.
C	light blue	High-value regrowth areas	Exempt clearing work, or notification and compliance with managing Category C regrowth vegetation accepted development vegetation clearing code.
R	yellow	Regrowth within 50m of a watercourse or drainage feature in the Great Barrier Reef catchment areas	Exempt clearing work, or notification and compliance with managing Category R regrowth accepted development vegetation clearing code or area management plans.
X	white	Clearing on freehold land, indigenous land and leasehold land for agriculture and grazing purposes is considered exempt clearing work under the vegetation management framework. Contact the Department to clarify whether a development approval is required for other State land tenures.	No permit or notification required on freehold land, indigenous land and leasehold land for agriculture and grazing. A development approval may be required for some State land tenures.

Property Map of Assessable Vegetation (PMAV)

The following Property Map of Assessable Vegetation (PMAVs) may be present on this property.
Reference number:
2008/008489

3.2 Regional ecosystems

The endangered, of concern and least concern regional ecosystems on your property are shown on the vegetation management supporting map in section 4.2 and are listed in Table 5.

A description of regional ecosystems can be accessed online at
https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/descriptions/

Table 5: Regional ecosystems present on subject property

Regional Ecosystem	VMA Status	Category	Area (Ha)	Short Description	Structure Category
11.3.1	Endangered	R	0.60	Acacia harpophylla and/or Casuarina cristata open forest on alluvial plains	Mid-dense
11.3.2	Of concern	R	0.08	Eucalyptus populnea woodland on alluvial plains	Sparse
11.3.25	Least concern	R	0.12	Eucalyptus tereticornis or E. camaldulensis woodland fringing drainage lines	Sparse
11.4.9	Endangered	R	53.12	Acacia harpophylla shrubby woodland with Terminalia oblongata on Cainozoic clay plains	Sparse
11.9.2	Least concern	R	3.64	Eucalyptus melanophloia +/- E. orgadophila woodland to open woodland on fine-grained sedimentary rocks	Sparse
11.9.5	Endangered	R	14.57	Acacia harpophylla and/or Casuarina cristata open forest to woodland on fine-grained sedimentary rocks	Mid-dense
non-rem	None	X	1,046.64	None	None

Please note:
1. All area and area derived figures included in this table have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.
2. If Table 5 contains a Category 'plant', please be aware that this refers to 'plantations' such as forestry, and these areas are considered non-remnant under the VMA.

The VMA status of the regional ecosystem (whether it is endangered, of concern or least concern) also determines if any of the following are applicable:

- exempt clearing work;
- accepted development vegetation clearing codes;
- performance outcomes in State Code 16 of the State Development Assessment Provisions (SDAP).

3.3 Watercourses

Vegetation management watercourses and drainage features for this property are shown on the vegetation management supporting map in section 4.2.

3.4 Wetlands

There are no vegetation management wetlands present on this property.

3.5 Essential habitat

Under the VMA, essential habitat for protected wildlife is native wildlife prescribed under the *Nature Conservation Act 1992* (NCA) as critically endangered, endangered, vulnerable or near-threatened wildlife.

Essential habitat for protected wildlife includes suitable habitat on the lot, or where a species has been known to occur

up to 1.1 kilometres from a lot on which there is assessable vegetation. These important habitat areas are protected under the VMA.

Any essential habitat on this property will be shown as blue hatching on the vegetation supporting map in section 4.2.

If essential habitat is identified on the lot, information about the protected wildlife species is provided in Table 6 below. The numeric labels on the vegetation management supporting map can be cross referenced with Table 6 to outline the essential habitat factors for that particular species. There may be essential habitat for more than one species on each lot, and areas of Category A, Category B and Category C can be mapped as Essential Habitat.

Essential habitat is compiled from a combination of species habitat models and buffered species records. Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated. Essential habitat, for protected wildlife, means an area of vegetation shown on the Regulated Vegetation Management Map -

1) that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database. Essential habitat factors are comprised of - regional ecosystem (mandatory for most species), vegetation community, altitude, soils, position in landscape; or
2) in which the protected wildlife, at any stage of its life cycle, is located.

If there is no essential habitat mapping shown on the vegetation management supporting map for this lot, and there is no table in the sections below, it confirms that there is no essential habitat on the lot.

Category A and/or Category B and/or Category C

Table 6: Essential habitat in Category A and/or Category B and/or Category C
No records

3.6 Area Management Plan(s)

Nil

3.7 Coastal or non-coastal

For the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP), this property is regarded as*

Non Coastal

*See also Map 4.3

3.8 Agricultural Land Class A or B

The following can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code:

Does this lot contain land that is mapped as Agricultural Land Class A or B in the State Planning Interactive Mapping System?

No Class A

No Class B

Note - This confirms Agricultural Land Classes as per the State Planning Interactive Mapping System only. This response does not include Agricultural Land Classes identified under local government planning schemes. For further information, check the Planning Scheme for your local government area.

See Map 4.4 to identify the location and extent of Class A and/or Class B Agricultural land on Lot: 50 Plan: SP117237.

4. Vegetation management framework maps

Vegetation management maps included in this report may also be requested individually at:
https://www.qld.gov.au/environment/land/management/vegetation/maps/map-request

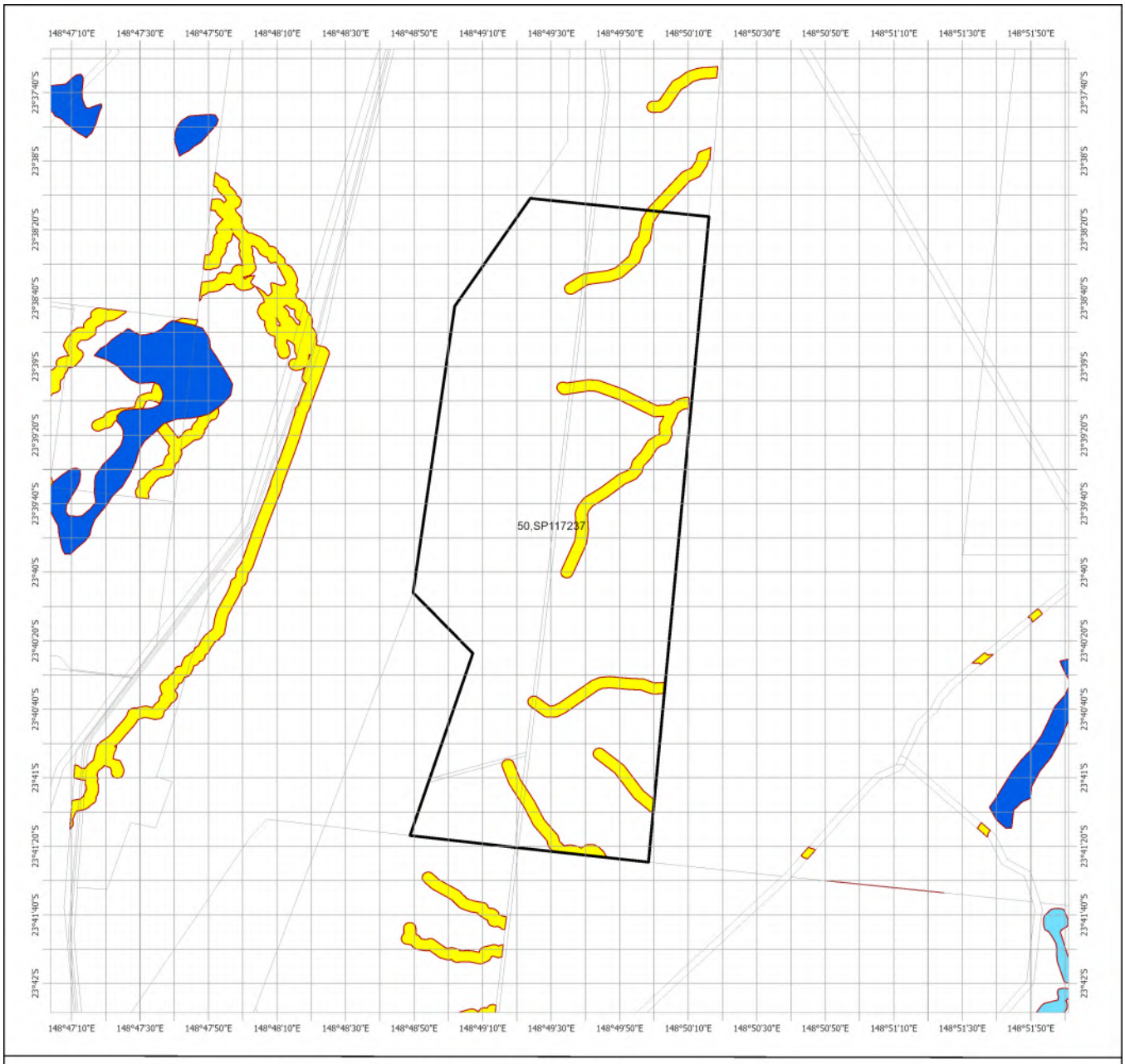
Regulated vegetation management map
The regulated vegetation management map shows vegetation categories needed to determine clearing requirements. These maps are updated monthly to show new property maps of assessable vegetation (PMAV).

Vegetation management supporting map
The vegetation management supporting map provides information on regional ecosystems, wetlands, watercourses and essential habitat.

Coastal/non-coastal map
The coastal/non-coastal map confirms whether the lot, or which parts of the lot, are considered coastal or non-coastal for the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP).

Agricultural Land Class A or B as per State Planning Policy: State Interest for Agriculture
The Agricultural Land Class map confirms the location and extent of land mapped as Agricultural Land Classes A or B as identified on the State Planning Interactive Mapping System. Please note that this map does not include areas identified as Agricultural Land Class A or B in local government planning schemes. This map can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code.

4.1 Regulated vegetation management map



Regulated Vegetation Management Map

Queensland Government

Category A area (Vegetation offsets/compliance notices/VDecs)
Category B area (Remnant vegetation)
Category C area (High-value regrowth vegetation)
Category R area (Reef regrowth watercourse vegetation)
Category X area (Exempt clearing work on Freehold, Indigenous and Leasehold land)
Water
Other land parcel boundaries
Selected Lot and Plan

LOCALITY DIAGRAM



N

0 500 1,000 1,500 2,000 2,500 m

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GDA2020

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Additional information required for the assessment of vegetation values is provided in the accompanying "Vegetation Management Supporting map". For further information go to the web site: www.nrmmrrd.qld.gov.au or contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development.

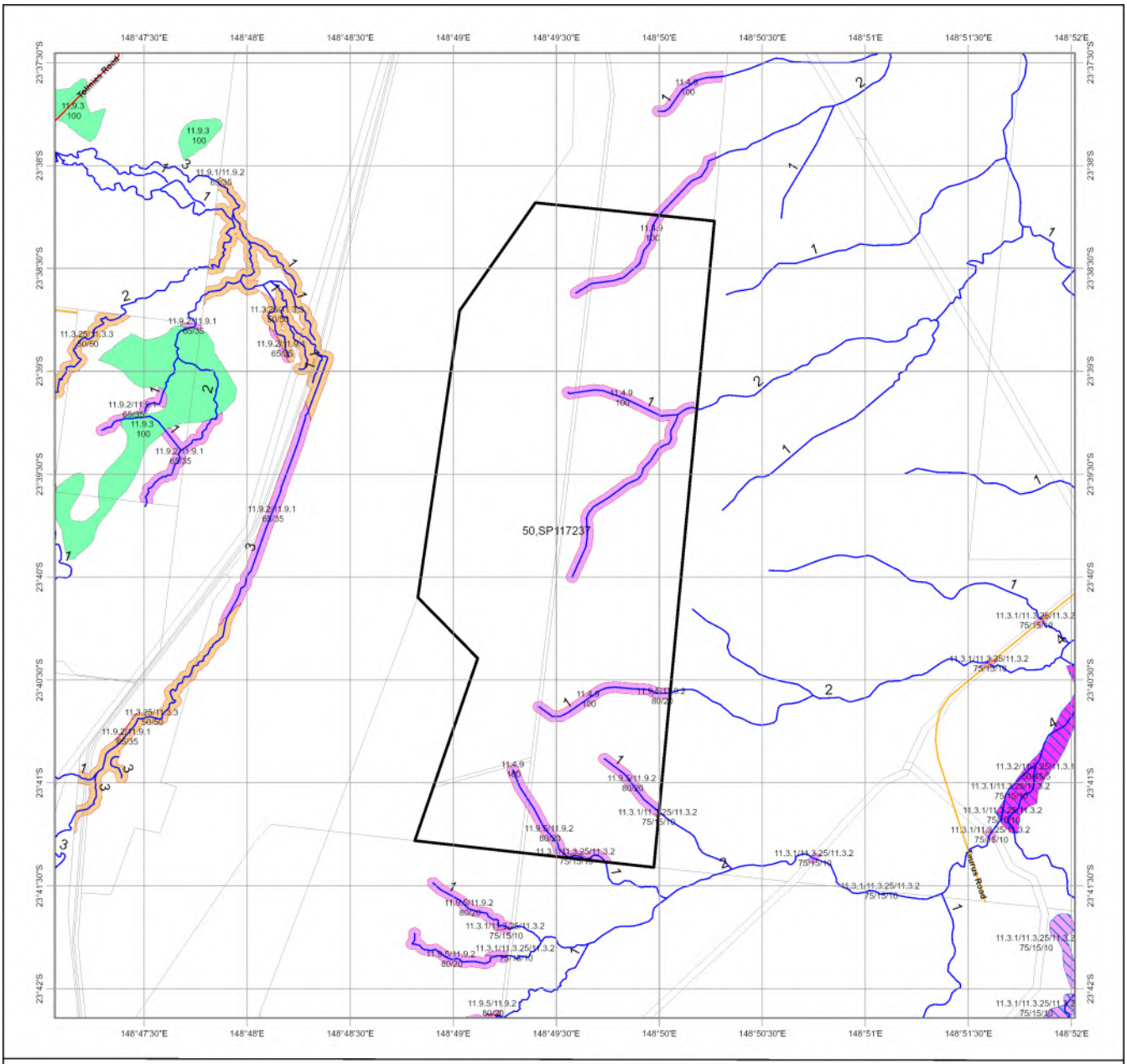
Digital data for the regulated vegetation management map is available from the Queensland Spatial Portal at http://www.spatial.information.qld.gov.au/

Land parcel boundaries are provided as locational aid only.

This map is updated on a monthly basis to ensure new PMAVs are included as they are approved.

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4.2 Vegetation management supporting map



Vegetation Management Supporting Map

- 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
- Category X area
- Water
- Wetland on the vegetation management wetlands map
- Essential habitat on the essential habitat map
- Essential habitat species record
- Watercourses and drainage features on the vegetation management watercourse and drainage features map (Stream order shown as black number against stream where available)
- Highway
- Connector
- Street/Local Road
- National Parks, State Forest and other reserves
- Other land parcel boundaries
- Selected Lot and Plan

Queensland Government

LOCALITY DIAGRAM



N

0 350 700 1,050 1,400 1,750 m

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Labels for Essential Habitat are centred on the area of enquiry.

Regional ecosystem linework has been compiled at a scale of 1:100 000, except in designated areas where a compilation scale of 1:50 000 is available. Linework should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100 000 is +/- 100 metres.

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Additional information may be required for the purposes of land clearing or assessment of a regional ecosystem map or PMAV applications. For further information go to the web site: www.nrmmrrd.qld.gov.au or contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development.

Digital data for the vegetation management watercourse and drainage feature map, vegetation management wetlands map, essential habitat map and the vegetation management remnant and regional ecosystem map are available from the Queensland Spatial Portal at http://www.spatial.information.qld.gov.au/

Land parcel boundaries are provided as locational aid only.

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4.3 Coastal/non-coastal map



Coastal/Non Coastal Map

Coastal
Non Coastal
Other land parcel boundaries
Selected Lot and Plan

LOCALITY DIAGRAM



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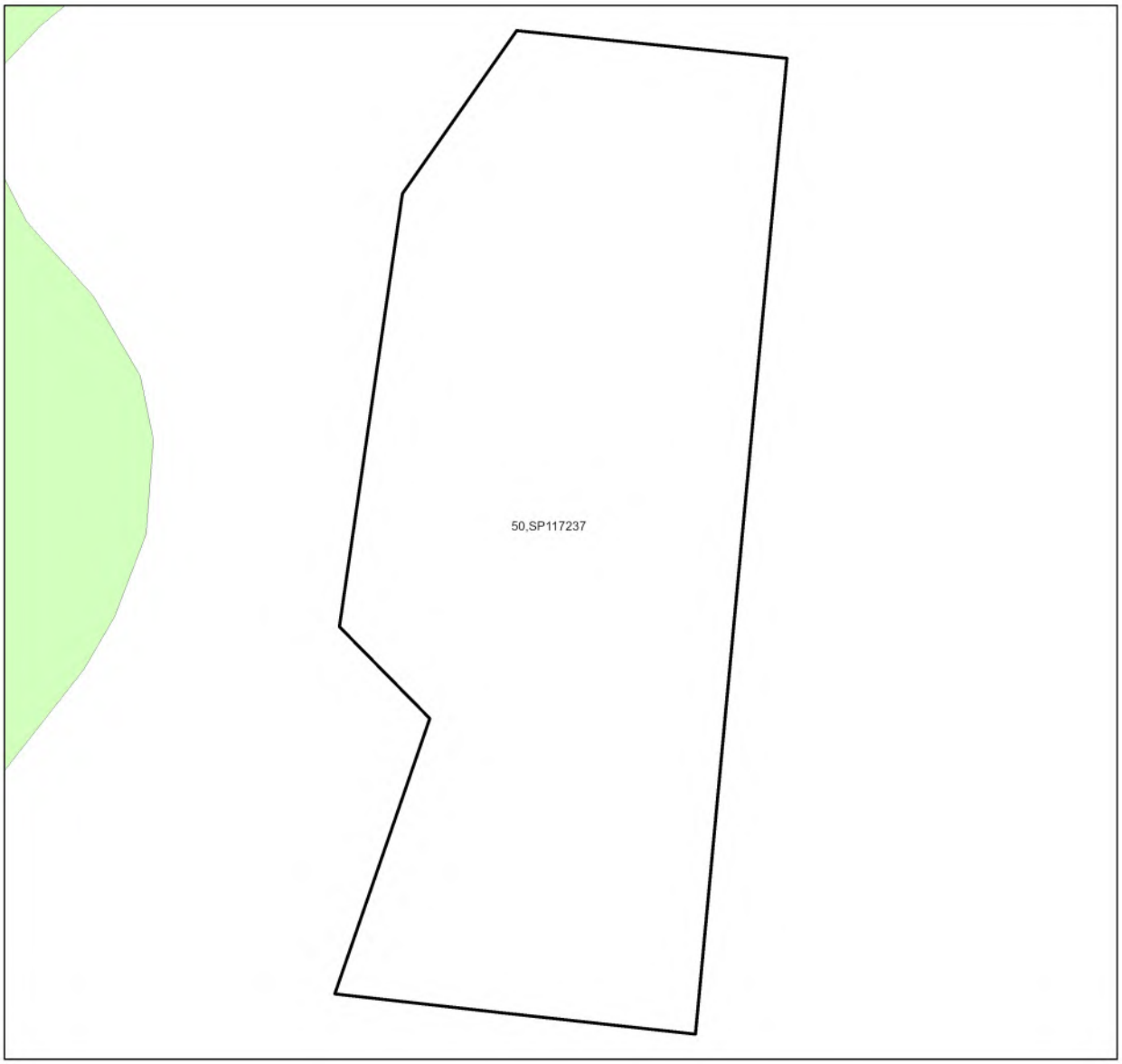
N

0 360 720 1,080 1,440 1,800 m

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4.4 Agricultural Land Class A or B as per State Planning Policy: State Interest for Agriculture



Agricultural Land Class A or B
as per State Planning Policy: State Interest for Agriculture

Towns
Rivers and creeks
Freeways / motorways; Highways
Secondary roads; Streets
Agricultural land class A or B
A
B
Not class A or B
Selected Lot and Plan

LOCALITY DIAGRAM



N

0 360 720 1080 1440 1800 m

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5. Protected plants framework (administered by the Department of the Environment, Tourism, Science and Innovation (DETSI))

In Queensland, all plants that are native to Australia are protected plants under the *Nature Conservation Act 1992* (NCA). The NCA regulates the clearing of protected plants 'in the wild' (see Operational policy: When a protected plant in Queensland is considered to be 'in the wild') that are listed as critically endangered, endangered, vulnerable or near threatened under the Act.

Please note that the protected plant clearing framework applies irrespective of the classification of the vegetation under the *Vegetation Management Act 1999* and any approval or exemptions given under another Act, for example, the *Vegetation Management Act 1999* or *Planning Regulation 2017*.

5.1 Clearing in high risk areas on the flora survey trigger map

The flora survey trigger map identifies high-risk areas for threatened and near threatened plants. These are areas where threatened or near threatened plants are known to exist or are likely to exist based on the habitat present. The flora survey trigger map for this property is provided in section 5.5.

If you are proposing to clear an area shown as high risk on the flora survey trigger map, a flora survey of the clearing impact area must be undertaken by a suitably qualified person in accordance with the Flora survey guidelines. The main objective of a flora survey is to locate any threatened or near threatened plants that may be present in the clearing impact area.

If the flora survey identifies that threatened or near threatened plants are not present within the clearing impact area or clearing within 100m of Endangered, Vulnerable, Near-Threatened (EVNT) plants can be avoided, the clearing activity is exempt from a permit. An exempt clearing notification form must be submitted to the Department of the Environment, Tourism, Science and Innovation, with a copy of the flora survey report, at least one week prior to clearing.

If the flora survey identifies that threatened or near threatened plants are present in, or within 100m of, the area to be cleared, a clearing permit is required before any clearing is undertaken. The flora survey report, as well as an impact management report, must be submitted with the clearing permit application form.

5.2 Clearing outside high risk areas on the flora survey trigger map

In an area other than a high risk area, a clearing permit is only required where a person is, or becomes aware that threatened or near threatened plantsare present in, or within 100m of, the area to be cleared. You must keep a copy of the flora survey trigger map for the area subject to clearing for five years from the day the clearing starts. If you do not clear within the 12 month period that the flora survey trigger map was printed, you need to print and check a new flora survey trigger map.

5.3 Exemptions

Many activities are 'exempt' under the protected plant clearing framework, which means that clearing of native plants that are in the wild can be undertaken for these activities with no need for a flora survey or a protected plant clearing permit. The Information sheet - General exemptions for the take of protected plants provides some of these exemptions.

Some exemptions under the NCA are the same as exempt clearing work (formerly known as exemptions) under the *Vegetation Management Act 1999* (i.e. listed in Schedule 21 of the Planning Regulations 2017) while some are different.

5.4 Contact information for DETSI

For further information on the protected plants framework:
Phone 1300 130 372 (and select option four)
Email palm@des.qld.gov.au
Visit https://www.qld.gov.au/environment/plants-animals/plants/protected-plants

5.5 Protected plants flora survey trigger map

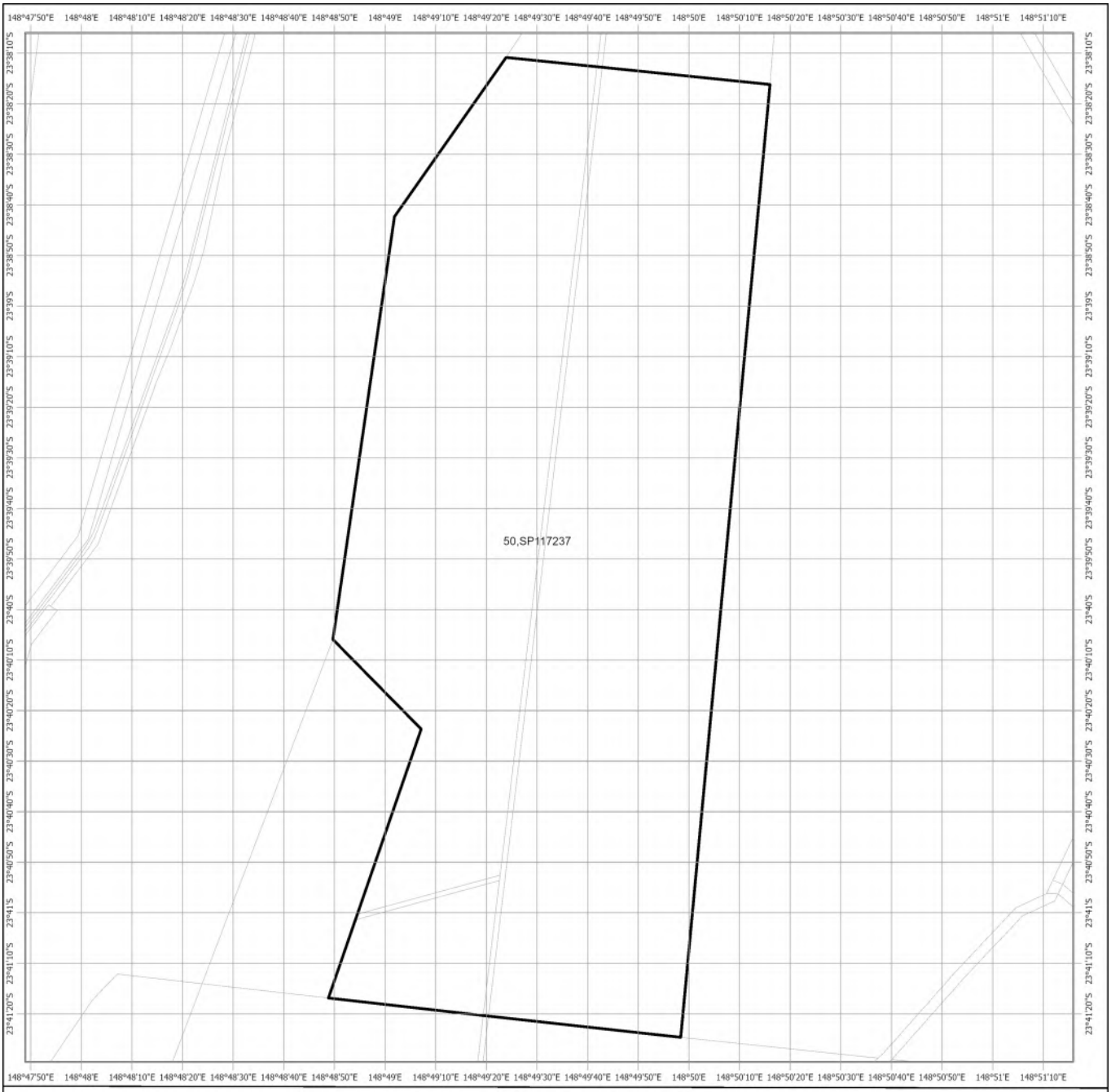
This map included may also be requested individually at: https://apps.des.qld.gov.au/map-request/flora-survey-trigger/.

Updates to the data informing the flora survey trigger map

The flora survey trigger map will be reviewed, and updated if necessary, at least every 12 months to ensure the map reflects the most up-to-date and accurate data available.

Species information

Please note that flora survey trigger maps do not identify species associated with 'high risk areas'. While some species information may be publicly available, for example via the Queensland Spatial Catalogue, the Department of the Environment, Tourism, Science and Innovation does not provide species information on request. Regardless of whether species information is available for a particular high risk area, clearing plants in a high risk area may require a flora survey and/or clearing permit. Please see the Department of the Environment, Tourism, Science and Innovation webpage on the clearing of protected plants for more information.



Protected Plants Flora Survey Trigger Map

High risk area
Other land parcel boundaries
Freeways / motorways / highways
Secondary roads / streets
Selected Lot and Plan

LOCALITY DIAGRAM



N

0 240 480 720 960 1,200 m

This product is displayed in:
GDA2020

This map shows areas where particular provisions of the Nature Conservation Act 1992 apply to the clearing of protected plants.

Land parcel boundaries are provided as locational aid only.

This map is produced at a scale relevant to the size of the area selected and should be printed as A4 size in portrait orientation.

For further information or assistance with interpretation of this product, please contact the Department of the Environment, Tourism, Science and Innovation at palm@des.qld.gov.au

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6. Koala protection framework (administered by the Department of the Environment, Tourism, Science and Innovation (DETSI))

The koala (*Phascolarctos cinereus*) is listed in Queensland as endangered by the Queensland Government under *Nature Conservation Act 1992* and by the Australian Government under the *Environment Protection and Biodiversity Conservation Act 1999*.

The Queensland Government's koala protection framework is comprised of the *Nature Conservation Act 1992*, the Nature Conservation (Animals) Regulation 2020, the Nature Conservation (Koala) Conservation Plan 2017, the *Planning Act 2016* and the Planning Regulation 2017.

6.1 Koala mapping

6.1.1 Koala districts

The parts of Queensland where koalas are known to occur has been divided into three koala districts - koala district A, koala district B and koala district C. Each koala district is made up of areas with comparable koala populations (e.g. density, extent and significance of threatening processes affecting the population) which require similar management regimes.

Section 7.1 identifies which koala district your property is located in.

6.1.2 Koala habitat areas

Koala habitat areas are areas of vegetation that have been determined to contain koala habitat that is essential for the conservation of a viable koala population in the wild based on the combination of habitat suitability and biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water). In order to protect this important koala habitat, clearing controls have been introduced into the Planning Regulation 2017 for development in koala habitat areas.

Please note that koala habitat areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley, Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

There are two different categories of koala habitat area (core koala habitat area and locally refined koala habitat), which have been determined using two different methodologies. These methodologies are described in the document Spatial modelling in South East Queensland.

Section 7.2 shows any koala habitat area that exists on your property.

Under the Nature Conservation (Koala) Conservation Plan 2017, an owner of land (or a person acting on the owner's behalf with written consent) can request to make, amend or revoke a koala habitat area determination if they believe, on reasonable grounds, that the existing determination for all or part of their property is incorrect.

More information on requests to make, amend or revoke a koala habitat area determination can be found in the document Guideline - Requests to make, amend or revoke a koala habitat area determination.

The koala habitat area map will be updated at least annually to include any koala habitat areas that have been made, amended or revoked.

Changes to the koala habitat area map which occur between annual updates because of a request to make, amend or revoke a koala habitat area determination can be viewed on the register of approved requests to make, amend or revoke a koala habitat area available at: https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/koalamaps. The register includes the lot on plan for the change, the date the decision was made and the map issued to the landholder that shows areas determined to be koala habitat areas.

6.1.3 Koala priority areas

Koala priority areas are large, connected areas that have been determined to have the highest likelihood of achieving conservation outcomes for koalas based on the combination of habitat suitability, biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water) and a koala conservation cost benefit analysis.

Conservation efforts will be prioritised in these areas to ensure the conservation of viable koala populations in the wild including a focus on management (e.g. habitat protection, habitat restoration and threat mitigation) and monitoring. This includes a prohibition on clearing in koala habitat areas that are in koala priority areas under the Planning Regulation 2017 (subject to some exemptions).

Please note that koala priority areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley, Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

Section 7.2 identifies if your property is in a koala priority area.

6.1.4 Identified koala broad-hectare areas

There are seven identified koala broad-hectare areas in SEQ. These are areas of koala habitat that are located in areas committed to meet development targets in the SEQ Regional Plan to accommodate SEQ's growing population including bring-forward Greenfield sites under the Queensland Housing Affordability Strategy and declared master planned areas under the repealed *Sustainable Planning Act 2009* and the repealed *Integrated Planning Act 1997*.

Specific assessment benchmarks apply to development applications for development proposed in identified koala broad-hectare areas to ensure koala conservation measures are incorporated into the proposed development.

Section 7.2 identifies if your property is in an identified koala broad-hectare area.

6.2 Koala habitat planning controls

On 7 February 2020, the Queensland Government introduced new planning controls to the Planning Regulation 2017 to strengthen the protection of koala habitat in South East Queensland (i.e. koala district A).

More information on these planning controls can be found here:
https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy.

As a high-level summary, the koala habitat planning controls make:

- development that involves interfering with koala habitat (defined below) in an area that is both a koala priority area and a koala habitat area, prohibited development (i.e. development for which a development application cannot be made);
- development that involves interfering with koala habitat (defined below) in an area that is a koala habitat area but is not a koala priority area, assessable development (i.e. development for which development approval is required); and
- development that is for extractive industries where the development involves interfering with koala habitat (defined below) in an area that is both a koala habitat area and a key resource area, assessable development (i.e. development for which development approval is required).

Interfering with koala habitat means:

1. Removing, cutting down, ringbarking, pushing over, poisoning or destroying in anyway, including by burning, flooding or draining native vegetation in a koala habitat area; but
2. Does not include destroying standing vegetation stock or lopping a tree.

However, these planning controls do not apply if the development is exempted development as defined in Schedule 24 of the Planning Regulation 2017. More information on exempted development can be found here:
https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy.

There are also assessment benchmarks that apply to development applications for:

- building works, operational works, material change of use or reconfiguration of a lot where:

  - the local government planning scheme makes the development assessable;
  - the premises includes an area that is both a koala priority area and a koala habitat area; and
  - the development does not involve interfering with koala habitat (defined above); and

- development in identified koala broad-hectare areas.

The Guideline - Assessment Benchmarks in relation to Koala Habitat in South East Queensland assessment benchmarks outlines these assessment benchmarks, the intent of these assessment benchmarks and advice on how proposed development may meet these assessment benchmarks.

6.3 Koala Conservation Plan clearing requirements

Section 10 and 11 of the Nature Conservation (Koala) Conservation Plan 2017 prescribes requirements that must be met when clearing koala habitat in koala district A and koala district B.

These clearing requirements are independent to the koala habitat planning controls introduced into the Planning Regulation 2017, which means they must be complied with irrespective of any approvals or exemptions offered under other legislation.

Unlike the clearing controls prescribed in the Planning Regulation 2017 that are to protect koala habitat, the clearing requirements prescribed in the Nature Conservation (Koala) Conservation Plan 2017 are in place to prevent the injury or death of koalas when koala habitat is being cleared.

6.4 Contact information for DETSI

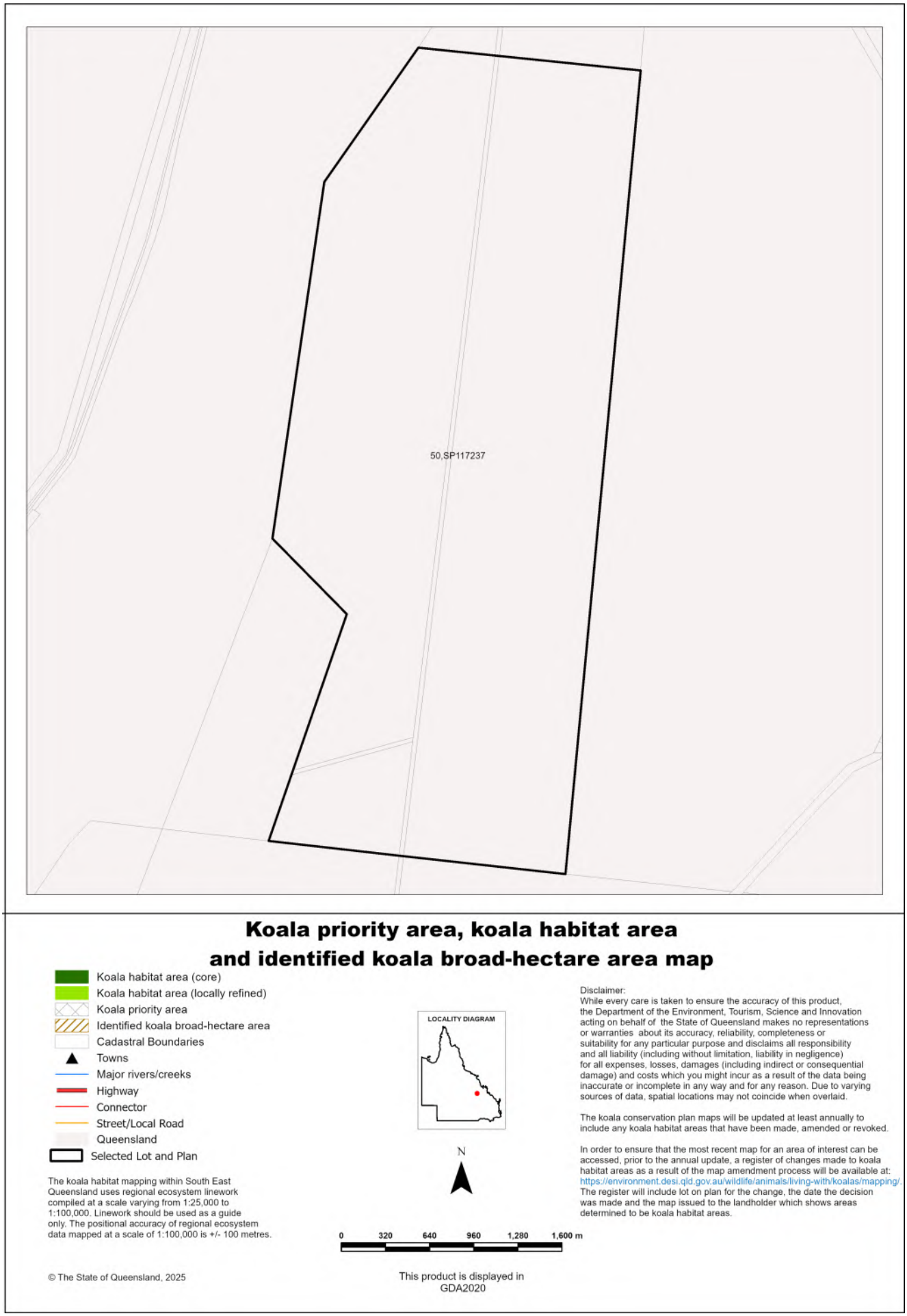
For further information on the koala protection framework:
Phone 13 QGOV (13 74 68)
Email koala.assessment@detsi.qld.gov.au
Visit https://environment.desi.qld.gov.au/wildlife/animals/living-with/koalas/mapping

7. Koala protection framework details for Lot: 50 Plan: SP117237

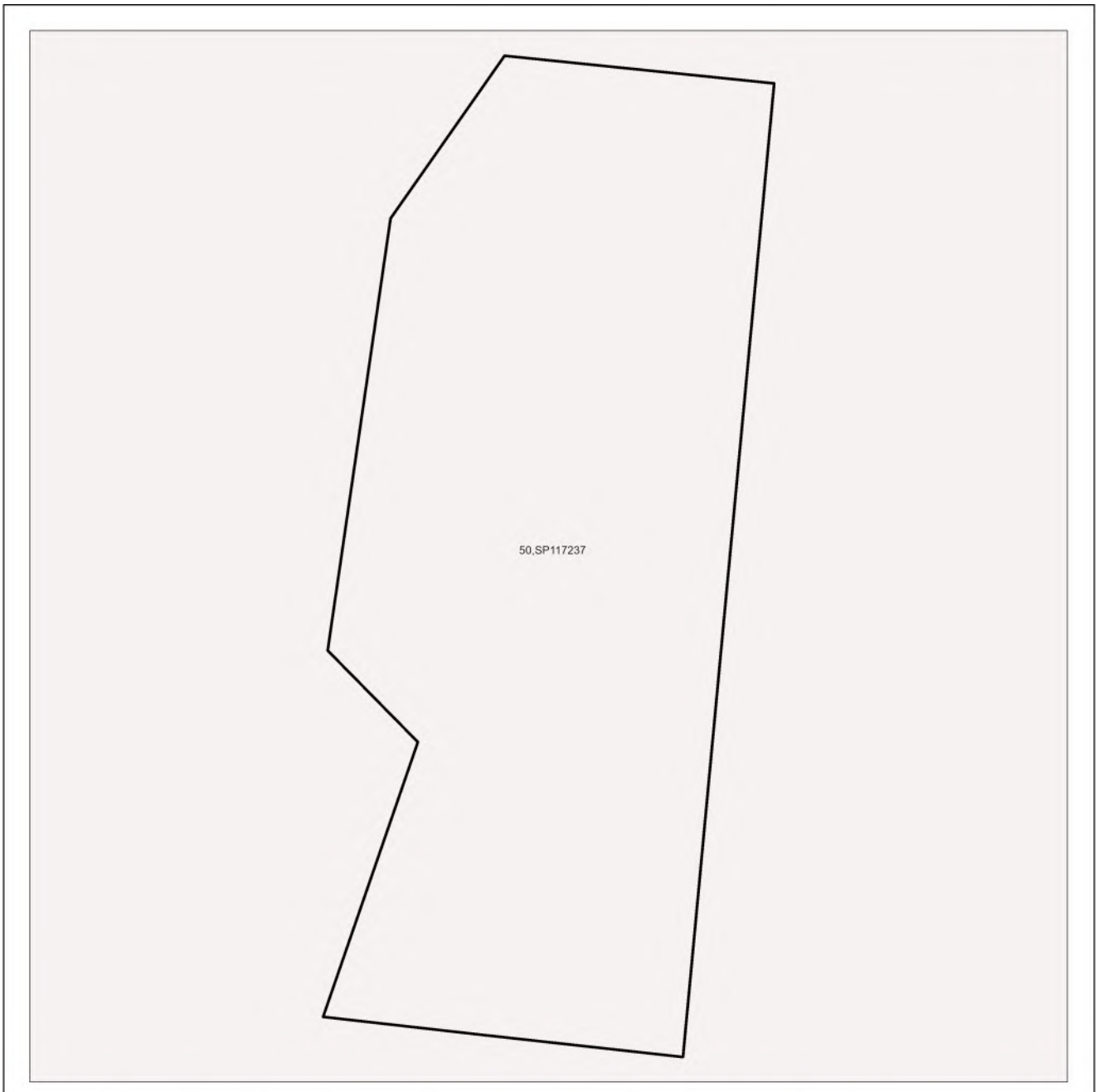
7.1 Koala districts

Koala District C

7.2 Koala priority area, koala habitat area and identified koala broad-hectare map



7.3 Koala habitat regional ecosystems for core koala habitat areas



8. Other relevant legislation contacts list

Activity	Legislation	Agency	Contact details
Interference with overland flow	*Water Act 2000*	Department of Local Government, Water and Volunteers	Ph: 13 QGOV (13 74 68) www.dlgwv.qld.gov.au
Earthworks, significant disturbance	*Soil Conservation Act 1986*	Queensland Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development	Ph: 13 QGOV (13 74 68) www.nrmmrrd.qld.gov.au
Fire Permits	*Fire and Emergency Services Act 1990*	Queensland Fire Department	Ph: 13 QGOV (13 74 68) www.fire.qld.gov.au
Indigenous Cultural Heritage	*Aboriginal Cultural Heritage Act 2003* *Torres Strait Islander Cultural Heritage Act 2003*	Queensland Department of Women, Aboriginal and Torres Strait Islander Partnerships and Multiculturalism	Ph: 13 QGOV (13 74 68) www.tatsipca.qld.gov.au
Mining and environmentally relevant activities Infrastructure development (coastal) Heritage issues	*Environmental Protection Act 1994* *Coastal Protection and Management Act 1995* *Queensland Heritage Act 1992*	Queensland Department of the Environment, Tourism, Science and Innovation	Ph: 13 QGOV (13 74 68) www.detsi.qld.gov.au
Protected plants and protected areas	*Nature Conservation Act 1992* *Planning Act 2016*	Queensland Department of the Environment, Tourism, Science and Innovation	Ph: 1300 130 372 (option 4) palm@detsi.qld.gov.au www.detsi.qld.gov.au
Koala mapping and regulations	*Nature Conservation Act 1992*	Queensland Department of the Environment, Tourism, Science and Innovation	Ph: 13 QGOV (13 74 68) Koala.assessment@detsi.qld.gov.au
Interference with fish passage in a watercourse, mangroves Forestry activities	*Fisheries Act 1994* *Forestry Act 1959*	Queensland Department of Primary Industries	Ph: 13 QGOV (13 74 68) www.daf.qld.gov.au
Matters of National Environmental Significance including listed threatened species and ecological communities	*Environment Protection and Biodiversity Conservation Act 1999*	Department of Climate Change, Energy, the Environment and Water (Australian Government)	Ph: 1800 803 772 www.dcceew.gov.au
Development and planning processes	*Planning Act 2016* *State Development and Public Works Organisation Act 1971*	Queensland Department of State Development, Infrastructure and Planning	Ph: 13 QGOV (13 74 68) www.planning.qld.gov.au
Coordinated projects	*Planning Act 2016* *State Development and Public Works Organisation Act 1971*	Office of the Coordinator-General	Ph: 13 QGOV (13 74 68) www.statedevelopment.qld.gov.au/coordinator-general
Wet Tropics World Heritage Area	*Wet Tropics World Heritage Protection and Management Act 1993*	Queensland Wet Tropics Management Authority	Ph: (07) 4241 0500 www.wettropics.gov.au
Requirements on State controlled road	*Transport Infrastructure Act 1994*	Queensland Department of Transport and Main Roads	Ph: 13 QGOV (13 74 68) https://www.tmr.qld.gov.au
Local government requirements	*Local Government Act 2009* *Planning Act 2016*	Your relevant local government office	Local Government Contact Directory



Vegetation management report

For Lot: 24 Plan: CP855505
11/04/2025

nrmmrrd.qld.gov.au

Queensland Government

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Recent changes

Updated mapping

Updated vegetation mapping was released on 22 November 2023 and includes the most recent Queensland Herbarium scientific updates to the Regulated Vegetation Management Map, regional ecosystems, essential habitat, wetland and high-value regrowth mapping.

The Department of the Environment, Tourism, Science and Innovation have also updated their koala protection mapping to align with the Queensland Herbarium scientific updates.

The latest version (v10) of the Protected Plants Flora Survey Trigger Map (trigger map) was released on 6 September 2023.

Overview

Based on the lot on plan details you have supplied, this report provides the following detailed information:
Property details - information about the specified Lot on Plan, lot size, local government area, bioregion(s), subregion(s) and catchment(s);

Vegetation management framework - an explanation of the application of the framework and contact details for the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development who administer the framework;

Vegetation management framework details for the specified Lot on Plan including:

- the vegetation management categories on the property;
- the vegetation management regional ecosystems on the property;
- vegetation management watercourses or drainage features on the property;
- vegetation management wetlands on the property;
- vegetation management essential habitat on the property;
- whether any area management plans are associated with the property;
- whether the property is coastal or non-coastal; and
- whether the property is mapped as Agricultural Land Class A or B;

Protected plant framework - an explanation of the application of the framework and contact details for the Department of the Environment, Tourism, Science and Innovation who administer the framework, including:

- high risk areas on the protected plant flora survey trigger map for the property;

Koala protection framework - an explanation of the application of the framework and contact details for the Department of the Environment, Tourism, Science and Innovation who administer the framework; and

Koala protection framework details for the specified Lot on Plan including:

- the koala district the property is located in;
- koala priority areas on the property;
- core and locally refined koala habitat areas on the property;
- whether the lot is located in an identified koala broad-hectare area; and
- koala habitat regional ecosystems on the property for core koala habitat areas.

This information will assist you to determine your options for managing vegetation under:
- the vegetation management framework, which may include:

- exempt clearing work;
- accepted development vegetation clearing code;
- an area management plan;
- a development approval;

- the protected plant framework, which may include:

- the need to undertake a flora survey;
- exempt clearing;
- a protected plant clearing permit;

- the koala protection framework, which may include:

- exempted development;
- a development approval;
- the need to undertake clearing sequentially and in the presence of a koala spotter.

Other laws

The clearing of native vegetation is regulated by both Queensland and Australian legislation, and some local governments also regulate native vegetation clearing. You may need to obtain an approval or permit under another Act, such as the Commonwealth Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Section 8 of this guide provides contact details of other agencies you should confirm requirements with, before commencing vegetation clearing.

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1. Property details

1.1 Tenure and title area

All of the lot, plan, tenure and title area information associated with property Lot: 24 Plan: CP855505 are listed in Table 1.

Table 1: Lot, plan, tenure and title area information for the property

Lot	Plan	Tenure	Property title area (sq metres)
24	CP855505	Lands Lease	38,266,670
B	HT455	Easement	146,600
H	HT609	Easement	122
D	HT455	Easement	82,810
G	HT605	Easement	7,395
C	HT455	Easement	46,280
J	CP855505	Easement	76,560

The tenure of the land may affect whether clearing is considered exempt clearing work or may be carried out under an accepted development vegetation clearing code.

Does the property Lot: 24 Plan: CP855505 have a freehold tenure and is in the Wet Tropics of Queensland World Heritage Area?

No, this property is not located in the Wet Tropics of Queensland World Heritage Area.

1.2 Property location

Table 2 provides a summary of the locations for property Lot: 24 Plan: CP855505, in relation to natural and administrative boundaries.

Table 2: Property location details

Local Government(s)	Catchment(s)	Bioregion(s)	Subregion(s)
Central Highlands Regional	Fitzroy	Brigalow Belt	Isaac - Comet Downs

2. Vegetation management framework (administered by the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development)

The *Vegetation Management Act 1999* (VMA), the Vegetation Management Regulation 2023, the *Planning Act 2016* and the Planning Regulation 2017, in conjunction with associated policies and codes, form the Vegetation Management Framework.

The VMA does not apply to all land tenures or vegetation types. State forests, national parks, forest reserves and some tenures under the *Forestry Act 1959* and *Nature Conservation Act 1992* are not regulated by the VMA. Managing or clearing vegetation on these tenures may require approvals under these laws.

The following native vegetation is not regulated under the VMA but may require permit(s) under other laws:

- grass or non-woody herbage;
- a plant within a grassland regional ecosystem identified in the Vegetation Management Regional Ecosystem Description Database (VM REDD) as having a grassland structure; and
- a mangrove.

2.1 Exempt clearing work

Exempt clearing work is an activity for which you do not need to notify the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development or obtain an approval under the vegetation management framework. Exempt clearing work was previously known as exemptions.

In areas that are mapped as Category X (white in colour) on the regulated vegetation management map (see section 4.1), and where the land tenure is freehold, indigenous land and leasehold land for agriculture and grazing purposes, the clearing of vegetation is considered exempt clearing work and does not require notification or development approval under the vegetation management framework. For all other land tenures, contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development before commencing clearing to ensure that the proposed activity is exempt clearing work.

A range of routine property management activities are considered exempt clearing work. A list of exempt clearing work is available at

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/exemptions/.

Exempt clearing work may be affected if the proposed clearing area is subject to development approval conditions, a covenant, an environmental offset, an exchange area, a restoration notice, or an area mapped as Category A. Exempt clearing work may require approval under other Commonwealth, State or Local Government laws, or local government planning schemes. Contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development prior to clearing in any of these areas.

2.2 Accepted development vegetation clearing codes

Some clearing activities can be undertaken under an accepted development vegetation clearing code. The codes can be downloaded at

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/codes/

If you intend to clear vegetation under an accepted development vegetation clearing code, you must notify the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development before commencing. The information in this report will assist you to complete the online notification form.

You can complete the online form at
https://vegetation-apps.dnrm.qld.gov.au

2.3 Area management plans

Area Management Plans (AMP) provide an alternative approval system for vegetation clearing under the vegetation management framework. They list the purposes and clearing conditions that have been approved for the areas covered by the plan. It is not necessary to use an AMP, even when an AMP applies to your property.

On 8 March 2020, AMPs ended for fodder harvesting, managing thickened vegetation and managing encroachment. New notifications cannot be made for these AMPs. You will need to consider options for fodder harvesting, managing thickened vegetation or encroachment under a relevant accepted development vegetation clearing code or apply for a development approval.

New notifications can be made for all other AMPs. These will continue to apply until their nominated end date.

If an Area Management Plan applies to your property for which you can make a new notification, it will be listed in Section 3.6 of this report. Before clearing under one of these AMPs, you must first notify the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development and then follow the conditions and requirements listed in the AMP.

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/area-management-plans

2.4 Development approvals

If under the vegetation management framework your proposed clearing is not exempt clearing work, or is not permitted under an accepted development vegetation clearing code, or an AMP, you may be able to apply for a development approval. Information on how to apply for a development approval is available at

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/development

2.5. Contact information for the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development

For further information on the vegetation management framework:

Phone 135VEG (135 834)

Email vegetation@resources.qld.gov.au

Visit https://www.resources.qld.gov.au/?contact=vegetation to submit an online enquiry.

3. Vegetation management framework for Lot: 24 Plan: CP855505

3.1 Vegetation categories

The vegetation categories on your property are shown on the regulated vegetation management map in section 4.1 of this report. A summary of vegetation categories on the subject lot are listed in Table 3. Descriptions for these categories are shown in Table 4.

Table 3: Vegetation categories for subject property

Vegetation category	Area (ha)
Category C	44.93
Category R	less than 0.01
Category X	3,778.52

Table 4: Description of vegetation categories

Category	Colour on Map	Description	Requirements / options under the vegetation management framework
A	red	Compliance areas, environmental offset areas and voluntary declaration areas	Special conditions apply to Category A areas. Before clearing, contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development to confirm any requirements in a Category A area.
B	dark blue	Remnant vegetation areas	Exempt clearing work, or notification and compliance with accepted development vegetation clearing codes, area management plans or development approval.
C	light blue	High-value regrowth areas	Exempt clearing work, or notification and compliance with managing Category C regrowth vegetation accepted development vegetation clearing code.
R	yellow	Regrowth within 50m of a watercourse or drainage feature in the Great Barrier Reef catchment areas	Exempt clearing work, or notification and compliance with managing Category R regrowth accepted development vegetation clearing code or area management plans.
X	white	Clearing on freehold land, indigenous land and leasehold land for agriculture and grazing purposes is considered exempt clearing work under the vegetation management framework. Contact the Department to clarify whether a development approval is required for other State land tenures.	No permit or notification required on freehold land, indigenous land and leasehold land for agriculture and grazing. A development approval may be required for some State land tenures.

Property Map of Assessable Vegetation (PMAV)

The following Property Map of Assessable Vegetation (PMAVs) may be present on this property.
Reference number:

2009/006406

2017/004269

3.2 Regional ecosystems

The endangered, of concern and least concern regional ecosystems on your property are shown on the vegetation management supporting map in section 4.2 and are listed in Table 5.

A description of regional ecosystems can be accessed online at
https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/descriptions/

Table 5: Regional ecosystems present on subject property

Regional Ecosystem	VMA Status	Category	Area (Ha)	Short Description	Structure Category
11.3.1	Endangered	C	33.70	Acacia harpophylla and/or Casuarina cristata open forest on alluvial plains	Mid-dense
11.3.1	Endangered	R	less than 0.01	Acacia harpophylla and/or Casuarina cristata open forest on alluvial plains	Mid-dense
11.3.2	Of concern	C	4.49	Eucalyptus populnea woodland on alluvial plains	Sparse
11.3.2	Of concern	R	less than 0.01	Eucalyptus populnea woodland on alluvial plains	Sparse
11.3.25	Least concern	C	6.74	Eucalyptus tereticornis or E. camaldulensis woodland fringing drainage lines	Sparse
11.3.25	Least concern	R	less than 0.01	Eucalyptus tereticornis or E. camaldulensis woodland fringing drainage lines	Sparse
11.4.9	Endangered	R	less than 0.01	Acacia harpophylla shrubby woodland with Terminalia oblongata on Cainozoic clay plains	Sparse
11.9.2	Least concern	R	less than 0.01	Eucalyptus melanophloia +/- E. orgadophila woodland to open woodland on fine-grained sedimentary rocks	Sparse
11.9.5	Endangered	R	less than 0.01	Acacia harpophylla and/or Casuarina cristata open forest to woodland on fine-grained sedimentary rocks	Mid-dense
non-rem	None	X	3,778.52	None	None

Please note:
1. All area and area derived figures included in this table have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.
2. If Table 5 contains a Category 'plant', please be aware that this refers to 'plantations' such as forestry, and these areas are considered non-remnant under the VMA.

The VMA status of the regional ecosystem (whether it is endangered, of concern or least concern) also determines if any of the following are applicable:

- exempt clearing work;
- accepted development vegetation clearing codes;
- performance outcomes in State Code 16 of the State Development Assessment Provisions (SDAP).

3.3 Watercourses

Vegetation management watercourses and drainage features for this property are shown on the vegetation management supporting map in section 4.2.

3.4 Wetlands

There are no vegetation management wetlands present on this property.

3.5 Essential habitat

Under the VMA, essential habitat for protected wildlife is native wildlife prescribed under the *Nature Conservation Act 1992* (NCA) as critically endangered, endangered, vulnerable or near-threatened wildlife.

Essential habitat for protected wildlife includes suitable habitat on the lot, or where a species has been known to occur up to 1.1 kilometres from a lot on which there is assessable vegetation. These important habitat areas are protected under the VMA.

Any essential habitat on this property will be shown as blue hatching on the vegetation supporting map in section 4.2.

If essential habitat is identified on the lot, information about the protected wildlife species is provided in Table 6 below. The numeric labels on the vegetation management supporting map can be cross referenced with Table 6 to outline the essential habitat factors for that particular species. There may be essential habitat for more than one species on each lot, and areas of Category A, Category B and Category C can be mapped as Essential Habitat.

Essential habitat is compiled from a combination of species habitat models and buffered species records. Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated. Essential habitat, for protected wildlife, means an area of vegetation shown on the Regulated Vegetation Management Map -

1) that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database. Essential habitat factors are comprised of - regional ecosystem (mandatory for most species), vegetation community, altitude, soils, position in landscape; or
2) in which the protected wildlife, at any stage of its life cycle, is located.

If there is no essential habitat mapping shown on the vegetation management supporting map for this lot, and there is no table in the sections below, it confirms that there is no essential habitat on the lot.

Category A and/or Category B and/or Category C

Table 6: Essential habitat in Category A and/or Category B and/or Category C

Label	Scientific Name	Common Name	NCA Status	Vegetation Community	Altitude	Soils	Position in Landscape
483	Denisonia maculata	ornamental snake	V	Riparian woodland/open forest and shrub/woodland including Brigalow Acacia harpophylla; into drier habitats in summer.	100-450m.	Cracking clay with gilgai/soil crack microrelief and sandy loam substrates.	Near freshwater waterholes/creeks and low lying poorly drained areas that are frequently inundated by freshwater.

Label	Regional Ecosystem (mandatory unless otherwise specified)
483	10.3.2, 10.3.3, 10.3.4, 10.3.7, 10.3.13, 10.3.14, 10.3.15, 10.3.16, 10.3.27, 10.3.30, 10.3.31, 10.4.1, 10.4.2, 10.4.3, 10.4.4, 10.4.5, 10.4.6, 10.4.7, 10.4.8, 10.5.5, 10.9.1. 10.9.6. 10.9.7, 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.6, 11.3.9, 11.3.10, 11.3.12, 11.3.15, 11.3.21, 11.3.23, 11.3.24, 11.3.25, 11.3.27, 11.3.28, 11.3.31, 11.3.34, 11.3.37, 11.3.38, 11.3.40, 11.4.2, 11.4.3, 11.4.4, 11.4.6, 11.4.7, 11.4.8, 11.4.9, 11.4.11, 11.5.2, 11.5.3, 11.5.16, 11.8.11, 11.9.1, 11.9.2, 11.9.3, 11.9.5, 11.9.7, 11.9.11, 11.9.12, 11.9.14, 11.11.15, 11.12.6

3.6 Area Management Plan(s)

Nil

3.7 Coastal or non-coastal

For the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP), this property is regarded as*

Non Coastal

*See also Map 4.3

3.8 Agricultural Land Class A or B

The following can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code:

Does this lot contain land that is mapped as Agricultural Land Class A or B in the State Planning Interactive Mapping System?

No Class A

No Class B

Note - This confirms Agricultural Land Classes as per the State Planning Interactive Mapping System only. This response does not include Agricultural Land Classes identified under local government planning schemes. For further information, check the Planning Scheme for your local government area.

See Map 4.4 to identify the location and extent of Class A and/or Class B Agricultural land on Lot: 24 Plan: CP855505.

4. Vegetation management framework maps

Vegetation management maps included in this report may also be requested individually at:
https://www.qld.gov.au/environment/land/management/vegetation/maps/map-request

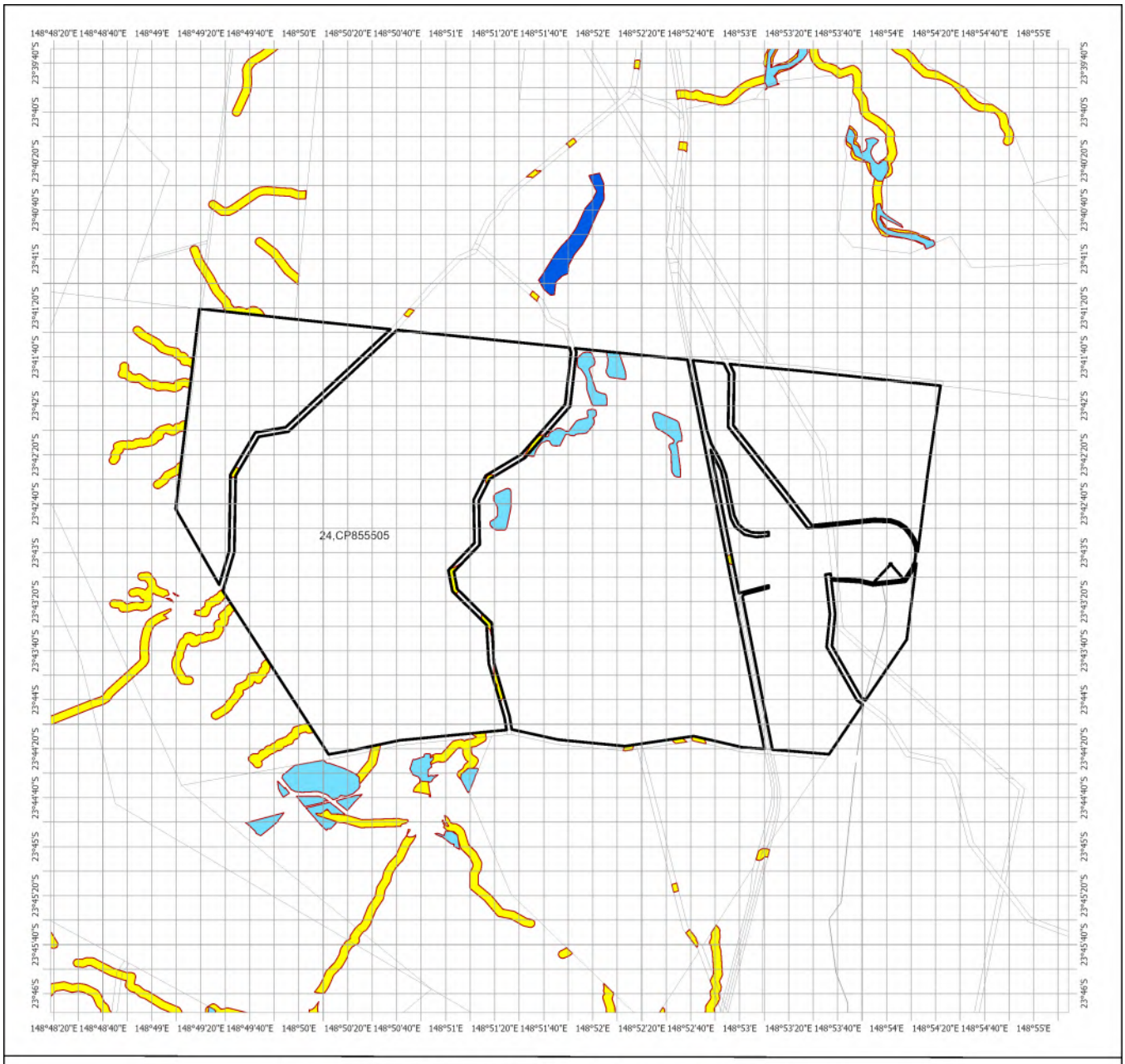
Regulated vegetation management map
The regulated vegetation management map shows vegetation categories needed to determine clearing requirements. These maps are updated monthly to show new property maps of assessable vegetation (PMAV).

Vegetation management supporting map
The vegetation management supporting map provides information on regional ecosystems, wetlands, watercourses and essential habitat.

Coastal/non-coastal map
The coastal/non-coastal map confirms whether the lot, or which parts of the lot, are considered coastal or non-coastal for the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP).

Agricultural Land Class A or B as per State Planning Policy: State Interest for Agriculture
The Agricultural Land Class map confirms the location and extent of land mapped as Agricultural Land Classes A or B as identified on the State Planning Interactive Mapping System. Please note that this map does not include areas identified as Agricultural Land Class A or B in local government planning schemes. This map can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code.

4.1 Regulated vegetation management map



Regulated Vegetation Management Map

Queensland Government

Category A area (Vegetation offsets/compliance notices/VDecs)
Category B area (Remnant vegetation)
Category C area (High-value regrowth vegetation)
Category R area (Reef regrowth watercourse vegetation)
Category X area (Exempt clearing work on Freehold, Indigenous and Leasehold land)
Water
Other land parcel boundaries
Selected Lot and Plan

LOCALITY DIAGRAM

N

0 690 1,380 2,070 2,760 3,450 m

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Additional information required for the assessment of vegetation values is provided in the accompanying "Vegetation Management Supporting map". For further information go to the web site: www.nrmmrrd.qld.gov.au or contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development.

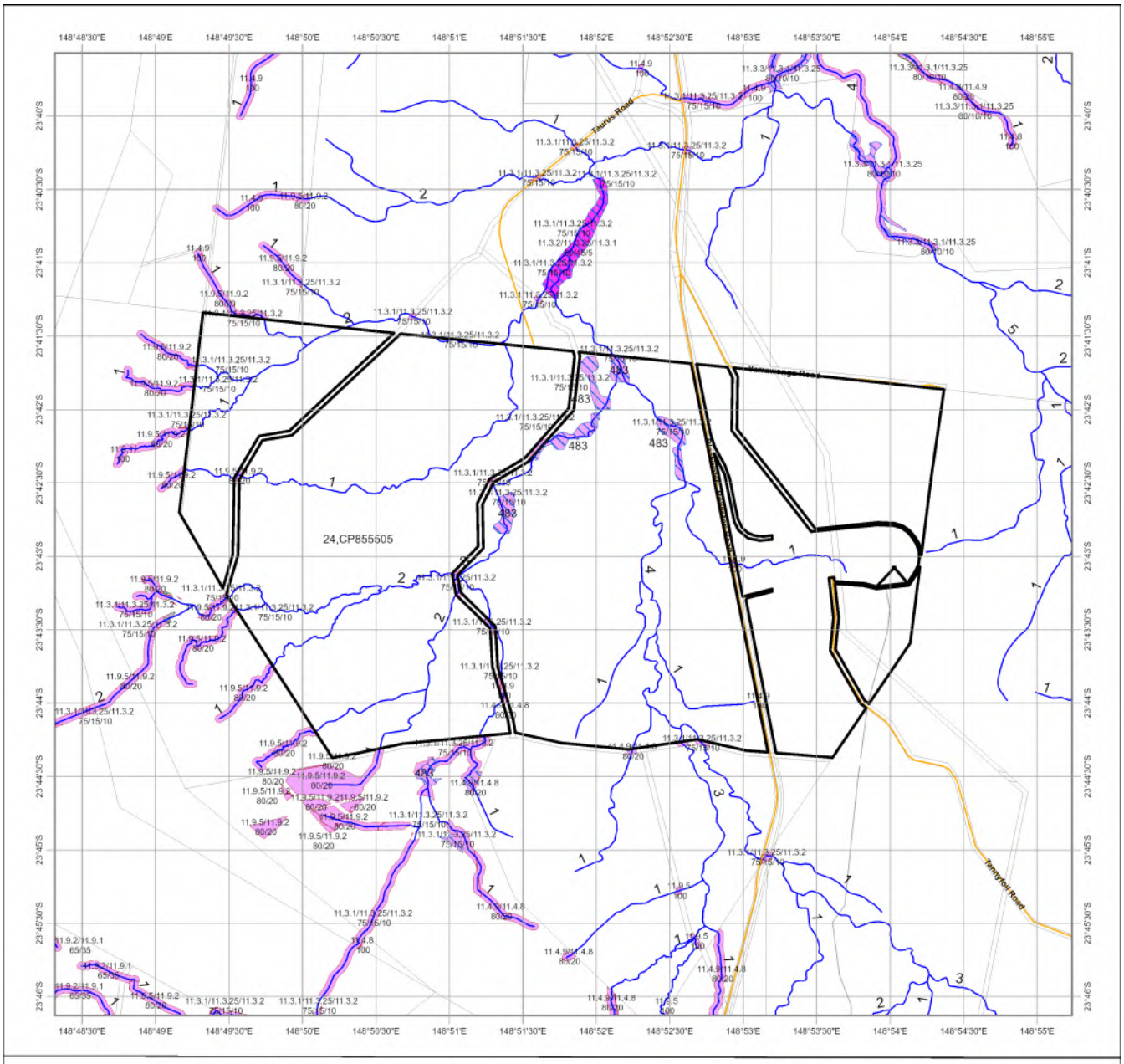
Digital data for the regulated vegetation management map is available from the Queensland Spatial Portal at http://www.spatial.information.qld.gov.au/

Land parcel boundaries are provided as locational aid only.

This map is updated on a monthly basis to ensure new PMAVs are included as they are approved.

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4.2 Vegetation management supporting map



Vegetation Management Supporting Map

- 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
- Category X area
- Water
- Wetland on the vegetation management wetlands map
- Essential habitat on the essential habitat map
- Essential habitat species record
- Watercourses and drainage features on the vegetation management watercourse and drainage features map (Stream order shown as black number against stream where available)
- Highway
- Connector
- Street/Local Road
- National Parks, State Forest and other reserves
- Other land parcel boundaries
- Selected Lot and Plan

Queensland Government

LOCALITY DIAGRAM



N

0 500 1,000 1,500 2,000 2,500 m

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Labels for Essential Habitat are centred on the area of enquiry.

Regional ecosystem linework has been compiled at a scale of 1:100 000, except in designated areas where a compilation scale of 1:50 000 is available. Linework should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100 000 is +/- 100 metres.

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Additional information may be required for the purposes of land clearing or assessment of a regional ecosystem map or PMAV applications. For further information go to the web site: www.nrmmrrd.qld.gov.au or contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development.

Digital data for the vegetation management watercourse and drainage feature map, vegetation management wetlands map, essential habitat map and the vegetation management remnant and regional ecosystem map are available from the Queensland Spatial Portal at http://www.spatial.information.qld.gov.au/

Land parcel boundaries are provided as locational aid only.

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4.3 Coastal/non-coastal map



Coastal/Non Coastal Map

Coastal
Non Coastal
Other land parcel boundaries
Selected Lot and Plan

LOCALITY DIAGRAM



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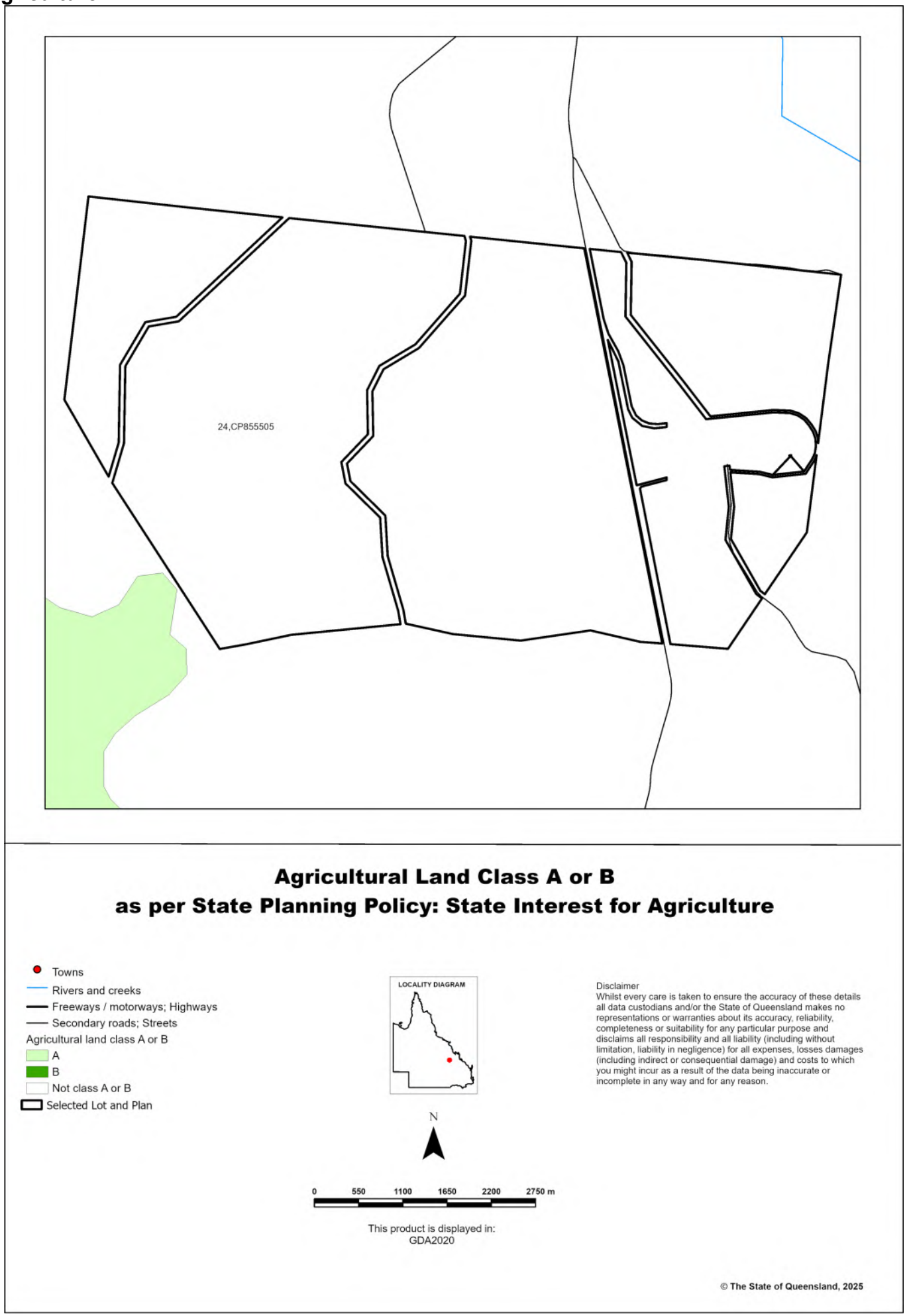
N

0 550 1,100 1,650 2,200 2,750 m

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4.4 Agricultural Land Class A or B as per State Planning Policy: State Interest for Agriculture



5. Protected plants framework (administered by the Department of the Environment, Tourism, Science and Innovation (DETSI))

In Queensland, all plants that are native to Australia are protected plants under the *Nature Conservation Act 1992* (NCA). The NCA regulates the clearing of protected plants 'in the wild' (see Operational policy: When a protected plant in Queensland is considered to be 'in the wild') that are listed as critically endangered, endangered, vulnerable or near threatened under the Act.

Please note that the protected plant clearing framework applies irrespective of the classification of the vegetation under the *Vegetation Management Act 1999* and any approval or exemptions given under another Act, for example, the *Vegetation Management Act 1999* or *Planning Regulation 2017*.

5.1 Clearing in high risk areas on the flora survey trigger map

The flora survey trigger map identifies high-risk areas for threatened and near threatened plants. These are areas where threatened or near threatened plants are known to exist or are likely to exist based on the habitat present. The flora survey trigger map for this property is provided in section 5.5.

If you are proposing to clear an area shown as high risk on the flora survey trigger map, a flora survey of the clearing impact area must be undertaken by a suitably qualified person in accordance with the Flora survey guidelines. The main objective of a flora survey is to locate any threatened or near threatened plants that may be present in the clearing impact area.

If the flora survey identifies that threatened or near threatened plants are not present within the clearing impact area or clearing within 100m of Endangered, Vulnerable, Near-Threatened (EVNT) plants can be avoided, the clearing activity is exempt from a permit. An exempt clearing notification form must be submitted to the Department of the Environment, Tourism, Science and Innovation, with a copy of the flora survey report, at least one week prior to clearing.

If the flora survey identifies that threatened or near threatened plants are present in, or within 100m of, the area to be cleared, a clearing permit is required before any clearing is undertaken. The flora survey report, as well as an impact management report, must be submitted with the clearing permit application form.

5.2 Clearing outside high risk areas on the flora survey trigger map

In an area other than a high risk area, a clearing permit is only required where a person is, or becomes aware that threatened or near threatened plantsare present in, or within 100m of, the area to be cleared. You must keep a copy of the flora survey trigger map for the area subject to clearing for five years from the day the clearing starts. If you do not clear within the 12 month period that the flora survey trigger map was printed, you need to print and check a new flora survey trigger map.

5.3 Exemptions

Many activities are 'exempt' under the protected plant clearing framework, which means that clearing of native plants that are in the wild can be undertaken for these activities with no need for a flora survey or a protected plant clearing permit. The Information sheet - General exemptions for the take of protected plants provides some of these exemptions.

Some exemptions under the NCA are the same as exempt clearing work (formerly known as exemptions) under the *Vegetation Management Act 1999* (i.e. listed in Schedule 21 of the Planning Regulations 2017) while some are different.

5.4 Contact information for DETSI

For further information on the protected plants framework:
Phone 1300 130 372 (and select option four)
Email palm@des.qld.gov.au
Visit https://www.qld.gov.au/environment/plants-animals/plants/protected-plants

5.5 Protected plants flora survey trigger map

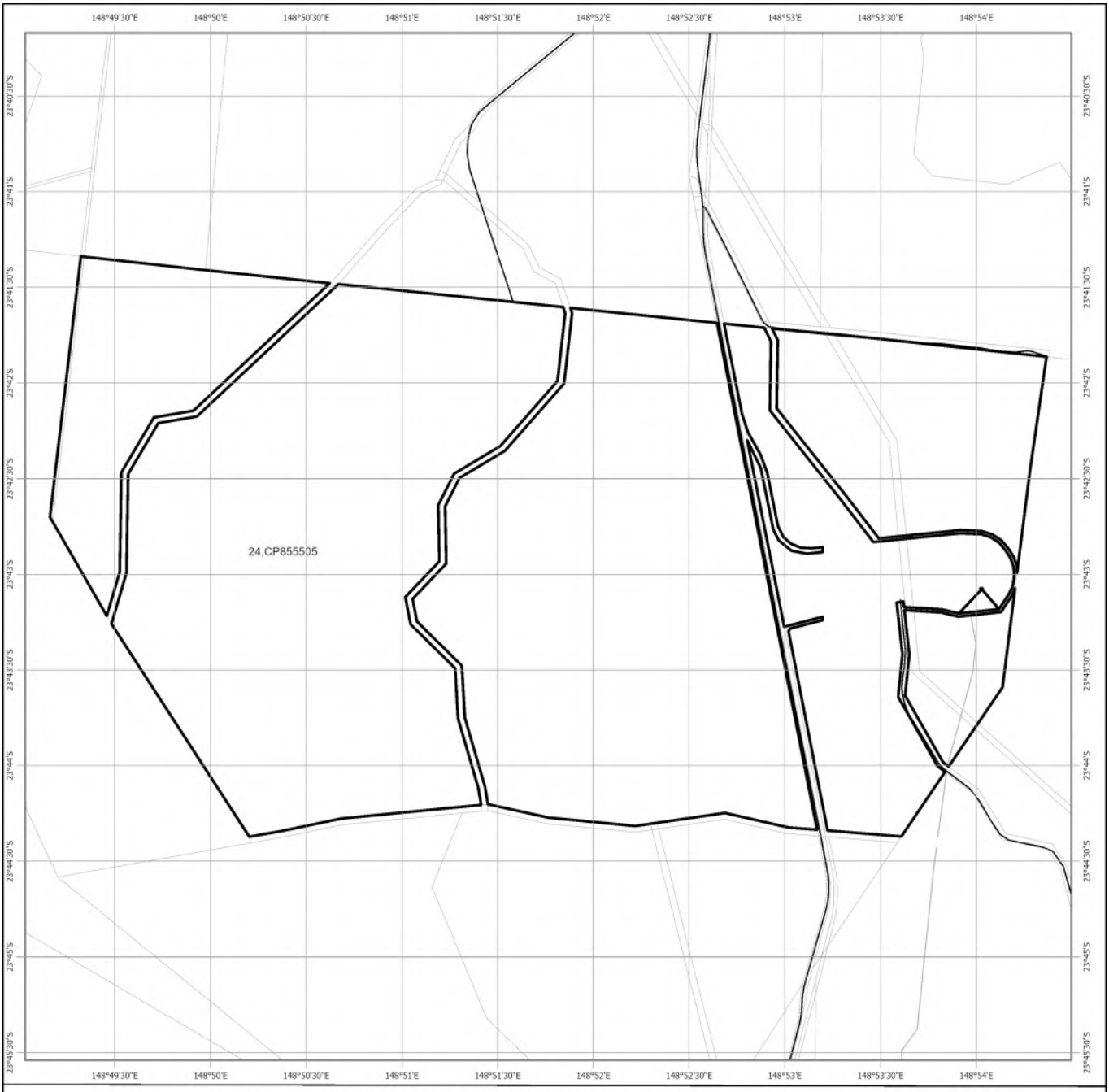
This map included may also be requested individually at: https://apps.des.qld.gov.au/map-request/flora-survey-trigger/.

Updates to the data informing the flora survey trigger map

The flora survey trigger map will be reviewed, and updated if necessary, at least every 12 months to ensure the map reflects the most up-to-date and accurate data available.

Species information

Please note that flora survey trigger maps do not identify species associated with 'high risk areas'. While some species information may be publicly available, for example via the Queensland Spatial Catalogue, the Department of the Environment, Tourism, Science and Innovation does not provide species information on request. Regardless of whether species information is available for a particular high risk area, clearing plants in a high risk area may require a flora survey and/or clearing permit. Please see the Department of the Environment, Tourism, Science and Innovation webpage on the clearing of protected plants for more information.



Protected Plants Flora Survey Trigger Map

High risk area
Other land parcel boundaries
Freeways / motorways / highways
Secondary roads / streets
Selected Lot and Plan

LOCALITY DIAGRAM



N

0 375 750 1,125 1,500 1,875 m

This product is displayed in:
GDA2020

This map shows areas where particular provisions of the Nature Conservation Act 1992 apply to the clearing of protected plants.

Land parcel boundaries are provided as locational aid only.

This map is produced at a scale relevant to the size of the area selected and should be printed as A4 size in portrait orientation.

For further information or assistance with interpretation of this product, please contact the Department of the Environment, Tourism, Science and Innovation at palm@des.qld.gov.au

Disclaimer: While every care is taken to ensure the accuracy of the data used to generate this product, the Queensland Government makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaim all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damages) and costs which might be incurred as a consequence of reliance on the data, or as a result of the data being inaccurate or incomplete in any way and for any reason.

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6. Koala protection framework (administered by the Department of the Environment, Tourism, Science and Innovation (DETSI))

The koala (*Phascolarctos cinereus*) is listed in Queensland as endangered by the Queensland Government under *Nature Conservation Act 1992* and by the Australian Government under the *Environment Protection and Biodiversity Conservation Act 1999*.

The Queensland Government's koala protection framework is comprised of the *Nature Conservation Act 1992*, the Nature Conservation (Animals) Regulation 2020, the Nature Conservation (Koala) Conservation Plan 2017, the *Planning Act 2016* and the Planning Regulation 2017.

6.1 Koala mapping

6.1.1 Koala districts

The parts of Queensland where koalas are known to occur has been divided into three koala districts - koala district A, koala district B and koala district C. Each koala district is made up of areas with comparable koala populations (e.g. density, extent and significance of threatening processes affecting the population) which require similar management regimes.

Section 7.1 identifies which koala district your property is located in.

6.1.2 Koala habitat areas

Koala habitat areas are areas of vegetation that have been determined to contain koala habitat that is essential for the conservation of a viable koala population in the wild based on the combination of habitat suitability and biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water). In order to protect this important koala habitat, clearing controls have been introduced into the Planning Regulation 2017 for development in koala habitat areas.

Please note that koala habitat areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley, Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

There are two different categories of koala habitat area (core koala habitat area and locally refined koala habitat), which have been determined using two different methodologies. These methodologies are described in the document Spatial modelling in South East Queensland.

Section 7.2 shows any koala habitat area that exists on your property.

Under the Nature Conservation (Koala) Conservation Plan 2017, an owner of land (or a person acting on the owner's behalf with written consent) can request to make, amend or revoke a koala habitat area determination if they believe, on reasonable grounds, that the existing determination for all or part of their property is incorrect.

More information on requests to make, amend or revoke a koala habitat area determination can be found in the document Guideline - Requests to make, amend or revoke a koala habitat area determination.

The koala habitat area map will be updated at least annually to include any koala habitat areas that have been made, amended or revoked.

Changes to the koala habitat area map which occur between annual updates because of a request to make, amend or revoke a koala habitat area determination can be viewed on the register of approved requests to make, amend or revoke a koala habitat area available at: https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/koalamaps. The register includes the lot on plan for the change, the date the decision was made and the map issued to the landholder that shows areas determined to be koala habitat areas.

6.1.3 Koala priority areas

Koala priority areas are large, connected areas that have been determined to have the highest likelihood of achieving conservation outcomes for koalas based on the combination of habitat suitability, biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water) and a koala conservation cost benefit analysis.

Conservation efforts will be prioritised in these areas to ensure the conservation of viable koala populations in the wild including a focus on management (e.g. habitat protection, habitat restoration and threat mitigation) and monitoring. This includes a prohibition on clearing in koala habitat areas that are in koala priority areas under the Planning Regulation 2017 (subject to some exemptions).

Please note that koala priority areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley, Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

Section 7.2 identifies if your property is in a koala priority area.

6.1.4 Identified koala broad-hectare areas

There are seven identified koala broad-hectare areas in SEQ. These are areas of koala habitat that are located in areas committed to meet development targets in the SEQ Regional Plan to accommodate SEQ's growing population including bring-forward Greenfield sites under the Queensland Housing Affordability Strategy and declared master planned areas under the repealed *Sustainable Planning Act 2009* and the repealed *Integrated Planning Act 1997*.

Specific assessment benchmarks apply to development applications for development proposed in identified koala broad-hectare areas to ensure koala conservation measures are incorporated into the proposed development.

Section 7.2 identifies if your property is in an identified koala broad-hectare area.

6.2 Koala habitat planning controls

On 7 February 2020, the Queensland Government introduced new planning controls to the Planning Regulation 2017 to strengthen the protection of koala habitat in South East Queensland (i.e. koala district A).

More information on these planning controls can be found here:
https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy.

As a high-level summary, the koala habitat planning controls make:

- development that involves interfering with koala habitat (defined below) in an area that is both a koala priority area and a koala habitat area, prohibited development (i.e. development for which a development application cannot be made);
- development that involves interfering with koala habitat (defined below) in an area that is a koala habitat area but is not a koala priority area, assessable development (i.e. development for which development approval is required); and
- development that is for extractive industries where the development involves interfering with koala habitat (defined below) in an area that is both a koala habitat area and a key resource area, assessable development (i.e. development for which development approval is required).

Interfering with koala habitat means:

1. Removing, cutting down, ringbarking, pushing over, poisoning or destroying in anyway, including by burning, flooding or draining native vegetation in a koala habitat area; but
2. Does not include destroying standing vegetation stock or lopping a tree.

However, these planning controls do not apply if the development is exempted development as defined in Schedule 24 of the Planning Regulation 2017. More information on exempted development can be found here:
https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy.

There are also assessment benchmarks that apply to development applications for:

- building works, operational works, material change of use or reconfiguration of a lot where:

  - the local government planning scheme makes the development assessable;
  - the premises includes an area that is both a koala priority area and a koala habitat area; and
  - the development does not involve interfering with koala habitat (defined above); and

- development in identified koala broad-hectare areas.

The Guideline - Assessment Benchmarks in relation to Koala Habitat in South East Queensland assessment benchmarks outlines these assessment benchmarks, the intent of these assessment benchmarks and advice on how proposed development may meet these assessment benchmarks.

6.3 Koala Conservation Plan clearing requirements

Section 10 and 11 of the Nature Conservation (Koala) Conservation Plan 2017 prescribes requirements that must be met when clearing koala habitat in koala district A and koala district B.

These clearing requirements are independent to the koala habitat planning controls introduced into the Planning Regulation 2017, which means they must be complied with irrespective of any approvals or exemptions offered under other legislation.

Unlike the clearing controls prescribed in the Planning Regulation 2017 that are to protect koala habitat, the clearing requirements prescribed in the Nature Conservation (Koala) Conservation Plan 2017 are in place to prevent the injury or death of koalas when koala habitat is being cleared.

6.4 Contact information for DETSI

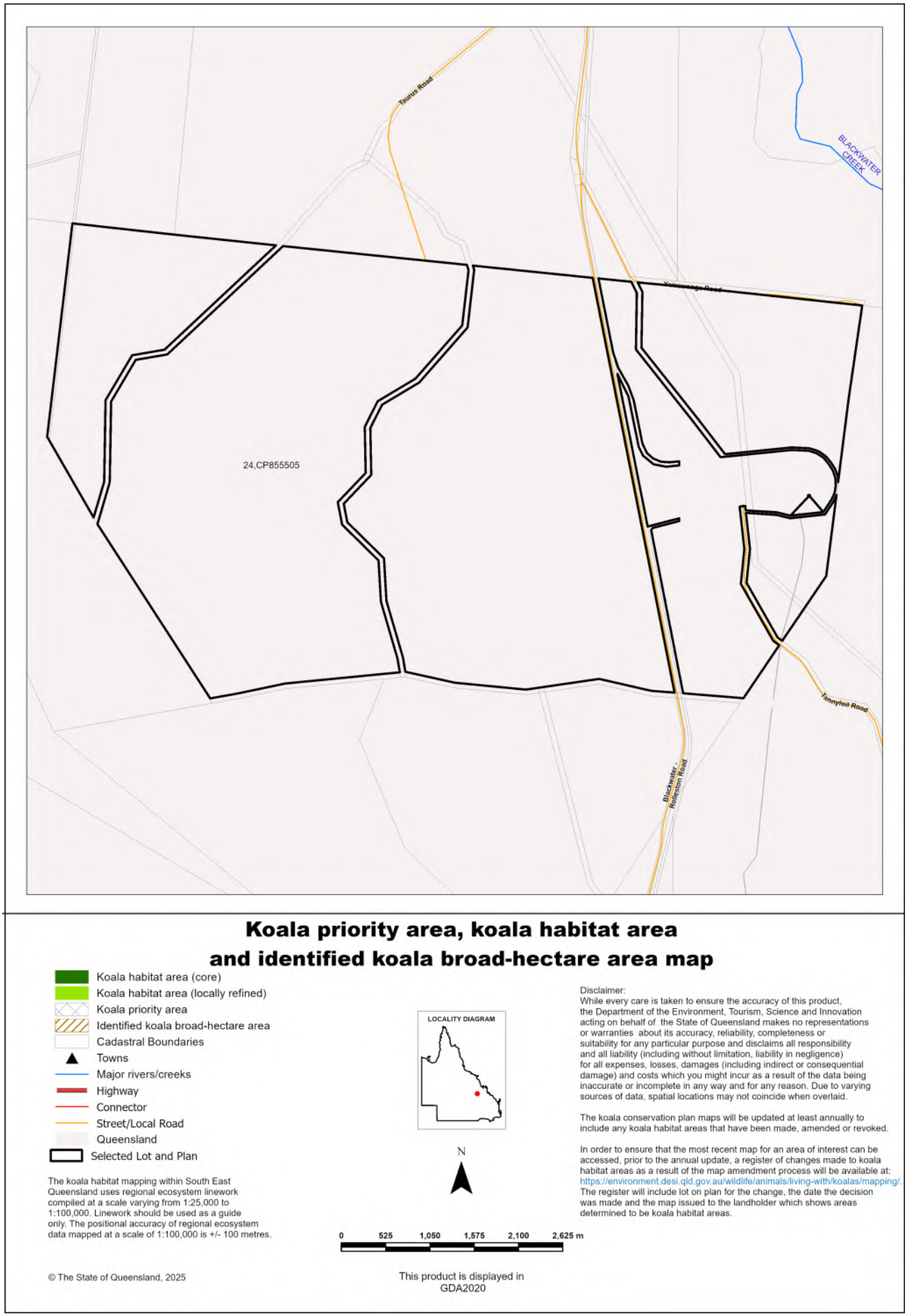
For further information on the koala protection framework:
Phone 13 QGOV (13 74 68)
Email koala.assessment@detsi.qld.gov.au
Visit https://environment.desi.qld.gov.au/wildlife/animals/living-with/koalas/mapping

7. Koala protection framework details for Lot: 24 Plan: CP855505

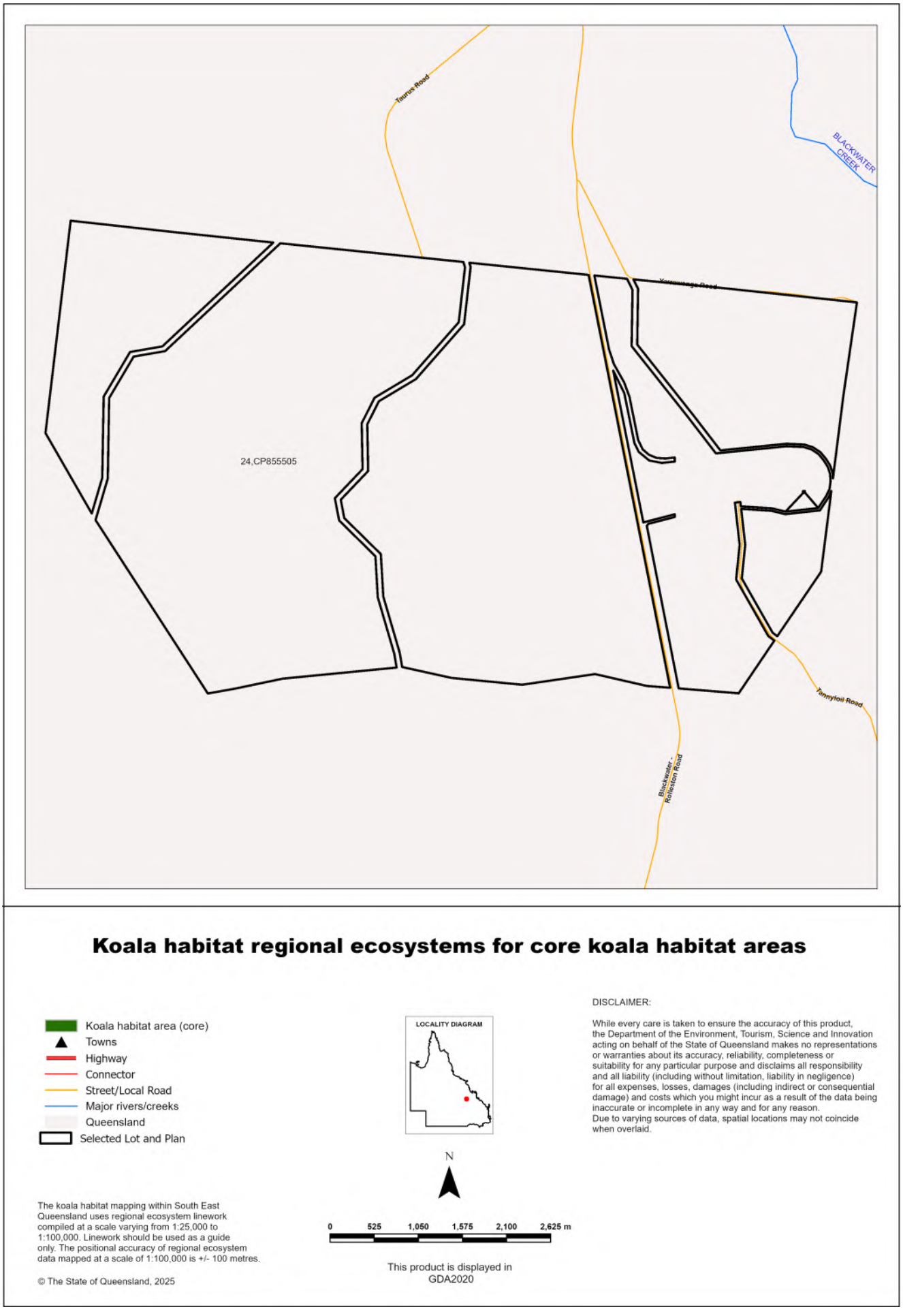
7.1 Koala districts

Koala District C

7.2 Koala priority area, koala habitat area and identified koala broad-hectare map



7.3 Koala habitat regional ecosystems for core koala habitat areas



8. Other relevant legislation contacts list

Activity	Legislation	Agency	Contact details
Interference with overland flow	*Water Act 2000*	Department of Local Government, Water and Volunteers	Ph: 13 QGOV (13 74 68) www.dlgwv.qld.gov.au
Earthworks, significant disturbance	*Soil Conservation Act 1986*	Queensland Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development	Ph: 13 QGOV (13 74 68) www.nrmmrrd.qld.gov.au
Fire Permits	*Fire and Emergency Services Act 1990*	Queensland Fire Department	Ph: 13 QGOV (13 74 68) www.fire.qld.gov.au
Indigenous Cultural Heritage	*Aboriginal Cultural Heritage Act 2003* *Torres Strait Islander Cultural Heritage Act 2003*	Queensland Department of Women, Aboriginal and Torres Strait Islander Partnerships and Multiculturalism	Ph: 13 QGOV (13 74 68) www.tatsipca.qld.gov.au
Mining and environmentally relevant activities Infrastructure development (coastal) Heritage issues	*Environmental Protection Act 1994* *Coastal Protection and Management Act 1995* *Queensland Heritage Act 1992*	Queensland Department of the Environment, Tourism, Science and Innovation	Ph: 13 QGOV (13 74 68) www.detsi.qld.gov.au
Protected plants and protected areas	*Nature Conservation Act 1992* *Planning Act 2016*	Queensland Department of the Environment, Tourism, Science and Innovation	Ph: 1300 130 372 (option 4) palm@detsi.qld.gov.au www.detsi.qld.gov.au
Koala mapping and regulations	*Nature Conservation Act 1992*	Queensland Department of the Environment, Tourism, Science and Innovation	Ph: 13 QGOV (13 74 68) Koala.assessment@detsi.qld.gov.au
Interference with fish passage in a watercourse, mangroves Forestry activities	*Fisheries Act 1994* *Forestry Act 1959*	Queensland Department of Primary Industries	Ph: 13 QGOV (13 74 68) www.daf.qld.gov.au
Matters of National Environmental Significance including listed threatened species and ecological communities	*Environment Protection and Biodiversity Conservation Act 1999*	Department of Climate Change, Energy, the Environment and Water (Australian Government)	Ph: 1800 803 772 www.dcceew.gov.au
Development and planning processes	*Planning Act 2016* *State Development and Public Works Organisation Act 1971*	Queensland Department of State Development, Infrastructure and Planning	Ph: 13 QGOV (13 74 68) www.planning.qld.gov.au
Coordinated projects	*Planning Act 2016* *State Development and Public Works Organisation Act 1971*	Office of the Coordinator-General	Ph: 13 QGOV (13 74 68) www.statedevelopment.qld.gov.au/coordinator-general
Wet Tropics World Heritage Area	*Wet Tropics World Heritage Protection and Management Act 1993*	Queensland Wet Tropics Management Authority	Ph: (07) 4241 0500 www.wettropics.gov.au
Requirements on State controlled road	*Transport Infrastructure Act 1994*	Queensland Department of Transport and Main Roads	Ph: 13 QGOV (13 74 68) https://www.tmr.qld.gov.au
Local government requirements	*Local Government Act 2009* *Planning Act 2016*	Your relevant local government office	Local Government Contact Directory



Vegetation management report

For Lot: 3 Plan: RP843182
11/04/2025

nrmmrrd.qld.gov.au

Queensland Government

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Recent changes

Updated mapping

Updated vegetation mapping was released on 22 November 2023 and includes the most recent Queensland Herbarium scientific updates to the Regulated Vegetation Management Map, regional ecosystems, essential habitat, wetland and high-value regrowth mapping.

The Department of the Environment, Tourism, Science and Innovation have also updated their koala protection mapping to align with the Queensland Herbarium scientific updates.

The latest version (v10) of the Protected Plants Flora Survey Trigger Map (trigger map) was released on 6 September 2023.

Overview

Based on the lot on plan details you have supplied, this report provides the following detailed information:
Property details - information about the specified Lot on Plan, lot size, local government area, bioregion(s), subregion(s) and catchment(s);

Vegetation management framework - an explanation of the application of the framework and contact details for the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development who administer the framework;

Vegetation management framework details for the specified Lot on Plan including:

- the vegetation management categories on the property;
- the vegetation management regional ecosystems on the property;
- vegetation management watercourses or drainage features on the property;
- vegetation management wetlands on the property;
- vegetation management essential habitat on the property;
- whether any area management plans are associated with the property;
- whether the property is coastal or non-coastal; and
- whether the property is mapped as Agricultural Land Class A or B;

Protected plant framework - an explanation of the application of the framework and contact details for the Department of the Environment, Tourism, Science and Innovation who administer the framework, including:

- high risk areas on the protected plant flora survey trigger map for the property;

Koala protection framework - an explanation of the application of the framework and contact details for the Department of the Environment, Tourism, Science and Innovation who administer the framework; and

Koala protection framework details for the specified Lot on Plan including:

- the koala district the property is located in;
- koala priority areas on the property;
- core and locally refined koala habitat areas on the property;
- whether the lot is located in an identified koala broad-hectare area; and
- koala habitat regional ecosystems on the property for core koala habitat areas.

This information will assist you to determine your options for managing vegetation under:
- the vegetation management framework, which may include:

- exempt clearing work;
- accepted development vegetation clearing code;
- an area management plan;
- a development approval;

- the protected plant framework, which may include:

- the need to undertake a flora survey;
- exempt clearing;
- a protected plant clearing permit;

- the koala protection framework, which may include:

- exempted development;
- a development approval;
- the need to undertake clearing sequentially and in the presence of a koala spotter.

Other laws

The clearing of native vegetation is regulated by both Queensland and Australian legislation, and some local governments also regulate native vegetation clearing. You may need to obtain an approval or permit under another Act, such as the Commonwealth Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Section 8 of this guide provides contact details of other agencies you should confirm requirements with, before commencing vegetation clearing.

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1. Property details

1.1 Tenure and title area

All of the lot, plan, tenure and title area information associated with property Lot: 3 Plan: RP843182 are listed in Table 1.

Table 1: Lot, plan, tenure and title area information for the property

Lot	Plan	Tenure	Property title area (sq metres)
3	RP843182	Freehold	7,996,000

The tenure of the land may affect whether clearing is considered exempt clearing work or may be carried out under an accepted development vegetation clearing code.

Does the property Lot: 3 Plan: RP843182 have a freehold tenure and is in the Wet Tropics of Queensland World Heritage Area?

No, this property is not located in the Wet Tropics of Queensland World Heritage Area.

1.2 Property location

Table 2 provides a summary of the locations for property Lot: 3 Plan: RP843182, in relation to natural and administrative boundaries.

Table 2: Property location details

Local Government(s)	Catchment(s)	Bioregion(s)	Subregion(s)
Central Highlands Regional	Fitzroy	Brigalow Belt	Isaac - Comet Downs

2. Vegetation management framework (administered by the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development)

The *Vegetation Management Act 1999* (VMA), the Vegetation Management Regulation 2023, the *Planning Act 2016* and the Planning Regulation 2017, in conjunction with associated policies and codes, form the Vegetation Management Framework.

The VMA does not apply to all land tenures or vegetation types. State forests, national parks, forest reserves and some tenures under the *Forestry Act 1959* and *Nature Conservation Act 1992* are not regulated by the VMA. Managing or clearing vegetation on these tenures may require approvals under these laws.

The following native vegetation is not regulated under the VMA but may require permit(s) under other laws:

- grass or non-woody herbage;
- a plant within a grassland regional ecosystem identified in the Vegetation Management Regional Ecosystem Description Database (VM REDD) as having a grassland structure; and
- a mangrove.

2.1 Exempt clearing work

Exempt clearing work is an activity for which you do not need to notify the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development or obtain an approval under the vegetation management framework. Exempt clearing work was previously known as exemptions.

In areas that are mapped as Category X (white in colour) on the regulated vegetation management map (see section 4.1), and where the land tenure is freehold, indigenous land and leasehold land for agriculture and grazing purposes, the clearing of vegetation is considered exempt clearing work and does not require notification or development approval under the vegetation management framework. For all other land tenures, contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development before commencing clearing to ensure that the proposed activity is exempt clearing work.

A range of routine property management activities are considered exempt clearing work. A list of exempt clearing work is available at

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/exemptions/.

Exempt clearing work may be affected if the proposed clearing area is subject to development approval conditions, a covenant, an environmental offset, an exchange area, a restoration notice, or an area mapped as Category A. Exempt clearing work may require approval under other Commonwealth, State or Local Government laws, or local government planning schemes. Contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development prior to clearing in any of these areas.

2.2 Accepted development vegetation clearing codes

Some clearing activities can be undertaken under an accepted development vegetation clearing code. The codes can be downloaded at

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/codes/

If you intend to clear vegetation under an accepted development vegetation clearing code, you must notify the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development before commencing. The information in this report will assist you to complete the online notification form.

You can complete the online form at
https://vegetation-apps.dnrm.qld.gov.au

2.3 Area management plans

Area Management Plans (AMP) provide an alternative approval system for vegetation clearing under the vegetation management framework. They list the purposes and clearing conditions that have been approved for the areas covered by the plan. It is not necessary to use an AMP, even when an AMP applies to your property.

On 8 March 2020, AMPs ended for fodder harvesting, managing thickened vegetation and managing encroachment. New notifications cannot be made for these AMPs. You will need to consider options for fodder harvesting, managing thickened vegetation or encroachment under a relevant accepted development vegetation clearing code or apply for a development approval.

New notifications can be made for all other AMPs. These will continue to apply until their nominated end date.

If an Area Management Plan applies to your property for which you can make a new notification, it will be listed in Section 3.6 of this report. Before clearing under one of these AMPs, you must first notify the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development and then follow the conditions and requirements listed in the AMP.

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/area-management-plans

2.4 Development approvals

If under the vegetation management framework your proposed clearing is not exempt clearing work, or is not permitted under an accepted development vegetation clearing code, or an AMP, you may be able to apply for a development approval. Information on how to apply for a development approval is available at

https://www.qld.gov.au/environment/land/management/vegetation/clearing-approvals/development

2.5. Contact information for the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development

For further information on the vegetation management framework:

Phone 135VEG (135 834)

Email vegetation@resources.qld.gov.au

Visit https://www.resources.qld.gov.au/?contact=vegetation to submit an online enquiry.

3. Vegetation management framework for Lot: 3 Plan: RP843182

3.1 Vegetation categories

The vegetation categories on your property are shown on the regulated vegetation management map in section 4.1 of this report. A summary of vegetation categories on the subject lot are listed in Table 3. Descriptions for these categories are shown in Table 4.

Table 3: Vegetation categories for subject property

Vegetation category	Area (ha)
Category R	less than 0.01
Category X	798.86

Table 4: Description of vegetation categories

Category	Colour on Map	Description	Requirements / options under the vegetation management framework
A	red	Compliance areas, environmental offset areas and voluntary declaration areas	Special conditions apply to Category A areas. Before clearing, contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development to confirm any requirements in a Category A area.
B	dark blue	Remnant vegetation areas	Exempt clearing work, or notification and compliance with accepted development vegetation clearing codes, area management plans or development approval.
C	light blue	High-value regrowth areas	Exempt clearing work, or notification and compliance with managing Category C regrowth vegetation accepted development vegetation clearing code.
R	yellow	Regrowth within 50m of a watercourse or drainage feature in the Great Barrier Reef catchment areas	Exempt clearing work, or notification and compliance with managing Category R regrowth accepted development vegetation clearing code or area management plans.
X	white	Clearing on freehold land, indigenous land and leasehold land for agriculture and grazing purposes is considered exempt clearing work under the vegetation management framework. Contact the Department to clarify whether a development approval is required for other State land tenures.	No permit or notification required on freehold land, indigenous land and leasehold land for agriculture and grazing. A development approval may be required for some State land tenures.

Property Map of Assessable Vegetation (PMAV)

The following Property Map of Assessable Vegetation (PMAVs) may be present on this property.
Reference number:
2009/006406

3.2 Regional ecosystems

The endangered, of concern and least concern regional ecosystems on your property are shown on the vegetation management supporting map in section 4.2 and are listed in Table 5.

A description of regional ecosystems can be accessed online at
https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/descriptions/

Table 5: Regional ecosystems present on subject property

Regional Ecosystem	VMA Status	Category	Area (Ha)	Short Description	Structure Category
11.4.8	Endangered	R	less than 0.01	Eucalyptus cambageana woodland to open forest with Acacia harpophylla or A. argyrodendron on Cainozoic clay plains	Sparse
11.4.9	Endangered	R	less than 0.01	Acacia harpophylla shrubby woodland with Terminalia oblongata on Cainozoic clay plains	Sparse
11.9.5	Endangered	R	less than 0.01	Acacia harpophylla and/or Casuarina cristata open forest to woodland on fine-grained sedimentary rocks	Mid-dense
non-rem	None	X	798.86	None	None

Please note:
1. All area and area derived figures included in this table have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 1994). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.
2. If Table 5 contains a Category 'plant', please be aware that this refers to 'plantations' such as forestry, and these areas are considered non-remnant under the VMA.

The VMA status of the regional ecosystem (whether it is endangered, of concern or least concern) also determines if any of the following are applicable:

- exempt clearing work;
- accepted development vegetation clearing codes;
- performance outcomes in State Code 16 of the State Development Assessment Provisions (SDAP).

3.3 Watercourses

Vegetation management watercourses and drainage features for this property are shown on the vegetation management supporting map in section 4.2.

3.4 Wetlands

There are no vegetation management wetlands present on this property.

3.5 Essential habitat

Under the VMA, essential habitat for protected wildlife is native wildlife prescribed under the *Nature Conservation Act 1992* (NCA) as critically endangered, endangered, vulnerable or near-threatened wildlife.

Essential habitat for protected wildlife includes suitable habitat on the lot, or where a species has been known to occur up to 1.1 kilometres from a lot on which there is assessable vegetation. These important habitat areas are protected under the VMA.

Any essential habitat on this property will be shown as blue hatching on the vegetation supporting map in section 4.2.

If essential habitat is identified on the lot, information about the protected wildlife species is provided in Table 6 below. The numeric labels on the vegetation management supporting map can be cross referenced with Table 6 to outline the essential habitat factors for that particular species. There may be essential habitat for more than one species on each lot, and areas of Category A, Category B and Category C can be mapped as Essential Habitat.

Essential habitat is compiled from a combination of species habitat models and buffered species records. Regional ecosystem is a mandatory essential habitat factor, unless otherwise stated. Essential habitat, for protected wildlife, means an area of vegetation shown on the Regulated Vegetation Management Map -

1) that has at least 3 essential habitat factors for the protected wildlife that must include any essential habitat factors that are stated as mandatory for the protected wildlife in the essential habitat database. Essential habitat factors are comprised of - regional ecosystem (mandatory for most species), vegetation community, altitude, soils, position in landscape; or
2) in which the protected wildlife, at any stage of its life cycle, is located.

If there is no essential habitat mapping shown on the vegetation management supporting map for this lot, and there is no table in the sections below, it confirms that there is no essential habitat on the lot.

Category A and/or Category B and/or Category C

Table 6: Essential habitat in Category A and/or Category B and/or Category C

No records

3.6 Area Management Plan(s)

Nil

3.7 Coastal or non-coastal

For the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP), this property is regarded as*

Non Coastal

*See also Map 4.3

3.8 Agricultural Land Class A or B

The following can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code:

Does this lot contain land that is mapped as Agricultural Land Class A or B in the State Planning Interactive Mapping System?

No Class A

No Class B

Note - This confirms Agricultural Land Classes as per the State Planning Interactive Mapping System only. This response does not include Agricultural Land Classes identified under local government planning schemes. For further information, check the Planning Scheme for your local government area.

See Map 4.4 to identify the location and extent of Class A and/or Class B Agricultural land on Lot: 3 Plan: RP843182.

4. Vegetation management framework maps

Vegetation management maps included in this report may also be requested individually at:
https://www.qld.gov.au/environment/land/management/vegetation/maps/map-request

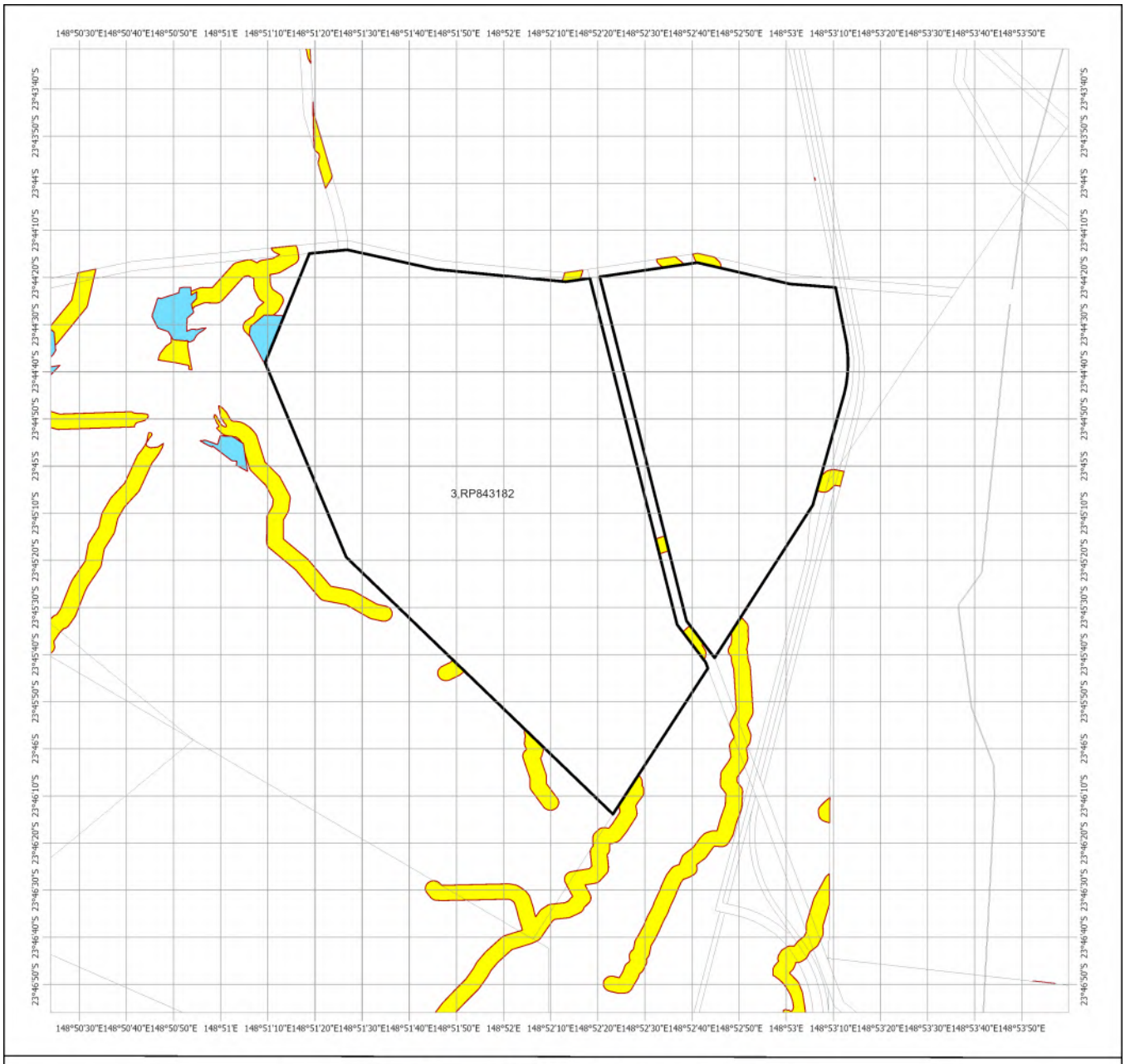
Regulated vegetation management map
The regulated vegetation management map shows vegetation categories needed to determine clearing requirements. These maps are updated monthly to show new property maps of assessable vegetation (PMAV).

Vegetation management supporting map
The vegetation management supporting map provides information on regional ecosystems, wetlands, watercourses and essential habitat.

Coastal/non-coastal map
The coastal/non-coastal map confirms whether the lot, or which parts of the lot, are considered coastal or non-coastal for the purposes of the accepted development vegetation clearing codes and State Code 16 of the State Development Assessment Provisions (SDAP).

Agricultural Land Class A or B as per State Planning Policy: State Interest for Agriculture
The Agricultural Land Class map confirms the location and extent of land mapped as Agricultural Land Classes A or B as identified on the State Planning Interactive Mapping System. Please note that this map does not include areas identified as Agricultural Land Class A or B in local government planning schemes. This map can be used to identify Agricultural Land Class A or B areas under the "Managing regulated regrowth vegetation" accepted development vegetation clearing code.

4.1 Regulated vegetation management map



Regulated Vegetation Management Map

Queensland Government

LOCALITY DIAGRAM



- Category A area (Vegetation offsets/compliance notices/VDecs)
- Category B area (Remnant vegetation)
- Category C area (High-value regrowth vegetation)
- Category R area (Reef regrowth watercourse vegetation)
- Category X area (Exempt clearing work on Freehold, Indigenous and Leasehold land)
- Water
- Other land parcel boundaries
- Selected Lot and Plan

N

0 360 720 1,080 1,440 1,800 m

This product is displayed in: GDA2020

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Additional information required for the assessment of vegetation values is provided in the accompanying "Vegetation Management Supporting map". For further information go to the web site: www.nrmmrrd.qld.gov.au or contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development.

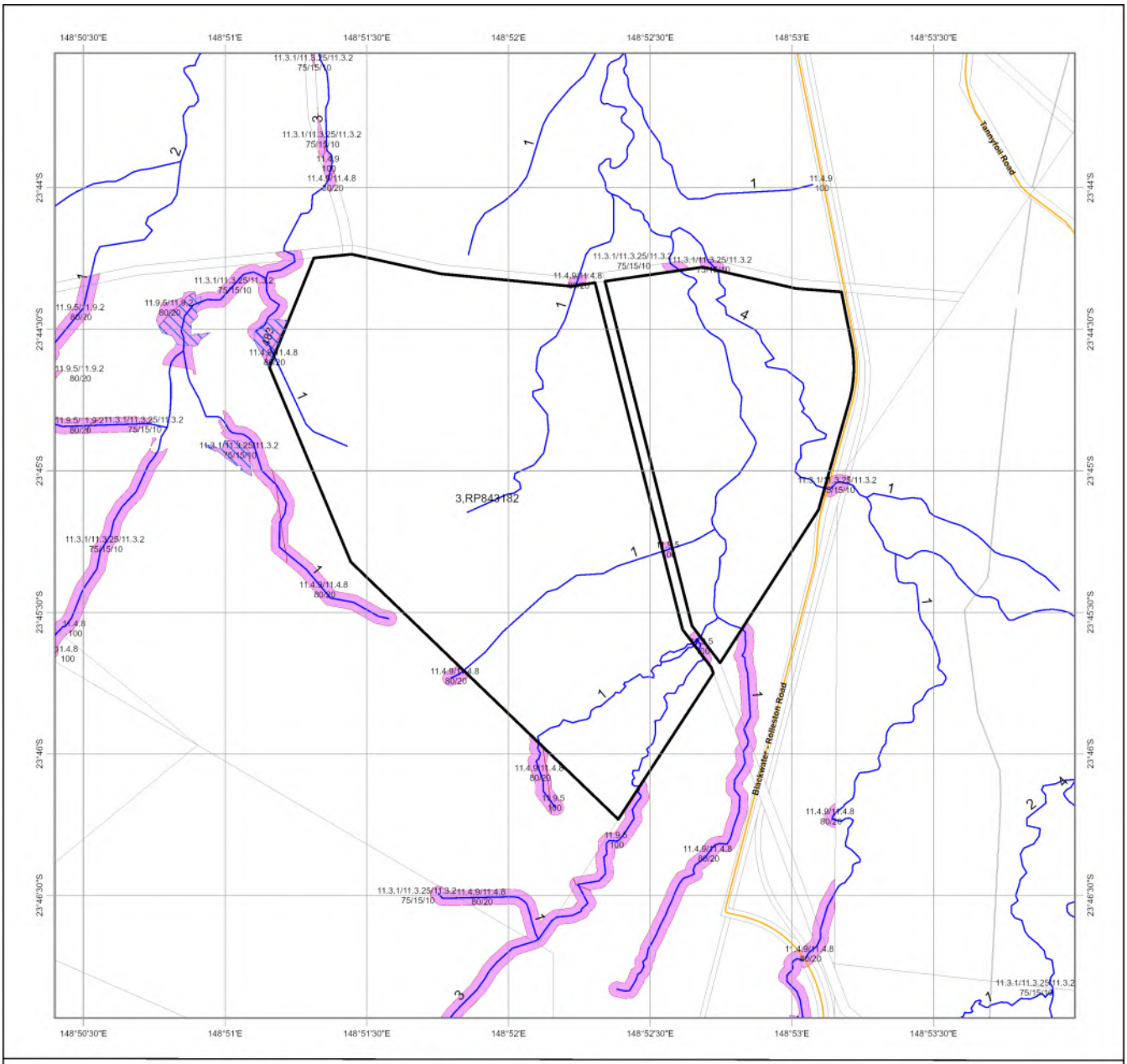
Digital data for the regulated vegetation management map is available from the Queensland Spatial Portal at http://www.spatial.information.qld.gov.au/

Land parcel boundaries are provided as locational aid only.

This map is updated on a monthly basis to ensure new PMAVs are included as they are approved.

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4.2 Vegetation management supporting map



Vegetation Management Supporting Map

- 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
- Category X area
- Water
- Wetland on the vegetation management wetlands map
- Essential habitat on the essential habitat map
- Essential habitat species record
- Watercourses and drainage features on the vegetation management watercourse and drainage features map (Stream order shown as black number against stream where available)
- Highway
- Connector
- Street/Local Road
- National Parks, State Forest and other reserves
- Other land parcel boundaries
- Selected Lot and Plan

Queensland Government

LOCALITY DIAGRAM



N

0 260 520 780 1,040 1,300 m

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Labels for Essential Habitat are centred on the area of enquiry.

Regional ecosystem linework has been compiled at a scale of 1:100 000, except in designated areas where a compilation scale of 1:50 000 is available. Linework should be used as a guide only. The positional accuracy of RE data mapped at a scale of 1:100 000 is +/- 100 metres.

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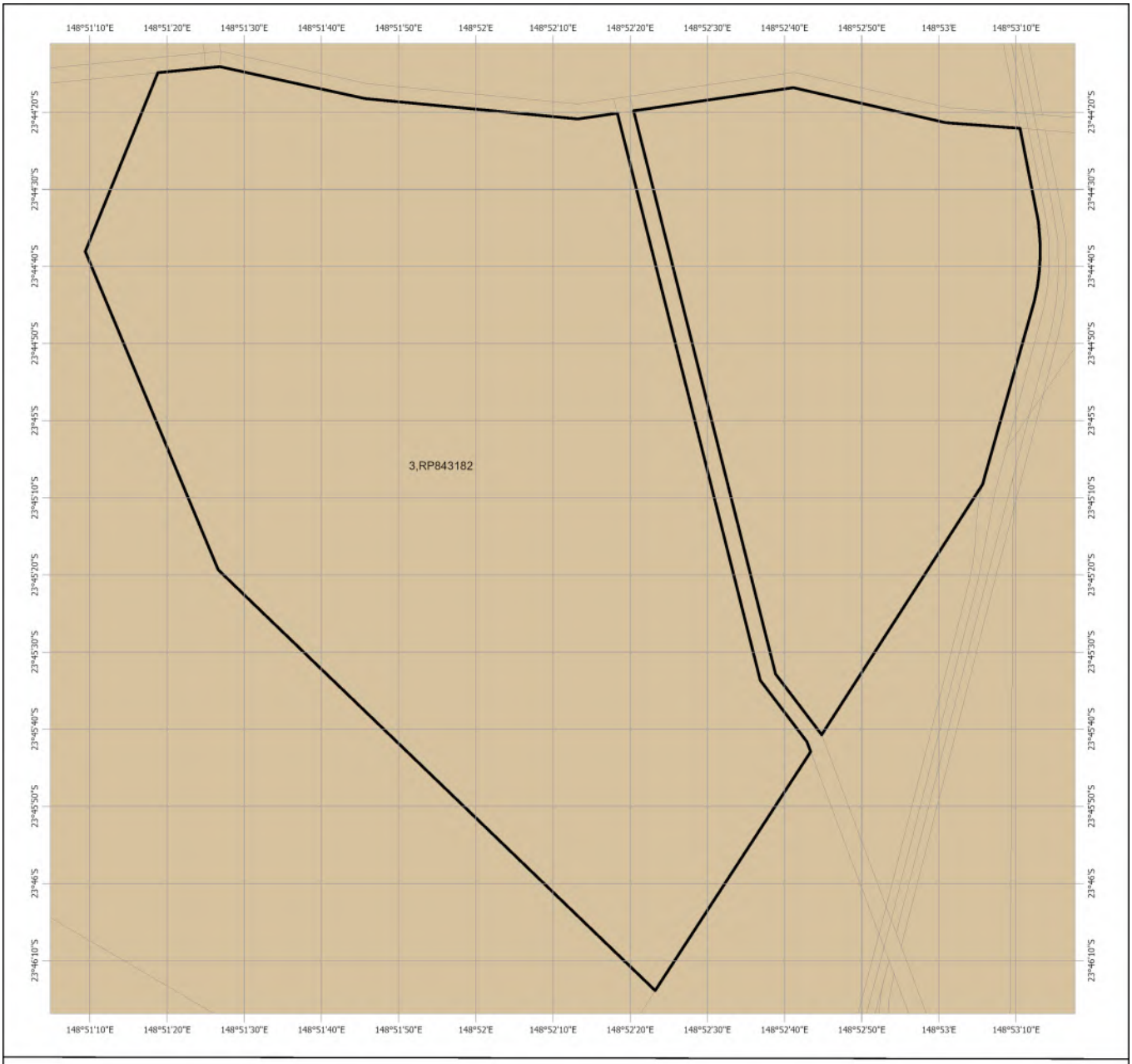
Additional information may be required for the purposes of land clearing or assessment of a regional ecosystem map or PMAV applications. For further information go to the web site: www.nrmmrrd.qld.gov.au or contact the Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development.

Digital data for the vegetation management watercourse and drainage feature map, vegetation management wetlands map, essential habitat map and the vegetation management remnant and regional ecosystem map are available from the Queensland Spatial Portal at http://www.spatial.information.qld.gov.au/

Land parcel boundaries are provided as locational aid only.

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4.3 Coastal/non-coastal map



Coastal/Non Coastal Map

Coastal
Non Coastal
Other land parcel boundaries
Selected Lot and Plan

LOCALITY DIAGRAM



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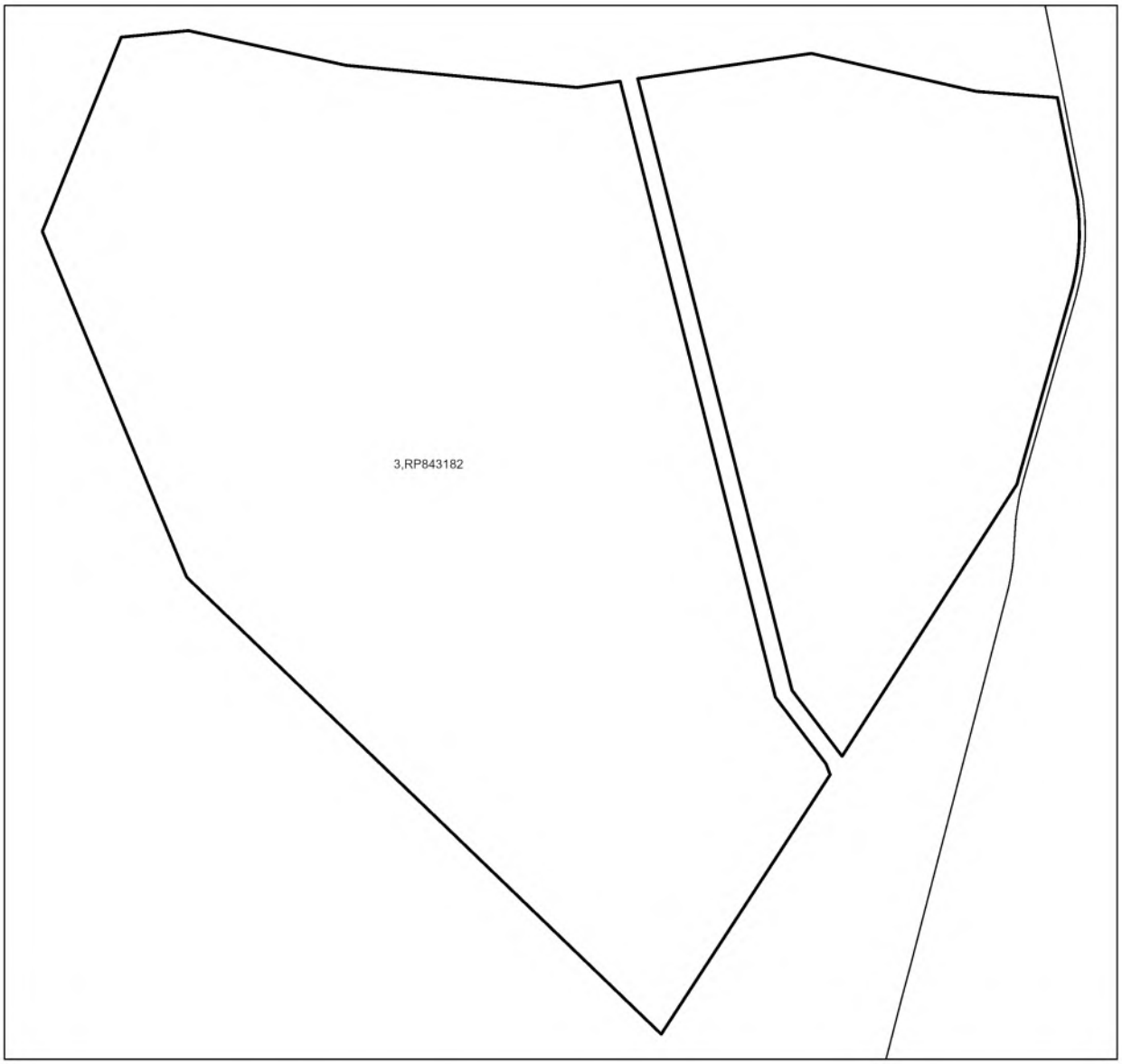
N

0 220 440 660 880 1,100 m

This product is displayed in:
GDA2020

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4.4 Agricultural Land Class A or B as per State Planning Policy: State Interest for Agriculture



Agricultural Land Class A or B
as per State Planning Policy: State Interest for Agriculture

- Towns
- Rivers and creeks
- Freeways / motorways; Highways
- Secondary roads; Streets

Agricultural land class A or B

- A
- B
- Not class A or B
- Selected Lot and Plan

LOCALITY DIAGRAM



N

0 225 450 675 900 1125 m

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5. Protected plants framework (administered by the Department of the Environment, Tourism, Science and Innovation (DETSI))

In Queensland, all plants that are native to Australia are protected plants under the *Nature Conservation Act 1992* (NCA). The NCA regulates the clearing of protected plants 'in the wild' (see Operational policy: When a protected plant in Queensland is considered to be 'in the wild') that are listed as critically endangered, endangered, vulnerable or near threatened under the Act.

Please note that the protected plant clearing framework applies irrespective of the classification of the vegetation under the *Vegetation Management Act 1999* and any approval or exemptions given under another Act, for example, the *Vegetation Management Act 1999* or *Planning Regulation 2017*.

5.1 Clearing in high risk areas on the flora survey trigger map

The flora survey trigger map identifies high-risk areas for threatened and near threatened plants. These are areas where threatened or near threatened plants are known to exist or are likely to exist based on the habitat present. The flora survey trigger map for this property is provided in section 5.5.

If you are proposing to clear an area shown as high risk on the flora survey trigger map, a flora survey of the clearing impact area must be undertaken by a suitably qualified person in accordance with the Flora survey guidelines. The main objective of a flora survey is to locate any threatened or near threatened plants that may be present in the clearing impact area.

If the flora survey identifies that threatened or near threatened plants are not present within the clearing impact area or clearing within 100m of Endangered, Vulnerable, Near-Threatened (EVNT) plants can be avoided, the clearing activity is exempt from a permit. An exempt clearing notification form must be submitted to the Department of the Environment, Tourism, Science and Innovation, with a copy of the flora survey report, at least one week prior to clearing.

If the flora survey identifies that threatened or near threatened plants are present in, or within 100m of, the area to be cleared, a clearing permit is required before any clearing is undertaken. The flora survey report, as well as an impact management report, must be submitted with the clearing permit application form.

5.2 Clearing outside high risk areas on the flora survey trigger map

In an area other than a high risk area, a clearing permit is only required where a person is, or becomes aware that threatened or near threatened plantsare present in, or within 100m of, the area to be cleared. You must keep a copy of the flora survey trigger map for the area subject to clearing for five years from the day the clearing starts. If you do not clear within the 12 month period that the flora survey trigger map was printed, you need to print and check a new flora survey trigger map.

5.3 Exemptions

Many activities are 'exempt' under the protected plant clearing framework, which means that clearing of native plants that are in the wild can be undertaken for these activities with no need for a flora survey or a protected plant clearing permit. The Information sheet - General exemptions for the take of protected plants provides some of these exemptions.

Some exemptions under the NCA are the same as exempt clearing work (formerly known as exemptions) under the *Vegetation Management Act 1999* (i.e. listed in Schedule 21 of the Planning Regulations 2017) while some are different.

5.4 Contact information for DETSI

For further information on the protected plants framework:
Phone 1300 130 372 (and select option four)
Email palm@des.qld.gov.au
Visit https://www.qld.gov.au/environment/plants-animals/plants/protected-plants

5.5 Protected plants flora survey trigger map

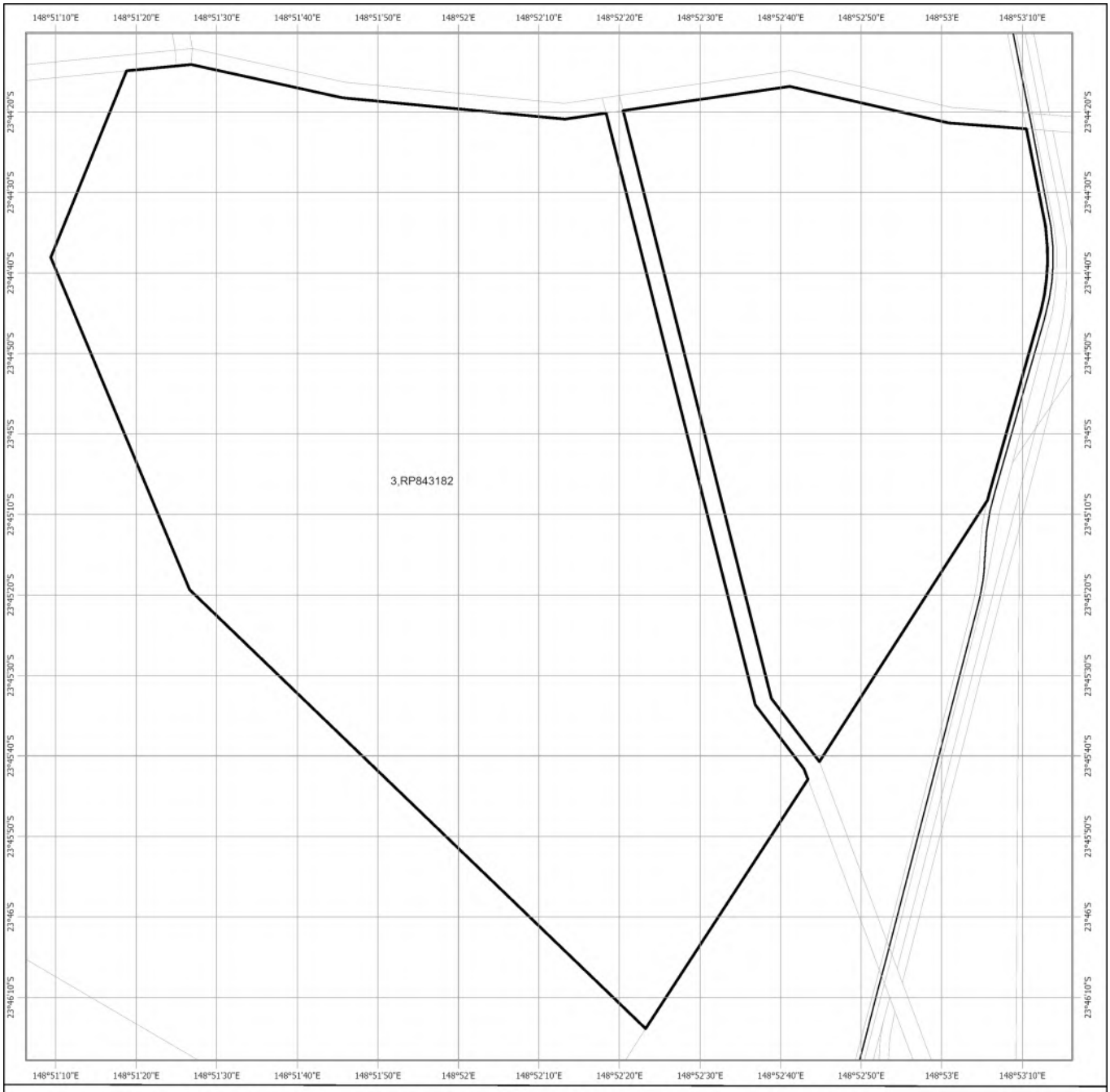
This map included may also be requested individually at: https://apps.des.qld.gov.au/map-request/flora-survey-trigger/.

Updates to the data informing the flora survey trigger map

The flora survey trigger map will be reviewed, and updated if necessary, at least every 12 months to ensure the map reflects the most up-to-date and accurate data available.

Species information

Please note that flora survey trigger maps do not identify species associated with 'high risk areas'. While some species information may be publicly available, for example via the Queensland Spatial Catalogue, the Department of the Environment, Tourism, Science and Innovation does not provide species information on request. Regardless of whether species information is available for a particular high risk area, clearing plants in a high risk area may require a flora survey and/or clearing permit. Please see the Department of the Environment, Tourism, Science and Innovation webpage on the clearing of protected plants for more information.



Protected Plants Flora Survey Trigger Map

High risk area
Other land parcel boundaries
Freeways / motorways / highways
Secondary roads / streets
Selected Lot and Plan

LOCALITY DIAGRAM



N

0 150 300 450 600 750 m

This product is displayed in:
GDA2020

This map shows areas where particular provisions of the Nature Conservation Act 1992 apply to the clearing of protected plants.

Land parcel boundaries are provided as locational aid only.

This map is produced at a scale relevant to the size of the area selected and should be printed as A4 size in portrait orientation.

For further information or assistance with interpretation of this product, please contact the Department of the Environment, Tourism, Science and Innovation at palm@des.qld.gov.au

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6. Koala protection framework (administered by the Department of the Environment, Tourism, Science and Innovation (DETSI))

The koala (*Phascolarctos cinereus*) is listed in Queensland as endangered by the Queensland Government under *Nature Conservation Act 1992* and by the Australian Government under the *Environment Protection and Biodiversity Conservation Act 1999*.

The Queensland Government's koala protection framework is comprised of the *Nature Conservation Act 1992*, the Nature Conservation (Animals) Regulation 2020, the Nature Conservation (Koala) Conservation Plan 2017, the *Planning Act 2016* and the Planning Regulation 2017.

6.1 Koala mapping

6.1.1 Koala districts

The parts of Queensland where koalas are known to occur has been divided into three koala districts - koala district A, koala district B and koala district C. Each koala district is made up of areas with comparable koala populations (e.g. density, extent and significance of threatening processes affecting the population) which require similar management regimes.

Section 7.1 identifies which koala district your property is located in.

6.1.2 Koala habitat areas

Koala habitat areas are areas of vegetation that have been determined to contain koala habitat that is essential for the conservation of a viable koala population in the wild based on the combination of habitat suitability and biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water). In order to protect this important koala habitat, clearing controls have been introduced into the Planning Regulation 2017 for development in koala habitat areas.

Please note that koala habitat areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley, Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

There are two different categories of koala habitat area (core koala habitat area and locally refined koala habitat), which have been determined using two different methodologies. These methodologies are described in the document Spatial modelling in South East Queensland.

Section 7.2 shows any koala habitat area that exists on your property.

Under the Nature Conservation (Koala) Conservation Plan 2017, an owner of land (or a person acting on the owner's behalf with written consent) can request to make, amend or revoke a koala habitat area determination if they believe, on reasonable grounds, that the existing determination for all or part of their property is incorrect.

More information on requests to make, amend or revoke a koala habitat area determination can be found in the document Guideline - Requests to make, amend or revoke a koala habitat area determination.

The koala habitat area map will be updated at least annually to include any koala habitat areas that have been made, amended or revoked.

Changes to the koala habitat area map which occur between annual updates because of a request to make, amend or revoke a koala habitat area determination can be viewed on the register of approved requests to make, amend or revoke a koala habitat area available at: https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/koalamaps. The register includes the lot on plan for the change, the date the decision was made and the map issued to the landholder that shows areas determined to be koala habitat areas.

6.1.3 Koala priority areas

Koala priority areas are large, connected areas that have been determined to have the highest likelihood of achieving conservation outcomes for koalas based on the combination of habitat suitability, biophysical variables with known relationships to koala habitat (e.g. landcover, soil, terrain, climate and ground water) and a koala conservation cost benefit analysis.

Conservation efforts will be prioritised in these areas to ensure the conservation of viable koala populations in the wild including a focus on management (e.g. habitat protection, habitat restoration and threat mitigation) and monitoring. This includes a prohibition on clearing in koala habitat areas that are in koala priority areas under the Planning Regulation 2017 (subject to some exemptions).

Please note that koala priority areas only exist in koala district A which is the South East Queensland "Shaping SEQ" Regional Plan area. These areas include the local government areas of Brisbane, Gold Coast, Logan, Lockyer Valley, Ipswich, Moreton Bay, Noosa, Redland, Scenic Rim, Somerset, Sunshine Coast and Toowoomba (urban extent).

Section 7.2 identifies if your property is in a koala priority area.

6.1.4 Identified koala broad-hectare areas

There are seven identified koala broad-hectare areas in SEQ. These are areas of koala habitat that are located in areas committed to meet development targets in the SEQ Regional Plan to accommodate SEQ's growing population including bring-forward Greenfield sites under the Queensland Housing Affordability Strategy and declared master planned areas under the repealed *Sustainable Planning Act 2009* and the repealed *Integrated Planning Act 1997*.

Specific assessment benchmarks apply to development applications for development proposed in identified koala broad-hectare areas to ensure koala conservation measures are incorporated into the proposed development.

Section 7.2 identifies if your property is in an identified koala broad-hectare area.

6.2 Koala habitat planning controls

On 7 February 2020, the Queensland Government introduced new planning controls to the Planning Regulation 2017 to strengthen the protection of koala habitat in South East Queensland (i.e. koala district A).

More information on these planning controls can be found here:
https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy.

As a high-level summary, the koala habitat planning controls make:

- development that involves interfering with koala habitat (defined below) in an area that is both a koala priority area and a koala habitat area, prohibited development (i.e. development for which a development application cannot be made);
- development that involves interfering with koala habitat (defined below) in an area that is a koala habitat area but is not a koala priority area, assessable development (i.e. development for which development approval is required); and
- development that is for extractive industries where the development involves interfering with koala habitat (defined below) in an area that is both a koala habitat area and a key resource area, assessable development (i.e. development for which development approval is required).

Interfering with koala habitat means:

1. Removing, cutting down, ringbarking, pushing over, poisoning or destroying in anyway, including by burning, flooding or draining native vegetation in a koala habitat area; but
2. Does not include destroying standing vegetation stock or lopping a tree.

However, these planning controls do not apply if the development is exempted development as defined in Schedule 24 of the Planning Regulation 2017. More information on exempted development can be found here:
https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping/legislation-policy.

There are also assessment benchmarks that apply to development applications for:

- building works, operational works, material change of use or reconfiguration of a lot where:

  - the local government planning scheme makes the development assessable;
  - the premises includes an area that is both a koala priority area and a koala habitat area; and
  - the development does not involve interfering with koala habitat (defined above); and

- development in identified koala broad-hectare areas.

The Guideline - Assessment Benchmarks in relation to Koala Habitat in South East Queensland assessment benchmarks outlines these assessment benchmarks, the intent of these assessment benchmarks and advice on how proposed development may meet these assessment benchmarks.

6.3 Koala Conservation Plan clearing requirements

Section 10 and 11 of the Nature Conservation (Koala) Conservation Plan 2017 prescribes requirements that must be met when clearing koala habitat in koala district A and koala district B.

These clearing requirements are independent to the koala habitat planning controls introduced into the Planning Regulation 2017, which means they must be complied with irrespective of any approvals or exemptions offered under other legislation.

Unlike the clearing controls prescribed in the Planning Regulation 2017 that are to protect koala habitat, the clearing requirements prescribed in the Nature Conservation (Koala) Conservation Plan 2017 are in place to prevent the injury or death of koalas when koala habitat is being cleared.

6.4 Contact information for DETSI

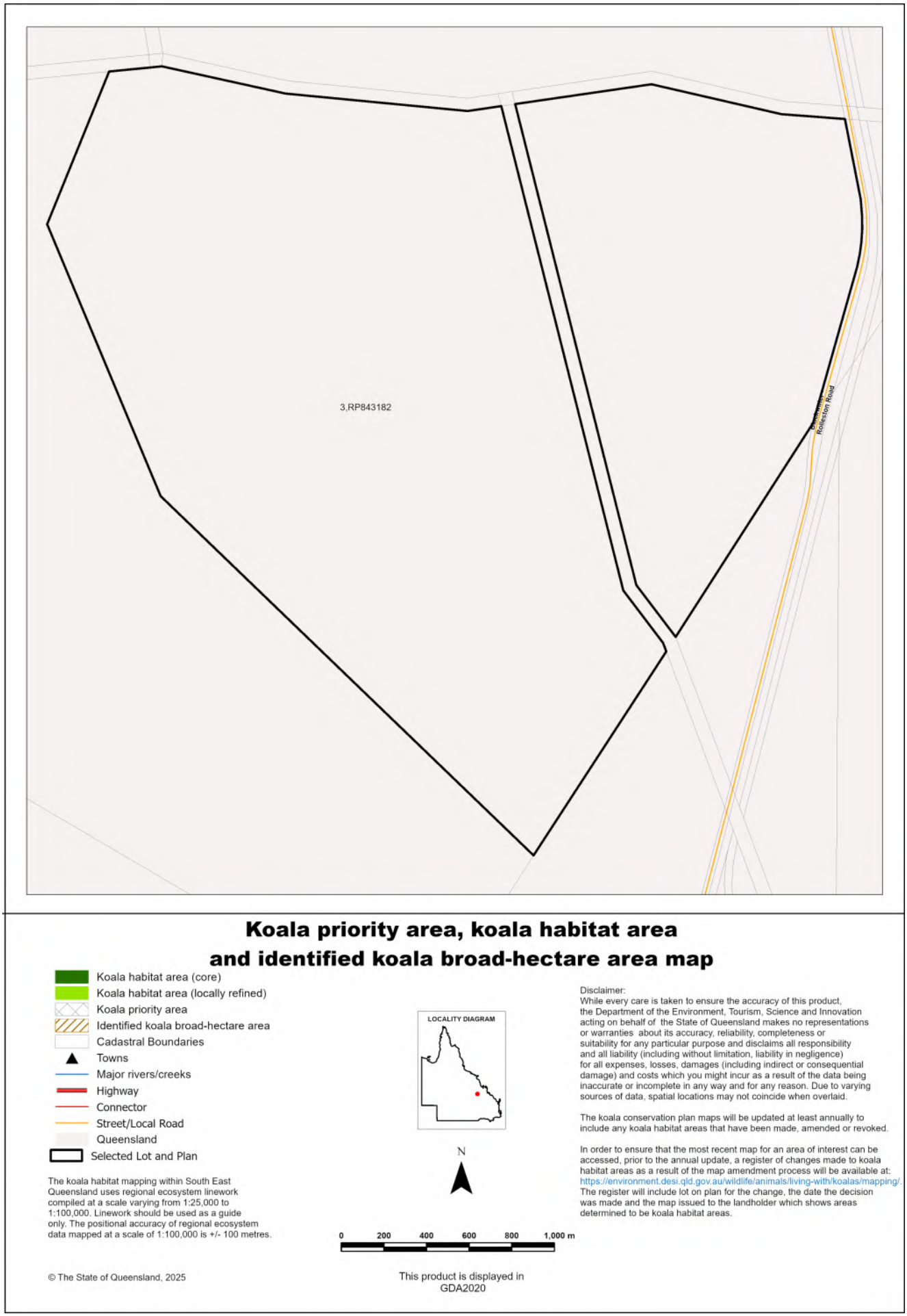
For further information on the koala protection framework:
Phone 13 QGOV (13 74 68)
Email koala.assessment@detsi.qld.gov.au
Visit https://environment.desi.qld.gov.au/wildlife/animals/living-with/koalas/mapping

7. Koala protection framework details for Lot: 3 Plan: RP843182

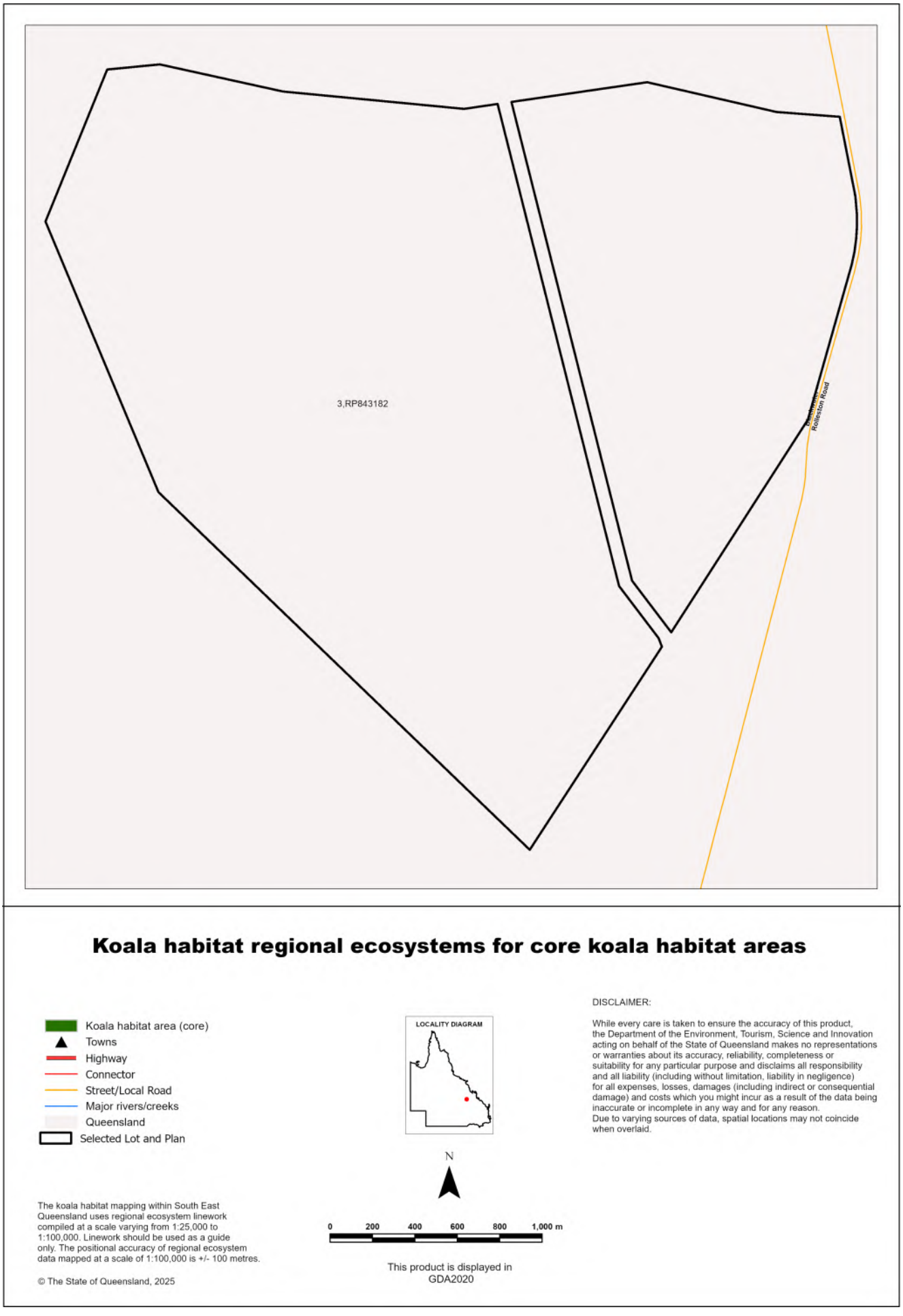
7.1 Koala districts

Koala District C

7.2 Koala priority area, koala habitat area and identified koala broad-hectare map



7.3 Koala habitat regional ecosystems for core koala habitat areas



8. Other relevant legislation contacts list

Activity	Legislation	Agency	Contact details
Interference with overland flow	*Water Act 2000*	Department of Local Government, Water and Volunteers	Ph: 13 QGOV (13 74 68) www.dlgwv.qld.gov.au
Earthworks, significant disturbance	*Soil Conservation Act 1986*	Queensland Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development	Ph: 13 QGOV (13 74 68) www.nrmmrrd.qld.gov.au
Fire Permits	*Fire and Emergency Services Act 1990*	Queensland Fire Department	Ph: 13 QGOV (13 74 68) www.fire.qld.gov.au
Indigenous Cultural Heritage	*Aboriginal Cultural Heritage Act 2003* *Torres Strait Islander Cultural Heritage Act 2003*	Queensland Department of Women, Aboriginal and Torres Strait Islander Partnerships and Multiculturalism	Ph: 13 QGOV (13 74 68) www.tatsipca.qld.gov.au
Mining and environmentally relevant activities Infrastructure development (coastal) Heritage issues	*Environmental Protection Act 1994* *Coastal Protection and Management Act 1995* *Queensland Heritage Act 1992*	Queensland Department of the Environment, Tourism, Science and Innovation	Ph: 13 QGOV (13 74 68) www.detsi.qld.gov.au
Protected plants and protected areas	*Nature Conservation Act 1992* *Planning Act 2016*	Queensland Department of the Environment, Tourism, Science and Innovation	Ph: 1300 130 372 (option 4) palm@detsi.qld.gov.au www.detsi.qld.gov.au
Koala mapping and regulations	*Nature Conservation Act 1992*	Queensland Department of the Environment, Tourism, Science and Innovation	Ph: 13 QGOV (13 74 68) Koala.assessment@detsi.qld.gov.au
Interference with fish passage in a watercourse, mangroves Forestry activities	*Fisheries Act 1994* *Forestry Act 1959*	Queensland Department of Primary Industries	Ph: 13 QGOV (13 74 68) www.daf.qld.gov.au
Matters of National Environmental Significance including listed threatened species and ecological communities	*Environment Protection and Biodiversity Conservation Act 1999*	Department of Climate Change, Energy, the Environment and Water (Australian Government)	Ph: 1800 803 772 www.dcceew.gov.au
Development and planning processes	*Planning Act 2016* *State Development and Public Works Organisation Act 1971*	Queensland Department of State Development, Infrastructure and Planning	Ph: 13 QGOV (13 74 68) www.planning.qld.gov.au
Coordinated projects	*Planning Act 2016* *State Development and Public Works Organisation Act 1971*	Office of the Coordinator-General	Ph: 13 QGOV (13 74 68) www.statedevelopment.qld.gov.au/coordinator-general
Wet Tropics World Heritage Area	*Wet Tropics World Heritage Protection and Management Act 1993*	Queensland Wet Tropics Management Authority	Ph: (07) 4241 0500 www.wettropics.gov.au
Requirements on State controlled road	*Transport Infrastructure Act 1994*	Queensland Department of Transport and Main Roads	Ph: 13 QGOV (13 74 68) https://www.tmr.qld.gov.au
Local government requirements	*Local Government Act 2009* *Planning Act 2016*	Your relevant local government office	Local Government Contact Directory

Queensland Government

Department of the Environment, Tourism, Science and Innovation

Environmental Reports

Matters of State Environmental Significance

For the selected area of interest

Custom input

Environmental Reports - General Information

The Environmental Reports portal provides for the assessment of selected matters of interest relevant to a user specified location, or area of interest (AOI). All area and derivative figures are relevant to the extent of matters of interest contained within the AOI unless otherwise stated. Please note, if a user selects an AOI via the "central coordinates" option, the resulting assessment area encompasses an area extending for a 2km radius from the point of interest.

All area and area derived figures included in this report have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 2020). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

Figures in tables may be affected by rounding.

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no values have been identified within the site.

The information presented in this report should be considered as a guide only and a field survey may be required to validate values on the ground.

Please direct queries about these reports to: Planning.Support@des.qld.gov.au

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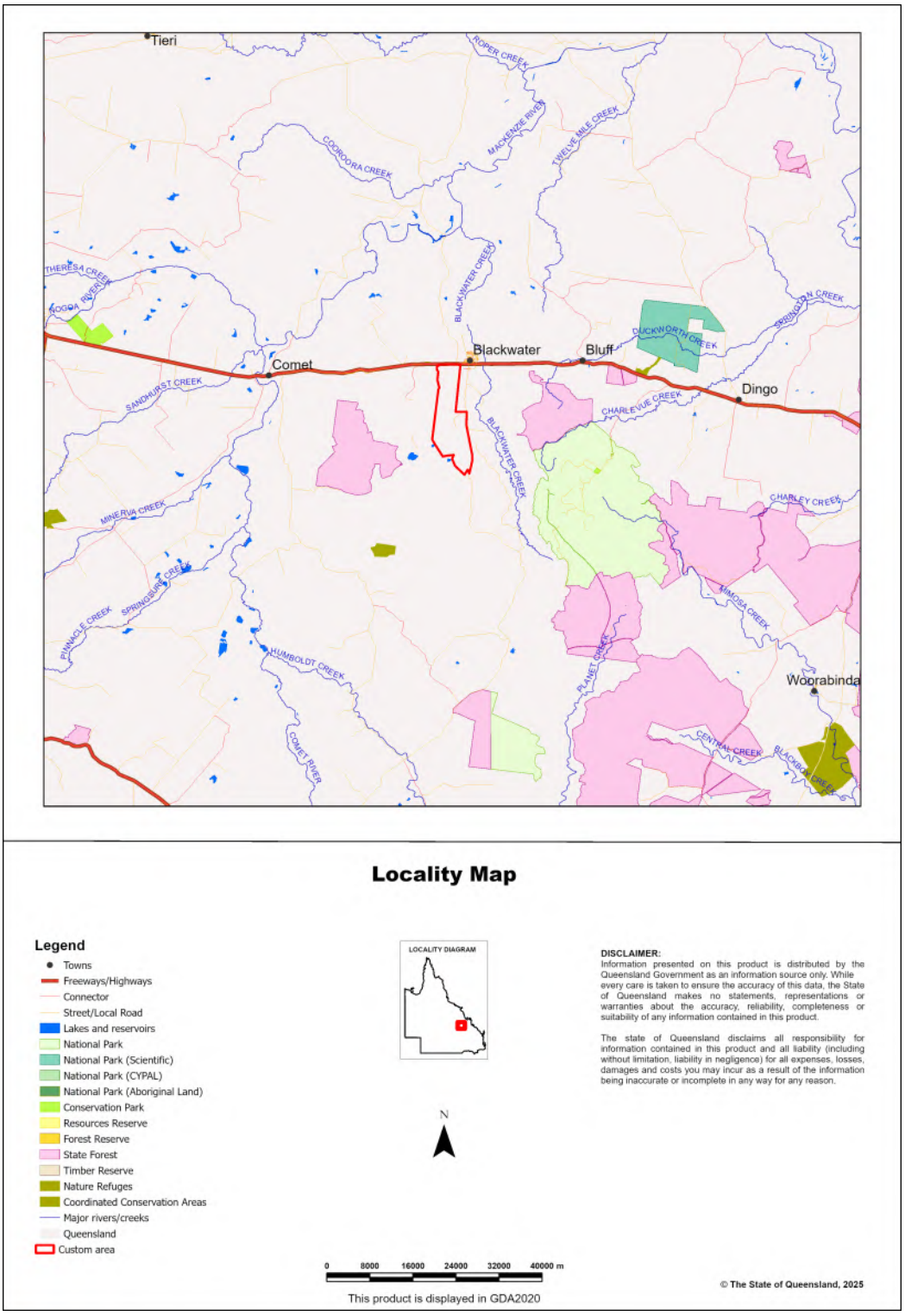
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Assessment Area Details

The following table provides an overview of the area of interest (AOI) with respect to selected topographic and environmental values.

Table 1: Summary table, details for AOI: Custom input, with area 8521.7 ha

Local Government(s)	Catchment(s)	Bioregion(s)	Subregion(s)
Central Highlands Regional	Fitzroy	Brigalow Belt	Isaac - Comet Downs



Matters of State Environmental Significance (MSES)

MSES Categories

Queensland's State Planning Policy (SPP) includes a biodiversity State interest that states:

'The sustainable, long-term conservation of biodiversity is supported. Significant impacts on matters of national or state environmental significance are avoided, or where this cannot be reasonably achieved; impacts are minimised and residual impacts offset.'

The MSES mapping product is a guide to assist implementation of the SPP biodiversity policy. While it supports the SPP, the mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations.

The SPP defines matters of state environmental significance as:

- Protected areas (including all classes of protected area except coordinated conservation areas) under the *Nature Conservation Act 1992;*

- Marine parks and land within a 'marine national park', 'conservation park', 'scientific research', 'preservation' or 'buffer' zone under the Marine Parks Act 2004 ;

- Areas within declared fish habitat areas that are management A areas or management B areas under the Fisheries Regulation 2008;

- *Threatened wildlife under the Nature Conservation Act 1992* and special least concern animals under the Nature Conservation (Wildlife) Regulation 2006;

- Regulated vegetation under the *Vegetation Management Act 1999* that is:

  - Category B areas on the regulated vegetation management map, that are 'endangered' or 'of concern' regional ecosystems;
  - Category C areas on the regulated vegetation management map that are 'endangered' or 'of concern' regional ecosystems;
  - Category R areas on the regulated vegetation management map;
  - Regional ecosystems that intersect with watercourses identified on the vegetation management watercourse and drainage feature map;
  - Regional ecosystems that intersect with wetlands identified on the vegetation management wetlands map;

- Strategic Environmental Areas under the *Regional Planning Interests Act 2014* ;

- Wetlands in a wetland protection area of wetlands of high ecological significance shown on the Map of Queensland Wetland Environmental Values under the Environment Protection Regulation 2019;

- Wetlands and watercourses in high ecological value waters defined in the Environmental Protection (Water) Policy 2009, schedule 2;
- Legally secured offset areas.

MSES Values Present

The MSES values that are present in the area of interest are summarised in the table below:

Table 2: Summary of MSES present within the AOI

1a Protected Areas- estates	0 ha	0.0%
1b Protected Areas- nature refuges	0 ha	0.0%
1c Protected Areas- special wildlife reserves	0 ha	0.0%
2 State Marine Parks- highly protected zones	0 ha	0.0%
3 Fish habitat areas (A and B areas)	0 ha	0.0%
4 Strategic Environmental Areas (SEA)	0 ha	0.0%
5 High Ecological Significance wetlands on the Map of Queensland Wetland Environmental Values	0 ha	0.0%
6a High Ecological Value (HEV) wetlands	0 ha	0.0%
6b High Ecological Value (HEV) waterways	0 km	Not applicable
7a Threatened (endangered or vulnerable) wildlife	73.38 ha	0.9%
7b Special least concern animals	0 ha	0.0%
7c i Koala habitat area - core (SEQ)	0 ha	0.0%
7c ii Koala habitat area - locally refined (SEQ)	0 ha	0.0%
7d Sea turtle nesting areas	0 km	Not applicable
8a Regulated Vegetation - Endangered/Of concern in Category B (remnant)	26.96 ha	0.3%
8b Regulated Vegetation - Endangered/Of concern in Category C (regrowth)	44.98 ha	0.5%
8c Regulated Vegetation - Category R (GBR riverine regrowth)	127.32 ha	1.5%
8d Regulated Vegetation - Essential habitat	71.94 ha	0.8%
8e Regulated Vegetation - intersecting a watercourse	112.9 km	Not applicable
8f Regulated Vegetation - within 100m of a Vegetation Management Wetland	0 ha	0.0%
9a Legally secured offset areas- offset register areas	0 ha	0.0%
9b Legally secured offset areas- vegetation offsets through a Property Map of Assessable Vegetation	0 ha	0.0%

Additional Information with Respect to MSES Values Present

MSES - State Conservation Areas

1a. Protected Areas - estates

(No results)

1b. Protected Areas - nature refuges

(No results)

1c. Protected Areas - special wildlife reserves

(No results)

2. State Marine Parks - highly protected zones

(No results)

3. Fish habitat areas (A and B areas)

(No results)

Refer to **Map 1 - MSES - State Conservation Areas** for an overview of the relevant MSES.

MSES - Wetlands and Waterways

4. Strategic Environmental Areas (SEA)

(No results)

5. High Ecological Significance wetlands on the Map of Queensland Wetland Environmental Values

(no results)

6a. Wetlands in High Ecological Value (HEV) waters

(no results)

6b. Waterways in High Ecological Value (HEV) waters

(no results)

Refer to **Map 2 - MSES - Wetlands and Waterways** for an overview of the relevant MSES.

MSES - Species

7a. Threatened (endangered or vulnerable) wildlife

Values are present

7b. Special least concern animals

Not applicable

7c i. Koala habitat area - core (SEQ)

Not applicable

7c ii. Koala habitat area - locally refined (SEQ)

Not applicable

7d. Wildlife habitat (sea turtle nesting areas)

Not applicable

Threatened (endangered or vulnerable) wildlife habitat suitability models

Species	Common name	NCA status	Presence
Boronia keysii	Keys boronia	V	None
Calyptorhynchus lathami	Glossy black cockatoo	V	None
Casuarius casuarius johnsonii	Sthn population cassowary	E	None
Crinia tinnula	Wallum froglet	V	None
Denisonia maculata	Ornamental snake	V	Core
Euastacus bindal	Mount Elliot crayfish	CR	None
Euastacus binzayedi		CR	None
Euastacus eungella		E	None
Euastacus hystricosus		E	None
Euastacus jagara	Jagara hairy crayfish	CR	None
Euastacus maidae		CR	None
Euastacus monteithorum		E	None
Euastacus robertsi		E	None
Taudactylus pleione	Kroombit tinkerfrog	E	None
Litoria freycineti	Wallum rocketfrog	V	None
Litoria olongburensis	Wallum sedgefrog	V	None
Macadamia integrifolia		V	None
Melaleuca irbyana	swamp tea-tree	E	None
Macadamia ternifolia		V	None
Macadamia tetraphylla	bopple nut	V	None
Petrogale penicillata	brush-tailed rock-wallaby	V	None
Petrogale coenensis	Cape York rock-wallaby	E	None
Petrogale purpureicollis	purple-necked rock-wallaby	V	None
Petrogale sharmani	Sharmans rock-wallaby	V	None
Petrogale xanthopus celeris	yellow-footed rock-wallaby (Qld subspecies)	V	None
Petaurus gracilis	Mahogany Glider	E	None
Petrogale persephone	Proserpine rock-wallaby	E	None
Phascolarctos cinereus	Koala - outside SEQ*	E	None
Pezoporus wallicus wallicus	Eastern ground parrot	V	None
Xeromys myoides	Water Mouse	V	None

*For koala model, this includes areas outside SEQ. Check 7c SEQ koala habitat for presence/absence.

Threatened (endangered or vulnerable) wildlife species records

(No results)

Special least concern animal species records

(No results)

Shorebird habitat (critically endangered/endangered/vulnerable)

Not applicable

Shorebird habitat (special least concern)

Not applicable

**Nature Conservation Act 1992 (NCA) Status- Endangered (E), Vulnerable (V) or Special Least Concern Animal (SL). Environment Protection and Biodiversity Conservation Act 1999 (EPBC) status: Critically Endangered (CE) Endangered (E), Vulnerable (V)*

Migratory status (M) - China and Australia Migratory Bird Agreement (C), Japan and Australia Migratory Bird Agreement (J), Republic of Korea and Australia Migratory Bird Agreement (R), Bonn Migratory Convention (B), Eastern Flyway (E)

To request a species list for an area, or search for a species profile, access Wildlife Online at:

https://www.qld.gov.au/environment/plants-animals/species-list/

Refer to **Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals** and **Map 3b - MSES - Species - Koala habitat area (SEQ)** and **Map 3c - MSES - Wildlife habitat (sea turtle nesting areas)** for an overview of the relevant MSES.

MSES - Regulated Vegetation

For further information relating to regional ecosystems in general, go to:

https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/

For a more detailed description of a particular regional ecosystem, access the regional ecosystem search page at:

https://environment.ehp.qld.gov.au/regional-ecosystems/

8a. Regulated Vegetation - Endangered/Of concern in Category B (remnant)

Regional ecosystem	Vegetation management polygon	Vegetation management status
11.3.1/11.3.25/11.3.2	E-dom	rem_end
11.3.2/11.3.25/11.3.1	E-subdom	rem_end

8b. Regulated Vegetation - Endangered/Of concern in Category C (regrowth)

Regional ecosystem	Vegetation management polygon	Vegetation management status
11.3.1/11.3.25/11.3.2	E-dom	hvr_end
11.4.9/11.4.8	E-dom	hvr_end

8c. Regulated Vegetation - Category R (GBR riverine regrowth)

Regulated vegetation map category	Map number
R	8650

8d. Regulated Vegetation - Essential habitat

Values are present

8e. Regulated Vegetation - intersecting a watercourse**

A vegetation management watercourse is mapped as present

8f. Regulated Vegetation - within 100m of a Vegetation Management wetland

Not applicable

Refer to **Map 4 - MSES - Regulated Vegetation** for an overview of the relevant MSES.

MSES - Offsets

9a. Legally secured offset areas - offset register areas

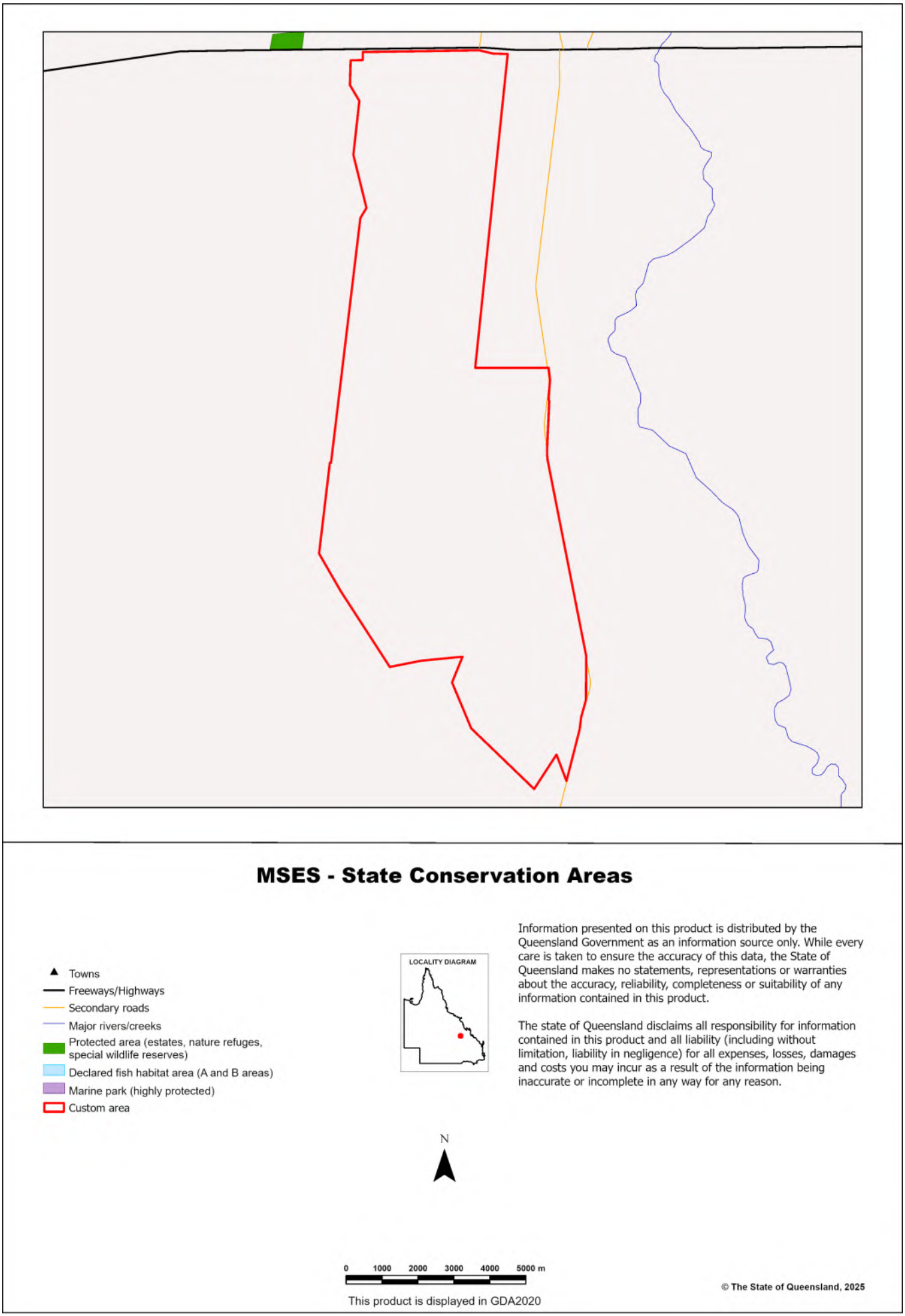
(No results)

9b. Legally secured offset areas - vegetation offsets through a Property Map of Assessable Vegetation

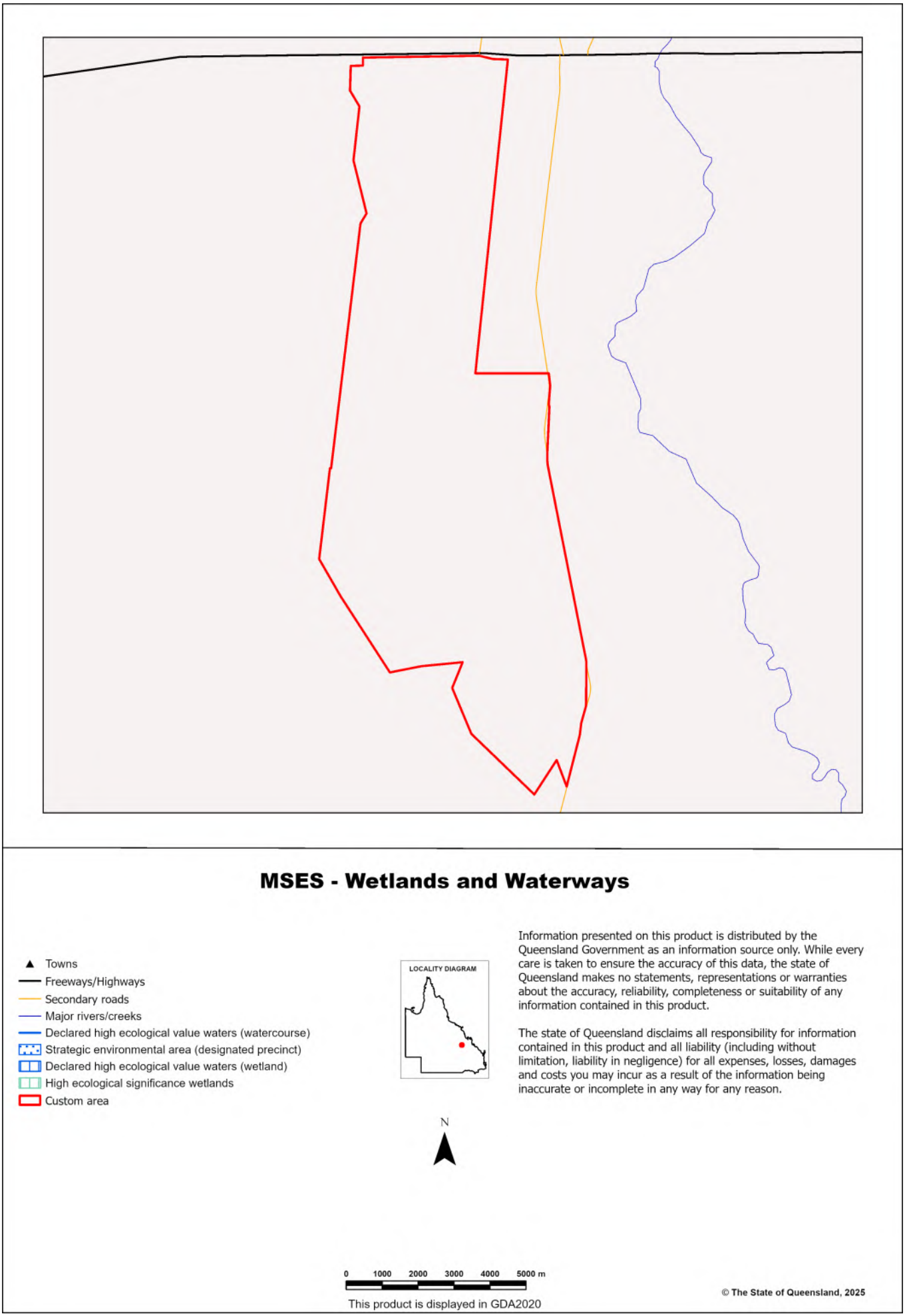
(No results)

Refer to **Map 5 - MSES - Offset Areas** for an overview of the relevant MSES.

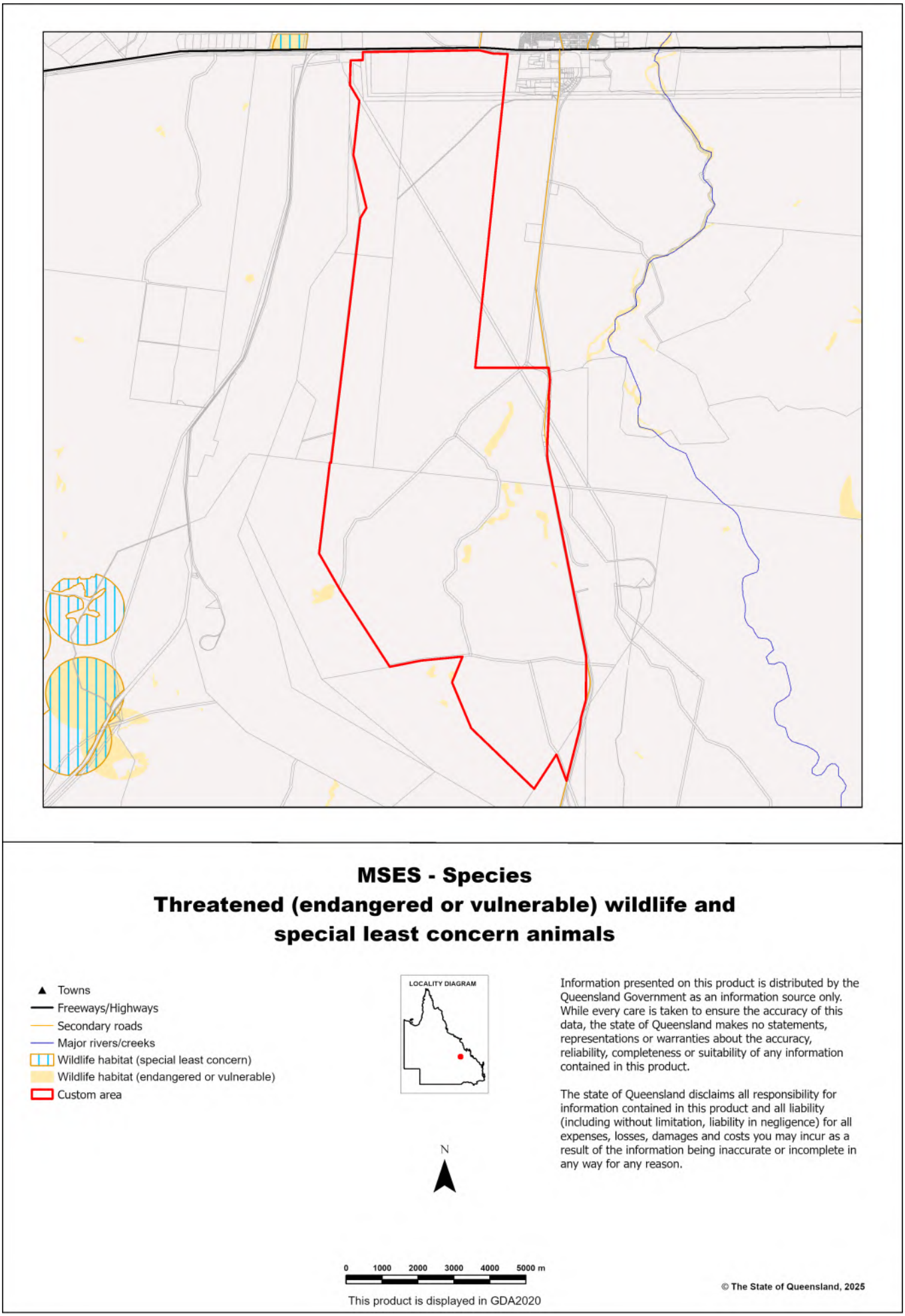
Map 1 - MSES - State Conservation Areas



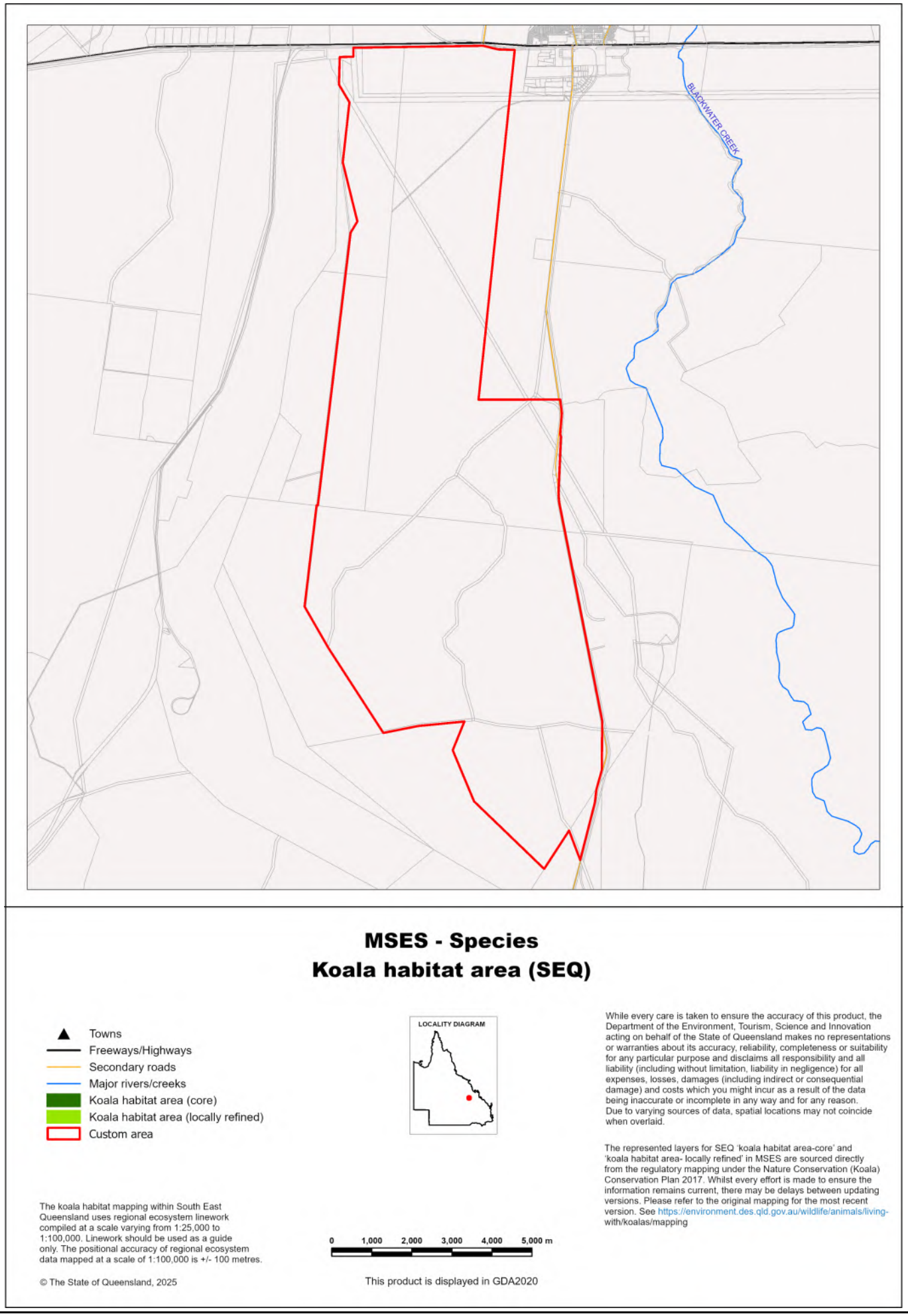
Map 2 - MSES - Wetlands and Waterways



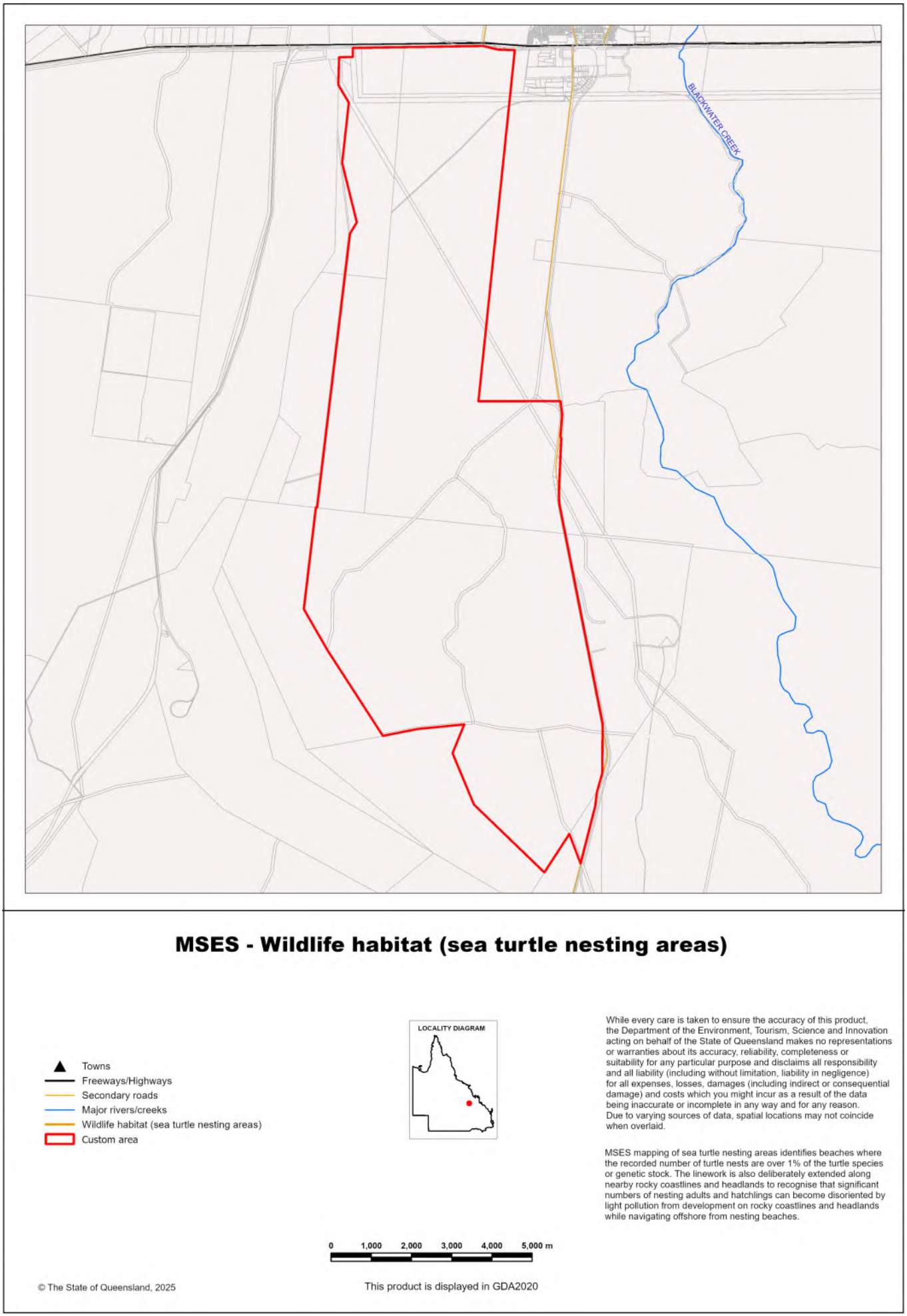
Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals



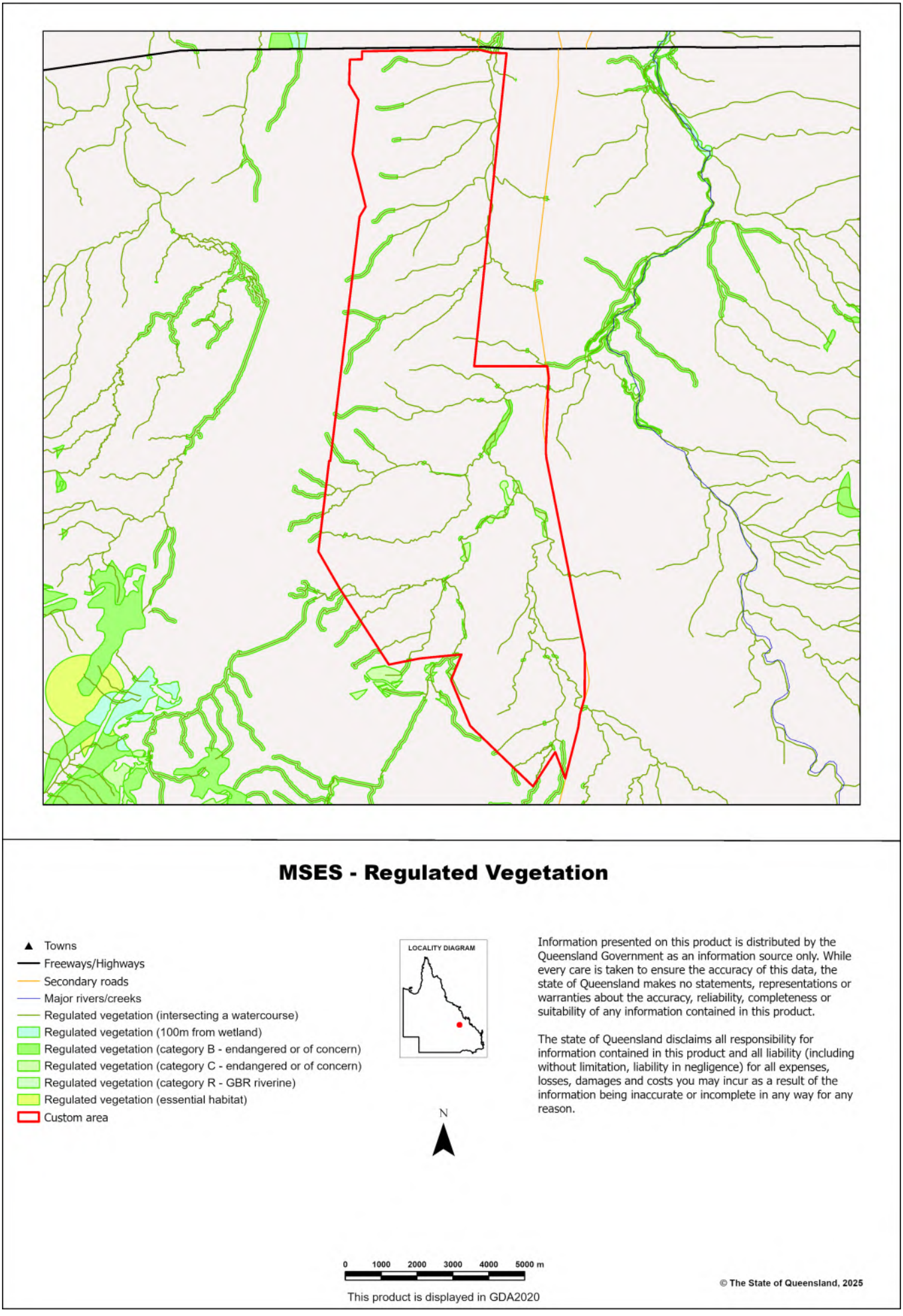
Map 3b - MSES - Species - Koala habitat area (SEQ)



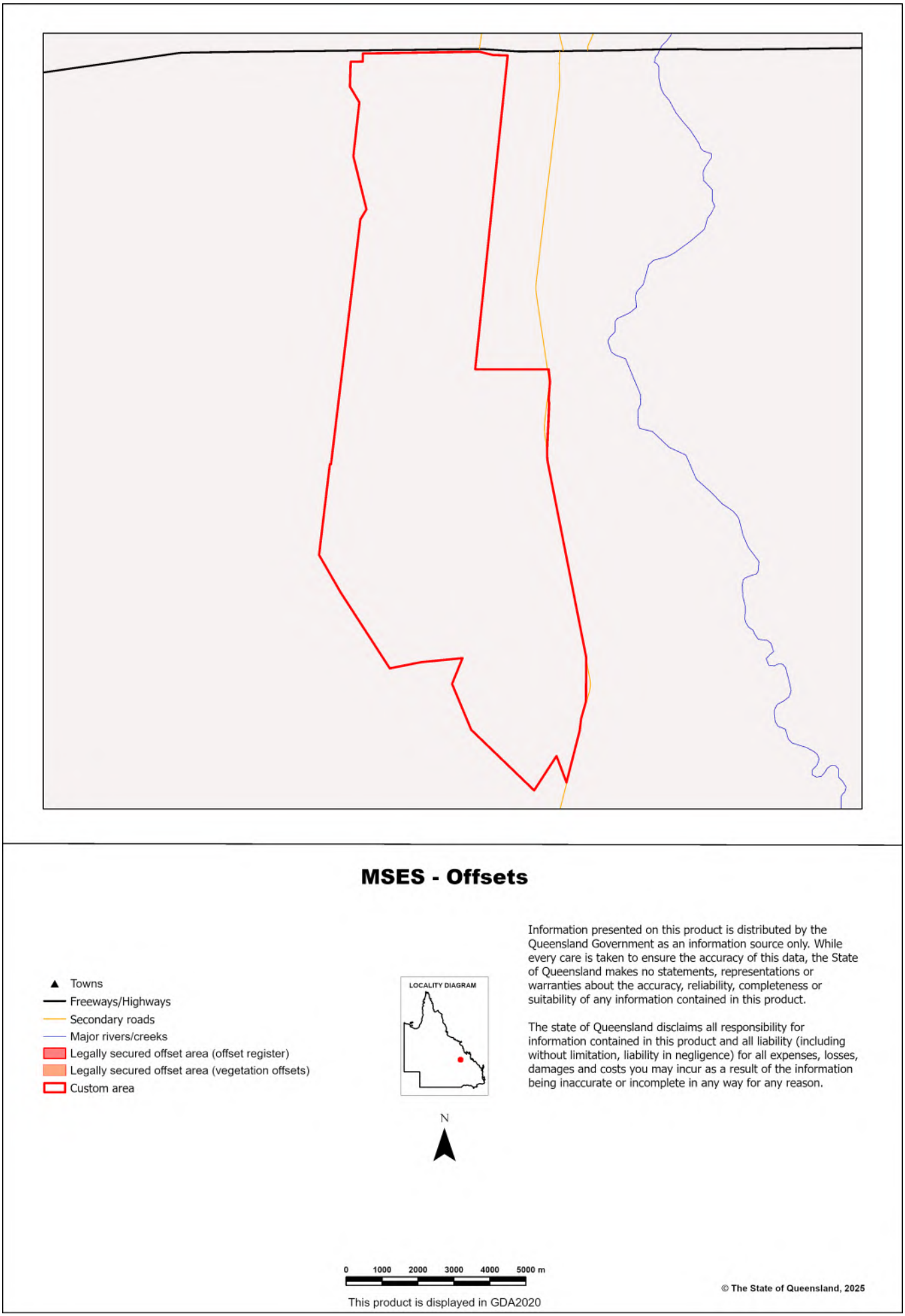
Map 3c - MSES - Species - Wildlife habitat (sea turtle nesting areas)



Map 4 - MSES - Regulated Vegetation



Map 5 - MSES - Offset Areas



Appendices

Appendix 1 - Matters of State Environmental Significance (MSES) methodology

MSES mapping is a regional-scale representation of the definition for MSES under the State Planning Policy (SPP). Its primary purpose is to support implementation of the SPP biodiversity policy.

MSES mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations.

MSES mapping does not determine whether state or local development assessment is required. For state assessment triggers refer to the Development Assessment Mapping System (DAMS). For local assessment triggers, refer to the relevant local planning scheme.

The Queensland Government's "Method for mapping - matters of state environmental significance can be downloaded from:

http://www.ehp.qld.gov.au/land/natural-resource/method-mapping-mses.html .

Appendix 2 - Source Data

The datasets listed below are available on request from:

http://qldspatial.information.qld.gov.au/catalogue/custom/index.page

- Matters of State environmental significance

Note: MSES mapping is not based on new or unique data. The primary mapping product draws data from a number of underlying environment databases and geo-referenced information sources. MSES mapping is a versioned product that is updated generally on a twice-yearly basis to incorporate the changes to underlying data sources. Several components of MSES mapping made for the current version may differ from the current underlying data sources. To ensure accuracy, or proper representation of MSES values, it is strongly recommended that users refer to the underlying data sources and review the current definition of MSES in the State Planning Policy, before applying the MSES mapping.

Individual MSES layers can be attributed to the following source data available at QSpatial:

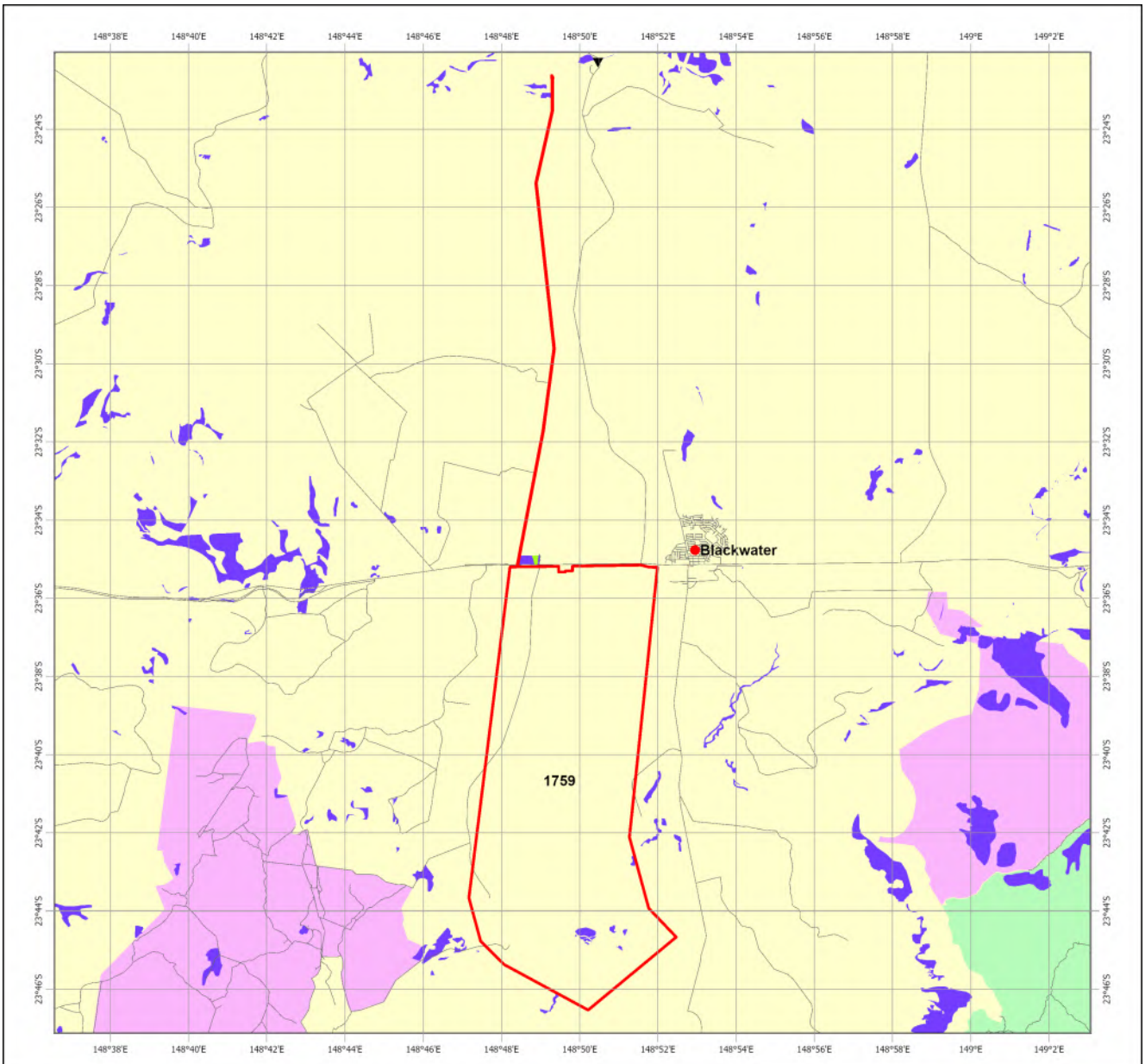
MSES layers	**current QSpatial data (http://qspatial.information.qld.gov.au)**
Protected Areas-Estates, Nature Refuges, Special Wildlife Reserves	- Protected areas of Queensland - Nature Refuges - Queensland - Special Wildlife Reserves- Queensland
Marine Park-Highly Protected Zones	Moreton Bay marine park zoning 2008
Fish Habitat Areas	Queensland fish habitat areas
Strategic Environmental Areas-designated	Regional Planning Interests Act - Strategic Environmental Areas
HES wetlands	Map of Queensland Wetland Environmental Values
Wetlands in HEV waters	HEV waters: - EPP Water intent for waters Source Wetlands: - Queensland Wetland Mapping (Current version 5) Source Watercourses: - Vegetation management watercourse and drainage feature map (1:100000 and 1:250000)
Wildlife habitat (threatened and special least concern)	-WildNet database species records - habitat suitability models (various) - SEQ koala habitat areas under the Koala Conservation Plan 2019
VMA regulated regional ecosystems	Vegetation management regional ecosystem and remnant map
VMA Essential Habitat	Vegetation management - essential habitat map
VMA Wetlands	Vegetation management wetlands map
Legally secured offsets	Vegetation Management Act property maps of assessable vegetation. For offset register data-contact DETSI
Regulated Vegetation Map	Vegetation management - regulated vegetation management map

Appendix 3 - Acronyms and Abbreviations

AOI	- Area of Interest
DETSI	- Department of the Environment, Tourism, Science and Innovation
EP Act	- Environmental Protection Act 1994
EPP	- Environmental Protection Policy
GDA2020	- Geocentric Datum of Australia 2020
GEM	- General Environmental Matters
GIS	- Geographic Information System
MSES	- Matters of State Environmental Significance
NCA	- Nature Conservation Act 1992
RE	- Regional Ecosystem
SPP	- State Planning Policy
VMA	- Vegetation Management Act 1999

Centred on tenure: ML: 1759

Map requested: 11/04/2025 16:31:34



ENVIRONMENTALLY SENSITIVE AREAS - Mining Activities

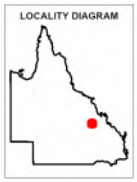
CATEGORY A
- National Parks
- Conservation Parks
- Forest Reserves
- Special Wildlife Reserve
- Wet Tropics World Heritage Area
- Great Barrier Reef Region
- Marine Parks other than General Use Zones

CATEGORY B
- Queensland Heritage Register Places
- Ramsar Sites
- Cultural Heritage Registered Areas and DLA's other than Stanbroke
- Special Forestry Areas
- Seaward Side of Highest Astronomical Tide
- Fish Habitat Areas
- Coordinated Conservation Areas
- Endangered Regional Ecosystems - regrowth and remnant (Biodiversity Status)
- General Use Zones of Marine Parks
- Marine Plants
- Selected Mining Lease (ML)

CATEGORY C
- Nature Refuges
- Resources Reserve
- State Forests
- Timber Reserves
- River Improvement Areas
- Stanbroke DLA
- Coastal Management District
- Dams and Weirs

OTHERS
- Towns
- Roads
- Repealed Wild River Nominated Waterways
- Repealed Wild River Preservation Areas
- Repealed Wild River High Preservation Areas
- Mahogany Glider Habitat
- Directory of Important Wetlands
- Queensland

LOCALITY DIAGRAM



N

0 2,500 5,000 7,500 10,000 12,500 m

This product is displayed in GDA2020

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NOTE TO USER: Themes presented in this map are indicative only. Field survey may be required to verify the 'true' spatial extent and value. Not all environmentally sensitive areas are presented in this map. A user should refer to the particular circumstances relevant to their situation to assess the 'completeness' of themes provided.

The user should note that some boundaries and indicated values are ambient and may change over time (e.g. regional ecosystem boundaries and conservation status, watercourse mapping etc.).

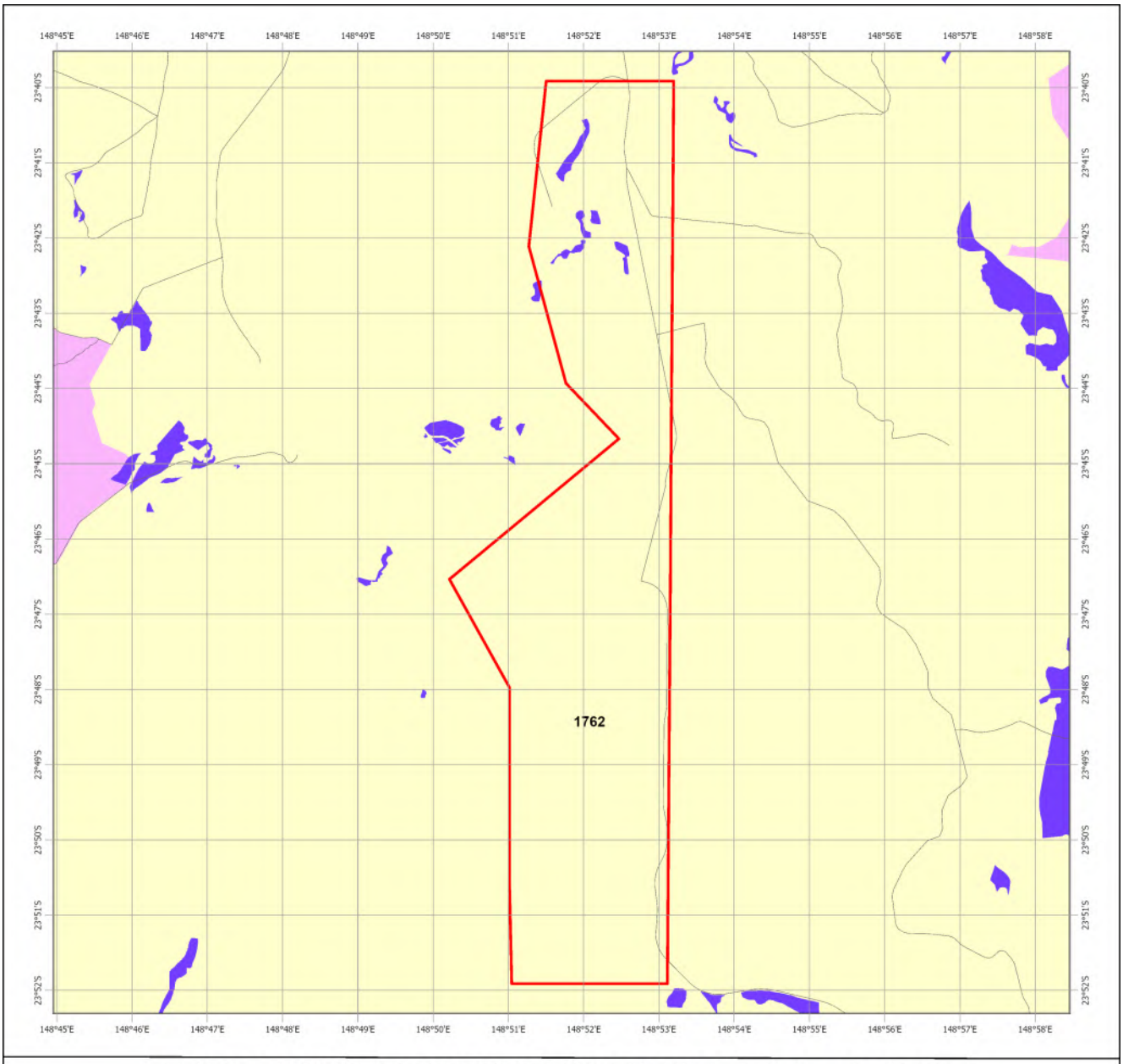
The user should be aware that due to multiple overlapping themes/ layers present, some themes/layers may be obscured by others. Ordering in the Legend does not accurately reflect the order by which themes/layers are displayed.

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Centred on tenure: ML: 1762

Map requested: 11/04/2025 16:32:13



ENVIRONMENTALLY SENSITIVE AREAS - Mining Activities

CATEGORY A

- National Parks
- Conservation Parks
- Forest Reserves
- Special Wildlife Reserve
- Wet Tropics World Heritage Area
- Great Barrier Reef Region
- Marine Parks other than General Use Zones

CATEGORY B

- Queensland Heritage Register Places
- Ramsar Sites
- Cultural Heritage Registered Areas and DLA's other than Stanbroke
- Special Forestry Areas
- Seaward Side of Highest Astronomical Tide
- Fish Habitat Areas
- Coordinated Conservation Areas
- Endangered Regional Ecosystems - regrowth and remnant (Biodiversity Status)
- General Use Zones of Marine Parks
- Marine Plants
- Selected Mining Lease (ML)

CATEGORY C

- Nature Refuges
- Resources Reserve
- State Forests
- Timber Reserves
- River Improvement Areas
- Stanbroke DLA
- Coastal Management District
- Dams and Weirs

OTHERS

- Towns
- Roads
- Repealed Wild River Nominated Waterways
- Repealed Wild River Preservation Areas
- Repealed Wild River High Preservation Areas
- Mahogany Glider Habitat
- Directory of Important Wetlands
- Queensland

LOCALITY DIAGRAM



N

0 1,000 2,000 3,000 4,000 5,000 m

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Appendix B Likelihood of occurrence

B.1 Threatened ecological communities (TECs)

Community name	EPBC Act status	Habitat preference and distribution	Likelihood of occurrence
Brigalow (*Acacia harpophylla* dominant and co-dominant)	E	Brigalow (*Acacia harpophylla* dominant and co-dominant) (Brigalow TEC) is a woodland ecological community characterised by the presence of *Acacia harpophylla* as one of the most abundant tree species (Butler, 2007). *Acacia harpophylla* is either a dominant in the tree layer, or co-dominant with other species – notably *Casuarina cristata* (belah), other species of *Acacia*, or species of *Eucalyptus*. The community is usually characterised by an open forest or woodland structure with a mixture of eucalypts, acacia and casuarina species in the canopy and occurs with a considerable range of vegetation structure and suite of species on acidic and salty clay soils (DotE, 2013a). The Brigalow TEC occurs over a substantial geographic area in semi-arid eastern Australia. Brigalow woodlands are found mostly west of the Great Dividing Range, stretching in a broad swathe east of Blackall, Charleville and Cunnamulla, north almost to Townsville in Qld, south to Narrabri in NSW, and west to Bourke on the Darling River and Blackall in central western Qld. In Qld it is found in the Brigalow Belt North, Brigalow Belt South, Mulga Lands, Darling Riverine Plains and Southeast Queensland IBRA bioregions (DotE, 2013a). Brigalow TEC coincides with 16 Qld REs under the EPBC Act (Queensland Herbarium, 2025b): In the Qld Brigalow Belt Bioregion – REs 11.3.1, 11.4.3, 11.4.7, 11.4.8, 11.4.9, 11.4.10, 11.5.16, 11.9.1, 11.9.5, 11.9.6, 11.11.14 and 11.12.21; In the Qld Southeast Queensland Bioregion – REs 12.8.23, 12.9-10.6 and 12.12.26; and, In the Qld Mulga Lands Bioregion – RE 6.4.2.	**Confirmed present** A total of 148.88 ha of Brigalow TEC was mapped within the Study Area in association with remnant and high value regrowth areas of RE 11.3.1 and 11.9.5 and remnant RE 11.4.9.
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	E	The Coolibah – Black Box Woodlands of the Darling Riverine Plains and the Brigalow Blet South Bioregions TEC are characterised by the dominance of *Eucalyptus coolabah* subsp. *coolabah* (Coolibah, Coolabah) and/or *Eucalyptus largiflorens* (Black Box) in the canopy of a eucalypt woodland structure where the understorey tends to be grassy (DSEWPC, 2011).	**Not present** Mapped areas of RE 11.3.3, which is analogous with the TEC, were identified within the Study Area, however the Study Area is located outside of the Brigalow Belt southern bioregion in which this TEC is located (DSEWPaC, 2011a).

Community name	EPBC Act status	Habitat preference and distribution	Likelihood of occurrence
		The TEC is found on the grey, self-mulching clays of periodically waterlogged floodplains, swamp margins, ephemeral wetlands and stream levees (DSEWPC, 2011). The landscape is flat to low relief where small changes in slope and height can influence the species composition. Found in a climatic zone with summer dominant rainfall of an average of approximately 250-700 mm/year. Average minimum monthly temperatures range from -2°C to 5°C and average maximum monthly temperatures range from 23°C to 35°C (DSEWPC, 2011). Vegetation structure may vary from tall woodland in riparian zones to very open woodland with a sparse id layer of shrubs and saplings and a grassy ground layer, typically forming mosaics with grasslands, shrublands and wetlands. *Eucalyptus coolabah subsp. coolabah* (Coolibah) must be present in the tree canopy and is typically a dominant. The relative dominance of Coolibah and Black Box varies across the range of the ecological community and in response to landscape position. Black Box may be a dominant tree species on parts of the central and northern riverine plains of NSW and on slightly more elevated parts of the floodplain. Black Box is less common in the north-eastern part of the ecological community's range (DSEWPC, 2011). or subdominant tree species. Where Coolibah is not the dominant tree species present on its own, then Coolibah together with *E. largiflorens* (Black Box) make up the dominant tree species in the canopy (TSSC, 2011). It is a floodplain ecological community within the upper reaches of the Murray-Darling Basin and southern part of the Fitzroy River system, limited to the Darling Riverine Plains and Brigalow Belt South bioregions in northern NSW and southern QLD. The northern limit is the northern boundary of the Brigalow Belt South bioregion in QLD. In QLD it is likely to occur in the following Catchment Management Authorities/Natural Resource Management Regions: Border Rivers Maranoa-Balonne, Condamine, Desert Channels, Fitzroy and South-West Queensland (DSEWPC, 2011). The Coolibah – Black Box Woodlands TEC coincides with 5 Qld REs: 11.3.3, 11.3.15, 11.3.16, 11.3.28 and 11.3.37 (TSSC, 2011).	
Natural Grasslands of the Queensland	E	The Natural grasslands of the Queensland central highlands and northern Fitzroy Basin TEC occurs in a subtropical, subhumid climatic	**Not present**

Community name	EPBC Act status	Habitat preference and distribution	Likelihood of occurrence
Central Highlands and northern Fitzroy Basin		zone with a marked wet summer and moderately dry winter. Mean annual rainfall over most of the ecological community ranges from 500-700 mm. Usually, this TEC occurs on flat ground or gently undulating rises on soils that have formed either in situ on the fresh basalt, or on fine-grained sedimentary rocks, or where the material has been transported to form extensive alluvial plains along ancient and flood-prone watercourses. Soils include cracking clays, often deep and dark in colour though may be shallower on ridges or sloping land. The cracking or self-mulching nature means that they expand when wet and contract when dry (TSSC, 2009b). The ecological community is endemic to Queensland. It broadly occurs where the Fitzroy River Basin and the Brigalow Belt North coincide. It extends from Collinsville in the north to Carnarvon National Park in the south. It is bounded to the south by the Expedition, Carnarvon, Great Dividing, Drummond and Narrien ranges; and to the north by the Clark, Denham, Connors and Broadsound ranges (TSSC, 2009b). Trees are mostly excluded from the area possibly due to the cracking that might tear tap roots and inhibit deep penetration during most rainfall events. The TEC is typically composed of a mixture of forbs (i.e. herbs that are broad-leaved and not grass-like) and native grasses. The perennial native grasses are the primary indicators, based on their prominence and utility as indicators. They are mostly dominated by Dichanthium spp. (Bluegrasses), with tropical Aristida spp. (Three-awned grasses) and Panicum spp. (Panic grasses) also a major component (TSSC, 2009b). Temperate grasses, such as Austrostipa spp. (Spear grasses) and Austrodanthonia spp. (Wallaby grasses), are lacking and are more a feature of grasslands further south (Fensham, 2003). Drier sites of the TEC may include a higher proportion of Astrebla spp. (Mitchell grasses). Whilst shrub cover is typically a minor component of the grassland, in some areas the cover of shrubs, such as Acacia salicina (Sally Wattle) and Acacia farnesiana (Mimosa), can be more extensive QLD REs include: 11.3.21, 11.4.4, 11.4.11, 11.8.11, 11.9.3, 11.9.12, and 11.11.17 (TSSC, 2009b).	No vegetation communities with potential to contain this TEC were found to occur within the Study Area (TSSC, 2009b).

Community name	EPBC Act status	Habitat preference and distribution	Likelihood of occurrence
Poplar Box Grassy Woodland on Alluvial Plains	E	The Poplar Box Grassy Woodland on Alluvial Plains TEC is typically a grassy woodland with a canopy dominated by *Eucalyptus populnea* and understorey mostly of grasses and other herbs. The TEC may include a low density of shrubs, however patches of the ecological community generally lack a substantial mid layer (tall shrub). Vegetative ground cover can be very sparse during dry periods but become mid-dense after rain particularly if fire has been absent for a long time. It occurs on paleo and recent depositional soils in flat terrain and occasionally along watercourses in undulating country. It is mainly associated with active and depositional plains and flats including back plains, higher terraces, levees along rivers particularly in QLD. It is sometimes found in close proximity to ephemeral watercourses and depressions. The soils in these watercourses are considered alluvial and the regularity of flow after heavy rain curtails shrub growth. These soils typically occur as clay, clay-loam, loam or sandy-loam (DEE, 2019). Of note, *Eucalyptus populnea* is commonly known as either Poplar Box or bimble box, depending on the region and subspecies that were formerly recognised (DEE, 2019). The TEC is located west of the Great Dividing Range, typically at less than 300 m ASL and between latitudes 20°S to 34°S. The ecological community is scattered across a broad distribution in eastern Australia, intergrading with but ranging further west and north than other grassy woodlands that extend through NSW and southern Qld, including: south of Charters Towers in Qld, north of Leeton in NSW, west of Ipswich in Qld and Armidale in NSW and east of Longreach in Queensland and Hillston in NSW. As the TEC has a wide distribution, the mean annual rainfall can range from about 400 mm up to 800 mm per year in agro-climates within QLD that range from semi-arid to limited moisture (DEE, 2019). REs considered analogous to this TEC include; 11.3.2, 11.3.17, 11.4.7, 11.4.12, and 12.3.10 (DEE, 2019).	**Not present** Mapped areas of RE 11.3.2, which is analogous with the TEC, were identified within the Study Area, however these patches did not meet the minimum condition thresholds.
Semi-evergreen vine thickets of the Brigalow Belt (North and South)	E	Semi-Evergreen Vine Thickets of the Brigalow Belt (North and South) and Nandewar Bioregions TEC is a community of extremely dry seasonal subtropical rainforest. The TEC occurs just north-west of Townsville in Queensland to central northern NSW, mostly within the	**Not present** Remnant REs containing vine thickets listed as potentially analogous with this TEC were not

Community name	EPBC Act status	Habitat preference and distribution	Likelihood of occurrence
and Nandewar Bioregions		Brigalow Belt North and South bioregions. Post-clearing distribution of the TEC means that remnant patches are scattered on rocky outcrops in the Broken River subregion of the Einasleigh Uplands, through the northern and central parts of the Brigalow Belt to its south-eastern parts between Jandowae and Killarney on the Queensland/New South Wales border. In QLD, the TEC is generally characterised by the prominence of trees with microphyll sized leaves (2.5–7.5 cm long) and the frequent presence of swollen-stemmed *Brachychiton* spp. (bottle trees) as emergents from the vegetation. The thickets typically have an uneven canopy 4–9 m high with mixed evergreen, semievergreen and deciduous emergent tree species 9–18 m high and vines, twining or scrambling plants prominent. Fluctuations in the composition and diversity of species can be based on the amount of rainfall received, with floristic composition differing as follows (DCCEEW, 2023a): • Brigalow Belt North: trees typically include Brachychiton australis (Broad-leaved Bottle Tree), Drypetes deplanchei (Yellow Tulip), Diospyros humilis (Small-leaved Ebony), Gyrocarpus americanus (Helicopter Tree), Geijera salicifolia (Brush Wilga), Planchonella cotinifolia (Yellow Lemon) and Strychnos psilosperma (Strychnine), with the vines Cissus reniformis and Jasminum didymum. Common emergent trees range from fully deciduous (e.g. Broad-leaved Bottle Tree, Helicopter Tree) to semi-evergreen (e.g. Euroschinus falcata (Ribbonwood), Pleiogynium timorense (Burdekin Plum)). • Brigalow Belt South: vine thickets in Qld commonly, but not invariably, have a shrub understorey, with common species including Acalypha eremorum (Soft Acalypha), Alectryon diversifolius (Scrub Boonaree), Everistia vacciniifolia, Carissa spinarum (Currantbush), Croton phebalioides, Exocarpos latifolius, Geijera parviflora (Wilga), Pittosporum spinescens (Wallaby Apple) and Triflorensia ixoroides. Common vines/lianes include Clematicissus opaca, Cissus oblonga, Trophis scandens, Jasminum spp., Marsdenia spp., Cynanchum viminale subsp. brunonianum, Secamone elliptica, Parsonsia lanceolata and Tylophora spp.	identified within the Study Area (DCCEEW, 2023a).

Community name	EPBC Act status	Habitat preference and distribution	Likelihood of occurrence
		In Queensland, the ecological community is most common on undulating plains on fine grained sedimentary rocks (frequently shale) and on basalt hills and plains, though also occurring less frequently on coastal dunes, Quaternary alluvium, Tertiary clay plains, old loamy and sandy plains, or hills and lowlands on metamorphic rocks (DCCEEW, 2023a). QLD REs include: 11.2.3, 11.3.11, 11.4.1, 11.5.15, 11.8.3, 11.8.6, 11.8.13, 11.9.4, 11.9.8 and 11.11.18 (DCCEEW, 2023a).	
Weeping Myall Woodlands	E	Weeping Myall Woodlands occur in a range from open woodlands to woodlands, generally 4-12 m high, in which Weeping Myall (*Acacia pendula*) trees are the sole or dominant overstorey species. Other vegetation may occur in the community but not as dominant species (TSSC, 2009a). It occurs on the inland alluvial plains west of the Great Dividing Range in QLD and NSW, and an outlying patch in VIC. In QLD it occurs in the Darling Riverine Plains, Brigalow Belt South, Brigalow Belt North and Nandewar IBRA Bioregions. It generally occurs as part of a mosaic of sparse to open woodlands and treeless shrublands and grasslands. It generally occurs on flat areas, shallow depressions or gilgais on raised (relict) alluvial plains. These areas are not associated with active drainage channels and are rarely if ever flooded. It occurs on black, brown, red-brown or grey clay or clay loam soils (TSSC, 2009a). It varies in structure throughout its range forming an open woodland in higher rainfall areas, becoming sparse/scattered stands of woodland occurring in discrete bands fringing better-watered country with decreasing rainfall. Can also occur as relatively narrow strips on the margins of floodplain woodland or on minor depressions or run-on areas adjacent to sandhills (TSSC, 2009a). In QLD it is restricted to small patches within REs 11.3.2 and 11.3.28 (TSSC, 2009a).	**Not present** While RE 11.3.2 was observed within the Study Area, the eponymous weeping myall (*Acacia pendula*) was not recorded (DEWHA, 2009).

B.2 Flora

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
Acacia storyi	-	V	This species typically grows on sandstone plateaux with sandy, shallow skeletal soils over sandstone. The vegetation in these areas includes open forests or tall open forests, with associated species such *as Eucalyptus tereticornis*, *E. hendersonii*, *E. cloeziana*, *E.melanoleuca*, *E. propinqua*, and *Aristida spp*. Most populations of the species are found on Blackdown Tableland, with three additional populations located outside the park in Rockland Spring and upper Davy Creek, near the footslopes of Experiditon Range (DETSI, 2025a).	No habitat occurring within the Study Area.	18 occurrence records (ALA, Wildnet) within the desktop search extent. All records are restricted to Blackdown Tablelands.	**Unlikely to occur** The species has not been recorded in the Study Area and nearby records are limited to Blackdown Tablelands.
Aristida annua **Annual wiregrass**	V	V	This species is known to occur in eucalypt woodlands with *Eucalyptus orgadophila* on black clay, basalt, and sandy, red loamy soils (DCCEEW, 2025j). This species is restricted to central QLD in the Emerald and Springsure districts. The northern distribution of the species occurs on the eastern slopes of Lord's Table Mountain, north of Yungaba. Other locations include Gindie Downs via Springsure; 50km south of Comet Downs; 8-	No habitat occurring within the Study Area.	No occurrence records within the desktop search extent. The nearest record occurs 27km southwest of the Study Area.	**Unlikely to occur** The Study Area does not comprise suitable habitat for the species.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			30km south of Springsure (DCCEEW, 2025a).			
Arthraxon hispidus **Hairy-joint grass**	V	V	This species is found within or on the edges of rainforest and in wet eucalypt forest, near creeks and swamps, woodlands, around freshwater springs on coastal foreshore dunes, shaded gullies, creek banks and on alluvium in creek beds in open forest and also with bog mosses in mound springs (DCCEEW, 2025j). This species has scattered locations throughout QLD and on the northern tablelands and north coast of NSW, and overseas from tropical Africa to Asia. This species occurs as far south as Kempsey, and west to Glen Innes, NSW; in QLD it occurs north to Port Douglas, and west to disjunct occurrences around mound springs in Carnarvon National Park (NP); however, most occurrences are from Noosa southwards (DCCEEW, 2025j).	No habitat occurring within the Study Area.	No occurrence records within the desktop search extent.	**Unlikely to occur** The Study Area is outside of the species known distribution.
Baeckea trapeza	-	V	This species is endemic to the Blackdown Tableland, west of Rockhampton in central Queensland, where it grows at altitudes of 700-800 meters. It thrives on sandy soils in open Eucalyptus forests, often in association with species such as Leptospermum polygalifolium,	No habitat occurring within study the area. This species is endemic to Blackdown Tableland National Park.	4 occurrence records (ALA) within the desktop search extent. The nearest occurrence occurs approximately 17km from the Study Area.	**Unlikely to occur** The Study Area is outside of the species known distribution and does not contain suitable habitat.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			Triplarina paludosa, Casuarina torulosa, and Melastoma affine (DETSI, 2025b).			
Bertya opponens	V	LC	This species occurs in a variety of vegetation communities including mixed shrubland, lancewood woodland, mallee woodland, eucalypt/acacia open forest with shrubby understorey, eucalypt/callitris open woodland and semi-evergreen vine-thicket. It grows in soils which are generally shallow sandy loams or red earths associated mostly with sandstone, but also with rhyolite, shale, and metasediments. Associated species include: woodland with *Eucalyptus citriodora* and *Alyxia spicata*; *Corymbia leichhardtii* woodland with some *Acacia harpophylla* on sandstone; sheltered sandstone gully with *Acacia shirleyi*, *Corymbia citriodora*, *C. trachyphloia*, *Gahnia aspera*; woodland of *E. cloeziana* with *E. suffulgens* and *Callitris endlicheri*; *E. crebra* /*C. trachyphloia* tall woodland; and in open woodland of *E. exserta*, *E. panda*, *C. trachyphloia* on lateritic sandstone (DCCEEW, 2025j; DETSI, 2025c). This species occurs in QLD and NSW in the Cobar	Suitable habitat present.	6 occurrence records (ALA, Wildnet) within the desktop search extent. The species has been observed in previous surveys in high densities (>6,500) along periphery of disturbed areas in association with Lancewood dominated communities of RE 11.7.2 south of the Study Area.	**Unlikely to occur** This species has been observed south of the Study Area in land zone 7. However, no suitable habitat was observed in the Study Area.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			Peneplain, Brigalow Belt South, Brigalow Belt North, Southeastern QLD, NSW North Coast and New England Tablelands IBRA regions. In QLD, it is widely distributed within an area bounded by Emerald in the north and Charleville in the west, with an outlier near Charters Tower. In NSW, the species has been recorded at the following sites: north-east of Cobar; in the Jacks Creek State Forest area of the Pilliga Scrub; Gibraltar Range National Park east of Glen Innes; and Kangaroo River State Forest north-west of Coffs Harbour (TSSC, 2016).			
Bertya pedicellata	-	NT	This species has been recorded on rocky hillsides in eucalypt forest or woodland, Acacia woodland or shrubland and open heathland or vine thicket communities. The soil it grows in soils include skeletal to shallow sandy, sandy clay or clay loams overlaying rhyolite, trachyte, or sandstone substrates. Associated species include *Corymbia trachyphloia, Dodonaea filifolia, Acacia catenulata, A. curvinervia, A. shirleyi, A. rhodoxylon, A. sparsiflora, E. crebra, Acacia harpophylla* and *E. decorticans* (Department of Environment, Tourism, Science and Innovation (DETSI), 2025b).	No habitat occurring within the Study Area.	3 occurrence records (ALA) within the desktop search extent. The nearest record is approximately 12km East of the Study Area in Arthurs Bluff State Forest.	**Unlikely to occur** The species has been previously recorded within the desktop search extent, however the Study Area does not contain suitable habitat.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			This species is confined to central and south-east QLD, from near Aramac eastwards to Rockhampton and south to near Biggenden with an isolated record from the Warwick district. The species has been recorded in Peak Range National Park and Allies Creek State Forest (Department of Environment, Tourism, Science and Innovation (DETSI), 2025b).			
Cadellia pentastylis **Ooline**	V	V	This species grows in dry rainforest, semi-evergreen vine thickets and sclerophyll ecological communities, often locally dominant or as an emergent, on undulating terrain of various geology, including sandstone, conglomerate, and claystone. Soils generally have low to medium nutrient content and are normally associated with upper and mid-slopes in the landscape. The altitude is generally 300-460m above sea-level. The species forms a closed or open canopy, as a dominant or commonly with *Eucalyptus albens* and *Callitris glaucophylla*, with an open understorey and leaf litter dominating the forest floor. There is some uniformity in the understorey, with Native Olive (*Notelaea microcarpa*), Pinkwood (*Beyeria viscosa*), Bitterbark (*Alstonia constricta*), Wilga	No habitat occurring within the Study Area.	3 occurrence records (ALA) within the desktop search extent. The nearest record is 11km south of the Study Area.	**Unlikely to occur** The species has been previously recorded within the desktop search extent, however the Study Area does not contain suitable habitat.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			(*Geijera parviflora*), Berry Saltbush (*Einadia hastate*), *Stipa* spp. and *Aristida* spp., abundant at many locations (DCCEEW, 2025j). This species occurs on the western edge of the NSW north-west slopes, from Mt Black Jack near Gunnedah to west of Tenterfield, and extends into QLD to Carnarvon Range and Callide Valley, south-west of Rockhampton (DCCEEW, 2025j).			
Cerbera dumicola	-	NT	*Cerbera dumicola* occurs across a range of habitats in central and southern QLD. Associated vegetation and species include: sandstone hills in open *E. umbra* subsp. *carnea*; on plateaus, in woodland of *Acacia shirleyi* with *Corymbia dolichocarpa*; acidic soils in mine rehabilitation area; woodland of *A. catenulata* and *A. shirleyi* with *E. thozetiana* on a slope of sand/clay soil; semi-deciduous notophyll-microphyll vine forest of *Brachychiton australis*, *Gyrocarpus americanus*, *Flindersia australis*, *Pleiogynium timorense*, *Drypetes deplanchei* and *Sterculia quadrifida* on rhyolite hillslopes; open-woodland of *E. melanophloia* with occasional *Acacia shirleyi*, *E. populnea* and *E. brownii*; semi-evergreen vine thicket with	No suitable land zone 7 habitat is present within the Study Area.	9 occurrence records (ALA, Wildnet) within the desktop search extent. Historical surveys by EMM identified a population within remnant RE 11.7.2 in ML1792 south of the Study Area.	**Unlikely to occur** This species has been observed south of the Study Area in land zone 7. However, no suitable habitat was observed in the Study Area.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			Corymbia citriodora and *Corymbia aureola* emergents; woodland of *A. rhodoxylon* on brown, sandy loam; and in *Corymbia tessellaris - Acacia aneura* open woodland (DETSI, 2025d) . Cerbera dumicola is known from central coastal and subcoastal QLD, with a few populations located in central QLD. The most northern populations are located 23km southwest of Charters Towers and the most southern population occurs at Baralaba (DETSI, 2025d).			
Coleus blakei	-	NT	This species typically grows in moist, well-drained soils, thriving in tropical and subtropical climates and preferring partial shade (Suva et al., 2015).	No habitat occurring within the Study Area. A population is present within Blackdown Tableland National Park.	10 occurrence records (ALA, Wildnet) within the desktop search extent. The nearest record occurs 15km from the Study Area.	**Unlikely to occur** The Study Area is outside of the species known distribution and does not contain suitable habitat.
Commersonia pearnii	-	CR	This species inhabits open forest and woodland alongside a range of canopy species. It grows on sandstone escarpments and tablelands with shallow, medium- to coarse-grained soils. It is only known from the Blackdown Tableland in central Queensland (DETSI, 2025e).	No habitat occurring within the Study Area. The species is restricted to Blackdown Tableland National Park.	1 occurrence record (ALA) within the desktop search extent within Blackdown Tableland National Park.	**Unlikely to occur** The Study Area is outside of the species known distribution and does not contain suitable habitat.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
Corunastylis valida	-	V	This species grows in sandy soil in rocky places on the Blackdown Tableland (ALA, 2025)	No habitat occurring within the Study Area.	1 occurrence record (Wildnet) within the desktop search extent within Blackdown Tableland National Park.	**Unlikely to occur** The Study Area is outside of the species known distribution and does not contain suitable habitat.
Daviesia discolor	V	V	This species occurs on the Blackdown Tableland on sandy soil derived from sandstone and on lateritic clay, at altitudes of 60-900m, in open eucalypt forest dominated by species such as *Eucalyptus sphaerocarpa* and *Eucalyptus nigra*. In the Mount Walsh area, this species grows in very tall open forests of *Corymbia trachyphloia* and *Eucalyptus acmenoides* on hillcrests and slopes at 500-580m altitude on well-drained, shallow sandy loam to sandy clays. The population in Carnarvon National Park occurs on brown sandy loam of creek banks, in mixed shrubland with scattered Triodia sp. hummocks and Angophora sp. trees (DEWHA, 2008d). This is known from three widely disjunct localities in QLD, near Blackwater on the Blackdown Tableland, in the Mount Walsh area near Biggenden and north of Mount Playfair within Carnarvon National Park (DEWHA, 2008d).	No habitat occurring within the Study Area. A local population occurs within Blackdown Tableland National Park.	3 occurrence records (ALA) within the desktop search extent, the nearest occurrence approximately 12km East of the Study Area within Arthurs Bluff State Forest.	**Unlikely to occur** The species has been previously recorded within the desktop search extent, however the Study Area does not comprise suitable habitat for the species.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
Dichanthium queenslandicum **King Blue-grass**	E	V	This species occurs on black cracking clay in tussock grasslands in association with other species of blue grasses (*Dichanthium spp.* & *Bothriochloa spp.*). It is mostly confined to natural grassland on the heavy black clay soils (basalt downs, basalt cracking clay, open downs) on undulating plains. Other species include *Aristida leptopoda, Bothriochloa erianthoides, Moorochloa eruciformis, Corchorus trilocularis, Cyperus bifax, Dichanthium sericeum, Digitaria brownii, D. divaricatissima, Eulalia fulva, Ipomoea lonchophylla, Iseilema vaginiflorum, Panicum decompositum, P. queenslandicum, Paspalidium globoideum, Parthenium hysterophorus* and *Thellungia advena*. Communities include *Acacia salicina* thickets in grassland and eucalypt woodlands (i.e. *Corymbia dallachiana, C. erythrophloia, E. orgadophila*) (TSSC, 2013). This species occurs from near Dalby north to about 90km north of Hughenden and west as far as Clermont. The main concentration of populations in central QLD in the Emerald region. It is found in Gemini Peaks NP north east of Clermont and	No habitat occurring within the Study Area.	No occurrence records within the desktop search extent. The nearest record occurs 28km Southwest of the Study Area.	**Unlikely to occur** The species has not been recorded within the desktop search extent and the the Study Area does not comprise suitable habitat for the species.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			Alpinia NP near Rolleston (TSSC, 2013).			
Dichanthium setosum **Bluegrass**	V	LC	This species is associated with heavy basaltic black soils and red-brown loams with clay subsoil. Associated species: White Box (*Eucalyptus albens*), Silver-leaved Ironbark (*E. melanophloia*), Yellow Box (*E. melliodora*), Manna Gum (*E. viminalis*), Amulla (*Myoporum debile*), Purple Wire-grass (*Aristida ramosa*), Kangaroo Grass (*Themeda triandra*), Fine-leaved Tussock-grass (*Poa sieberiana*), Red-leg Grass (*Bothriochloa ambigua*), Pitted Blue-grass (*B. decipiens*), *Macrozamia stenomera*, Small Woolly Burr-medic (*Medicago minima*), Scaly Buttons (*Leptorhynchos squamatus*), *Lomandra aff. longifolia*, Australian Bugle (*Ajuga australis*), Bogan-flea (*Calotis hispidula)* and *Austrodanthonia spp., Dichopogon spp., Brachyscome spp., Vittadinia spp., Wahlenbergia spp.* and *Psoralea spp.* This species is often found in moderately disturbed areas such as cleared woodland, grassy roadside remnants, and highly disturbed pasture. It is often collected from	No habitat occurring within the Study Area.	No occurrence records within the desktop search extent.	**Unlikely to occur** The Study Area is outside of the species known distribution and does not comprise suitable habitat for the species.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			disturbed open grassy woodlands on the northern tablelands, where the habitat has been variously grazed, nutrient-enriched and water-enriched (DCCEEW, 2025j). It occurs chiefly on the northern tablelands in the Saumarez area, west of Armidale, and 18–30km east of Guyra. It is more rarely found on the north-western slopes, central western slopes and north-western plains of NSW, extending west to Narrabri. In QLD it has been reported from the Leichhardt, Morton, North Kennedy and Port Curtis regions (TSSC, 2012).			
Eucalyptus raveretiana **Black ironbox**	V	-	This species grows along watercourses and occasionally 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 650–1100m. The species is said to be highly salt tolerant. It does not occur in pure stands, but is co-dominant with species such as Broad-leaved Teatree (*Melaleuca leucadendra*), *M. fluviatilis*, Forest Red Gum (*Eucalyptus tereticornis*), Carbeen (*Corymbia tessellaris*) (Regional Ecosystem 11.3.25a) and occasionally in semi evergreen vine thicket (e.g.	No habitat occurring within the Study Area.	No occurrence records within the desktop search extent.	**Unlikely to occur** The Study Area is outside of the species known distribution and does not comprise suitable habitat for the species.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			Broad-leaved Bottle Tree (*Brachychiton australis*), Narrow-leaved Bottle Tree (*Brachychiton rupestris*), Scrub Wilga (*Geijera salicifolia*) and *Lysiphyllum* spp.) (Regional Ecosystem 11.3.11). Other species it grows in association with include River Red Gum (*E. camaldulensis*), Moreton Bay Ash (*Corymbia tessellaris*), River Oak (*Casuarina cuninghamiana*) and Weeping Paperbark (*Melaleuca fluviatilis*) and other Regional Ecosystems that include 9.3.1 and 8.3.3 (DCCEEW, 2025j). This species occurs between Rockhampton and Ayr in QLD (Department of the Environment, Water, Heritage and the Arts (DEWHA), 2008a).			
Homoranthus decumbens	E	V	This species occurs on flat country on deep sandy soils with lateritic pebbles, in heath and shrubby woodland. It has been recorded growing with *Goodenia racemosa*, *Petrophile sp.*, *Xanthorrhoea spp.* and Dwarf Banksia (*Banksia oblongifolia*) (DCCEEW, 2025j). This species occurs in QLD where it is restricted to Barakula State Forest near Chinchilla (DCCEEW, 2025j).	No habitat occurring within the Study Area. This species is restricted to Barakula State Forest.	No occurrence records within the desktop search extent.	**Unlikely to occur** The Study Area is outside of the species known distribution and does not contain suitable habitat.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
Logania diffusa	V	V	*Logania diffusa* occurs on the top of the plateau escarpment in heathland dominated by *Banksia oblongifolia* and *Leptospermum spp*. and in open forest with Eucalyptus spp. and Forest Sheoak (*Allocasuarina torulosa*) in shallow, sandy, often stony soil overlying sandstone (DEWHA, 2008e). *Logania diffusa* is known from the Blackdown Tableland, central-eastern Queensland (DEWHA, 2008e).	No habitat occurring within the Study Area.	4 occurrence records (ALA) within the desktop search extent. The nearest record occurs approximately 12km East of the Study Area within Arthurs Bluff State Forest.	**Unlikely to occur** The Study Area is outside of the species known distribution and does not contain suitable habitat.
Macrozamia platyrhachis	E	E	*Macrozamia platyrhachis* occurs in eucalypt woodland or open forest at altitudes between 300-780m above sea level. The mid- and under-stories of the vegetation may be quite dense, but this is variable depending on fire history. The species grows on deep sandy soils, derived from sandstone (DESI, 2024). *M. platyrhachis* has a restricted distribution in the Blackdown Tableland – Planet Downs area of the Dawson Range in central Queensland. There are also historical records from the Ceres Holding southeast of Springsure (1973) and from Spring Creek (1972), but these populations have not yet been relocated (DETSI, 2025f).	No habitat occurring within the Study Area. The species is restricted to Blackdown Tableland.	20 occurrence records (ALA, Wildnet) within the desktop search extent. The nearest record occurs approximately 12km from the Study Area in Blackdown Tableland National Park.	**Unlikely to occur** The Study Area is outside of the species known distribution and does not contain suitable habitat.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
Polianthion minutiflorum	V	V	It grows in forest and woodland on sandstone slopes and gullies with skeletal soil, or deeper soils adjacent to deeply weathered laterite (DCCEEW, 2025b). Trymalium minutiflorum is known from five areas in east Queensland, from Redcliffe Vale, about 110 km west of Mackay, south to Kingaroy, covering approximately 800km (DCCEEW, 2025b).	No habitat occurring within the Study Area.	3 occurrence records (ALA, Wildnet) within the desktop search extent. The nearest record occurs approximately 12km West of the Study Area within Amaroo State Forest.	**Unlikely to occur** The Study Area is outside of the species known distribution and does not contain suitable habitat.
Solanum adenophorum	-	E	*Solanum adenophorum* occurs mostly in brigalow woodland and on very gently inclined slopes. It also occurs in gidgee (*Acacia cambagei*) scrub on deep cracking clay soils (Bean, 2004). The species is distributed within the Dingo-Nebo-Clermont region in central-eastern Queensland (Bean, 2004).	No habitat occurring within the Study Area.	1 occurrence record (Wildnet) within the desktop search extent, occurring approximately 18km North of the Study Area near Curragh Mine.	**Unlikely to occur** The Study Area is outside of the species known distribution.
Solanum dissectum	E	E	*Solanum dissectum* has a restricted distribution in central Queensland. The species occurs in open forest and woodland of brigalow (*Acacia harpophylla*) or *Eucalyptus thozetiana* on solodic clay soils (Department of the Environment, Tourism, Science and Innovation (DETSI), 2025d).	Suitable Brigalow dominated communities occur within the Study Area.	4 occurrence records (ALA) within the desktop search extent, the nearest records approximately 20km South of the Study Area.	**Unlikely to occur** This species is identifiable year-round, and as it has not been recorded during multiple targeted surveys, it is unlikely to occur in the Study Area.
Solanum elachophyllum	-	E	*Solanum elachophyllum* grows on fertile cracking-clay soils in open forest of Eucalyptus thozetiana,	Suitable habitat present.	13 historical occurrence records (ALA, Wildnet)	**Known to occur**

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			Acacia harpophylla, with understorey of Geijera parviflora, Casuarina cristata, Macropteranthes leichhardtii, Eucalyptus cambageana, or woodland of E. crebra and E. tenuipes (Bean, 2004; Queensland Herbarium, 2012).		within the desktop search extent. A substantial population (>1200) was recorded by EMM at 27 locations associated with RE's 11.3.1/11.3.6 and non-remnant vegetation. The species was also observed in high densities by E2M during 2025 surveys.	The species has been observed within the Study Area at multiple locations.

[1] CR = Critically Endangered, E = Endangered, V = Vulnerable, NT = Near Threatened, SLC = Special Least Concern

[2] Habitat types including microhabitat features where relevant and distribution of the species from reputable online sources and databases

[3] Presence, extent, condition and proximity/connectivity to other habitat and type of habitat whether breeding, feeding, shelter, dispersal, and temporary use.

[4] Nearest and notable records of the species from relevant databases

[5] Most suitable and relevant survey timing and required effort to detect the species (time of year, rainfall events, temperature etc.)

[6] Assessment result of likelihood of species occurring

B.3 Fauna

Amphibians

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area or surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
tusked frog *Adelotus brevis*	-	V	Inhabits wet eucalypt forest, rainforest, and sometimes dry eucalypt forest, where it can be found near suitable breeding habitat such as ponds and slow-moving sections of streams. It has also been recorded from dams and garden ponds in urban and peri-urban areas. It has a disjunct distribution, occurring in the Clarke Range (mideast QLD); then from Shoalwater Bay (mid-east QLD) south to near Moss Vale (mid-east NSW). In QLD, inland populations are also present at Blackdown Tableland and Carnarvon Gorge and in Barakula State Forest (Rowland, 2013).	The Study Area is unlikely to support preferred habitats for this species.	There are 15 occurrence records (ALA) within the desktop search extent. The nearest record is 15km to the East of the Study Area.	**Unlikely to occur** The Study Area is outside of the species known distribution and does not contain suitable habitat.

[1] EX = Extinct, PE = Extinct in the wild, CE = Critically Endangered, CR = Critically Endangered, E = Endangered, V = Vulnerable, NT = Near Threatened, SLC = Special Least Concern.

[2] Habitat types including microhabitat features where relevant and distribution of the species from reputable online sources and databases.

[3] Presence, extent, condition and proximity/connectivity to other habitat and type of habitat whether breeding, feeding, shelter, dispersal, and temporary use.

[4] Nearest and notable records of the species from relevant databases.

[5] Most suitable and relevant survey timing and required effort to detect the species (time of year, rainfall events, temperature etc.).

[6] Assessment result of likelihood of species occurring.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
Common sandpiper *Actitis hypoleucos*	Marine, Migratory (Bonn, CAMBA, JAMBA, ROKAMBA)	SLC	The species has been recorded from a wide range of wetland habitats, of varying levels of salinity. The species typically forages in shallow water and on bare soft mud at the edges of wetlands (Department of Climate Change, Energy, the Environment and Water (DCCEEW), 2025a). The common sandpiper is found along all coastlines of Australia, including several areas inland, but is concentrated to northern and western Australia. In Queensland, areas of national importance occur in southeastern Gulf of Carpentaria and the Cairns foreshore. The south-eastern Gulf of Carpentaria is also a site of international importance (Department of Climate Change, Energy, the Environment and Water (DCCEEW), 2025a).	The Study Area is unlikely to support preferred habitats for this species. Potential distribution for this species occurs 70km towards the East of the Study Area.	The species has not been recorded within the desktop search extent.	**Unlikely to occur** The Study Area is outside of the species known distribution.
Fork-tailed swift *Apus pacificus*	Migratory (CAMBA, JAMBA, ROKAMBA)	SLC	The species is predominantly aerial and occurs over inland areas and occasionally above the foothills in coastal areas with dry and open habitat. The species can also occur over low scrub, heathland, saltmarsh and riparian woodlands and are associated with low pressure systems that favour the occurrence of insect prey (DCCEEW, 2026). The fork-tailed swift is a non-breeding visitor to all states and territories of Australia which consists of its core range. In Qld, scattered records occur in the Gulf Country, and a few records on Cape York Peninsula. There are many records east of the Great Divide, from near Cooktown and south to Townsville. They are also widespread but scattered in coastal areas from 20° S, south to Brisbane and in much of the south south-eastern region. They are more widespread west of the Great	Suitable habitat is present within the Study Area.	16 occurrence records (ALA) within desktop search extent. 4 of these records occur within 5km of the Study Area in the town of Blackwater, with the nearest	**Known to occur** There is suitable habitat within the Study Area and the species has been observed within the Study Area on multiple occasions.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			Divide and are commonly found west of the line joining Chinchilla and Hughenden. They are found to the west between Richmond and Winton, Longreach, Gowan Range, Maraila National Park and Dirranbandi. They are rarely found further west to Windorah and Thargomindah (DCCEEW, 2026).		record 1.3km to the East of the Study Area.	
Sharp-tailed sandpiper *Calidris acuminata*	V, Marine, Migratory (Bonn, CAMBA, JAMBA, ROKAMBA)	SL	The species typically inhabits 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 salt lakes inland. The species may use flooded paddocks, sedgelands and other ephemeral wetlands, but vacate these habitats during dry conditions. Marine habitats for the species include intertidal mudflats in sheltered bays, inlets, estuaries, or seashores, and swamps and creeks lined with mangroves. They sometimes occur on rocky shores and rarely on exposed reefs (Department of Climate Change, Energy, the Environment and Water (DCCEEW), 2024). In Queensland, they are recorded in most regions, being widespread along much of the coast and are very sparsely scattered inland, particularly in central and south-western regions (Higgins & Davies, 1996). There are 39 international important sites across Australia, four of which are in Queensland comprising south-east Gulf of Carpentaria, Lake Machattie, Lake Yamma Yamma, and Lake Numalla (Department of Climate Change, Energy, the Environment and Water (DCCEEW), 2024).	Limited suitable habitat present.	1 occurrence record (ALA) desktop search extent, 12 km north of the Study Area.	**Possibly occurring** Due to its migratory nature, the presence of potentially suitable habitat within the Study Area and an occurrence record to the North of the Study Area, the species is considered possibly occurring.
Curlew sandpiper *Calidris ferruginea*	CE, Marine, Migratory (Bonn, CAMBA,	CR	This species usually forages and roosts in 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	No suitable habitat present.	The species has not been recorded within the desktop	**Unlikely to occur** The Study Area is outside of the species known

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
	JAMBA, ROKAMBA)		(Department of Climate Change, Energy, the Environment and Water (DCCEEW), 2023b). Curlew sandpipers commonly occur around the Australian coastline. Queensland records indicate that this species is more widespread in coastal areas south of Cairns, however scattered records occur in the Gulf of Carpentaria. There are sparsely scattered records inland (Department of Climate Change, Energy, the Environment and Water (DCCEEW), 2023b).		search extent.	distribution. There is potential for the species to occur during migration, but this is unlikely.
Pectoral sandpiper *Calidris melanotos*	Marine, Migratory (Bonn, JAMBA, ROKAMBA)	SL	Typical habitat for the species comprises shallow fresh to saline wetlands, including 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 further inland. Also recorded in swamp overgrown with lignum (Department of Climate Change, Energy, the Enviornment and Water (DCCEEW), 2026). In Queensland, most records for the species occur around Cairns. There are scattered records elsewhere, mainly from east of the Great Divide between Townsville and Yeppoon. Records also exist in the south-east of the state as well as a few inland records at Mount Isa, Longreach and Oakey (Department of Climate Change, Energy, the Enviornment and Water (DCCEEW), 2026).	No suitable habitat present.	The species has not been recorded within the desktop search extent.	**Unlikely to occur** The Study Area is outside of the species known distribution and does not contain suitable habitat.
South-eastern Glossy black-cockatoo *Calyptorhynchus lathami lathami*	-	V	This species feed exclusively on the cones and seed of *Allocasuarina* and *Casuarina spp.* and is dependent on these spp. (Chapman, 2007), with feed tree species use varying across the species' range (Higgins, 1999). In south-east QLD and north-east NSW, the species shows a strong preference for *A. littoralis* and *A. torulosa* trees (Higgins, 1999). There are also records of the species feeding on *A. inophloia*, *C. equisetifolia* and, to a lesser extent, *C. cunninghamiana* and *C. glauca*	Limited habitat is present within the Study Area. Suitable habitat is present in	64 occurrence records (ALA) within the desktop search extent, with the nearest record 3.7km	**Possibly occurring** Due to the large number of occurrences within proximity to the Study

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			(Glossy Black Conservancy, 2021). In the Brigalow Belt bioregion, *Casuarina cristata* and *Allocasuarina luehmannii* are also used as feed trees (Hourigan, 2012a). As a hollow nester, they require large old trees (living or dead), usually eucalypts, for breeding (S. T. Garnett et al., 1999). Nests are typically located in proximity to a water source (within 1.5 km of a permanent water source) usually in eucalypt, particularly *Eucalyptus crebra*, but at least once recorded in Kurrajong *Brachychiton populneus* where hollows are usually 10-20 m above ground in vertical or near vertical branches, stems, and spouts or in trunk cavities (BirdLife Australia, 2023; S. T. Garnett et al., 1999). It prefers woodland areas dominated by Allocasuarina, or open sclerophyll forests and woodlands with a middle stratum of Allocasuarina beneath Eucalyptus, Corymbia or Angophora (BirdLife Australia, 2023). It has also been observed in mixed Allocasaurina, Casuarina, Callitris and brigalow woodland assemblages (BirdLife Australia, 2023). Occasionally in *Allocasuarina* in grasslands, towns and on golf-courses, and possibly among mangroves and cereal crops (BirdLife Australia, 2023). Often in coastal or subcoastal areas, including foreshores and offshore islands but also occur farther inland in foothills, mountain ranges and plains, especially in *Allocasuarina* associations fringing watercourses or on stony ridges (BirdLife Australia, 2023). Also known to utilise appropriate remnant woodlands and Allocasuarina and Casuarina feed trees in urban areas (BirdLife Australia, 2023; Hourigan, 2012b). South-eastern Glossy black-cockatoo occurs in the north and central east coast of QLD. This subspecies ranges from the Dawson-Mackenzie-Isaac Rivers basin, north to the Connors-Clarke Ranges, south to Dawes and Many Peaks Ranges, and inland to the Expedition, Peak and Denham Ranges, including the Blackdown Tableland (Hourigan, 2012b). The species	Blackdown Tableland National Park, Southeast of the buffer zone of the Study Area.	to the Southeast in Blackdown Tableland National Park. Evidence of feeding (orts) has been identified during previous surveys.	Area and observations of potential feeding (orts) within the Study Area (EMM), it is possible this species will occur, however there is limited foraging opportunities (i.e. *Allocasuarina* or *Casuarina* spp.) present within the Study Area.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			movement patterns, and home ranges have not been well identified in literature.			
Oriental cuckoo *Cuculus optatus*	Marine, Migratory (CAMBA, JAMBA, ROKAMBA)	SL	Inhabits monsoon forest, rainforest edges, isolated trees in paddocks, river flats, roadsides, mangroves, islands (Pizzey & Knight, 2007). Also occurs in woodlands and open forest associated with riparian areas. The species frequents sheltered gullies, and slopes with a dense understorey of shrubs and ferns within wet sclerophyll forests (DotE, 2015c). Core non-breeding range in Queensland includes Northern QLD and the Gulf of capenteria and extends along eastern QLD (DotE, 2015c). The species is a regular nonbreeding migrant to coastal northern and eastern Australia. The species occurs in the Gulf of Carpentaria and Cape York Peninsular to the QLD-NSW border, including inland areas of eastern Queensland (Pizzey & Knight, 2007).	No suitable habitat within the Study Area.	1 occurrence record (eBird) from 2019 within the desktop search extent.	**Unlikely to occur** The species has only been detected on a single occasion within the desktop search extent and the Study Area contains limited marginal habitat for the species.
Red goshawk *Erythrotriorchis radiatus*	E	E	The species occurs over wooded and forested lands of tropical and warm-temperate Australia, coastal and sub-coastal (BirdLife Australia, 2023). It prefers tall open forest, woodland and rainforest edges with a mosaic of vegetation types, large population of birds (largely prey species) and permanent water; riverine vegetation much used (BirdLife Australia, 2023). Forests of intermediate density are favoured, as are ecotones between habitats of differing densities: e.g. between rainforest and eucalypt forest, between gallery forest and woodland, or on edges of woodland and forest where they meet grassland, cleared land, roads or watercourses (BirdLife Australia, 2023). Avoid very dense and very open habitats, although sometimes seen over open agricultural land or grassland. Rarely enter dense forest (rainforest, tall wet forest), except as drought refuge; but may occur on edges and in clearings, penetrate along roads or watercourses, or hunt over canopy (BirdLife Australia, 2023). Immature birds reported	No suitable habitat within the Study Area.	1 occurrence record (ALA) within the desktop search extent. Historical records occur within Blacktown Tableland National Park, approximately 20 km Northeast of the Study Area.	**Unlikely to occur** The species has only been detected on a single occasion within the desktop search extent and the Study Area contains limited marginal habitat for the species.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			from mangroves, open river floodplains, low open woodland, agricultural land and pasture, but such habitats not used regularly (BirdLife Australia, 2023). Few detailed descriptions of structure and floristics of habitats. In eastern Australia rainforest, tall open forest, open forest in rugged terrain; mixed eucalypt woodland with scrubby understorey (Blue Gum *E. saligna*, Lemon-scented Gum *E. citriodora*); valley with subtropical rainforest, open forest of Spotted Gum *E. maculata*and ironbarks, forest of Hoop Pine *Araucaria cunninghamii* and vines, regrowth of eucalypt and *Acacia*, and farmland; mixed eucalypt woodland with thickets of *Melaleuca*; low *Melaleuca* lining watercourse through *Banksia* heath on dunes; tall forest of *E. pilularis* and *Melaleuca* fringing river; gallery forest of *Casuarina* along river, through partly cleared eucalypt open forest; *Melaleuca* swamp forest (BirdLife Australia, 2023). In NT: coastal and subcoastal tall open forests and woodlands, and savannas traversed by forested or wooded rivers; gallery forest along watercourses, eucalypt woodland and open forest to 15–40 m (BirdLife Australia, 2023). Nesting occurs in tall trees within one kilometre of permanent water, generally in open, biologically rich forest or woodlands (DCCEEW, 2025). The range of the red goshawk has significantly retracted in recent years towards northern Australia and is now considered locally extinct in southern Queensland and NSW (DCCEEW, 2025). Although the movement patterns are poorly known, they are generally considered sedentary with some dispersive individuals and no evidence for migration (BirdLife Australia, 2024a; DCCEEW, 2025). One radio-telemetry study has been conducted on a pair of Red Goshawks in northern Australia which resulted in an estimated home range for the breeding female of 120 km^2, and 200 km^2 for the male with some			

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			indications that it might have been larger (DCCEEW, 2025). Five historic records of pairs of Red Goshawks in southeastern Queensland suggested home range may vary from 50–220 km^2 based on the available habitat surrounding the areas where the pairs were located (DCCEEW, 2025). It appears the species is no longer present or is present at critically low levels in Eastern Australian Temperate Forests and Brigalow Tropical Savannah ecoregions in coastal and sub-coastal eastern Australia. It is thought the species is no longer present in the Rockhampton and Eungella regions (MacColl et al., 2023). Recent records in Queensland suggest that the species is existing in National Parks or State forests with a stronghold in north-east Queensland and eastern Cape York Peninsula (DERM, 2012; MacColl et al., 2023).			
Grey falcon *Falco hypoleucos*	V	V	The grey falcon occurs over open country and wooded lands of tropical and temperate Australia (BirdLife Australia, 2023; TSSC, 2020). It mainly occurs on sandy and stony plains of inland drainage systems, lightly timbered with acacia scrublands and intersected by eucalypt-lined, wooded, watercourses (BirdLife Australia, 2023). They hunt far into open areas, over spinifex (*Triodia*), tussock grassland (*Astrebla*), and low shrubland (e.g. bluebush), as well as near and over swamps, bores and waterholes, where surface water attracts prey, similarly occurring in tussock grasslands and open woodlands during winter (BirdLife Australia, 2023; TSSC, 2020). Occasionally they are found near the coast in open woodlands (e.g. mallee), lightly timbered plains and grasslands of lowlands and foothills, as well as occasionally entering country towns (BirdLife Australia, 2023). Nesting occurs on usually slender, sloping, or vertical fork in top part of tallest tree in area, usually near water or dry	No suitable habitat present.	No occurrence records within the desktop search extent. The nearest record occurs 35km to the Northwest of the Study Area.	**Unlikely to occur** The species has not been previously recorded within the desktop search extent and the Study Area contains limited marginal habitat for the species.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			watercourses. Height of nests: from 6 m to over 25 m (BirdLife Australia, 2023). The grey falcon is poorly understood and is considered to be Australia's rarest falcon and the rarest Falco species in the world (Schoenjahn, 2013). It occurs in arid and semi-arid Australia, with a stronghold in arid and semi-arid zones with a mean annual rainfall <500 mm but seldom in waterless desert, with the exception of drought conditions following wet years where the species may become marginally more widespread (BirdLife Australia, 2023; TSSC, 2020). This includes the Murray-Darling Basin, Eyre Basin, central Australia and Western Australia (TSSC, 2020). It is a highly mobile species travelling hundreds of kilometres dispersing during periods of drought to coastal areas, with wintering occurring within northern Australia (mostly immature birds) (NSW Scientific Committee, 2009). It is a resident or nomadic visitor to inland parts of all mainland states, recorded from most of Australia except Cape York Peninsula and areas east of the Great Dividing Range in QLD and NSW (S. Garnett et al., 2021; TSSC, 2020). Their home range size is not specified however they are likely to be larger than 100 km^2 (NSW Scientific Committee, 2009).			
Latham's snipe, Japanese snipe *Gallinago hardwicki*i	V, Marine, Migratory (Bonn, JAMBA, ROKAMBA)	V	In Australia the species typically occurs in permanent and ephemeral wetlands up to 2000 m above sea-level. They generally occupy flooded meadows, seasonal or semi-permanent swamps, or open waters, but various other freshwater habitats can be used including bogs, waterholes, billabongs, lagoons, lakes, creek or river margins, river pools and floodplains. However, they can also occur in habitats with saline or brackish water, in modified or artificial habitats, and in habitats located close to humans or human activity (DCCEEW), 2025).	Suitable habitat is present.	EMM has recorded the species during autumn surveys in area of Gilgai on ML1762 and recorded twice during March 2020 surveys.	**Known to occur** There is suitable habitat within the Study Area and the species has been observed within the Study Area (EMM).

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			Known from all east coast areas. Extends inland over the eastern tablelands in south-eastern Queensland (and occasionally from Rockhampton in the north), and to west of the Great Dividing Range in New South Wales. Occasionally recorded in south-western Queensland (DCCEEW, 2025j).			
Squatter pigeon (southern) *Geophaps scripta scripta*	V	V	This species' habitat occurs in tropical, open, dry sclerophyll woodlands and savannahs of north-east Australia (DCCEEW, 2025j; TSSC, 2015). The species is generally found in areas mostly dominated in the overstorey by *Eucalyptus*, *Acacia* and *Callitris* species, in remnant, regrowth or partly modified vegetated communities and within 3km of water bodies or water courses (DCCEEW, 2025j). Water bodies suitable for the species include permanent or seasonal rivers, creeks, lakes, ponds and waterholes (BirdLife Australia, 2023; TSSC, 2015). The species drinks daily and prefers to drink where there is gently sloping, bare ground on which to approach and stand at the water's edge. A small patch (less than a square metre) of bare ground at the water's edge is what the bird requires (DCCEEW, 2025j). Squatter Pigeon (southern) foraging and breeding habitat is known to occur on well-draining, sandy or loamy soils on low, gently sloping, flat to undulating plains and foothills (LZ 5) and and lateritic (duplex) soils on low 'jump-ups' and escarpments (LZ 7). mainly forages on seeds which have fallen to the ground from low vegetation, such as grasses, herbs and shrubs (Chrome 1976b; Chrome and Shields 1992). The patchy, ground layer of vegetation rarely exceeds 33% of the ground area The species is locally abundant within the northern part of its range (i.e. Brigalow Belt (North) and Desert Uplands Bioregions). It is common in grazing country north of the Tropic of Capricorn. The squatter pigeon (southern) occurs on the inland slopes of the Great Dividing Range. Its current	Suitable habitat present.	6 occurrence records (ALA, Wildnet) desktop search extent. The nearest occurrence record (2023) occurs approximately 1.5km East of the Study Area.	**Known to occur** Suitable habitat to support the species is present within the Study Area, and the species has been recorded in the Study Area (EMM).

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			distribution extends from the Burdekin-Lynd Divide in central Queensland, west to Longreach and Charleville, east to the coast between Port Curtis and Proserpine, and south to NSW north of 29°S (Cooper et al., 2015). There is a broad zone of hybridisation with the northern subspecies along the Burdekin-Lynd Divide (S. T. Garnett & Crowley, 2000; Higgins & Davies, 1996). It is known to occur within the following natural resource management regions: Desert Channels, Burdekin, Mackay Whitsunday, Fitzroy, Burnett Mary, South East Queensland, Condamine, Border Rivers and Maranoa-Balonne, and South West Queensland (DCCEEW, 2025j). The species is considered sedentary or locally nomadic (Squatter Pigeon Workshop, 2011). They are likely to be sedentary where both food and water resources are reliable however, when these resources become unavailable, they may disperse along vegetated corridors to areas where there is access to permanent water (Squatter Pigeon Workshop, 2011).			
Painted honeyeater *Grantiella picta*	V	V	Painted honeyeater habitat mostly comprises a strong association with mistletoes, occurring in eucalypt forests, woodlands, riparian woodlands of *Eucalyptus largiflorens* and *E. camaldulensis*, box-ironbark-yellow gum woodlands, acacia dominated woodlands, paperbarks, *Casuarina* spp., *Callitris* spp. and trees on farmland or in gardens (BirdLife Australia, 2023; DoE, 2015a). The species prefer woodlands that with a higher number of mature trees which generally contain more mistletoes, and are more common in wider areas of woodland than in narrower strips (DCCEEW, 2025j). Mainly in box-ironbark woodlands and forests on inland foothills of Great Divide, dominated by species such as Red Ironbark, Mugga, Yellow Box, Broad-leaved Peppermint *E. dives* or Red Stringybark *E. macrorhyncha* with Drooping *Amyema pendulum* and Box *A.*	The Study Area consists of sub-optimal habitat for mistletoe.	4 occurrence records (ALA, Wildnet) within desktop search extent.	**Possibly occurring** The species has been previously recorded within the desktop search extent, however habitat within the Study Area is marginal and limited due to a low abundance of mistletoe.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			miquelii Mistletoes; also in box-casuarina woodlands, especially those dominated by Yellow Gum with Buloke, and Belah (BirdLife Australia, 2023). Also common in riparian forests of River Sheoak with Needle-leaf Mistletoe *Amyema cambagei* (BirdLife Australia, 2023). Often found on plains with scattered eucalypts, and remnant trees on farmland, sometimes in stands of acacia, such as Myall, Prickly Wattle *A. victoriae*, Mulga, Brigalow and Silver Wattle with mistletoes, including Grey *Amyema quandang* and Wire-Leaf *A. preissii* Mistletoes (BirdLife Australia, 2023). Also occurs in woodlands dominated by native pine *Callitris*; or River Red Gum and Black Box, with Box and Drooping Mistletoes (BirdLife Australia, 2023). Sometimes observed in urban parks and gardens, especially those with large eucalypts (BirdLife Australia, 2023). Widespread and sparsely distributed from southeastern Australia to northwestern Queensland and eastern Northern Territory (S. T. Garnett & Crowley, 2000). The greatest concentrations and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland (DCCEEW, 2025j). Painted honeyeater follows a seasonal north-south movement dictated by mistletoe fruiting (DoE, 2015a). After breeding, the species then moves to semi-arid areas such as central and western Queensland (DAWE, 2021). Given this, the species is considered to be highly dispersive and nomadic, and thus can occur across a wide variety of land tenures (DAWE, 2021).			
White-throated needletail	V, Marine, Migratory (CAMBA,	V	The species is almost exclusively aerial in Australia. It breeds in Siberia from April to August and in the non-breeding season, can occur over most habitat types. The species is most often	Suitable habitat present.	10 occurrence records (ALA) within	**Likely to occur** Suitable habitat to support the

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
Hirundapus caudacutus	JAMBA, ROKAMBA)		recorded above wooded areas including open forest, closed forest and rainforest. In coastal areas, they are sometimes seen flying over sandy beaches or mudflats, and often around coastal cliffs and other areas with prominent updraughts, such as ridges and sand-dunes. The species is commonly observed high on storm fronts feeding exclusively on insects. It has been recorded from ground level up to 1000m. The species has been recorded roosting in hollows in Australia. Roosting habitat has been recorded as hollow-bearing trees on cliffs, ridges, edges of clearing areas and emergents (DCCEEW, 2025j). The species Core nonbreeding range is widespread in eastern and south-eastern Australia, recorded in all coastal regions of Queensland and NSW. Their range extends to the western slopes of the Great Dividing Range and are occasionally seen over the adjacent inland plains (TSSC, 2019).		desktop search extent.	species is present within the Study Area, and the species has been previously recorded within the desktop search extent.
Caspian tern *Hydroprogne caspia*	Marine, Migratory (JAMBA)	SL	Mostly found in sheltered coastal embayments (harbours, lagoons, inlets, bays, estuaries and river deltas) and those with sandy or muddy margins are preferred. They also occur on near coastal or inland terrestrial wetlands that are either fresh or saline, especially lakes (including ephemeral lakes), waterholes, reservoirs, rivers and creeks. They also use artificial wetlands, including reservoirs, sewage ponds and saltworks. In offshore areas the species prefers sheltered situations, particularly near islands, and is rarely seen beyond reefs. Breeding sites include low islands, cays, spits, banks, ridges, beaches of sand or shell, terrestrial wetlands and stony or rocky islets or banks (DCCEEW, 2025j). Widespread in coastal regions from the southern Gulf of Carpentaria to the Torres Strait, and along the eastern coast. Recorded in the western districts, especially the Lake Eyre Drainage Basin, north-west to the Gulf Country north of Mt Isa and Cloncurry, there are also scattered records for central Queensland (Higgins & Davies, 1996). Breeding occurs on the	No suitable habitat present.	1 occurrence record (Wildnet) within the desktop search extent, occurring approximately 23 km North of the Study Area.	**Unlikely to occur** The species has only been detected on a single occasion within the desktop search extent and the Study Area contains limited marginal habitat for the species.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			Wellesley Islands, south-east Gulf of Carpentaria; islands off the far north coast, from Bird Island, south to Three Isles; and from islands around Shoalwater Bay, including Pelican Rock, south to Fairfax Island. Inland breeding records occur at Lake Bindegolly and Lake Moondarra (Chatto, 2001; Higgins & Davies, 1996).			
Yellow wagtail *Motacilla flava*	Marine, Migratory (CAMBA, JAMBA, ROKAMBA)	SL	The species typically inhabits short grass and bare ground; swamp margins, sewage ponds, saltmarshes, playing fields, airfields, ploughed land and town lawns (Pizzey & Knight, 2007). The species is regularly recorded as a regular summer migrant to coastal northern Australia, or as a vagrant to southern states (DotE, 2015; Pizzey & Knight, 2007).	No suitable habitat present.	No occurrence records within the desktop search extent.	**Unlikely to occur** The Study Area is outside of the species known distribution and does not contain suitable habitat.
Star finch (eastern and southern) *Neochmia ruficauda ruficauda*	E	E	The star finch mainly inhabit grassy open (savanna) woodland, tall, rank grassland, rushes with woodland, mixed-forest woodland, and riparian woodland, damp grassland, and sedgeland all intrinsically associated with permanent surface water and regularly (seasonally) inundated areas (BirdLife Australia, 2023; DEWHA, 2010; DEWHA, 2008b). Grassy woodlands are typically interspersed with shrubs or small trees which has previously been eucalypt woodland with vine forest that had been cleared (Holmes, 1998). It often occurs among rank grass, reeds, rushes, or canegrass (BirdLife Australia, 2023). Frequently associated woodland tree species include *Eucalyptus coolabah, E. tereticornis, E. tessellaris, Melaleuca leucadendra, E. camaldulensis* and *Casuarina cunninghamiana* (Holmes, 1998). Woodland tree species may also be dominated by *Pandanus*, paperbarks, such as Weeping paperbarks, eucalypts including Coolibah, Forest Red Gum, River Red Gum Moreton Bay Ash,	No suitable habitat present.	No occurrence records within the desktop search extent.	**Unlikely to occur** The species has only been detected on a single occasion within the desktop search extent and the Study Area contains limited marginal habitat for the species.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			casuarinas such as River Sheoak or combinations of these (BirdLife Australia, 2023). This species avoids expansive open lands without trees or shrubs (Holmes, 1998). In Lakefield NP, QLD, they disperse to nearby saltmarsh during wet season and return to grasslands at the end of the wet season to breed (BirdLife Australia, 2023). Sometimes occurring in farmland, such as irrigated pasture or rice fields, or cane fields, around stockyards and sewage ponds (BirdLife Australia, 2023). On Cape York, the species is known from the following vegetation types: • woodlands and open woodlands dominated by *Eucalyptus chlorophylla*, *E. microtheca* and *E. acroleuca* • woodlands and open woodlands dominated by *E. clarksoniana*, *E. novoguinensis* or *E. polycarpa* • low open woodlands and low woodlands dominated by broad-leaved paperbarks *Melaleuca viridiflora* on depositional plains • tussock grasslands on marine and alluvial plains or on longitudinal drainage depressions • woodlands and herblands on beach ridges and at the littoral margins; and • sedgelands, lakes and lagoons (Holmes, 1998). Most records from Cape York Peninsula come from grasslands or open woodlands, and in the east, near Princess Charlotte Bay, the dominant grasses are *Sporobolus virginicus, Dichanthium sp.*, *Panicum maximum, Xerochloa imberbis* and *Oryza*			

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			australiensis, with the sedge *Fimbristylis littoralis* (Holmes, 1998). The distribution of star finch is poorly known but it is thought to only occur in central Queensland from Bowen in the north, to Winton in the west and Wowan in the south (DCCEEW, 2025j). It is possible that the distribution extends farther north to Mount Surprise and the Cloncurry-Mount Isa region, but records from these locations could relate to the subspecies *N. r. subclarescens* (DCCEEW, 2025j). Recent studies estimate the total population at 50 individuals or as being possibly extinct (DEWHA, 2008b). Species movements are poorly known though generally considered sedentary or resident with some localised movements (BirdLife Australia, 2023; Holmes, 1998). During a banding study of star finches in Western Australia, it was found that the average distance star finches moved within the one Study Area was 4.05 km. Average movements between separate Study Areas was 10.2 km and of the banded birds, only 6% were making these larger movements (Lewis, & Leyrer, Jutta, 2015).			
Osprey, Eastern Osprey *Pandion haliaetus/ Pandion cristatus*	Marine, Migratory (Bonn)	SL	The species inhabits littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. The species has been recorded within a variety of wetland habitats including swamps and marshes; margins of rivers and lakes; damp or flooded grasslands, pastures or agricultural lands; reservoirs; sewage treatment ponds; drainage channels; salt pans and salt lakes; salt marshes; estuarine mudflats, tidal streams; mangrove swamps; coastal lagoons; and offshore reefs (DCCEEW, 2025j). The species occurs along the coast around the entirety of Australia, with the breeding range extending from the south-west coast of Western Australia, up and around through Queensland and south to Lake Macquarie in NSW. They	No suitable habitat present.	No occurrence records within the desktop search extent.	**Unlikely to occur** The species has not been previously recorded within the desktop search extent and the Study Area contains limited marginal habitat for the species.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			occasionally travel inland along major rivers, particularly in northern Australia. They can occur in central Australia between May and December during years of average or above-average rainfall, when fish are abundant in inland waterways (DCCEEW, 2025j).			
Glossy ibis *Plegadis falcinellus*	Marine, Migratory (Bonn)	SL	The species typically inhabits freshwater marshes at the edges of lakes and rivers, lagoons, floodplains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation. The species is occasionally found in coastal locations such as estuaries, deltas, saltmarshes and coastal lagoons. Sometimes recorded in wooded swamps, artificial wetlands (such as irrigated fields), and in mangroves for breeding. Feeds in very shallow water (DCCEEW, 2025). The species is found in most states of Australia and throughout Queensland. Commonly in largest numbers in drying Top End grass/sedge swamps and Channel Country grass/forb meadows. The glossy ibis breeds at only a limited number of locations within Australia, including the Channel Country of Queensland/South Australia (wetlands of the Bulloo, Diamantina and Georgina River systems, occasionally also Cooper Creek) (DCCEEW, 2025).	Suitable habitat present.	2 occurrence records (ALA, Wildnet) within desktop search extent, the nearest record 1.5km Northeast of the Study Area.	**Likely to occur** The species has been observed within the previous surveys (EMM), approximately 2 km north of the current Study Area in habitat consistent with that present within the Study Area.
Black-throated finch (southern subspecies) *Poephila cincta cincta*	E	E	Occurs mainly in dry, open, grassy woodlands and forests, typically dominated by *Eucalyptus*, *Corymbia* and *Melaleuca*, and occasionally in tussock grasslands of the tropics and subtropics with seeding grasses and free water (BirdLife Australia, 2023; DCCEEW, 2025j). They mainly inhabit dry, open to very open (savanna) eucalypt woodlands, often along or near watercourses, or in the vicinity of water but also woodlands dominated by paperbarks or acacias (BirdLife Australia, 2023; DCCEEW, 2025j). Almost all recent records of the finch from south of the tropics have been in riparian habitat (Black-throated Finch Recovery Team, 2007). Some of	No suitable habitat present.	No occurrence records within desktop search extent.	**Unlikely to occur** There are no occurrence records for this species and there is no suitable habitat present within the Study Area.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			the more common species of eucalypts in woodlands and forests frequented by the subspecies include *Eucalyptus platyphylla, Corymbia clarksoniana, Melaleuca viridiflora, E. melanophloia, E. brownii, E. similis, E. crebra, E. tereticornis* and *E. camaldulensis.* (DAWE, 2023). Areas with a high diversity of grass species, particularly native grass species are likely to be favoured by the species as they are a specialist granivore requiring year-round access to grass seed (DAWE, 2023). On Atherton Tableland, ne. Qld, recorded in grassy grevillea–paperbark woodland dominated by Fern-leaved Grevillea *Grevillea pteridifolia*, Bushman's Clothes Pegs *G. glauca*, Yellow-barked Paperbark *Melaleuca nervosa*and *M. stenostachya*, with ground-cover of grasses *Setaria*, *Rhynchelytrum*, *Schizarchyrium*, *Panicum* and *Aristida*, and with several dams and an irrigation channel nearby; and also recorded in open mixed forests of eucalypts, casuarinas, *Tristania* and acacias, with *Callistemon* along streams (BirdLife Australia, 2023). In se. Qld, formerly recorded in dry open forest on ridges, grassy hillsides and 'mountain flats'; and, round Inverell, northern NSW, in riparian vegetation of thickets of Yellow Tea-tree *Leptospermum flavescens* and *Melaleuca*, and dense River Sheoaks surrounded by grassy open woodland (BirdLife Australia, 2023). Also, often on grassy plains; and on C. York Pen. and near coast, on grassy flats with *Pandanus*. Recorded in cultivation surrounded by woodland, and grazed paddocks. Said usually to avoid settled areas (Immelmann), though recorded on mown lawn near Ashford, NSW, once recorded in suburban garden in Townsville and formerly said to have been found in towns and cities in se. Qld (BirdLife Australia, 2023). This subspecies historically contacted the northern subspecies near Mareeba where the current distribution of the black-throated finch (southern) has now largely contracted and is			

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			only locally common in Queensland at sites near Townsville and Charters Towers, with small flocks scattered throughout the Brigalow Belt North and Desert Uplands bioregions (Black-throated Finch Recovery Team, 2007). Very few records occur south of Rockhampton after the 1970s and no populations are known to occur on conservation reserves (DCCEEW, 2025j). There are no modern records (since 2000) in the northern Bowen Basin (DAWE, 2023). Although movements are poorly known they are probably sedentary or resident around Charters Towers, Innisfail, Townsville and Rockhampton in QLD (BirdLife Australia, 2023). Some movement may be triggered by drought: gather in large mobile flocks around waterholes during drought (BirdLife Australia, 2023).			
Australian painted snipe *Rostratula australis*	E, Marine	E	This species inhabits shallow terrestrial freshwater (occasionally brackish) wetlands (ephemeral and permanent) (BirdLife Australia, 2023; DCCEEW, 2025j). This primarily includes temporary and permanent lakes, swamps, claypans, inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains (BirdLife Australia, 2023; DCCEEW, 2025j). Vegetation in these habitat areas typically include emergent tussocks of grass, sedges, rushes, reeds or samphire, often with lignum *Muehleneckia* sp. (lignum), cane grass or tea-tree *Melaleuca*; sometimes tree-lined, with some scattered fallen or washed-up timber (BirdLife Australia, 2023; DCCEEW, 2025j). The structure of vegetation is important for the species, with patchy to continuous low vegetation in and/or surrounding the wetland being essential (Rogers et al., 2003). Extensive reed-beds (or similar) are avoided (Rogers et al., 2003). Breeding occurs in shallow wetlands with areas of bare wet mud and both upper and canopy cover nearby, typically from or near small islands in freshwater wetlands (BirdLife Australia, 2023;	Suitable habitat is present. Constructed dams and flooded Gilgai known to provide suitable habitat for the species.	This species has been recorded on 3 occasions by EMM ecologists (2020) within the Study Area on lease ML1762 during both dry and wet conditions.	**Known to occur** Suitable habitat to support the species is present within the Study Area, and the species has been recorded in the Study Area (EMM).

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			DCCEEW, 2025j). Use modified habitats, such as low-lying woodlands converted to grazing pasture, sewage farms, dams, bores and irrigation schemes (BirdLife Australia, 2023). This species occurs in all states of Australia but is most common in eastern Australia being well-known from the Murray-Darling basin (BirdLife Australia, 2023; DCCEEW, 2025j). Other sightings include the Channel Country and the Fitzroy basin, and recently from the floodwater plains of coastal central and north Qld (DCCEEW, 2025j). The migratory patterns of the Australian painted snipe is poorly known, however, they are possibly dispersive or migratory due to evidence of irregular and infrequent occurrence and breeding at various locations (DCCEEW, 2025j). Dispersive moments have been attributed to local conditions as the species seeks flooded and wetland areas to avoid areas affected by drought (DCCEEW, 2025j). There have been claims of regular seasonal influxes, for example species numbers increasing in spring-summer or summer in Cunnamulla and Minden in Queensland (DCCEEW, 2025j). Suspected to be regular migrants to coastal floodwater plains, in autumn and winter (DCCEEW, 2025j).			
Diamond firetail *Stagonopleura guttata*	V	V	Habitat critical to the survival of the diamond firetail includes areas of eucalypt, acacia or casuarina woodlands, open forests and other lightly timbered habitats including farmlands and grasslands scattered with trees; habitat with low tree density, few large logs, and little litter cover but high grass cover for foraging, roosting and breeding; and drooping she-oak (*Allocasuarina verticillata*) within the Mt Lofty Ranges (DCCEEW, 2023h). Often inhabit open woodlands and forests, usually dominated by eucalypts such as red gums (particularly River Red Gum and Blakely's Red Gum) and other gums (e.g. Yellow Gum, Spotted Gum, Manna Gum), stringybarks (especially Broad-leaved Stringybark), ironbarks and box	No suitable habitat present.	No occurrence records within the desktop search extent.	**Unlikely to occur** There are no occurrence records of this species within the desktop search extent and the Study Area is outside of the species

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			eucalypts (especially Yellow, Grey and White Box) and other species such as Moreton Bay Ash, and typically with open or sparse (though occasionally dense) understorey of shrubs, small trees or regrowth, and grass ground-cover (e.g. of Kangaroo Grass *Themeda australis*. and including mallee woodlands (BirdLife Australia, 2023). Sometimes also in woodlands dominated by casuarinas, such as Buloke or Belah, and cypress-pines *Callitris*, such as White Cypress-pine *Callitris columellaris*, sometimes in mixed associations with eucalypts (BirdLife Australia, 2023). The species is found on the south-east mainland of Australia from south-east Queensland to Eyre Peninsula, South Australia and 300km inland from coastal areas. In Qld, their range previously extended to north Queensland, however it has greatly retracted and they now only occur in the very south of the state (DCCEEW, 2023h). Movements are apparently mainly resident or sedentary throughout its range, but short-distance migrant in parts of western Victorian (<200km), and seasonal occurrence or movements reported elsewhere in Victoria and SA (BirdLife Australia, 2023). Described as resident or present throughout year in many areas throughout range: e.g. Rockhampton, QLD; various sites and regions in NSW; round Caniambo, northern Victoria; and in Scott CP on Fleurieu Peninsula, SA (BirdLife Australia, 2023). At Boree, NSW, vacated garden in winter, and suggested to have moved into nearby bushland (BirdLife Australia, 2023).			current known distribution.
Black-breasted button-quail *(Turnix melanogaster)*	V	V	Black-breasted button-quail in SE QLD are restricted to rainforests and forests with a thick leaf litter between 3-10cm deep, a largely closed canopy with >70-80% canopy cover, and that receive 800-1200 mm annual average rainfall (BirdLife Australia, 2023; Mathieson & Smith, 2009). They prefer drier low closed forests, particularly semi-evergreen vine thicket, low microphyll vine forest, araucarian microphyll forest and	No suitable habitat present within Study Area.	No occurrence records within the desktop search extent.	**Unlikely to occur** The Study Area is outside of the species known distribution and

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			araucarian notophyll vine forest. The species also is found in softwood scrubs, vine scrub regrowth, mature hoop pine plantations, especially where there is lantana, dry sclerophyll forest adjacent to rainforest and Acacia and Austromyrtus scrubs on sandy coastal soils (TSSC, 2015b). The shrub layers vary from dense to absent and often comprises many fruit-producing plants and a sparse ground cover (BirdLife Australia, 2023). Favoured vegetation is described as Bottletree scrub: dry rainforest of Brigalow Acacia harpophylla, Belah Casuarina cristata and Bottletree Brachychiton rupestris, with or without emergent Hoop Pine Araucaria cunninghamii, with shrub understorey and thick litter (BirdLife Australia, 2023). Other records in se. Qld from semi-evergreen vine thicket with emergent Coowarra Box Eucalyptus cambageana and Australian Teak Flindersia australis; semi-evergreen vine thicket with undergrowth of shrubs and Prickly Pear Opuntia; open sclerophyll forest dominated by Spotted Gum Eucalyptus maculata, with ground cover comprising clumps of Wallaby Grass Danthonia and deep litter; forest or rainforest with an understorey of introduced lantana; lantana thickets; and occasionally plantations of Hoop Pine or introduced Pinus (BirdLife Australia, 2023). On Fraser Island, in Brush Box Tristania conferta, Pink Bloodwood Eucalyptus intermedia and Forest Red Gum E. tereticornis forest, with an understorey of Black She-oak Allocasuarina littoralis, acacia, lantana and berry-bearing shrubs (BirdLife Australia, 2023). Occasionally occur in grain stubble, well distant from forest, e.g. Moore area, Brisbane R (BirdLife Australia, 2023). Nests are often found in areas with the following understorey plants: Pteridium esculentum, Doodia aspera and Lantana camara (TSSC, 2015b). This species is endemic to eastern Australia and is restricted to coastal and near-coastal regions of south-eastern QLD and north-eastern NSW (DCCEEW, 2025j). The main populations occur within south-east QLD (DCCEEW, 2025j). It has been			does not contain suitable habitat.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			recorded from the Byfield region in the north to at least the Border Ranges rainforests, generally east of the Great Dividing Range, although some observations have been made on its western slopes, up to 300 km inland at locations such as Palm Grove National Park and Barakula State Forest in QLD (DCCEEW, 2025j). A lack of knowledge of the species' dispersal capability and propensity makes it difficult to determine whether isolated groups represent single interbreeding populations (DCCEEW, 2025j). However, given the species' specialised habitat requirements and the lack of records from intervening cleared land and other habitats, it may be surmised that little interchange occurs between widely fragmented populations (DCCEEW, 2025j). It is generally considered to be a sedentary species, although it can appear intermittently or as a transient in other areas and has an estimated home-ranges ranged from 1.9 ha to 6.2 ha (BirdLife Australia, 2023; DCCEEW, 2025j).			

[1] CR = Critically Endangered, E = Endangered, V = Vulnerable, NT = Near Threatened, SLC = Special Least Concern.

[2] Habitat types including microhabitat features where relevant and distribution of the species from reputable online sources and databases.

[3] Presence, extent, condition and proximity/connectivity to other habitat and type of habitat whether breeding, feeding, shelter, dispersal, and temporary use.

[4] Nearest and notable records of the species from relevant databases.

[5] Most suitable and relevant survey timing and required effort to detect the species (time of year, rainfall events, temperature etc.).

[6] Assessment result of likelihood of species occurring.

Mammals

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
Silver-headed antechinus *Antechinus argentus*	E	E	At Kroombit Tops National Park, the silver-headed antechinus occurs on an undulating sandstone plateau bounded on the eastern side by an escarpment with cliffs, at an elevation of 850-900 m asl. The habitat comprises of *Eucalyptus montivaga* (a blackbutt) with subdominant *Corymbia trachyphloia* (brown bloodwood) shrubby tall open forest. At Blackdown Tableland National Park and Bulburin National Park, the silver-headed antechinus occurs in similar wet, high altitude open forest habitat (DCCEEW, 2025j; TSSC, 2018). The silver-headed antechinus is known from three isolated subpopulations located in central eastern Queensland - the plateau at the eastern escarpment of Kroombit Tops National Park, located 70 km south-west of Gladstone; Blackdown Tableland National Park, located 220 km west of Gladstone (Mason et al., 2016); and Bulburin National Park, located 80 km south-east of Gladstone (TSSC, 2018).	No suitable habitat present within Study Area.	2 occurrence records (ALA) within the desktop search extent. The nearest record occurs approximately 23km from the Study Area in Blackdown Tableland National Park.	**Unlikely to occur** The Study Area is outside of the known distribution and does not contain suitable habitat.
Large-eared pied bat	E	E	Sandstone cliffs and fertile woodland valley habitat within	No suitable habitat present within Study	2 occurrence records (ALA, Wildnet) within	**Unlikely to occur**

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
Chalinolobus dwyeri			proximity of each other is habitat of importance to the large-eared pied bat. Records from southeast Queensland suggest that rainforest and moist eucalypt forest habitats on other geological substrates (rhyolite, trachyte and basalt) at high elevation are of similar importance to the species (DCCEEW, 2025j). Records in Queensland are known from sandstone escarpments in the Carnarvon and Expedition Ranges, Blackdown Tablelands and Cania Gorge. It is likely that these areas support a high proportion of Queensland populations. Additional records exist in the Scenic Rim near the NSW/Queensland border (DCCEEW, 2025j).	Area. The Study Area occurs 10km west of the species distribution extent in Arthurs Bluff State Forest.	the desktop search extent, the nearest record approximately 12km East in Blackdown Tableland National Park.	The Study Area is outside of the species known distribution.
Northern quoll *Dasyurus hallucatus*	E	LC	The species inhabits a diverse range of habitats including eucalypt forest and woodlands, rainforests, sandy lowlands and beaches, shrubland, grasslands and desert. The species is also known to occupy non-rocky lowland habitats such as beach scrub communities in central Queensland. Their habitat generally encompasses some form of rocky area for denning purposes with surrounding vegetated habitats used for foraging and dispersal. Rocky habitats are	No suitable habitat present within Study Area.	No occurrence records within this desktop search extent.	**Unlikely to occur** The Study Area does not comprise of suitable habitat for the species and there are no historical occurrence records within the desktop search extent.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			usually of high relief, often rugged and dissected but can also include tor fields or caves in low lying areas. Eucalypt forest or woodland habitats usually have a high structural diversity containing large diameter trees, termite mounds or hollow logs for denning purposes. Dens are made in rock crevices, tree holes or occasionally termite mounds (DCCEEW, 2025j). The northern quoll occurs in five regional populations across northern Australia, including Queensland, the Northern Territory, Western Australia and offshore islands. In Queensland, they are known to occur as far south as Gracemere and Mt Morgan, south of Rockhampton; as far north as Weipa; and as far west in central Queensland to the vicinity of Carnarvon Range National Park (McGoldrick, 2013; Woinarski et al., 2008). There are occasionally records as far south as Maleny on the Sunshine Coast hinterland. Recent records in central Queensland are from around Proserpine, Midge Point, Eungella and Cape Upstart. In northern Queensland recent records exist from Mareeba, Mount			

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			Carbine, Tolga, Weipa and around Cooktown (DCCEEW, 2025j).			
Ghost Bat *Macroderma gigas*	V	E	The species occurs across a range of habitats, from arid Pilbara to tropical savanna woodlands and rainforests. During the daytime they roost in caves, rock crevices and old mines. Roost sites used permanently are generally deep natural caves or disused mines with a relatively stable temperature of 23°–28°C and a moderate to high relative humidity of 50–100 percent. The average foraging distance is approximately 2 km from the daytime roost (TSSC, 2016a). The species' current range is discontinuous, with geographically disjunct colonies occurring in the Pilbara, Kimberley (including several islands), northern Northern Territory (including Groote Eylandt), the Gulf of Carpentaria, coastal and near coastal eastern Queensland from Cape York to near Rockhampton, and western Queensland (including Riversleigh and Cammoweal districts (TSSC, 2016a).	No suitable habitat present within Study Area.	No occurrence records within desktop search extent.	**Unlikely to occur** The Study Area is outside of the species known distribution and does not contain suitable habitat.
South-eastern long-eared bat	V	V	This species inhabits inland woodland vegetation types, including woodlands of *Allocasuarina luehmannii*, *Acacia*	No suitable habitat present within Study Area.	No occurrence records within the desktop search extent.	**Unlikely to occur** The Study Area is outside of the species known

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
Nyctophilus corbeni			*harpophylla*, *Casuarina cristata*, *Angophora costata*, *Eucalyptus camaldulensis*, *E. largiflorens* and various types of tree mallee, however, the most common is box, ironbark and cypress pine vegetation (TSSC, 2016). The species is most abundant in more extensive stands of vegetation and habitats with a distinct tree canopy and dense, cluttered understorey (TSSC, 2016). It also appears to prefer old-growth forest where it roosts in dead trees or dead spouts of live trees (TSSC, 2016). The species has also been found to nest in exfoliating bark (DEWHA, 2010). It generally forages in concentrated tree patches within the landscape (TSSC, 2016). The species is found in southern central Queensland, central western New South Wales, north-western Victoria and eastern South Australia, where it is patchily distributed, with most of its range in the Murray Darling Basin. Most records are from inland of the Great Dividing Range. The species is uncommon within this distribution and is rarely recorded, except in some areas including the Nandewar and Brigalow Belt South bioregions in			distribution range and does not contain suitable habitat.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			New South Wales and Queensland (TSSC, 2015).			
Bridled nail-tail wallaby *Onychogalea fraenata*	E	E	The preferred habitat of bridled nail tail wallabies is the narrow band of transitional vegetation that separates dense *Acacia* scrub from open grassy eucalypt woodland. Within Taunton National Park, bridled nail tail wallabies are found in open grassy eucalypt woodland dominated by *Eucalyptus populnea* (poplar box), dense acacia forest dominated by *Acacia harpophylla* (brigalow) and transitional vegetation intermediate between the woodland and forest areas of very dense *brigalow regrowth ylla* (brigalow) scrub, preferring areas with the most fertile soil. During the day, the species prefers habitat that consists of young Acacia harpophylla regrowth or contains fallen logs, for shelter. They generally choose shelter sites with the densest cover of foliage and stems at the species height (25-50 cm), and this type of shelter is concentrated at the edges of wooded areas such as Acacia harpophylla regrowth (DCCEEW, 2025j; TSSC, 2016c). The historical distribution of the bridled nail tail wallaby extended across inland eastern Australia, from north-central Victoria to	No suitable habitat present within the Study Area. Taunton National Park (30km to the East of the Study Area) contains a dense brigalow *Acacia harpophylla* forest and grassy eucalypt woodland habitat (Department of Environment and Resource Management, 2011), and supports a population of the species.	No occurrence records within desktop search extent.	**Unlikely to occur** The Study Area is outside of the species known distribution range and does not contain suitable habitat.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			near Ravenswood in Queensland. The bridled nail tail wallaby is now restricted to Taunton National Park, central Queensland (area of occupancy: 4 km2), Avocet Nature Refuge, central Queensland (area of occupancy: 2 km2) and Scotia Sanctuary, New South Wales (area of occupancy: 80 km2) (DCCEEW, 2025j; TSSC, 2016c).			
Greater glider (southern and central) *Petauroides volans/ Petauroides volans volans*	E	E	This species is largely restricted to eucalypt forests and woodlands of eastern Australia, typically found in highest abundance in taller, montane, moist eucalypt forest on fertile soils, with relatively old trees and abundant hollows. Six species were identified as dominant or co-dominant species to the majority of greater glider habitat: *Corymbia citriodora, Eucalyptus moluccana, E. tereticornis, E. crebra, C. intermedia and E. portuensis*. Size of trees is also important for Greater Gliders, with trees >30cm DBH preferentially selected for foraging and >50cm DBH for denning as they are more likely to contain suitable hollows for sheltering. Greater glider shelters in tree hollows, with a preference for large hollows in large old trees that are both dead and alive.	No suitable habitat present within Study Area.	4 occurrence records (ALA, Wildnet) within the desktop search extent. The nearest record (1994) occurs approximately 7km North of the Study Area. More recent observations (2022-2025) occur approximately 20km from the Study Area in Blackdown Tableland National Park.	**Unlikely to occur** The Study Area does not comprise of suitable habitat for the species.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			In SE QLD, the species shows a strong preference for three den-tree species; broad-leaved white mahogany, red ironbark, and forest red gum. The species requires at least two-four live den trees for every 2 ha of suitable forest habitat. The species also prefers a cool microclimate and favours protected gullies, sheltered high elevation areas, coastal lowland areas and southern slopes (DAWE, 2022a). The species occurs in eastern Australia, where it has a broad distribution from around Proserpine in Qld, south through NSW and the ACT, to Wombat State Forest in central Victoria. It occurs across an elevational range of 0–1200 m above sea level (DAWE, 2022a).			
Yellow-bellied glider *Petaurus australis australis*	V	V	This species occurs in eucalypt-dominated woodlands and forests, including both wet and dry sclerophyll forests. The subspecies shows a preference for large patches of mature old growth forest that provide old, large (usually more than one meter in diameter) hollow bearing trees that can be utilised as den sites for breeding and sheltering during	Lack of suitable habitat present within Study Area.	8 occurrence records (ALA, Wildnet) within the desktop search extent. The nearest record occurs approximately 7km West of the Study Area. Multiple occurrence records recorded within Blackdown Tableland National Park.	**Unlikely to occur** The Study Area is outside of the species known distribution and does not contain suitable habitat.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			the day (DAWE, 2022). There is also a clear preference for forests with a high proportion of winter-flowering and smooth-barked eucalypts. They are found at altitudes ranging from sea level to 1400 m above sea level (DAWE, 2022). The species utilised for sap feeding include; *Angophora leiocarpa, Corymbia citriodora, C. intermedia, Eucalyptus biturbinata*, E. longirostrata, *E. major, E. melliodora, E. mollucana, E. tereticornis, E. racemosa, E. resinifera, E. laevopinea* and *E. sphaerocarpa* (Eyre & Goldingay, 2005). They have a widespread but patchy distribution from southeast Queensland (Qld) to far southeast SA near the SA-Vic border. Most of the Qld distribution is coastal, extending southward along the eastern seaboard from north of Mackay and continuing through the NSW-Qld border. However, isolated subpopulations are found inland in the Blackdown and Canarvon Ranges of central Qld (DAWE, 2022).			
Koala *Phascolarctos cinereus*	E	E	In Queensland, koalas inhabit moist coastal forests, southern and central western subhumid woodlands, and several eucalypt	Small patches of suitable habitat are present.	5 occurrence records (ALA) within the desktop search extent. Several old scratches	**Known to occur** The species has been indirectly observed in the Study Area during previous

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			woodlands adjacent to waterbodies in semi-arid western parts of the state. Surveys in north-western Qld found koalas were patchily distributed and associated with creek-lines and areas of higher tree species richness, with higher abundance correlating with leaf-moisture content. Koalas are reported to utilise more than 400 different tree species for their food and habitat requirements, with tree species varying by habitat type and location across their range. Primary food species differ across habitats and may be as few as two at a particular location (DAWE, 2022b). Koalas feed on approximately 120 species of *Eucalyptus, Corymbia and Angophora*. The listed population of the koala has a wide but patchy distribution that spans the coastal and inland areas of QLD north to the Herberton area and westwards into hotter and dryer semi-arid climates of central QLD, NSW and the ACT. Koalas are widespread across QLD, occurring in patchy and often low-density populations across the different bioregions. They occur as far north as the Einasleigh Uplands and Wet		have been identified on Blue Gums along Taurus Creek on ML1762 by EMM ecologists.	surveys (EMM) with suitable habitat present within the Study Area.

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
			Tropics bioregions, and to the south and west in the Desert Uplands, Central Mackay Coast, Mitchell Grass Downs, Mulga Lands, Brigalow Belt North, Brigalow Belt South, and South Eastern QLD bioregions, where they are most frequently sighted (DAWE, 2022b).			
Short-beaked echidna *Tachyglossus aculeatus*	-	SL	The species occurs throughout Australia in a wide variety of habitats including mountains, tropics, open woodlands, grasslands, arid zones and coastal environments; wherever there is a supply of ants and termites, upon which it feeds. They prefer to inhabit areas with vegetation that provides cover such as gaps under rocks, hollow logs, hollows at the base of trees, piles of leaves or bunched grasses (S. C. Nicol et al., 2011). The species also enters a period of torpor or deep hibernation during autumn and winter, during which time it also requires these forms of cover (ALA, 2025). The short-beaked echidna is found throughout Australia including Tasmania (Van Dyck & Strahan, 2008).	Suitable habitat is present, particularly within Amaroo State Forest.	17 occurrence records (ALA, Wildnet) within the desktop search extent. The nearest occurrence is approximately 1km Northwest of the Study Area, with multiple occurrences within Amaroo State Forest.	**Likely to occur** Suitable habitat to support the species is present within the Study Area, and the species has been previously recorded within the desktop search extent.

[1] CR = Critically Endangered, E = Endangered, V = Vulnerable, NT = Near Threatened, SLC = Special Least Concern

Species name	EPBC Act Status[1]	NC Act Status[1]	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]

[2] Habitat types including microhabitat features where relevant and distribution of the species from reputable online sources and databases

[3] Presence, extent, condition and proximity/connectivity to other habitat and type of habitat whether breeding, feeding, shelter, dispersal, and temporary use.

[4] Nearest and notable records of the species from relevant databases

[5] Most suitable and relevant survey timing and required effort to detect the species (time of year, rainfall events, temperature etc.)

[6] Assessment result of likelihood of species occurring

Reptiles

Species name	EPBC Act Status1	NC Act Status[1] e	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
Collared delma *Delma torquata*	V	V	The collared delma typically inhabits eucalypt-dominated woodlands and open forests where it is associated with suitable microhabitat features including exposed rocky outcrops, rocks, logs, bark and other coarse woody debris and mats of leaf litter (typically 30–100 mm thick). The ground cover is predominantly native grasses, such as *Themeda triandra*, *Cymbopogon refractus*, *Aristida* sp. and *Lomandra* sp. It occurs in QLD Land Zones 3 (alluvium river and creek flats), 9 (undulating country on fine-grained sedimentary rocks) and 10 (sandstone ranges), and has been recorded in REs 11.3.2, 11.9.10 ,11.10.1 and 11.10.4 Recorded from several soil types throughout SEQ. Essential (DCCEEW, 2025j; DSEWPC, 2011b). The species is endemic to QLD and has been recorded in southwest and central QLD, however most records are from southeast Queensland such as the western suburbs of Brisbane and inland to the Bunya Mountains. Recorded at the following sites: Bunya Mountains, Blackdown Tablelands National Park, Expedition National Park, Western Creek near Millmerran, Toowoomba Range, and large concentration of records from the western suburbs of Brisbane (DCCEEW, 2025j; Department of the Environment, Water, Heritage and the Arts (DEWHA), 2008c).	Limited suitable habitat present.	No occurrence records within the desktop search extent.	**Unlikely to occur** The Study Area is outside of the species known distribution and there is limited suitable habitat present within the Study Area.

Ornamental snake *Denisonia maculata*	V	V	Ornamental snake prefer moist areas in woodlands and open forests, particularly in depressions located in QLD Regional Ecosystem (RE) Land Zone 4 and in Gilgai mounds occurring in areas of deep cracking alluvial soils with high clay content (DCCEEW, 2025j).The species habitat is generally found in *Acacia harpophylla*, *A. cambagei*, *A. argyrodendron* or *Eucalyptus coolabah* dominated communities including primarily REs 11.4.3, 11.4.6, 11.4.8 and 11.4.9 (DCCEEW, 2025j). Habitat is also found in grasslands that contain Gilgai (DCCEEW, 2025j). Ornamental snake shelter under logs, leaf litter, bark, rocks and coarse woody debris on the ground, and during dry periods they will seek refuge within clay cracks in Gilgai (Brigalow Belt Reptiles Workshop, 2010). Habitat characteristics that are shared across locations in which ornamental snake have been recorded include; • located in the lowest part of the catchment • have a diversity of Gilgai size and depth • contain soils of high clay content and deep cracking characteristics • the presence of ground timber is usually common (especially piles) • burrowing frogs are abundant; and, • habitat patches are greater than 10 ha and are within, or connected, to larger areas of remnant vegetation (DCCEEW, 2025j). The ornamental snake is only known from the Brigalow Belt North, and parts of the Brigalow Belt South Bioregions. The stronghold of this species is within the Fitzroy and Dawson River catchments, particularly in the area surrounding Moranbah (DCCEEW, 2025j).	Areas of high-quality Gilgai habitat is present. Despite this, the Gilgai is observed to be at risk of degradation by cattle and non-native grass and weed species.	3 occurrence records (ALA, Wildnet) within the desktop search extent. The nearest record is approximately 10km South of the Study Area.	**Known to occur** This species has been recorded within the Study Area during previous surveys (EMM) with areas of gilgai microrelief providing habitat for the species.

Species name	EPBC Act Status1	NC Act Status[1] e	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
Yakka skink *Egernia rugosa*	V	V	The species is known to occur in open dry sclerophyll forest, woodland and scrub, including on Land Zones 3, 4, 5, 7, 9 and 10. Common woodland and open forest types include *Acacia harpophylla*, *A. aneura*, *A. catenulata*, *A. shirleyi*, *Casuarina cristata*, *Eucalyptus populnea*, *Eucalyptus* spp. and *Callitris glaucophylla*. This species will often take refuge among dense ground vegetation, large hollow logs, cavities in soil-bound root systems of fallen trees and beneath rocks. The species also utilises coarse woody debris and rabbit warrens (DCCEEW, 2025j).It is commonly found in cavities under and between partly buried rocks, logs or tree stumps, root cavities and abandoned animal burrows. The species often takes refuge in large hollow logs and has been known to excavate deep burrow systems, sometimes under dense ground vegetation. In cleared habitat, this species can persist where there are shelter sites such as raked log piles, deep gullies, tunnel erosion/sinkholes and rabbit warrens. This species is not generally found in trees or rocky habitats (DoE, 2025). Yakka skink is endemic to Queensland where its distribution is patchy. Isolated populations occur throughout subhumid areas in the interior of Queensland from St George in the south, to Coen and Cape York in the north. In the southern half of the Brigalow Belt it occurs near Rockhampton, south to St George and west to Chesterton Range National Park (DotE, 2014).	No suitable habitat present within Study Area.	No occurrence records within the desktop search extent.	**Unlikely to occur** The species has not been previously recorded within the desktop search extent and the Study Area does not contain suitable habitat for the species due to it being highly degraded and containing limited suitable microhabitat features.

Species name	EPBC Act Status1	NC Act Status[1] e	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
Dunmall's snake *Furina dunmalli*	V	V	The species inhabits a range of habitats including forests and woodlands on black alluvial cracking clay and clay loams dominated by *Acacia harpophylla*, other wattles (*A. burowii, A. deanii, A. leiocalyx*), *Callitris* spp. or *Allocasuarina luehmannii*; and *Corymbia citriodora*, *Eucalyptus crebra*, *E. melanophloia*, *Callitris glaucophylla* and *A. luehmannii* open forest and woodland associations on sandstone derived soils (DCCEEW, 2025j). The species has been found sheltering under fallen timber and ground litter and may use cracks in alluvial clay soils. Records indicate the species prefers habitats between 200 to 500 m above sea level (DSEWPC, 2011). Dunmall's snake is found from near the Queensland border throughout the Brigalow Belt South and Nandewar bioregions, and as far south as Ashford in NSW. In QLD, it occurs primarily in the Brigalow Belt region in the south-eastern interior. The snake is very rare or secretive with limited records existing. It has been recorded at Archokoora, Oakey, Miles, Glenmorgan, Wallaville, Gladstone, Lake Broadwater, Mount Archer, Tarong Power Station, Exhibition Range National Park, roadside reserves between Inglewood and Texas, Rosedale, Yeppoon and Lake Broadwater Conservation Park (DCCEEW, 2025j).	No suitable habitat present.	No occurrence records within the desktop search extent.	**Unlikely to occur** The Study Area is outside of the species known distribution and does not contain suitable habitat.

Species name	EPBC Act Status1	NC Act Status[1] e	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]
Grey snake *Hemiaspis damelii*	E	E	The grey snake favours woodlands (typically *Acacia harpophylla* and *Casuarina cristata*), usually on heavier, cracking clay soils, particularly in association with water bodies or in areas with small gullies and ditches (gilgai). It shelters under rocks, logs, other debris in soil cracks and abandoned burrows (DCCEEW, 2025b). The grey snake distribution extends from central inland NSW, north to several isolated populations near Rockhampton in QLD. Within QLD, records are known from near Goondiwindi and the adjacent Darling-Riverine Plain, from the Darling Downs and from the Lockyer Valley. The species core area is in the Brigalow Belt south of the Great Dividing Range, between Dalby and Glenmorgan. A single reliable record (captured, no specimen collected) is known from Currawinya National Park in western QLD (DCCEEW, 2025b).	No suitable habitat present.	No occurrence records within the desktop search extent.	**Unlikely to occur** The Study Area is outside of the species known distribution and does not contain suitable habitat.
Fitzroy River turtle *Rheodytes leukops*	V	E	Fitzroy River turtle occurs in flowing rivers with large deep pools with rocky, gravelly or sandy substrates, connected by shallow riffles. Preferred areas have high water clarity and are often associated with Ribbonweed (*Vallisneria* sp.) beds. Common riparian vegetation includes Blue Gums (*Eucalyptus tereticornis*), River Oaks (*Casuarina cunninghamiana*), Weeping Bottlebrushes (*Callistemon viminalis*) and paperbarks (*Melaleuca linariifolia*) (DCCEEW, 2025j; DEWHA, 2008). The species is restricted to the Fitzroy River and its tributaries. Known sites include Boolburra, Gainsford, Glenroy Crossing, Theodore, Baralba, the Mackenzie River, the Connors River, Duaringa, Marlborough Ck, and Gogango (DCCEEW, 2025j; DEWHA, 2008).	No suitable habitat present.	No occurrence records within the desktop search extent.	**Unlikely to occur** The Study Area is outside of the known distribution and does not contain suitable habitat.

Species name	EPBC Act Status1	NC Act Status[1] e	Habitat and Distribution[2]	Suitable habitat present within Study Area and surrounds[3]	Occurrence records[4]	Likelihood of occurrence[6]

[1] CR = Critically Endangered, E = Endangered, V = Vulnerable, NT = Near Threatened, SLC = Special Least Concern

[2] Habitat types including microhabitat features where relevant and distribution of the species from reputable online sources and databases

[3] Presence, extent, condition and proximity/connectivity to other habitat and type of habitat whether breeding, feeding, shelter, dispersal, and temporary use.

[4] Nearest and notable records of the species from relevant databases

[5] Most suitable and relevant survey timing and required effort to detect the species (time of year, rainfall events, temperature etc.)

[6] Assessment result of likelihood of species occurring

Appendix C Flora and fauna species list

Table A - 1: Flora species identified during field surveys

Species name	Common name	Status		Exotic status[2]
		EPBC Act	NC Act[1]	
Abutilon sp.	-	-	C	-
Acacia excelsa	-	-	C	-
Acacia harpophylla	Brigalow	-	C	-
Acacia salicina	Doolan	-	C	-
Acacia sp.	-	-	C	-
Acalypha eremorum	Soft acalypha	-	C	-
Alectryon diversifolius	Scrub boonaree	-	C	-
Alstonia constricta	Bitterbark	-	C	-
Amyema quandang	-	-	C	-
Amyema salignum	-	-	C	-
Aristida calycina	-	-	C	-
Aristida latifolia	Feathertop wiregrass	-	C	-
Aristida ramosa	Purple wiregrass	-	C	-
Aristida sp.	-	-	C	-
Atalaya hemiglauca	-	-	C	-
Atriplex muelleri	Lagoon saltbush	-	C	-
Bothriochloa bladhii	-	-	C	-
Bothriochloa ewartiana	Desert bluegrass	-	C	-
*Bothriochloa pertusa**	-	-	-	-
Brachychiton rupestris	-	-	SL	-
Brachyscome sp.	-	-	C	-
*Bryophyllum daigremontianum**	-	-	-	-
*Bryophyllum delagoense**	-	-	-	RI Cat 3
*Bryophyllum pinnatum**	-	-	-	-
Capparis lasiantha	Nipan	-	C	-
Carissa ovata	Currantbush	-	C	-
Cassia brewsteri	-	-	C	-

Casuarina cristata	Belah	-	C	-
*Cenchrus ciliaris**	Buffel grass	-	-	-
Chloris divaricata	-	-	C	-
Chloris ventricosa	Tall chloris	-	C	-
Chrysopogon fallax	-	-	C	-
Citrus glauca	-	-	C	-
Clematicissus opaca	-	-	C	-
Commaleana sp.	-	-	C	-
Blakella dallachiana	-	-	C	-
Blakella tessellaris	Moreton Bay ash	-	C	-
Crotolaria sp.	-	-	C	-
*Cryptostegia grandiflora**	-	-	-	WoNS, RI Cat 3
*Cynodon dactylon**	-	-	-	-
Cyperus sp.	-	-	C	-
Dactyloctenium radulans	Button grass	-	C	-
Dichanthium sericeum	-	-	C	-
*Echinochloa colona**	-	-	-	-
Enchylaena tomentosa	-	-	C	-
Enneapogon polyphyllus	Leafy nineawn	-	C	-
Enteropogon acicularis	Curly windmill grass	-	C	-
Enteropogon ramosus	-	-	C	-
Eragrostis parviflora	Weeping lovegrass	-	C	-
*Eragrostis trichophora**	-	-	-	-
Eremophila mitchellii	-	-	C	-
Eriachne sp.	-	-	C	-
Eriochloa pseudoacrotricha	-	-	C	-
Erythroxylum australe	Cocaine tree	-	C	-
Eucalyptus camaldulensis	-	-	C	-

Eucalyptus coolabah	Coolabah	-	C	-
Eucalyptus crebra	Narrow-leaved ironbark	-	C	-
Eucalyptus melanophloia	-	-	C	-
Eucalyptus populnea	Poplar box	-	C	-
Eucalyptus tereticornis	-	-	C	-
Evolulus sp.	-	-	C	-
Fimbristylis dichotoma	Common fringe-rush	-	C	-
Flindersia dissosperma	-	-	C	-
Geijera parviflora	-	-	C	-
*Gomphocarpus physocarpus**	-	-	-	-
Grevillea parvifolia	Wilga	-	C	-
Grevillea striata	Beefwood	-	C	-
Grewia sp.	-	-	C	-
Harrisia cactus	-	-	C	-
*Harrisia martinii**	-	-	-	RI Cat 3
Heteropogon contortus	Black speargrass	-	C	-
Juncus sp.	-	-	C	-
Lysiana subfalcata	-	-	C	-
Lysiphyllum carronii	Ebony tree	-	C	-
Lysiphyllum cunninghamii	-	-	C	-
Lysiphyllum hookeri	Queensland ebony	-	C	-
Maireana microphylla	-	-	C	-
*Malvastrum americanum**	-	-	-	-
*Megathyrsus maximus**	-	-	-	-
Melaleuca bracteata	-	-	C	-
Melhania oblongifolia	-	-	C	-
*Melinis repens**	-	-	-	-

Notelaea microcarpa	-	-	C	-
Nyssanthes diffusa	Barbed-wire weed	-	C	-
*Opuntia streptacantha**	-	-	-	WoNS, RI Cat 3
*Opuntia stricta**	-	-	-	WoNS, RI Cat 3
*Opuntia tomentosa**	-	-	-	WoNS, RI Cat 3
Owenia acidula	Emu apple	-	C	-
Panicum decompositum	-	-	C	-
Panicum effusum	-	-	C	-
*Parkinsonia aculeata**	-	-	-	WoNS, RI Cat 3
Parkinsonia sp.	-	-	C	-
*Parthenium hysterophorus**	-	-	-	WoNS, RI Cat 3
*Portulaca oleracea**	-	-	-	-
Portulaca sp.	-	-	C	-
Salsola australis	-	-	C	-
Santalum lanceolatum	-	-	SL	-
Scleroleana muricata	-	-	C	-
Sesbania cannabina	-	-	C	-
Sida fibulifera	-	-	C	-
*Sida filiformis**	-	-	-	-
Sida hackettiana	-	-	C	-
Solanum elachophyllum	-	-	E	-
Sporobolus actinocladus	Katoora grass	-	C	-
Sporobolus caroli	Fairy grass	-	C	-
Sporobolus creber	-	-	C	-
*Stylosanthes scabra**	-	-	-	-
*Synedrella nodiflora**	-	-	C	-
Terminalia oblongata	-	-	C	-
Themeda triandra	Kangaroo grass	-	C	-

*Urochloa mosambicensis**	-	-	-	-
*Vachellia farnesiana**	-	-	-	-

Notes:

* Species is introduced to Queensland

1 Species is listed as E = endangered, SL = special least concern, C = least concern under the Queensland Nature Conservation Act 1999

3 GBO = general biosecurity obligation, RI Cat2 to 5 = Restricted invasive species category under the Queensland Biosecurity Act 2014

Table A - 2: Fauna species identified during field surveys

Common name	Species name	Status		Exotic status[3]
		EPBC Act[1]	NC Act[2]	
Apostlebird	*Struthidea cinerea*	-	C	-
Australasian darter	*Anhinga novaehollandiae*	-	C	-
Australasian grebe	*Tachybaptus novaehollandiae*	-	C	-
Australasian pipit	*Anthus novaeseelandiae*	Ma	C	-
Australian bustard	*Ardeotis australis*	-	C	-
Australian magpie	*Cracticus tibicen*	-	C	-
Australian owlet-nightjar	*Aegotheles cristatus*	-	C	-
Australian reed-warbler	*Acrocephalus australis*	Ma	C	-
Bar-shouldered dove	*Geopelia humeralis*	-	C	-
Black kite	*Milvus migrans*	-	C	-
Black-faced cuckoo-shrike	*Coracina novaehollandiae*	Ma	C	-
Black-faced woodswallow	*Artamus cinereus*	-	C	-
Black-shouldered kite	*Elanus axillaris*	-	C	-
Blue-faced honeyeater	*Entomyzon cyanotis*	-	C	-
Broad palmed rocketfrog	*Litoria latopalmata*	-	C	-
Brown falcon	*Falco berigora*	-	C	-
Brown honeyeater	*Lichmera indistincta*	-	C	-
Brown quail	*Coturnix ypsilophora*	-	C	-
Bush stone-curlew	*Burhinus grallarius*	-	C	-
Cane toad*	*Rhinella marina**	-	-	GBO
Common brushtail possum	*Trichosurus vulpecula*	-	C	-
Common green treefrog	*Litoria caerulea*	-	C	-

Common myna*	*Acridotheres tristis**	-	-	GBO
Crested pigeon	*Ocyphaps lophotes*	-	C	-
Dingo*	*Canis lupus dingo**	-	-	Cat 3,4,5 & 6
Dog*	*Canis lupus familiaris**	-	-	Cat 3,4 & 6
Double-barred finch	*Taeniopygia bichenovii*	-	C	-
Dusky moorhen	*Gallinula tenebrosa*	-	C	-
Eastern great egret	*Ardea alba modesta*	-	C	-
Eastern grey kangaroo	*Macropus giganteus*	-	C	-
European hare*	*Lepus europaeus**	-	-	GBO
European rabbit*	*Oryctolagus cuniculus**	-	-	Cat 3,4,5 & 6
Feral cat*	*Felis catus**	-	-	Cat 3,4 & 6
Forest kingfisher	*Todiramphus macleayii*	Ma	C	-
Fork-tailed swift	*Apus pacificus*	Ma, Mi	C	-
Freshwater snake	*Tropidonophis mairii*	-	SL	-
Galah	*Eolophus roseicapilla*	-	C	-
Golden-headed cisticola	*Cisticola exilis*	-	C	-
Grey butcherbird	*Cracticus torquatus*	-	C	-
Grey fantail	*Rhipidura albiscapa*	-	C	-
Grey shrike-thrush	*Colluricincla harmonica*	-	C	-
Grey-crowned babbler	*Pomatostomus temporalis*	-	C	-
Hardhead	*Aythya australis*	-	C	-
Horsfield's bronze-cuckoo	*Chalcites basalis*	Ma	C	-
Jacky winter	*Microeca fascinans*	-	C	-
Little friarbird	*Philemon citreogularis*	-	C	-
Little pied cormorant	*Microcarbo melanoleucos*	-	C	-
Little red flying-fox	*Pteropus scapulatus*	-	C	-
Magpie-lark	*Grallina cyanoleuca*	Ma	C	-
Masked lapwing	*Vanellus miles*	-	C	-

Masked woodswallow	*Artamus personatus*	-	C	-
Mistletoebird	*Dicaeum hirundinaceum*	-	C	-
Myall snake	*Suta suta*	-	C	-
Noisy friarbird	*Philemon corniculatus*	-	C	-
Noisy miner	*Manorina melanocephala*	-	C	-
Ornate burrowing frog	*Platyplectrum ornatum*	-	C	-
Pacific black duck	*Anas superciliosa*	-	C	-
Pale-headed rosella	*Platycercus adscitus*	-	C	-
Pied butcherbird	*Cracticus nigrogularis*	-	C	-
Pig*	*Sus scrofa**	-	-	Cat 3,4 & 6
Plum-headed finch	*Neochmia modesta*	-	C	-
Red-backed fairy-wren	*Malurus melanocephalus*	-	C	-
Red-winged parrot	*Aprosmictus erythropterus*	-	C	-
Rufous whistler	*Pachycephala rufiventris*	-	C	-
Salmon-striped frog	*Limnodynastes salmini*	-	C	-
Singing honeyeater	*Gavicalis virescens*	-	C	-
Spangled drongo	*Dicrurus bracteatus*	Ma	C	-
Spotted bowerbird	*Ptilonorhynchus maculatus*	-	C	-
Striped burrowing frog	*Cyclorana alboguttata*	-	C	-
Striped honeyeater	*Plectorhyncha lanceolata*	-	C	-
Sulphur-crested cockatoo	*Cacatua galerita*	-	C	-
Superb fairy-wren	*Malurus cyaneus*	-	C	-
Torresian crow	*Corvus orru*	-	C	-
Tree martin	*Petrochelidon nigricans*	Ma	C	-

Wedge-tailed eagle	*Aquila audax*	-	C	-
Whistling kite	*Haliastur sphenurus*	Ma	C	-
White-bellied cuckoo-shrike	*Coracina papuensis*	Ma	C	-
White-breasted woodswallow	*Artamus leucorynchus*	-	C	-
White-faced heron	*Egretta novaehollandiae*	-	C	-
White-necked heron	*Ardea pacifica*	-	C	-
Willie wagtail	*Rhipidura leucophrys*	-	C	-
Zebra finch	*Taeniopygia guttata*	-	C	-

Notes:
* Species is introduced to Queensland
1 Species listed as Ma = marine, M = migratory under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999
2 Species is listed as SL = special least concern, C = least concern under the Queensland Nature Conservation Act 1999
3 GBO = general biosecurity obligation, RI Cat2 to 6 = Restricted invasive species category under the Queensland Biosecurity Act 2014

Appendix D MNES Significant Residual Impact Assessments

Definitions

Key terms are used within the significant impact assessment criteria and must be addressed as part of the assessment. These include:

- important populations
- habitat critical to the survival of the species or ecological community; and
- important habitat and significant proportion of a population for migratory species.

Important populations

The Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) Matters of National Environmental Significance: Significant Impact Guidelines 1.1 (MNES SIA guidelines) (DotE, 2013) define important populations for vulnerable species listed under the EPBC Act as a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

- key source populations either for breeding or dispersal
- populations that are necessary for maintaining genetic diversity; and/or
- populations that are near the limit of the species' range.

Habitat critical to the survival of the species or ecological community

The MNES SIA guidelines (DotE, 2013) define habitat critical to the survival of a species or ecological community as areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development; or
- for the reintroduction of populations or recovery of the species or ecological community.

Species specific referral guidelines, recovery plans and conservation advice may further define habitat critical to the survival of a species or community.

Important habitat for migratory species

The MNES SIA guidelines (DotE, 2013) define an area of 'important habitat' for a migratory species as:

- habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species
- habitat that is of critical importance to the species at particular life-cycle stages
- habitat utilised by a migratory species which is at the limit of the species range; and/or
- habitat within an area where the species is declining.

Ecologically significant proportions of a population of a migratory species

Additionally, the *Referral guidelines for the 14 migratory species under the EPBC Act* (Migratory Bird Guidelines) identify ecologically significant proportion of the population of a migratory species (Department of the Environment (DotE), 2015c). Where this is not available for the species the Internation Union for Conservation of Nature (IUCN) estimated, total population was extrapolated to estimate internationally and nationally ecologically significant proportions of a population (IUCN, 2025). The ecologically significant proportion of the population of migratory species applicable to the Project are detailed in Table A - 3.

Table A - 3: Ecologically significant proportions of a migratory species population

Species	Ecologically significant proportion of a population (individuals)[1]	
	Internationally	Nationally
White-throated needletail (*Hirundapus caudacutus*)	100	10
Fork-tailed swift (*Apus pacificus*)	1,000	100
Latham's snipe (*Gallinago hardwickii*)	300[2]	18[2]
Glossy ibis (*Plegadis falcinellus*)	1,190-8,600[3]	119-860[3]

[1] For species that aggregate in flocks, 1% of the population is considered internationally important, 0.1% as nationally important (Department of the Environment (DotE), 2015c).
[2] The migratory species not listed in the Migratory Bird Guidelines, internationally and nationally ecologically significant proportions of a population are described in conservation advice for the species (DCCEEW, 2024).
[3] The migratory species not listed in the Migratory Bird Guidelines, as such ecologically significant proportions of a population have been extrapolated based on IUCN population estimates (IUCN, 2025).

D.1 Brigalow TEC

The Brigalow (Acacia *harpophylla* dominant and co-dominant) Threatened Ecological Community (Brigalow TEC) is listed as endangered under the EPBC Act.

Habitat preferences and distribution

The Brigalow TEC occurs in semi-arid eastern New South Wales and Queensland, predominantly west of the Great Dividing Range (DotE, 2013a). For additional information on the Brigalow TEC habitat preferences and distribution, refer to Section 4.1.2.1.

Presence in the Disturbance Footprint

A total of 40.29 ha of Brigalow TEC was recorded within the Disturbance Footprint during field surveys. These areas are associated with high value regrowth and remnant sections of Regional Ecosystems (REs) 11.3.1, 11.4.9, and 11.9.5, where *Acacia harpophylla* was identified as a dominant or co-dominant species and met the TEC condition thresholds. Further details regarding the presence of Brigalow TEC can be found in Section 4.1.2.1.

Habitat critical to the survival of the species

Habitat considered critical to the survival of the Brigalow TEC is any vegetation meeting the criteria listed in the conservation advice (DotE, 2013a). Therefore, all areas of Brigalow TEC present in the Disturbance Footprint are considered habitat critical to the survival of the community.

Threatening processes

Key threats to the Brigalow TEC have been identified as those that may lead to further reduction in extent or cause a decline in condition (DotE, 2013a). These are listed and discussed below in order of significance:

- clearing for resource extraction and illegal logging
- the introduction of invasive pasture species such as Rhode's grass (*Chloris gayana*), Buffel grass (*Cenchrus ciliaris)* and Green panic (*Megathyrsus maximus)*, which increases biomass and fuel load and subsequently increase fire risk
- the infestation of introduced weeds can alter the structure of the community
- feral animals, particularly feral pigs which degrade habitat by disturbing soil and destroying young and small plants; and
- cattle grazing which can impact the ground layer through disturbing leaf litter, interfering with recruitment, altering the composition of the ground and shrub layer and compacting soil.

Recovery actions

Priority recovery and threat abatement actions listed in the approved conservation advice for the Brigalow TEC (DotE, 2013a) include, but are not limited to:

- protecting and conserving remnant and regrowth areas of the Brigalow TEC
- managing areas of the Brigalow TEC to reduce threats, including through fire management and targeted weed and feral animal control
- encouraging landholders to balance primary production and the conservation of native flora and fauna within and close to the Brigalow TEC

- undertaking regeneration of high-value regrowth sites and revegetation of degraded sites
- devising and implementing water management, sediment erosion and pollution control and monitoring plans; and
- consulting with land managers, local and state authorities and Indigenous groups to develop environmentally sustainable management guidelines and education programs (DotE, 2013a).

Significant impact assessment

Approximately 40.29 hectares (ha) of Brigalow TEC is located within the Disturbance Footprint and will be cleared for the Project (Figure 9). A significant impact assessment has been completed against the MNES SIA Guidelines (DotE, 2013b) in Table A - 4.

Table A - 4: Significant impact assessment for the Brigalow TEC

MNES Significant Impact Guideline criteria for TEC	Response
An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:	
reduce the extent of an ecological community	A total seven patches of Brigalow TEC, totalling 40.29 ha, will be directly removed for surface infrastructure and mining operations for the Project. As such the Project would reduce the extent of the ecological community.
fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines	A total of 40.29 ha of Brigalow TEC will be removed as a result of surface infrastructure and mining operations for the Project. The Project will fragment or increase fragmentation of the ecological community in the Disturbance Footprint, as it partially impacts five patches of TEC. These patches are primarily located along Two Mile Gully, Deep Creek and associated tributaries.
adversely affect habitat critical to the survival of an ecological community	Surface disturbance associated with the Project would result in the direct removal of 40.29 ha, which is identified as habitat critical to the survival of Brigalow TEC as outlined above. As such, the Project would adversely affect habitat critical to the survival of the TEC.
modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns	Alterations to surface water drainage patterns, as well as physical changes to soil and nutrient profiles has the potential to impact downstream TEC patches outside of the Disturbance Footprint (Palamara et al., 2006; Lechner et al., 2016). Mitigation measures described in Section 7.4.2 which includes erosion and sediment control and annual monitoring of these measures will negate these potential impacts for the Brigalow TEC. As such, there is no real chance or possibility that the Project would modify abiotic factors necessary for the ecological community's survival outside of the Disturbance Footprint.

MNES Significant Impact Guideline criteria for TEC	Response
cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting	Indirect impacts (e.g. edge effects and weed invasion) which can alter species composition or loss of functionality in the Threatened Ecological Community (TEC), can be reasonably managed and avoided as per mitigation and management measures discussed in Section 7.1.3. Dust and weed management measures identified in Section 7.5.2 and 7.3.2 will be essential to ensure that degradation of adjacent retained patches of Brigalow TEC does not occur as a result of the Project. Additionally, prescribed burning is not expected to occur as part of the Project and can be reasonably managed with mitigation actions described in Section 7.6.2, including Bushfire Management Plans, appropriate chemical storage, designated access tracks and fire breaks and emergency response procedures. Additionally, there is no scope for flora harvesting associated with this Project. As such, there is a very low chance or possibility that the Project would cause a substantial change in the species composition of an occurrence of an ecological community.
cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: – assisting invasive species, that are harmful to the listed ecological community, to become established, or – causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community	The presence of weeds, particularly species most threatening to Brigalow TEC such as Rhode's grass (*Chloris gayana*), Buffel grass (*Cenchrus ciliaris)* and Green panic (*Megathyrsus maximus)* (DoE, 2013a), are already present within the landscape and abundant in some locations as described in Section 4.1.4. These species increase may increase fire frequency and severity within Brigalow TEC (DoE, 2013a). The implementation of mitigation measures presented in Section 7.3.2 are expected to reasonably manage the introduction and proliferation of weeds and pests within the Study Area, reducing the risk of changes to species composition or loss of functionality in the TEC as a result of the Project. Storage and management of equipment and chemicals on site will be contained and involve relatively small quantities in any given location. Furthermore, the risk of spills, leaks or other accidental mobilisation of hazardous materials will be avoided and managed in accordance with management plans identified in Section 7.4.2. Therefore, there is a very low possibility that the Project would cause a substantial reduction in the quality or integrity of an occurrence of this TEC within the remainder of the Study Area by assisting weed invasion or mobilisation of hazardous materials.
interfere with the recovery of an ecological community	There is no Recovery Plan for the Brigalow TEC, however, the approved conservation advice is recommended as an effective guide to support the recovery of this TEC. Land clearance is listed as a key threatening process under the EPBC Act and is relevant to this TEC. As such, due to the removal of 40.29 ha of Brigalow TEC, the Project has a real chance or possibility to interfere with the recovery of the ecological community.
Conclusion	*The Project would have a significant residual impact to the Brigalow TEC due to the area of clearing proposed, which is habitat critical to the survival of the TEC and the potential for this impact to interfere with the recovery of the TEC.*

D.2 Australian painted snipe *(Rostratula australis)*

The Australian painted snipe is listed as endangered under the EPBC Act.

Habitat preferences and distribution

This species generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans (DCCEEW, 2025j). This species occurs in all states of Australia but is most common in eastern Australia and is well-known from the Murray-Darling basin (DCCEEW, 2025j).

For additional information on the Australian painted snipe habitat preferences and distribution, refer to Section 4.2.3.3.

Presence in the Disturbance Footprint

DPM (2026) describe that the lacustrine wetlands (hydrologically modified or artificial) within the Study Area are either farm dams with constructed earthen walls on the downstream side or are constructed mine water dams. Some dams identified within the Study Area were not considered suitable habitat as they contained unvegetated steep bank margins. As this species requires dense low vegetation for cover (Department of the Environment and Energy, 2019), these areas were excluded from habitat. Additionally, some gilgai microrelief lacked suitable native aquatic vegetation, were extremely shallow and lacked the capability to hold water for prolonged periods (Rogers et al., 2005).

A total of 610.00 ha of foraging habitat for Australian painted snipe was identified in the Study Area, of which only 14.45 ha of intermittent foraging habitat and 6.41 ha of permanent foraging habitat (farm dams [man-made]) occurs within the Disturbance Footprint. No suitable breeding habitat was identified within the Disturbance Footprint.

For additional information on Australian painted snipe habitat in the Study Area, refer to Section 4.2.3.2.

Habitat critical to the survival of the species

Habitat critical to the survival of the Australian painted snipe is recognised in the National Recovery Plan for the species but is not clearly defined. The National Recovery Plan describes habitats that provide suitable combinations of plants, animals, water depth, geology, landforms and climate that is relevant to the geographical unit (DCCEEW, 2022). It also refers to habitats that may be a natural wetland where the species is likely or known to occur or an area that may be periodically occupied by the Australian painted snipe when wetland conditions are favourable (DCCEEW, 2022). The listing advice for the species also refers to preservation of wetland habitat suitable for breeding as ‘critical to the species’ survival (TSSC, 2013). Habitat critical to the survival of the species is defined within the MNES SIA guidelines as habitat that contains features that are crucial for the species’ persistence in an area, including for activities such as foraging, breeding, roosting or dispersal (DotE, 2013)..

The species was observed within dams and non-remnant gilgai habitat, which provide suitable foraging opportunities. No suitable breeding habitat was identified within the Study Area.

Given the degraded nature of non-remnant gilgai habitat within the Study Area and the extensive occurrence of similar intermittent foraging habitat throughout the region, these areas are not considered habitat critical to the survival of the species. Furthermore, given the permanent foraging habitat present within the Study Area largely consists of constructed farm dams and similar farm dams are abundant throughout the landscape, these areas are not considered crucial for the species’ persistence in an area and therefore not considered habitat critical to the survival of the species.

Threatening processes

The main identified threat to the Australian painted snipe is the loss and degradation of wetlands, through drainage and the diversion of water for agriculture and reservoirs. Loss of breeding habitat is noted for the Murray-Darling Basin through hydrological changes. These changes have occurred in parallel with an extended period of drought in Australia which has intensified the impacts of wetland degradation and water diversion in the Murray-Darling Basin (Lane & Rogers, 2000) (Rogers et al., 2005).

Other more broadly described threats to the Australian painted snipe include (Department of Sustainability, Environment, Water, 2013):

- grazing and the associated trampling of wetland vegetation and nests
- nutrient enrichment
- reduced rainfall and runoff in the Murray Darling basin associated with climate change
- predation by feral animals (e.g. nest predation by foxes or cats)
- coastal port and infrastructure development
- shale oil mining near autumn-winter sites; and
- the replacement of native wetland vegetation by invasive weeds.

Recovery actions

The *National Recovery Plan for the Australian Painted Snipe* describes a key objective as sustaining a positive population trend in the number of mature individuals (DCCEEW, 2022). The strategies to achieve this objective are listed below:

- manage and protect known Australian painted snipe habitat at the landscape scale
- develop and apply techniques to measure changes in population trajectory in order to measure the success of recovery actions
- reduce, or eliminate threats at breeding and non-breeding habitats
- undertake research to improve knowledge of the habitat requirements, biology and behaviour of Australian painted snipe
- engage community stakeholders to improve awareness of the conservation of Australian painted snipe; and
- coordinate, review and report on recovery progress.

Significant impact assessment

Approximately 20.86 ha of Australian painted snipe foraging habitat is located within the Disturbance Footprint, including 6.41 ha of permanent foraging habitat in the form of dams and 14.45 ha of intermittent foraging habitat (Figure 14). A significant impact assessment has been completed against the MNES SIA Guidelines (DotE, 2013b) in Table A - 5.

Table A - 5: Significant impact assessment for the Australian painted snipe

MNES Significant Impact Guideline criteria for Endangered Species	Response
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:	
lead to a long-term decrease in the size of a population	The Australian painted snipe population is small, likely to be continuous, dispersive or migratory (DCCEWW, 2022) and unlikely to comprise local sub-populations. The Project would result in the removal of 20.86 ha of foraging habitat for Australian painted snipe, with no suitable breeding habitat present within the Disturbance Footprint (refer to Section 4.2.3.2). The foraging habitat present consists of 6.41 ha of permanent foraging opportunities in the form of farm dams and 14.45 ha of ephemeral/intermittent foraging opportunities in the form of cleared gilgai pastureland. Areas of similar foraging habitat are abundant throughout the wider Study Area, including 10.03 ha of farm dams or wetlands, 520.20 ha of non-remnant gilgai and 8.71 ha of remnant RE 11.3.27 providing wetland habitat. Therefore, given the Project would not result in the removal of breeding habitat and impact a small proportion (3.42%) of available foraging habitat within the Study Area, there is a very low chance or possibility that the Project would lead to a long-term decrease in the size of a population.
reduce the area of occupancy of the species	The area of occupancy for the Australian painted snipe is estimated to be 2,000 square kilometres (km^2), with low reliability (S. T. Garnett et al., 2011). Given, the species is widespread and dispersive, and the Project would result in the removal of a small portion (20.86 ha/3.42%) of similar foraging habitat within the Study Area, there is a very low possibility that the Project would likely reduce the area if occupancy of the species.
fragment an existing population into two or more populations	The Australian painted snipe is a mobile avian species, and the Project would not create barriers to movement. The species will be able to persist within the landscape. Therefore, there is no chance or possibility that the Project would fragment and existing population.
adversely affect habitat critical to the survival of a species	The species was observed within dams and non-remnant gilgai habitat within the Study Area, which provide suitable foraging opportunities. No suitable breeding habitat was identified within the Study Area. Given the degraded nature of non-remnant gilgai habitat within the Study Area and the extensive occurrence of similar intermittent foraging habitat throughout the region, these areas are not considered habitat critical to the survival of the species. Furthermore, given the permanent foraging habitat present within the Disturbance Footprint consists solely of constructed farm dams and similar farm dams are abundant throughout the landscape, these areas are not considered crucial for the species' persistence in an area and therefore not considered habitat critical to the survival of the species.

MNES Significant Impact Guideline criteria for Endangered Species	Response
disrupt the breeding cycle of a population	Foraging habitat in the form of ephemeral gilgais and dams are proposed to be impacted for the Project. However, this habitat is not expected to support breeding resources for the species as described in Section 4.2.3.2. Nonetheless, the Land and Biodiversity Management Plan ((Whitehaven Coal Pty Ltd, 2020)) will be updated to manage potential impacts to Australian painted snipe (refer to 7.2.2). Therefore, there is no real chance or possibility that the Project would disrupt the breeding cycle of a population of Australian painted snipe.
modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The removal of 6.41 ha of permanent foraging habitat and 14.45 ha of intermittent foraging habitat for this species is unlikely to decrease the availability of habitat to the extent the species is likely to decline due to the extent of similar habitat retained within the broader Study Area (refer to Section 4.2.3.2) and the highly mobile nature of the species, which minimises the risk of isolation of habitat. Similarly, potential indirect impacts such as changes to the hydrology, invasion by exotic weeds and disturbance and predation by pest animals will be managed (as described in Section 7.4.1 and Section 7.3.1 respectively) to the extent they are unlikely to decrease the availability or quality of habitat remaining in the Study Area. Therefore, there is a very low chance or possibility that the Project would modify, destroy, remove or decrease the availability of habitat to the extent that the species is likely to decline.
result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	The Study Area is already impacted by grazing, clearing and mining activities and invasive species are established in the area. Threats to the species as a result of this existing disturbance includes proliferation of weed species, degradation of already modified seasonal and ephemeral wetland habitat by feral pigs and predation by feral cats. Management and control of weed and pest species, as described in Section 7.3, will include standard industry accepted measures to minimise the spread of weeds and pest animals (e.g. feral pigs, that have the potential to degrade the ground layer and foraging resources for the Australian painted snipe, and feral cats which prey on the species). Therefore, there is no real chance or possibility that the Project would contribute substantially to an invasive species becoming established in Australian painted snipe habitat.
introduce disease that may cause the species to decline	There are no diseases listed as threats to the Australian painted snipe. Therefore, the Project is not expected to result in the introduction of a disease that would cause the species to decline.

MNES Significant Impact Guideline criteria for Endangered Species	Response
interfere with the recovery of the species	The strategies identified to achieve the recovery plan objectives include the management and protection of known habitat at a landscape level, reduce or eliminate threats at breeding and non-breeding habitat as well as research activities relating to population trajectories, habitat requirements and the engagement of stakeholders (DCCEWW, 2022). While the removal of 6.41 ha of permanent foraging habitat and 14.45 ha of intermittent foraging habitat is not conducive with reducing threats to the species, given the availability of similar habitat within the Study Area and broader region, the extent of proposed clearing is not considered of a scale which is likely to interfere with the recovery of the species.
Outcome	*While The Project would result in the removal of 14.45 ha of intermittent foraging habitat and 6.41 ha of permanent foraging habitat for Australian painted snipe. Given the extent of similar habitat available throughout the Study Area and wider region, these impacts are not considered important, notable, or of consequence, having regard to its context and intensity.*

D.3 Koala (*Phascolarctos cinereus*)

The Koala is listed as endangered under the EPBC Act.

Habitat preferences and distribution

Koalas inhabit a range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by species from the genera *Eucalyptus*, *Corymbia* and *Angophora* (Martin & Handasyde, 1999). Within central Queensland, Koalas have been studied at Tambo (Mitchell Grass Downs bioregion), Springsure and Blair Athol (both in Brigalow Belt North bioregion). Koalas in this region typically occur in low densities and have large home ranges (Ellis et al., 2002).

For additional information on Koala habitat and preferences, refer to Section 4.2.3.6.

Presence in the Disturbance Footprint

Previous ecological assessments undertaken by EMM Pty Ltd (EMM) recorded evidence of Koala activity (i.e. tree scratch marks) within the Study Area (EMM, 2020). Based on desktop and field investigations, the Disturbance Footprint contains 50.01 ha of habitat for the species. This includes:

- 2.72 ha of breeding and foraging habitat; and
- 48.29 ha of dispersal habitat.

For additional information on Koala presence in the Study Area, refer to Section 4.2.3.6.

Habitat critical to the survival of the species

Habitat critical to the survival of the species is the area that the species relies on to halt decline and promote the recovery of the species. The approved conservation advice for the species describes key questions for evaluating habitat critical to the survival of the Koala as:

- whether the habitat is used during periods of stress (examples flood, drought or fire)
- whether the habitat is used to meet essential life cycle requirements (e.g. foraging, breeding, social behaviour, dispersal)
- the extent to which the habitat is used by important populations
- whether the habitat is necessary to maintain genetic diversity and long-term evolutionary development
- whether the habitat is necessary for use as corridors to allow the species to move freely between sites used to meet essential life cycle requirements
- whether the habitat is necessary to ensure the long-term future of the species or ecological community through reintroduction or re-colonisation; and
- any other way in which habitat may be critical to the survival of the listed threatened species (DAWE, 2022c).

Vegetation is highly fragmented, and there are no large, intact eucalypt woodlands present. While some riparian corridors may support limited breeding and foraging activity, these areas are sparse and degraded. The habitat is not likely used by important Koala populations, nor is it essential for maintaining genetic diversity or ensuring the species' long-term survival. Although the riparian corridors may facilitate movement between sites, their fragmentation significantly reduces their effectiveness.

Based on these factors, there is no habitat critical to the survival of the species present within the Disturbance Footprint.

Threatening processes

The main identified threats to the species are (DAWE, 2022):

- climate change driven processes and threats:
  - loss of climatically suitable habitat
  - increased intensity/frequency of drought, heatwaves and bushfire
  - declining nutritional value of foliage
- human related activities:
  - clearing and degradation of Koala habitat
  - encounter mortality with vehicles and dogs; and
- disease and health:
  - Koala retrovirus (KoRV) and chlamydia (*Chlamydia percorum*).

Drought and extreme heat are also known to cause significant mortality, and post-drought recovery may be substantially impaired by the range of other threatening factors (DAWE, 2022).

Recovery actions

The objectives for the recovery of the species listed in the National Recovery Plan for the Koala (DAWE, 2022) are as follows:

- the area of occupancy and estimated size of populations that are declining, suspected to be declining, or predicted to decline are instead stabilised then increased

- the area of occupancy and estimated size of populations that are suspected and predicted to be stable are maintained or increased
- metapopulation processes are maintained or improved; and
- partners, communities and individuals have a greater role and capability in Koala monitoring, conservation and management.

Significant impact assessment

Approximately 2.72 ha of Koala breeding and foraging habitat, and 48.29 ha of dispersal habitat is located within the Disturbance Footprint and will be cleared for the Project (Figure 18). A significant impact assessment has been completed against the MNES SIA Guidelines (DotE, 2013b) in Table A - 6.

Table A - 6: Significant impact assessment for Koala

MNES Significant Impact Guideline criteria for Endangered Species	Response
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:	
lead to a long-term decrease in the size of a local population	The Project would remove a total of 50.01 ha of habitat for the species. This will comprise of 2.72 ha of breeding and foraging habitat and 48.29 ha of dispersal habitat, with majority of habitat highly degraded as a result of historical clearing (refer to Section 4.1.1). Given the paucity of records within the Study Area and the degraded nature of the habitat, no resident populations are expected to occur within the Study Area, with any individuals likely to occur transiently when moving between areas of higher quality habitat. Additionally, habitat present within the Disturbance Footprint does not provided connectivity between areas of higher quality habitat, with the primary movement corridor along Taurus Creek and Two Mile Gully being retained. Therefore, given the Study Area is unlikely to contain a resident population of Koalas and the Project would result in the removal of 88.47 ha of highly degraded habitat which is unlikely to be utilised by the species, there is a very low chance or possibility that the Project would cause a long term decrease in the size of a local population.
reduce the area of occupancy of the species	In 2023, the area of occupancy for the species was calculated as 19,428 km^2 with a contracting trend (Department of Climate Change, Energy, the Environment and Water (DCCEEW), 2023e). While the Project would result in the removal of 50.01 ha of habitat, including 2.72 ha of breeding and foraging habitat and 48.29 ha of dispersal habitat, these areas are highly degraded and do not provide connectivity between areas of higher quality habitat. As such these areas are considered unlikely to be occupied by Koalas. Therefore, given habitat within the Disturbance Footprint is unlikely to be occupied by Koalas and the primary movement corridor within the Study Area (i.e. Taurus Creek and Two Mile Gully) is being retained, there is a very low chance or possibility that the Project would reduce the area of occupancy of the species.

MNES Significant Impact Guideline criteria for Endangered Species	Response
fragment an existing population into two or more populations	Koalas are known to traverse up to 1-3 km on ground and will often travel through cleared or treeless areas (DAWE, 2022). While the Project would result in the removal of 50.01 ha of habitat, including 2.72 ha of breeding and foraging habitat and 48.29 ha of dispersal habitat, these areas are highly degraded and do not provide connectivity between areas of higher quality habitat. Therefore, given the Project would not impact habitat providing connectivity for Koalas and the primary movement corridor within the Study Area (i.e. Taurus Creek and Two Mile Gully) is being retained, there is a very low chance or possibility that the Project would fragment an existing population.
adversely affect habitat critical to the survival of a species	Habitat critical to the survival of the Koala does not occur within the Disturbance Footprint, as outlined in the section above. As a result, there is no real chance or possibility that the Project would have an adverse effect on habitat that is considered critical to the survival of the species.
cause disruption to the breeding cycle of a population	Koalas do not have specific breeding habitat requirements. Males are most active during the breeding season and can cover areas of several kilometres (km) with limited vegetation (DAWE, 2022c). Clearing for the Project would not fragment habitat to the extent that dispersing males looking for mates would be unable to do so. Additionally, it is considered unlikely that habitat within the Disturbance Footprint would be occupied by the species. Nonetheless, vegetation clearing during construction activities, has the potential to disrupt breeding individuals, therefore, Koala specific management measures will be put in place as part of the updated Blackwater Mine Land and Biodiversity Management Plan (Whitehaven Coal Pty Ltd, 2020) to ensure this threat is mitigated (Section 7.2.2). Important measures will include but not be limited to; pre-clearance surveys to detect the presence of Koalas, directional clearing towards habitat to be retained, leaving identified Koalas in place with dispersal routes and connecting trees available until the individual has moved on without interference. As a result, there is a very low chance or possibility that the Project would disrupt the breeding cycle of a population.
modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	While the Project would result in the removal of 50.01 ha of habitat, including 2.72 ha of breeding and foraging habitat and 48.29 ha of dispersal habitat, these areas are highly degraded, do not provide connectivity between areas of higher quality habitat and don't provide refuge habitat. Additionally, the implementation of mitigation measures presented in Sections 7.2.2, 7.3.2 and 7.5.2 will reduce indirect impacts to Koala as a result of the Project including construction disturbance, and weed and pest incursion. Therefore, based on the proposed minimal direct impacts Koala habitat and negligible indirect impacts, there is a very low chance or possibility that the project is likely to modify, destroy, remove, isolate or decrease the availability of quality of habitat of habitat to the extent that the species is likely to decline.

MNES Significant Impact Guideline criteria for Endangered Species	Response
result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	The primary invasive species, which poses a threat to Koala are dogs (DAWE, 2022). Dogs were recorded in the Study Area during the field survey, though given the already highly disturbed nature of the Study Area and the Project implementing specific environmental management plans including a Pest and Weed Management Plan to mitigate the threat of dogs (see Section 7.3.2), it is unlikely that the Project would proliferate the occurrence of dogs within the area. Therefore, there is no real chance or possibility that the Project would result in invasive species that are harmful to Koala becoming established in Koala habitat.
introduce disease that may cause the population to decline	Diseases such as Chlamydia (*Chlamydia pecorum*) and Koala retrovirus (KoRV) have been identified in the populations within the region (DAWE, 2022). The prevalence of disease (chlamydiosis) has been found to increase following extreme stress from hot weather, drought, habitat loss and fragmentation (Lunney et al., 2012; McCallum et al., 2017). Symptoms of individuals carrying Chlamydia can become overt when subjected to additional stress. Such stress may be caused by habitat clearing associated with the Project. However, Koala specific management measures will be put in place as part of the updated Blackwater Mine Land and Biodiversity Management Plan (Whitehaven Coal Pty Ltd, 2020) to ensure this threat is mitigated (Section 7.1.2). Important measures will include but not be limited to; pre-clearance surveys to detect the presence of Koalas, directional clearing towards habitat to be retained, leaving identified Koalas in place with dispersal routes and connecting trees available until the individual has moved on without interference. Implementation of these measures will ensure there is no real chance or possibility that the Project would introduce diseases or exacerbate existing diseases that may cause the species to decline.
interfere with the recovery of the species	The National Recovery Plan identifies recovery objectives and threats to be managed for the recovery of the species (DAWE, 2022). The key threats to the species listed in the recovery plan that are relevant to the Project include habitat loss, fragmentation and degradation. In relation to these threats: • the Disturbance Footprint will involve clearing of habitat, although these areas are considered unlikely to be occupied by individuals, will not impact refuge habitat and will not fragment remaining habitat to the extent the species cannot continue to disperse through the landscape; and • suitable habitat will remain in the Study Area and will continue to be available to support the long-term persistence of the species. As the species is expected to persist in the Study Area, there is a very low chance or possibility that the Project would interfere with the recovery of the species.

MNES Significant Impact Guideline criteria for Endangered Species	Response
Outcome	*Given the limited extent of proposed clearing, the species being considered unlikely to occupy habitat within the Disturbance Footprint, the absence of habitat critical to the Koala's survival, and the Project not fragmenting or isolating populations, there is a very low chance or possibility that the Project would result in a significant impact on the Koala.*

D.4 Latham's snipe (*Gallinago hardwickii*)

The Latham's snipe is listed as vulnerable and migratory (Bonn, JAMBA, ROCKAMBA) under the EPBC Act.

Habitat preferences and distribution

This species typically occurs in permanent and ephemeral wetlands up to 2,000 m above sea-level. They usually inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies) (DCCEEW, 2025j). The species is known from all east coast areas and extends inland over the eastern tablelands in south-eastern Queensland (and occasionally from Rockhampton in the north), and to the west of the Great Dividing Range in New South Wales (DCCEEW, 2025j).

For additional information on Latham's snipe habitat preferences and distribution, refer to Section 4.2.3.3.

Presence in the Disturbance Footprint

No individuals of Latham's snipe were observed within the Disturbance Footprint during field surveys. Suitable foraging habitat within the Disturbance Footprint comprises dams and non-remnant gilgai habitat. This includes 14.45 ha of intermittent foraging habitat in the form of all remnant, high value regrowth or non-remnant areas with gilgai microrelief, and 6.41 ha of permanent foraging habitat in the form of dams/wetlands with shallow sloping margins and dense fringing vegetation (e.g. reeds and sedges). No suitable breeding habitat was identified within the Disturbance Footprint.

For additional information on Latham's snipe presence in the Study Area, refer to Section 4.2.3.3.

Important populations

The entire population of Latham's snipe is thought to migrate to Australia during the northern hemisphere's winter (i.e. December to February) (DCCEEW, 2025j). While the Species Profile and Threats Database (SPRAT) profile and Conservation Advice for Latham's snipe (DCCEEW, 2025j) do not detail information about important populations of this species, the Conservation Advice refers to 'important sites or habitat' as those areas regularly supporting internationally significant numbers of the species, which is 300 individuals.

Nationally important habitat is described as areas previously been identified as internationally important or areas that support at least 18 individuals (DCCEEW, 2024). Based on outcomes of the seasonal surveys, the Study Area does not support an important population of Latham's snipe as evidence of large numbers of the species would have been identified.

Habitat critical to the survival of the species

The Conservation Advice for Latham's snipe states habitat critical to the survival of the species as areas that are necessary for:

- foraging, breeding (outside Australia), roosting or dispersal activities
- long term maintenance of the species
- maintaining genetic diversity and long-term evolutionary development; or
- assisting in the reintroduction of populations or recovery of the species (DCCEEW, 2024).

Based on the definitions above, habitat within the Disturbance Footprint has potential to be considered habitat critical to the survival of the species. However, given the degraded nature of non-remnant gilgai

habitat within the Disturbance Footprint and the extensive occurrence of similar intermittent foraging habitat throughout the region, these areas have not been considered habitat critical to the survival of the species.

Threatening processes

Threats to the Latham's snipe, as identified on the SPRAT profile include loss of habitat, which includes drainage and modification of wetlands, excess mortality from hunting. However, bans on shooting have been implemented throughout Australia (DCCEEW, 2025j).

Threats identified in the Latham's snipe Conservation Advice (DCCEEW, 2024) include habitat loss caused by residential and commercial development, habitat degradation by high-intensity grazing, increased frequency or severity of drought and fires, cat and fox predation, broad-leaved tea-tree invasion of grasslands, and hunting.

Recovery actions

Latham's snipe does not have an adopted or made Recovery Plan. Conservation and recovery actions, listed in the Conservation Advice outlines actions to address and manage the following key threats:

- habitat loss
- habitat degradation caused by high-intensity grazing
- climate change and severe weather impacts; and
- hunting (DCCEEW, 2024).

Significant impact assessment

Approximately 14.45 ha of intermittent foraging habitat and 6.41 ha of permanent foraging habitat is located within the Disturbance Footprint and will be cleared for the Project (Figure 15). A significant impact assessment has been completed against the MNES SIA Guidelines (DotE, 2013b) in Table A - 7.

Table A - 7: Significant impact assessment for the Latham's snipe

MNES Significant Impact Guideline Criteria for Vulnerable Species	Response
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
lead to a long-term decrease in the size of an important population	As described in the section above, the Study Area does not support an important population of the species. Therefore, the removal of 14.45 ha of intermittent foraging habitat and 6.41 ha of permanent foraging habitat has no chance or possibility of leading to a long-tern decrease in the size of an important population.
reduce the area of occupancy of an important population	The Area of Occupancy for Latham's Snipe has been estimated as 3,430,000 km^2 (DCCEEW, 2024). As described in the section above, the Study Area does not support an important population of the species. Therefore, the removal of 6.41 ha of permanent foraging opportunities in the form of dams and 14.45 ha of ephemeral/intermittent foraging opportunities in the form of cleared gilgai pastureland has a no chance or possibility of reducing the area of occupancy of an important population.

MNES Significant Impact Guideline Criteria for Vulnerable Species	Response
fragment an existing important population into two or more populations	As described in the sections above, the Study Area does not support an important population of the species. Latham's snipe are a highly mobile species, able to travel long distances and the Project would not cause a barrier to movement for this species. Furthermore, the species will be able to persist in remaining habitats in the Study Area and broader landscape. Therefore, there is a no chance or possibility that Project would result in the fragmentation of an important population, nor an existing population of Latham's snipe.
adversely affect habitat critical to the survival of a species	The Project will not remove habitat considered critical to the survival of the species, as no individuals were recorded in the Disturbance Footprint, and habitat within the Disturbance Footprint is degraded and is unlikely to support important populations.
cause disruption to the breeding cycle of an important population	As described above, the Study Area does not support an important population. Further, Latham's snipe does not breed within Australia. Therefore, there is no chance or possibility that the Project would result in a disruption to the breeding cycle of this species.
modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The removal of 6.41 ha of permanent foraging opportunities in the form of dams and 14.45 ha of ephemeral/intermittent foraging opportunities in the form of cleared gilgai pastureland. for this species is unlikely to decrease the availability of habitat to the extent the species is likely to decline due to the extent of similar habitat retained within the broader Study Area (refer to Section 4.2.3.3) and the highly mobile nature of the species, which minimises the risk of isolation of habitat. Similarly, potential indirect impacts such as changes to the hydrology, invasion by exotic weeds and disturbance and predation by pest animals will be managed (as described in Section 7.4.1 and Section 7.3.1 respectively) to the extent they are unlikely to decrease the availability or quality of habitat remaining in the Study Area. Therefore, there is no real chance or possibility the Project would modify, destroy, remove, isolate or decrease the availability of habitat available that would result in the decline of the Latham's snipe.
result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The Study Area is already impacted by grazing, clearing and mining activities and invasive species are established in the area. Threats to the species as a result of this existing disturbance includes proliferation of weed species and the degradation of habitat by feral pigs and predation by feral cats. Management and control of weed and pest species, as described in Section 7.3.2, will include standard industry accepted measures to minimise the spread of weeds and pest animals (e.g. feral pigs, that have the potential to degrade the ground layer and foraging resources for the Latham's snipe, and feral cats which prey on the species). Therefore, there is no real chance or possibility that the Project would contribute substantially to an invasive species becoming established in Latham's snipe habitat.

MNES Significant Impact Guideline Criteria for Vulnerable Species	Response
introduce disease that may cause the population to decline	The Approved conservation advice for Latham's snipe does not identify any diseases that are likely to impact the species (DCCEEW, 2024). The Project is not expected to result in the introduction of a disease that would impact Latham's snipe.
interfere substantially with the recovery of the species	While the removal of 14.45 ha of intermittent foraging habitat and 6.41 ha of permanent foraging habitat is inconsistent with the objective of reducing habitat loss, given the availability of similar habitat within the Study Area and broader region, the extent of proposed clearing is not considered of a scale which is likely to interfere with the recovery of the species.
Outcome	*While The Project would result in the removal of 20.86 ha of foraging habitat for the Latham's snipe, given the extent of similar habitat available throughout the Study Area and wider region, these impacts are not considered important, notable, or of consequence, having regard to its context and intensity.*

D.5 Ornamental snake (*Denisonia maculata*)

The Ornamental snake is listed as vulnerable under the EPBC Act.

Habitat preferences and distribution

This species prefer moist areas in woodlands and open forests, particularly in depressions located in Queensland RE Land Zone 4 and in gilgai mounds occurring in areas of deep cracking alluvial soils with high clay content (DCCEEW, 2011). Ornamental snake shelter under logs, leaf litter, bark, rocks and coarse woody debris on the ground, and during dry periods they will seek refuge within clay cracks in gilgai (Brigalow Belt Reptiles Workshop, 2010).

For additional information on the Ornamental snake habitat preferences and distribution, refer to Section 4.2.3.1

Presence in the Disturbance Footprint

Ornamental snake was not recorded within the Disturbance Footprint. Based on field investigations, the Disturbance Footprint does not contain breeding and foraging habitat for the species, as it lacks suitable microhabitat features such as soil cracks.

For additional information on the Ornamental snake habitat, refer to Section 4.2.3.1.

Important populations

Important habitat for the Ornamental snake has been defined by the DCCEEW as of gilgai depressions and mounds, as well as habitat connectivity between gilgais and other suitable habitat (DCCEEW, 2023c).

The DCCEEW considers that an occurrence of important habitat for the Ornamental snake is a surrogate for an 'important population' of the species (DCCEEW, 2025j). A total of 497.52 ha of gilgai habitat in the Study Area meets the definition of important habitat and therefore is considered to support an important population of the species.

Important habitat

Draft Referral Guidelines for the Nationally Listed Brigalow Belt Reptiles (DCCEEW, 2023c) specifies that for Brigalow Belt reptiles, important habitat is considered a surrogate for an important population. Additionally, any suitable habitat where the species presence has been confirmed, is near the limit of the known range, or is a large patch of contiguous suitable habitat, is considered to be important habitat. This species has not been identified in the disturbance footprint during field surveys. Additionally, no habitat for this species has been identified in the disturbance footprint, therefore, there is no important habitat within the disturbance footprint.

Habitat critical to the survival of the species

Given the highly disturbed and degraded nature of the Disturbance Footprint, and the absence of suitable habitat for the species, there is no habitat critical to the survival of the species is located within the Disturbance Footprint.

Threatening processes

The Ornamental snake has undergone a decline in abundance in the past few decades. There are a variety of factors that are possibly contributing to this decline, including:

- habitat loss through clearing (roads, ploughing, railways, mining-related activities, pipeline constructions)
- habitat fragmentation
- habitat degradation by overgrazing by stock, especially cattle, or grazing of gilgais during the wet season leads to soil compaction and compromising of soil structure
- alteration of landscape hydrology in and around gilgai environments
- alteration of water quality through chemical and sediment pollution of wet areas
- contact with the cane toad
- predation by feral species; and
- invasive weeds (Brigalow Belt Reptiles Workshop, 2010); Cogger et al. 1993).

Recovery actions

The Ornamental snake does not have a contemporary recovery plan. Research priorities and conservation actions are described in the species conservation advice and include the following matters:

- refine understanding of population metrics, habitat needs, and threat impacts
- develop and apply monitoring in key habitats and priority areas
- track existing populations to identify emerging threats
- evaluate recovery progress and adapt management strategies as needed
- identify and prioritise key populations for conservation
- explore legal protection options for private and crown lands, including reserve inclusion
- reduce land-use pressures at known sites
- control invasive species, particularly pigs, at critical locations
- establish and implement cane toad management practices; and
- promote awareness of the Ornamental snake within the Brigalow Belt Bioregion (DEWHA, 2014).

Significant impact assessment

No habitat for the Ornamental snake is located within the Disturbance Footprint (Figure 13). A significant impact assessment has been completed against the MNES SIA Guidelines (DotE, 2013b) in Table A - 8.

Table A - 8: Significant impact assessment for the Ornamental snake

MNES Significant Impact Guideline Criteria for Vulnerable Species	Response
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
lead to a long-term decrease in the size of an important population	No Ornamental snake habitat was identified within the Disturbance Footprint. Additionally, indirect impacts on retained habitat are considered negligible based on the implementation of mitigation measures detailed in Section 7. As such, the Project would not lead to a long-term decrease in the size of an important population.
reduce the area of occupancy of an important population	The current area of occupancy for this species is 21,315 km^2 (ALA, 2025). Whilst the Study Area is considered likely to contain an important population, no Ornamental snake habitat was identified within the Disturbance Footprint. Additionally, indirect impacts on retained habitat are considered negligible based on the implementation of mitigation measures detailed in Section 7. As such, the Project would not reduce the area of occupancy of an important population.
fragment an existing important population into two or more populations	Whilst the Study Area is considered likely to contain an important population, no Ornamental snake habitat was identified within the Disturbance Footprint. As such, there is no chance or possibility the Project would fragment an existing important population into two or more populations.
adversely affect habitat critical to the survival of a species	The habitat in the Study Area and Disturbance Footprint is unlikely to be habitat critical to the survival of the species as due to the degraded and highly disturbed nature of the habitat.
cause disruption to the breeding cycle of an important population	Whilst the Study Area is considered likely to contain an important population, no Ornamental snake habitat was identified within the Disturbance Footprint. Additionally, indirect impacts on retained habitat are considered negligible based on the implementation of mitigation measures detailed in Section 7. As such, the Project would not cause disruption to the breeding cycle of an important population.
modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	No Ornamental snake habitat was identified within the Disturbance Footprint and indirect impacts on retained habitat are considered negligible based on the implementation of mitigation measures detailed in Section 7. As such, the Project would not modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

MNES Significant Impact Guideline Criteria for Vulnerable Species	Response
result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Threats to the species include habitat degradation by feral herbivores such as rabbits and feral pigs, contact with cane toads, proliferation of weed species and predation by feral carnivores, such as foxes and feral cats. The Study Area is already impacted by grazing, clearing and mining extraction activities and invasive species are already established in the landscape, including those listed as potential threats above. Management and control of weed and pest species, as described in Section 7.3.2, will include standard industry accepted measures to minimise the spread of weeds and proliferation of pest animals that have the potential to impact the Ornamental snake. Therefore, the Project would not result in an invasive species becoming established in the Ornamental snake habitat remaining in the Study Area.
introduce disease that may cause the population to decline	No introduced diseases are known to significantly impact this species. As such, there is no real chance of possibility that the Project would introduce a disease that may cause the population to decline.
interfere with the recovery of the species	No Ornamental snake habitat was identified within the Disturbance Footprint, and indirect impacts on retained habitat are considered negligible based on the implementation of mitigation measures detailed in Section 7. As such, the Project would not interfere with the recovery of the species.
Outcome	*The Project is unlikely to have a significant impact on the Ornamental snake, as no habitat will be directly removed and potential indirect impacts on retained habitat is considered negligible based on implementation of proposed mitigation measures.*

D.6 Squatter pigeon (southern) (*Geophaps scripta scripta*)

The Squatter pigeon (southern) is listed as vulnerable under the EPBC Act.

Habitat preferences and distribution

The subspecies occurs on the inland slopes of the Great Dividing Range from the Burdekin-Lynd Divide in central Queensland, west to Longreach and Charleville and south to Moree in New South Wales (TSSC, 2015). The Squatter pigeon (southern) inhabits eucalypt woodland communities with a grassy understorey in proximity to permanent water sources, such as rivers, creeks and dams (TSSC, 2015a).

For additional information on the Squatter pigeon (southern) habitat preferences and distribution, refer to Section 4.2.3.4.

Presence in the Disturbance Footprint

This species has not been recorded in the Disturbance Footprint during field surveys. Habitat within the Disturbance Footprint includes 26.05 ha of breeding and foraging, 6.41 ha of foraging, and 262.34 ha of dispersal habitat.

For additional information on the Squatter pigeon (southern) habitat preferences and distribution, refer to Section 4.2.3.4.

Important populations

As this species currently has no adopted recovery plan, important populations of Squatter pigeon (southern) have been defined as per those listed in the SPRAT database (DCCEEW, 2025f):

- populations occurring in the Condamine River catchment and darling downs of southern Queensland
- the populations known to occur in the Warwick-Inglewood-Texas region of southern Queensland; and
- any populations potentially occurring in northern New South Wales.

Based on these criteria, any Squatter pigeon (southern) within the Study Area is unlikely to be part of an important population. Furthermore, in consideration of the MNES SIA Guidelines, the local population is unlikely to be a key source population for breeding or dispersal, or maintaining genetic diversity due to its relatively common occurrence in the local region and the Study Area is not at the limit of the species distribution.

Habitat critical to the survival of the species

Habitat critical to the survival of the species is not defined for the species in the approved conservation advice or listing advice. As such the MNES SIA guidelines (DotE, 2013) for habitat critical to the survival of a species is applied and includes as areas for activities such as foraging, breeding, roosting, or dispersal. Habitat within the Study Area does not provide particularly unique or rare resources that are important for the long-term maintenance of the species, maintaining genetic diversity, or provide area to support reintroductions of the species. Given the degraded nature of habitat within the Disturbance Footprint and no records of Squatter pigeon (southern) have been recorded in the Disturbance Footprint, it is unlikely to be considered habitat critical to the survival of the species.

Threatening processes

Current threats to the Squatter pigeon (southern) include (DCCEEW, 2025f):

- ongoing vegetation clearance and fragmentation

- overgrazing of habitat by livestock and feral herbivores such as rabbits, cows and sheep
- introduction and degradation of habitats by invasive weeds, such as Buffel grass
- inappropriate fire regimes
- thickening of understorey vegetation
- predation by feral cats and foxes and avian predators; and
- trampling of nests by domestic stock.

Recovery actions

Conservation and management actions specified by the Approved Conservation Advice (TSSC, 2015a) for the species are as follows:

- identify sub-populations of high conservation priority, especially in the southern part of the Squatter pigeon (southern) range
- protect and rehabilitate areas of vegetation that support important sub-populations
- protect sub-populations of the listed subspecies through the development of covenants, conservation agreements or inclusion in reserve tenure
- develop and implement a stock management plan for key sites
- develop and implement a management plan, or nominate an existing plan to be implemented, for the control and eradication of feral herbivores in areas inhabited by the Squatter pigeon (southern); and
- raise awareness of the Squatter pigeon (southern) within the local community, particularly among land managers.

Significant impact assessment

Approximately 26.05 ha of breeding and foraging habitat, 6.41 ha of foraging-only habitat, and 262.34 ha of dispersal habitat for the Squatter pigeon (southern) is located within the Disturbance Footprint and will be cleared for the Project (Figure 16). A significant impact assessment has been completed against the MNES SIA Guidelines (DotE, 2013b) in Table A - 9.

Table A - 9: Significant impact assessments for Squatter pigeon (southern)

MNES Significant Impact Guideline Criteria for Vulnerable Species	Response
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
lead to a long-term decrease in the size of an important population	As described in the section above, the Study Area does not support an important population of the species. Therefore, the removal of approximately 26.05 ha of breeding and foraging habitat, 6.41 ha of foraging-only habitat, and 262.34 ha of dispersal habitat, has no chance or possibility of leading to a long-term decrease in the size of an important population.
reduce the area of occupancy of an important population	The area of occupancy for the species has been calculated to be 2,888 km^2 (Queensland Resources Council, 2015). As described in the section above, the Study Area does not support an important population of the species. Therefore, the removal of approximately 26.05 ha of breeding and foraging habitat, 6.41 ha of foraging-only habitat, and 262.34 ha of dispersal habitat, has no chance or possibility of reducing the area of occupancy of an important population.
The action is likely to fragment an existing important population into two or more populations	As described in the section above, the Study Area does not support an important population of the species. Therefore, the removal of approximately 26.05 ha of breeding and foraging habitat, 6.41 ha of foraging-only habitat, and 262.34 ha of dispersal habitat, has no chance or possibility of fragmenting and important population.
adversely affect habitat critical to the survival of a species	Habitat critical to the survival of the species for the squatter pigeon (southern) is not present within the Disturbance Footprint. As such, the Project will not adversely affect habitat critical to the survival of the species.
cause disruption to the breeding cycle of an important population	As described in the section above, the Study Area does not support an important population of the species. Therefore, the Project would not disrupt the breeding cycle of an important population. Nonetheless, the Blackwater Land and Biodiversity Management plan will be updated for the Project as discussed in Section 7.2.2 and will include industry standard and acceptable measures to avoid and minimise impacts to animal breeding places and unnecessary stress on native fauna.
modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The Project proposes the removal of approximately 32.46 ha of combined potential breeding and foraging habitat for the species. Although this represents a relatively large area, no individuals were recorded in the Disturbance Footprint, which suggests limited use of the habitat by the species. In addition, the substantial extent of similar habitat retained within both the Study Area and the broader region, along with the minimal potential for indirect impacts on retained habitat, indicates that the Project has a very low chance or possibility to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

MNES Significant Impact Guideline Criteria for Vulnerable Species	Response
result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Threats to the species include overgrazing by feral herbivores such as rabbits, proliferation of weed species and predation by feral carnivores such as Foxes and feral cats. The Disturbance Footprint is already impacted by grazing, clearing and mining activities and invasive species are established in the area including feral cats. Implementation of a Weed and Pest Management Plan, as described in Section 7.3.2, will include standard industry accepted measures to minimise the spread of weeds and proliferation of pest animals that have the potential to degrade the ground layer and foraging resources for the Squatter pigeon (southern). Therefore, there is a very low chance or possibility the Project would contribute to a harmful invasive species becoming established in Squatter pigeon (southern) habitat within the Study Area.
introduce disease that may cause the population to decline	Disease has not been identified as a threat to the Squatter pigeon (southern). Therefore, the Project is not expected to result in the introduction of a disease that may cause population decline.
interfere with the recovery of the species	Recovery actions primarily address impacts to important sub-populations of the Squatter pigeon (southern), of which none occur in the Study Area. Given the low abundance of individuals recorded in the Study Area and availability of similar habitat elsewhere in the region, there is a very low chance or probability that the Project would interfere with the recovery of the Squatter pigeon (southern).
Outcome	*The Project is unlikely to have a significant impact on the Squatter Pigeon (southern subspecies), as the Study Area does not support an important population or habitat critical to the survival of the species. Additionally, the Project has a very low possibility to remove or isolate the availability of habitat to the extent that the species is likely to decline.*

D.7 White-throated needletail (*Hirundapus caudacutus*)

The White-throated needletail is listed as vulnerable and migratory (CAMBA, JAMBA, ROCKAMBA) under the EPBC Act.

Habitat preferences and distribution

The White-throated needletail is a non-breeding visitor to Australia where it is widespread across eastern and south-eastern Queensland (TSSC, 2019). It is most often recorded above wooded areas such as open forest and rainforest (TSSC, 2019).

For additional information on White-throated needletail habitat preferences and distribution, refer to Section 4.2.3.5.

Presence in the Disturbance Footprint

White-throated needletail has not been recorded during any surveys; however, the species is considered likely to occur based on habitat availability and previous records within the vicinity of the Study Area. Suitable foraging habitat for the species was identified as the airspace above the entirety of the Study Area.

For additional information on White-throated needletail presence in the Study Area, refer to Section 4.2.3.5.

Important populations

An important population has not been specifically defined for the White-throated needletail and in consideration of the MNES SIA definition for 'important population', the Study Area is unlikely to support such a population as outlined below:

- a key source population either for breeding or dispersal – the species is a non-breeding migrant to Australia and the Study Area does not support a population of this species as it is likely to only overfly the Study Area
- populations that are necessary for maintaining genetic diversity –the Study Area is unlikely to support a nationally or internationally significant proportion of a population; and
- populations that are near the limit of the species range – the Study Area is not at the limit of this species migratory range in Australia.

The Migratory Bird Guidelines (DotE, 2015c) addresses referral considerations for the White-throated needletail. The relationship between important habitat and important populations is discussed, whereby avoiding impacts to important habitat for the species and implementing mitigation measures will help reduce the risk of a significant impact on the population. For the White-throated needletail, important habitat is described as large tracts of native vegetation, particularly forest, and the species appears to have traditional roost sites (DotE, 2015c). The Study Area does not contain large tracts of forested habitat; instead, remnant vegetation is highly fragmented and patchily distributed. However, approximately 8.5 km east of the Study Area lie the Blackdown Tablelands, which support extensive and intact forested ecosystems that may offer more suitable habitat for the species.

The Migratory Bird Guidelines (DotE, 2015c) also provide advice about 'ecologically significant proportions' of populations. For the white throated needletail, an ecologically significant proportion of the national population is 10 birds (0.1% of the population) and for the international population is 100 birds (i.e. 1% of the population) (DotE, 2015c) . The Study Area is unlikely to support an ecologically significant proportion of the population.

Habitat critical to the survival of the species

Habitat critical to the survival of the species has not been defined for the White-throated needletail (DCCEEW, 2025e; TSSC, 2019). Areas deemed as habitat critical to the survival of the species may be considered traditional roost sites where the species has been known to frequent, which are not evident within the Study Area. All areas that provide foraging habitat in the airspace above the Study Area are not considered habitat critical to the survival of the species due to the availability of similar habitat throughout the region. Therefore, the Study Area is not considered to contain habitat critical to the survival of the species.

Threatening processes

Due to the widespread distribution and aerial nature of the White-throated needletail, no significant threats have been identified for the species in Australia (DCCEEW, 2025e; TSSC, 2019). Some potential threats have been suggested to include collision with wind turbines, overhead wires, windows and lighthouses, and degradation of forest and woodland area resulting in the loss of roosting sites and reduction in availability of prey (TSSC, 2019).

Recovery actions

No specific recovery actions have been identified for the White-throated needletail, however primary conservation actions relevant to the species within Australia include:

- identify requirements of important habitat in Australia
- support initiatives to improve habitat management at key sites in Australia
- stakeholder engagement to promote conservation and the exchange of information
- enhance existing monitoring programs particularly to improve coverage in under surveyed parts of Australia; and
- information and research priorities including improved knowledge on threatened processes and understanding of life history, population size, distribution and ecological requirements in Australia (TSSC, 2019).

Significant impact assessment

Approximately 2,316.58 ha of aerial foraging habitat is located within the Disturbance Footprint and will be cleared for the Project (Figure 17). A significant impact assessment has been completed against the MNES SIA Guidelines (DotE, 2013b) in Table A - 10.

Table A - 10: Significant impact assessment for the White-throated needletail

MNES Significant Impact Guideline Criteria for Vulnerable Species	Response
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
lead to a long-term decrease in the size of an important local population	As described in the section above, the Study Area does not support an important population of the species. Therefore, the removal of approximately 2,316.58 ha of aerial foraging habitat, has no chance or possibility of leading to a long-term decrease in the size of an important population.

MNES Significant Impact Guideline Criteria for Vulnerable Species	Response
reduce the area of occupancy of an important population	As described in the section above, the Study Area does not support an important population of the species. Therefore, the removal of approximately 2,316.58ha of aerial foraging habitat, has no chance or possibility of reducing the area of occupancy of an important population.
fragment an existing important population into two or more populations	As described in the section above, the Study Area does not support an important population of the species. Additionally, the species is highly mobile, almost exclusively aerial species. Therefore, the removal of approximately 2,316.58 ha of aerial foraging habitat, has no chance or possibility of fragment an existing important population.
adversely affect habitat critical to the survival of a species	As described in the section above, given this is a non-breeding visitor to Australia, is an almost exclusively aerial species within Australia and the Disturbance Footprint and surrounding Study Area is unlikely to provide preferred roosting habitat for this species, the Study Area is not considered likely to contain habitat critical to the survival of the species. As such, there is no chance the Project would adversely affect habitat critical to the survival of a species.
cause disruption to the breeding cycle of an important population	The White-throated needletail does not breed within Australia. Therefore, the Project would not result in disruption to the breeding cycle of this species.
modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Clearing and disturbance of vegetation communities, over which this species is likely to forage and disperse, is proposed as part of the Project. However, this species is highly mobile, and almost exclusively aerial, occurring over a variety of habitats throughout Australia. As such, there is a very low chance that the Project would modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The conservation advice does not identify any invasive species that are considered likely to impact the species. Additionally, the Project is not expected to result in the introduction of an invasive species that would be harmful to White-throated needletails becoming established within the Study Area.
introduce disease that may cause the population to decline	The conservation advice does not identify any diseases that are likely to impact the species. Therefore, the Project is not expected to result in the introduction of a disease that may cause population decline.
interfere substantially with the recovery of the species	The species is unlikely to directly use vegetation communities in the Disturbance Footprint and surrounding Study Area therefore it is not considered to provide habitat critical for the survival of the species or support an important population, therefore there is a very low chance or possibility that the Project would interfere substantially with the recovery of the species.

MNES Significant Impact Guideline Criteria for Vulnerable Species	Response
Outcome	*Given the Study Area is unlikely to contain an important population or habitat critical to the survival of the species, and impacts will be limited to aerial foraging habitat which is widely available throughout the region, the Project is considered unlikely to result in a significant impact to this species.*

D.8 Migratory species

Fork-tailed swift (*Apus pacificus*)

The Fork-tailed swift is listed as migratory (CAMBA, JAMBA, ROCKAMBA) under the EPBC Act.

Habitat preferences and distribution

The Fork-tailed swift is almost exclusively aerial in Australia, where it occurs primarily over inland areas of dry or open habitat comprising riparian woodlands, tea-tree swamps, low scrub, heath or saltmarsh (DCCEEW, 2025j). The Fork-tailed swift is a non-breeding visitor to all states and territories of Australia (DCCEEW, 2025e; DotE, 2015). The Fork-tailed swift generally arrive to Australia in October and leave to return to their breeding grounds in Siberia during the second half of April (DCCEEW, 2025e; DotE, 2015).

For additional information on the Fork-tailed swift habitat preferences and distribution, refer to Section 4.2.4.1.

Presence in the Disturbance Footprint

This species has been observed on a single occasion during surveys above the Study Area, during the 2025 wet season survey. Suitable foraging habitat for the species was identified in the airspace above the entirety of the Study Area. Based on desktop and field investigations to date, the Study Area contains 6,907.49 ha of suitable aerial foraging habitat for the Fork-tailed swift as illustrated in Figure 20.

For additional information on the Fork-tailed swift presence in the Study Area, refer to Section 4.2.4.1.

Important habitat

The Fork-tailed swift is a non-breeding visitor to Australia. The species is found across a range of habitats from open plains to wooded areas and it is exclusively aerial (Department of the Environment (DotE), 2015c). Important habitat is defined in the Migratory Bird Guideline as:

- habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species
- habitat that is of critical importance to the species at particular life-cycle stages
- habitat utilised by a migratory species which is at the limit of the species range; or
- habitat within an area where the species is declining.

The Study Area is unlikely to provide important habitat for this species due to the fragmented and patchy landscape in which the Study Area is located. The species is exclusively aerial and known roosts have not been identified in the local areas. Therefore, the Study Area is considered unlikely to provide resources for this species other than as overfly habitat.

Ecologically significant proportion of the population

The Migratory Bird Guidelines define the ecologically significant proportion of the national population (0.1%) as 100 birds and for the international population (1%) 1,000 birds (Department of the Environment (DotE), 2015c).The Study Area is unlikely to support an ecologically significant proportion of the population as this would have been evident in literature or as a result of seasonal surveys.

Threatening processes

The Fork-tailed swift faces no significant threats within Australia. While potential risks such as habitat loss and predation by feral animals exist, the species' extensive range means that any localised impacts are considered negligible and unlikely to affect the overall population (BirdLife International, 2009).

Recovery actions

No specific recovery actions have been identified for the Fork-tailed swift.

Significant impact assessment

Approximately 2,316.58 ha of foraging habitat is located within the Disturbance Footprint and will be cleared for the Project (Figure 20). A significant impact assessment has been completed against the MNES SIA Guidelines (DotE, 2013b) in Table A - 11.

Table A - 11: Significant impact assessment for the Fork-tailed swift

MNES Significant Impact Guideline Criteria for Migratory Species	Response
An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:	
substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species	As described in the section above, the Study Area does not support an important habitat for the species. Therefore, the removal of approximately 2,316.58 ha of aerial foraging habitat, has no chance or possibility of leading to a long-term decrease in the size of an important population.
result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species, or	As described in the section above, the Study Area does not support an important habitat for the species. Additionally, the Project is not expected to result in the introduction of an invasive species that would be harmful to Fork-tailed swifts becoming established within the Study Area.
result seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species	As described in the section above, the Study Area is unlikely to contain an ecologically significant proportion. Nonetheless, should an ecologically significant proportion of a population overfly the Study Area as part of migratory movements, there is a very low chance or possibility that the Projects activities would seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of the species.
Outcome	*The Project is unlikely to result in a significant impact to this species, as the Study Area is unlikely to contain important habitat or an ecological significant proportion of the population.*

Glossy ibis (*Plegadis falcinellus*)

The Glossy ibis is listed as migratory (Bonn) under the EPBC Act.

Habitat preferences and distribution

Glossy ibis typically inhabits freshwater marshes at the edges of lakes and rivers, lagoons, floodplains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation (DCCEEW, 2025j). The Glossy ibis is found throughout Queensland and breeds at only a limited number of locations within Australia including the Channel Country of Queensland/South Australia (i.e. wetlands of the Bulloo, Diamantina and Georgina River systems, occasionally also Cooper Creek) (DCCEEW, 2025j).

For additional information on Glossy ibis habitat preferences and distribution, refer to Section 4.2.4.2.

Presence in the Disturbance Footprint

While not recorded during E2M Pty Ltd (E2M) surveys, Glossy ibis has been detected on a single location during previous EMM ecological surveys, approximately 2 km north of the current Study Area. No suitable breeding habitat was mapped within the Study Area. 610 ha of suitable foraging habitat was mapped in the Study Area consisting of dams with shallow sloping margins and dense fringing vegetation (e.g. reeds and sedges), and all remnant, high value regrowth or non-remnant areas with gilgai microrelief.

For additional information on Glossy ibis habitat preferences and distribution, refer to Section 4.2.4.2.

Important habitat

Important habitat for the Glossy ibis is not defined on the species profile (DotE, 2025l). Therefore, it is considered that all known and potential breeding areas comprise important habitat for the species.

Breeding habitat in Australia is limited to five known locations, including the Murray-Darling Basin and Channel Country of Queensland/South Australia for Queensland. In addition, the species has also been recorded is small, isolated breeding colonies throughout eastern Australia (DotE, 2025l).

Breeding habitat types in Australia includes wooded and shrubby swamps in the semi-arid and arid regions of the Northern Territory and Queensland. This includes Cooba (*Acacia stenophylla*), *Eucalyptus*/lignum swamps (*Muehlenbeckia florulenta*) of the Murray-Darling Basin and in *Melaleuca*/reed swamps at near-coastal breeding colonies in the south (DotE, 2025l).

Therefore, given the Study Area is not located within any of these areas and does not contain suitable breeding habitat, it is considered unlikely that habitat within Study Area constitutes important habitat for Glossy ibis.

Ecologically significant proportion of the population

The total population of Glossy ibis globally is estimated to be between 119,000 and 860,000 individuals (IUCN, 2025). Nationally important ecologically significant proportions of a population for the species are estimated to be between 119 and 860 individuals. Therefore, considering the widespread distribution and the detection of only a single individual approximately 2 km north of the Study Area, it is unlikely that any individuals present would constitute an ecologically significant portion of the population.

Threatening processes

Threats to the Glossy ibis populations in Australia, as identified in the SPRAT Profile (DotE, 2025l) include:

- wetland habitat degradation due to agricultural expansion and urban development

- hydrological alterations from irrigation and damming, disrupting natural water regimes
- water pollution from nutrient-rich runoff and urban waste, reducing prey availability
- anthropogenic disturbance from recreational activities, especially during breeding periods
- climate variability and change, affecting rainfall patterns and wetland persistence; and
- invasive species impacts, including predation and competition for nesting sites.

Recovery actions

No specific recovery actions have been identified for the Glossy ibis.

Significant impact assessment

Approximately 20.86 ha of foraging habitat for the Glossy ibis is located within the Disturbance Footprint and will be cleared for the Project (Figure 21). A significant impact assessment has been completed against the MNES SIA Guidelines (DotE, 2013b) in Table A - 12.

Table A - 12: Significant impact assessment for the Glossy ibis

MNES Significant Impact Guideline Criteria for Migratory Species	Response
An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:	
substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species	As described in the section above, the Study Area does not support an important habitat for the species. Therefore, the removal of approximately 20.86 ha of foraging habitat, has no chance or possibility of leading to a long-term decrease in the size of an important population.
result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species, or	As described in the section above, the Study Area does not support an important habitat for the species. Additionally, the Disturbance Footprint is already impacted by grazing, clearing and mining activities and invasive species are established in the area including exotic grasses, pigs, cats and dogs. Management and control of weed and pest species, as described in Section 7.3.2, will include standard industry accepted measures to minimise the spread of weeds and proliferation of pest animals. Therefore, there is no real chance or possibility that the Project would substantially modify, destroy or isolate an area of important habitat for the species.
result seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species	As described in the section above, the Study Area is unlikely to contain an ecologically significant proportion. Nonetheless, should an ecologically significant proportion of a population utilise the Study Area, given the abundance of similar foraging habitat throughout the region, there is a very low chance or possibility the removal of 20.86 ha of foraging habitat would seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population

MNES Significant Impact Guideline Criteria for Migratory Species	Response
Outcome	*The Project is unlikely to result in a significant impact to this species, as the Study Area is unlikely to contain important habitat or an ecological significant proportion of the population.*

Appendix E MSES Significant Residual Impact Assessments

E.1 Regulated vegetation

Matters of State Environmental Significance (MSES) regulated vegetation within the Study Area was assessed using ground-truthed RE mapping. MSES Regulated Vegetation occurring within the Study Area has been assessed against the Queensland Environmental Offsets Policy – Significant Residual Impact Guideline (MSES SRI Guideline) (DSDIP, 2014) in Table A - 13. This assessment shows that an SRI is likely to occur to endangered RE 11.3.1.

Table A - 13: Regulated vegetation significant residual impact assessment

RE	VM Act status	Structure Category	Assessment criteria	Assessment	Significant residual impact likely?
Endangered and Of Concern REs					
11.3.1	Endangered	Mid-dense	Clearing of an area greater than 0.5 ha where in a mid-dense (structural category) RE.	Clearing of 1.21 ha of remnant RE 11.3.1 will be undertaken within the Disturbance Footprint.	Yes, clearing is greater than the clearing threshold of 0.5 ha.
11.3.2	Of Concern	Sparse	Clearing of an area greater than 2 ha where in a sparse (structural category) RE.	No clearing of remnant RE 11.3.2 will be undertaken within the Disturbance Footprint.	No, the clearing threshold is not exceeded.
11.3.3	Of Concern	Sparse	Clearing of an area greater than 2 ha where in a sparse (structural category) RE.	No clearing of remnant RE 11.3.3 will be undertaken within the Disturbance Footprint.	No, the clearing threshold is not exceeded.
REs within the defined distance of the defining banks of a relevant watercourse or drainage feature					
11.3.1	NA	Mid-dense	• Clearing of an area greater than 0.5 ha where in a mid-dense (structural category) RE; and • Clearing within 5 metres (m) of the defining bank.	Clearing of 0.06 ha of remnant RE 11.3.1 within a defined distance to a watercourse will be undertaken within the Disturbance Footprint including disturbance within 5 m of the defining bank.	No, the clearing threshold is not exceeded.

RE	VM Act status	Structure Category	Assessment criteria	Assessment	Significant residual impact likely?
11.3.2	NA	Sparse	• Clearing of an area greater than 2 ha where in a sparse (structural category) RE; and • Clearing within 5 m of the defining bank.	No clearing of remnant RE 11.3.2 will be undertaken within the Disturbance Footprint.	No, the clearing threshold is not exceeded.
11.3.3	NA	Sparse	• Clearing of an area greater than 2 ha where in a sparse (structural category) RE; and • Clearing within 5 m of the defining bank.	No clearing of remnant RE 11.3.3 will be undertaken within the Disturbance Footprint.	No, the clearing threshold is not exceeded.
11.3.6	NA	Sparse	• Clearing of an area greater than 2 ha where in a sparse (structural category) RE; and • Clearing within 5 m of the defining bank.	Clearing of 0.18 ha of remnant RE 11.3.6 within a defined distance to a watercourse will be undertaken within the Disturbance Footprint. This includes areas being cleared within 5 m of defining banks.	No, the clearing threshold is not exceeded.
11.3.27	NA	Sparse	• Clearing of an area greater than 2 ha where in a sparse (structural category) RE; and • Clearing within 5 m of the defining bank.	No clearing of remnant 11.3.27 will be undertaken within the Disturbance Footprint.	No, the clearing threshold is not exceeded.

E.2 Connectivity

The Landscape Fragmentation Connectivity tool performs a desktop assessment of development impacts on connectivity areas containing remnant vegetation. The tool is a test for significant residual impacts on connectivity, a Prescribed Environmental Matter (PEM) under the Environmental Offsets Framework. It is also effective as a mechanism for quantifying the fragmentation of remnant REs at the bioregion scale.

The Landscape Fragmentation Connectivity tool results for the Project are summarised in Table A - 14 below and used the Queensland Herbarium certified mapping for the Study Area. The outcome of this tool determined that no significant impact would occur for connectivity areas. Particularly, as the change of core remnant areas post impact are low (0.0%).

Table A - 14: Landscape fragmentation and connectivity significant residual impact assessment

Output	Value
Significance test one	
Regional total area	202,133.05 ha
Regional extent of core remnant	56,862.04 ha
Area of core at the local scale (pre impact)	232.49 ha
Area of core at the local scale (post impact)	232.48 ha
Percent change of core at the local scale (post impact)	0.0%
Significance test two	
The number of core remnant areas occurring on the site	0
The number of core remnant areas occurring on the site post impact	0
Result	*This analysis has determined no significant impact on connectivity areas.*

E.3 Protected Wildlife Habitat - *Solanum elachophyllum*

Solanum elachophyllum, is listed as Endangered under the Nature Conservation Act 1992 (NC Act).

Habitat preferences and distribution

S. elachophyllum is found primarily on fertile cracking-clay soils in open forest of *Eucalyptus thozetiana*, *Acacia harpophylla*, with understorey of *Geijera parviflora*, *Casuarina cristata*, *Macropteranthes leichhardtii*, *E. cambageana*, or woodland of *E. crebra* and *E. tenuipes* (Bean, 2004). This species grows in vegetation communities in which fire is normally absent (Bean, 2004) on fertile cracking soils between Middlemount and Theodore.

For additional information on *S. elachophyllum* habitat preferences and distribution, refer to Section 4.1.3.1.

Presence in the Disturbance Footprint

S. elachophyllum, has been identified numerous locations within the Disturbance Footprint, during E2M field surveys and additional locations during EMM surveys. Suitable habitat for *Solanum elachophyllum* within the Disturbance Footprint, comprises known habitat which consists of 6.00 ha of suitable habitat within 50 m of known records of the species and 2,299.78 ha of potential habitat which consists of potential suitable habitat outside areas of known habitat.

Populations within the Disturbance Footprint surveyed by E2M and EMM consisted of approximately 369 individuals across 10 discrete locations. These individuals were located in non-remnant areas and high value regrowth RE 11.3.1, 11.4.9 and 11.9.5.

For additional information on *S. elachophyllum* habitat preferences and distribution, refer to Section 4.1.3.1.

Threatening processes

The primary threats to *S. elachophyllum* include habitat loss through vegetation clearing and reduced habitat availability, particularly due to the spread of invasive species such as introduced pasture grasses (Bean, 2004). Additional risks arise from the destruction of individuals and populations on private freehold land, where small vegetation patches may be cleared without detection under the Vegetation Management Act 1999. The species is also vulnerable to stochastic events (such as changes in drainage, drought, fire, and wildlife predation) which can significantly reduce or eliminate populations. This vulnerability is heightened by the fragmented nature of remaining vegetation, with populations at the Brigalow Research Station notably impacted by heavy wallaby grazing (Bean, 2004). Furthermore, small population sizes across all known sites raise concerns about genetic inbreeding depression.

Recovery actions

There are no recovery actions for *S. elachophyllum*. However, monitoring is recommended to improve species management and knowledge (DERM, 2011). Further field studies are required to locate any additional populations and to precisely determine the number of populations, geographical range, area of occupancy and number of individuals.

Significant impact assessment

Approximately 6.00 ha of known habitat and 2,299.78 ha of potential habitat for *S. elachophyllum* is located within the Disturbance Footprint and will be cleared for the Project (Figure 10). A significant residual impact assessment has been completed against the MSES SRI Guidelines (DSDIP, 2014) and is provided in Table A - 15.

Table A - 15: Significant residual impact assessment for the *Solanum elachophyllum*

Significant impact criteria	Response
An action is likely to have a significant impact on endangered and vulnerable wildlife if the impact on the habitat is likely to:	
lead to a long-term decrease in the size of a local population	A total 6.00 ha of known *S. elachophyllum* habitat, including the removal of approximately 123 stems, will be removed as part of the Project. This removal of known individuals is likely to lead to a long-term decrease in the size of the local population.
reduce the extent of occurrence of the species	The extent of occurrence for this species is 53,798 km^2 (ALA, 2025). The proposed disturbance is located in Blackwater, which lies centrally within the known distribution of the species. Therefore, given the Projects central position within the species known distribution and the number of records within the Study Area and surrounding region, the Project is unlikely to result in a reduction of the species' extent of occurrence.
fragment an existing population	The Project would require the removal of approximately 6.00 ha of known *S. elachophyllum* habitat, including the removal of approximately 123 stems, as well as an additional 2,299.78 ha of potential habitat. However, while entire patches of individuals will be removed as part of the Project, given the Study Area is already highly fragmented and individuals occur as small, isolated patches, it is unlikely that the Project would fragment an existing population.
result in genetically distinct populations forming as a result of habitat isolation	As the landscape within the Study Area is already highly fragmented and existing records of the species occur in small, isolated patches, it is unlikely that the Project would result in genetically distinct populations forming as a result of habitat isolation.
result in invasive species that are harmful to an endangered, vulnerable or near-threatened species becoming established in the endangered, vulnerable or near-threatened species' habitat	As discussed above, one of the greatest threats to the species is reduced habitat availability, due to the spread of invasive species such as introduced pasture grasses (Bean, 2004). Pasture grasses such as Buffel grass are already prevalent within the species habitat and widespread throughout the broader landscape. Nonetheless, implementation of a Weed and Pest Management Plan, as described in Section 7.3.2, will include standard industry accepted measures to minimise the introduction and spread of weeds. As such, it is unlikely that the Project would result in the establishment or proliferation of invasive species which are harmful to the species.
introduce disease that may cause the population to decline	There are no diseases listed as threats to *S. elachophyllum*. Therefore, the Project is not expected to result in the introduction of a disease that would cause the species to decline.

Significant impact criteria	Response
interfere with the recovery of the species	The Project would require the removal of approximately 6.00 ha of known *S. elachophyllum* habitat, including the removal of approximately 123 stems, as well as an additional 2,299.78 ha of potential habitat. While this result in a reduction in the local population, given the extent of similar habitat and known record within and surrounding the Study Area, it is considered unlikely that the Project would substantially interfere with the recovery of the species.
cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species	The potential habitat mapped within the Disturbance Footprint is unlikely to be an ecologically significant location as more extensive, better-connected, and higher-quality habitat is available elsewhere within the Study Area and boarder landscape. As such, the Project is unlikely to cause disruption to an ecological significant location for the species.
Outcome	*The Project is likely to lead to a long-term decrease in the size of a local population. Therefore, it is likely the Project would have a significant residual impact on S. elachophyllum.*

E.4 Protected Wildlife Habitat - Australian painted snipe (*Rostratula australis*)

The Australian painted snipe is listed as endangered under and the NC Act.

Habitat preference and distribution

Refer to Appendix D.2.

Presence within the Disturbance Footprint

Refer to Appendix D.2.

Threatening processes

Refer to Appendix D.2.

Recovery actions

Refer to Appendix D.2.

Significant impact assessment

Approximately 20.86 ha of foraging habitat for Australian painted snipe is located within the Disturbance Footprint and will be cleared for the Project (Figure 14). A significant residual impact assessment has been completed against the MSES SRI Guidelines (DSDIP, 2014) and is provided in Table A - 16.

Table A - 16: Significant residual impact assessment for the Australian painted snipe

Significant impact criteria	Response
An action is likely to have a significant impact on endangered and vulnerable wildlife if the impact on the habitat is likely to:	
lead to a long-term decrease in the size of a local population	The Australian painted snipe population is small, likely to be continuous, dispersive or migratory (DCCEWW, 2022) and unlikely to comprise local sub-populations. The Project would result in the removal of 20.86 ha of foraging habitat for Australian painted snipe, with no suitable breeding habitat present within the Disturbance Footprint (refer to Section 4.2.3.2). The foraging habitat present consists of 6.41 ha of permanent foraging opportunities in the form of dams and 14.45 ha of ephemeral/intermittent foraging opportunities in the form of cleared gilgai pastureland. Areas of similar foraging habitat are abundant throughout the wider Study Area, including 10.03 ha of dams or wetlands, 520.20 ha of non-remnant gilgai and 8.71 ha of remnant RE 11.3.27 providing wetland habitat. Therefore, given the Project would not result in the removal of breeding habitat, impact a small proportion (3.42%) of available foraging habitat within the Study Area, it is unlikely the Project would lead to a long-term decrease in the size of a local population.

Significant impact criteria	Response
reduce the extent of occurrence of the species	The extent of occurrence for the species is estimated at 7,100,000 km^2 (S. T. Garnett et al., 2011). Given, the species is widespread and dispersive, and the Project would result in the removal of a small portion (20.86 ha / 3.42%) of similar foraging habitat within the Study Area, it is considered unlikely the Project would reduce the extent of occurrence of the species.
fragment an existing population	This is a highly mobile species for which the Project is unlikely to create barriers to movement, and the species will be able to persist within the landscape. Therefore, the Project is not expected to fragment an existing population.
result in genetically distinct populations forming as a result of habitat isolation	Given that the Project is unlikely to fragment an existing population, it is also unlikely to lead to the formation of genetically distinct populations through habitat isolation. Furthermore, the habitat affected by the Project is already extremely fragmented, reducing the potential for additional genetic divergence.
result in invasive species that are harmful to an endangered, vulnerable or near-threatened species becoming established in the endangered, vulnerable or near-threatened species' habitat	The Study Area is already impacted by grazing, clearing and mining activities and invasive species are established in the area. Threats to the species as a result of this existing disturbance includes proliferation of weed species, degradation of already modified seasonal and ephemeral wetland habitat by feral pigs and predation by feral cats. Management and control of weed and pest species, as described in 0, will include standard industry accepted measures to minimise the spread of weeds and pest animals (e.g. feral pigs, that have the potential to degrade the ground layer and foraging resources for the Australian painted snipe, and feral cats which prey on the species). Therefore, the Project is unlikely to contribute substantially to an invasive species becoming established in Australian painted snipe habitat.
introduce disease that may cause the population to decline	There are no diseases listed as threats to the Australian painted snipe. Therefore, the Project is not expected to result in the introduction of a disease that would cause the species to decline.
interfere with the recovery of the species	The strategies identified to achieve the recovery plan objectives include the management and protection of known habitat at a landscape level, reduce or eliminate threats at breeding and non-breeding habitat as well as research activities relating to population trajectories, habitat requirements and the engagement of stakeholders (DCCEWW, 2022). While the removal of 20.86 ha of foraging habitat goes against the reducing threats to the species, given the availability of similar habitat within the Study Area and broader region, the extent of proposed clearing is not considered of a scale which is likely to interfere with the recovery of the species.

Significant impact criteria	Response
cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species	The Project would result in the removal of 20.86 ha of foraging habitat for Australian painted snipe, with no suitable breeding habitat present within the Disturbance Footprint (refer to Section 4.2.3.2). The foraging habitat present consists of 6.41 ha of permanent foraging opportunities in the form of dams and 14.45 ha of ephemeral/intermittent foraging opportunities in the form of cleared gilgai pastureland. Therefore, given the Disturbance Footprint does not contain suitable breeding habitat for the species and similar foraging habitat is abundant throughout the Study Area and broader region, habitat within the Disturbance Footprint is unlikely to constitute ecologically significant location.
Outcome	*While The Project would result in the removal of 20.86 ha of foraging habitat for Australian painted snipe, given these areas are not considered ecological significant locations based on extensive similar habitat being available within the broader region, the Project is unlikely to have a significant impact on the species.*

E.5 Protected Wildlife Habitat - Koala (*Phascolarctos cinereus*)

The Koala is listed as endangered under the NC Act.

Habitat preference and distribution

Refer to Appendix D.3.

Presence within the Disturbance Footprint

Refer to Appendix D.3.

Threatening processes

Refer to Appendix D.3.

Recovery actions

Refer to Appendix D.3.

Significant impact assessment

Approximately 2.72 ha of Koala breeding and foraging habitat, and 48.29 ha of dispersal habitat is located within the Disturbance Footprint and will be cleared for the Project (Figure 18). A significant residual impact assessment has been completed against the MSES SRI Guidelines (DSDIP, 2014) and is provided in Table A - 17.

Table A - 17: Significant residual impact assessment for the Koala

Significant impact criteria	Response
An action is likely to have a significant impact on endangered and vulnerable wildlife if the impact on the habitat is likely to:	
lead to a long-term decrease in the size of a local population	The Project would remove a total of 50.01 ha of habitat for the species. This will comprise of 2.72 ha of breeding and foraging habitat and 48.29 ha of dispersal habitat, with majority of habitat highly degraded as a result of historical clearing (refer to Section 4.1.1). Given the paucity of records within the Study Area and the degraded nature of the habitat, no resident populations are expected to occur within the Study Area, with any individuals likely to occur transiently when moving between areas of higher quality habitat. Additionally, habitat present within the Disturbance Footprint does not provided connectivity between areas of higher quality habitat, with the primary movement corridor along Taurus Creek and Two Mile Gully being retained. Therefore, given the Study Area is unlikely to contain a resident population of Koalas and the Project would result in the removal of 50.01 ha of highly degraded habitat which is unlikely to be utilised by the species, it is unlikely the Project would lead to a long-term decrease in the size of a local population.

Significant impact criteria	Response
reduce the extent of occurrence of the species	The extent of occurrence was calculated as 1,665,850 km (DAWE, 2022). While the Project would result in the removal of 50.01 ha of habitat, including 2.72 ha of breeding and foraging habitat and 48.29 ha of dispersal habitat, these areas are highly degraded and do not provide connectivity between areas of higher quality habitat. As such these areas are considered unlikely to be occupied by Koalas. Therefore, given habitat within the Disturbance Footprint is unlikely to be occupied by Koalas and the primary movement corridor within the Study Area (i.e. Taurus Creek and Two Mile Gully) is being retained, it is unlikely the Project would reduce the extent of occurrence of this species.
fragment an existing population	Koalas are known to traverse up to 1-3 km on ground and will often travel through cleared or treeless areas (DAWE, 2022). While the Project would result in the removal of 50.01 ha of habitat, including 2.72 ha of breeding and foraging habitat and 48.29 ha of dispersal habitat, these areas are highly degraded and do not provide connectivity between areas of higher quality habitat. Therefore, given the Project would not impact habitat providing connectivity for Koalas and the primary movement corridor within the Study Area (i.e. Taurus Creek and Two Mile Gully) is being retained, it is unlikely the Project would fragment an existing population.
result in genetically distinct populations forming as a result of habitat isolation	Given that the Project is unlikely to fragment an existing population, it is also unlikely to lead to the formation of genetically distinct populations through habitat isolation. Furthermore, the habitat affected by the Project is already extremely fragmented and provides limited connectivity, reducing the potential for additional genetic divergence.
result in invasive species that are harmful to an endangered, vulnerable or near-threatened species becoming established in the endangered, vulnerable or near-threatened species' habitat	The primary invasive species, which poses a threat to Koala are dogs (DAWE, 2022). Dogs were recorded in the Study Area during the field survey, though given the already highly disturbed nature of the Study Area and the Project implementing specific environmental management plans including a Pest and Weed Management Plan to mitigate the threat of dogs (see Section 7.3.2), it is unlikely that the Project would proliferate the occurrence of dogs within the area.

Significant impact criteria	Response
introduce disease that may cause the population to decline	Diseases such as Chlamydia (*Chlamydia pecorum*) and Koala retrovirus (KoRV) have been identified in the populations within the region. The prevalence of disease (chlamydiosis) has been found to increase following extreme stress from hot weather, drought, habitat loss and fragmentation (Lunney et al., 2012; McCallum et al., 2017). Symptoms of individuals carrying Chlamydia can become overt when subjected to additional stress. Such stress may be caused by habitat clearing associated with the Project. However, Koala specific management measures will be put in place as part of the updated Blackwater Mine Land and Management Plan (Whitehaven Coal Pty Ltd, 2020) to ensure this threat is mitigated (Section 7.1.2). Important measures will include but not be limited to; pre-clearance surveys to detect the presence of Koalas, directional clearing towards habitat to be retained, leaving identified Koalas in place with dispersal routes and connecting trees available until the individual has moved on without interference. Implementation of these measures will ensure the Project is unlikely to introduce diseases or exacerbate existing diseases that may cause the species to decline.
interfere with the recovery of the species	The National Recovery Plan identifies recovery objectives and threats to be managed for the recovery of the species (DAWE, 2022). The key threats to the species listed in the recovery plan that are relevant to the Project include habitat loss, fragmentation and degradation. In relation to these threats: • the Disturbance Footprint will involve clearing of habitat, although these areas are considered unlikely to be occupied by individuals, will not impact refuge habitat and will not fragment remaining habitat to the extent the species cannot continue to disperse through the landscape; and • suitable habitat will remain in the Study Area and will continue to be available to support the long-term persistence of the species. As the species is expected to persist in the Study Area, the Project is unlikely to interfere with the recovery of the species.
cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species	The suitable habitat within the Disturbance Footprint is not considered to constitute an ecological significant location, given: • the area is unlikely to occupy the habitat • is highly degraded; and • does not provide connectivity between larger areas of higher quality habitat. Additionally, potential indirect impacts on retained habitat are considered to be negligible based on the implementation of mitigation measures detailed in Section 7. As such, the Project is considered unlikely to cause disruption to ecological significant locations of the species.

Significant impact criteria	Response
Outcome	*Given the limited extent of proposed clearing, the species being considered unlikely to occupy habitat within the Disturbance Footprint, the absence of ecological significant locations and the Project not fragmenting or isolating populations, it is unlikely the Project would result in a significant residual impact on the Koala.*

E.6 Protected Wildlife Habitat - Latham's snipe (*Gallinago hardwickii*)

The Latham's snipe is listed as vulnerable under the NC Act.

Habitat preference and distribution

Refer to Appendix D.4.

Presence within the Disturbance Footprint

Refer to Appendix D.4.

Threatening processes

Refer to Appendix D.4.

Recovery actions

Refer to Appendix D.4.

Significant impact assessment

Approximately 20.86 ha of foraging habitat for the Latham's snipe is located within the Disturbance Footprint and will be cleared for the Project (Figure 15). A significant residual impact assessment has been completed against the MSES SRI Guidelines (DSDIP, 2014) and is provided in Table A - 18.

Table A - 18: Significant residual impact assessment for the Latham's snipe

Significant impact criteria	Response
An action is likely to have a significant impact on endangered and vulnerable wildlife if the impact on the habitat is likely to:	

Significant impact criteria	Response
lead to a long-term decrease in the size of a local population	The Study Area is unlikely to support a local population of the species, and the entire population of Latham's snipe migrate to Australia during the northern hemisphere boreal winter where it returns to breed, and therefore local populations do not occur in the Study Area. The foraging habitat present consists of 6.41 ha of permanent foraging opportunities in the form of dams/wetlands and 14.45 ha of ephemeral/intermittent foraging opportunities in the form of cleared gilgai pastureland. Areas of similar foraging habitat are abundant throughout the wider Study Area, including 10.03 ha of dams or wetlands, 520.20 ha of non-remnant gilgai and 8.71 ha of remnant RE 11.3.27 providing wetland habitat. Therefore, given the Project would impact a small proportion (3.42%) of available foraging habitat within the Study Area, it is unlikely the Project would lead to a long-term decrease in the size of a local population.
reduce the extent of occurrence of the species	The Extent of occurrence for Latham's Snipe has been estimated at 13,000 km^2 (DCCEEW, 2024). Approximately 20.86 ha of foraging habitat to be removed within the Disturbance Footprint. Given, the species is widespread and dispersive, and the Project would result in the removal of a small portion (20.86 ha / 3.42%) of similar foraging habitat within the Study Area, there is a very low possibility that the Project would likely reduce the extent of occurrence of the species.
fragment an existing population	Latham's Snipe are a highly mobile species, able to travel long distances and the Project would not cause a barrier to movement for this species. Furthermore, the species will be able to persist in remaining habitat which offers greater quality and quantity in the Study Area and broader landscape. Therefore, the Project is not expected to result in the fragmentation of an existing population of Latham's Snipe.
result in genetically distinct populations forming as a result of habitat isolation	The Project would impact 20.86 ha of foraging habitat for this species. However, the relatively small area of impact to foraging habitat is already well isolated and, as such is unlikely to result in genetically distinct populations. In addition, Latham's snipe do not breed in Australia and the removal of 20.86 ha of foraging habitat outside of the breeding habitat for the species is unlikely to cause the creation of genetically distinct populations. Similarly, potential indirect impacts such as changes to the hydrology, invasion by exotic weeds and disturbance and predation by pest animals will be managed (as described in Section 7.4.1 and Section 7.3.1 respectively) to the extent they are unlikely to decrease the availability or quality of habitat remaining in the Study Area.

Significant impact criteria	Response
result in invasive species that are harmful to an endangered, vulnerable or near-threatened species becoming established in the endangered, vulnerable or near-threatened species' habitat	The Study Area is already impacted by grazing, clearing and mining activities and invasive species are established in the area. Threats to the species as a result of this existing disturbance includes proliferation of weed species, degradation of wetland habitat by feral pigs and predation by feral cats. Management and control of weed and pest species, as described in 0, will include standard industry accepted measures to minimise the spread of weeds and pest animals that have the potential to degrade the ground layer and foraging resources for the Latham's snipe and prey on the species. Therefore, the Project is unlikely to contribute substantially to an invasive species becoming established in Latham's snipe habitat.
introduce disease that may cause the population to decline	The Approved conservation advice for Latham's snipe does not identify any diseases that are likely to impact the species (DCCEEW, 2024). The Project is not expected to result in the introduction of a disease that would impact Latham's snipe.
interfere with the recovery of the species	The removal of 20.86 ha of foraging habitat is not expected to interfere with the recovery of the species. In addition, large areas of non-remnant gilgai habitat that provide high-quality foraging opportunities will remain within the Study Area, continuing to support habitat availability for the species. Therefore, it is unlikely the Project would interfere with the recovery of the species.
cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species	The Project proposes the removal of approximately 20.86 ha of anthropogenic wetlands and dams, along with non-remnant gilgai habitat that may offer ephemeral habitat following rainfall events. While foraging habitat does exist within the Disturbance Footprint, it is relatively isolated from larger, higher-quality habitat areas elsewhere in the Study Area. As a result, these foraging areas are unlikely to be ecologically significant locations.
Outcome	*While The Project would result in the removal of 20.86 ha of foraging habitat for the Latham's snipe, given the extent of similar habitat available throughout the Study Area and wider region, these impacts are not considered important, notable, or of consequence, having regard to its context and intensity.*

E.7 Protected Wildlife Habitat - Ornamental snake (*Denisonia maculata*)

The Ornamental snake is listed as vulnerable under the NC Act.

Habitat preference and distribution

Refer to Appendix D.5.

Presence within the Disturbance Footprint

Refer to Appendix D.5.

Threatening processes

Refer to Appendix D.5.

Recovery actions

Refer to Appendix D.5.

Significant impact assessment

No habitat for the Ornamental snake is located within the Disturbance Footprint (Figure 13). A significant residual impact assessment has been completed against the MSES SRI Guidelines (DSDIP, 2014) and is provided in Table A - 19.

Table A - 19: Significant residual impact assessment for the Ornamental snake

Significant impact criteria	Response
An action is likely to have a significant impact on endangered and vulnerable wildlife if the impact on the habitat is likely to:	
lead to a long-term decrease in the size of a local population	No Ornamental snake habitat was identified within the Disturbance Footprint. The Project would therefore not result in the direct loss of suitable habitat and is unlikely to lead to a long-term decline in the size of an important population. The gilgai habitat remaining in the Study Area that is likely to support an important population will not be directly impacted by the Project
reduce the extent of occurrence of the species	The extent of occurrence for this species is 376,319 km^2 (ALA, 2025). As no Ornamental snake habitat was identified within the Disturbance Footprint, the Project would not reduce the extent of occurrence for the species. Additionally, indirect impacts on retained habitat are considered negligible based on the implementation of mitigation measures detailed in Section 7. As such, there is a very low chance or possibility that the Project would reduce the extent of occurrence of the species.
fragment an existing population	As no Ornamental snake habitat was identified within the Disturbance Footprint, the Project is unlikely to fragment an existing population. The gilgai habitat remaining in the Study Area that is likely to support an important population will not be directly impacted by the Project.

Significant impact criteria	Response
result in genetically distinct populations forming as a result of habitat isolation	As no suitable habitat for the species has been identified within the Disturbance Footprint, there is no chance or possibility the Project would result in genetically distinct populations forming as a result of habitat isolation.
result in invasive species that are harmful to an endangered, vulnerable or near-threatened species becoming established in the endangered, vulnerable or near-threatened species' habitat	Threats to the species include overgrazing and degradation by feral herbivores such as rabbits and feral pigs, proliferation of weed species and predation by feral carnivores, such as foxes and feral cats. The Study Area is already impacted by grazing, clearing and mining extraction activities and invasive species are already established in the landscape, including those listed as potential threats above. Management and control of weed and pest species, as described in Section 7.3.2, will include standard industry accepted measures to minimise the spread of weeds and proliferation of pest animals that have the potential to degrade the ground layer. Therefore, the Project is unlikely to contribute to an invasive species becoming established in the Ornamental snake habitat remaining in the Study Area.
introduce disease that may cause the population to decline	No introduced diseases are known to significantly impact this species. It is unlikely the Project would introduce such as disease in this region.
interfere with the recovery of the species	No Ornamental snake habitat was identified within the Disturbance Footprint, and indirect impacts on retained habitat are considered negligible based on the implementation of mitigation measures detailed in Section 7. As such, there is a very low chance or possibility that the Project would interfere with the recovery of the species.
cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species	As no Ornamental snake habitat was identified within the Disturbance Footprint, the Project is unlikely to cause disruption to ecologically significant locations. The gilgai habitat remaining in the Study Area that is likely to support an important population will not be directly impacted by the Project.
Outcome	*The Project is unlikely to have a significant residual impact on the Ornamental snake, as there is no habitat within the Disturbance Footprint.*

E.8 Protected Wildlife Habitat - Squatter pigeon (southern) (*Geophaps scripta scripta*)

The Squatter pigeon (southern) is listed as vulnerable under the NC Act.

Habitat preference and distribution

Refer to Appendix D.6.

Presence within the Disturbance Footprint

Refer to Appendix D.6.

Threatening processes

Refer to Appendix D.6.

Recovery actions

Refer to Appendix D.6.

Significant impact assessment

Approximately 26.05 ha of breeding and foraging habitat, 6.41 ha of foraging-only habitat, and 262.34 ha of dispersal habitat for the Squatter pigeon (southern) is located within the Disturbance Footprint (totalling 294.80 ha) and will be cleared for the Project (Figure 16). A significant residual impact assessment has been completed against the MSES SRI Guidelines (DSDIP, 2014) and is provided in Table A - 20.

Table A - 20: Significant residual impact assessment for the Squatter pigeon (southern)

Significant impact criteria	Response
An action is likely to have a significant impact on endangered and vulnerable wildlife if the impact on the habitat is likely to:	
lead to a long-term decrease in the size of a local population	The Project proposes the removal of approximately 26.05 ha of breeding and foraging habitat, 6.41 ha of foraging-only habitat, and 262.34 ha of dispersal habitat. However, this impact is unlikely to lead to a long-term decrease in the size of a local population, as any individuals present are expected to be in very low numbers. Additionally, suitable breeding and foraging habitat remains available elsewhere within the Study Area.
reduce the extent of occurrence of the species	The extent of occurrence for the species has been calculated at 1,684,230 km^2 (Queensland Resources Council, 2015). The species will persist in the Study Area and broader region despite the removal of approximately 26.05 ha of breeding and foraging habitat, 6.41 ha of foraging-only habitat, and 262.34 ha of dispersal habitat. Therefore, the Project has a low chance or possibility to reduce the extent of occurrence of the species.

Significant impact criteria	Response
fragment an existing population	The proposed removal will affect approximately 26.05 ha of breeding and foraging habitat, 6.41 ha of foraging-only habitat, and 262.34 ha of dispersal habitat within the Disturbance Footprint. However, this impact has a low chance or possibility to fragment an existing population, as any individuals present are expected to be in very low numbers. Additionally, suitable breeding and foraging habitat remains available elsewhere within the Study Area.
result in genetically distinct populations forming as a result of habitat isolation	The presence of individuals within the Disturbance Footprint is anticipated to be minimal, if any. Furthermore, the habitat across the Study Area is well connected, and any impacts within the Disturbance Footprint are unlikely to result in the formation of genetically distinct populations due to habitat isolation.
result in invasive species that are harmful to an endangered, vulnerable or near-threatened species becoming established in the endangered, vulnerable or near-threatened species' habitat	Threats to the species include overgrazing by feral herbivores such as rabbits, proliferation of weed species and predation by feral carnivores such as foxes and feral cats. The Disturbance Footprint is already impacted by grazing, clearing and mining activities and invasive species are established in the area including feral cats. Implementation of a Weed and Pest Management Plan, as described in Section 7.3.2, will include standard industry accepted measures to minimise the spread of weeds and proliferation of pest animals that have the potential to degrade the ground layer and foraging resources for the Squatter pigeon (southern). Therefore, the Project has a low chance or possibility of contributing to an invasive species becoming established in Squatter pigeon (southern) habitat.
introduce disease that may cause the population to decline	Disease has not been identified as a threat to the Squatter pigeon (southern). Therefore, the Project would not introduce disease that may cause the species to decline.
interfere with the recovery of the species	Recovery actions primarily address impacts to important sub-populations of the Squatter pigeon (southern), of which none occur in the Study Area. Given the low abundance of individuals recorded in the Study Area and availability of habitat elsewhere in the region and mitigation proposed, it is unlikely the Project would interfere with the recovery of the Squatter pigeon (southern).
cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species	The Project proposed the removal of 26.05 ha of breeding and foraging habitat along with 6.41 ha of foraging-only habitat for the species. Although, habitat within the Study Area does not provide particularly unique or rare resources that are important for the long-term maintenance of the species, maintaining genetic diversity, or provide area to support reintroductions of the species.
Outcome	*The Project is unlikely to have a significant impact on the Squatter pigeon (southern) as habitat within the Disturbance Footprint is degraded and unlikely to contain important habitat for the species.*

E.9 Protected Wildlife Habitat - White-throated needletail (*Hirundapus caudacutus*)

The White-throated needletail is listed as vulnerable under the NC Act.

Habitat preference and distribution

Refer to Appendix D.7.

Presence within the Disturbance Footprint

Refer to Appendix D.7.

Threatening processes

Refer to Appendix D.7.

Recovery actions

Refer to Appendix D.7.

Significant impact assessment

Approximately 2,316.58 ha of foraging habitat is located within the Disturbance Footprint and will be cleared for the Project (Figure 17). A significant residual impact assessment has been completed against the MSES SRI Guidelines (DSDIP, 2014) and is provided in Table A - 21.

Table A - 21: Significant residual impact assessment for the White-throated needletail

Significant impact criteria	Response
An action is likely to have a significant impact on endangered and vulnerable wildlife if the impact on the habitat is likely to:	
lead to a long-term decrease in the size of a local population	Given the species' migratory and highly mobile nature, the Study Area is unlikely to support a local population. Therefore, removal of approximately 2,316.58 ha of aerial foraging habitat has a low chance or possibility of leading to a long-term decrease in the size of a local population.
reduce the extent of occurrence of the species	The Disturbance Footprint and surrounding Study Area is unlikely to support a local population of White-throated needletail. Despite the removal of approximately 2,316.58 ha of aerial foraging habitat for the Project, the species is likely to continue to overfly the Study Area and landscapes within the broader region. Therefore, the action has no chance or possibility of reducing the extent of occurrence of the species.
fragment an existing population	The Disturbance Footprint and surrounding Study Area is unlikely to support a local population of White-throated needletails. This is a highly mobile, almost exclusively aerial species. Therefore, the clearing of vegetation within the Disturbance Footprint is unlikely to fragment an existing population.
result in genetically distinct populations forming as a result of habitat isolation	The removal of approximately 2,316.58 ha of aerial foraging habitat has no chance or possibility of resulting in habitat isolation that will lead to the formation of genetically distinct populations given that the species is highly mobile and almost exclusively aerial.

Significant impact criteria	Response
result in invasive species that are harmful to an endangered, vulnerable or near-threatened species becoming established in the endangered, vulnerable or near-threatened species' habitat	The *Conservation Advice Hirundapus caudacutus White-throated Needletail* (TSSC, 2019) does not identify any invasive species that are considered likely to impact the species. The Project is not expected to result in the introduction of an invasive species that would be harmful to White-throated needletails becoming established within overfly habitat for this species.
introduce disease that may cause the population to decline	The *Conservation Advice Hirundapus caudacutus White-throated Needletail* (TSSC, 2019) does not identify any diseases that are likely to impact the species. The Project is not expected to result in the introduction of a disease that would impact White-throated needletails.
interfere with the recovery of the species	The species is unlikely to directly use vegetation communities in the Disturbance Footprint and surrounding Study Area therefore it is not considered to provide ecologically significant habitat for the species or support a local population, therefore the action is unlikely to interfere substantially with the recovery of the species.
cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species	Given this is a non-breeding visitor to Australia, an almost exclusively aerial species and the Disturbance Footprint and surrounding Study Area is unlikely to provide preferred roosting habitat for this species, the Project has no chance or possibility of causing disruption to ecologically significant locations of the species.
Outcome	*Given the species is almost exclusively aerial, the Project is unlikely to cause disruption to ecologically significant locations, fragment an existing population or lead to a long-term decrease in the size of a location population. The Project is therefore considered unlikely to result in a significant residual impact to this species.*

E.10 Protected Wildlife Habitat - Short-beaked echidna (*Tachyglossus aculeatus*)

Short-beaked echidna is listed as Special Least Concern under the NC Act.

Habitat preferences and distribution

The Short-beaked echidna is widespread and occurs throughout Australia in a broad variety of habitats where there is a supply of ants and termites upon which it feeds (Van Dyck & Strahan, 2008). The species also utilises microhabitat features such as thick bushes, hollow logs and debris piles for shelter (Van Dyck & Strahan, 2008) (refer to Section 4.2.3.7).

Presence in the Disturbance Footprint

Short-beaked echidna has not been recorded during any surveys within the Disturbance Footprint. However, given the species is widespread and utilises and range of habitats, suitable habitat within the Disturbance Footprint, includes 122.11 ha of breeding and foraging habitat consisting of remnant, high value regrowth and young regrowth communities.

For additional information on Short-beaked echidna habitat preferences and distribution, refer to Section 4.2.3.7.

Threatening processes

Across most of its range, the Short-beaked echidna is considered to have few major threats (Aplin, 2015). At an individual scale they are susceptible to predation by feral cats and pigs as well as being hit by motor vehicles (S. Nicol, 2015). Land clearing for agriculture and livestock may reduce habitat quality and microhabitat availability for the species (Eldridge et al., 2016).

Recovery actions

There are no recovery actions for the short beaked echidna as the species has a wide distribution, is a habitat generalist and there are limited key threats to the species.

Significant impact assessment

Approximately 122.11 ha of breeding and foraging habitat for the Short-beaked echidna is located within the Disturbance Footprint and will be cleared for the Project (Figure 19). A significant residual impact assessment has been completed against the MSES SRI Guidelines (DSDIP, 2014) and is provided in Table A - 22.

Table A - 22: Significant residual impact assessment for the Short-beaked echidna

Significant impact criteria	Response
An action is likely to have a significant impact on a special least concern (non-migratory) animal wildlife habitat if it is likely that it will result in:	
a long-term decrease in the size of a local population	Up to 122.11 ha of breeding and foraging is proposed to be cleared within the Disturbance Footprint. This is unlikely to lead to a long-term decrease in the size of the local Short-beaked echidna population, given: • measures to mitigate mortality or injury of animals during clearing and construction works (as detailed in Section 7.1.2 of this report) • the presence and extent of similarly suitable habitat adjacent to and connected with the Disturbance Footprint • the species' mobility and continued ability to access foraging and shelter resources within the Study Area and surrounds, and • potential utilisation of cleared and disturbed areas for foraging following rehabilitation or revegetation works.
a reduced extent of occurrence of the species	The Project is unlikely to reduce the species' extent of occurrence, given: • the extent of similarly suitable habitat adjoining and connected with the Disturbance Footprint and within the broader surrounding landscape; and • the species' mobility and continued ability to access breeding, foraging and shelter resources within the Study Area and surrounds.
fragmentation of an existing population	The Project is unlikely to fragment an existing population, as any individuals present are expected to be in very low numbers and the species is known to move across cleared areas.
genetically distinct populations forming as a result of habitat isolation	The Project is likely to remove a total of 122.11 ha of breeding and foraging habitat. This disturbance will not create dispersal barriers that would result in genetically distinct populations forming as the species is the known to move across cleared areas and any individuals present are expected to be in very low numbers.
disruption to ecologically significant locations (breeding, feeding or nesting sites) of a species	The Study Area is unlikely to support ecologically significant locations for this species given the similar nature of vegetation and habitat across the landscape in this region. Nonetheless, the Blackwater Mine Land and Biodiversity Management Plan will be updated as discussed in Section 7, and which will include industry standards to avoid and minimise impacts to animal breeding places and unnecessary stress on native fauna.
Outcome	*The Project is unlikely to result in a significant impact on Short-beaked echidna as the species is likely to occupy the surrounding landscape and the Project is unlikely to fragment or isolate populations of the species.*

Appendix F Vegetation community descriptions

RE 11.3.1 - Remnant

Habitat quality sites:
7



Landform: alluvial plains and channels

Geology/Soils: Quaternary – Quaternary alluvium containing clay, silt, sand and gravel

Land zone: 3

Description: *Acacia harpophylla* woodland on alluvial plains. The subcanopy contained *Terminalia oblongata, Acacia excelsa* and *Lysiphyllum hookeri*. The shrub layer included *Lysiphyllum carronii, Atalaya hemiglauca, Terminalia oblongata, Erythroxylum australe,* and *Citrus glauca*.

Structural formation: Woodland	**Ecologically Dominant Layer (EDL):** T1
Comment: -	**VM Act status/BD:** Endangered/ Endangered

T1

Height interval: 7-16 m	**Median Height:** 10 m	**Estimated Cover Density:** 3-46%

Species: *Acacia harpophylla* (d), *Eucalyptus coolabah* (a), *Lysiphyllum carronii* (a), *Brachychiton rupestris* (a), *Atalaya hemiglauca* (a), *Acacia excelsa* (a), *Erythroxylum australe* (a)

T2

Height interval: 3-6 m	**Median Height:** 4.5 m	**Estimated Cover Density:** 3-48%

Species: *Lysiphyllum carronii, Terminalia oblongata, Acacia excelsa, Erythroxylum australe, Brachychiton rupestris, Lysiphyllum hookeri, Grevillea parviflora*

S1

Height interval: 0.5-8 m	**Median Height:** 3 m	**Estimated Cover Density:** 1-7%

Species: *Lysiphyllum carronii, Atalaya hemiglauca, Citrus glauca, Erythroxylum australe, Terminalia oblongata, Alstonia constricta, Lysiphyllum hookeri, Notelaea microcarpa, Owenia acidula,* and *Grevillea parviflora*

Groundcover

Estimated Cover Density: 12-80%

Species: *Dichanthium sericeum, Aristida calycina, Sporobolus caroli, S. actinocladus, Cynodon dactylon*, Enteropogon ramosus, Chloris divaricata, Heteropogon contortus, Salsola australis, Atriplex muelleri, Enchylaena tomentosa, Nyssanthes diffusa, Capparis lasiantha, Cenchrus ciliaris*, Bothriochloa pertusa*, Urochloa mosambicensis*, Megathyrsus maximus*, Opuntia tomentosa*, Malvastrum americanum*, Harrisia cactus*, Eragrostis trichophora*, Parthenium sp.*, Cryptostegia grandiflora**

RE 11.3.1 – High value regrowth

Habitat quality sites:
3



Landform: alluvial plains

Geology/Soils: Quaternary – Quaternary alluvium containing clay, silt, sand and gravel

Land zone: 3

Description: *Acacia harpophylla* low open woodland on alluvial plain. The subcanopy contained *Lysiphyllum carronii, Terminalia oblongata, A. excelsa, Erythroxylum australe, Brachychiton rupestris, L. hookeri* and *Grevillea parviflora*. The shrub layer included *Terminalia oblongata, L. carronii, Atalya hemiglauca, L. hookeri, and A. harpophylla.*

Structural formation: Woodland	**Ecologically Dominant Layer (EDL):** T1
Comment: -	**VM Act status/BD:** Endangered/ Endangered

T1

Height interval: 7- 8 m	**Median Height:** 7.5 m	**Estimated Cover Density:** 17-58%

Species: *Acacia harpophylla*

T2

Height interval: 3-6 m	**Median Height:** 4.5 m	**Estimated Cover Density:** 7-12%

Species: *Lysiphyllum carronii, Terminalia oblongata, Acacia excelsa, Erythroxylum australe, Brachychiton rupestris, Lysiphyllum hookeri, Grevillea parviflora*

S1

Height interval:1-2 m	**Median Height:** 1.5 m	**Estimated Cover Density:** 1-12%

Species: *Terminalia oblongata, Lysiphyllum carronii, Atalaya hemiglauca, L. hookeri, Acacia harpophylla, Capparis sp.*

Groundcover

Estimated Cover Density: 15-51%

Species: *Sporobolus caroli, S. actinocladus, Dichanthium sericeum, Eragrostis trichophora*, Cynodon dactylon*, Cenchrus ciliaris*, Megathyrsus maximus*, Cyperus sp., Salsola australis, Sclerolaena sp., Atriplex muelleri, Portulaca sp., Parthenium hysterophorus*, Bryophyllum delagoense*, Harrisia sp.**

RE 11.3.2 - Remnant

Habitat quality sites:
2



Landform: alluvial plain

Geology/Soils: Quaternary – Quaternary alluvium containing clay, silt, sand and gravel

Land zone: 3

Description: *Eucalyptus populnea* dominated open woodland on alluvial plain. The subcanopy contained *A. saligna, Terminalia oblongata, Owenia acidula* and *Eremophila mitchellii*. The shrub layer included *Lysiphyllum hookeri, Cassia brewsteri, Capparis lasiantha, Carissa ovata, A. excelsa, Citrus glauca, Owenia acidula,* and *A. saligna.*

Structural formation: Open woodland	**Ecologically Dominant Layer (EDL):** T1
Comment: -	**VM Act status/BD:** Of concern

T1

Height interval: 10-16m	**Median Height:** 15m	**Estimated Cover Density:** 8-44%

Species: *Eucalyptus coolabah (d), E. camaldulensis (d), Lysiphyllum carronii (d), E. populnea (d), Acacia harpophylla (a)*

T2

Height interval: 4 – 7m	**Median Height:** 6m	**Estimated Cover Density:** 12%

Species: *Acacia saligna, Terminalia oblongata, Owenia acidula, Eremophila mitchellii*

S1

Height interval: 2 – 4 m	**Median Height:** 3 m	**Estimated Cover Density:** 0-4%

Species: *Lysiphyllum carronii, Acacia salicina, A. harpophylla, Grewia sp., Atalaya hemiglauca, Citrus glauca, Lysiphyllum hookeri, Owenia acidula, Cassia brewsteri, Capparis lasiantha, Carrisa ovata, Acacia excelsa, Eucalyptus populnea*

Groundcover

Estimated Cover Density: 86 -95%

Species: *Dichanthium sericeum, Chloris divaricata, Eriachne sp., Bothriochloa ewartiana, Bothriochloa pertusa*, Enneapogon polyphyllus, Enteropogon ramosus, Aristida ramosa, Themeda triandra, Eragrostis trichophora*, Stylosanthes scabra*, Abutilon sp., Sida hackettiana, Salsola australis, Melhania oblongifolia, Enchylaena tomentosa, Evolvulus sp., Sclerolaena sp., Cyperus sp., Sida filicaulis, Cenchrus ciliaris*, Megathyrsus maximus*, Urochloa mosambicensis*, Parthenium hysterophorus*, Bryophyllum delagoense*, Harrisia martinii*, Opuntia tomentosa*, Opuntia stricta**

RE 11.3.3 - Remnant

Habitat quality sites:
2



Landform: alluvial channels

Geology/Soils: Quaternary – Quaternary alluvium containing clay, silt, sand and gravel

Land zone: 3

Description: *Eucalyptus coolabah* open forest woodland on alluvial plains. The subcanopy contained *Lysiphyllum carronii, Alstonia constricta, E. melanophloia, Brachychiton rupestris,* and *Erythroxylum australe*. The shrub layer included *Acacia harpophylla, Lysiphyllum carronii, Atalaya hemiglauca* and *Erythroxylum australe*.

Structural formation: Woodland	**Ecologically Dominant Layer (EDL):** T1
Comment: -	**VM Act status/BD:** Of concern

T1

Height interval: 18m	**Median Height:** 18 m	**Estimated Cover Density:** 37-87%

Species: *Eucalyptus coolabah (d), Acacia harpophylla (a), Lysiphyllum sp. (a) and Terminalia oblongata (a).*

T2

Height interval: 8m	**Median Height:** 8 m	**Estimated Cover Density:** 12–34%

Species: *Lysiphyllum carronii, Alstonia constricta, Eucalyptus melanophloia, Brachychiton rupestris,* and *Erythroxylum australe*

S1

Height interval:1-3 m	**Median Height:** 2 m	**Estimated Cover Density:** 2–8%

Species: *Acacia harpophylla, Lysiphyllum carronii, Atalaya hemiglauca, Erythroxylum australe*

Groundcover

Estimated Cover Density: 50-52%

Species: *Dichanthium sericeum, Megathyrsus maximus*, Bothriochloa pertusa*, Cenchrus ciliaris*, Cyperus sp., Malvastrum americanum*, Vittadinia sp., Amyema preissii, Cryptostegia grandiflora*, Parthenium hysterophorus*, Bryophyllum delagoense**

RE 11.3.6 - Remnant

Habitat quality sites:
2



Landform: alluvial plains **and channels**

Geology/Soils: Quaternary – Quaternary alluvium containing clay, silt, sand and gravel

Land zone: 3

Description: *Eucalyptus melanophloia* woodland on alluvial plan. The subcanopy included *Lysiphyllum hookeri, Terminalia oblongata, Acacia harpophylla, Alectryon diversifolius*. The shrub layer included *L. hookeri, Alstonia constricta, A. harpophylla, Terminalia oblongata, Carissa ovata, Atalaya hemiglauca,* and *A. salicina*.

Structural formation: Woodland	**Ecologically Dominant Layer (EDL):** T1
Comment: -	**VM Act status/BD:** Endangered/ Endangered

T1

Height interval: 7-16 m	**Median Height:** 10 m	**Estimated Cover Density:** 12-16%

Species: *Eucalyptus melanophloia* (d), *Acacia harpophylla* (a), *Lysiphyllum carronii* (a), *Acacia excelsa* (a), *Erythroxylum australe* (a)

T2

Height interval: 6-8m	**Median Height:** 7 m	**Estimated Cover Density:** 33-35%

Species: *Lysiphyllum hookeri, Terminalia oblongata, Acacia harpophylla, Alectryon diversifolius, Atalaya hemiglauca*

S1

Height interval: 0.5-2 m	**Median Height:** 1.5 m	**Estimated Cover Density:** 1-30%

Species: *Lysiphyllum hookeri, Terminalia oblongata, Carissa ovata, Acacia harpophylla, Alstonia constricta, Atalaya hemiglauca, Acacia Salicina*

Groundcover

Estimated Cover Density: 40%

Species: *Bothriochloa bladhii, Chloris sp., Sporobolus caroli, Dichanthium sericeum, Chrysopogon fallax, Enteropogon acicularis, Cynodon dactylon*, Aristida calycina, Megathyrsus maximus*, Urochloa mosambicensis*, Cenchrus ciliaris*, Enchylaena tomentosa, Sclerolaena sp., Salsola australis, Capparis lasiantha, Brachyscome sp., Abutilon sp., Cyperus sp., Evolvulus sp., Sida hackettiana, Parthenium sp.*, Harrisia martinii*, Opuntia tomentosa*, Bryophyllum delagoense*, Cryptostegia grandiflora**

RE 11.3.6 - Disturbed Remnant

Habitat quality sites:
3



Landform: alluvial plains **and channels**

Geology/Soils: Quaternary – Quaternary alluvium containing clay, silt, sand and gravel

Land zone: 3

Description: Disturbed *Eucalyptus melanophloia* open forest with understorey of *Lysiphyllum hookeri* and *Terminalia oblongata* along watercourse.

Structural formation: Woodland	**Ecologically Dominant Layer (EDL):** T1
Comment: -	**VM Act status/BD:** Endangered/ Endangered

T1

Height interval: 7-16 m	**Median Height:** 10 m	**Estimated Cover Density:** 16-60%

Species: *Eucalyptus melanophloia* (d), Eucalyptus camaldulensis (sd), *Lysiphyllum hookeri* (sd), *Acacia harpophylla (a),*

T2

Height interval: 4.5-12m	**Median Height:** 8 m	**Estimated Cover Density:** 23-46%

Species: *Acacia harpophylla, Terminalia oblongata, Lysiphyllum hookeri, Alectryon diversifolius, Grevillia parviflora*

S1

Height interval: 0.5-4 m	**Median Height:** 2.5 m	**Estimated Cover Density:** 1-30%

Species: *Lysiphyllum hookeri, Alstonia constricta, Acacia harpophylla, Carissa ovata*

Groundcover

Estimated Cover Density: 56-95%

Species: *Bothriochloa bladhii, Chloris sp., Sporobolus caroli, Salsola australis, Enchylaena tomentosa, Sclerolaena sp., Megathyrsus maximus*, Urochloa mosambicensis*, Cenchrus ciliaris*, Parthenium sp., Harrisia martini*, Bryophyllum delagoense**

RE 11.3.27 - Remnant

Habitat quality sites:
2



Landform: swamp

Geology/Soils: Quaternary – Quaternary alluvium containing clay, silt, sand and gravel

Land zone: 3

Description: *Eucalyptus camaldulensis* woodland fringing watercourse. The subcanopy included *Eremophila mitchellii, Atalaya hemiglauca, Grevillea parvifolia, Lysiphyllum carronii, Owenia acidula, Terminalia oblongata, Acacia salicina.* The shrub layer included *Lysiphyllum carronii, Acacia harpophylla, Acacia saligna, Citrus glauca, Carissa ovata and Capparis lasiantha.*

Structural formation: Woodland

Ecologically Dominant Layer (EDL): T1

Comment: -

VM Act status/BD: Endangered/ Endangered

T1

Height interval: 15.2-16.5 m | **Median Height:** 15.9 m | **Estimated Cover Density:** 7-26%

Species: *Eucalyptus camaldulensis (d), Acacia harpophylla (a), Eucalyptus populnea (a)*

T2

Height interval: 7 m | **Median Height:** 7 m | **Estimated Cover Density:** 10%

Species: *Eremophila mitchellii, Atalaya hemiglauca, Grevillea parvifolia, Lysiphyllum carronii, Owenia acidula, Terminalia oblongata, Acacia salicina,*

S1

Height interval:1-3 m | **Median Height:** 2 m | **Estimated Cover Density:** 3-4%

Species: *Lysiphyllum carronii, Acacia harpophylla, Acacia saligna, Citrus glauca, Carissa ovata, Capparis lasiantha*

Groundcover

Estimated Cover Density: 26-34%

Species: *Bothriochloa ewartiana, Enchylaena tomentosa, Megathyrsus maximus*, Cenchrus ciliaris*, Chloris ventricosa, Aristida ramosa, Urochloa mosambicensis*, Harrisia martinii*, Malvastrum americanum**

RE 11.4.9 – High value regrowth

Habitat quality sites:
2



Landform: gently undulating clay plains

Geology/Soils: Late Tertiary / Quaternary – Locally red-brown mottled, poorly consolidated sand, silty clay, minor gravel; high-level alluvial deposits (generally related to present stream valleys but commonly dissected

Land zone: 4

Description: *Acacia harpophylla* low open forest. The shrub layer included *Carissa ovata, Lysiphyllum carronii, Acacia harpophylla, Citrus glauca, Terminalia oblongata,* and *Acacia salicina*

Structural formation: Low open forest	**Ecologically Dominant Layer (EDL):** T1
Comment: No T2 layer present.	**VM Act status/BD:** Endangered/ Endangered

T1

Height interval: 6-8 m	**Median Height:** 5 m	**Estimated Cover Density:** 26%

Species: *Clematicissus opaca, Atalaya hemiglauca, Owenia acidula, Geijera parviflora, Santalum lanceolatum, Acacia harpophylla (d), Lysiphyllum hookeri (sd), Eucalyptus populnea (scattered), Lysiphyllum carronii, Apophyllum anomalum, Cassia brewsteri, Eremophila mitchellii, Terminalia oblongata, Acacia salicina, Lysiana subfalcata,* and *Amyema quandang.*

T2

Height interval: NA	**Median Height:** 0 m	**Estimated Cover Density:** NA

Species: NA

S1

Height interval:1-2 m	**Median Height:** 1.5 m	**Estimated Cover Density:** 4%

Species: *Carissa ovata, Lysiphyllum carronii, Acacia harpophylla, Citrus glauca, Terminalia oblongata,* and *Acacia salicina.*

Groundcover

Estimated Cover Density: 66%

Species: *Aristida ramosa, Sporobolus caroli, Panicum decompositum, Eriachne mucronata, Eriochloa sp., Sida fibulifera, Cheilanthes sieberi, Oxalis sp., Salsola australis, Enchylaena tomentosa, Trianthema triquetra, Euphorbia sp., Indigofera sp., Cenchrus ciliaris*, Harrisia martinii*, Opuntia stricta*, Abutilon sp., Chloris gayana*, Melinis repens*, Megathyrsus maximus*,* and *Bothriochloa pertusa*.*

RE 11.9.5 – High value regrowth

Habitat quality sites:
4



Landform: gently undulating plains

Geology/Soils: Early Triassic / Middle Triassic - Lithic sandstone, pebbly lithic sandstone, green to reddish brown mudstone and minor volcanilithic pebble conglomerate.

Land zone: 9

Description: *Acacia harpophylla* open woodland. The shrub layer included *Lysiphyllum carronii*, *Atalaya hemiglauca, Terminalia oblongata, Erythroxylum australe*, and *Citrus glauca.*

Structural formation: Woodland	**Ecologically Dominant Layer (EDL):** T1
Comment: -	**VM Act status/BD:** Endangered/ Endangered

T1

Height interval: 6-8.5 m	**Median Height:** 7.8 m	**Estimated Cover Density:** 12-31%

Species: *Acacia harpophylla (d), Flindersia dissosperma (sd), Terminalia oblongata, Santalum lanceolatum, Eremophila mitchellii, Eucalyptus populnea, Brachychiton rupestris*

T2

Height interval: 3-5 m	**Median Height:** 4 m	**Estimated Cover Density:** 8-24%

Species: *Acacia harpophylla, Lysiphyllum carronii, Terminalia oblongata, Owenia acidula, Acacia salicina, Amyema quandang,* and *Atalaya hemiglauca.*

S1

Height interval: 1-2 m	**Median Height:** 1.5 m	**Estimated Cover Density:** 0-16%

Species: *Acacia harpophylla, Terminalia oblongata, Acacia salicina, Atalaya hemiglauca, Carissa ovata, Eremophila mitchellii, Santalum lanceolatum, Grewia latifolia, Alstonia constricta, Jasminum didymum subsp. lineare, Capparis loranthifolia. Cynanchum viminale, Lysiphyllum carronii, Capparis lasiantha, Capparis mitchellii*

Groundcover

Estimated Cover Density: 5-13%

Species: *Achyranthes aspera, Trianthema triquetra, Cenchrus ciliaris*, Enchylaena tomentosa, Enteropogon acicularis, Enteropogon ramosus, Chloris divaricata, Panicum decompositum, Aristida latifolia, Aristida ramosa, Dipteracanthus australis, Sporobolus caroli, Sporobolus actinocladus, Harrisia martini*, Dactyloctenium radulans*, Hypochaeris sp., Phyllanthus sp., Sida sp., Dianella sp., Enneapogon sp.*

Whitehaven

Blackwater North Extension Project

Appendix E
Aquatic Ecology and Groundwater-Dependent Ecosystems Assessment



DPM ENVIROSCIENCES



Blackwater North Project – Aquatic Ecology and Groundwater-Dependent Ecosystems Assessment

September 2026

Blackwater North Extension Project – Aquatic Ecology and Groundwater-Dependent Ecosystems Assessment

3 September 2026

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Blackwater North Extension Project – Aquatic Ecology and Groundwater-Dependent Ecosystems Assessment

3 September 2026

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EXECUTIVE SUMMARY

Whitehaven Blackwater Pty Ltd (Whitehaven Blackwater) owns and operates the Blackwater Mine (BWM), situated approximately 20 kilometres (km) south of Blackwater, Queensland. The BWM has been operating since 1967 and currently operates under Environmental Authority EPML00717813, with existing run-of-mine coal production at approximately 19 million tonnes per annum.

Whitehaven Blackwater is planning an expansion of its current mining footprint to the east of the existing operation. DPM Envirosciences Pty Ltd (DPM Envirosciences) was commissioned by Whitehaven Blackwater to undertake seasonal aquatic ecology and groundwater-dependent ecosystem (GDE) surveys and assessments across the proposed mine expansion areas defined as the Blackwater North Extension Project (the Project).

The scope of this assessment was to describe the aquatic values of the Blackwater North Extension Project area (the Study Area), identify any conservation significant species under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and Queensland *Nature Conservation Act 1992* (NC Act), identify the potential for GDEs to occur, identify and describe any aquatic Matters of State or National Environmental Significance, assess impacts of the Project on aquatic and GDE values and propose impact avoidance and mitigation measures to protect these values.

The findings discussed in this report are based on a desktop assessment and seasonal field surveys by DPM Envirosciences in June-July 2025 and October 2025. Earlier aquatic ecology surveys of the Study Area were undertaken by DPM Envirosciences on behalf of EMM Consulting Pty Ltd (EMM) in December 2019 and May 2020. The findings of these earlier surveys form part of the desktop assessment and provide contextual baseline information alongside the 2025 field surveys.

Aquatic ecology surveys were undertaken in accordance with the Australian River Assessment System (AusRivAS) protocols for Queensland streams. Aquatic GDEs were assessed by desktop assessment, field assessment for visual indicators, and comparison of surface water and groundwater samples for major cations and anions consistent with the Australian *Environmental water tracers in environmental impacts assessments for coal seam gas and large coal mining developments – factsheet*. Subterranean GDEs were assessed by desktop assessment and seasonal pilot survey in accordance with the Queensland *Guideline for the Environmental Assessment of Subterranean Aquatic Fauna* (Department of Science, Information Technology and Innovation 2015). Terrestrial GDEs were assessed by desktop assessment and field measurement of pre-dawn LWP in accordance with the *Australian groundwater-dependent ecosystems toolbox part 2: assessment tools* (Richardson et al. 2011). The assessment of aquatic, subterranean and terrestrial GDEs of the Study Area follows the logical framework identified in the *Information Guidelines Explanatory Note: Assessing groundwater-dependent ecosystems* (Doody, Hancock and Pritchard 2019).

The waterways of the Study Area range from small first order tributaries to the larger fourth order Two Mile Gully and Taurus Creek. Other named waterways of the Study Area include Sagittarius and Deep Creeks. Mapped wetlands in the Study Area are comprised of artificial or modified lacustrine wetlands and include farm dams and two mine water dams (Deep Creek Dam and Taurus Dam). Several smaller, unmapped lacustrine wetland waterbodies (farm dams and a riverine flood channel wetland) also occur. The waterways of the Study Area are ephemeral and are expected to experience flow only after sustained or intense rainfall and runoff in the catchment. Stream flows are highly variable, with most channels expected to dry during winter to early spring when rainfall and runoff is lower. Consequently, physical attributes, water quality, and the composition of aquatic flora and fauna communities are expected to vary seasonally.

Aquatic habitat assessment was undertaken at 13 sites in June-July 2025. The same 13 sites and an additional three aquatic habitat assessment sites were assessed in October 2025. The additional sites were positioned to address amendments to the layout of the Study Area and proposed waterway crossings. The 16 sites comprised 12 sites on riverine system drainage lines, two farm dam sites and two mine water dams. Detailed survey was undertaken at a subset of these sites and included backpack electrofishing, netting for fish/turtles and aquatic macroinvertebrate sampling. No flow was encountered during both survey periods due to prevailing dry conditions in the months leading up to sampling, therefore detailed survey was limited to isolated riverine pools and the dams. However, these conditions provided an opportunity to identify dry season refuge pools that may be important for 'seeding' waterways with fish, turtles, macrocrustaceans and other obligate aquatic invertebrates in times of flow. The dry conditions also presented an opportunity to inform the likelihood of occurrence of surface expression and terrestrial GDEs.

Fish, macroinvertebrates and turtles were surveyed at most wetted sites. Nine Least Concern native fish species, one pest fish species, two Least Concern native turtle species, and a diversity of aquatic macroinvertebrates were detected. Aquatic macroinvertebrate indices, including taxa richness Plecoptera, Ephemeroptera and Trichoptera richness, Stream Invertebrate Grade Number – Average Level Version 2, tolerant taxa and AusRivAS OE50 scores, were variable but likely reflected seasonality more than catchment impacts.

Seasonal flora surveys across the Study Area detected 22 species of aquatic or semi-aquatic flora species, comprising 20 Least Concern native species and two introduced species of little ecological significance.

Overall aquatic value scored at each of the 16 survey sites ranged from Low to Moderate. Sites on Taurus Creek and Two Mile Gully were rated Moderate, due to their importance as regional conduits for fish passage (mapped High or Major risk waterways for fish passage in State mapping). Riverine sites with a stream order 1-2 were rated as having Low aquatic value, except where the Aquatic Conservation Assessment mapping identified the waterway as being of Medium conservation significance – in which case they were rated Moderate aquatic value. The lacustrine wetlands (farm and mine water dams) were rated Low-Moderate or Moderate. Although these lacustrine wetlands are modified or artificial, the semi-permanence of water offers dry season refuge for Least Concern fish and turtle species.

No conservation significant aquatic flora or fauna species listed under the NC Act and/or EPBC Act were recorded in the Study Area. Due to habitat requirements and distributional range, it is unlikely that any conservation-significant aquatic flora or fauna species occur within the waterways or wetlands of the Study Area as either resident or transient occurrences.

There are no wetlands of International Importance or National Importance identified within the Study Area.

Matters of State Environment Significance (MSES) relevant to this aquatic ecology assessment comprise waterways providing for fish passage, which is an MSES only if waterway barrier works are proposed that would limit the passage of fish along the waterway. While the upper extent of several low order (stream order 1 and 2) waterways would be removed for mining, these waterways do not connect to important fish habitat upstream because upstream reaches are within existing active mining areas. As such, their removal would not fragment fish habitat in these waterways as they do not connect to fish habitat further upstream.

Waterway crossings would be positioned on Deep and Taurus creeks. Fish passage would be maintained between existing upstream and downstream habitats because these waterway crossings would be designed and constructed in accordance with the *Accepted development requirements for operational work that is constructing or raising waterway barrier works* (Department of Primary Industries [DPI] 2025b).

Terrestrial GDEs occur within the Study Area in part of the riparian corridor of Taurus Creek. There is no evidence of surface expression or subterranean GDEs within the Study Area, both of which are unlikely to occur. The presence of stygofauna in an aquifer would indicate a subterranean GDE; however, no stygofauna were detected from five bores and five micropiezometers sampled as part of a pilot survey in both July and October 2025, and there is no evidence of stygofauna having previously been detected from within 5 km of the Study Area.

Groundwater is expected to occur in the shallow alluvium of Taurus Creek as ephemeral, discontinuous perched aquifers in sandier material; with clayey material forming aquitards. The alluvial sediments are expected to be of limited extent and thickness but are likely to be episodically recharged by rainfall run-off when Taurus Creek hosts water, resulting in the presence of perched aquifers associated with the alluvium. Given Taurus Creek is subject to continuous natural wetting and drying cycles, the riparian vegetation likely accesses available moisture in the soil/sediment following rainfall, runoff and flow, and accesses available shallow groundwater in the alluvial aquifer for short periods in drier times. The terrestrial GDEs associated with this aquifer would likely be opportunistic, utilising small inputs of groundwater in the alluvial aquifer on occasion, but likely persisting without this input.

The alluvial aquifer of Taurus Creek is recharged by surface flows within Taurus Creek. The Surface Water Assessment for the Project (WRM Water and Environment Pty Ltd 2026) indicates that, notwithstanding the 8.9 percent (%) reduction in the contributing Taurus Creek catchment area during mining, the Project is not expected to materially alter the overall magnitude, duration or frequency characteristics of flows within Taurus Creek. Accordingly, recharge processes to the alluvial aquifer are anticipated to be maintained. On this basis, potential impacts to terrestrial GDEs associated with perched alluvial aquifers are expected to be low.

With effective implementation of mitigation and management measures presented in this report, the Project is unlikely to result in significant impacts on aquatic ecosystem values, including aquatic Matters of National Environmental Significance or MSES.

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Acronyms

Acronym	Description
ACA	Aquatic Conservation Assessment (associated with AquaBAMM)
ALA	Atlas of Living Australia
AquaBAMM	Aquatic Biodiversity Assessment Mapping Methodology
AusRivAS	Australian River Assessment System
BoM	The Bureau of Meteorology
CE	Critically Endangered (threatened fauna species conservation status)
cm	centimetre
DCCEEW	The Commonwealth Department of Climate Change, Environment, Energy and Water
DEHP	The former Queensland Department of Environment and Heritage Protection
DERM	The former Queensland Department of Environment and Resource Management
DES	The former Queensland Department of Environment and Science
DETSI	The Queensland Department of the Environment, Tourism, Science and Innovation
DLGWV	The Queensland Department of Local Government, Water and Volunteers
DNRM	The former Queensland Department of Natural Resources and Mines
DNRMMRRD	Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development
DO	Dissolved Oxygen
DPI	Department of Primary Industries
DSITI	The former Queensland Department of Science, Information Technology and Innovation
E	Endangered (threatened species conservation status)
EA	Environmental Authority
EC	Electrical Conductivity
EO Regulation	Queensland Environmental Offsets Regulation 2014
EPP 2019	*Environmental Protection (Wetland and Water Biodiversity) Policy 2019*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
GDA	Geocentric Datum of Australia
GDE	Groundwater-Dependent Ecosystem
GES	General Ecological Significance (relating to wetlands identified under the EPP 2019)
HES	High Ecological Significance (relating to wetlands identified under the EPP 2019)
HEV	High Ecological Value (relating to waters identified under the EPP 2019)
IESC	Independent Expert Scientific Committee
km^2	Square kilometres
LC	Least Concern species conservation status under the NC Act
LEV	Low Ecological Value

LWP	Pre-dawn leaf water potential
m	metres
mAHD	Metres above (or below) the Australian Height Datum
mbgl	Metres Below Ground Level
MDB	Murray-Darling Basin
MNES	Matters of National Environmental Significance
MQWEV	Map of Queensland Wetland Environmental Values
MSES	Matters of State Environmental Significance
NC Act	Queensland *Nature Conservation Act 1992*
NT	Near Threatened (species conservation status)
NTU	Nephelometric Turbidity Units
PET	Plecoptera, Ephemeroptera and Trichoptera macroinvertebrate richness
RE	Regional Ecosystem
SEA	Sensitive Environmental Area
SIGNAL2	Stream Invertebrate Grade Number – Average Level Version 2
SLC	Special Least Concern species conservation status under the NC Act
SWP	Soil water potential
V	Vulnerable (threatened species conservation status)
WoNS	Weeds of National Significance
WQO	Water Quality Objective

Definitions

Term	Description
Aquatic fauna	An aquatic animal is either a vertebrate or invertebrate that lives in water for most or all of its life. It does not include amphibians or waterbirds (which are considered terrestrial fauna).
Aquatic flora	Plants that have adapted to living in aquatic environments (saltwater or freshwater). These plants require special adaptations for living submerged in water, or at the water's surface.
Biosecurity matter	A living thing, other than a human or part of a human; or a pathogenic agent that can cause disease in a living thing, other than a human, or a pathogenic agent that can cause disease in a human, by the transmission of a pathogenic agent from an animal to a human; or a disease; or a contaminant.
Conservation-significant species	Threatened species listed as Critically Endangered, Endangered, or Vulnerable under the EPBC Act, or as Endangered, Vulnerable, or Near Threatened under the NC Act.
Ephemeral waterways	Waterways that flow for short periods of time following rain events.
Focus Area	An area extending 5 kilometres beyond the Study Area, used for consideration of potential groundwater-dependent ecosystems in the broader area.
Groundwater-Dependent Ecosystem	Groundwater-Dependent Ecosystems (or GDEs) are ecosystems that rely upon groundwater for their continued existence. They may be 100% dependent on groundwater, such as aquifer GDEs, or may access groundwater intermittently to supplement their water requirements, such as riparian tree species in arid and semi-arid areas.
Intermittent waterways	Waterways with seasonal flow during certain times of the year when smaller upstream waters are flowing and/or when groundwater provides enough water for stream flow.
Lacustrine wetland	Large, open, water-dominated systems (for example, lakes) typically larger than 8 hectares. This definition also applies to modified systems (for example, dams), which are similar to lacustrine systems (for example, deep, standing or slow-moving waters) (DERM 2011).
Restricted matter	Listed in Schedule 2 of the Queensland *Biosecurity Act 2014* and refers to biosecurity matter that are currently found in Queensland and that are known to have a significant impact on human health, social amenity, the economy or the environment.
Search Area	The areas/extents of the desktop searches identified in Section 3.5.
Study Area	The polygon provided by Whitehaven and their consultant Resource Strategies.
Stygofauna	Stygofauna are aquatic fauna that live part or all their lives in groundwater systems such as aquifers or underground caves. Stygofauna are found in aquifers and caves, inhabiting the water filled pore spaces, voids, cracks and fissures.
Stygoxenes	Fauna that are not obligate inhabitants of groundwater system (i.e. are not stygofauna).
Waterway	Waterways include riverine systems, watercourses, waterways or drainage lines identified in Queensland Wetlands Map 2009, *Fisheries Act 1994*, Queensland Waterways for Waterway Barrier Works map or Watercourse identification map (*Water Act 2000*).
Waterway barrier works	Defined in Schedule 2 of the *Environmental Offsets Regulation 2014*, and means a dam, weir or other barrier across a waterway.
Wetland	Wetlands include marine, estuarine, riverine, lacustrine and palustrine waterbodies and wetland Regional Ecosystems in Queensland identified in the Queensland Wetlands Mapping, Wetlands of International Importance (EPBC Act), Wetlands of National Importance (EPBC Act), or in the Queensland Wetland Environmental Values map.

1 INTRODUCTION

1.1 Background

The Blackwater Mine (BWM) is an existing, open cut metallurgical coal mine located approximately 20 kilometres (km) south-west of Blackwater in the Bowen Basin, Queensland (Figure 1).

The BWM has been in operation since 1967 and operates in accordance with, amongst other authorisations, Environmental Authority (EA) EPML00717813, granted under the *Environmental Protection Act 1994*.

The BWM is a joint venture between Whitehaven Coal Limited (Whitehaven) (70 percent [%]), Nippon Steel Corporation (20%) and JFE Steel Corporation (10%). Whitehaven Blackwater Pty Ltd (Whitehaven Blackwater), a wholly owned subsidiary of Whitehaven, is the operator of BWM.

The existing BWM comprises a series of open-cut mining pits along an approximate 80 km long strike length. The BWM extracts coal using drill and blast methods, draglines, dozers and truck and shovel fleets for overburden removal and haulage. Existing infrastructure at BWM includes two rail spurs and balloon loops from the Bauhinia Railway Line, a coal handling and preparation plant (CHPP), thermal coal plant (TCP), product stockpiles, run-of-mine (ROM) coal stockpiles, tailings storage facility, in-pit spoil (i.e. waste rock) dumps, train-load out facilities, water management infrastructure and other supporting infrastructure (e.g. haul roads, access roads, laydown areas, electricity transmission lines, workshops and offices).

Whitehaven Blackwater proposes to develop the Blackwater North Extension Project (the Project), which would extend the current open cut mining development at the BWM to within Surface Area (SA) 7 on Mining Lease (ML) 1762 and SA 10 on ML 1759. The Project is expected to optimise mining operations at BWM allowing ongoing employment and economic benefits from the BWM to the local area, region, and State of Queensland.

The Project would include the following activities:

- extension of open cut operations into SA 7 on ML 1762 and SA 10 on ML 1759 to allow mining of additional coal reserves to approximately 2055;
- extraction of an additional 200 million tonnes (Mt) (approximately) of ROM coal;
- continued extraction of up to 19 Mtpa of ROM coal;
- continued use of existing BWM infrastructure (e.g. CHPP, TCP, ROM and product coal stockpiles;
- train load-out, water management, tailings management and other supporting infrastructure;
- construction and operation of new water management and water storage infrastructure in support of extended mining operations;
- development of waste rock emplacement areas;
- continued co-disposal of coarse rejects with waste rock and disposal of tailings into an approved tailings storage facility or in-pit void;
- construction of semi-permanent tailings cells to be utilised for the disposal of fine rejects;
- progressive rehabilitation of the Project;
- ongoing exploration activities in the Project area; and
- other associated infrastructure, equipment and activities.

1.2 Purpose

The purpose of this Aquatic Ecology and Groundwater-dependent Ecosystem (GDE) Assessment is to describe the aquatic ecology and GDE values of the Study Area (Figure 2) as relevant to current Commonwealth and State legislation, and to assess the impact of the Project on these values.

This report includes a baseline assessment of aquatic ecology and GDE values of the Study Area based on desktop assessments of available information, a post-wet season survey conducted June-July 2025, and a follow-up pre-wet season survey conducted in October 2025. Earlier aquatic ecology surveys of the Study Area were undertaken by DPM Enviросciences on behalf of EMM Consulting Pty Ltd (EMM) in December 2019 and May 2020. The findings of these earlier surveys form part of the desktop assessment and provide contextual baseline information alongside the 2025 field surveys. In addition to baseline assessment, this report assesses the impact of the Project on these values and proposes measures to avoid, minimise and mitigate these impacts.

1.3 Scope of work

The scope of work for this Aquatic Ecology and GDE Assessment included the following tasks:

- Conduct a desktop review of available literature and previous studies in the vicinity of the Study Area and conduct database searches for conservation-significant aquatic species.
- Undertake aquatic ecology surveys throughout the Study Area using appropriate methodology to:
  - describe aquatic habitats and their value and importance, including features such as substrate, stream type, water quality, and surrounding land uses;
  - describe aquatic flora and fauna (including mammals, fish, reptiles and aquatic invertebrates) present, or likely to be present at any time of the year;
  - identify and describe any conservation-significant aquatic species, and any introduced aquatic species, that are present or likely to be present in the Study Area, and identify their habitat resources;
  - consider relevant State and Commonwealth guidelines associated with conservation-significant aquatic species likely to occur in the Study Area;
  - identify and describe wetlands present, and their value and importance; and
  - identify and describe GDEs.
- Prepare a comprehensive Aquatic Ecology and GDE Assessment that presents the methods and results of the desktop and field studies, assesses the potential impacts of the Project on aquatic and GDE values, and proposes methods to avoid and mitigate impacts on these values.

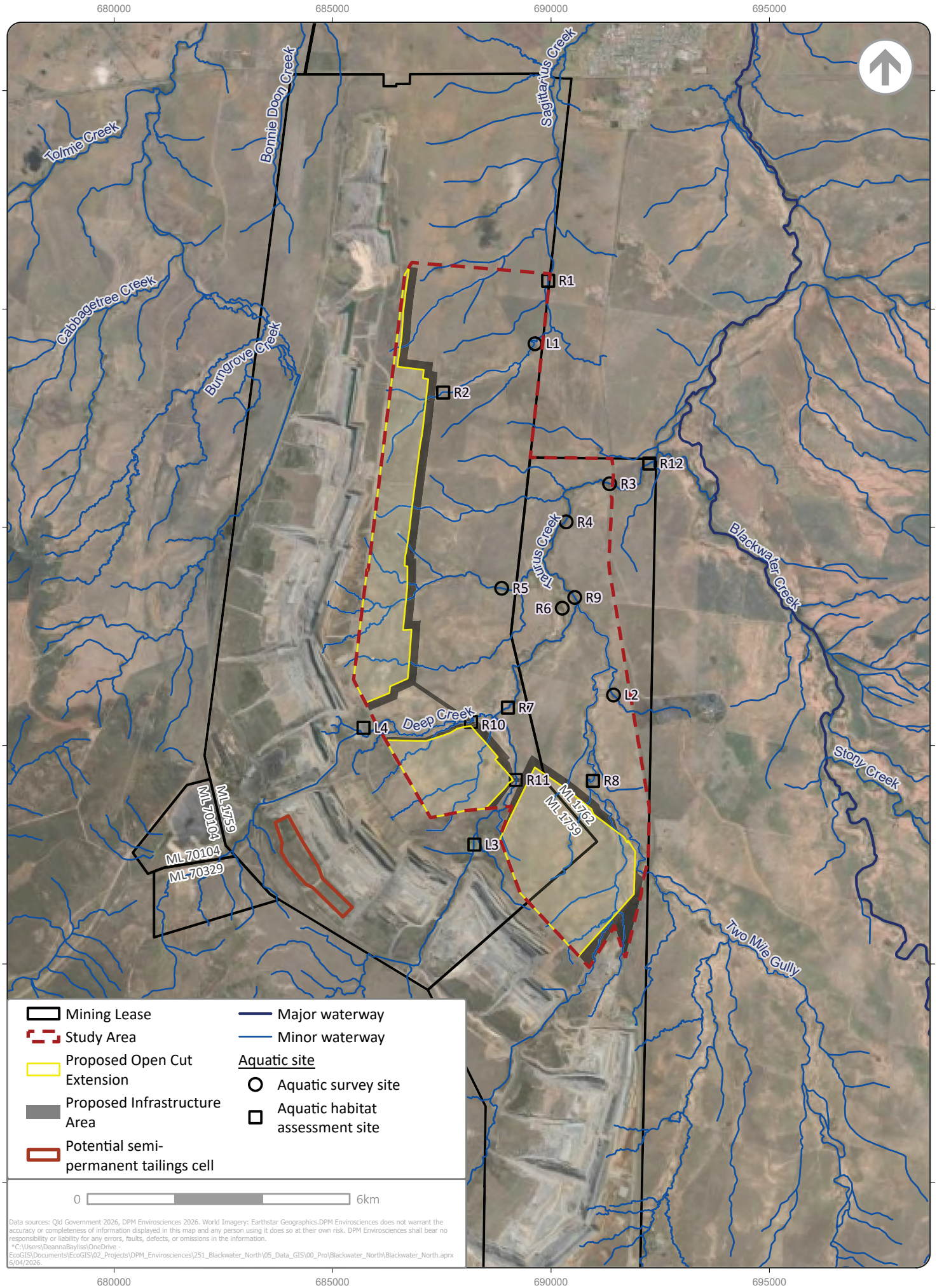


Data sources: Qld Government 2026, DPM Enviroscience 2026. World Hillshade: Esri, USGS.DPM Enviroscience does not warrant the accuracy or completeness of information displayed in this map and any person using it does so at their own risk. DPM Enviroscience shall bear no responsibility or liability for any errors, faults, defects, or omissions in the information.
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REGIONAL CONTEXT

Blackwater North Extension Project - Aquatic Ecology and GDE Assessment

FIGURE 1



BLACKWATER NORTH STUDY AREA

Blackwater North Extension Project - Aquatic Ecology and GDE Assessment

FIGURE 2

2 EXISTING ENVIRONMENT

2.1 Climate and weather

The Study Area falls within the Central Highlands Region of Queensland. The region's climate is sub-tropical, sub-humid, with nearly half its annual rainfall (535 millimetres [mm] per annum) occurring in summer (The Bureau of Meteorology [BoM] 2025).

In the months preceding the June-July 2025 survey, Blackwater Airport weather station 35134 recorded 85.8 mm of rainfall in March, 79.8 mm in April, and 47.0 mm in May 2025 (BoM 2025), representing above-average rainfall in each month. Dry conditions then prevailed in June, with only 1.4 mm rainfall in the 20 days preceding sampling (BoM 2025).

In the three months preceding the October 2025 survey, Blackwater Airport weather station 35134 recorded 42.4 mm of rainfall in July, 17.2 mm in August and 13.0 mm in September (BoM 2025). Dry conditions then prevailed in October leading into the pre-wet survey.

Mean minimum and maximum temperatures for June 2025 at Blackwater Airport were 8.8°C and 23.3°C, respectively, both slightly below average (BoM 2025). Mean minimum and maximum temperatures for October 2025 at Blackwater Airport were 18.6°C and 35.4°C, respectively; both slightly higher than average (BoM 2025).

2.2 Topography and drainage

The topography of the Study Area is gently undulating and low-lying (less than 300 metres Australian Height Datum [mAHD]). Elevation ranges from about 240 mAHD near tributaries of Two Mile Gully to about 170 mAHD in the downstream-most reach of Sagittarius Creek (Queensland Globe 2025). The Study Area is located within the Mackenzie River Sub-basin of the broader Fitzroy Basin. Two Mile Gully and Deep Creek flow into Taurus Creek within the Study Area, which then flows into Blackwater Creek downstream of the Study Area. Blackwater Creek flows in a general northern direction passing to the east of Blackwater township (Figure 2). Sagittarius Creek flows north and passes to the west of Blackwater township, meeting Blackwater Creek to the north of Blackwater township, then into the Mackenzie River. The Mackenzie River converges with the Dawson River to form the Fitzroy River which flows initially north and then east towards the east coast of Queensland and discharges into the Coral Sea south-east of Rockhampton near Port Alma.

Upstream of the Study Area, a third order tributary of Two Mile Gully has historically been diverted to a third order tributary of Taurus Creek, creating fourth and subsequent fifth order reaches of Taurus Creek within the Study Area (actual stream order, based on Strahler 1952) (Figure 3, Section 3.6.1). The Department of the Environment, Tourism, Science and Innovation (DETSI) Queensland Wetlands Mapping (DETSI 2025e, Section 4.1) and the Department of Primary Industries (DPI) Queensland Waterway Barrier Works mapping (DPI 2025a, Section 4.1.3) present the original flow path and therefore third and fourth order reaches of Taurus Creek within the Study Area. Further references to stream order in this document refer to the actual (on ground) stream order based on Strahler 1952, unless specifically referring to State mapping.

At a regional scale, the Mackenzie River Sub-basin is approximately 13,059 square kilometres (km²) and the broader Fitzroy Basin is approximately 142,483 km² (DETSI 2025a).

The *Environmental Protection (Water) Policy 2009: Mackenzie River Sub-basin Environmental Values and Water Quality Objectives Basin No. 130 (part), including all waters of the Mackenzie River Sub-basin* (former Department of Environment and Heritage Protection [DEHP] 2011) and accompanying maps identify environmental values (EVs) for the Study Area. The relevant EVs for the Mackenzie southern tributaries are:

- aquatic ecosystems;

- farm supply/use;
- stock water;
- human consumption;
- primary, secondary and visual recreation;
- drinking water;
- industrial use; and
- cultural and spiritual values.

Whitehaven Blackwater is authorised to release mine-affected water directly to Deep Creek, Taurus Creek and a tributary of Two Mile Gully in accordance with EA EPML00717813 (DETSI 2025a).

2.3 Land Zones

The Study Area contains two Land Zones (Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development [DNRMMRRD] 2025a), comprising:

- Land Zone 3 – Recent Quaternary alluvial systems, including closed depressions, paleo-estuarine deposits, currently under freshwater influence, inland lakes and associated wave-built lunettes. Excludes colluvial deposits such as talus slopes and pediments. Includes a diverse range of soils, predominantly Vertosols and Sodosols; also, with Dermosols, Kurosols, Chromosols, Kandosols, Tenosols, Rudosols and Hydrosols; and Organosols in high rainfall areas.
- Land Zone 4 – Tertiary-early Quaternary clay deposits, usually forming level to gently undulating plains not related to recent Quaternary alluvial systems. Excludes clay plains formed in-situ on bedrock. Mainly Vertosols with gilgai microrelief but includes thin sandy or loamy surfaced Sodosols and Chromosols with the same paleo-clay subsoil deposits.

2.4 Land use

The Study Area is located in the Bowen Basin, where coal mining is prevalent. Land within the Study Area is used predominately for cattle grazing, with areas on the western periphery overlapping with existing coal mining operations at BWM. The land has been largely cleared through past agricultural practices and ongoing disturbance. Relatively small and narrow tracts of remnant vegetation remain (or have re-established) along some of the waterways.

3 METHODS

3.1 Taxonomic nomenclature

Scientific names of fauna used in this report follow those in the WildNet database (DETSI 2025c). Scientific names of flora used in this report follow the Census of the Queensland Flora (Laidlaw 2022).

3.2 Determination of significance level

Conservation-significant species are those taxa listed in the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or Queensland *Nature Conservation Act 1992* (NC Act) as Critically Endangered (CE or CR), Endangered (E), Vulnerable (V), Near Threatened (NT) or conservation dependent (i.e. the focus of a specific conservation program and would become V or E without intervention).

All other native species are Special Least Concern (SLC) or Least Concern (LC) under the NC Act.

3.3 Conservation-significant species likelihood of occurrence

Conservation-significant species identified from the desktop assessment were assigned a likelihood of occurrence based on the criteria identified in Table 1. Targeted searches were undertaken in the field for species identified as either being likely to occur or having potential to occur within the Study Area, based on desktop sources. The assessment was applied again after the surveys to determine the likelihood of occurrence once site-based information became available.

Table 1 Criteria adopted for the likelihood of conservation-significant species, identified from the desktop assessment, occurring within the Study Area

Likelihood of occurrence	Description
Known	The species was positively identified and recorded in the Study Area during the field assessment; previous records of occurrence within the Study Area.
Likely	The species was not recorded during the field survey or previously; however, there are known records within 10 km of the Study Area and suitable habitat exists within the Study Area.
Potential	The species was not recorded during the field survey or previously; however, there are known records within 50 km of the Study Area and suitable habitat exists within the Study Area.
Unlikely	Habitat in the Study Area might be suitable; however, the species was not recorded during the field survey, and no known records of the species exist within 50km of the Study Area.

3.4 Groundwater-dependent ecosystem assessment framework

The assessment of aquatic, subterranean and terrestrial GDEs of the Study Area follows the logical framework identified in the *Information Guidelines Explanatory Note: Assessing GDEs* (Doody, Hancock and Pritchard 2019). The steps of the framework include:

1. defining the project impact area (which includes the footprint of surface infrastructure and the extent of groundwater depressurisation);
2. undertaking a desktop study to identify potential GDEs and potential risks to GDEs in the project impact area (which includes the footprint of surface infrastructure and the extent of groundwater depressurisation);
3. assessing the level of groundwater dependence for each GDE and the potential pathways of cause and effect of activities;
4. identifying the baseline ecological condition and value of each GDE;
5. assessing the likelihood, frequency and magnitude of potential impacts on GDEs and determining the risks related to the activity; and
6. prioritising options to avoid or mitigate impacts on GDEs and establishing a monitoring plan to test the effectiveness of mitigation strategies.

This impact assessment presents and discusses the existing Queensland GDE and Potential GDE Aquifer Mapping (DETSI 2025d) with reference to site observations made during post wet and pre-wet surveys (Section 4.8). In addition to the above, this impact assessment considers a remote sensing-derived GDE mapping dataset (2rog Consulting Pty Ltd [2rog Consulting] 2021) developed for several tenements throughout the Bowen Basin, including BWM, applying the remote sensing method recommended by the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (IESC 2018). The impact assessment also considers a terrestrial GDE desktop assessment for BWM prepared by RDM Hydro Pty Ltd (RDM Hydro), 3D Environmental and Groundwater Enterprises (2023). These datasets have been used to assess the potential for terrestrial GDEs to occur in the Study Area. Field verification of potential GDEs in July and October 2025 approximated the extent of terrestrial GDEs within the Study Area (Section 4.8).

3.4.1 Groundwater-dependent ecosystem risk assessment

A GDE risk assessment process was undertaken following the *Risk Assessment Guidelines for Groundwater Dependent Ecosystems* (Serov, Kuginis and Williams 2012), as referred to in the *Information Guidelines Explanatory Note: Assessing GDEs* (Doody, Hancock and Pritchard 2019) (Section 4.8). This included:

- Identifying GDE types and subtypes and their inferred dependency on groundwater;
- determining the ecological value of the aquifer and its associated GDEs;
- determining the impact of an activity to the aquifer and/or associated GDEs;
- determining the magnitude of potential risk from the project; and
- developing management action strategies through a risk matrix approach.

3.4.2 Ecological value of groundwater-dependent ecosystems

Ecological value ratings were assigned to relevant (terrestrial) GDEs following the *Risk Assessment Guidelines for Groundwater Dependent Ecosystems* (Serov, Kuginis and Williams 2012) (Table 2), as referred to in the *Information Guidelines Explanatory Note: Assessing GDEs* (Doody, Hancock and Pritchard 2019).

Table 2 Criteria adopted for assigning GDE ecological values ratings, adapted from the New South Wales Risk assessment guidelines for GDEs (Serov, Kuginis and Williams 2012)

Ecological value	Criteria
Category 1 – High Ecological Value (HEV) – Sensitive environmental areas	▪ GDE communities (including stygofauna) where only slight changes in key groundwater attributes below or above a threshold would result in their loss; i.e. entirely dependent ecosystems. ▪ GDEs or aquifers that are partly or wholly located within a State or Federal Reserve System; e.g. National Park / Reserve, or a high conservation area. ▪ Any GDE or aquifer that is relatively unaltered and in good condition. ▪ Any natural GDE that is habitat for any endemic, relictual, rare or endangered biota (fauna or flora), populations or communities as listed under State or Commonwealth legislation or identified as above by an acknowledged expert taxonomist/ecologist.
Category 2 – Moderate Ecological Value (MEV) – Sensitive environmental area	▪ GDE communities where moderate change in groundwater discharge or water tables is required to cause change in their distribution, composition and/or health (the value is based on the potential vulnerability/sensitivity to change). ▪ Any natural GDE system that is habitat for any vulnerable or threatened biota (fauna or flora), populations or communities as listed under State or Commonwealth legislation. ▪ Any GDE or aquifer that provides ecological services to other ecosystems such as rivers, wetlands and estuaries. ▪ GDE communities that exhibit either a threshold or proportional response to changes in groundwater attributes. Moderate systems can include highly dependent systems which can exhibit a threshold response. ▪ Any GDE or aquifer that is regarded as in moderate to good condition from its natural state but not covered by state or federal legislation. ▪ Ecosystems where groundwater appears only to play a minor role in the water balance of such ecosystems such as at the end of a dry season or during extreme drought.
Category 3 – Low Ecological Value (LEV)	▪ Any aquifer or GDE type that is highly modified from that of its natural state (that don't otherwise contain High or Moderate value attributes). ▪ Would likely involve a high cost to rehabilitate, if even possible, and there are other similar GDE types in moderate to good condition; i.e. have little need of rehabilitation, existing within the catchment/aquifer.

3.4.3 Potential impacts to an aquifer and/or associated groundwater-dependent ecosystem

Potential impacts to aquifers and/or associated GDEs within the Study Area were considered following the *Risk Assessment Guidelines for Groundwater Dependent Ecosystems* (Serov, Kuginis and Williams 2012), as referred to in the *Information Guidelines Explanatory Note: Assessing GDEs* (Doody, Hancock and Pritchard 2019) (Section 5.6).

3.4.4 Magnitude of risk

The magnitude of risk from Project activities on aquifers and/or associated GDEs of the Study Area has been determined following the *Risk Assessment Guidelines for Groundwater Dependent Ecosystems* (Serov, Kuginis and Williams 2012), as referred to in the *Information Guidelines Explanatory Note: Assessing groundwater-dependent ecosystems* (Doody, Hancock and Pritchard 2019) (Table 3).

Table 3 Determining the magnitude of potential risk to aquifers and GDEs (Serov, Kuginis and Williams 2012)

Risk factors	High	Moderate	Low	Insufficient data or unknown
Water quantity asset				
What will be the risk of a change in groundwater levels/pressure on GDEs?	Reduction in groundwater level(s) or piezometric pressure beyond seasonal variation, resulting in permanent loss or alteration of defined habitat type.	Reduction in groundwater level(s) or piezometric pressure beyond seasonal variation, resulting in temporary loss or alteration of defined habitat type.	No change to aquifer water levels or pressure.	-
What will be the risk of a change in the timing or magnitude of groundwater level fluctuations on GDEs?	Fluctuation in groundwater level(s) or piezometric pressure beyond established seasonal variation, resulting in permanent loss or alteration of defined habitat type.	Fluctuation in groundwater level(s) or piezometric pressure beyond seasonal variation, resulting in temporary loss or alteration of defined habitat type.	No change in timing of water level fluctuations.	-
What will be the risk of changing base flow conditions on GDEs?	Permanent reversal of base flow conditions.	Temporary reversal of base flow conditions exceeding seasonal variation.	No change in direction of flow.	-
Water quality asset				
What is the risk of changing the chemical conditions of the aquifer?	Permanent change; e.g. in pH, dissolved oxygen (DO), nutrients, temperature and/or turbidity.	Temporary change; e.g. in pH, DO, nutrients, temperature and/or turbidity.	Negligible change (<5%).	-
What is the risk on the aquifer by a change in the salt/freshwater interface?	Permanent change in location or gradient of salt/freshwater interface.	Temporary change in location or gradient of salt/freshwater interface.	No change or not applicable.	-

Risk factors	High	Moderate	Low	Insufficient data or unknown
What is the likelihood of a change in beneficial use of the aquifer?	Reduction in water quality beyond designated beneficial use category (for identified trigger parameters).	Reduction in water quality within designated beneficial use category (for identified trigger parameters).	Negligible change for identified triggers (<5%).	-
Aquifer integrity asset				
What is the risk of damage to the geologic structure?	Permanent destruction of the aquifer matrix. Major cracking/fracturing of the bedrock/stream bed leading to complete dewatering of the GDE.	Temporary adjustment to the aquifer matrix. Major cracking/fracturing of the bedrock/stream bed leading to complete dewatering of the GDE.	No change.	-
Biological integrity				
What is the risk of alterations to the number of native species (i.e. richness) within the groundwater-dependent communities (fauna and flora)?	>10% reduction in number of species.	10 to 5% reduction in number of species.	No reduction in number of species.	-
What is the risk of alterations to the species composition (i.e. diversity) of the groundwater-dependent communities (fauna and flora)?	>10% change in species composition.	10 to 5% change in species composition.	No change in species composition.	-
What is the risk of increasing the presence of exotic flora or fauna?	Large populations of one or more species.	Species in small numbers.	None exist.	-
What is the risk of removing or altering a GDE subtype habitat?	>20% removal or alteration of habitat area.	10 to 20% removal or alteration of habitat.	No removal or alteration of habitat.	-

Exception rule: if the number of unknown exceed 50% of questions, the risk is considered to be high until proven otherwise.

3.4.5 Risk matrix and determination of management actions

A risk matrix was applied consistent with the *Risk Assessment Guidelines for Groundwater Dependent Ecosystems* (Serov, Kuginis and Williams 2012), as referred to in the *Information Guidelines Explanatory Note: Assessing GDEs* (Doody, Hancock and Pritchard 2019) (Table 4) to outline the most appropriate management response to potential impacts on EVs (Section 5.6.2).

Table 4 GDE risk matrix (Serov, Kuginis and Williams 2012)

Category 1 HEV Sensitive Environmental Area (SEA)	**A**	**B**	**C**
Category 2 MEV SEA	**D**	**E**	**F**
Category 3 LEV	**G**	**H**	**I**
	Category 1 **Low Risk**	**Category 2** **Moderate Risk**	**Category 3** **High Risk**

3.5 Desktop assessment

3.5.1 Surface aquatic ecosystems, including surface expression groundwater-dependent ecosystems

Desktop searches were undertaken prior to field survey in June 2025. This included a review of available aerial imagery and the following:

- The Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) EPBC Act Protected Matters Search Tool, to identify potential aquatic Matters of National Environmental Significance (MNES) within approximately 10 km of the Study Area (Appendix A) (DCCEEW 2025a).
- DETSI Wetland*Info* Wetland Summary Information (including species listings) for the Mackenzie River drainage sub-basin and the broader Fitzroy Basin, incorporating data from the DETSI WildNet database, Queensland Museum and Queensland Herbarium (DESTI 2025b, c).
- Mapping of Matters of State Environmental Significance (MSES) (the former Department of Environment and Science [DES] 2023), to identify aquatic matters of state interest under the *State Planning Policy 2017* and *Environmental Offsets Regulation 2014* (EO Regulation).
- DETSI WildNet database, to identify aquatic species records within approximately 10 km and 50 km of the Study Area (DETSI 2025c).
- Atlas of Living Australia (ALA) (2025), to interrogate existing species records.
- Queensland Waterways for Waterway Barrier Works mapping (Queensland Department of Primary Industries [DPI] 2025a).
- Queensland Watercourse Identification Series (Queensland Department of Local Government, Water and Volunteers [DLGWV] 2025a).
- Queensland GDE and Potential GDE Aquifer Mapping (DETSI 2025d).
- DETSI Queensland Wetland Data Series Version 7 – Queensland Wetlands Mapping (DETSI 2025e), to determine the classification, extent and significance of lacustrine, palustrine and riverine systems within the Study Area and surrounds.
- Queensland Map of Great Barrier Reef Wetland Protection Areas (DETSI 2025f).
- Queensland Map of Queensland Wetland Environmental Values (DETSI 2025g).
- Queensland Aquatic Conservation Assessment (ACA) mapping (DETSI 2025h).
- Published ecological information on conservation-significant and SLC aquatic flora and fauna species.
- Previous studies relating to aquatic ecology in the Project Area, including:
  - Blackwater Mine – North Extension Project, Aquatic Ecology Baseline Assessment (prepared by DPM Enviros ciences for EMM 2023);
- Relevant survey guidelines, including the Australian River Assessment System (AusRivAS) protocols for Queensland streams (the former Queensland Department of Natural Resources and Mines [DNRM] 2001).

3.5.2 Subterranean groundwater-dependent ecosystems

DPM Enviros applied the Queensland *Guideline for the Environmental Assessment of Subterranean Aquatic Fauna* (the former Queensland Department of Science, Information Technology and Innovation [DSITI] 2015). This included a desktop review to assess the likely presence and composition of subterranean aquatic faunal communities within 5 km of the Study Area. The desktop review involved:

- assessing the suitability of local habitat for subterranean aquatic fauna based on local geological and hydrological conditions; and
- determining the presence and composition of subterranean aquatic fauna in the Focus Area based on any available previous studies or relevant databases, including:
  - *BMA Blackwater Mine: Stygofauna Pilot Survey* (Freshwater Ecology Pty Ltd [Freshwater Ecology] 2021); and
  - the Queensland subterranean aquatic fauna database (Queensland Herbarium 2025), for a search area extending 50 km from the Study Area.

The desktop review results are provided in Section 4.8.1. Freshwater Ecology (2021) sampled 10 bores for stygofauna in November 2020 and May 2021. However, five of these bores are screened too deep (>168 metres below ground level [mbgl]) for subterranean fauna to have access to the borehole and two of the five shallower bores were dry at the time of each seasonal sampling event. Consequently, only three of the 10 bores sampled for stygofauna met the criteria for sampling as per the DSITI (2015) guideline.

DPM Enviros conducted a seasonal stygofauna pilot survey of 10 suitable bores in accordance with the DSITI (2015) guideline, described further in Section 3.7.

3.5.3 Terrestrial groundwater-dependent ecosystems

Desktop searches included a review of the following:

- potential terrestrial GDE mapping in the Queensland GDE and Potential GDE Aquifer Mapping (DETSI 2025d); and
- previous studies relating to the Study Area, including:
  - Remote Sensing of Terrestrial GDEs (2rog Consulting 2021); and
  - BHP Groundwater Dependent Ecosystem Desktop Assessment – Blackwater Mine (RDM Hydro, 3D Environmental and Groundwater Enterprises 2023).

3.6 Survey of surface aquatic ecosystems, including aquatic (surface expression) groundwater-dependent ecosystems

3.6.1 Survey timing, site selection and effort

A post-wet season survey was undertaken across the Study Area by DPM Enviros within the period 18 June to 2 July 2025, aligning with the AusRivAS late wet or post-wet sampling season (May to July). A follow-up dry season survey was undertaken within the period 20 to 25 October 2025, aligning with the AusRivAS early wet or pre-wet sampling season (October to December).

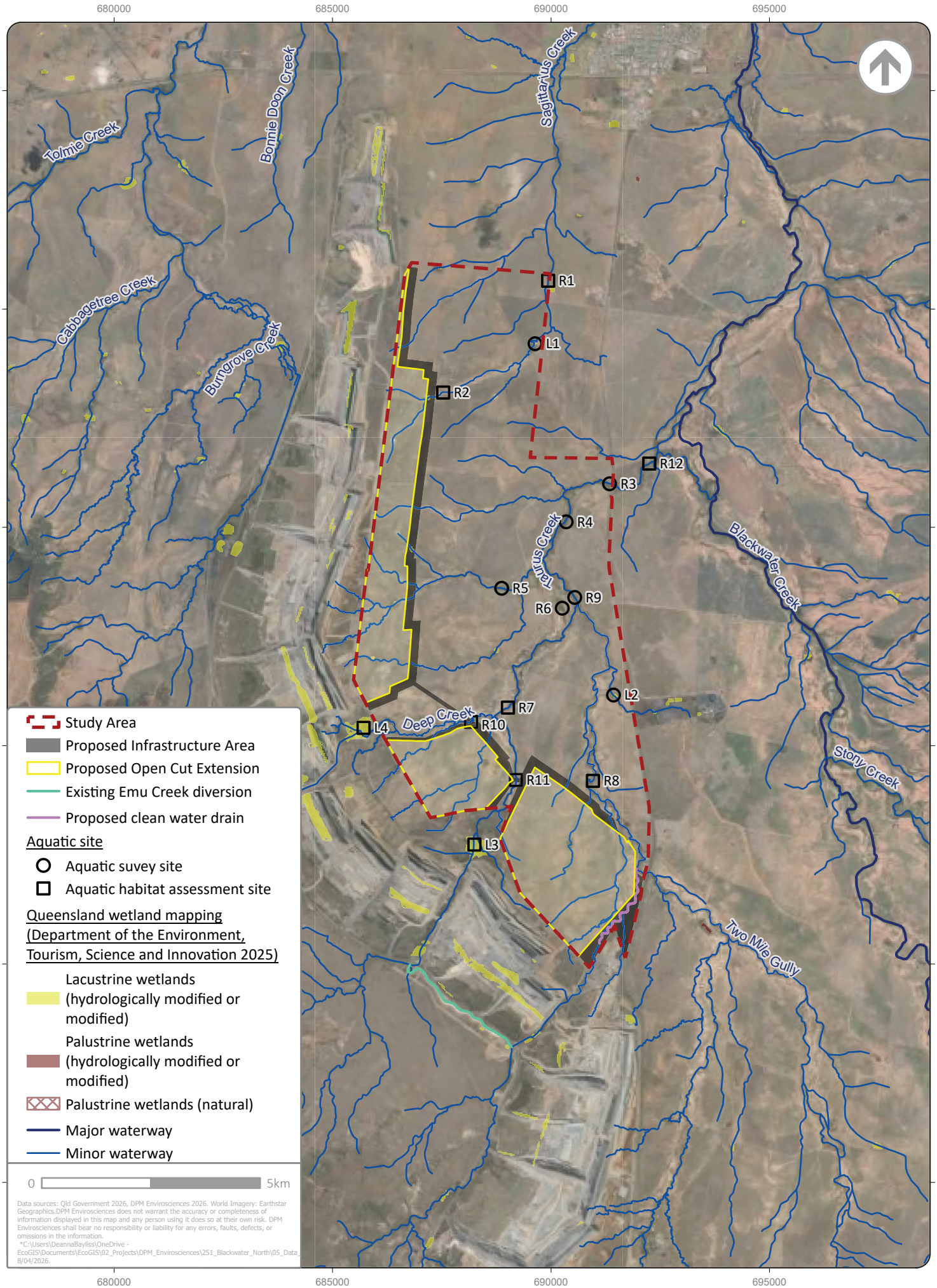
Desktop results were used to identify representative stream reaches and wetland waterbodies for field assessment. Aquatic habitat assessment was undertaken at sites representative of the waterways and wetlands of the Study Area. This comprised 13 sites in June-July 2025 (nine riverine and four wetland sites) (Table 5). The same 13 sites and an additional three riverine aquatic habitat assessment sites were assessed in October 2025, to address amendments to the layout of the Study Area and proposed waterway crossings. Aquatic habitat assessment sites comprised (Figure 3):

1. 12 riverine system drainage lines based on the Strahler (1952) stream order system:
    - three sites (R2, R5 and R10) on second order waterways, including Sagittarius Creek;
    - one site (R1) on third order Sagittarius Creek;
    - four sites (R6, R7, R8 and R11) on fourth order waterways, including Taurus Creek and Two Mile Gully; and
    - four sites (R3, R4, R9 and R12) on the fifth order Taurus Creek (note: appears as fourth order in various State mapping datasets but is verified as a fifth order creek due to the existing Emu Creek Diversion into Taurus Creek.
2. four lacustrine wetland sites (hydrologically modified or artificial):
    - two farm sites on unnamed tributaries (L1 and L2); and
    - two mine water dams on Deep and Taurus creeks (L4 and L3, respectively).

No flow was encountered during the June-July 2025 survey due to prevailing dry conditions in the month leading up to sampling. However, above-average rainfall in March, April and May 2025 resulted in isolated pools and dams sufficient for detailed survey at seven sites in the post-wet (June-July) 2025 survey (Table 5). Detailed survey (including habitat assessment, fish/turtle and macroinvertebrate sampling) was undertaken at five riverine drainage line sites (R3, R4, R5, R6 and R9) and two farm dam sites (L1 and L2). Habitat assessment was undertaken at all 13 sites in June 2025 (Appendix B). Dry conditions provided an opportunity to identify dry season refuge pools important for ‘seeding’ waterways with fish, turtles, macrocrustaceans and other obligate aquatic invertebrates in later times of flow. The dry conditions also presented an opportunity to inform the likelihood of occurrence of surface expression GDEs.

Similarly, lack of rainfall in early October 2025 resulted in dry conditions in the pre-wet survey. Consequently, detailed survey was undertaken at two of the 12 riverine drainage line sites (R3 and R6) and the same two farm dam sites (L1 and L2) in October 2025. All other riverine drainage line sites were dry at the time of assessment. Habitat assessment was undertaken at all 16 sites in October 2025 (Appendix B).

The sampling sites and survey effort are identified in Table 5.



WATERWAYS & WETLANDS OF THE STUDY AREA

Blackwater North Extension Project - Aquatic Ecology and GDE Assessment

FIGURE 3

Table 5 Aquatic survey effort across the Study Area

Site description	Site ID	Date	Stream order (actual, Strahler 1952)	Latitude (Geocentric Datum of Australia [GDA] '20)	Longitude (GDA'20)	Fish survey effort			Turtle effort		Macroinverts.		Physico-chemical water quality	Water sample retained for ion analysis	Habitat assess./aquatic plant survey/photos
						Backpack Electrofishing	Fyke nets	Box traps	Fyke nets	Cathedral traps	Bed habitat	Edge habitat			
Riverine drainage system sites															
Sagittarius Creek	R1	17/06/25	3	-23.6287	148.8619	-	-	-	-	-	-	-	-	-	✓
		20/10/25				-	-	-	-	-	-	-	-	-	✓
Sagittarius Creek	R2	17/06/25	2	-23.6521	148.8387	-	-	-	-	-	-	-	-	-	✓
		20/10/25				-	-	-	-	-	-	-	-	-	✓
Taurus Creek	R3	20/06/25	5	-23.6705	148.8762	✓	✓	✓	✓	-	✓	✓	✓	✓	✓
		22/10/25				✓	-	-	-	-	✓	✓	✓	✓	✓
Taurus Creek	R4	20/06/25	5	-23.6785	148.8666	✓	-	-	-	-	✓	✓	✓	✓	✓
		21/10/25				-	-	-	-	-	-	-	-	-	✓
Taurus Creek tributary	R5	18/06/25	2	-23.6924	148.8523	✓	-	-	-	-	✓	✓	✓	✓	✓
		21/10/25				-	-	-	-	-	-	-	-	-	✓
Taurus Creek flood channel	R6	1/07/25	4	-23.6963	148.8660	✓	✓	✓	✓	-	✓	✓	✓	✓	✓
		21/10/25				✓	-	-	-	-	✓	✓	✓	✓	✓
Taurus Creek	R7	1/07/25	4	-23.7170	148.8541	-	-	-	-	-	-	-	-	-	✓
		22/10/25				-	-	-	-	-	-	-	-	-	✓
Two Mile Gully	R8	1/07/25	4	-23.7319	148.8734	-	-	-	-	-	-	-	-	-	✓
		22/10/25				-	-	-	-	-	-	-	-	-	✓
Taurus Creek	R9	18/06/25	5	-23.6941	148.8688	✓	-	✓	-	-	✓	✓	✓	✓	✓
		21/10/25				-	-	-	-	-	-	-	-	-	✓
Deep Creek	R10	21/10/25	2	-23.7201	148.8459	-	-	-	-	-	-	-	-	-	✓
Taurus Creek	R11	21/10/25	4	-23.7320	148.8561	-	-	-	-	-	-	-	-	-	✓
Taurus Creek	R12	23/10/25	5	-23.6662	148.8851	-	-	-	-	-	-	-	-	-	✓

Site description	Site ID	Date	Stream order (actual, Strahler 1952)	Latitude (Geocentric Datum of Australia [GDA] '20)	Longitude (GDA'20)	Fish survey effort			Turtle effort		Macroinverts.		Physico-chemical water quality	Water sample retained for ion analysis	Habitat assess./aquatic plant survey/photos
						Backpack Electrofishing	Fyke nets	Box traps	Fyke nets	Cathedral traps	Bed habitat	Edge habitat			
Lacustrine waterbody sites															
Farm dam	L1	17/06/25	1	-23.6417	148.8591	✓	✓	✓	✓	-	✓		✓	✓	✓
		20/10/25				✓	✓	✓	✓	-	✓		✓	✓	✓
Farm dam	L2	17/06/25	1	-23.7141	148.8778	✓	✓	✓	✓	-	✓		✓	✓	✓
		22/10/25				✓	✓	✓	✓	-	✓		✓	✓	✓
Taurus Dam (mine water)	L3	3/07/25	3	-23.7454	148.8470	-	-	-	-	-	-		✓	✓	✓
		20/10/25				-	-	-	-	-	-		✓	✓	✓
Deep Creek Dam (mine water)	L4	3/07/25	2	-23.7216	148.8217	-	-	-	-	-	-		✓	✓	✓
		20/10/25				-	-	-	-	-	-		✓	✓	✓

3.6.2 Aquatic habitats

Aquatic habitats were described in accordance with AusRivAS protocols for Queensland streams (DNRM 2001). This established a general description of the environment of each site and its immediate surrounds. The classifications are based on flow level, depth, velocity, width, canopy cover, substrate types, habitat attributes, local catchment erosion, sediment deposits, water colour, algae, water odour, substrate odour, presence of large woody debris, riparian zone width and cover, and general signs of disturbance.

Variable flows, caused by natural events such as rainfall, runoff and drought/flood cycles influence the aquatic ecosystems of an area. This should be taken into consideration for future studies which may utilise results contained in this report.

Habitat assessment scores (out of 135) were made for each site based on the 9 AusRivAS categories (Table 6). Aquatic habitat at each site was classified as Poor, Fair, Good or Excellent based on the overall score.

A detailed description of the aquatic habitat encountered at each site is included in the site profiles in Appendix B.

Table 6 Aquatic habitat assessment variables and categories

Habitat variable	Poor	Fair	Good	Excellent
Bottom substrate/available cover	0 – 5	6 – 10	11 – 15	16 – 20
Embeddedness	0 – 5	6 – 10	11 – 15	16 – 20
Velocity/depth category	0 – 5	6 – 10	11 – 15	16 – 20
Channel alteration	0 – 3	4 – 7	8 – 11	12 – 15
Bottom scouring and deposition	0 – 3	4 – 7	8 – 11	12 – 15
Pool/riffle, run/bend ratio	0 – 3	4 – 7	8 – 11	12 – 15
Bank stability	0 – 2	3 – 5	6 – 8	9 – 10
Bank vegetative stability	0 – 2	3 – 5	6 – 8	9 – 10
Streamside cover	0 – 2	3 – 5	6 – 8	9 – 10
Total	**0 – 38**	**39 – 74**	**75 – 110**	**111 – 135**

3.6.3 Surface water quality

In-situ physico-chemical water quality was assessed as a component of the AusRivAS aquatic habitat assessments, to inform initial equipment settings for backpack electrofishing, and to assist in the interpretation of collected macroinvertebrate data. The ionic composition of surface water was sampled and assessed to assist in characterising surface waters of the Study Area, including their likely interaction with groundwater.

In-situ measurements

In-situ physico-chemical water quality parameters were measured at each wetted survey site using a YSI Professional Plus multi-parameter water quality meter and Hach Turbidimeter 2100Q, each calibrated prior to and following sampling. Water quality parameters measured included:

- temperature (°C);
- pH;
- electrical conductivity (EC; micro siemens per centimetre [µS/cm]);
- turbidity (Nephelometric Turbidity Units [NTU]); and
- DO (milligrams per litre [mg/L] and % saturation).

For the purposes of this assessment, salinity descriptors were based on the following EC ranges (the former Department of Agriculture, Fisheries and Forestry 2012):

- fresh – <800 µS/cm;
- marginal – 800 to 1,600 µS/cm;
- brackish – 1,600 to 4,800 µS/cm;
- slightly saline – 4,800 to 10,000 µS/cm;
- moderately saline – 10,000 to 20,000 µS/cm; and
- saline – >20,000 µS/cm.

Ions

Water samples were obtained from each wetted site in accordance with the *Monitoring and Sampling Manual* (DES 2018). Samples were chilled and delivered to ALS Environmental (a National Association of Testing Authorities [NATA] accredited laboratory) and were analysed for the following major ions to assist in characterising surface waters of the Study Area:

- major anions (Cl, SO_4 and alkalinity); and
- major cations (Ca, Mg, Na and K).

Groundwater samples were also obtained from subterranean GDE sampling sites (Section 3.7.2) for analysis and comparison of major anions and cations consistent with the IESC *Fact Sheet: Environmental water tracers in environmental impact assessments for coal seam gas and large coal mining development* (Office of Water Science 2020).

Data analysis

Physico-chemical water quality measurements were compared against Water Quality Objectives (WQOs) nominated in *Environmental Protection (Water) Policy 2009: Mackenzie River Sub-basin Environmental Values and Water Quality Objectives Basin No. 130 (part), including all waters of the Mackenzie River Sub-basin* (DEHP 2011). This includes WQOs for moderately disturbed aquatic ecosystems (applied to riverine sites) and WQOs for lakes/reservoirs (applied to wetland waterbody sites).

3.6.4 Fish

Fish were surveyed at seven wetted sites using a combination of backpack electrofishing, dip-netting, and overnight deployment of baited box traps and fyke nets (Section 3.6.1) where sufficient depth was encountered (Table 5).

Fish survey effort included:

- backpack electrofishing using a Smith-Root LR-24 electrofisher for up to 1200 seconds power-on time (100 hertz frequency; 20% duty cycle; 200-400 volts, to suit conductivity);
- dip-netting in combination with backpack electrofishing, using an Environet® manoeuvred through the water column;
- fyke netting – with two fyke nets, dual wing, 4 metres (m) wing lengths, 0.6 m drop, 3 mm mesh, baited with apple, banana, beef, spinach and rinsed sardines – deployed overnight to capture active fish (and both carnivorous and omnivorous turtles); and
- box traps – with five traps, 22 centimetres (cm) x 22 cm x 40 cm, 2 mm mesh, 50 mm opening, baited with dry cat food.

Fish survey was restricted to backpack electrofishing and dip-netting at some sites, due to insufficient depth for deployment of fyke nets or box traps (Table 5). However, these sites were thoroughly fished using backpack electrofishing techniques.

Captured fish were identified, with native species released at the point of capture.

3.6.5 Turtles

The Survey Guidelines for Australia's Threatened Reptiles (Department of Sustainability, Environment, Water, Population and Community [DSEWPC] 2011) suggest that the Fitzroy River turtle (*Rheodytes leukops*) can be readily observed in riffle zones by diving with a face mask and snorkel, or collected by seine netting, and also that the partly carnivorous diet of this species indicates it might be attracted to meat baits in traps. Survey guidelines for the white-throated snapping turtle (*Elseya albagula*) are not identified in the DSEWPC (2011) survey guidelines due to the subsequent listing of this species as Critically Endangered (from Least Concern) in November 2014. However, DPM Enviros has successfully captured this species using baited fyke nets and cathedral traps on other projects in the Mackenzie River Sub-basin.

The Terrestrial Vertebrate Fauna Survey Guidelines for Queensland (Department of Science, Technology, Innovation and the Arts 2014) suggest that freshwater turtle surveys should employ one or more of the following techniques:

- visual survey;
- snorkelling;
- spotlighting;
- trapping; and
- seine netting.

Freshwater turtles were surveyed at sites R3, R6, L1 and L2 (Section 3.6.1) by overnight deployment of baited fyke nets, as well as observations of the bank and water surface for sunning and breaching turtles. Suitable habitat for the deployment of cathedral traps (i.e. trees or snags overhanging deep pools) was not encountered.

Snorkelling surveys are not permitted by Whitehaven Coal Limited safety policy.

3.6.6 Mammals

Habitat suitability for platypus (*Ornithorhynchus anatinus*) was assessed at each site. This included targeted searches for burrows along banks.

3.6.7 Freshwater macroinvertebrates

Freshwater macroinvertebrate samples were collected from suitable habitats in June 2025 (sites R3, R4, R5, R6, L1 and L2) and October 2025 (sites R3, R6, L1 and L2) to gain an improved understanding of the health, trophic interactions and values of representative aquatic sites. Samples were collected by AusRivAS accredited ecologists following AusRivAS protocols for Queensland streams (DNRM 2001; DES 2018). AusRivAS protocols specify a standardised, qualitative, rapid bioassessment method that aims to consistently sample a wide diversity of macroinvertebrates within a defined timeframe.

The bed and edge habitats were sampled separately at each riverine site in accordance with AusRivAS protocols. At wetland waterbody sites (farm dams), a composite sample was collected incorporating all habitat conditions available (i.e. woody debris, macrophytes, bed and edge, deep and shallow areas).

A standard sized dip net with 250 micrometre (µm) mesh was used to sample macroinvertebrates. Following collection, the samples were transferred to plastic sorting trays, where the contents were sorted and live-picked for 30 minutes. Picked specimens were placed into specimen jars with 70% ethanol.

Samples were identified by an AusRivAS accredited ecologist to AusRivAS taxonomic level in the laboratory under stereomicroscope. AusRivAS taxonomic identification is primarily to Family level, with the exception of lower Phyla such as Porifera, Nematoda and Nemertea, Oligochaetes (freshwater worms), Acarina (mites), and microcrustacea such as Ostracoda, Copepoda and Cladocera. Chironomids (midges) are identified to sub-family taxonomic level.

Data analysis

The macroinvertebrate data was used to calculate a number of community descriptors as described in the following sections.

Taxonomic richness

Taxonomic richness was calculated from the number of taxa present in each sample, with richness typically increasing with ecological condition.

Plecoptera, Ephemeroptera and Trichoptera

The Plecoptera, Ephemeroptera and Trichoptera (PET) richness was calculated from the number of taxa belonging to the three PET orders. These orders are widely accepted as being most sensitive to environmental change, such as habitat degradation and pollution (DEHP 2009). A low PET richness score, due to the absence of these pollution-sensitive taxa, suggests that a site may be impacted by degradation or pollution. Conversely, a high PET richness suggests a system free from degradation or pollution.

Stream Invertebrate Grade Number – Average Level Version 2

Stream Invertebrate Grade Number – Average Level Version 2 (SIGNAL2) indices were calculated, with each taxon allocated a score from 1 to 10 based on Chessman (2003). Taxa with low scores are most tolerant of a range of environmental conditions, and those with high scores are more sensitive to pollution. The presence/absence data of each taxon were used to calculate the SIGNAL2 average for the site, in accordance with the protocols described by Chessman (2003).

Pollution-tolerant taxa

The percentage of pollution-tolerant taxa was calculated based on the SIGNAL2 indices. Tolerant taxa are classified as those with a SIGNAL2 score of 3 or less (Marshall et al. 2001). Macroinvertebrate families in this group are expected to tolerate changes to their environment, including habitat degradation and some pollution. An absence of more sensitive taxa suggests environmental conditions may be too harsh for sensitive taxa (those with SIGNAL2 scores above 3) to tolerate.

Australian River Assessment System OE50

The macroinvertebrate and predictor variables (habitat) data were analysed using the AusRivAS macroinvertebrate predictive modelling program, version 3.2.2 (eWater Ltd 2017). The predictive models are typically based on semi-permanent to permanent reference streams. Although the models provide another useful macroinvertebrate community descriptor, the results are applied to ephemeral waterways with caution.

AusRivAS OE50 values were derived from the AusRivAS model, comparing the observed taxonomic assemblages to those expected (i.e. O/E) (with a >50% chance of occurring at a test site) under 'reference' (least disturbed) conditions in the broader catchment. OE50 taxa are attributed to bands representing different levels of biological condition. The band width is based on the distribution of OE50 taxa values for the reference sites in each model. The AusRivAS bands and descriptions are identified in Table 7.

Table 7 AusRivAS bands and descriptions (based on Coysh et al. 2000)

Band	Description	OE50 taxa	O/E taxa interpretation
X	More biologically diverse than reference	OE50 greater than 90th percentile of reference sites used to create the model.	More families found than expected. Potential biodiversity "hot spot" or mild organic enrichment. Continuous irrigation flow in a normally intermittent stream.
A	Similar to reference	OE50 within ranged of central 80% of reference sites used to create the model.	Expected number of families within the range found at 80% of the reference sites.
B	Significantly impaired	OE50 below 10th percentile of reference sites used to create the model. Same width as Band A.	Fewer families than expected. Potential impact either on water and/or habitat quality resulting in a loss of families.
C	Severely impaired	OE50 below Band B. Same width as band A.	Many fewer families than expected. Loss of families from substantial impairment of expected biota caused by water and/or habitat quality.
D	Extremely impaired	OE50 below Band C down to zero.	Few of the expected families and only the hardy, pollution tolerant families remain.

The AusRivAS models utilised, based on location, season and habitats sampled, are identified in Table 8 (post-wet) and Table 9 (pre-wet), along with the different input variables applied to each season.

Table 8 AusRivAS post-wet habitat predictor model variables for Queensland Regional Coastal draining sites, and the values applied

Code	Description	Riverine site and input value				
		R3	R4	R5	R6	R9
Edge habitat						
ALTITUDE	Height above sea level (mAHD)	182	185	192	190	190
BEDSLOPE	Slope of bed (m/m)	0.002	0.002	0.004	0.002	0.002
LONGITUDE	Decimal degrees to 4 decimal places	148.8762	148.8666	148.8523	148.8660	148.8688
MDMR	Mean dry season monthly rainfall (mm)	21	21	21	21	21
RAINRANGE	Annual range in mean monthly rainfall	74	74	74	74	74
RAWD	Ratio of mean wet season to mean dry season rainfall	3.25	3.25	3.25	3.25	3.25
WETPERCENT	Percentage rainfall in wet season	76	76	76	76	76
Pool/bed habitat						
COBBLE	Percent cobble (64-256 mm diameter sediments) in habitat	0	0	0	0	0
DFS	Distance from source (km)	41	39	6	20	36
MDMR	Mean dry season monthly rainfall (mm)	21	21	21	21	21
MINTEMP	Mean daily minimum temperature (°C)	16.3	16.3	16.3	16.3	16.3
RAINFALL	Mean annual rainfall (mm)	535	535	535	535	535

Notes:

Rainfall and temperature data derived from the BoM station 35134 – Blackwater Airport (2013-2025).

°C = degrees Celsius.

Table 9 AusRivAS pre-wet habitat predictor model variables for Queensland Regional Coastal draining sites, and the values applied

Code	Description	Riverine site and input value	
		R3	R6
Edge habitat			
ALTITUDE	Height above sea level (mAHD)	182	190
LONGITUDE	Decimal degrees to 4 decimal places	148.8762	148.8660
MDMR	Mean dry season monthly rainfall (mm)	21	21
MINTEMP	Mean daily minimum temperature (°C)	16.3	16.3
RAWD	Ratio of mean wet season to mean dry season rainfall	3.25	3.25
WETR	Range in wet season monthly rainfall means (mm)	40.7	40.7
Pool/bed habitat			
COBBLE	Percent cobble (64-256 mm diameter sediments) in habitat	0	0
MDMR	Mean dry season monthly rainfall (mm)	21	21
PROCESSZONE	Process zone category (2 = erosional; 1 = transport; 0 = depositional)	1	1
RAINRANGE	Annual range in mean monthly rainfall	74	74
RAINGETEMP	Mean daily temperature range (°C)	14.1	14.1

Notes:
Rainfall and temperature data derived from the BoM station 35134 – Blackwater Airport (2013-2025).
°C = degrees Celsius.

3.6.8 Aquatic flora

Aquatic plants were surveyed at each site. All aquatic plants were identified to species using available literature and taxonomic keys where needed. The abundance of each species was estimated using the AusRivAS (DNRM 2001) categories: extensive (>75% cover), moderate (50-75%), some (10-50%) or little (1-10%).

3.6.9 Overall aquatic values

An aquatic values rating of Low, Moderate or High was assigned to each site based on the summation of all available information from the desktop and field assessments (Table 10). When assessing each site, the most conservative criteria was applied. The criteria in Table 10 are listed from most to least important.

Table 10 Adopted criteria for assigning aquatic values ratings

Aquatic values/sensitivity	Key aquatic values/criteria
High	A site can have one or more of the following to be considered 'High': ▪ Permanent riverine waterbody or natural wetland. ▪ Wetland of High Ecological Significance. ▪ Conservation-significant species habitat present. ▪ Known presence of platypus breeding place. ▪ Near natural / excellent in-stream habitat. ▪ Mapped as High or Very High conservation significance in ACA mapping. ▪ Excellent habitat assessment score (111 – 135).
Moderate	A site can have one or more of the following to be considered 'Moderate': ▪ Ephemeral or semi-permanent waterbody. ▪ Wetland of General Ecological Significance. ▪ Platypus foraging habitat present. ▪ Some good quality in-stream habitat. ▪ Mapped as Major or High risk of impact from fish barriers. ▪ Mapped as Medium conservation significance in ACA mapping. ▪ Good habitat assessment score (75 – 110). ▪ Dry season riverine refuge for common (Least Concern) species.
Low	A site can have one or more of the following to be considered 'Low': ▪ Ephemeral waterbody. ▪ No conservation-significant species or platypus habitat. ▪ In-stream habitat highly modified/disturbed. ▪ Mapped as Low or Very Low conservation significance in ACA mapping. ▪ Poor to Fair habitat assessment score (0 – 74).

3.7 Field-verification of subterranean groundwater-dependent ecosystems

3.7.1 Stygofauna sampling effort

A seasonal pilot survey was undertaken to sample the local presence of subterranean aquatic fauna in consideration of the *Guideline for the Environmental Assessment of Subterranean Aquatic Fauna* (DSITI 2015). Field sampling protocols were consistent with the *Monitoring and Sampling Manual* (DES 2018).

Consideration of existing groundwater bores for sampling

A review of the DLGWV (2025b) groundwater database identified 49 registered bores within 5 km of the Study Area. Bore reports were reviewed to assess the suitability of bores for sampling and their likelihood of containing stygofauna.

The *Guideline for the Environmental Assessment of Subterranean Aquatic Fauna* (DSITI 2015) requires that bores sampled for stygofauna be at least 6-months old, have groundwater present, and are constructed such that subterranean fauna would have access to the borehole. The *Information Guidelines Explanatory Note: Assessing GDEs* (Doody, Hancock and Pritchard 2019) identifies characteristics of bores most likely to yield stygofauna, including screen aperture (slot widths) of at least 1 mm wide in the screened interval to allow entry of larger taxa such as amphipods.

Stygofauna in Queensland have been encountered at depths of up to 60 mbgl, at conductivities above 50,000 µS/cm and in both acidic and alkaline environments (Schultz et al. 2013 and Glanville et al. 2016, cited in DES 2018). 4T Consultants Pty Ltd (4T 2012) prepared a desktop assessment of at least 13 stygofauna studies in Queensland and established water quality conditions in which stygofauna were likely to be found. In fractured rock, stygofauna were more likely where the aquifer was <50 mbgl, pH 6.5-8.5 and EC <5,000 µS/cm (4T 2012). In alluvium, stygofauna were more likely where the aquifer was <20 mbgl, pH 6.5-8.5 and EC <2,000 µS/cm (4T 2012).

Bores within the Focus Area with these characteristics, or similar, were targeted for field sampling in July and October 2025. Of the 49 bores within the Focus Area (Appendix C), 10 were considered suitable to target for stygofauna. Of these 10 target bores, only five contained water at the time of sampling (Section 4.8.1). Five micropiezometer sampling sites were established in the sandy/gravelly alluvium of Blackwater Creek (Section 3.7.2) to fulfill the DSITI (2015) guideline requirement for 10 locations sampled (twice/seasonally) in a pilot survey.

3.7.2 Field sampling

Stygofauna sampling from bores

Three sizes of phreatobiological nets were carried in the field for stygofauna sampling, with diameters of 40 mm, 90 mm and 130 mm. Nets are constructed of 50 µm monomesh and are weighted at the bottom. The net tapers to a removable collection chamber at the base, allowing ease of collection for replicate samples following each haul.

Nets were lowered to the bottom of the bore, bounced five to 10 times to dislodge resting animals, then retrieved. The collection chamber was rinsed into a 50 µm mesh sieve at the top of each haul. The 20 litres (L) of purged water was also run through the 50 µm mesh sieve. Once 6 hauls were completed, the entire sieve contents were transferred to a labelled sample jar and preserved in ethanol.

Nets were washed thoroughly three times in deionised water between sampling locations.

Stygofauna sampling from micropiezometers

Samples were collected from the hyporheic zones at the edge of standing pools using a hand-operated bilge-pump to extract water from micropiezometers (13 mm internal diameter, 2 mm openings; of similar construction to Hancock and Boulton 2005) hammered into the sediments with a metal driving rod to a total depth of 1 mbgl and with a screened interval of 0.3-1.0 mbgl (Plate 1). A sample of 10 L was extracted from micropiezometers MP1 to MP5 (Figure 23) and run through a 50 µm monomesh filter. The filtered contents were transferred to a labelled sample jar and preserved in ethanol.



Plate 1 Micropiezometers (small, temporary polyvinyl chloride wells) utilised for stygofauna sampling from the stream bed

Physico-chemical water quality

A water sample was retained from each bore and micropiezometer after the stygofauna sampling. EC and pH were measured from this sample on site using a YSI Professional Plus multi-parameter water quality meter, calibrated prior to and following sampling.

Ions

A separate water sample was retained from each bore immediately after obtaining the water sample for physico-chemical water quality. Samples for major cations were field-filtered and collected in bottles pre-treated with nitric acid. Samples for major anions were placed in bottles without preservative. Samples were chilled and delivered to ALS Environmental (a NATA accredited laboratory) and were analysed for the following major ions to assist in characterising surface water/groundwater interactions of the Project site:

- major anions (Cl, SO_4, F and HCO_3); and
- major cations (Ca, Mg, Na and K).

3.7.3 Sample processing

Field samples were sorted in the laboratory under stereomicroscope. Each sample container was drained of ethanol and washed into a channelled counting tray to create a thin layer of sediment spread across the bottom of the tray. Aquatic animals were picked under stereomicroscope. Potential significant stygofauna would have been sent to Dr Peter Hancock, a stygofauna specialist, for identification to genus/morphospecies taxonomic level; however, no potential stygofauna were detected.

3.7.4 Personnel

Field sampling was led by David Moore, an aquatic ecologist with over 20 years of experience on both surface water and groundwater projects across Australia, including stygofauna sampling. Laboratory processing was undertaken by Chris Pietsch, an aquatic ecologist with 20 years of experience in aquatic assessments across Australia, including processing of aquatic invertebrate samples.

3.8 Field-verification of terrestrial groundwater-dependent ecosystems

3.8.1 Approach

State-mapped terrestrial GDEs were field verified on 19-20 June 2025 using measurements of pre-dawn leaf water potential (LWP) and soil water potential (SWP). Dry conditions in the lead-up to and throughout the fieldwork (only 1.4 mm in 20 days preceding sampling [BoM 2025]) made for suitable conditions to differentiate between trees utilising soil moisture in the upper soil profile versus those trees accessing deeper sources of moisture/groundwater. Follow-up sampling was conducted on 25 October 2025 at the same locations. Additional locations upstream and downstream of the initial survey location were scheduled for October 2025 to further inform the delineation of GDEs along Taurus Creek. However, trees within the original sites were not accessing groundwater in October 2025 and therefore no delineation was undertaken.

LWP is a measure of the resistance of the pathway to water movement and is a function of the soil water availability, evaporative demand and the conductivity of the soil-to-leaf pathway (Richardson et al. 2011). There is generally little to no transpiration of water during the night from most types of plants and so the movement of water through the stem approaches static conditions overnight. For this reason, pre-dawn LWP is generally in equilibrium with the matric potential of the soil (the tension with which water is held to soil particles) at the main depth at which the plant takes up water.

Pre-dawn LWP measurements were used to compare trees against the expected LWP range for known terrestrial GDEs subject to fresh to slightly saline salinity regimes as is expected in the shallow alluvial aquifers of the Study Area. The expected pre-dawn LWP range was drawn from a range of published and unpublished sources including DPM Enviroscsiences (2022), 3D Environmental (2020), Jones et al (2019), Holland et al (2006) and Mensforth et al (1994). Expected pre-dawn LWP for trees in equilibrium with:

- a fresh to marginal saturated source of moisture (EC <1,500 µS/cm) = >-0.2 megapascals (MPa);
- a slightly saline saturated source of moisture (EC >1,500 to 10,000 µS/cm) = <-0.2 to >-0.55 MPa; and
- a moderately saline to saline saturated source of moisture (EC >10,000 to 25,000 µS/cm) = <-0.55 to >-1.4 MPa.

Trees that demonstrated pre-dawn LWP values that were more negative than the expected range for the local groundwater salinity regime (i.e. <-0.55 MPa) were assumed not to be groundwater dependent.

For trees where pre-dawn LWP was within the expected range of values for GDEs accessing fresh to slightly saline saturated sources of moisture (i.e. pre-dawn LWP ≥-0.55 MPa), comparison with SWP values from the soil profile (at 1 and 2 m depths) was undertaken to determine whether moisture for transpiration was likely being supplied from the upper soil profile or whether deeper sources of moisture/groundwater can be inferred.

Field survey results were analysed spatially to distinguish between canopy trees that were likely accessing groundwater at the time of assessment and those which were not.

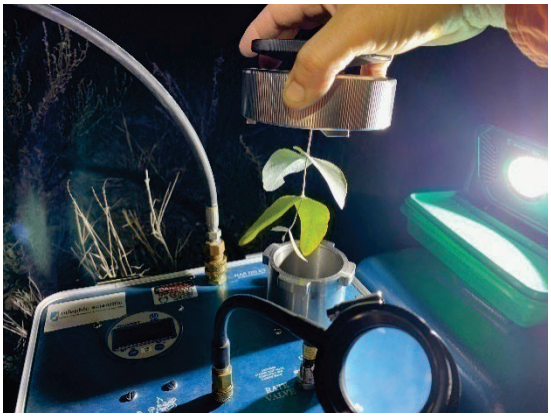
3.8.2 Pre-dawn leaf water potential

Measurements of pre-dawn LWP were obtained within 2-hours of dawn using a pressure chamber (Model 1505D, scale range of 0.0 to 10.0 MPa, PMS Instrument Company, Oregon, USA) filled with nitrogen gas. Measurements were taken from excised shoots, each with 3-10 leaves, sampled from the lower foliage (mean height of 4.7 m from ground level, range 1 to 8 m) of each sample tree (Plate 2). Twelve trees were sampled on 20 June 2025, comprising six trees at each of two sites. Coolibah (*Eucalyptus coolabah*) was the dominant canopy species at each site, with only rare occurrence of other species. Consequently, only coolibah trees were sampled. The same 12 coolibah trees were sampled on 25 October 2025, plus three silver-leaved ironbark (*E. melanophloia*) and two poplar box (*E. populnea*) individuals.

Nitrogen gas was used to apply pressure to each leaf/shoot sample in the pressure chamber. Most of the shoot is placed inside the chamber, but the cut end of the stem (the petiole) is exposed outside the chamber. The amount of pressure it takes to cause water to appear at the cut surface of the petiole indicates how much tension the leaf is experiencing on its water supply. A high value of required pressure means a high value of tension and a high degree of water stress.



Pre-dawn collection of leaves using a pole saw



Pre-dawn measurement of leaf water potential

Plate 2 Measuring pre-dawn leaf water potential

3.8.3 Soil water potential

Soil samples were collected in June and October 2025 from two depths (1 and 2 m below surface) from two locations at each of the two sites using a battery-powered drill, auger bit and soil probe. Samples were not required from 2 m at two locations in June 2025 due to saturated soils at 1 m negating the need for deeper samples. Samples were placed in a 50 millilitre jar, sealed, then analysed later that day using a WP4C chilled mirror hygrometer (Plate 3).



Collection of soil from 1 m and 2 m depths with a drill and probe combination



Analysis of samples with a chilled mirror hygrometer

Plate 3 Measuring soil water potential

4 RESULTS – AQUATIC ECOLOGY CHARACTERISTICS OF THE STUDY AREA

4.1 Waterways

The Queensland Wetlands Mapping (DETSI 2025e) identifies riverine systems, watercourses, waterways or drainage lines (herein referred to collectively as waterways) for the Study Area.

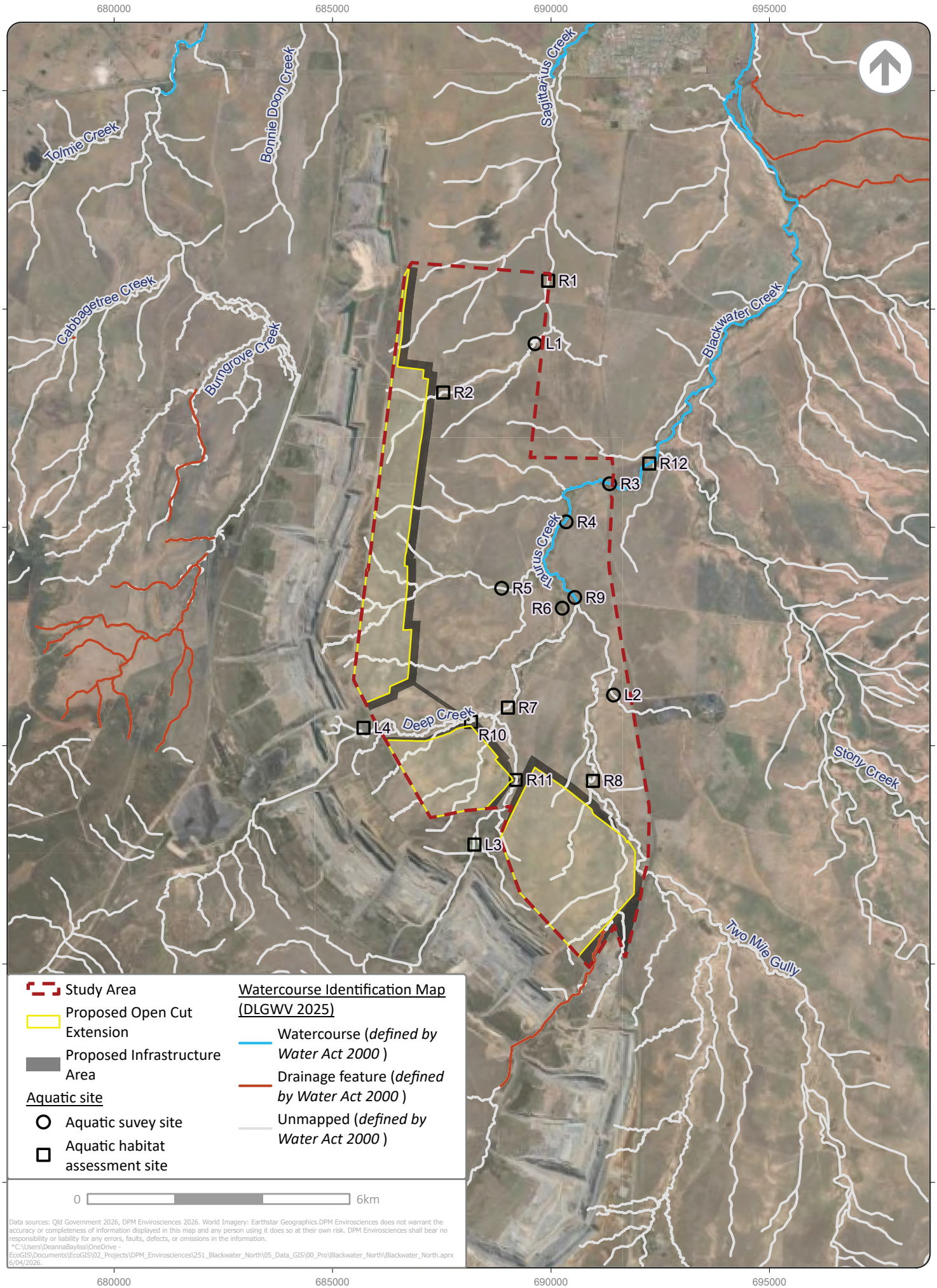
The waterways of the Study Area comprise mainly first and second order waterways (based on Strahler 1952). The third order waterways comprise Sagittarius and Taurus Creeks and an unnamed tributary of Two Mile Gully. The fourth order waterways comprise Taurus Creek and Two Mile Gully. Taurus Creek also includes a fifth order reach within the Study Area (Figure 3).

The waterways of the Study Area are ephemeral, experiencing flow for relatively short duration following rainfall and runoff in the catchment, likely ceasing to flow within days to weeks, and supporting aquatic life whose life cycles are adapted to these conditions. Flow within the larger fifth order Blackwater Creek, approximately 1.8 km downstream of the Study Area, is likely ephemeral to intermittent, with seasonal flow during certain times of the year when smaller upstream waterways are flowing and/or when groundwater contributions provide enough water for stream flow following recharge of the alluvial aquifer.

4.1.1 Watercourses

State-mapped watercourses

The DLGWV (2025a) watercourse identification map (Figure 4) identifies Taurus Creek, downstream of its confluence with Two Mile Gully, as a waterway that exhibits the characteristics of a watercourse as defined by the *Water Act 2000*. All other waterways of the Study Area were yet to be mapped by DLGWV (2025a) at the time of this assessment.



WATERCOURSE IDENTIFICATION MAP

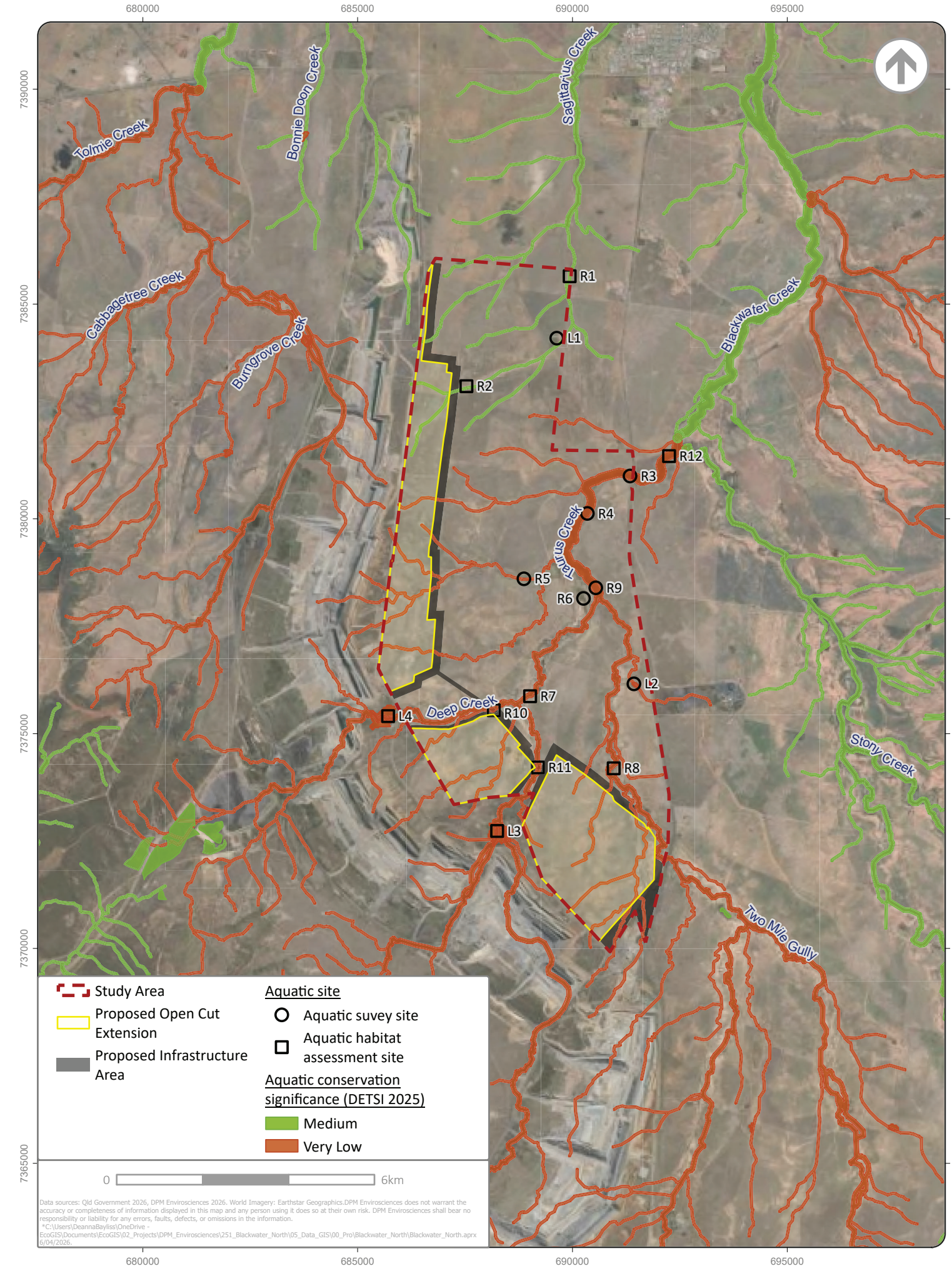
Blackwater North Extension Project - Aquatic Ecology and GDE Assessment

FIGURE 4

4.1.2 Conservation values

The Aquatic Biodiversity Assessment and Mapping Method (AquaBAMM) (Clayton et al. 2006), was developed to assess conservation values of wetlands and waterways in Queensland. It is a comprehensive method that uses available data (including data from expert opinion) to identify relative non-social, non-economic conservation/ecological values within a specified area. The criteria in AquaBAMM are naturalness (aquatic), naturalness (catchment), diversity and richness, threatened species and ecosystems, priority species and ecosystems, special features, connectivity and representativeness. The ACA for the riverine (Inglis and Howell 2009) and non-riverine (Rollason and Howell 2012) wetlands of the Great Barrier Reef (produced by the former Queensland Department of Environment and Resource Management) is a product of applying this method. The associated ACA mapping (DETSI 2025h) identifies (Figure 5):

- Sagittarius Creek and its tributaries as being of Medium conservation significance;
- Taurus Creek and its tributaries as being of Very Low conservation significance; and
- Lacustrine waterbodies (farm and mine water dams), where mapped, as being of very low conservation significance.



AQUATIC CONSERVATION ASSESSMENT

Blackwater North Extension Project - Aquatic Ecology and GDE Assessment

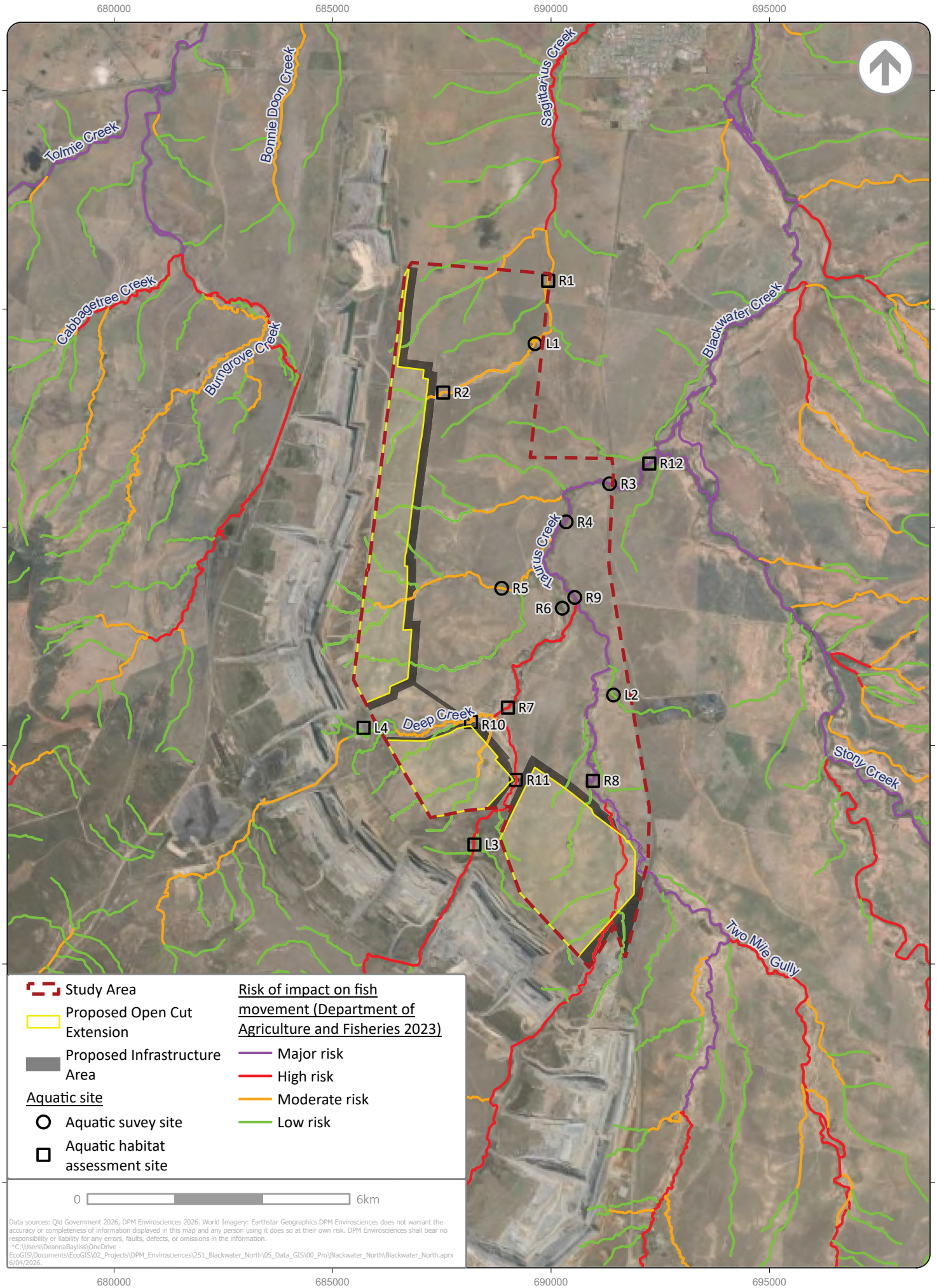
FIGURE 5

4.1.3 Waterways for fish passage

While it is understood that a waterways barrier works permit is not required where the works occur in a ML authorised under an EA, fish passage is a MSES and so is addressed here.

Waterways, as defined by the *Fisheries Act 1994*, include rivers, creeks, streams, watercourses or inlets of the sea. The DPI (2025a) Queensland Waterways for Waterway Barrier Works mapping (Figure 6) indicates the level of 'risk' associated with undertaking waterway barrier works within Queensland waterways. Waterways with higher stream orders, steeper slopes, higher flow rates, greater numbers of fish present and fish with stronger swimming abilities are allocated a higher level of risk (Department of Agriculture and Fisheries 2023).

In consideration of these factors, Two Mile Gully and the downstream reach of Taurus Creek are State-mapped as being at Major risk of adverse impact from waterway barrier works on fish movement (DPI 2025a). Waterways State-mapped as being at High risk of adverse impact from waterway barrier works on fish movement (DPI 2025a) include the upstream reach of Taurus Creek and an unnamed tributary of Two Mile Gully. Other mapped waterways within the Study Area are indicated as being at Low to Moderate risk of adverse impact from waterway barrier works on fish movement (DPI 2025a) (Figure 6).



WATERWAYS FOR WATERWAY BARRIER WORKS MAPPING

Blackwater North Extension Project - Aquatic Ecology and GDE Assessment

FIGURE 6

4.2 Aquatic habitat

The waterways of the Study Area are ephemeral and experience flow only after sustained or intense rainfall and runoff in the catchment. Stream flows are highly variable, with most channels expected to dry during winter to early spring when rainfall and runoff is generally lower. During these times, aquatic fauna concentrates in senescing pools and may perish. Consequently, physical attributes, water quality, and the composition of aquatic flora and fauna communities are expected to vary seasonally.

Aquatic habitat was assessed at 12 riverine sites (sites R1 to R12) on representative waterways of the Study Area (Figure 3). No flow was encountered at the time of assessment in June-July 2025, but isolated pools were encountered at sites R3, R4, R5, R6 and R9. In October 2025, isolated pools of much less extent were encountered only at sites R3 and R6.

There are 12 State-mapped (DETSI 2025e) lacustrine wetlands (hydrologically modified or artificial) within the Study Area, all of which are either farm dams with constructed earthen walls on the downstream side or are constructed mine water dams. Numerous smaller farm dams occur throughout the Study Area but are too small to form part of the Queensland Wetland Mapping (DETSI 2025e). The lacustrine wetland waterbodies of the Study Area provide semi-permanent aquatic habitat, although are likely only connective with downstream habitats when flow is encountered following sufficient rainfall and runoff in the catchment that results in filling and spill from these dams. Aquatic habitat was assessed at four of the State-mapped lacustrine wetlands, comprising two representative farm dams (sites L1 and L2) and the two mine water dams (sites L3 and L4) within the Study Area. Site L3 comprises a mine water dam on Taurus Creek referred to as Taurus Dam or Release Point (RP) 2 in EA EPML00717813 (DETSI 2025a). Site L4 comprises a mine water dam on Deep Creek referred to as Deep Creek Dam or RP3 in EA EPML00717813.

4.2.1 Physico-chemical water quality

Post-wet (June-July) 2025

Surface water temperatures at the time of assessment in June-July 2025 ranged from 11.5°C to 17.2°C (Table 11). Water temperatures are influenced by time of day, shading and depth. The slightly higher temperature of 17.2°C at site L2 likely reflects temperature absorption from black sediments containing coal fines washed down from the Cook CHPP, observed in June 2025 (Appendix B) and also in 2019-2020 (EMM 2023).

pH levels ranged from 6.2 (slightly acid) to 8.9 (strongly alkaline), falling within the WQO guideline range of 6.5-8.5 at the riverine sites, falling below the WQO range at farm dam site L1, and exceeding the WQO range at mine water dam sites L3 and L4 (Table 11).

The riverine and farm dam sites exhibited ‘fresh’ (<800 µS/cm) water (Table 11). Marginal water was detected at mine water dam L4 (965 µS/cm) and slightly saline water was detected at mine water dam L3 (5,124 µS/cm). EC levels exceeded the relevant WQO guideline (<310 µS/cm for riverine sites and <250 µS/cm for lakes/reservoirs) at sites R5 (378 µS/cm), L2 (628 µS/cm), L3 and L4. The EC levels at sites L3 and L4 (RP2 and RP3 in EA EPML00717813, respectively) were below the release limit (for context only) of 10,000 µS/cm (being slightly to moderately saline water) identified in EA EPML00717813 (DETSI 2025a).

Surface water DO levels were variable across the Study Area (Appendix B), reflecting several factors including time of day, temperature, organic load, biological activity, flow (or lack thereof) and rate of transfer from the atmosphere. DO measurements ranged from 45.8% (low saturation) at riverine site R9 to 98.4% (saturated) at riverine site R5 (Table 11).

Turbidity levels ranged from 9.6 NTU (high clarity) at farm dam site L1 (fenced to exclude cattle) to 394 NTU (poor clarity; opaque) at riverine site R4 on Taurus Creek. The higher turbidity levels at some sites reflect a high washload (silts and clays held in suspension) likely associated with cattle and other animals accessing these drying pools, as well as bioturbation from aquatic fauna within these pools.

Pre-wet (October) 2025

Surface water temperatures at the time of assessment in October 2025 ranged from 21.3°C to 33.1°C (Table 12). Water temperatures are influenced by time of day, shading and depth.

pH levels ranged from 7.5 (mildly alkaline) to 9.7 (very strongly alkaline), falling within the WQO guideline range of 6.5-8.5 at riverine site R3, exceeding this range at site R6, and exceeding the WQO guideline range of 6.5-8.0 at each lacustrine site (Table 12). The elevated pH levels are associated with high DO levels.

Low DO levels at site R3 reflects a combination of factors including time of day (early morning), lack of flow, and oxygen consumption by aerobic bacteria associated with the breakdown of organic matter in senescing pools. Supersaturated DO levels at sites R6, L1 and L3 reflect the time of day and photosynthetic release of oxygen from the extensive algae and macrophyte cover at these sites. The consumption of carbon dioxide during photosynthesis reduces the formation of carbonic acid and decreases the concentration of hydrogen ions, increasing the pH of the water. Both DO and pH levels are expected to fluctuate vastly over a 24-hour period, especially as isolated waterbodies senesce, nutrients concentrate, temperatures increase, and both algae levels and macrophyte cover proliferate.

The riverine and farm dam sites exhibited ‘fresh’ (<800 µS/cm) water (Table 12). Marginal water was again detected at mine water dam L4 (1,403 µS/cm) and slightly saline water was again detected at mine water dam L3 (4,951 µS/cm). EC levels exceeded the relevant WQO guideline (<310 µS/cm for riverine sites and <250 µS/cm for lakes/reservoirs) at sites R3 (633 µS/cm), R6 (471 µS/cm), L2 (786 µS/cm), L3 and L4. The EC levels at sites L3 and L4 (RP2 and RP3 in EA EPML00717813, respectively) were below the release limit (for context only) of 10,000 µS/cm (being slightly to moderately saline water) identified in EA EPML00717813 (DETSI 2025a).

Turbidity levels ranged from 13.2 NTU (high clarity) at farm dam site L1 (fenced to exclude cattle) to 220 NTU (poor clarity; opaque) at riverine site R3 on Taurus Creek.

Table 11 Surface water quality measurements, post-wet (June-July) 2025

Parameter	Units	WQO (DEHP 2011)	Riverine sites									Lacustrine sites			
			R1	R2	R3	R4	R5	R6	R7	R8	R9	L1	L2	L3	L4
Date	DD/MM/2025	-	18/06	17/06	20/06	20/06	18/06	18/06	1/07	1/07	18/06	17/06	30/06	3/07	3/07
Time	HH:MM	-	12:10	16:30	11:00	07:34	10:21	12:37	12:00	14:28	08:12	13:51	15:57	9:13	7:47
Flow	NA	-	Dry	Dry	Nil	Nil	Nil	Nil	Dry	Dry	Nil	Nil	Nil	Nil	Nil
Physico-chemical water quality															
Temperature	°C	-	-	-	13.0	11.7	13.4	13.8	-	-	11.5	14.1	17.2	13.9	14.5
pH	pH units	6.5-8.5[R], 6.5-8.0[L]	-	-	7.0	7.1	7.6	6.8	-	-	6.6	**6.2**	7.6	**8.4**	**8.9**
EC	µS/cm (@25C°)	<310[R, B], <250[L, B]	-	-	286	187	**378**	234	-	-	159	196	**628**	**5124**	**965**
DO	% saturation	85-110[R], 90-110[L]	-	-	**77.0**	**64.4**	98.4	**81.3**	-	-	**45.8**	**88.5**	**83.7**	**76.6**	94.8
	mg/L	-	-	-	8.10	6.98	10.27	8.35	-	-	5.00	9.10	7.92	7.78	9.63
Turbidity	NTU	50[R], 1-20[L]	-	-	37	**394**	**153**	**217**	-	-	**289**	9.6	11.2	**38**	16.5
Alkalinity (as $CaCO_3$)	mg/L	-	-	-	110	78	171	92	-	-	78	93	121	630	161
Major cations															
Calcium (Ca^{2+})	mg/L	-	-	-	23	15	37	19	-	-	15	16	32	31	35
Magnesium (Mg^{2+})	mg/L	-	-	-	8	5	8	6	-	-	4	6	13	40	14
Sodium (Na^{+})	mg/L	-	-	-	23	16	39	22	-	-	12	19	48	1000	140
Potassium (K^{+})	mg/L	-	-	-	7	6	4	6	-	-	54	5	9	10	6
Major anions															
Chloride (Cl^{-})	mg/L	-	-	-	24	10	18	15	-	-	7	8	40	1160	161
Sulphate (SO_4^{2-})	mg/L	<10[R]	-	-	5	7	4	8	-	-	2	<1	**99**	**537**	**110**
Bicarbonate (HCO_3^{-})	mg/L	-	-	-	110	78	171	92	-	-	78	93	121	578	149

Notes: [R] WQO applies to riverine sites. [B] WQO for no flow or baseflow conditions (differs for high flow conditions). [L] WQO applies to freshwater lakes / reservoirs.* DO levels for fresh waters only apply to flowing waters. Stagnant pools in intermittent streams naturally experience values of DO below 50% saturation (DEHP 2011).

Table 12 Surface water quality measurements, pre-wet (October) 2025

Parameter	Units	WQO (DEHP 2011)	Riverine sites												Lacustrine sites			
			R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	L1	L2	L3	L4
Date	DD/MM/2025	-	20/10	20/10	22/10	21/10	21/10	21/10	22/10	22/10	21/10	21/10	21/10	23/10	20/10	22/10	20/10	20/10
Time	HH:MM	-	14:00	11:00	07:15	09:30	10:15	11:40	09:30	12:00	10:40	14:30	15:15	13:30	15:07	12:46	10:04	09:21
Flow	NA	-	Dry	Dry	Nil	Dry	Dry	Nil	Dry	Dry	Dry	Dry	Dry	Dry	Nil	Nil	Nil	Nil
Physico-chemical water quality																		
Temperature	°C	-	-	-	21.3	-	-	33.1	-	-	-	-	-	-	28.6	29.1	29.4	25.2
pH	pH units	6.5-8.5[R], 6.5-8.0[L]	-	-	7.5	-	-	**9.3**	-	-	-	-	-	-	**9.7**	**8.2**	**9.1**	**8.5**
EC	µS/cm (@25C°)	<310[R, B], <250[L, B]	-	-	**633**	-	-	**471**	-	-	-	-	-	-	210	**786**	**4951**	**1403**
DO	% saturation	85-110[R], 90-110[L]	-	-	**20.5**	-	-	**184.0**	-	-	-	-	-	-	**170.5**	91.6	**136.7**	**83.8**
	mg/L	-	-	-	1.82	-	-	13.17	-	-	-	-	-	-	13.15	7.02	10.29	6.88
Turbidity	NTU	50[R], 1-20[L]	-	-	**220**	-	-	**152**	-	-	-	-	-	-	13.2	19.2	**85.3**	**42.7**
Alkalinity (as $CaCO_3$)	mg/L	-	-	-	164	-	-	155	-	-	-	-	-	-	69	145	502	198
Major cations																		
Calcium (Ca^{2+})	mg/L	-	-	-	40	-	-	17	-	-	-	-	-	-	8	31	25	38
Magnesium (Mg^{2+})	mg/L	-	-	-	17	-	-	11	-	-	-	-	-	-	4	23	39	21
Sodium (Na^{+})	mg/L	-	-	-	58	-	-	54	-	-	-	-	-	-	26	96	939	228
Potassium (K^{+})	mg/L	-	-	-	14	-	-	9	-	-	-	-	-	-	4	10	11	7
Major anions																		
Chloride (Cl^{-})	mg/L	-	-	-	87	-	-	48	-	-	-	-	-	-	12	68	948	232
Sulphate (SO_4^{2-})	mg/L	<10[R]	-	-	2	-	-	4	-	-	-	-	-	-	<1	111	352	152
Bicarbonate (HCO_3^{-})	mg/L	-	-	-	164	-	-	147	-	-	-	-	-	-	54	145	488	198

Notes: [R] WQO applies to riverine sites. [B] WQO for no flow or baseflow conditions (differs for high flow conditions). [L] WQO applies to freshwater lakes / reservoirs.* DO levels for fresh waters only apply to flowing waters. Stagnant pools in intermittent streams naturally experience values of DO below 50% saturation (DEHP 2011).

4.2.2 Ionic composition of surface waters

The concentration and proportion of ions in surface waters depends on the location of the waterway (geology, land use, and topography), climate and the proportionate contributions of groundwater flow, interflow and overland flow (Boulton and Brock 2001). These proportionate contributions will vary depending on seasonal and climatic patterns and so the source of ions will also vary. During periods of low to no rainfall or runoff, groundwater contributions can become more evident. During periods of high rainfall and runoff, catchment and atmospheric sources typically dominate.

The concentrations of major anions and cations in surface water (and groundwater) samples collected from the Study Area (and broader GDE Focus Area) are provided in Appendix D. The relative proportions of these major cations and anions are presented in Piper plots for the post-wet sampling in June-July 2025 (Figure 7 and the pre-wet sampling in October 2025 (Figure 8). The Piper plots indicate that most surface waters of the Study Area are mixed bicarbonate waters. These waters are typical of many inland rivers, or the upland reaches of coastal draining rivers, where weak carbonic acid (formed from atmospheric carbon dioxide dissolved in water as well as from rainwater infiltrating carbon dioxide-rich soil) reacts with the sodium, magnesium and calcium in soil, rock or other deposits to form mixed bicarbonate waters.

The surface waters collected from the mine water dams (sites L3 and L4) (and the five sampled bores) were sodium chloride dominated. Chlorides are typically dissolved from rocks and soils derived from evaporites, minerals or igneous rock, although are also concentrated in animal excretions. Mine water runoff containing chlorides from coal and other Permian rock is the likely source of sodium chloride in these mine water dams.

The sodium chloride dominated waters from the mine water dams exhibited a moderate to high concentration (based on the logarithmic scale of Gibbs [1970]) of total dissolved salts (approximately 647 to 3,433 mg/L, inferred from EC levels of 965 to 5,124 µS/cm) (Figure 9 and Figure 10). These waters have incurred a higher contact time with Permian rock of the catchment than the fresh, mixed bicarbonate-dominated waters of the broader Study Area.

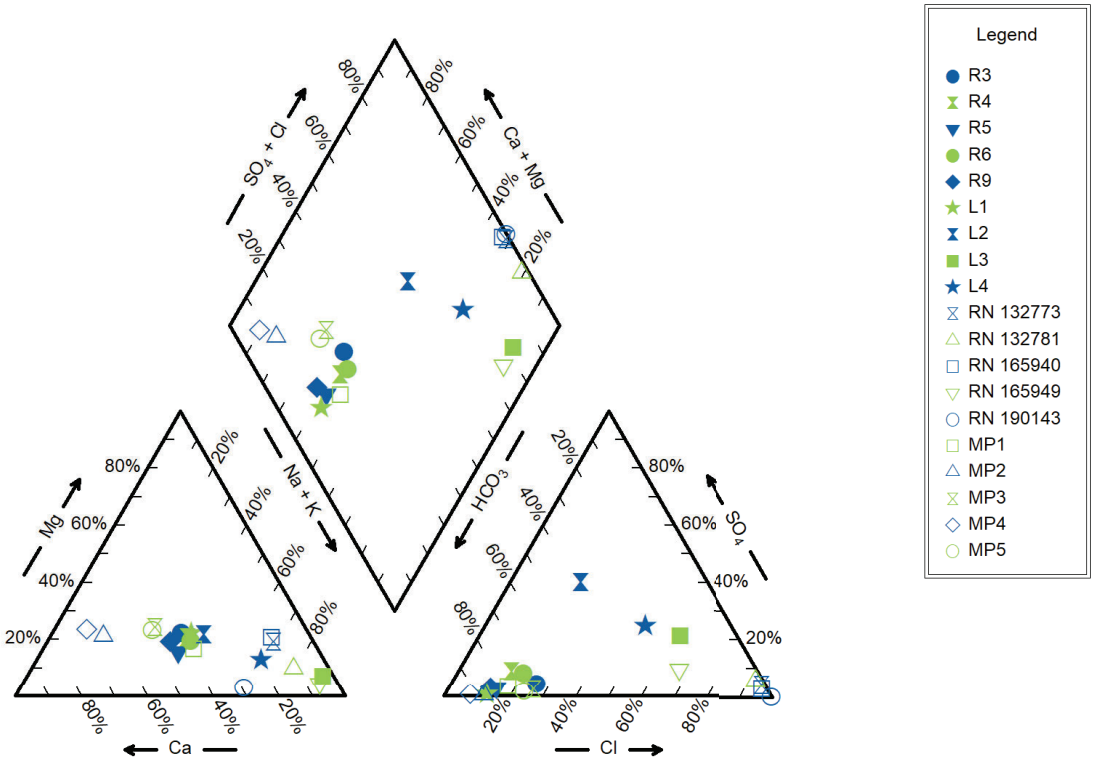


Figure 7 Piper plot showing relative abundance of major cations and anions from surface water and groundwater samples, post-wet (June-July) 2025

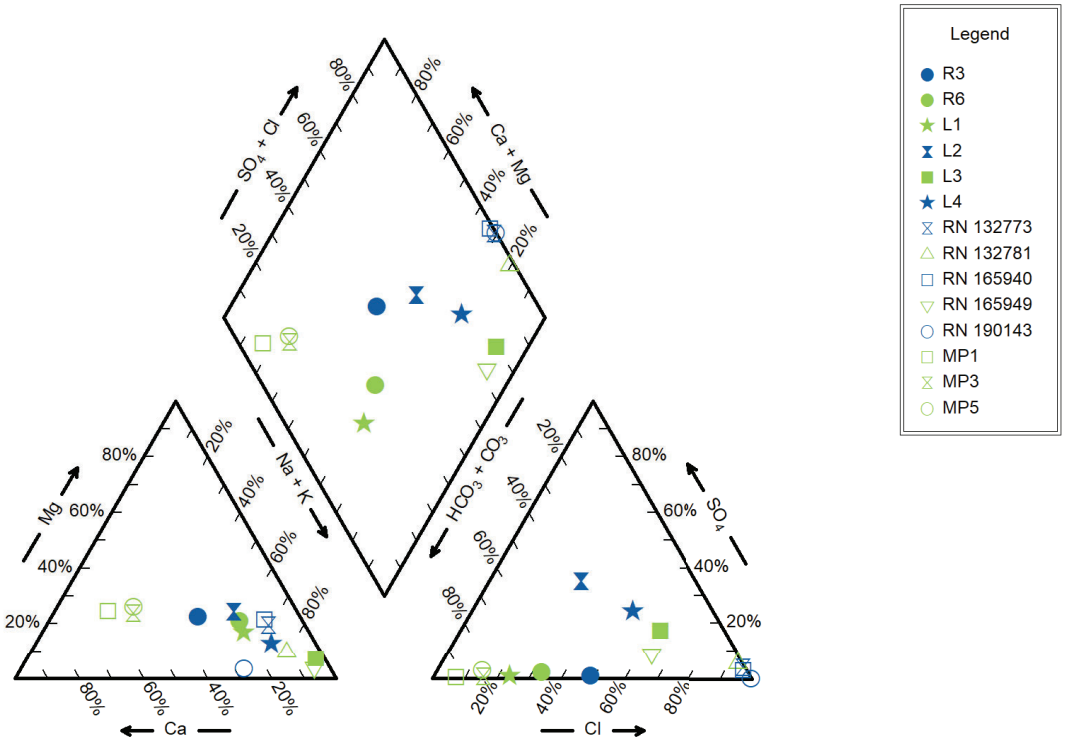


Figure 8 Piper plot showing relative abundance of major cations and anions from surface water and groundwater samples, pre-wet (October) 2025

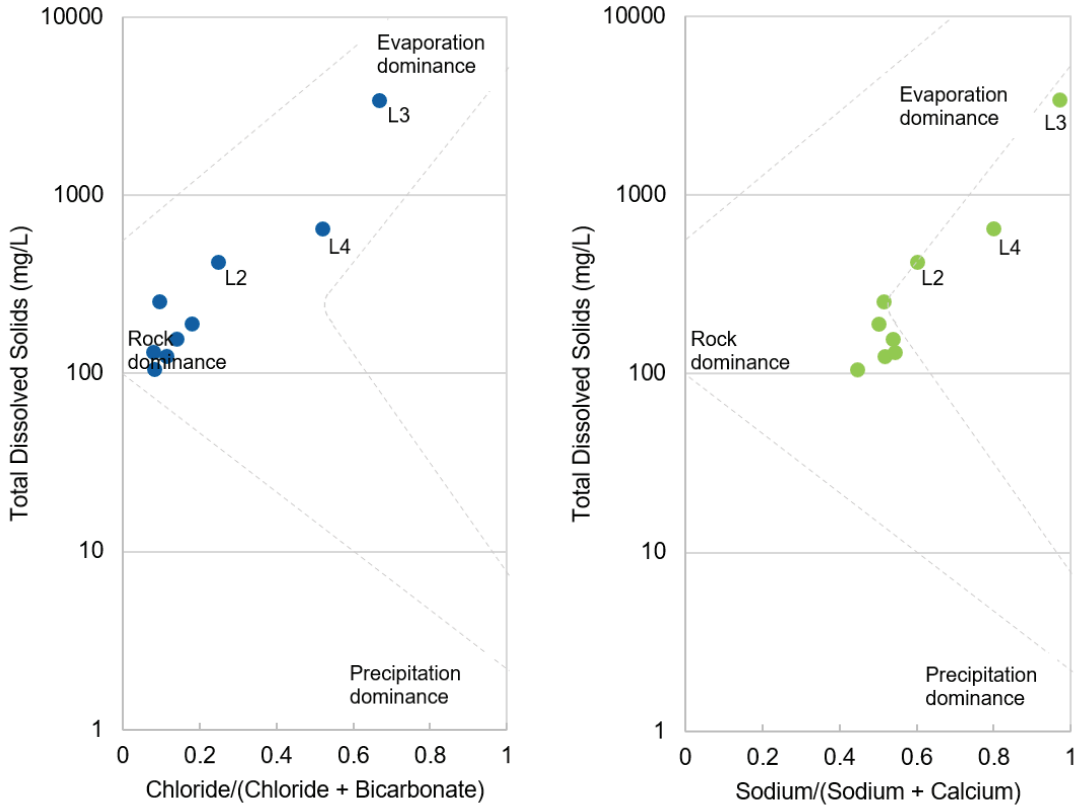


Figure 9 Gibbs (1970) diagrams and ionic balance of surface water samples, post-wet (June-July) 2025

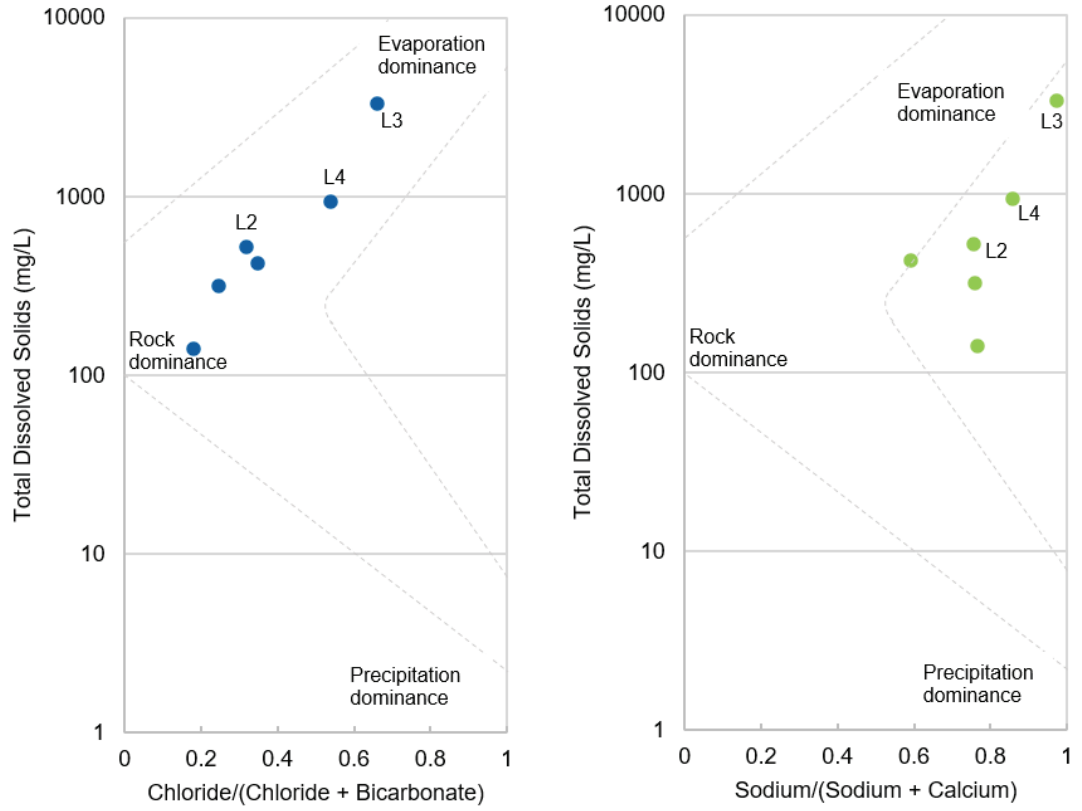


Figure 10 Gibbs (1970) diagrams and ionic balance of surface water samples, pre-wet (October) 2025

4.2.3 Instream habitat

Post-wet (June-July) 2025

Instream (aquatic) habitat assessment scores were Fair at each riverine survey site in the post-wet survey (Table 13). Bottom substrate / available cover and embeddedness was rated Poor at most sites, owing to the dominance of fine sediments (silt/clay and sand) and general lack of the larger pebble, cobble and boulder substrates. However, each site exhibited at least some detritus, sticks, branches and/or logs, providing some instream habitat and refugia for aquatic fauna. The velocity/depth category rated Poor to Fair at each riverine site, due to lack of flow. Sites rated Poor for velocity/depth had only shallow (<0.5 m) isolated pools. Those rated Fair had both shallow and deep (>0.5 m) isolated pools.

Table 13 Aquatic habitat assessment scores for riverine survey sites across the Study Area, post-wet (June-July) 2025

Habitat variable	R1	R2	R3	R4	R5	R6	R7	R8	R9
Bottom substrate/available cover	P (2)	P (2)	F (6)	P (3)	P (2)	P (2)	P (2)	P (2)	F (6)
Embeddedness	P (2)	P (2)	P (3)	P (2)	P (2)	P (2)	P (2)	P (2)	P (3)
Velocity/depth category	P (0)	P (0)	F (6)	F (6)	P (2)	F (6)	P (0)	P (0)	P (2)
Channel alteration	G (8)	F (6)	F (5)	G (8)	G (8)	E (12)	F (5)	F (5)	F (5)
Bottom scouring and deposition	G (8)	G (8)	F (5)	F (5)	G (8)	G (8)	F (5)	F (5)	F (4)
Pool/riffle, run/bend ratio	F (5)	F (4)	F (6)	F (4)	F (5)	F (4)	F (6)	F (5)	F (7)
Bank stability	G (6)	G (7)	G (8)	G (7)	G (8)	G (8)	F (4)	F (5)	F (4)
Bank vegetative stability	E (9)	G (8)	G (7)	F (3)	E (9)	G (8)	G (8)	G (7)	G (7)
Streamside cover	E (9)	E (9)	E (9)	E (10)	E (9)	E (9)	E (9)	G (8)	E (10)
Total (out of 135)	**49**	**46**	**55**	**48**	**53**	**59**	**41**	**39**	**48**
Rating	**Fair**	**Fair**	**Fair**	**Fair**	**Fair**	**Fair**	**Fair**	**Fair**	**Fair**

Pre-wet (October) 2025

Instream (aquatic) habitat assessment scores were Fair at each riverine survey site in the pre-wet survey, including the additional sites R10, R11 and R12 (Table 14). Bottom substrate/available cover and embeddedness was rated Poor at most sites. The velocity/depth category rated Poor at each riverine site, due to either dry conditions or only shallow (<0.5 m deep) isolated pools encountered.

Table 14 Aquatic habitat assessment scores for riverine survey sites across the Study Area, pre-wet (October) 2025

Habitat variable	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12
Bottom substrate/available cover	P (2)	P (2)	P (3)	P (3)	P (2)	P (2)	P (2)	P (2)	P (3)	F (6)	P (3)	P (2)
Embeddedness	P (2)	P (2)	P (3)	P (2)	P (2)	P (2)	P (2)	P (2)	P (3)	P (4)	P (3)	P (2)
Velocity/depth category	P (0)	P (0)	P (3)	P (0)	P (0)	P (2)	P (0)	P (0)	P (2)	P (0)	P (0)	P (0)
Channel alteration	G (8)	F (6)	F (5)	G (8)	G (8)	E (12)	F (5)	F (5)	F (5)	F (7)	F (5)	G (8)
Bottom scouring and deposition	G (8)	G (8)	F (5)	F (5)	G (8)	G (8)	F (5)	F (5)	F (4)	F (7)	F (5)	F (4)
Pool/riffle, run/bend ratio	F (5)	F (4)	F (6)	F (4)	F (5)	F (4)	F (6)	F (5)	F (7)	F (5)	F (4)	F (5)
Bank stability	G (6)	G (7)	G (8)	G (7)	G (8)	G (8)	F (4)	F (5)	F (4)	P (2)	P (2)	G (6)
Bank vegetative stability	G (7)	G (6)	G (7)	F (3)	E (9)	F (5)	G (6)	G (7)	G (7)	G (7)	G (8)	F (5)
Streamside cover	E (9)	E (9)	E (9)	E (10)	E (9)	E (9)	E (9)	G (8)	E (10)	E (9)	E (9)	E (9)
Total (out of 135)	**47**	**44**	**56**	**42**	**51**	**52**	**39**	**39**	**45**	**47**	**39**	**41**
Rating	**Fair**	**Fair**	**Fair**	**Fair**	**Fair**	**Fair**	**Fair**	**Fair**	**Fair**	**Fair**	**Fair**	**Fair**

4.2.4 Bank stability/erosion

Bank vegetative stability ranged from Fair to Excellent at the riverine survey sites. Most sites rated Good, indicating that at least 50% of the stream banks were covered by vegetation at the time of assessment. Site R4 rated Fair, due to recent bank scouring removing much of the groundcover. This scoring is expected to improve throughout the dry season as groundcover re-establishes.

Bank stability ranged from Fair to Good across the riverine survey sites. Sites rated Good were moderately stable, with only infrequent, small areas of erosion mostly healed over. Sites rated Fair were moderately unstable, with moderate frequency and size of erosional areas, and present a higher erosion potential during extreme/high flows (Table 13 and Table 14).

4.2.5 Adjacent land use

Land use across the Study Area is dominated by cattle grazing of varying intensity. The Study Area has been largely cleared through past agricultural practices and ongoing disturbance. Relatively small and narrow tracts of remnant vegetation remain (or have re-established) along some of the waterways. Riparian zone widths ranged from approximately 2 m (on the periphery of constructed dams) to 25 m (site R4 on Taurus Creek) (Appendix B). Tree canopy species commonly encountered in riparian zones across the Study Area included yellowwood (*Terminalia oblongata*), brigalow (*Acacia harpophylla*), coolabah (*Eucalyptus coolabah*), forest red gum (*E. tereticornis*), silver-leaved ironbark (*E. melanophloia*), poplar box (*E. populnea*), white bauhinia (*Lysiphyllum hookeri*), red bauhinia (*Lysiphyllum carronii*) and sally wattle (*Acacia salicina*). The shrub layer and groundcover were variable across the Study Area (Appendix B).

4.2.6 Aquatic values

Aquatic values for each site are presented in the site profiles in Appendix B. Ratings for aquatic values were determined for each site based on the criteria in Section 3.6.9 and are presented in Table 15. The sites on Taurus Creek and Two Mile Gully were rated as having Moderate aquatic value due to their importance as regional conduits for fish passage (State-mapped High or Major risk waterways for fish passage, Section 4.1.3). Riverine sites with a stream order 1-2 were rated as having Low aquatic value, except where the ACA mapping identified the waterway as being of Medium conservation significance – in which case it was rated as having Moderate aquatic value.

The lacustrine wetlands (hydrologically modified or artificial) were rated as having Low-Moderate or Moderate aquatic value. Although these lacustrine wetlands are modified or artificial (dammed), the semi-permanence of water offers dry season refuge for Least Concern fish and turtle species.

Table 15 Aquatic values ratings for the Study Area

Site	Waterway	Stream order	Key aquatic values/criteria	Aquatic values rating
R1	Sagittarius Creek	3	▪ Ephemeral waterway. ▪ Fair habitat bioassessment score. ▪ No conservation-significant or SLC aquatic species detected, nor likely. ▪ Local conduit for fish passage (mapped Low risk). ▪ Mapped Medium conservation significance in ACA.	Moderate
R2	Sagittarius Creek	2	▪ Ephemeral waterway. ▪ Fair habitat bioassessment score. ▪ No conservation-significant or SLC aquatic species detected, nor likely. ▪ Local conduit for fish passage (mapped Moderate risk). ▪ Mapped Medium conservation significance in ACA.	Moderate

Site	Waterway	Stream order	Key aquatic values/criteria	Aquatic values rating
R3	Taurus Creek	4	▪ Ephemeral waterway. ▪ Fair habitat bioassessment score. ▪ No conservation-significant or SLC aquatic species detected, nor likely. ▪ Regional conduit for fish passage (mapped Major risk). ▪ Mapped Very Low conservation significance in ACA.	Moderate
R4	Taurus Creek	4	▪ Ephemeral waterway. ▪ Fair habitat bioassessment score. ▪ No conservation-significant or SLC aquatic species detected, nor likely. ▪ Regional conduit for fish passage (mapped Major risk). ▪ Mapped Very Low conservation significance in ACA.	Moderate
R5	Unnamed tributary of Taurus Creek	2	▪ Ephemeral waterway. ▪ Fair habitat bioassessment score. ▪ No conservation-significant or SLC aquatic species detected, nor likely. ▪ Local conduit for fish passage (mapped Moderate risk). ▪ Mapped Very Low conservation significance in ACA.	Low
R6	Taurus Creek flood channel wetland	4	▪ Ephemeral waterway. ▪ Fair habitat bioassessment score. ▪ No conservation-significant or SLC aquatic species detected, nor likely. ▪ Flood channel wetland on the floodplain of a regional conduit for fish passage (mapped High risk). ▪ Flood channel wetland on floodplain of waterways mapped Very Low conservation significance in ACA.	Moderate
R7	Taurus Creek	3	▪ Ephemeral waterway. ▪ Fair habitat bioassessment score. ▪ No conservation-significant or SLC aquatic species detected, nor likely. ▪ Regional conduit for fish passage (State-mapped High risk, verified Major risk). ▪ Mapped Very Low conservation significance in ACA.	Moderate
R8	Two Mile Gully	4	▪ Ephemeral waterway. ▪ Fair habitat bioassessment score. ▪ No conservation-significant or SLC aquatic species detected, nor likely. ▪ Regional conduit for fish passage (mapped Major risk). ▪ Mapped Very Low conservation significance in ACA.	Moderate
R9	Taurus Creek	4	▪ Ephemeral waterway. ▪ Fair habitat bioassessment score. ▪ No conservation-significant or SLC aquatic species detected, nor likely. ▪ Regional conduit for fish passage (mapped Major risk). ▪ Mapped Very Low conservation significance in ACA.	Moderate
R10	Deep Creek	2	▪ Ephemeral waterway. ▪ Fair habitat bioassessment score. ▪ No conservation-significant or SLC aquatic species detected, nor likely. ▪ Local conduit for fish passage (mapped Moderate risk). ▪ Mapped Very Low conservation significance in ACA.	Low

Site	Waterway	Stream order	Key aquatic values/criteria	Aquatic values rating
R11	Taurus Creek	4	▪ Ephemeral waterway. ▪ Fair habitat bioassessment score. ▪ No conservation-significant or SLC aquatic species detected, nor likely. ▪ Regional conduit for fish passage (State-mapped High risk, verified Major risk). ▪ Mapped Very Low conservation significance in ACA.	Moderate
R12	Taurus Creek	5	▪ Ephemeral waterway. ▪ Fair habitat bioassessment score. ▪ No conservation-significant or SLC aquatic species detected, nor likely. ▪ Regional conduit for fish passage (mapped Major risk). ▪ Mapped Very Low conservation significance in ACA.	Moderate
L1	Lacustrine wetland waterbody (farm dam)	1	▪ Semi-permanent waterbody. ▪ Modified wetland (constructed dam). ▪ No conservation-significant or SLC aquatic species detected, nor likely. ▪ Local conduit for fish passage (mapped Moderate risk). ▪ Provides dry season refuge for Least Concern aquatic fauna. ▪ On waterway of Medium conservation significance in ACA.	Moderate
L2	Lacustrine wetland waterbody (farm dam)	1	▪ Semi-permanent waterbody. ▪ Modified wetland (constructed dam). ▪ No conservation-significant or SLC aquatic species detected, nor likely. ▪ Local conduit for fish passage (mapped Moderate risk). ▪ Provides dry season refuge for Least Concern aquatic fauna. ▪ Mapped Very Low conservation significance in ACA.	Low-Moderate
L3	Lacustrine wetland waterbody (Taurus Dam – mine water dam)	3	▪ Semi-permanent waterbody. ▪ Modified wetland (constructed dam). ▪ conservation-significant or SLC aquatic species unlikely to occur. ▪ Regional conduit for fish passage (mapped High risk). ▪ May offer dry season refuge for Least Concern aquatic fauna. ▪ Mapped Very Low conservation significance in ACA.	Moderate
L4	Lacustrine wetland waterbody (Deep Creek Dam – mine water dam)	2	▪ Semi-permanent waterbody. ▪ Modified wetland (constructed dam). ▪ conservation-significant or SLC aquatic species unlikely to occur. ▪ Local conduit for fish passage (mapped Moderate risk). ▪ May offer dry season refuge for Least Concern aquatic fauna. ▪ Mapped Very Low conservation significance in ACA.	Low-Moderate

4.3 Wetlands

4.3.1 Wetlands of International importance

There are no wetlands of International Importance (i.e. Ramsar wetlands) identified within the Study Area or broader desktop search area in the EPBC Act Protected Matters Report (DCCEEW 2025a). Wetlands of International Importance nearest to the Study Area include those of the Shoalwater and Corio Bays Area, approximately 200 km to the north-east (DCCEEW 2025b).

4.3.2 Wetlands of National importance

No nationally important wetlands occur in the Mackenzie River Sub-basin (DCCEEW 2025b).

4.3.3 Queensland referrable wetlands

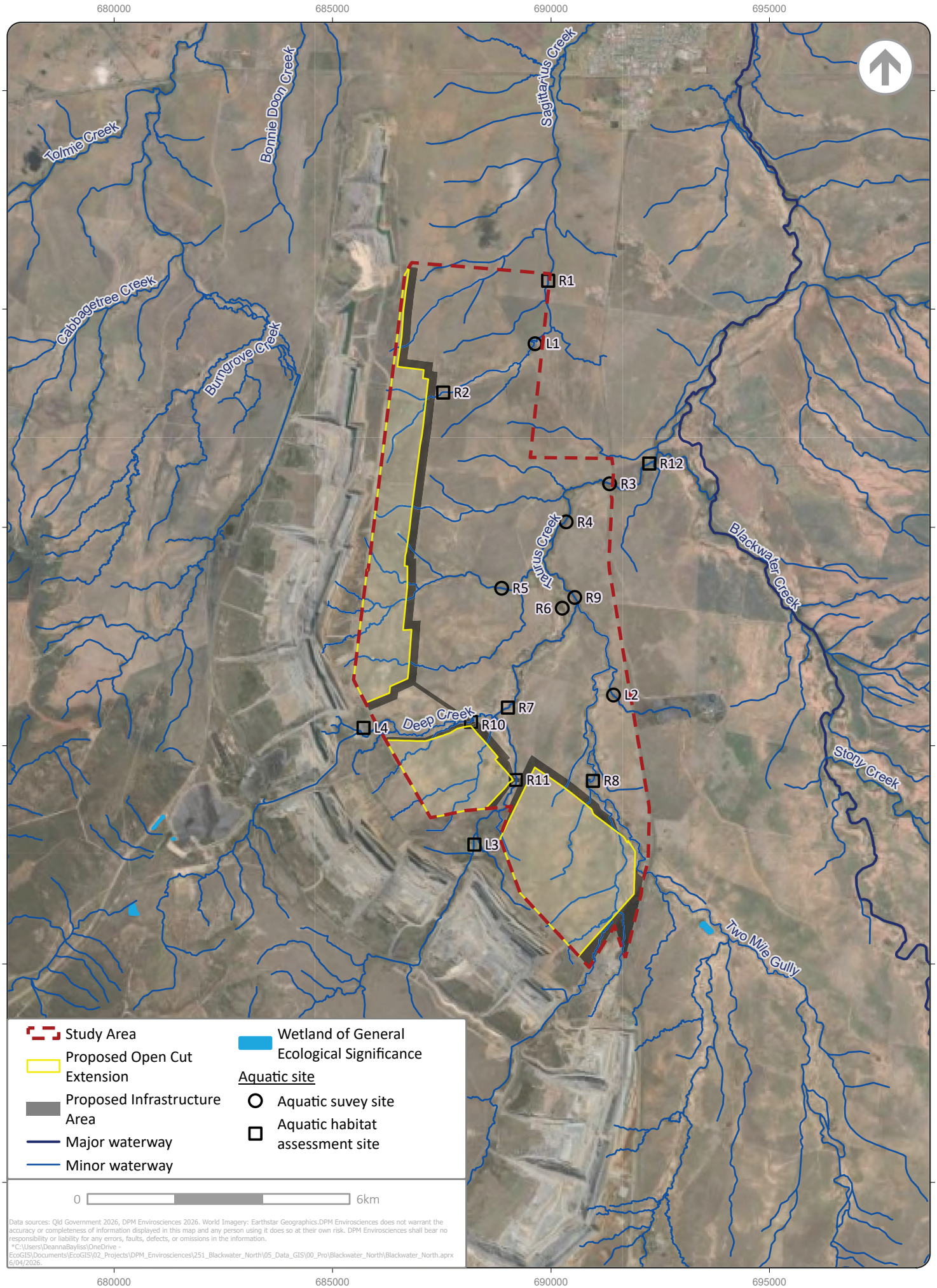
The Map of Great Barrier Reef Wetland Protection Areas (WPAs) (DETSI 2025f) shows the location of WPAs, comprising wetlands of High Ecological Significance (HES wetlands) and their 500 m policy trigger area buffers. These wetlands have been assessed as containing high ecological values by a bioregional ACA, the AquaBAMM (Rollason and Howell 2012). No HES wetlands are mapped as occurring in the Study Area or immediate surrounds.

4.3.4 Queensland Wetland Environmental Values

The Map of Queensland Wetland Environmental Values (MQWEV; DETSI 2025g) identifies the location and ecological significance of wetlands using the EVs for wetlands in section 7 of the *Environmental Protection (Wetland and Water Biodiversity) Policy 2019* (EPP 2019). Wetlands appearing on the MQWEV are considered either HES or General Ecological Significance (GES) for the purposes of allocating EVs. The MQWEV also shows HEV waters management intent under Schedule 2 of the EPP 2019.

No State-mapped HES or GES wetlands are mapped as occurring in the Study Area. One GES wetland is mapped nearby, upstream of the Study Area on Two Mile Gully (Figure 11).

No HEV waters are identified in the MQWEV for the Study Area or immediate surrounds.



QUEENSLAND WETLAND ENVIRONMENTAL VALUES

Blackwater North Extension Project - Aquatic Ecology and GDE Assessment

FIGURE 11

4.4 Aquatic flora

A total of 22 species of aquatic or semi-aquatic plants were recorded from the Study Area during the post-wet (June-July) 2025 survey (Table 16). One additional species (*Myriophyllum verrocosum*) was recorded during the pre-wet (October) 2025 survey (Table 17). All native aquatic flora species detected are considered Least Concern under the NC Act. Introduced species are discussed in Section 4.7.1.

Most aquatic flora species encountered are semi-aquatic species including grasses, sedges and rushes. The greatest diversity of aquatic flora was recorded from lacustrine wetland site L2, with 12 species detected in the post-wet 2025 survey.

The lack of both diversity and abundance of aquatic plants at most riverine sites reflects the harsh physical conditions, impacts from cattle grazing and trampling, or a combination of these factors.

Table 16 Aquatic flora recorded from the Study Area, post-wet (June-July) 2025

Scientific name	Common name	Riverine sites									Lacustrine			
		R1	R2	R3	R4	R5	R6	R7	R8	R9	L1	L2	L3	L4
Azolla pinnata	Ferny azolla											L		
Cyperus betchei	-			L		L	L							
Cyperus bifax	Western nutgrass			L	L				L	L				
Cyperus difformis	Rice sedge					L						L		
Cyperus exaltatus	Tall flatsedge										L			
Cyperus pygmaeus	Dwarf sedge						L				L			
*Echinochloa colona**	Awnless barnyard grass*			L		L						L	L	L
*Eclipta prostrata**	White eclipta*			L	L		L				L	L		
Juncus usitatus	Common rush											L		
Lemna aequinoctialis	Common duckweed											L		
Leptochloa digitata	Umbrella canegrass			L									L	L
Ludwigia octovalvis	Willow primrose					L	L							
Ludwigia peploides	Water primrose			L								S		
Najas tenuifolia	Waternymph											L		
Nitella sp.	Branched algae													L
Nymphoides indica	Water snowflake											S		
Persicaria attenuata	-			L			L				M		L	L
Persicaria lapathifolia	Pale knotweed												L	L
Polygonum minuta	Small knotweed													L
Potamogeton crispus	Curly pondweed											L		
Schoenoplectus validus	River clubrush											L	L	
Typha domingensis	Narrow-leaved cumbungi					L					E	S	L	
Species richness		**0**	**0**	**7**	**2**	**5**	**5**	**0**	**1**	**1**	**5**	**12**	**6**	**6**

Notes: * denotes introduced species; L = 1-10% (little); S = 10-50% (some); M = 50-75% (moderate); E = >75% (extensive), as per AusRivAS categories (DNRM 2001).

Table 17 Aquatic flora recorded from the Study Area, pre-wet (October) 2025

Scientific name	Common name	Riverine sites												Lacustrine			
		R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	L1	L2	L3	L4
Azolla pinnata	Ferny azolla														L		
Cyperus betchei	-			L		L	L										
Cyperus bifax	Western nutgrass			S	L				L	L	L		L				
Cyperus difformis	Rice sedge					L											
Cyperus exaltatus	Tall flatsedge													L	L		
Cyperus pygmaeus	Dwarf sedge						L							L			
*Echinochloa colona**	Awnless barnyard grass*			L		L										L	L
*Eclipta prostrata**	White eclipta*			L	L		L							L	L		
Juncus usitatus	Common rush														L		
Lemna aequinoctialis	Common duckweed														L		
Leptochloa digitata	Umbrella canegrass			L									L			L	L
Ludwigia octovalvis	Willow primrose					L	L										
Ludwigia peploides	Water primrose			L											L		
Myriophyllum verrucosum	Red water-milfoil																L
Najas tenuifolia	Waternymph														L		
Nitella sp.	Branched algae																
Nymphoides indica	Water snowflake														L		
Persicaria attenuata	-			L			L							M		L	L
Persicaria lapathifolia	Pale knotweed															L	L
Polygonum minuta	Small knotweed																L
Potamogeton crispus	Curly pondweed													L	M		
Schoenoplectus validus	River clubrush														L	L	
Typha domingensis	Narrow-leaved cumbungi					L								E	S	L	
Species richness		**0**	**0**	**7**	**2**	**5**	**5**	**0**	**1**	**1**	**1**	**0**	**2**	**6**	**11**	**6**	**6**

Notes: * denotes introduced species; L = 1-10% (little); S = 10-50% (some); M = 50-75% (moderate); E = >75% (extensive), as per AusRivAS categories (DNRM 2001).

4.5 Aquatic fauna

4.5.1 Fish

Nine Least Concern native species and one pest fish species were recorded from the Study Area in each of the post-wet (June-July) and pre-wet (October) 2025 surveys (Table 18 and Table 19). These species are commonly recorded from both high and low order drainage lines throughout the Mackenzie River Sub-basin.

Most fishes captured appeared healthy, with little sign of stress or disease. Some of the bony bream (*Nematalosa erebi*) and spangled perch (*Leiopotherapon unicolor*) collected from site R3 on Taurus Creek in June-July 2025 showed signs of likely epizootic ulcerative syndrome (Plate 4), being an endemic fungal disease that often appears in host species (including bony bream, catfish, rainbowfish and other freshwater and estuarine species) after acid water runoff following heavy rains (Queensland Government 2022).

All native fishes were released at the point of capture. Pest fish were humanely euthanised in accordance with DPM Enviroscences' Animal Ethics Committee approval and General Fisheries Permit.

The species composition is typical of ephemeral waterways and farm dams of Central Queensland.

Table 18 Fishes recorded from the Study Area, post-wet (June-July) 2025

Scientific name	Common name	Riverine sites					Dam site	
		R3	R4	R5	R6	R9	L1	L2
Ambassis agassizii	Agassiz's glassfish	54	27	12	5		55	17
Anguilla reinhardtii	Longfin eel						1	2
*Gambusia holbrooki**	Mosquitofish*						120	
Hypseleotris bucephala	Boofhead carp gudgeon	12	39		8	1	16	45
Leiopotherapon unicolor	Spangled perch	18	21	9	11		6	4
Melanotaenia splendida splendida	Eastern rainbowfish	55	5			1		48
Mogurnda adspersa	Purple-spotted gudgeon	6	8				6	2
Nematalosa erebi	Bony bream	5						
Neosilurus hyrtlii	Hyrtl's catfish	2						
Porochilus rendahli	Rendahl's tandan						6	
Number of individuals		**152**	**100**	**21**	**24**	**2**	**210**	**118**
Species richness		**7**	**5**	**2**	**3**	**2**	**7**	**6**

Notes: * denotes introduced species.

Table 19 Fishes recorded from the Study Area, pre-wet (October) 2025

Scientific name	Common name	Riverine sites		Dam site	
		R3	R6	L1	L2
Ambassis agassizii	Agassiz's glassfish	1	4	42	55
Anguilla reinhardtii	Longfin eel				1
*Gambusia holbrooki**	Mosquitofish*			103	
Hypseleotris bucephala	Boofhead carp gudgeon	41	19	24	38
Leiopotherapon unicolor	Spangled perch	17	38	8	14
Melanotaenia splendida splendida	Eastern rainbowfish	41		12	22
Mogurnda adspersa	Purple-spotted gudgeon	8		12	7
Nematalosa erebi	Bony bream	1	5		
Neosilurus hyrtlii	Hyrtl's catfish		2		
Porochilus rendahli	Rendahl's tandan			1	1
Number of individuals		**109**	**68**	**202**	**138**
Species richness		**6**	**5**	**7**	**7**

Notes: * denotes introduced species.



Agassiz's glassfish (*Ambassis agassizii*)



Longfin eel (*Anguilla reinhardtii*)



Mosquitofish (*Gambusia holbrooki*)*



Boofhead carp gudgeon (*Hypseleotris bucephala*)



Spangled perch (*Leiopotherapon unicolor*)



Eastern rainbowfish (*Melanotaenia splendida splendida*)



Purple-spotted gudgeon (*Mogurnda adspersa*)



Bony bream (*Nematalosa erebi*), with ulcerative lesions



Hyrtl's catfish (*Neosilurus hyrtlii*)



Rendahl's tandan (*Porochilus rendahli*)

Plate 4 Fish captured from the Study Area

4.5.2 Turtles

The Least Concern Krefft's river turtle (*Emydura macquarii krefftii*) was recorded at site L2 in June-July (seven adult males and three adult females) and in October 2025 (one adult male, one adult female and three juveniles), and at site L1 (two adult males) in October 2025. The Least Concern eastern snake-necked turtle (*Chelodina longicollis*) was recorded at site L2 (one juvenile) in October 2025. In an earlier study in December 2019 (EMM 2023) an adult eastern snake--necked turtle was also recorded at site L1. No conservation-significant turtles or their habitat were detected within the Study Area (Section 4.6.3).

4.5.3 Platypus

The platypus is listed as Special Least Concern under the NC Act. The Wetland*Info* database (DETS1 2025b) identifies the platypus as having previously been recorded from the Mackenzie River Sub-basin. The nearest record of platypus is from the Dawson Range Stage Forest, approximately 35 km east-southeast of the Study Area (ALA 2025).

The seasonal nature of waterways of the Study Area is not conducive to sustaining a population of platypus. Similarly, the lacustrine wetlands (i.e. farm and mine water dams) within the Study Area are unlikely to sustain a population of platypus as, despite relative permanence of wetted habitat, these wetlands lack the banks and habitat features required for platypus burrow construction.

No platypus burrows were encountered during the surveys, despite targeted searches at each site. It is considered unlikely that platypus occupies the waterways and bodies of the Study Area.

4.5.4 Aquatic invertebrates

Aquatic macroinvertebrates and stream health

A total of 50 taxa from 1,941 aquatic macroinvertebrates were collected from waterways and wetlands of the Study Area in June 2025. A total of 44 taxa from 986 aquatic macroinvertebrates were collected in October 2025. The raw data is presented in Appendix E. Sampling effort for the riverine sites was limited by the availability of wetted habitat. The post-wet (June) 2025 aquatic macroinvertebrate sampling consisted of five riverine bed habitat samples, five riverine edge habitat samples and two lacustrine wetland samples. Drier conditions were encountered in the pre-wet (October) 2025 sampling, with two riverine bed habitat samples, two riverine edge habitat samples and two lacustrine wetland samples obtained.

Taxonomic composition

The most taxa-rich order of aquatic macroinvertebrates collected from the Study Area in June 2025 was Diptera (true flies), with nine families identified. Hemiptera (true bugs) and Coleoptera (beetles) were also well represented, each with eight families identified. Hemiptera was the most taxa-rich order collected in October 2025, with 12 families identified. Other taxa included Ephemeroptera (mayflies), Trichoptera (caddis flies), Zygoptera (damselflies), Epiprocta (dragonflies), Acarina (mites), Decapoda (yabbies, river prawns and glass shrimp), Gastropoda (snails), Lepidoptera (aquatic caterpillars), Hirudinea (leeches), Nematoda (round worms), Platyhelminths (flat worms), Annelida (segmented worms), Cladocera (water fleas), Copepoda (copepods) and Ostracoda (seed shrimp).

Aquatic macroinvertebrate taxa richness ranged from 13 to 22 in samples collected from riverine bed habitats, from 11 to 31 in samples collected from riverine edge habitats, and from 20 to 34 in composite samples from lacustrine wetlands (farm dams) (Figure 12 and Figure 13). Data is presented alongside the DEHP (2011) WQOs for the Mackenzie River Sub-basin. The WQOs apply to riverine systems only. No taxa richness guidelines are available for lacustrine wetlands.

Taxa richness was variable; largely influenced by the extent of wetted habitat available in the drying pools sampled, and the extent of livestock access (Appendix B). The taxa richness of the five riverine bed habitat samples collected in June 2025 and the two bed habitat samples collected in October 2025 fell within or favourably above the DEHP (2011) 20:80 percentile range. The taxa richness of the riverine edge habitat sample collected from site R3 in June 2025 and the two edge habitat samples collected in October 2025 fell within the DEHP (2011) 20:80 percentile guideline range. Taxa richness was below this range in the edge habitat samples collected from sites R4, R5, R6 and R9 in June 2025 (Figure 12 and Figure 13). Taxa richness was greater in the edge habitats than in the bed habitats of most riverine sites, owing to the greater habitat complexity and food sources available.

Plecoptera, Ephemeroptera and Trichoptera taxa

Two PET taxa were recorded from the Study Area, including one Ephemeroptera (mayfly) family (Baetidae) and one Trichoptera (caddis fly) family (Leptoceridae). No Plecoptera (stonefly) families were recorded, nor were they expected due to lack of rocky substrates and riffle habitat.

PET taxa richness ranged from 0-2 taxa in the riverine bed samples, from 0-2 taxa in the riverine edge samples, and with 2 PET taxa in each of the lacustrine wetland samples (Figure 14 and Figure 15). Data is presented alongside the DEHP (2011) WQOs for the Mackenzie River Sub-basin. The WQOs apply to riverine systems only. As such, no guidelines are presented for the lacustrine wetland sites.

PET taxa in the bed and edge habitat samples collected from site R3 in June 2025 met the DEHP (2011) 20:80 percentile guideline range, indicating an expected number of pollutant sensitive taxa. PET richness was below the guideline range in all other riverine bed and edge habitat samples collected. However, this lower PET taxa richness most likely reflects seasonality and the ephemeral flow nature of these waterways, rather than pollution or other anthropogenic impacts.

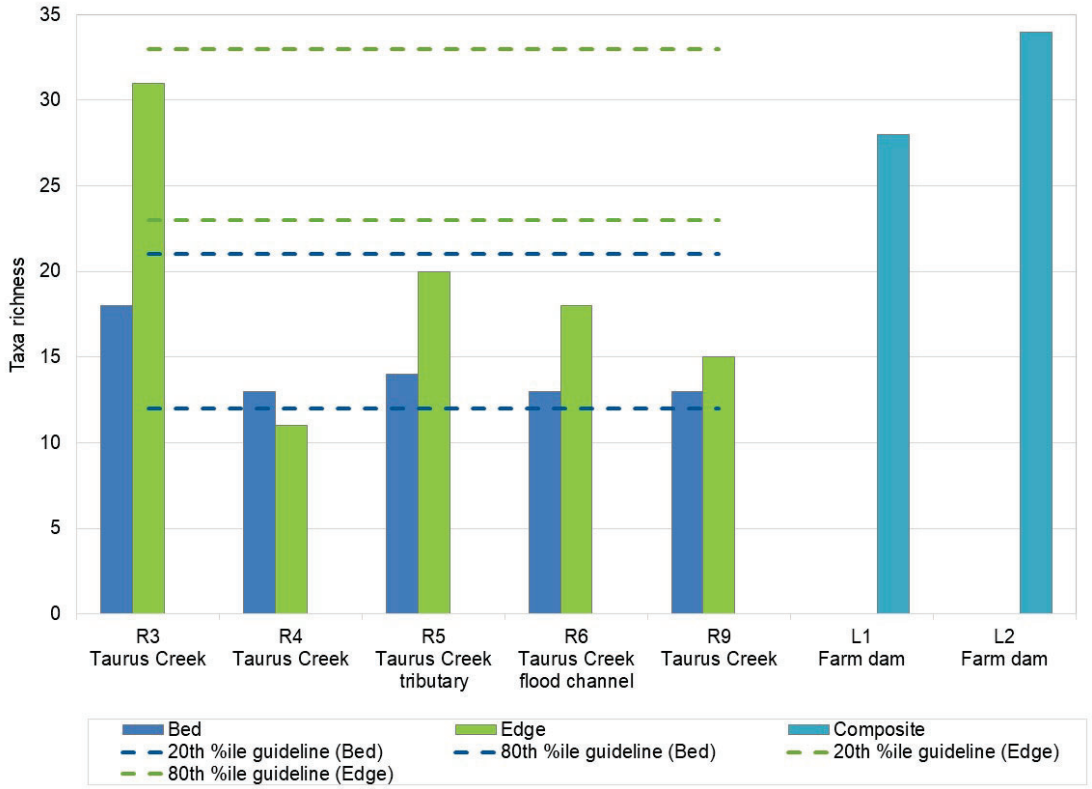


Figure 12 Taxa richness of aquatic macroinvertebrate samples collected from the Study Area, post-wet (June) 2025

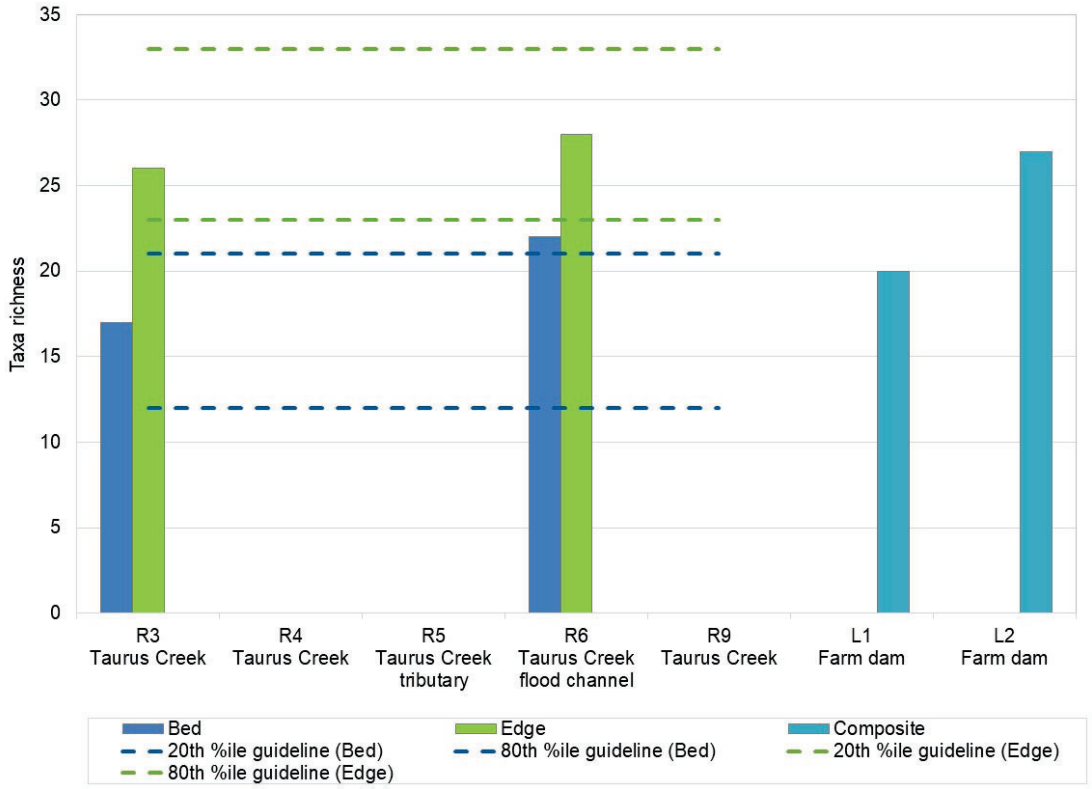


Figure 13 Taxa richness of aquatic macroinvertebrate samples collected from the Study Area, pre-wet (October) 2025

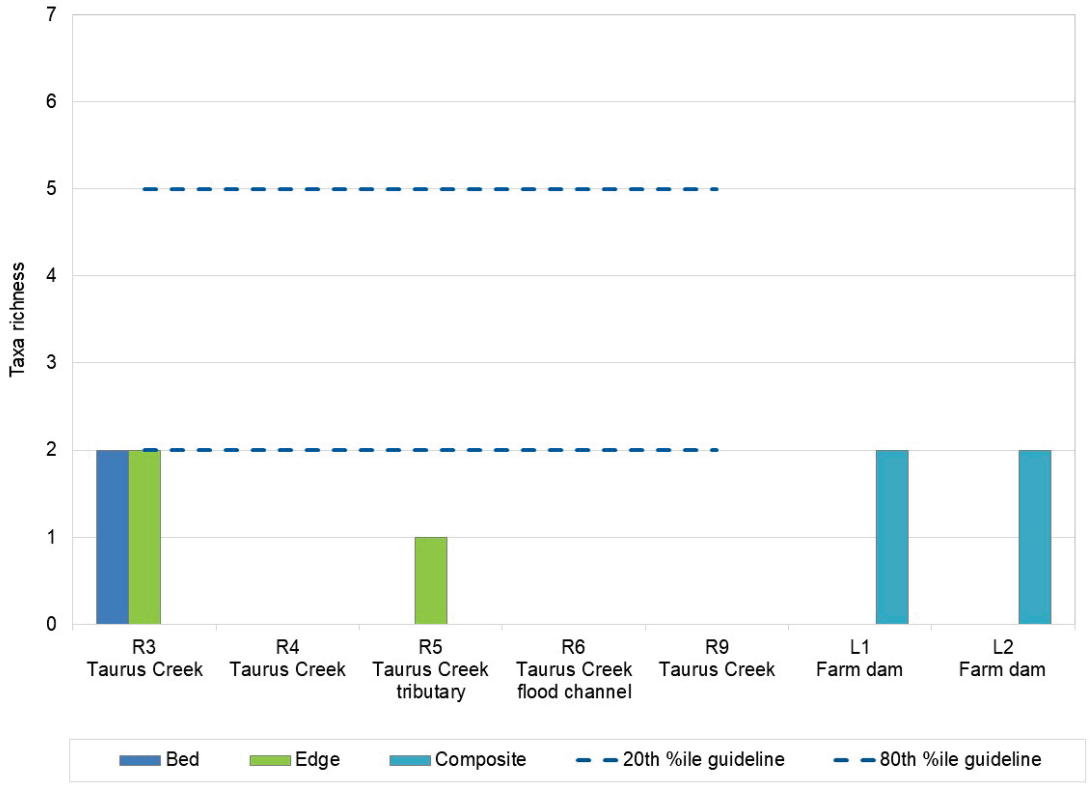


Figure 14 PET taxa richness for aquatic macroinvertebrate samples collected from the Study Area, post-wet (June) 2025

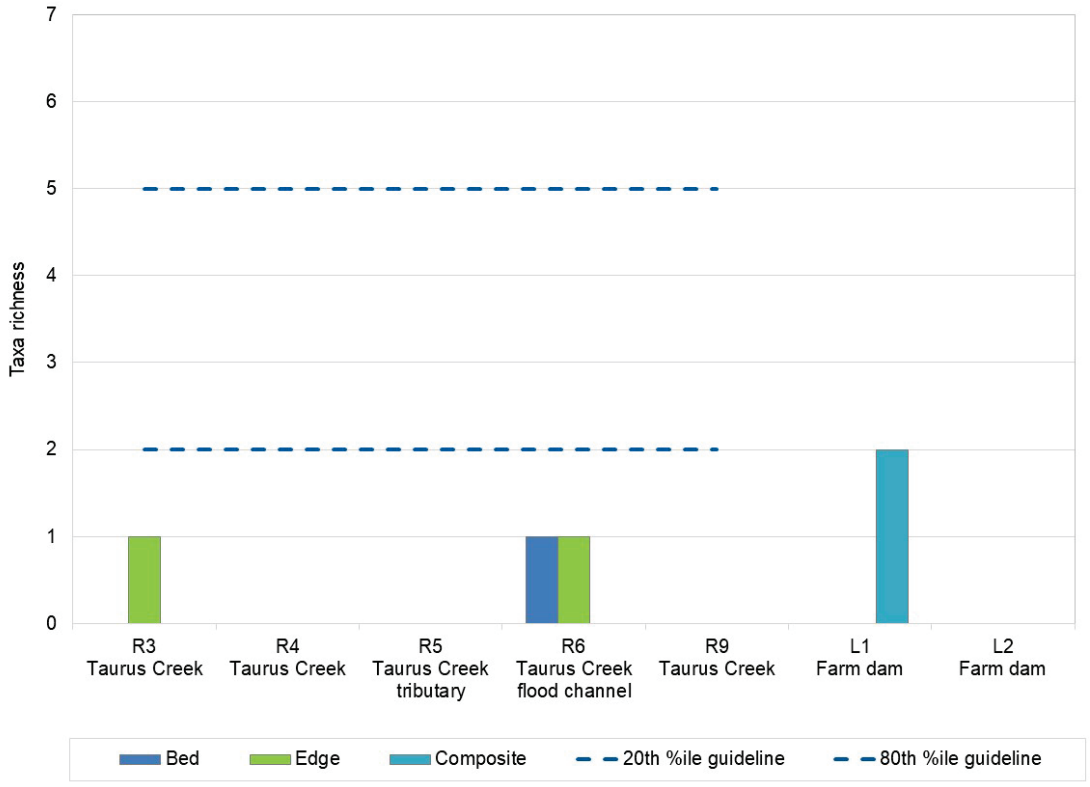


Figure 15 PET taxa richness for aquatic macroinvertebrate samples collected from the Study Area, pre-wet (October) 2025

Pollution-tolerant taxa

The percentage of pollution-tolerant taxa (SIGNAL2 score of 1-3) ranged from 40 to 82% in the riverine bed samples, from 40 to 65% in the riverine edge samples, and from 47 to 63% in the lacustrine wetland samples (Figure 16 and Figure 17). Data is presented alongside the DEHP (2011) WQOs for the Mackenzie River Sub-basin. The WQOs apply to riverine systems only. As such, no guidelines are presented for the lacustrine wetland sites.

The percentage of pollution-tolerant taxa exceeded the DEHP (2011) 20:80 percentile guideline range in most riverine samples (Figure 16 and Figure 17), indicating unfavourable physical conditions and/or reduced habitat quality, and likely reflecting the ephemeral flow regime.

Stream Invertebrate Grade Number – Average Level Version 2 scores

Average SIGNAL2 scores ranged from 2.36 to 3.70 for samples collected from riverine bed habitat, from 3.00 to 3.60 for samples collected from riverine edge habitat, and from 3.06 to 3.47 for samples collected from lacustrine wetland sites (Figure 18 and Figure 19). SIGNAL2 results are presented alongside the DEHP (2011) WQOs for the Mackenzie River Sub-basin. The WQOs apply to riverine systems only. As such, no guidelines are presented for the lacustrine wetland sites.

The SIGNAL2 scores for most bed and edge samples fell below the DEHP (2011) 20:80 percentile guideline range, reflecting a lower composition of pollution sensitive taxa (and a higher composition of pollutant tolerant taxa) than what is expected for the broader Mackenzie River Sub-basin. This likely indicates unfavourable physical conditions and/or reduced habitat quality associated with high ephemerality.

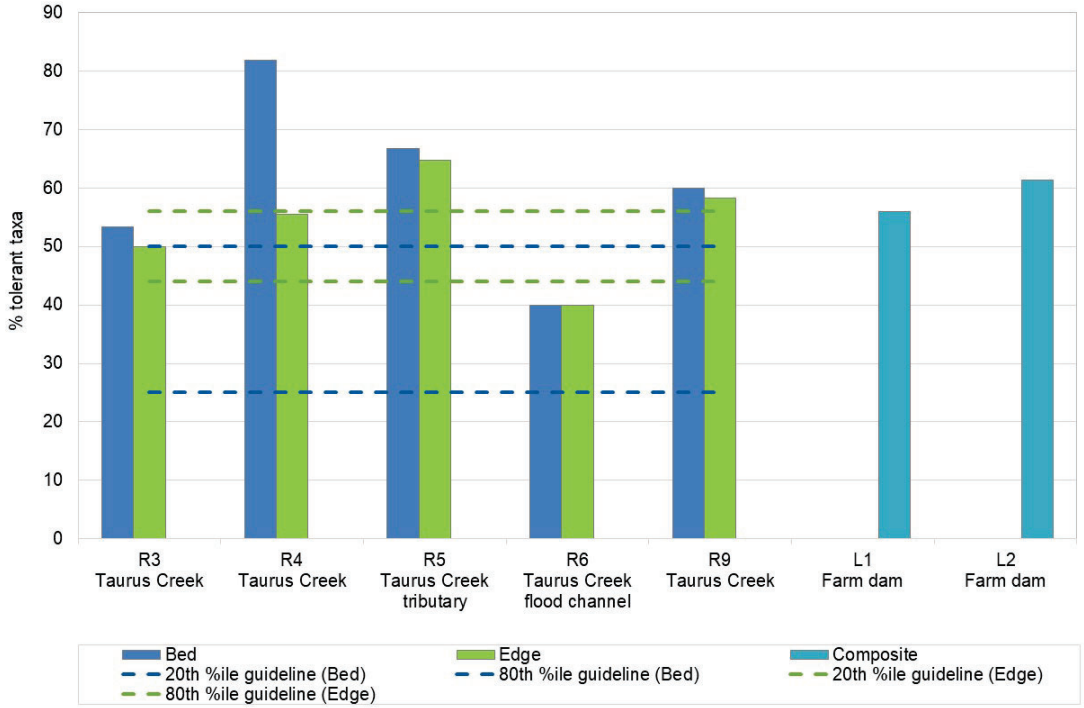


Figure 16 Percentage of pollution-tolerant taxa in aquatic macroinvertebrate samples collected from the Study Area, post-wet (June) 2025

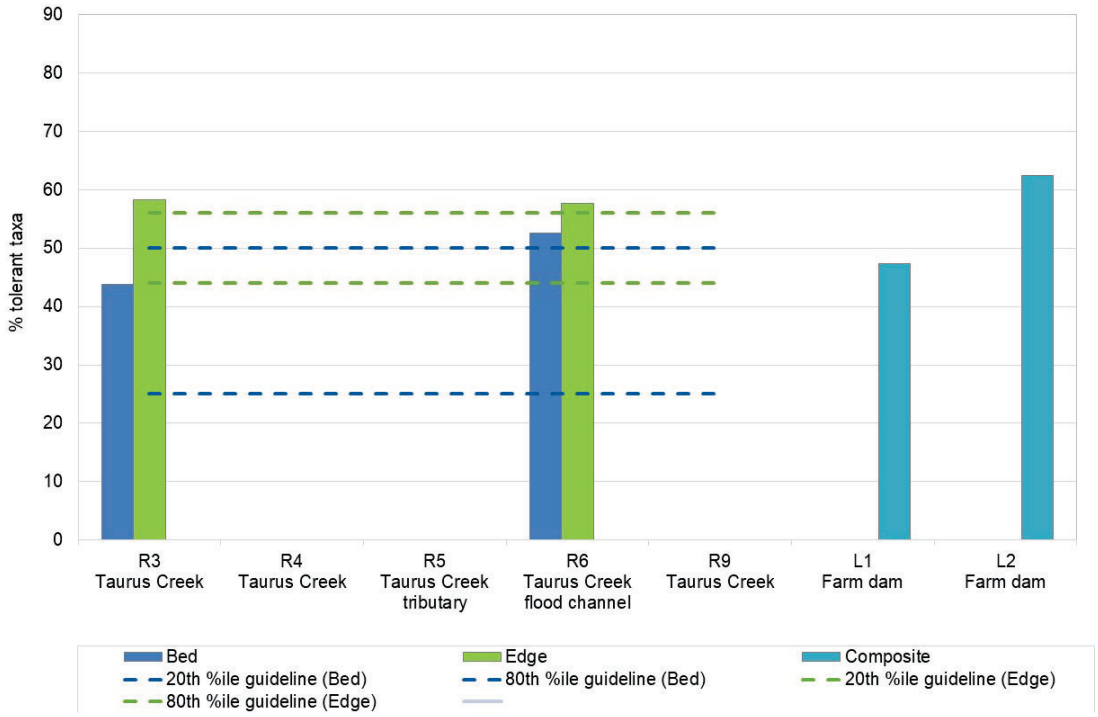


Figure 17 Percentage of pollution-tolerant taxa in aquatic macroinvertebrate samples collected from the Study Area, pre-wet (October) 2025

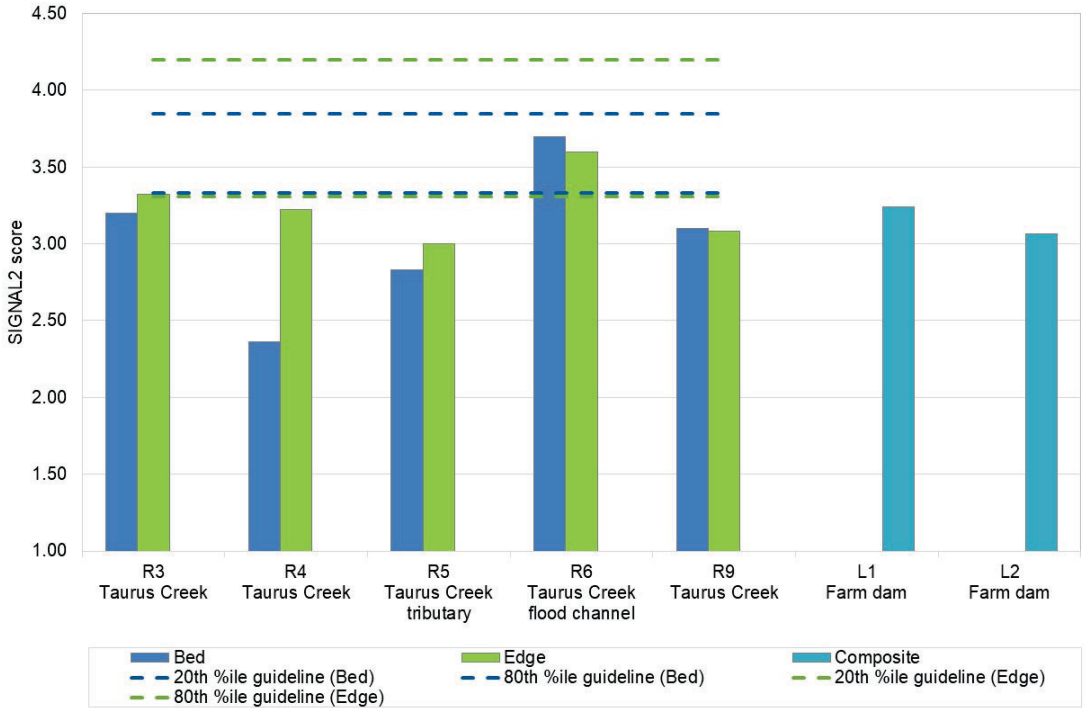


Figure 18 SIGNAL2 scores for aquatic macroinvertebrate samples collected from the Study Area, post-wet (June) 2025

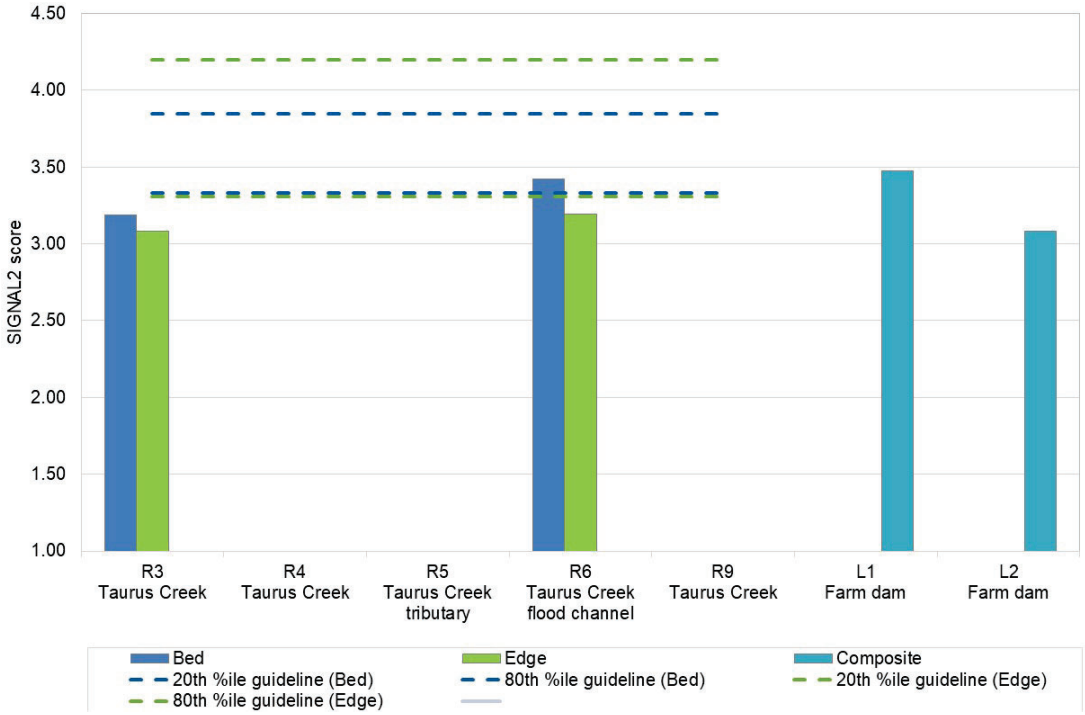


Figure 19 SIGNAL2 scores for aquatic macroinvertebrate samples collected from the Study Area, pre-wet (October) 2025

Australian River Assessment System OE50

Aquatic macroinvertebrate data from the post-wet (June) and pre-wet (October) 2025 sampling rounds was modelled using the AusRivAS Queensland regional coastal models for the seasons and habitats sampled. All riverine sites were within the experience of the models.

AusRivAS observed to expected (OE50) taxa scores indicate that the bed habitat samples were in reference condition (Band A; natural or near natural) at Taurus Creek site R3 in both June (Figure 20) and October 2025 (Figure 21), and at Taurus Creek flood channel site R6 in October 2025. Bed habitat samples were significantly impaired (Band B) in samples collected from Taurus Creek tributary site R5 and site R6 in June 2025. The bed habitat sample was severely impaired (Band C) at Taurus Creek sites R4 and R9 in June 2025, reflecting limited habitat in the senescing pools sampled. Sites R4 and R9 had dried completely by October 2025.

The AusRivAS OE50 taxa scores indicate that the edge habitat samples were in reference condition (Band A; natural or near natural) at Taurus Creek site R3 in June and October 2025, at Taurus Creek tributary site R5 in June 2025 (Figure 20), and at Taurus Creek flood channel site R6 in October 2025 (Figure 21). Edge habitat samples were significantly impaired (Band B) at sites R6 and Taurus Creek site R9 in June 2025. The edge habitat sample was severely impaired (Band C) at Taurus Creek site R4 in June 2025, reflecting limited edge habitat in the senescing pools sampled.

The prevalence of wetted habitat is a key driver in macroinvertebrate community structure and ecosystem functioning, and caution is applied to the use of AusRivAS ratings in ephemeral systems. The lower (Band B and C) OE50 taxa scores for most sites/samples are more likely a reflection of natural seasonality than catchment impacts.

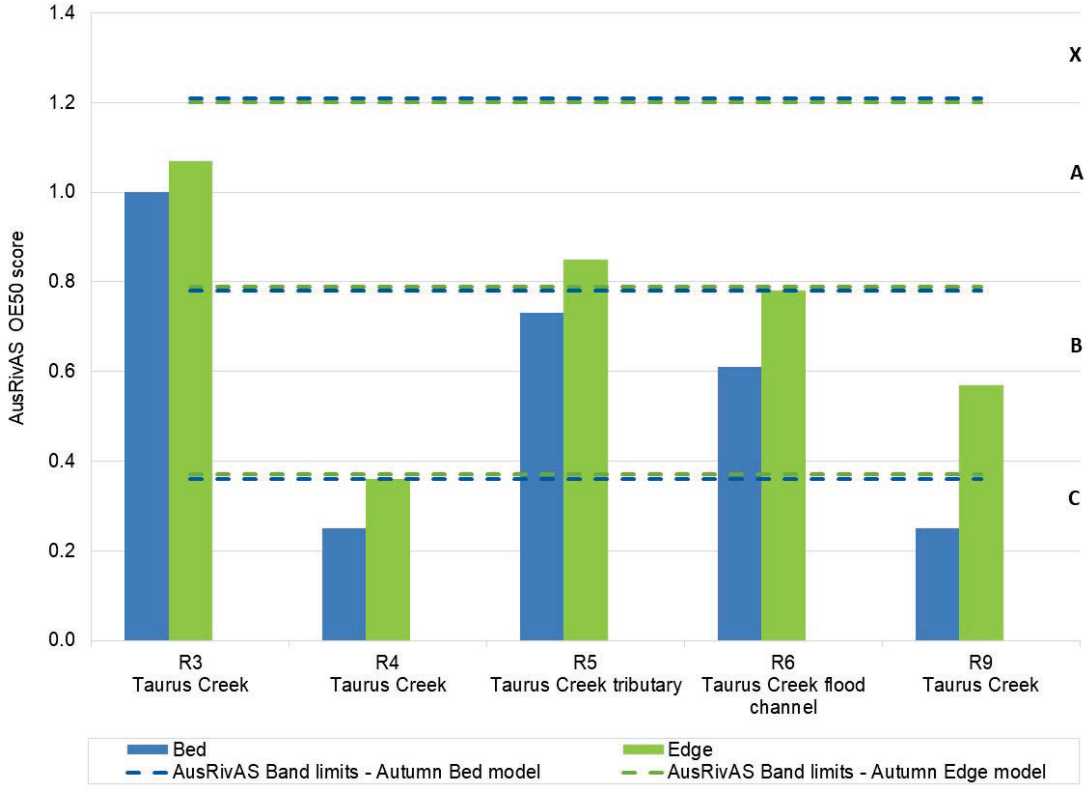


Figure 20 OE50 scores for riverine macroinvertebrate samples collected from the Study Area, post-wet (June) 2025

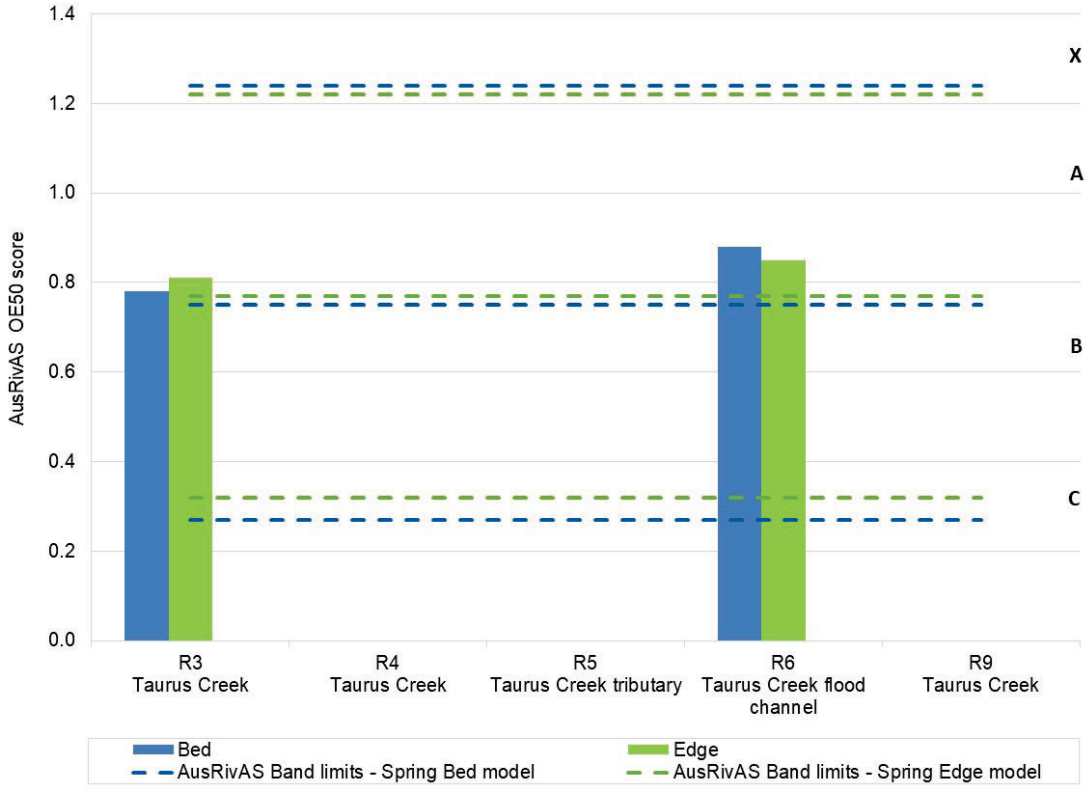


Figure 21 OE50 scores for riverine macroinvertebrate samples collected from the Study Area, pre-wet (October) 2025

4.6 Conservation-significant species

4.6.1 Aquatic flora

No conservation-significant aquatic flora species were recorded during the surveys. The Wetland*Info* database identifies 306 wetland indicator flora species/subspecies previously recorded from the broader Fitzroy Basin (DETSI 2025b). Of these, five are listed as conservation-significant (Table 20):

- salt pipewort/button grass (*Eriocaulon carsonii*) – Endangered (NC Act);
- salt pipewort/button grass (*Eriocaulon carsonii* subsp. *orientale*) – Endangered (EPBC Act and NC Act);
- *Maundia triglochinoides* – Vulnerable (NC Act);
- lesser swamp orchid (*Phaius australis*) – Endangered (EPBC Act and NC Act); and
- swamp fern (*Thelypteris confluens*) – Vulnerable (NC Act).

None of these species were recorded during the survey and are unlikely to occur within the Study Area (Table 20).

4.6.2 Fish

No conservation-significant fish species were recorded during the surveys. The Wetland*Info* database identifies 53 native fish species previously recorded from the Fitzroy Basin (DETSI 2025b). Of these, two are conservation-significant:

- silver perch (*Bidyanus bidyanus*) – Endangered (EPBC Act and NC Act); and
- Murray cod (*Maccullochella peelii*) – Vulnerable (EPBC Act).

It is unlikely that these conservation-significant species occur within waterways or wetlands of the Study Area as either resident or transient occurrences, as suitable habitat is not present, and the Study Area is outside the natural range of these species (Table 21).

4.6.3 Turtles

No conservation-significant turtle species were recorded during the surveys. The Wetland*Info* database identifies seven freshwater turtle species previously recorded from the Fitzroy Basin (DETSI 2025b). Of these, two are conservation-significant:

- white-throated snapping turtle (*Elseya albagula*) – Critically Endangered (EPBC Act and NC Act); and
- Fitzroy River turtle (*Rheodytes leukops*) – Vulnerable (EPBC Act and NC Act).

The white-throated snapping turtle and Fitzroy River turtle are also identified in the EPBC Act Protected Matters Report as ‘may’ occur and ‘likely’ to occur within the Search Area, respectively (DCCEEW 2025a, Appendix A).

It is unlikely that conservation-significant turtle species occur within the Study Area as either resident or transient occurrences, as suitable habitat was not detected during the field survey (Table 22).

4.6.4 Platypus

The Special Least Concern (NC Act) platypus (*Ornithorhynchus anatinus*) was not recorded during field surveys.

The ephemeral nature of the waterways of the Study Area are not conducive to sustaining a population of platypus. Similarly, the lacustrine waterbodies (i.e. farm and mine water dams) of the Study Area are unlikely to sustain a population of platypus as, despite relative permanence of wetted habitat, these waterbodies lack the bank structure required for platypus burrow construction.

4.6.5 Aquatic invertebrates

No conservation-significant aquatic invertebrates are identified in the EPBC Act Protected Matters Report (DCCEEW 2025a, Appendix A), nor in the Wetland*Info* database for the Fitzroy Basin (DETSI 2025b).

Table 20 Conservation-significant aquatic flora species recorded from the desktop Search Area

Scientific name	Common name	Status[1]		Preferred habitat	Likelihood of occurrence within the Project Area based on desktop	Likelihood of occurrence within the Project Area post field surveys	Data Source[2]			
		EPBC Act	NC Act				DCCEEW 2025a	DESTI 2025b (F-Basin)	DESTI 2025c (10km)	DESTI 2025c (50km)
Eriocaulon carsonii (including subsp. *orientale*)	salt pipewort/button grass	E	E	Restricted to saturated soil adjacent to flowing mound springs (Sainty and Jacobs 2003).	**Unlikely**. Mound springs not known to occur within the Study Area. Preferred habitat is unlikely to occur within the Study Area. There are no records within 50 km of the Study Area (DETSI 2025c).	**Unlikely**. Species or species habitat not detected during the field survey.		✓		
Maundia triglochinoides	-		V	Grows in coastal freshwater swamps and streams (Sainty and Jacobs 2003), in waters up to 0.5 m deep, or shallow waters that may dry up seasonally.	**Unlikely**. Preferred habitat unlikely to occur within the Study Area. There are no records within 50 km of the Study Area (DETSI 2025c).	**Unlikely**. Species or species habitat not detected during field surveys.				
Phaius australis	lesser swamp-orchid	E	E	Occurs near the coast. Grows in sandy areas where soils are almost always damp, but not flooded for lengthy periods; occurring in southern Queensland and northern New South Wales (DETSI 2025i).	**Unlikely**. Preferred habitat not known to occur within the Study Area. There are no records within 50 km of the Study Area (DETSI 2025c).	**Unlikely**. Species or species habitat not detected during the field survey.		✓		
Thelypteris confluens	swamp fern		V	Found in permanently swampy areas and mound springs (DETSI 2025i). Occurs in the Queensland pastoral districts on Leichhardt, Moreton and Wide Bay (DETSI 2025i).	**Unlikely**. Preferred habitat not known to occur within the Study Area. There are no records within 50 km of the Study Area (DESTI 2025c).	**Unlikely**. Species or species habitat not detected during the field survey.		✓		

Notes: [1] Status under the Commonwealth EPBC Act and/or Queensland NC Act as E = Endangered or V = Vulnerable.

[2] Data sources: Commonwealth EPBC Act Protected Matters Report – Study Area plus 10 km buffer – created 11 June 2025 (DCCEEW 2025a); Queensland WildNet database – Study Area plus approximate 10 km and 50 km buffers – created 11 June 2025 (DETSI 2025c); and Queensland WetlandInfo – Fitzroy Basin – Wetland Summary Information (DETSI 2025b).

Table 21 Conservation-significant fish species recorded from the desktop Search Area

Scientific name	Common name	Status[1]		Preferred habitat	Likelihood of occurrence within the Project Area based on desktop	Likelihood of occurrence within the Project Area post field surveys	Data Source[2]			
		EPBC Act	NC Act				DCCEEW 2025a	DESTI 2025b (F-Basin)	DETSI 2025c (10km)	DETSI 2025c (50km)
Bidyanus bidyanus	Silver perch	E	E	Faster-flowing water, including rapids and races, and more open sections of river, throughout the Murray-Darling Basin (MDB) (Clunie and Koehn 2001, cited in DotE 2013).	**Unlikely**. Distributional range is naturally in the MDB, although translocated to coastal streams in south-east Queensland (and other states). Preferred habitat not detected within the Study Area. No records within 50 km of the Study Area (DETSI 2025c).	**Unlikely**. Species or species habitat not detected during field surveys.	✓	✓		
Maccullochella peelii	Murray cod	V	LC	Deep water with in-stream habitat such as boulders, logs, and overhanging vegetation (Allen et al. 2002). From fast-moving clear upland streams to slow-flowing turbid lowland waters. Most individuals stay within a 10 km reach of the river (Pusey et al. 2004; Allen et al. 2002).	**Unlikely**. Distributional range is naturally in the MDB, although translocated to coastal streams in south-east Queensland (and other states). Preferred habitat not detected within the Study Area. No records within 50 km of the Study Area (DETSI 2025c).	**Unlikely**. Species or species habitat not detected during field surveys.	✓			✓

Notes: [1] Status under the Commonwealth EPBC Act and/or Queensland NC Act as E = Endangered or V = Vulnerable.

[2] Data sources: Commonwealth EPBC Act Protected Matters Report – Study Area plus 10 km buffer – created 11 June 2025 (DCCEEW 2025a); Queensland WildNet database – Study Area plus approximate 10 km and 50 km buffers – created 11 June 2025 (DETSI 2025c); and Queensland WetlandInfo – Fitzroy Basin – Wetland Summary Information (DETSI 2025b).

Table 22 Conservation-significant turtle species recorded from the desktop Search Area

Scientific name	Common name	Status[1]		Preferred habitat	Likelihood of occurrence within the Project Area based on desktop	Likelihood of occurrence within the Project Area post field surveys	Data Source[2]			
		EPBC Act	NC Act				DCCEEW 2025a	DESTI 2025b (F-Basin)	DETSI 2025c (10km)	DETSI 2025c (50km)
Rheodytes leukops	Fitzroy River turtle	V	V	Fast-flowing water of the Fitzroy River and its tributaries (Cogger 2014). Rivers with large, deep pools and rocky, gravelly or sandy substrates, connected by shallow riffles. Preferred areas have high water clarity and are often associated with ribbonweed (*Vallisneria* sp.) (DCCEEW 2025c).	**Unlikely**. Preferred habitat 'likely' to occur within the desktop Search Area (DCCEEW 2025a), but unlikely to occur within the Study Area. Recorded from within 50 km of the Study Area (DETSI 2025c), from the Mackenzie River (ALA 2025).	**Unlikely**. Species or species habitat not detected during field surveys.	✓	✓		
Elseya albagula	White-throated snapping turtle (also known as the southern snapping turtle)	CE	CR	Permanent flowing water habitats where there are suitable shelters and refuges (DETSI 2025i); clear, flowing, well-oxygenated waters (Todd et al. 2013) of the Fitzroy, Mary and Burnett catchments.	**Unlikely**. Preferred habitat 'may' occur within the desktop Search Area (DCCEEW 2025a), but unlikely to occur within the Study Area. Recorded from within 50 km of the Study Area, from the Comet and Mackenzie rivers (ALA 2025).	**Unlikely**. Species or species habitat not detected during field surveys.	✓	✓		

Notes: [1] Status under the Commonwealth EPBC Act and/or Queensland NC Act as E = Endangered or V = Vulnerable or CE = Critically Endangered.

[2] Data sources: Commonwealth EPBC Act Protected Matters Report – Study Area plus 10 km buffer – created 11 June 2025 (DCCEEW 2025a); Queensland WildNet database – Study Area plus approximate 10 km and 50 km buffers – created 11 June 2025 (DETSI 2025c); and Queensland WetlandInfo – Fitzroy Basin – Wetland Summary Information (DETSI 2025b).

4.7 Introduced species

4.7.1 Introduced aquatic flora

There are 22 introduced wetland indicator plant species known from the Fitzroy Basin (DETSI 2025b). Only two of these species were recorded in the Study Area during the seasonal surveys: awnless barnyard grass (*Echinochloa colona*) and white eclipta (*Eclipta prostrata*). Neither are of ecological significance.

Those invasive species considered to pose a particular threat to aquatic biodiversity, and that could potentially occur within the Study Area, are identified as either Weeds of National Significance (WoNS) (Weeds Australia 2025) or Restricted matter category 3 under the Queensland *Biosecurity Act 2014* (Table 23). None were detected in the Study Area.

Table 23 Introduced wetland indicator plants recorded from the desktop Search Area

Scientific name	Common name	National status^	Biosecurity Act status*
Arundo donax	-		
Cyperus esculentus	Yellow nutgrass		
Cyperus involucratus	-		
Cyperus papyrus	Papyrus		
Diplachne fusca var. *uninervia*	-		
Echinochloa colona	**Awnless barnyard grass**		
Echinochloa crus-galli	Barnyard grass		
Eclipta prostrata	**White eclipta**		
Eichhornia crassipes	Water hyacinth	WoNS	Restricted 3
Eleocharis minuta	-		
Hymenachne amplexicaulis 'Olive'	Olive hymenachne	WoNS	Restricted 3
Juncus bufonius	Toad rush		
Nymphaea caerulea	Cape waterlily		
Paspalum distichum	Water couch		
Paspalum vaginatum	Saltwater couch		
Pistia stratiotes	Water lettuce		Restricted 3
Polypogon monspeliensis	Annual beardgrass		
Rorippa nasturtium-aquaticum	Watercress		
Salix babylonica	Weeping willow		
Salvinia molesta	Salvinia	WoNS	Restricted 3
Sparganium erectum subsp. *stoloniferum*	Erect bur-reed		
Urochloa mutica	Para grass		

Notes: ^ Species listed as WoNS; * species listed under the Queensland *Biosecurity Act 2014*; * **Bold text** indicates species detected during field surveys.

4.7.2 Pest fish species

Six introduced fish species have been recorded from the Fitzroy Basin: mosquitofish (*Gambusia holbrooki*), guppy (*Poecilia reticulata*), goldfish (*Carassius auratus*), European carp (*Cyprinus carpio*), tilapia (*Oreochromus mossambicus*) and platy (*Xiphophorus maculatus*) (DETSI 2025b).

Mosquitofish was confirmed from site L1 in June and October 2025 (Section 4.5.1). The mosquitofish is a noxious species listed as restricted categories 3, 5, 6 and 7 in the *Biosecurity Act 2014*. This species was introduced into Australia from North America in 1929 as a biological control for mosquitos; however, this was unsuccessful and the species is now regarded as one of the greatest threats to Australia's native biodiversity (Business Queensland 2020). The mosquitofish has many traits that make them a good invader such as high reproductive potential, flexible diet, broad environmental tolerances and low vulnerability to predation, and they have the potential to rapidly outnumber native fish and dominate aquatic communities (Business Queensland 2020).

4.7.3 Introduced aquatic reptiles

No introduced aquatic reptile species were recorded during the surveys, and none were identified from the desktop assessments as having potential to occur in the Study Area.

4.8 Groundwater-dependent ecosystems

GDEs are ecosystems that rely upon groundwater for their continued existence. They may be 100% dependent on groundwater, such as aquifer GDEs, or may access groundwater intermittently to supplement their water requirements, such as riparian tree species in arid and semi-arid areas (IESC 2018). GDEs can be classified into three broad types:

- aquifer or cave ecosystems (subterranean GDEs);
- ecosystems dependent on the surface expression of groundwater (surface expression GDEs, including river baseflow systems, springs and swamps); and
- ecosystems dependent on the subsurface presence of groundwater (terrestrial GDEs, including some riparian vegetation communities).

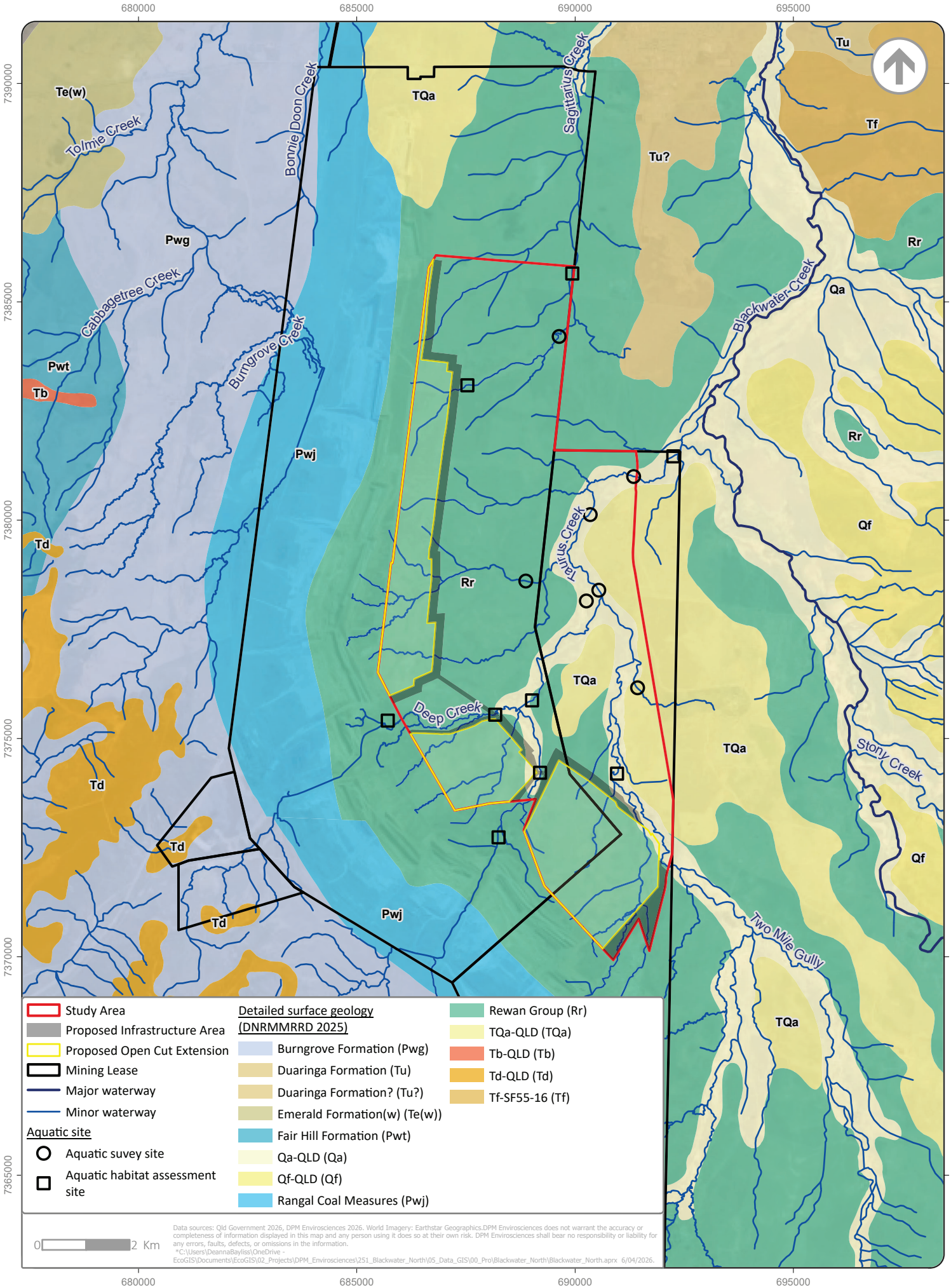
4.8.1 Subterranean groundwater-dependent ecosystems

Stygofauna desktop assessment results

Aquifers of the Study Area

The surface geology of the Study Area (Figure 22) is dominated by lithology belonging to the Rewan Group, which includes lithic sandstone, pebbly lithic sandstone, mudstone and minor volcanilithic pebble conglomerate at the base (DNRMMRRD 2025b). Late Tertiary to Quaternary alluvium, which includes high-level alluvial deposits of poorly consolidated sand, silt, clay and minor gravel, occurs on the broad valleys and floodplains of Taurus Creek and Two Mile Gully, extending east towards Blackwater Creek. The late Tertiary to Quaternary alluvium is intersected by more recent Quaternary alluvium, which includes unconsolidated clay, silt, sand and gravel, on the floodplain and channels of Two Mile Gully and Deep and Taurus creeks (Figure 22). More specifically, these potential GDE aquifers (Figure 23) are identified as 'Quaternary alluvial aquifers with fluctuating, intermittent groundwater connectivity regime and unknown pH' based on expert opinion (DETSI 2025d). These Quaternary alluvial aquifers align broadly with the Quaternary and late Tertiary to Quaternary alluvium identified in the surface geology mapping (DNRMMRRD 2025b) and correspond with the Land Zone mapping (Land Zone 3 [Section 2.3]; DNRMMRRD 2025b).

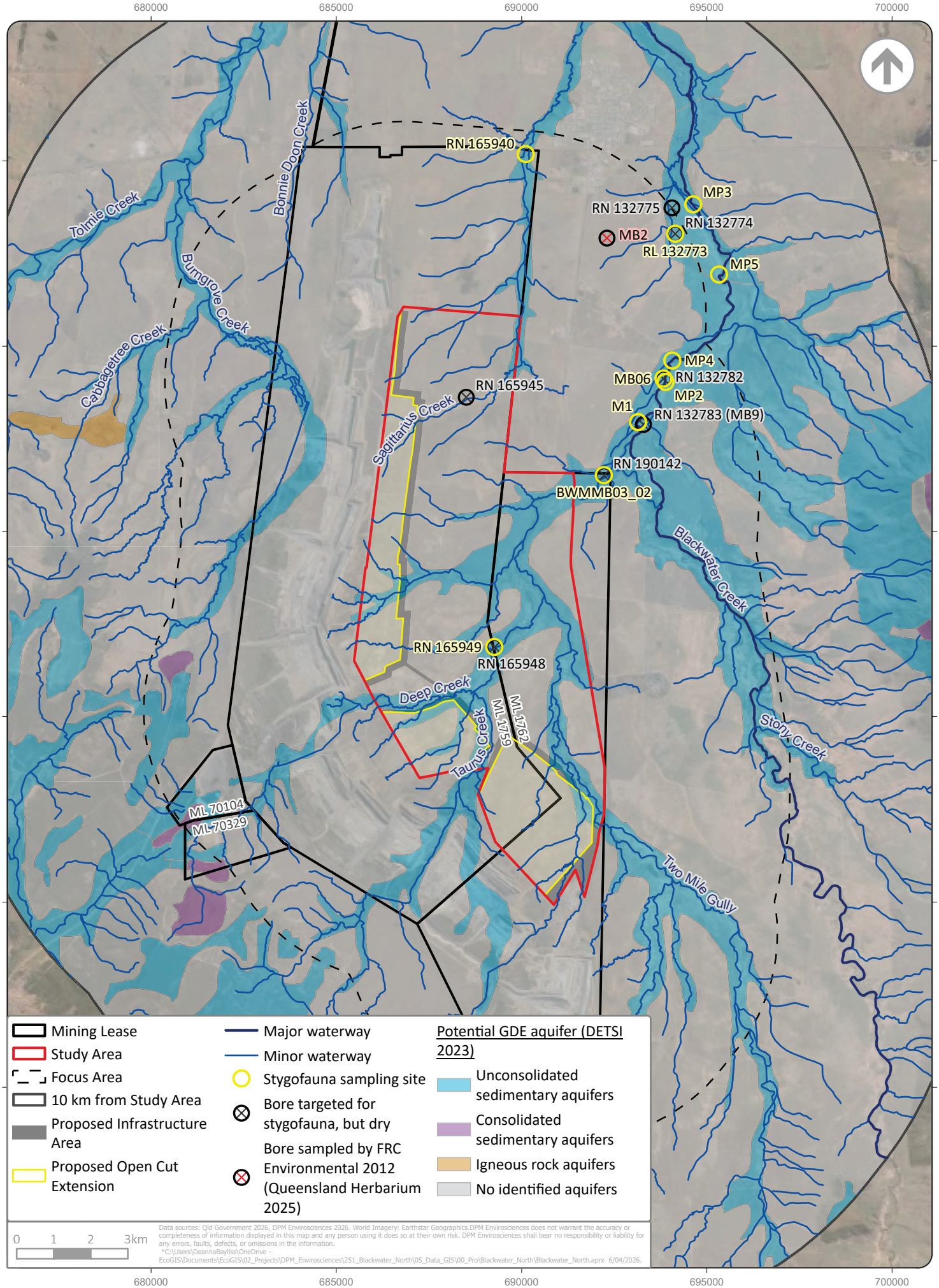
The alluvial aquifers of the Study Area are intercepted by a number of existing monitoring bores (Appendix C) with similar characteristics (lithology, aquifer depth, EC, pH etc.) to other bores in Queensland (4T 2012, DPM Enviroscences 2022 and Queensland Herbarium 2025) in which stygofauna have been previously detected.



SURFACE GEOLOGY OF THE STUDY AREA

Blackwater North Extension Project - Aquatic Ecology and GDE Assessment

FIGURE 22



GROUNDWATER-DEPENDENT ECOSYSTEM AQUIFERS

Blackwater North Extension Project - Aquatic Ecology and GDE Assessment

FIGURE 23

Stygofauna Potential Presence

The Queensland subterranean aquatic fauna database (Queensland Herbarium 2025) identifies several bores that have been sampled for stygofauna within a 50 km radius of the Study Area. Subterranean fauna (recognised as potential stygofauna at the time) were detected in two of these bores (Table 24) in 2012 by FRC Environmental as part of an assessment of the 'Minyango Project' (Queensland Herbarium 2025), comprising specimens from the:

- insect order Coleoptera (beetles), family Hydraenidae (one individual from bore MB2);
- annelid class Oligochaeta (segmented worms), family Naididae (one individual from bore MB2); and
- crustacean sub-class Copepoda, order Cyclopoida (two individuals from bore MB9).

Since 2012, there is a better understanding of taxa likely to be stygofauna and the previous specimens are considered unlikely to be stygofauna.

Bores MB2 and MB9, sampled by FRC Environmental in 2012, are located within 5 km of the Study Area. DPM Enviros attempted to sample bore MB9 (RN 132783) in July and October 2025, but it was dry at the time of sampling as shown in Table 24 and Figure 23. Bore MB2 (RN 132777) was not targeted by DPM Enviros as it is screened too deep (220--226 mbgl) to be suitable for stygofauna. Various species of hydraenid beetles live in riparian, littoral and aquatic habitats, but are not known to include stygofauna which potentially explains the individual recorded by FRC Environmental from bore MB2.

Oligochaete worms of the family Naididae (detritus worms) are key components of the benthic communities of many freshwater ecosystems. Naidids were once considered members of a community that occurs within the shallow to deep sand and gravel beds associated with areas of groundwater discharge (Gilbert et al. 1994), representing a common group of worms existing in all Australian States and Territories. However, subsequent studies now consider the broader Oligochaeta class as part of the soil fauna (Halse and Pearson 2014). The hydraenid and naidid specimens recorded from bore MB2 may be stygoxenes (i.e. not obligate inhabitants of groundwater systems) but are unlikely to be stygofauna.

Copepods in the taxonomic order Cyclopoida are normally associated with fine to coarse sandy substrates of still water environments of rivers, wetlands, the hyporheic zone and shallow groundwaters. The cyclopoid collected by FRC Environmental from bore MB9 in 2012 represents a likely stygoxene rather than stygofauna (see discussion in the 'Stygofauna sampling results' below).

Freshwater Ecology targeted 10 bores within and surrounding the Study Area in November 2020 and May 2021 (Freshwater Ecology 2021). Five of these bores are screened too deep (>168 mbgl) for stygofauna to have access to the borehole, and two of the five shallower bores were dry at the time of each seasonal sampling event. Consequently, only three of the 10 bores targeted for stygofauna met the criteria for sampling as per the DSITI (2015) guideline. No stygofauna was detected by Freshwater Ecology (2021).

Stygofauna sampling results

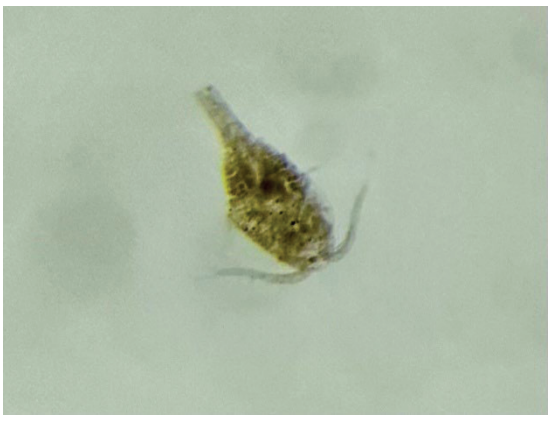
July 2025 sampling

Five wet groundwater bores and five wet micropiezometers were sampled for stygofauna in July 2025, as shown in Table 24 and Figure 23. Standing water levels ranged from 0.3 mbgl in each of the micropiezometers within the bed of Blackwater Creek to 14.55 mbgl at bore RN 132781 (MB6) on the floodplain of Blackwater Creek (Table 24). pH levels ranged from 6.2 (slightly acid) at bore RN 165940 on the floodplain of Sagittarius Creek to 8.3 (moderately alkaline) at micropiezometer site MP1 within Blackwater Creek. Specific conductivity levels ranged from 271 µS/cm (fresh) at site MP1 to 48,984 µS/cm (saline) at bore RN 132773 on the floodplain of Blackwater Creek.

A single cyclopoid copepod was identified in the sample collected from micropiezometer site MP4 on Blackwater Creek (Plate 5). Stygofauna specialist Dr Peter Hancock advised (pers. comm. 29/07/2025) that further taxonomy is unlikely to determine whether the cyclopoid is stygofauna or not. As the sampling was only shallow and close to the creek, it is more likely a surface/hyporheic benthic copepod (a stygoxene) taking refuge in shallow alluvium, but which may still rely on shallow groundwater during dry times. Copepod stygofauna are more commonly represented by harpacticoid copepods in alluvium, rather than cyclopoid copepods, as the large swimming antennae of cyclopoid copepods are not well suited to tightly packed aquifers (pers. comm. Dr Peter Hancock 29/07/2025). The cyclopoid copepod detected is considered to be a stygoxene. No stygofauna were detected.



Site MP4 on Blackwater Creek



Cyclopoid copepod specimen from site MP4

Plate 5 Micropiezometer site MP4 and cyclopoid specimen from Blackwater Creek, July 2025

October 2025

The same 10 locations sampled in July 2025 were targeted for follow-up seasonal sampling in October 2025 (Table 24). Standing water levels ranged from 0.1 mbgl at micropiezometer site MP3 in the bed of Taurus Creek to 14.50 mbgl at bore RN 132781 (MB6) on the floodplain of Blackwater Creek (Table 24). pH levels ranged from 6.4 (slightly acid) to 7.4 (neutral). Specific conductivity levels ranged from 420 µS/cm (fresh) at site MP5 to 48,563 µS/cm (saline) at bore RN 132773 on the floodplain of Blackwater Creek.

No stygofauna were detected.

Table 24 Characteristics of groundwater monitoring bores and micropiezometers targeted for stygofauna, July and October 2025

Bore ID^	Lithology at screened interval	Bore depth (mBGL)	Screen (mBGL)	SWL (mBGL)	Date sampled	pH	EC (µS/cm)	Ion sample	Stygo. sampling	Notes
RN 132773 (MB13A)	Siltstone	15.69	12.3-15.3	11.64	2/07/2025	6.5	48984	✓	✓	Six hauls off bottom, then purged/filtered 20 L (each time).
				11.65	25/10/2025	6.5	48563	✓	✓	
RN 132774 (MB13B)	Alluvial sand	9.15	6-9	-	2/07/2025	-	-	-	-	Dry at the time of sampling.
				-	25/10/2025	-	-	-	-	
RN 132775 (MB12)	Alluvial sand	9.98	6.5-9.5	-	2/07/2025	-	-	-	-	Dry at the time of sampling.
				-	25/10/2025	-	-	-	-	
RN 132781 (MB6)	Siltstone	41.23	32-41	14.55	2/07/2025	7.3	21370	✓	✓	Six hauls off bottom, then purged/filtered 20 L (each time).
				14.50	25/10/2025	6.8	22355	✓	✓	
RN 132782 (MB10)	Alluvial sand	8.45	6-9	-	2/07/2025	-	-	-	-	Dry at the time of sampling.
				-	25/10/2025	-	-	-	-	
RN 132783 (MB9^)	Alluvial sand	11.84	9-12	-	2/07/2025	-	-	-	-	Dry at the time of sampling.
				-	25/10/2025	-	-	-	-	
RN 165940 (MB19BWM02A)	Alluvial clay/sand	15.30	12-15	6.25	1/07/2025	6.2	37384	✓	✓	Six hauls off bottom, then purged/filtered 20 L (each time).
				6.36	20/10/2025	6.4	37326	✓	✓	
RN 165945 (MB19BWM05A)	Claystone	15.06	9-15	-	1/07/2025	-	-	-	-	Dry at the time of sampling.
				-	20/10/2025	-	-	-	-	
RN 165948 (MB19BWM07A)	Alluvial sand and gravel	7.06	4-7	-	1/07/2025	-	-	-	-	Dry at the time of sampling.
				-	22/10/2025	-	-	-	-	
RN 165949 (MB19BWM25P)	Sandstone	20.20	17-20	11.00	1/07/2025	7.3	5420	✓	✓	Six hauls off bottom, then purged/filtered 20 L (each time).
				11.20	22/10/2025	7.4	4601	✓	✓	
RN 190142 (BWMMB03_01)	Alluvial sand and gravel	11.13	8-11	-	2/07/2025	-	-	-	-	Dry at the time of sampling.
				-	23/10/2025	-	-	-	-	
RN 190143 (BWMMB03_02)	Sandstone	40.99	35-41	12.09	3/07/2025	6.6	36033	✓	✓	Six hauls, then purged/filtered 20 L (each time).
				12.12	23/10/2025	7.0	36159	✓	✓	
MP1	Alluvial sand and gravel	1.0	0.3-1.0	0.3	2/07/2025	8.3	271	✓	✓	10 L purged/filtered with micropiezometer.
		1.2	0.5-1.2	0.6	25/10/2025	7.4	743	✓	✓	

Bore ID^	Lithology at screened interval	Bore depth (mBGL)	Screen (mBGL)	SWL (mBGL)	Date sampled	pH	EC (µS/cm)	Ion sample	Stygo. sampling	Notes
MP2	Alluvial sand and gravel	1.0	0.3-1.0	0.3	2/07/2025	7.5	589	✓	✓	10 L purged/filtered with micropiezometer.
		-	-	-	25/10/2025	-	-	-	-	Dry. Excavated sand to dry clay layer beside lowest point in bed.
MP3	Alluvial sand and gravel	1.0	0.3-1.0	0.3	3/07/2025	7.4	341	✓	✓	10 L purged/filtered with micropiezometer (each time).
		0.5	0-0.5	0.1	25/10/2025	7.0	466	✓	✓	
MP4	Alluvial sand and gravel	1.0	0.3-1.0	0.3	3/07/2025	7.0	1112	✓	✓	10 L purged/filtered with micropiezometer.
		-	-	-	25/10/2025	-	-	-	-	Dry, Dard dry clay at 0.2 m below bed level of dried pool.
MP5	Alluvial sand and gravel	1.0	0.3-1.0	0.3	3/07/2025	7.6	315	✓	✓	10 L purged/filtered with micropiezometer (each time).
		1.2	0.5-1.2	0.9	25/10/2025	7.3	420	✓	✓	

Notes:

^ Indicates bores in which subterranean fauna was detected by FRC Environmental in 2012 (Queensland Herbarium 2025); and

* EC = Electrical Conductivity, standardised to 25˚C (i.e. Specific Conductivity).

4.8.2 Surface expression groundwater-dependent ecosystems

Desktop mapping of potential surface expression GDEs throughout Queensland (DETSI 2025d) shows no ‘known’ or ‘derived’ surface expression GDEs within the Study Area. ‘Derived’ surface expression GDE lines and areas of ‘moderate confidence’ are identified in the DETSI (2025d) mapping downstream of the Study Area to the north-east on Blackwater Creek (Figure 24). The lines represent ‘channels on alluvia overlying sandstone ranges with fresh, intermittent flow’, and the areas represent ‘riverine waterbodies on alluvia overlying sandstone ranges with fresh, intermittent flow’; each forming part of ‘Quaternary alluvial aquifers overlying sandstone ranges with fresh, intermittent groundwater connectivity regime’ (DETSI 2025d).

Micropiezometer site MP3 (Figure 23 in Section 4.8.1) was positioned in fresh (341 to 466 µS/cm) saturated alluvium beside an isolated pool on Blackwater Creek (downstream of the Study Area) that forms part of the State-mapped derived surface expression lines.

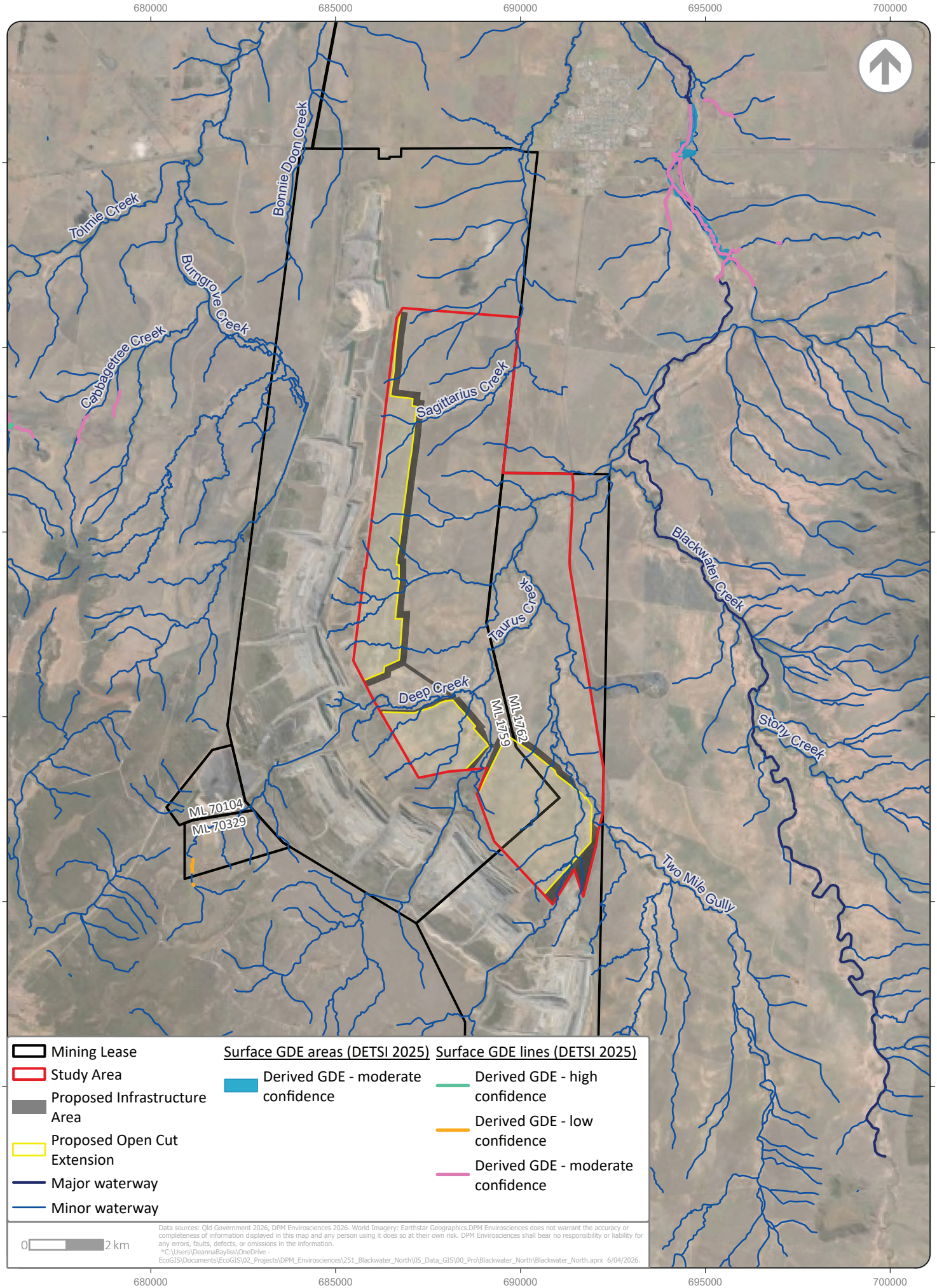
Water samples collected from site MP3 in July and October 2025 were both fresh and bicarbonate dominated, consistent with most surface waters of the Study Area (Figure 7 in Section 4.2.2). The alluvial aquifer of Blackwater Creek is expected to be recharged by rainfall and surface water infiltration in the catchment and channel. Saturated alluvia above the less permeable sandstone base may express water into Blackwater Creek, extending the duration of ephemeral/intermittent flow and isolated pools in Blackwater Creek for longer than waterways that lack alluvia overlying a sandstone base. Consequently, the State-mapped ‘derived’ surface expression GDEs of ‘moderate confidence’ on Blackwater Creek are indeed likely to be surface expression GDEs (Plate 6).

Field observations of waterways and wetlands within the Study Area (i.e. excluding Blackwater Creek) found no obvious evidence of groundwater expressions, salt seeps or other on-ground indicators of surface expression GDEs.



July 2025 October 2025

Plate 6 State-mapped ‘moderate confidence’ ‘surface expression groundwater-dependent ecosystem line’ at site MP3



SURFACE EXPRESSION GROUNDWATER-DEPENDENT ECOSYSTEMS

Blackwater North Extension Project - Aquatic Ecology and GDE Assessment

DPM ENVIROSCIENCES

FIGURE 24

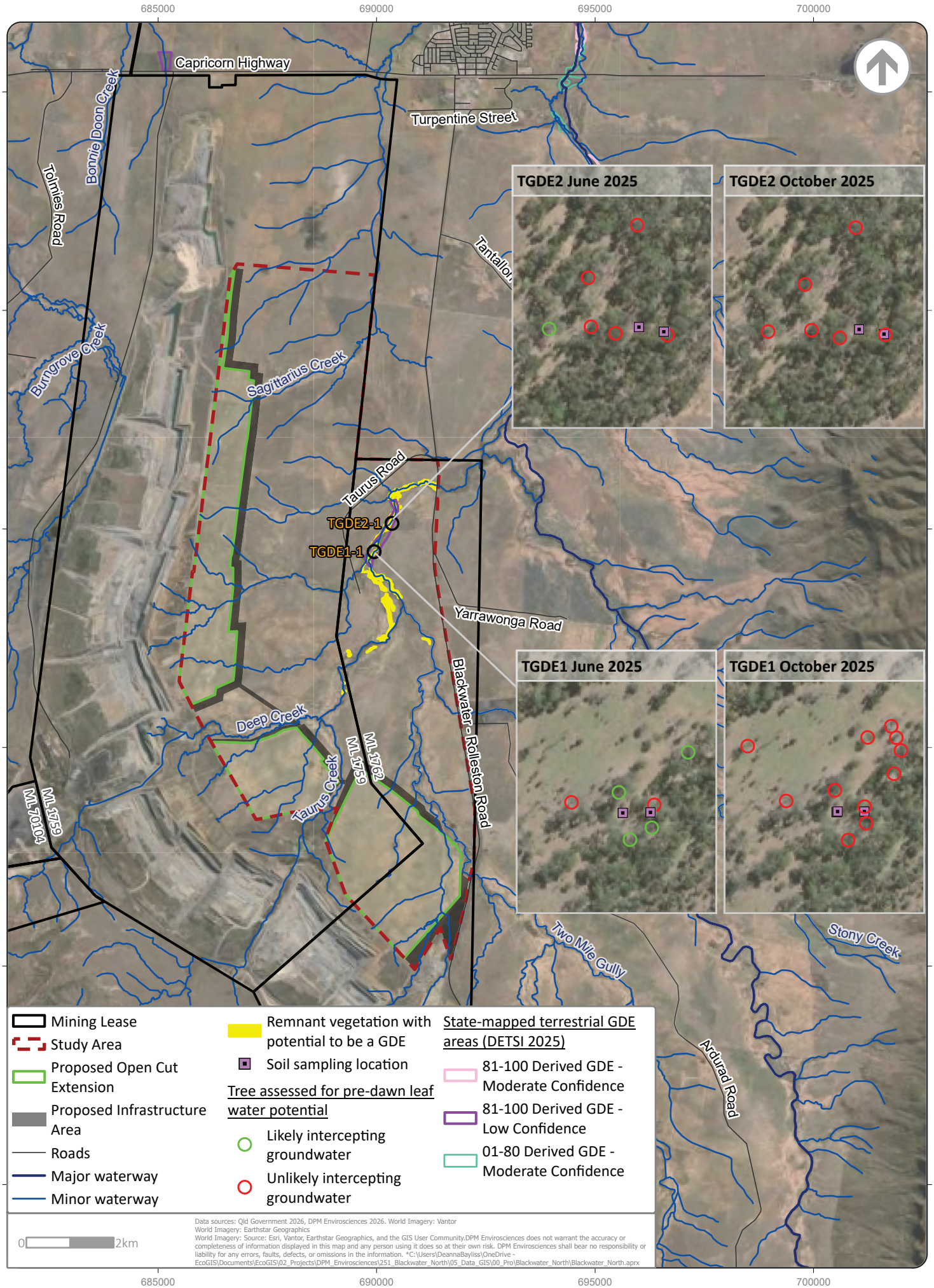
4.8.3 Terrestrial groundwater-dependent ecosystems

State-mapped terrestrial groundwater-dependent ecosystems

Desktop mapping of potential GDEs throughout Queensland (DETSI 2025d) shows no 'known' terrestrial GDEs within the Study Area. However, a single polygon of 'derived' terrestrial GDE of 'low confidence' is identified in the State mapping (DETSI 2025d), based on expert knowledge of the landscape and available spatial datasets (but without field verification) (Figure 25). Specifically, it is identified as a treed Regional Ecosystem (RE) on alluvia, with fluctuating, intermittent flow, that may be dependent on the sub-surface presence of groundwater (DETSI 2025d).

Remote sensing of terrestrial groundwater-dependent ecosystems

2rog Consulting (2021) developed a remote sensing dataset of potential terrestrial GDEs for several tenements throughout the Bowen Basin, applying the remote sensing method recommended by the IESC (Doody, Hancock and Pritchard 2019). This dataset identifies areas that are relatively wetter and greener than surrounding areas, though does not identify regions of confirmed terrestrial GDE. 2rog Consulting mapped potential terrestrial GDEs within a 50 km buffer of the assessed tenements, including BWM. No remotely sensed potential terrestrial GDEs were identified by 2rog Consulting in the BWM Study Area.



TERRESTRIAL GROUNDWATER-DEPENDENT ECOSYSTEMS

Blackwater North Extension Project- Aquatic Ecology and GDE Assessment

DPM ENVIROSCIENCES

FIGURE 25

Conceptual understanding

RDM Hydro, 3D Environmental and Groundwater Enterprises (2023) undertook a desktop assessment to identify the distribution of potential terrestrial GDEs within the Study Area. This included a hydrogeological review of shallow groundwater to better understand the groundwater regime with consideration of terrestrial GDEs. RDM Hydro et al. (2023) determined that the shallow water table is a subdued reflection of topography and is generally in excess of 25 mbgl, except in the vicinity of drainage lines and topographic lows where the water table is likely shallower.

RDM Hydro, 3D Environmental and Groundwater Enterprises (2023) presented conceptual ecohydrological models which are likely to be found across the broader BWM tenements and the wider Bowen Basin based on the findings of the desktop study and previous field assessments of other GDE studies in the Bowen Basin. The conceptual ecohydrological models include perched aquifers in alluvium and systems exhibiting interactions with Tertiary and Permo-Triassic sediments (coal seams and alluvium). For the Quaternary Alluvium formations, which includes Taurus Creek, groundwater occurs as ephemeral, discontinuous perched aquifers in sandier material, with clayey material forming aquitards (RDM Hydro, 3D Environmental and Groundwater Enterprises 2023). The alluvial sediments are of limited extent and thickness but are likely to be episodically recharged by rainfall run-off when the watercourse hosts water, resulting in the presence of perched aquifers associated with the alluvium (Figure 26).

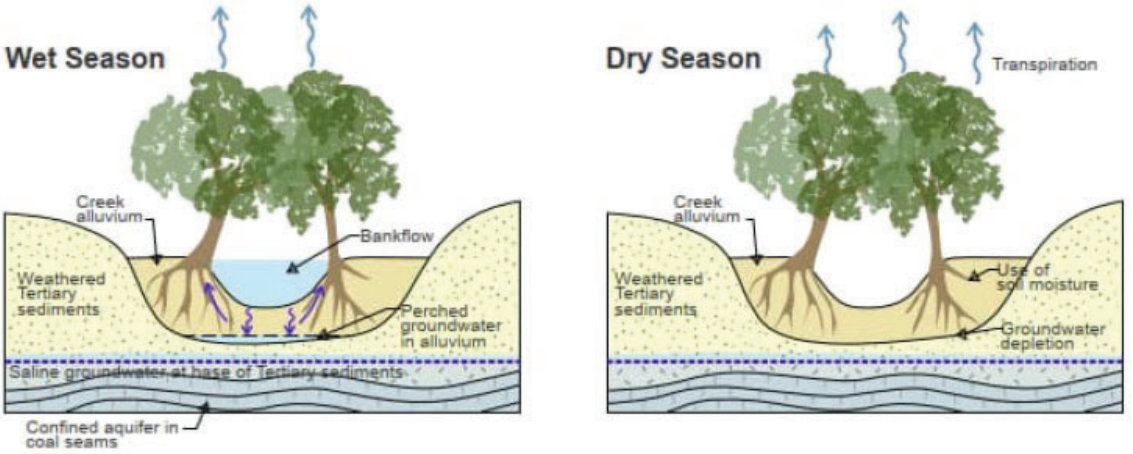


Figure 26 Perched aquifer in creek alluvium, showing seasonal depletion (RDM Hydro, 3D Environmental and Groundwater Enterprises 2023)

The potential terrestrial GDEs of Taurus Creek are dominated by coolibah (*Eucalyptus coolabah*), aligning with RE 11.3.3 on the channel and 11.3.1 further out on the floodplain where brigalow (*Acacia harpophylla*) tends to dominate. RDM Hydro, 3D Environmental and Groundwater Enterprises (2023) identify that the coolibah is likely to utilise groundwater only when groundwater is <5 mbgl and moisture availability in the vadose zone is extremely limited. Brigalow (*Acacia harpophylla*) is also prevalent within the State-mapped terrestrial GDE polygon, particularly on the floodplain away from the channel. However, brigalow is not considered to represent groundwater-dependent vegetation.

Field verification of terrestrial GDEs

Two sites/areas (TGDE-1 and TGDE-2) were field verified for groundwater-dependent trees within the single State-mapped polygon of potential terrestrial GDE (DETSI 2025d) adjoining Taurus Creek in the Study Area (Figure 25). These sites were assessed in June 2025, then again in October 2025. The raw data relating to pre-dawn LWP and SWP measurements is provided as Appendix F and is graphed in Figure 27. Pre-dawn LWP measurements ≥ - 0.55 MPa indicate trees that are likely accessing a saturated source of water (ranging from fresh to slightly saline) in either the soil profile or water table (Section 3.8.1; Figure 27).

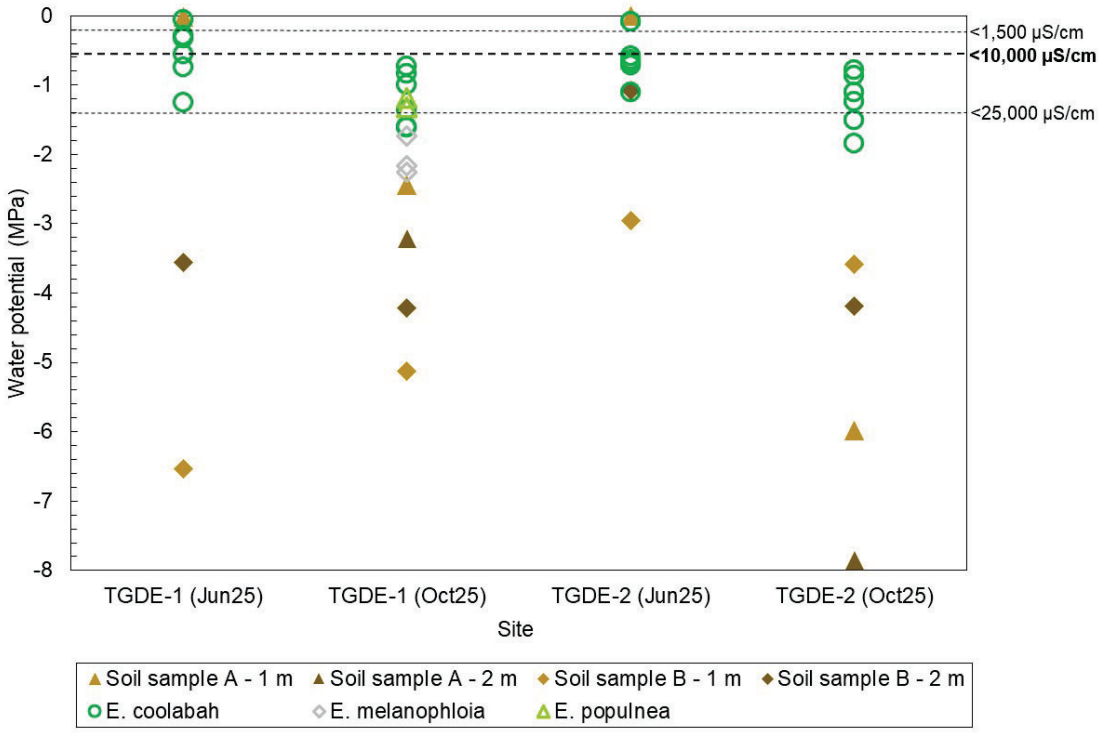


Figure 27 Pre-dawn leaf water potential (LWP) and soil water potential (SWP) measurements at target sites

Note: dashed lines indicate expected LWP value for trees in equilibrium with saturated moisture sources expected at 1,500 µS/cm, 10,000 µS/cm and 25,000 µS/cm.

Five of the 12 trees assessed at sites TGDE-1 and TGDE-2 were likely intercepting either soil water or groundwater at the time of assessment 20 June 2025. This comprised coolibah (*Eucalyptus coolabah*) in the channel, on the stream bank, and on the adjoining floodplain. Saturated sediments were encountered in the upper 1 m of bed sediments. Soil/sediments were much drier in the upper 2 m of the soil/sediment profile on the adjoining floodplain. It is likely that those well-hydrated trees (pre-dawn LWP ≥ -0.55 MPa) sampled on the bed and bank of Taurus Creek were intercepting soil/sediment water in the upper profile. However, some of the well-hydrated trees on the floodplain, which were up to 30 m from the channel, were likely intercepting deeper water in the perched alluvial aquifer at the time of assessment 20 June 2025.

The same 12 coolibah trees were assessed in October 2025. In addition, three silver-leaved ironbark (*E. melanophloia*) and two poplar box (*E. populnea*) individuals (rare occurrence of each in the vegetation community) were also assessed at site TGDE1 in October 2025 (Figure 25). Pre-dawn LWP measurements indicated that these 17 trees were unlikely accessing groundwater at the time of assessment, as indicated by measurements < -0.55 MPa. Sampling of nearby bore RN165949 (approximately 3 km upstream) indicated only brackish conditions (4,601 µS/cm, within the range of fresh to slightly saline [<800 to 10,000 µS/cm]) supporting the notion that trees were unlikely to be accessing any groundwater, as opposed to trees accessing moderately saline to saline groundwater (Section 3.8.1).

Given Taurus Creek is subject to continuous natural wetting and drying cycles, the riparian vegetation would access available moisture in the soil/sediment following rainfall, runoff and flow, and likely accesses shallow groundwater in the alluvial aquifer in drier times. This terrestrial GDE would likely be opportunistic, utilising small inputs of groundwater on occasion, but likely persisting without this input.

The upstream and downstream extents of terrestrial GDEs within the Study Area have not been delineated, but likely correspond with REs 11.3.2, 11.3.25, 11.3.27, 11.3.3 and 11.3.6 on Taurus Creek field verified by E2M Pty Ltd (E2M) (2026) (Figure 25). Remnant vegetation on Two Mile Gully and further upstream on Taurus Creek is unlikely to constitute terrestrial GDEs due to less extensive alluvial deposits and where site observations by DPM Enviroscences (aquatic sites R7, R8 and R11) found the riparian vegetation to be dominated by regrowth yellowwood (*Terminalia oblongata*) and brigalow (*Acacia harpophylla*), neither of which are considered to represent groundwater-dependent vegetation

Ecological value of terrestrial GDEs of the Study Area

The terrestrial GDEs of the Study Area would likely exist without groundwater input but are known to utilise groundwater on occasion (episodic or opportunistic GDEs, not obligate GDEs). Notwithstanding, these vegetation communities form potential habitat for the Endangered (EBPC Act and NC Act) folivorous species koala (*Phascolarctos cinereus*) and likely provide higher leaf moisture levels and nutritional value than surrounding vegetation not able to access groundwater in drier times.

Accordingly, the terrestrial GDEs of the Study Area would be attributed a HEV (Category 1 sensitive environmental area) in accordance with the *Risk Assessment Guidelines for GDEs* (Serov, Kuginis and Williams 2012), as referred to in the *Information Guidelines Explanatory Note: Assessing GDEs* (Doody, Hancock and Pritchard 2019).

4.9 Matters of National Environmental Significance

World and National Heritage properties

No World Heritage Properties or National Heritage Places are identified for the Search Area in the EPBC Act Protected Matters Report (DCCEEW 2025a; Appendix A).

Wetlands of International Importance

No wetlands of International Importance are identified within the Search Area in the EPBC Act Protected Matters Report (DCCEEW 2025a). Wetlands of International Importance nearest to the Study Area include those of the Shoalwater and Corio Bays Area, approximately 200 km to the north-east. These wetlands are well removed from the Study Area and are hydraulically connected only by the Coral Sea.

Threatened Ecological Communities

No EPBC Act listed TECs, relevant to aquatic ecology, are identified from the Search Area (DCCEEW 2025a). No aquatic TECs are expected to occur within the Study Area.

Threatened Species

No MNES aquatic flora or fauna species were detected during field surveys, nor were any detected during previous surveys of the Study Area (EMM 2023).

Aquatic fauna species that are MNES which are considered to have potential to occur in the broader desktop Search Area include the Critically Endangered white-throated snapping turtle (*Elseya albagula*) and the Vulnerable Fitzroy River turtle (*Rheodytes leukops*), each listed under the EPBC Act. However, due to habitat requirements, it is unlikely these species occur within waterways or wetlands of the Study Area as either resident or transient occurrences. Habitat for these species was not encountered within the Study Area (Section 4.6.3).

No MNES aquatic flora species are likely to occur within the Study Area (Section 4.6.1).

Migratory Species

No aquatic migratory species (i.e. migratory species that live in water for most or all their lives) are identified from the Search Area.

Commonwealth Marine Areas

The Study Area is located approximately 200 km west of any marine area and is separated hydraulically by at least two sub-catchments (Dawson River and the Fitzroy River) with varying land use and water quality.

Nuclear actions (including uranium mines)

The Action does not involve any nuclear actions.

Water resource

A water resource, in relation to coal seam gas development and large coal mining development, is an MNES. This report documents the aquatic ecology of water resources.

4.10 Matters of State Environmental Significance

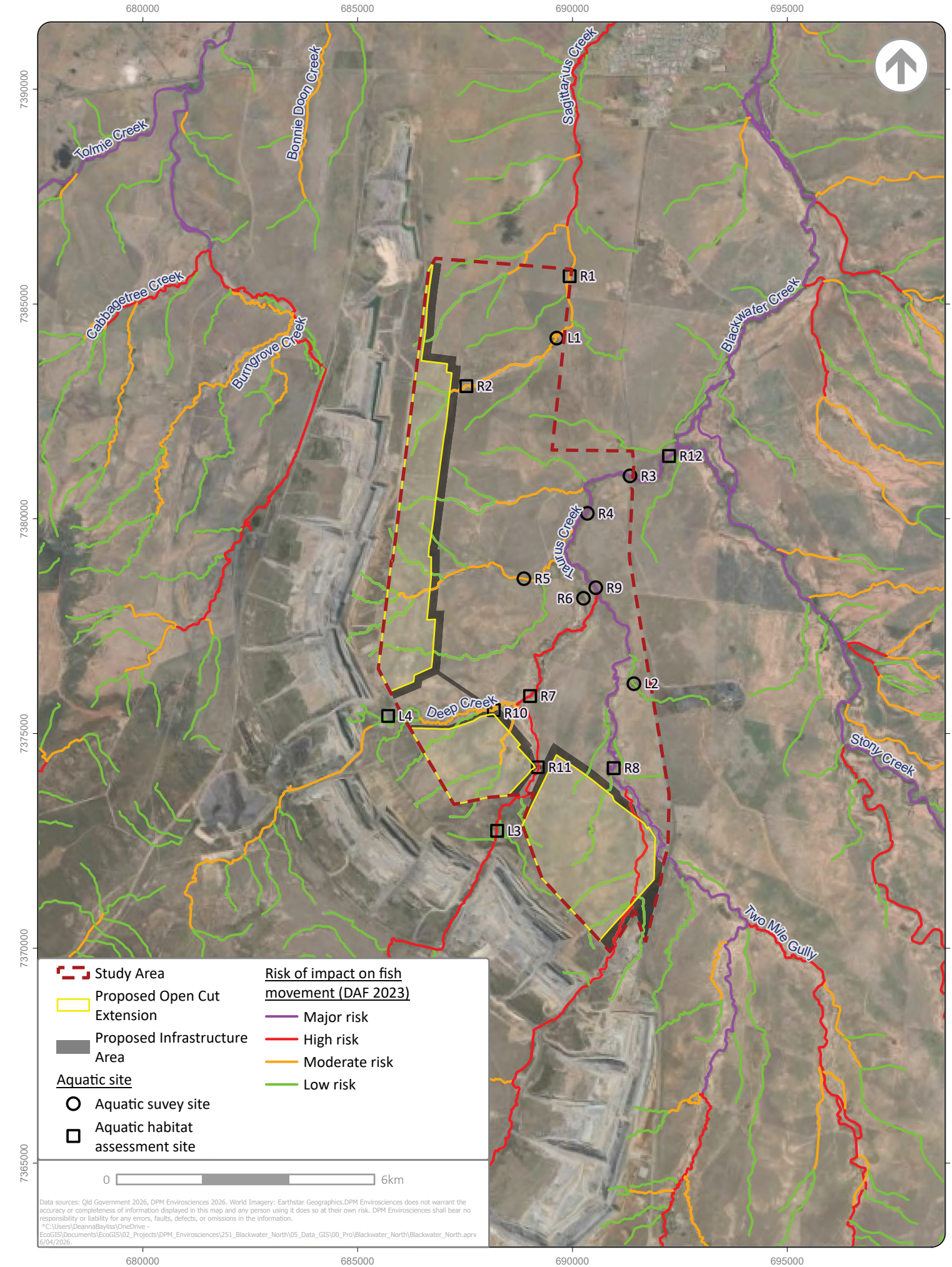
The environmental offsets framework in Queensland includes the *Environmental Offsets Act 2014*, the EO Regulation and the Queensland Environmental Offsets Policy. MSES are defined in the EO Regulation and are a component of the biodiversity state interest identified in the Queensland State Planning Policy.

MSES were identified during the desktop review as occurring within the Study Area (Table 25). Potential MSES of relevance to aquatic ecology include 'waterways providing for fish passage'. A 'waterway providing for fish passage' is only an MSES if waterway barrier work is proposed that would limit the passage of fish along a waterway.

Figure 28 presents the potential aquatic MSES mapping for the Study Area.

Table 25 Matters of State Environmental Significance located within the Study Area

Prescribed Environmental Matter	Within the Study Area	Detail
Regulated vegetation	-	Refer to terrestrial ecology assessment.
Connectivity areas	-	Refer to terrestrial ecology assessment.
Wetlands and watercourses	No	The Study Area does not contain any HES wetlands or High Ecological Value waters or watercourses (Figure 11).
Designated precinct in a strategic environmental area	No	The Study Area is not a designated precinct in a strategic environmental area.
Protected Wildlife Habitat	-	Refer to terrestrial ecology assessment. No Conservation-significant aquatic species observed or assessed as likely to occur.
Protected Areas	No	No Protected Areas occur within or adjoining the Study Area.
Fish Habitat Areas and Highly Protected Zones of State Marine Parks	No	The Study Area is not located in a State Marine Park.
Waterway providing for fish passage	Yes	Waterways within the Study Area provide for fish passage (Figure 28).
Marine Plants	No	The Study Area is not located in a marine environment.
Legally Secured Offset Area	-	Refer to terrestrial ecology assessment.



AQUATIC MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE MAPPING

Blackwater North Extension Project - Aquatic Ecology and GDE Assessment

FIGURE 28

5 POTENTIAL IMPACTS

5.1 Aquatic habitat modification and loss

The Project would remove or otherwise modify aquatic habitats in the Project Area, comprising ephemeral waterways and semi-permanent farm dams. These habitats are unlikely to support aquatic species of conservation significance listed under the NC Act or EPBC Act, given the lack of suitable habitat features (Section 4.6).

No 'watercourses', as defined by the *Water Act 2000,* would be directly impacted by the Project. Several first and second order waterways (based on Strahler 1952) would be removed (Section 4.1.3), comprising an aggregate 23.6 km of first order waterways and 5.2 km of second order waterways. Waterway crossings (either bridge, culvert or ford) are proposed on a retained second order reach of Deep Creek and a fourth order reach of Taurus Creek. Aquatic habitat would be modified at each of these locations to enable the construction of properly formed waterway crossings.

All aquatic flora and fauna species detected during the surveys are Least Concern under the NC Act. No aquatic fauna species listed under the EPBC Act or NC Act were detected. The extent of aquatic habitat, and consequently the extent of Least Concern aquatic flora and fauna species within the Project Area, would be reduced because of the Project. The species detected within the Study Area are common and have a broad distribution in the region and so the removal of these habitat areas from the Project area would not have a significant impact on these species as a whole.

5.2 Fish passage

'Waterway barrier works' are defined in the *Fisheries Act 1994* to mean a dam, weir or other barrier across a waterway if the barrier limits fish access and movement along a waterway. While it is understood that a waterways barrier works permit is not required where the works occur in a ML authorised under an EA, fish passage is an MSES and still needs to be considered. A 'waterway providing for fish passage' is an MSES (if located outside of Urban Areas – as per Schedule 2, Section 10 of the EO Regulation) only if a waterway barrier work is proposed that would limit the passage of fish.

The DPI (2025b) *Accepted development requirements for operational work that is constructing or raising waterway barrier works* states the requirements that must be complied with and provides guidance for conducting operational work that involves constructing or raising waterway barrier works. If the proposed waterway crossing does not meet the DPI (2025b) accepted development requirements, it would need to achieve the assessable development requirements (performance outcomes and/or acceptable outcomes) identified in the Department of State Development, Infrastructure and Planning (2025) *State Code 18: Constructing or raising waterways barrier works in fish habitats*, or be otherwise approved by DPI.

At the location of the proposed crossing (site R11), Taurus Creek is mapped by DPI (2025a) as being at High risk of adverse impact from waterway barrier works on fish movement Figure 6). Deep Creek (site R10) and other unnamed tributaries are State-mapped (DPI 2025a) as being at Moderate and Low risk of adverse impact from waterway barrier works on fish movement (Figure 6, Section 4.1.3).

Waterway removal

A number of first and second order (based on Strahler 1952) waterways within the Project area, being waterways State mapped as being at Low or Moderate risk of adverse impact from waterway barrier works on fish movement (Figure 6), would be completely removed or otherwise significantly altered by the Project. This comprises an aggregate 22.3 km of first order / Low risk waterways and 2.8 km of second order / Moderate risk waterways. An approximate 3.9 km third order / State mapped High risk waterway would also be removed and replaced with a constructed diversion channel (see 'Waterway diversion' below). While the Project would remove these waterways and wetlands (small farm dams) that provide fish habitat within the Proposed Project Area and Infrastructure Area, it would not fragment fish habitat as these waterways do not connect to fish habitat further upstream.

Waterway diversion

Approximately 3.9 km of an unnamed tributary of Two Mile Gully would be replaced by an approximate 2.4 km constructed clean water drain within the Project area (Figure 3, Section 3.6.1). This unnamed tributary of Two Mile Gully is State mapped (DPI 2025a) as being at High risk (third order) of adverse impact from waterway barrier works on fish movement (Figure 6), although would be considered only Moderate risk (second order) if considering the Emu Creek diversion already in place upstream.

The proposed clean water drain is a trapezoidal channel with base width of 5 m, a maximum top width of 65 m, 1V:5H (vertical rise to horizontal run) internal batter slopes and a longitudinal slope of 0.7% (WRM 2026). In comparison, the existing tributary (to be diverted) has a base width between <2 m and up to 5 m, with bank slopes of between 1V:5H to 1V:10H, and a longitudinal slope of 0.35% to 0.61% (WRM 2026). In summary, the proposed clean water drain is slightly steeper than the steepest section of the existing tributary being diverted. The channel shape of the proposed clean water drain generally would not replicate the existing tributary, due to the constraints of the site (WRM 2026). Fish passage is not a key consideration for the proposed clean water drain, as it does not connect to fish habitat upstream of the Project area. Notwithstanding, the clean water drain would incorporate a number of deeper pools to provide refuge to fish attempting to inhabit or pass through it.

Flood levees, constrained flow and increased flow velocities

Flood levees, built to contain 1 in 1,000-year flood events, would be positioned between Taurus Creek and the proposed pits and between Deep Creek and the proposed pits (WRM Water and Environment Pty Ltd [WRM] 2026). These levees would constrain flood flows within Taurus and Deep creeks during mining operations, increasing flood flow velocities to varying degrees.

The floodplains of Deep and Taurus creeks would likely be constrained adjoining the proposed open cut pits. However, the flood levees would be sloped and constructed with a rough earthen surface. Accordingly, these reaches are expected to still provide areas of low to no flow on the outer extremities to allow for fish passage and resting opportunities under all low, moderate and high flow conditions.

Waterway crossings

Waterway crossings would be constructed on a Moderate risk reach of Deep Creek (site R10 in Figure 6) and on a High risk reach of Taurus Creek (site R11 in Figure 6). These crossing locations are indicative and may be changed during the design process. Other Low and Moderate risk waterways (Figure 6) may also require either temporary or semi-permanent crossings as part of the Project, such as for development of the Proposed Infrastructure Area ahead of development of the proposed pits (Figure 6).

Of the stream crossing options available, bridges – especially those without instream support sections – would have the least impact on fish passage. It is anticipated that a culvert or ford crossing would be installed at the crossing of Deep Creek and any other waterways field verified as being at Low or Moderate risk of impact to fish passage that may require temporary or semi-permanent crossings as part of the Project (Figure 6).

Poorly designed waterway crossings can create a barrier to fish passage, restricting and/or isolating fish communities and preventing access to fish habitats otherwise available to them. Poorly designed structures can kill or injure fish moving over or around them or can cause fish to become stranded and subjected to poor water quality, lack of food, increased predation, crowding or other conditions that can impact their health, wellbeing and productivity.

Queensland policy and guidance material for waterway barrier works centres largely around the Queensland *Planning Act 2016*, which does not strictly apply to development authorised under the *Mineral Resources Act 1989*. Notwithstanding, the policies and guidance material help to achieve proper consideration of on-lease ecological values.

The Project would require crossings of waterways. However, the Project is unlikely to have a significant impact on Waterways Providing for Fish Passage given waterway crossings would be constructed in accordance with the *Accepted development requirements for operational work that is constructing or raising waterway barrier works* (DPI 2025b).

The detailed design and construction of each waterway crossing will involve an assessment against DPI (2025b), which is beyond the scope of this aquatic ecology and GDE assessment.

5.3 Release of mine-affected water

The Project includes the controlled release of mine affected water in accordance with the conditions of EA EPML00717813 (as amended).

5.3.1 Existing Environmental Authority release conditions

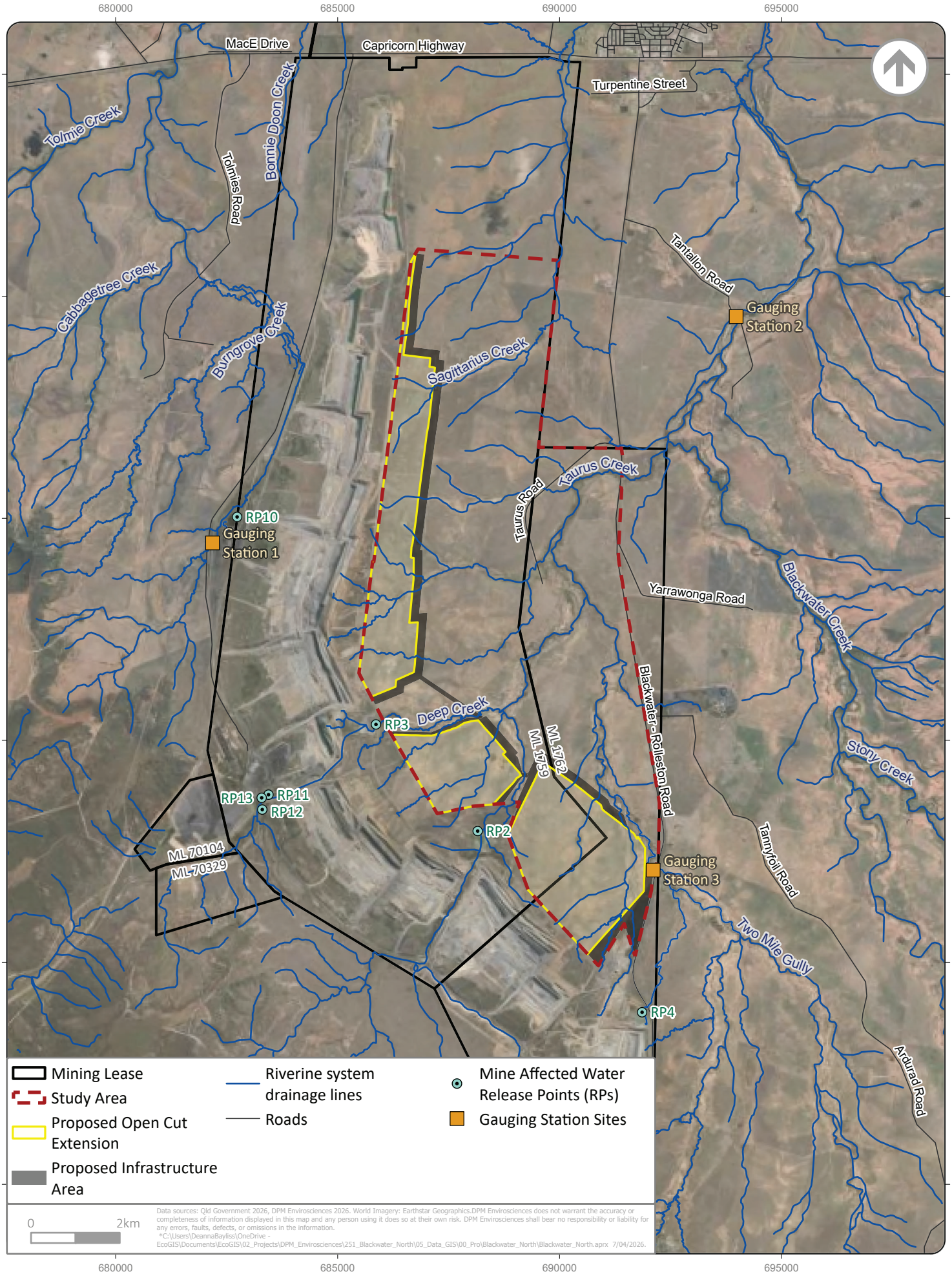
The existing EA includes 11 RPs; three of which are relevant to the Study Area: RP2 (Taurus Dam), RP3 (Deep Creek Dam) and RP4 (Tannyfoil Dam) (Figure 29). These dams are able to release both actively via a gate valve and passively via the spillway.

The existing EA permits the release of mine-affected water with an EC of up to 10,000 µS/cm (being slightly to moderately saline water) from RP3 and RP2 into the second order Deep Creek and fourth order Taurus Creek, respectively, when flows of ≥ 1 cubic metres per second (m^3/s) are encountered 18 km downstream at Gauging Station 2 on the fifth order Blackwater Creek (Figure 29). The existing EA allows for mine-affected water releases to commence when flows at this downstream gauging station exceed ≥ 1 m^3/s. Releases may then continue for up to 28 days, even when flows then fall below the 1 m^3/s, providing that the 80th percentile of EC levels at this downstream gauging station remain below 2,000 µS/cm throughout the release. The existing EA permits the same releases from RP4 into a first order tributary of Two Mile Gully when flows encountered approximately 5 km downstream at Gauging Station 3, on the fourth order Two Mile Gully, exceed ≥ 1 m^3/s.

The existing EA conditions allow for mine-affected water releases into Deep and Taurus creeks when the downstream, and much larger, Blackwater Creek is flowing, but when Deep and Taurus creeks are not necessarily flowing themselves. Such releases have the potential to impact the health and integrity of Deep and Taurus creeks and their ecosystem components, including aquatic ecosystems as well as terrestrial GDEs. The existing EA conditions allow Deep and Taurus creeks (from RP2 and RP3) to be used as conduits for slightly to moderately saline mine--affected water of up to 10,000 µS/cm until these flows reach Blackwater Creek approximately 14 km downstream. The existing EA conditions also allow the tributary of Two Mile Gully between RP4 and Two Mile Gully to be used as a conduit for this mine-affected water.

5.3.2 Changes to Environmental Authority release conditions

It is understood that releases of mine-affected water from Taurus and Deep Creek dams are proposed to continue consistent with the existing EA conditions (EA EPML00717813; DETSI 2025a).The Water Balance Assessment Report (HydroBalance 2026) indicates that the Project would result in relatively small increases to annual release volumes, including an 11-20% increase during median climatic conditions, up to a 7% increase during wet climatic conditions (tenth percentile) and a 2-4% increase during very wet (fifth percentile) climatic conditions (HydroBalance 2026). Release water quality is not expected to change as a result of the Project (HydroBalance 2026). Despite the relatively small increase to annual release volumes, the approved controlled release strategy is sufficient for maintaining excess mine-affected water volumes at BWM (HydroBalance 2026). There are no proposed changes to the currently approved controlled release strategy as a result of the Project (HydroBalance 2026). Accordingly, the release of mine-affected water from the Project is not anticipated to affect the receiving environment beyond existing impacts/conditions already approved under the existing EA for BWM.



EXISTING EA EPML00717813 MINE-AFFECTED WATER RELEASE POINTS AND GAUGING STATIONS

Blackwater North Extension Project - Aquatic Ecology and GDE Assessment

FIGURE 29

5.4 Changes in surface water

Surface water flows and quality are relevant to the health and productivity of aquatic ecosystems. The following sections discuss surface water and potential impacts of the Project on surface water from an ecological perspective. This section draws on the key conclusions from the *Surface Water Assessment* (WRM 2026) for the Project.

5.4.1 Surface water flow

Development of the open cut pits would remove several first and second order (based on Strahler 1952) waterways that are tributaries of Taurus Creek, and the upper reaches of three first order tributaries of Sagittarius Creek.

The Project would result in an approximate 8.9% reduction of the Taurus Creek catchment and a 7.9% reduction of the Sagittarius catchment, associated with capture of upstream catchment areas within the open cut pits (WRM 2026). While the reduction in Taurus Creek catchment area is slightly greater, the reduction in the Sagittarius Creek catchment is also material and therefore potential flow impacts to Sagittarius Creek are not necessarily negligible and require consideration in the context of overall hydrological behaviours.

A flow duration curve prepared for Taurus Creek, at the Taurus Creek downstream gauge near the downstream extent of the Study Area, shows that Taurus Creek is ephemeral, with flows >1 megalitre per day occurring less than 10% of the time (WRM 2026). The flow duration curve for both existing and Project conditions indicate only minor changes in the magnitude and frequency of flows under most flow conditions (WRM 2026). Whilst the Project may change the magnitude of peak flows marginally, the duration of flows in the Taurus Creek main channel would not be materially changed (WRM 2026).

A diversion of an unnamed tributary of Two Mile Gully is proposed within the Project area and is referred to as the proposed clean water drain. This flow would be diverted along the south-eastern margin of the Stewarton Pit to accommodate Project mining activities. Hydraulic modelling indicates the proposed clean water drain would safely convey flows up to and including the 0.1% AEP event, while maintaining an ephemeral, event-driven flow regime consistent with baseline conditions. Predicted changes to flow velocities and stream power would remain well within accepted stability thresholds (WRM 2026).

Further details regarding potential impacts to flows are outlined in the *Surface Water Assessment* (WRM 2026). Overall, notwithstanding the reduction in contributing catchment area, the Project is not expected to fundamentally alter the flow regime characteristics of the remaining waterways within the Project area and broader Study Area. Consequently, adverse impacts to aquatic ecology arising from changes in flow as a result of the Project are expected to be low.

5.4.2 Flood regimes

Protecting the open cut pits from flood ingress from Taurus and Deep creeks will require the construction of flood protection levees. Hydrologic and hydraulic modelling has been undertaken for a range of Annual Exceedance Probability (AEP) events under baseline (existing conditions), during mining and post-mining scenarios (WRM 2026). The events modelled for each scenario are summarised in Table 26.

Table 26 Flood Events Modelled for Baseline, During Mining and Post-Mining Scenarios (WRM 2026)

Mine Stage	Modelling Undertaken					
	50% AEP	5% AEP	2% AEP	1% AEP	0.1% AEP	PMF
Baseline (existing conditions)	✓	✓	✓	✓	✓ [a]	x
During Mining	✓	✓	✓	✓	✓	x
Post-Mining	x	x	x	✓	✓	✓

The modelling scope varies between scenarios to reflect the phase-specific flood, operational requirements and the progressive landform development.

The hydraulic modelling assessed potential changes in flood extent, depth, velocity and afflux associated with the construction of levees and post-mining landforms. The results (WRM 2026) indicate that:

- Predicted increases in peak flood levels are generally minor and contained on-lease for all events up to the 0.1% AEP.
- Increases in peak flood levels are generally less than 0.1 m and peak velocities are generally less than 0.5 m/s across the floodplains within the Project area.
- Increases in peak flood levels greater than 0.1 m and peak velocities greater than 0.5 m/s are generally localised to areas adjacent to the proposed levees, and along the Taurus Creek temporary diversion.
- Predicted velocities and stream power along the proposed clean water drain is predicted to be higher than the existing tributary (under existing conditions); however, would remain within accepted thresholds.

Potential impacts to aquatic flora and fauna are likely to be restricted to changes in flood levels during rare significant flood events (i.e. when the flood protection levees/landforms influence stream levels). Further details regarding potential impacts to flood regimes are outlined in the *Surface Water Assessment* (WRM 2026). Given changes in flood regimes are restricted to localised changes in flood levels during floods, adverse impacts on aquatic ecology are expected to be insignificant.

5.4.3 Surface water quality

Erosion and sedimentation within the Project Area can lead to locally increased dissolved and suspended solids, turbidity, nutrients and contaminants, and reduced DO levels in surface waters. Leaks or spills of hydrocarbon-based fluids from construction equipment and spread of coal dust can also affect surface water quality.

High levels of turbidity can reduce light penetration, photosynthesis and growth of aquatic macrophytes and algae, affecting aquatic ecosystem food chains. Reduced light penetration can also reduce the photosynthetic release of oxygen by these plants and algae, reducing productivity and the extent of habitable conditions available to aquatic fauna. Changes in water quality can also affect the behaviour of aquatic biota (including avoidance response, and reduced foraging) and physiology (including gill damage to fish or reduced efficacy of cloacal respiration in turtles) associated with increased suspended sediment concentrations and deposition. Increased salinity and contaminants such as metals and hydrocarbons can affect the health, reproduction and persistence of aquatic flora and fauna. Increased nutrients can lead to increased or excessive aquatic plant and algal growth, leading to extremes in diurnal DO levels, and in some cases eutrophication and fish kills. These changes in water quality can lead to changes in aquatic and riparian ecological health and community assemblages. The severity of these changes are influenced by the type, concentration and volume of suspended sediments, nutrients, salts and contaminants, along with environmental factors such as dilution and existing exposure levels.

In the absence of suitable controls, potential impacts to surface water quality as a result of the Project would include:

- Ground disturbance associated with vegetation clearing and earthworks may expose dispersive subsoils, increase erosion potential, or impact stream bank stability, which may impact surface water quality (particularly turbidity and suspended sediments).
- Surface water runoff from mine-affected areas may mobilise contaminants into downstream waterways.
- Dust and other airborne particulate matter may enter waterways and increase turbidity, sedimentation, nutrients and contaminants in downstream or other nearby waterways.
- Leaks or spills of hydrocarbon-based fluids from vehicles and equipment used during the Project may spill and enter waterways, impacting water quality.
- Uncontrolled releases of mine-affected water may adversely impact on receiving water quality.
- Continued releases of mine-affected water from Taurus and Deep Creek dams (Section 5.3) in accordance with existing EA conditions (EA EPML00717813; DETSI 2025a), which allows for the release of mine-affected water of up to 10,000 µS/cm (being slightly to moderately saline water), may adversely impact on receiving water quality in Deep Creek and the upper reach of Taurus Creek (until it is diluted in the lower reach of Taurus Creek).

Notwithstanding the above, impacts of the Project on existing water quality are expected to be minimal given the Project is a continuation of existing mining at BWM, with the Project largely utilising existing infrastructure and operating under existing EA conditions. By implementing the mitigation and management measures identified in Sections 6.2 and 6.3, the risk of adverse impacts to the water quality of waterways downstream of the Project is minimal.

5.5 Proliferation of aquatic pests

Aquatic pests, such as invasive pest fishes, can cause a variety of issues within the aquatic environment, such as competing with native fish for food and habitat, preying on native species, habitat disturbance and introduction of disease. Typically, established introduced species have a wide range of environmental tolerances, habitat requirements and food requirements. In addition, they tend to have high reproductive rates and be early maturing, allowing populations to become readily established. These attributes often allow introduced fishes to be more adaptable to changes in the environment, whether natural or manmade, than some native fish species.

The Project is unlikely to result in the addition of new aquatic flora or fauna pest species, nor the growth and spread of aquatic pest species. The Project does not involve the diversion of waterways into adjacent catchments (i.e. beyond the Blackwater Creek catchment) and will not create additional habitat for invasive species. Weed prevention, monitoring and control will continue to be undertaken across the broader BWM to mitigate the number and abundance of weeds. Weed hygiene protocols will continue to be implemented using the dedicated vehicle and machinery cleaning bay located at the Mine Infrastructure Area. Given the controls in place, risks are expected to be low.

5.6 Changes to groundwater-dependent ecosystems

No obligate GDEs are present. Baseline studies confirmed the occurrence of opportunistic facultative terrestrial GDEs within the Study Area (Section 4.8.3). No surface expression or subterranean GDEs were detected within the Study Area, nor are they likely to occur. If present (and undetected), it is likely that any surface expression GDEs would be opportunistic, utilising small inputs of groundwater on occasion, but persisting without this input. Most of the aquatic

biota of the Study Area is adapted to living in ephemeral waterways, reducing the potential risk of impacts to surface expression GDEs should they occur.

The following sections focus on potential impacts of the Project on facultative terrestrial GDEs known to occur within the Project area.

5.6.1 Impact mechanisms

No direct impacts to field-verified facultative GDEs are proposed. Indirect impacts of mining activities are typically associated with reduced surface water recharge, increased groundwater drawdown, and changes in groundwater quality.

Surface water recharge

Groundwater is expected to occur in the shallow alluvium of Taurus Creek as ephemeral, discontinuous perched aquifers in sandier material; with clayey material forming aquitards. The alluvial sediments are expected to be of limited extent and thickness but are episodically recharged by rainfall run-off when Taurus Creek hosts water, resulting in the presence of perched aquifers associated with the alluvium. Pre-dawn LWP measurements in the post-wet season (June 2025) demonstrated that some trees within the Taurus Creek riparian and floodplain corridor were accessing groundwater, likely from a perched alluvial aquifer. Pre-dawn LWP measurements of these same trees (and additional trees) in the pre-wet season (October 2025) demonstrated that none of these trees were accessing groundwater, as the perched alluvial aquifer had likely dried and the deeper tertiary aquifer was likely too deep for these trees to access.

The discontinuous perched aquifers that support opportunistic terrestrial GDEs of the Study Area are recharged by surface flows in Taurus Creek. WRM (2026) has determined that the impact of the Project on the magnitude of flows in Taurus Creek is insignificant and that the duration of flows in the Taurus Creek main channel would not be materially changed (WRM 2026). Consequently, the terrestrial GDEs of the Study Area are unlikely to be affected by the Project.

Groundwater drawdown

Dewatering and depressurisation would result in groundwater drawdown in the regional groundwater table, especially to aquifers near proposed open cut pits.

Dewatering unconfined aquifers can lower the water table to a depth that is inaccessible to tree roots. Terrestrial vegetation that once accessed shallow groundwater in drier times when soil water was not available can begin to show signs of impairment if groundwater levels fall too low. The response of vegetation to this water stress may result in dieback almost immediately or may take years to become obvious (Doody, Hancock and Pritchard 2019).

Changes to subsurface flow paths (by pumping water from mine pits or when groundwater drains through the walls and floors of mine pits) can alter the direction and velocity of groundwater flow, resulting in water moving away from a GDE and towards the extraction point.

Groundwater drawdown in the tertiary and deeper aquifers of the Study Area is unlikely to be of consequence to the terrestrial GDEs of the Study Area, as field surveys have demonstrated that these trees are unlikely to be accessing these regional groundwater aquifers (Section 4.8.3). Consequently, terrestrial GDEs of the Study Area are unlikely to be impacted by groundwater drawdown resulting from the Project.

Change in groundwater water quality

Reduced groundwater volumes and flows in the deeper aquifers can lead to reduced groundwater quality. This can be due to evaporative concentration of salts in mine voids, induced flow of groundwater of reduced quality towards depressurised zones, infiltration of water containing elevated concentrations of dissolved solids, sulphate and metals from waste rock emplacements and mine water storages, or from unintended leaks or spills. However, the discontinuous perched aquifers that support opportunistic terrestrial GDEs of the Study Area are recharged by surface flows in Taurus Creek. The Project is not expected to alter the duration of flows in Taurus Creek, and modelling indicates that changes to flow magnitude would be minor and not ecologically significant.

The facultative terrestrial GDEs of the Study Area are unlikely to be affected by changes in groundwater quality in the deeper aquifers, as field surveys have demonstrated that these trees are unlikely to be accessing these deeper aquifers (Section 4.8.3). Groundwater quality in the shallow perched alluvial aquifers is likely to continue to mirror surface water quality (Section 4.2.2). WRM (2026) identify that release water quality is not expected to change as a result of the Project and determined that impacts on surface water quality in Taurus Creek would be mitigated by adhering to the approved controlled release strategy. The approved controlled release strategy is sufficient for maintaining excess mine-affected water volumes at BWM. There are no proposed changes to the currently approved controlled release strategy as a result of the Project (WRM 2026). Consequently, groundwater quality in the shallow perched alluvial aquifers is unlikely to be impacted by the Project.

5.6.2 Terrestrial groundwater-dependent ecosystem – Taurus Creek riparian vegetation

Ecological value

The facultative terrestrial GDE comprising riparian (including floodplain) vegetation of Taurus Creek would likely exist without groundwater input but is known to utilise groundwater on occasion (episodic or opportunistic GDE, not obligate GDE). Notwithstanding, these vegetation communities form potential habitat for the Endangered (EBPC Act and NC Act) folivorous koala (*Phascolarctos cinereus*) (E2M 2026) and likely provide higher nutrient and leaf moisture levels than surrounding vegetation not able to access groundwater in drier times. Consequently, this terrestrial GDE is attributed a HEV (Category 1 sensitive environmental area) in accordance with the criteria adopted for this assessment (Section 3.4.2).

Impacts

No direct impacts (i.e. clearing) of terrestrial GDEs is proposed. The Project is unlikely to impact the perched alluvial aquifers of Taurus Creek (Section 5.6.1). Consequently, indirect impacts on terrestrial GDEs associated with this aquifer are unlikely. Impacts to the terrestrial GDE comprising riparian/floodplain vegetation of Taurus Creek have been assessed against the impact criteria identified in the *Risk Assessment Guidelines for GDEs* (Serov, Kuginis and Williams 2012), as referred to in the *Information Guidelines Explanatory Note: Assessing GDEs* (Doody, Hancock and Pritchard 2019). Impacts to the integrity of this terrestrial GDE are considered unlikely based on the majority rule as per Serov, Kuginis and Williams (2012) (Table 27).

Magnitude of risk

The magnitude of risk is determined to be Low when assessed against the criteria identified in the *Risk Assessment Guidelines for GDEs* (Serov, Kuginis and Williams 2012), as referred to in the *Information Guidelines Explanatory Note: Assessing GDEs* (Doody, Hancock and Pritchard 2019) (Table 28).

Table 27 Potential impacts of the Project on the perched alluvial aquifers and associated terrestrial GDEs of Taurus Creek (as per Serov, Kuginis and Williams 2012)

Impacts	Likely	Unlikely	Insufficient data
Water quantity impacts			
Will there be an alteration to the water table levels (rising or dropping water tables)?		✓	
Will there be any alteration to the aquifer flow paths?		✓	
Will there be any alteration of aquifer discharge volume to off-site GDEs?		✓	
Will there be an alteration of the frequency/timing of water table level fluctuations?		✓	
Will there be an alteration of surface river base flow?		✓	
Will there be a reduction in artesian/spring water pressure?		✓	
Water quality impacts			
Will there be an alteration to the natural groundwater chemistry and/or chemical gradients?		✓	
Will acid sulphate soils be exposed, resulting in the acidification of groundwater source and acid runoff?		✓	
Will there be an alteration in nutrient loads?		✓	
Will there be an alteration in sediment loads?		✓	
Will there be an alteration in groundwater salinity levels?		✓	
Will there be an alteration in groundwater temperatures?		✓	
Will there be any bioaccumulation of heavy metals?		✓	
Soil and geo-morphological impacts			
Will there be any substrate alteration or compaction; e.g. aquifer, river gravel bed compaction by heavy machinery or over extraction of water?		✓	
Will there be any cracking or fracturing of the bedrock?		✓	
Biological impacts			
Will there be an alteration to the number of native species (i.e. richness) within the groundwater-dependent communities (fauna and flora)?		✓	
Will there be an alteration to the species composition (i.e. diversity) of the groundwater-dependent communities (fauna and flora)?		✓	
Will exotic flora or fauna be introduced?		✓	
Will there be any removal or alteration of a GDE type/subtype habitat?		✓	
Totals	**0**	**19**	**0**
Impact is unlikely (based on the majority rule as per Serov, Kunis and Williams, 2012)			

Table 28 Magnitude of risk of the Project impacting the perched alluvial aquifers and associated terrestrial GDEs of Taurus Creek (as per Serov, Kuginis and Williams 2012)

Risk factors	High	Mod.	Low	ID*	Justification for risk rating
Water quantity asset					
What will be the risk of a change in groundwater levels/pressure on GDEs?			✓		No change to aquifer water levels or pressure.
What will be the risk of a change in the timing or magnitude of groundwater level fluctuations on GDEs?			✓		No change in timing of water level fluctuations.
What will be the risk of changing base flow conditions on GDEs?			✓		No change in direction of flow.
Water quality asset					
What is the risk of changing the chemical conditions of the aquifer?			✓		Negligible change (<5%).
What is the risk on the aquifer by a change in the salt/freshwater interface?			✓		Not applicable.
What is the likelihood of a change in beneficial use of the aquifer?			✓		Negligible change (<5%).
Aquifer integrity asset					
What is the risk of damage to the geologic structure?			✓		No change.
Biological integrity asset					
What is the risk of alterations to the number of native species (i.e. richness) within the groundwater--dependent communities (fauna and flora)?			✓		No reduction in number of species.
What is the risk of alterations to the species composition (i.e. diversity) of the groundwater--dependent communities (fauna and flora)?			✓		No change in species composition.
What is the risk of increasing the presence of exotic flora or fauna?		✓			Little to none.
What is the risk of removing or altering a GDE subtype habitat?			✓		No removal or alteration of habitat.
Total number of attributes	0	1	10	0	
Overall risk	**Low (based on the majority rule as per Serov, Kunis and Williams, 2012)**				

Notes: *ID = Insufficient Data

Application of risk matrix to determine management actions

Terrestrial GDEs comprising riparian (and floodplain) vegetation of Taurus Creek are of HEV but subject to a Low magnitude of risk from Project activities in accordance with Serov, Kuginis and Williams (2012), as referred to in the *Information Guidelines Explanatory Note: Assessing GDEs* (Doody, Hancock and Pritchard 2019). The risk matrix (Table 4, Section 3.4.5) therefore places this terrestrial GDE in the 'A' box, with the relevant management actions identified as (Serov, Kuginis and Williams 2012):

- short-term – protection measures for the aquifer and GDEs, and baseline risk monitoring;
- mid-term – continue protection measures for aquifers and GDEs, and periodic monitoring and assessment; and
- long-term – adaptive management, and continued monitoring.

Considering that impacts to this terrestrial GDE are unlikely, key measures would instead comprise the avoidance of both direct and indirect impacts on terrestrial GDEs.

5.7 Final landform

Final landform modelling for the Project indicates that the final landform would be stable and flood flows will be free draining (WRM 2026). At the conclusion of mining, final voids would remain. Three of these final voids are predicted to become long-term sinks and the remaining two are predicted to be flow through systems reporting to those long-term sinks (SLR 2026). These voids are not predicted to overflow into the environment (WRM 2026). Results of the flood modelling indicate that the proposed final landform design prevents flood ingress to the final void for events up to the 0.1% AEP event. Overall, the final landform is expected to be safe, stable, and with no adverse impacts to surrounding surface water quality or flood behaviour.

5.8 Evaluation of impacts on Matters of National Environmental Significance

The EPBC Act lists 'a water resource, in relation to coal seam gas development and large coal mining development' as an MNES. An assessment of the impacts on water resources is outside the scope of this assessment.

5.9 Evaluation of impacts on Matters of State Environmental Significance

No HES wetlands or HEV waterways are present within or in the vicinity of the Study Area. No aquatic MSES flora or fauna species have been recorded from the Study Area, nor are they likely to occur within or in the vicinity of the Study Area given the lack of suitable habitat. Waterways Providing for Fish Passage is the only MSES relevant to aquatic ecology that is known to occur in the Study Area or surrounds that may be subject to impacts from the Project.

The *Queensland Environmental Offsets Policy Significant Residual Impact Guideline* (DEHP 2014) is used to determine if a prescribed activity would have a significant residual impact on MSES. A significant residual impact is defined as an adverse impact, whether direct or indirect, of a prescribed activity on all or part of a prescribed environmental matter that:

a) remains, or will or is likely to remain (whether temporarily or permanently), despite on-site avoidance and mitigation measures for the prescribed activity; and

b) is, or will or is likely to be significant.

Potential impacts on the MSES Waterways Providing for Fish Passage are discussed below.

5.9.1 Waterways providing for fish passage

Most waterways that would be removed for mining within the Project footprint are mapped as having Low and Moderate risk of impact to fish passage in the Waterway Barrier Works mapping layer (Figure 6, Section 4.1.3). While the Project would remove waterways and wetlands (small farm dams) that provide fish habitat within the Proposed Project Area and Infrastructure Area, it would not fragment fish habitat as these waterways do not connect to fish habitat further upstream.

Approximately 3.9 km of an unnamed tributary of Two Mile Gully would be replaced by an approximate 2.4 km clean water drain within the Project area (Figure 3, Section 3.6.1). This tributary of Two Mile Gully is State mapped (DPI 2025a) as being at High risk (third order) of adverse impact from waterway barrier works on fish movement (Figure 6), although would be considered only Moderate risk (second order) if considering the Emu Creek diversion already in place upstream. Fish passage is not a key consideration for the proposed clean water drain, as it does not connect to fish habitat upstream of the Project area. Notwithstanding, the channel of the proposed clean water drain would incorporate a number of deeper pools to provide refuge to fish attempting to inhabit or pass through it.

At least two semi-permanent waterway crossings for vehicles would be constructed, including a crossing of the State-mapped Moderate risk Deep Creek and a crossing of the State-mapped High risk Taurus Creek. Culvert or ford crossings would be installed at the other crossings of waterways field verified as being at Low or Moderate risk of impact to fish passage.

Fish passage would be considered and maintained at each of these crossings. As described in Section 5.2, waterway crossings would be constructed in accordance with the *Accepted development requirements for operational work that is constructing or raising waterway barrier works* (DPI 2025b).

Fish passage requirements associated with the waterway barrier works (a dam, weir or other barrier across a waterway) are considered in relation to impacts on MSES. An assessment of the potential impacts on this MSES, in accordance with the *Queensland Environmental Offsets Policy Significant Residual Impact Guideline* (DEHP 2014) is provided in Table 29. The assessment concludes that the Project is unlikely to have a significant impact on Waterways Providing for Fish Passage on the basis that waterway crossings would be constructed in accordance with the *Accepted development requirements for operational work that is constructing or raising waterway barrier works* (DPI 2025b). Accordingly, offsets are not triggered for this matter.

Table 29 Waterways Providing for Fish Passage Significant Residual Impact Assessment

Criteria	Assessment/Consideration
An action is likely to have a significant impact on a waterway providing fish passage if there is a real possibility that the action will:	
Result in the mortality or injury of fish	The Project is unlikely to result in barriers that cause the mortality or injury of native fish because: ▪ waterway crossings would be constructed in accordance with the *Accepted development requirements for operational work that is constructing or raising waterway barrier works* (DPI 2025b), so as not to create a barrier to fish movement; ▪ the proposed clean water drain would incorporate a number of deeper pools to provide habitat and refuge for fish inhabiting or attempting to pass through it; ▪ native fish encountered in waterbodies (dams) that are dewatered would be relocated in accordance with a General Fisheries Permit or equivalent; and ▪ the reaches of Deep and Taurus creeks constrained by the proposed open cut pits and their flood levees would still provide areas of low to no flow on the outer extremities to allow for fish passage under all flow conditions (Section 5.2).
Result in conditions that substantially increase risks to the health, wellbeing and productivity of fish seeking passage such as through the depletion of fishes energy reserves, stranding, increased predation risks, entrapment or confined schooling behaviour in fish.	The Project is unlikely to result in conditions that would substantially increase risks to the health, wellbeing and productivity of fish seeking passage because: ▪ waterway crossings would be constructed so as not to create a barrier to fish movement; ▪ the Project is unlikely to lead to substantial changes in water quality parameters beyond existing conditions; and waterways constrained by proposed flood levees are still expected to provide areas of low to no flow on the outer extremities to allow for passage of all fish species under all flow conditions (Section 5.4.2).
Reduce the extent, frequency or duration of fish passage previously found at a site.	The Project would directly remove or otherwise alter the extent of an aggregate 22.3 km of Low risk waterways, 2.8 km of Moderate risk waterways and 3.9 km of High risk waterway (Figure 6). The frequency and duration of fish passage would decrease downstream of these removed waterways, owing to the reduced catchment area. These waterways are of relatively low ecological value (Section 4.2.6). These waterways are highly ephemeral; therefore, fish habitat and passage are restricted to periods during and immediately following rainfall. These waterways do not connect to important fish habitat upstream, given upstream reaches are within existing active mining areas. As such, the Project would remove these waterways providing fish habitat within the Project and Infrastructure areas, but would not fragment fish habitat in these waterways as they do not connect to fish habitat further upstream.

Criteria	Assessment/Consideration
	The Project involves the construction of two internal road crossings across Deep and Taurus creeks adjacent to the Deep Creek open pit. Deep and Taurus creeks are indicated as Moderate and High risk waterways in the DPI (2025a) Queensland Waterways for Waterway Barrier Works mapping in accordance with the *Accepted development requirements for operational work that is constructing or raising waterway barrier works* (DPI 2025b). The two proposed road crossings would be designed in accordance with the *Accepted development requirements for operational work that is constructing or raising waterway barrier works* (DPI 2025b) to facilitate fish passage along Deep and Taurus creeks. The Project is not expected to reduce the frequency or duration of fish passage within Two Mile Gully (WRM 2026).
Substantially modify, destroy or fragment areas of fish habitat (including, but not limited to in-stream vegetation, snags and woody debris, substrate, bank or riffle formations) necessary for the breeding and/or survival of fish.	The waterways of the Project area are not known to constitute any rare, unique or particularly important habitats or features essential for the breeding and/or survival of the native fish species known to utilise this area. Waterways verified as low stream order (1 or 2) would be removed or otherwise impacted by mining activities (Section 5.2; Figure 6). These waterways are highly ephemeral and are not considered to constitute, nor provide a conduit to, fish habitat areas essential for the breeding and/or survival of native fish. Waterway crossings would be positioned on Deep and Taurus creeks. Fish passage would be maintained between existing upstream and downstream habitats because these waterway crossings would be constructed in accordance with the *Accepted development requirements for operational work that is constructing or raising waterway barrier works* (DPI 2025b).
Result in a substantial and measurable change in the hydrological regime of the waterway, for example, a substantial change to the volume, depth, timing, duration and frequency of flows.	Surface water hydrology would be altered by the Project as a result of removing waterways, capturing water in pits or dams, water loss due to use for Project operation or pond evaporation. However, the volume, depth, timing, duration and frequency of flows would continue to reflect the ephemeral and variable flow nature of the waterways of the Project area. The Project is considered unlikely to result in a substantial and measurable change in the existing hydrological regime of the waterways draining the Project area. The seasonality of fish movements is unlikely to be affected.
Lead to significant changes in water quality parameters such as temperature, dissolved oxygen, pH and conductivity that provide cues to movement in local fish species.	The Project is unlikely to lead to substantial changes in water quality parameters beyond existing conditions. Any water releases required by the Project would be managed in accordance with the EA Conditions (as amended). The risk of deteriorating water quality would be mitigated by monitoring and maintaining receiving environment and release water quality and quantity in accordance with the EA Conditions (as amended).

The assessment concludes that significant residual impacts on this MSES are unlikely. Accordingly, offsets are not triggered for this matter.

6 AVOIDANCE AND MITIGATION MEASURES

Consistent with DETSI's management hierarchy, the mitigation strategy for the Project has focused on a hierarchy of:

1. avoidance;
2. minimisation;
3. mitigation; then
4. offset residual impacts.

The avoidance or minimisation of adverse impacts is most relevant to the design phase of the Project, where information collected through desktop analysis and field surveys can be incorporated into the planning and preliminary engineering work (Section 6.1). The mitigation of impacts and the implementation of monitoring and management plans are most relevant to the construction and operational phases of the Project. Table 30 provides a summary of the mitigation measures for the Project, with a brief description of potential impacts and measures that can be implemented during the construction and operational phases of the Project.

The requirement for environmental offsets has not been triggered by aquatic MNES or MSES.

6.1 Measures to avoid and minimise impacts

The following measures would be implemented to avoid and/or minimise impacts on aquatic ecology and GDEs:

- Where possible, waterways have been avoided in the mine design. The larger waterways in the Study Area, comprising of Deep Creek, Taurus Creek and Two Mile Gully do not require diversion.
- The construction of waterway crossings would be scheduled to coincide with periods of no to low flow, where possible.
- Direct impacts (such as clearing for drilling or access tracks) would avoid terrestrial GDEs along Taurus Creek.

6.2 Impact mitigation

Mitigation measures proposed to be implemented for the Project are detailed in Table 30.

Table 30 Mitigation measures

Potential impact	Mitigation measures

1. Aquatic habitat clearing	▪ Clearing of native vegetation undertaken progressively over the life of the mine and only in areas required for mining activities within the following year. This would have the effect of minimising the area of exposed land and associated sedimentation risk.
	▪ Update and implement the existing Environmental Management Plan (or equivalent) for the Blackwater Mine to include vegetation management measures relevant to Blackwater North, including:
	  ▪ demarcate exclusion zones to protect areas of vegetation to be retained prior to clearing; and
	  ▪ clearing of native vegetation to be undertaken progressively.
	▪ Update the BWM Erosion and Sediment Control Plan (Section 6.3) to include reference to the Project.
	▪ Update and implement the existing Environmental Management Plan (or equivalent) for the Blackwater Mine to include fauna species management measures relevant to Blackwater North, including:
	  ▪ use of suitable fauna spotter-catchers for relocation of animals, including any native fish or turtles during dewatering of any waterways (pools) and farm dams;
	  ▪ salvage of microhabitat features (e.g. logs and boulders) from waterway crossing construction footprints and reinstatement immediately downstream.
	▪ Progressive and timely re-instatement and rehabilitation of the disturbed landform consistent with the rehabilitation criteria in EA EPML00717813 (as amended).

2. Increased numbers of pests	▪ Identify and treat aquatic weed infestations that may arise within the Study Area. ▪ Implement strategies for preventing the spread of aquatic weeds and pest fish, including machinery (e.g. excavator) wash-down on arrival, and before entering, the Study Area.
3. Creating a barrier to fish passage	▪ Design and construct waterway crossings consistent with the *Accepted development requirements for operational work that is constructing or raising waterway barrier works* (DPI 2025b). ▪ Incorporate a number of deeper pools into the channel of the proposed clean water drain design to provide habitat and refuge for fish inhabiting or attempting to pass through it. ▪ Where possible, construct waterway crossings in the drier months of the year when surface water flows (and aquatic fauna) are less likely to be encountered.
4. Alteration to surface water quality and/or quantity	▪ Where possible, construct waterway crossings in the drier months of the year when surface water flow (and associated risk of impacting water quality) is less likely to be encountered. ▪ Clearing of native vegetation would be undertaken progressively over the life of the mine and only in areas required for mining activities within the following year. This would have the effect of minimising the area of exposed land and associated sedimentation risk. ▪ Refuel and maintain machinery in designated locations away from waterways. Use machinery that is regularly serviced in accordance with the manufacturer's recommendations. Familiarise operators with the spill response procedure for the BWM. ▪ Update the BWM Erosion and Sediment Control Plan (Section 6.3) to include reference to the Project. ▪ Update the BWM Water Management Plan (Section 6.3). ▪ Continued monitoring of surface water quality for receiving water in accordance with the EA. ▪ Update and implement the Fitzroy Regional Receiving Environment Monitoring Program for the BWM, to incorporate the Project.

6.3 Management plans

The existing management plans which would be updated to include the mitigation measures identified in Table 30 above for are:

- BWM Erosion and Sediment Control Plan (Whitehaven Blackwater 2022);
- BWM Land and Biodiversity Management Plan (Whitehaven Blackwater 2020); and
- BWM Water Management Plan (Whitehaven Blackwater 2023).

7 CONCLUSION

The waterways of the Study Area are predominantly first and second order tributaries, with some reaching up to fourth order, including Two Mile Gully and Taurus Creek. Two Mile Gully flows into Taurus Creek, which then flows north into the fifth order Blackwater Creek downstream of the Study Area. Mapped wetlands are comprised of lacustrine wetland waterbodies and include farm dams and two mine water dams (Deep Creek Dam and Taurus Dam). Several smaller, unmapped lacustrine wetland waterbodies (farm dams and a riverine flood channel wetland) also occur.

The waterways of the Study Area are ephemeral and are expected to experience flow only after sustained or intense rainfall and runoff in the catchment. Stream flows are highly variable, with most channels expected to dry during winter to early spring when rainfall and runoff is historically low. Consequently, physical attributes, water quality, and the composition of aquatic flora and fauna communities are expected to vary seasonally.

No conservation-significant aquatic flora or fauna species listed under the NC Act and/or EPBC Act were recorded from the Study Area. Due to habitat requirements and distributional range, it is unlikely that any conservation-significant aquatic flora or fauna species occur within the waterways or wetlands of the Study Area as either resident or transient occurrences.

There are no wetlands of International Importance or National Importance identified within the Study Area.

MSES relevant to this aquatic ecology assessment comprise waterways providing for fish passage, which is an MSES only if waterway barrier works are proposed that would limit the passage of fish along the waterway. While the upper extent of several low order (stream order 1 and 2) waterways would be removed for mining, these waterways do not connect to important fish habitat upstream, given upstream reaches are within existing active mining areas. Therefore, their removal would not fragment fish habitat in these waterways as they do not connect to fish habitat further upstream.

Waterway crossings would be positioned on retained waterways Deep Creek and Taurus Creek. Fish passage would be maintained between existing upstream and downstream habitats because these waterway crossings would be constructed in accordance with the *Accepted development requirements for operational work that is constructing or raising waterway barrier works* (DPI 2025b).

No stygofauna have been identified from the stygofauna pilot survey and there is no evidence of stygofauna having previously been detected within the Focus Area.

Given Taurus Creek is subject to continuous natural wetting and drying cycles, the riparian vegetation (dominated by coolibah [*Eucalyptus coolabah*]) likely accesses available moisture in the soil/sediment following rainfall, runoff and flow, and accesses available shallow groundwater in the alluvial aquifer for short periods in drier times. The facultative terrestrial GDEs associated with this aquifer would likely be opportunistic, utilising small inputs of groundwater in the alluvial aquifer on occasion, but likely persisting without this input.

The alluvial aquifer of Taurus Creek is recharged by surface flows within Taurus Creek. The *Surface Water Assessment* for the Project (WRM 2026) indicates that, notwithstanding the 8.9% reduction in the contributing Taurus Creek catchment area during mining, the Project is not expected to materially alter the overall magnitude, duration or frequency characteristics of flows within Taurus Creek. Accordingly, recharge processes to the alluvial aquifer are anticipated to be maintained. On this basis, potential impacts to terrestrial GDEs associated with perched alluvial aquifers are expected to be low.

With effective implementation of mitigation and management measures presented in Section 6 of this report, the Project is unlikely to result in significant impacts on aquatic ecosystem values, including aquatic MNES or MSES.

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Appendix A: EPBC Act Protected Matters Report

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: 11-Jun-2025

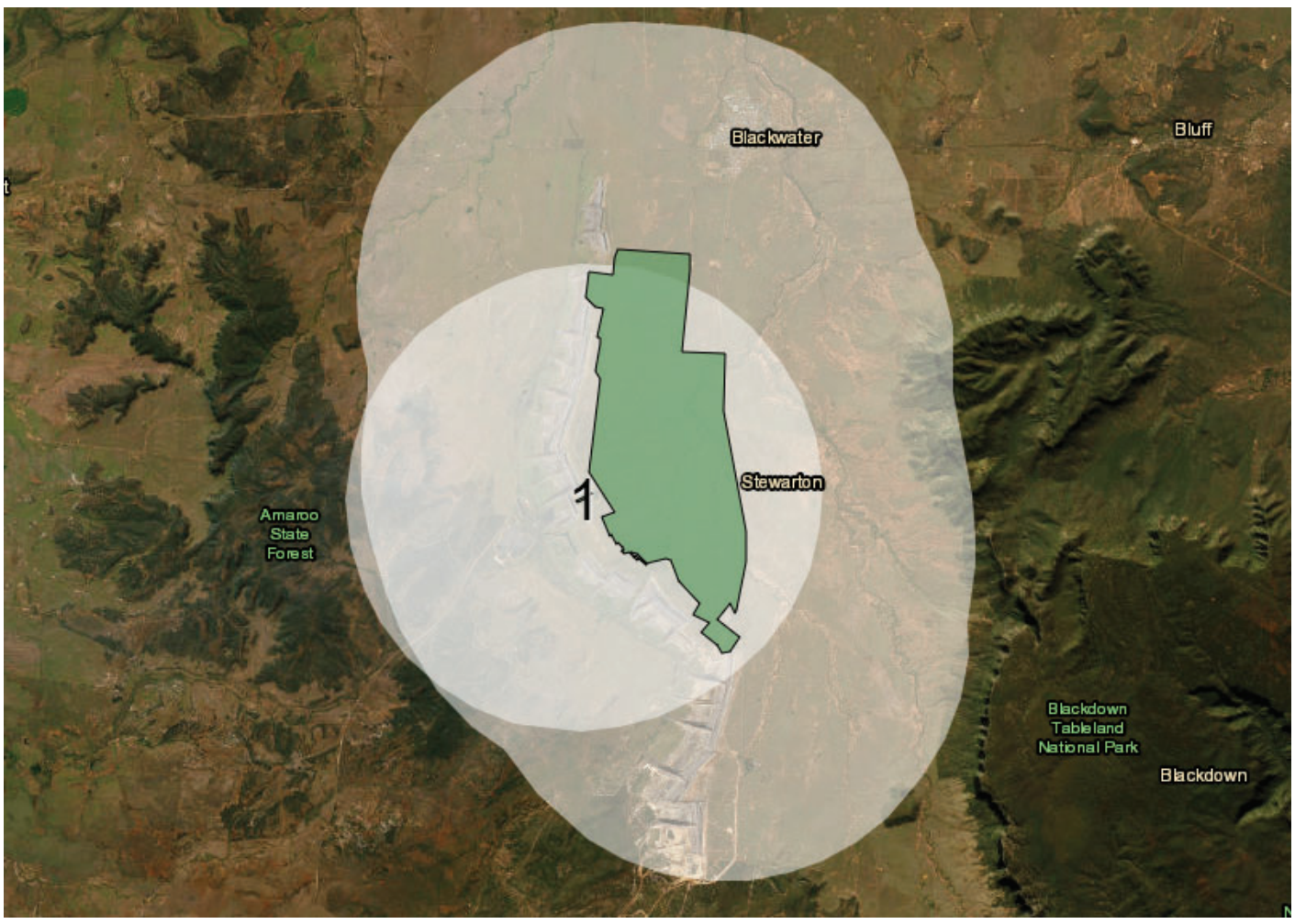
Summary

Details

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

Caveat

Acknowledgements



Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	36
Listed Migratory Species:	9

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:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	17
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	2
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	12
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

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

Community Name	Threatened Category	Presence Text	Buffer Status
Brigalow (Acacia harpophylla dominant and co-dominant)	Endangered	Community known to occur within area	In feature area
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Endangered	Community may occur within area	In buffer area only
Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin	Endangered	Community likely to occur within area	In feature area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community likely to occur within area	In feature area
Weeping Myall Woodlands	Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat known to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	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 buffer area only
Neochmia ruficauda ruficauda Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area	In feature area
Poephila cincta cincta Southern Black-throated Finch [64447]	Endangered	Species or species habitat may occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat may occur within area	In feature area
MAMMAL			
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat may occur within area	In buffer area only
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Macroderma gigas Ghost Bat [174]	Vulnerable	Species or species habitat may occur within area	In feature area
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may 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
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat likely to occur within area	In feature area
PLANT			
Arthraxon hispidus Hairy-joint Grass [9338]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Bertya opponens [13792]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Cadellia pentastylis Ooline [9828]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Daviesia discolor [3567]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Dichanthium queenslandicum King Blue-grass [5481]	Endangered	Species or species habitat may occur within area	In feature area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Eucalyptus raveretiana Black Ironbox [16344]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Homoranthus decumbens a shrub [55186]	Endangered	Species or species habitat may occur within area	In buffer area only
Macrozamia platyrhachis cycad [3412]	Endangered	Species or species habitat may occur within area	In buffer area only
Polianthion minutiflorum [82772]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Solanum dissectum [75720]	Endangered	Species or species habitat may occur within area	In buffer area only
REPTILE			
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Denisonia maculata Ornamental Snake [1193]	Vulnerable	Species or species habitat known to occur within area	In feature area
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Elseya albagula Southern Snapping Turtle, White-throated Snapping Turtle [81648]	Critically Endangered	Species or species habitat may occur within area	In feature area
Hemiaspis damelii Grey Snake [1179]	Endangered	Species or species habitat may occur within area	In feature area
Rheodytes leukops Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle, White-eyed River Diver [1761]	Endangered	Species or species habitat likely to occur within area	In feature area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		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 buffer area only
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Defence		
Defence - BLACKWATER TRAINING DEPOT [30270]	QLD	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
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
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area overfly marine area	In buffer area only
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 buffer area only
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 may occur within area overfly marine area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat may occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rostratula australis as Rostratula benghalensis (sensu lato)			
Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area overfly marine area	In feature area

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Blackdown Tableland	National Park	QLD	In buffer area only
Blackwater	Conservation Park	QLD	In buffer area only

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Blackwater Mine ? North Extension Project	2023/09723		Assessment	In feature area
rail track to link the proposed MIM Rolleston coal mine to existing rail network	2002/637		Post-Approval	In buffer area only
Controlled action				
Bowen Gas Project	2012/6377	Controlled Action	Post-Approval	In feature area
Construct and operate a coal gasification plant and carbon dioxide capture and storage	2006/3040	Controlled Action	Completed	In buffer area only
Curragh Extension Project, Blackwater, QLD	2015/7508	Controlled Action	Post-Approval	In buffer area only
Norwich Park & Blackwater CSG Fields & supporting infrastructure Bowen Basin	2011/6032	Controlled Action	Completed	In feature area
ZeroGen Integrated Gasification Combined Cycle Power Plant and CO2 Capture, Transport and Storage	2009/5195	Controlled Action	Completed	In feature area
Not controlled action				
Blackwater to Emerald Dual Circuit 132kV Powerline, QLD	2012/6480	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Development and operation of a new multi-seam underground coal mine with associated on-site infrastr	2011/5811	Not Controlled Action	Completed	In feature area
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
Blackwater to Rolleston 132 kV transmission line	2002/880	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Curragh West Project	2011/6187	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

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

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

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

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

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

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

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Appendix B: Aquatic Survey Site Profiles

AQUATIC HABITAT ASSESSMENT

Site code: R1	**Location:** Sagittarius Creek
Date: 17/06/2025	**Season:** late wet
Assessor: DM	**Coordinates:** -23.6287; 148.8619 (GDA 2020)
Water level: no flow - dry	**Likely flow nature:** ephemeral
State-mapped watercourse (DLGWV 2025): no, unmapped	
Likely a watercourse: no, likely a drainage feature	
State-mapped waterway providing for fish passage (DAF 2020): yes, Moderate risk of impact	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 0 m	**Bankfull width:** 10 m
Maximum depth: 0 m	**Bankfull height:** 1.8 m
Habitat types: 0% riffle, 0% run, 0% sandy pool, 0% rocky pool, 100% dry	
Variety of habitat: large woody debris	
Habitat attributes: detritus (L), sticks (L), branches (L), logs (L), periphyton (N), moss (N), filamentous algae (N), macrophytes (N), bank overhang (N), trailing bank vegetation (N), blanketing silt (N), substrate anoxia (N)	
Upstream landuse: moderate grazing, past vegetation clearing	
Adjacent landuse (right bank): moderate grazing, past vegetation clearing	
Adjacent landuse (left bank): moderate grazing, past vegetation clearing	
Bed, edge and bank characteristics	
Bed substrates: 70% silt/clay (<0.05 mm), 27% sand (0.05-2 mm), 3% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Edge substrates: 70% silt/clay (<0.05 mm), 27% sand (0.05-2 mm), 3% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Bank soils: clay	**Bank stability:** moderately stable
Bed stability: bed stable	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (N), sand (N)
Local catchment erosion: gully (L), rill (L), tunnel (N), sheet (N), bank slumping (L), cattle pugging (S)	



Upstream



Left bank



Downstream



Right bank

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 10 m	**Width of riparian zone on right bank:** 7 m
Bare ground: L	**Grasses/forbs:** E
Shrubs: L	**Trees <10 m:** S
Trees >10m: N	**Exotic riparian species:** M
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** 11.3.1
Vegetation status: regrowth	**Dominant stratum:** tree
Health: average	**Dieback:** 1-10%
EDL height: 9 m	**EDL cover:** 35%
Canopy species: *Eucalyptus coolabah* (D), *Acacia harpophylla* (D)	
Sub-canopy species: *Lysiphyllum carronii* (F), *Terminalia oblongata* subsp. *oblongata* (F), *Acacia harpophylla* (O)	
Shrub species: *Acacia harpophylla* (O), *Acalypha eremorum* (O), *Atalaya hemiglauca* (O), *Geijera parviflora* (O)	
Ground species: *Cenchrus ciliaris** (D), *Parthenium hysterophorus** (O), *Sida* sp. (O), *Enchylaena tomentosa* (O)	
Macrophytes	
Submerged macrophytes: none observed	
Floating macrophytes: none observed	
Emergent macrophytes: none observed	

Aquatic biota
Aquatic macroinvertebrate sampling undertaken: no
Habitat for platypus: unlikely habitat
Habitat for EVNT fish species: unlikely
Fish sampling undertaken: no
Suitable habitat for EVNT turtle species: unlikely
Turtle sampling undertaken: no
Aquatic vertebrates encountered: none observed

Aquatic habitat assessment scoring	
1. Bottom substrate/available cover	2 (Poor)
2. Embeddedness	2 (Poor)
3. Velocity/depth category	0 (Poor)
4. Channel alteration	8 (Good)
5. Bottom scouring and deposition	8 (Good)
6. Pool/riffle, run/bend ratio	5 (Fair)
7. Bank stability	6 (Good)
8. Bank vegetative stability	9 (Excellent)
9. Streamside cover	9 (Excellent)
Overall score	49 (Fair)
Overall aquatic value: Low	

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT

Site code: R1	**Location:** Sagittarius Creek
Date: 20/10/2025	**Season:** dry
Assessor: DM	**Coordinates:** -23.6287; 148.8619 (GDA 2020)
Water level: no flow - dry	**Likely flow nature:** ephemeral
State-mapped watercourse (DLGWV 2025): no, unmapped	
Likely a watercourse: no, likely a drainage feature	
State-mapped waterway providing for fish passage (DAF 2020): yes, Moderate risk of impact	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 0 m	**Bankfull width:** 10 m
Maximum depth: 0 m	**Bankfull height:** 1.8 m
Habitat types: 0% riffle, 0% run, 0% sandy pool, 0% rocky pool, 100% dry	
Variety of habitat: large woody debris	
Habitat attributes: detritus (S), sticks (S), branches (L), logs (L), periphyton (N), moss (N), filamentous algae (N), macrophytes (N), bank overhang (N), trailing bank vegetation (N), blanketing silt (N), substrate anoxia (N)	
Upstream landuse: moderate grazing, past vegetation clearing	
Adjacent landuse (right bank): moderate grazing, past vegetation clearing	
Adjacent landuse (left bank): moderate grazing, past vegetation clearing	
Bed, edge and bank characteristics	
Bed substrates: 70% silt/clay (<0.05 mm), 27% sand (0.05-2 mm), 3% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Edge substrates: 70% silt/clay (<0.05 mm), 27% sand (0.05-2 mm), 3% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Bank soils: clay	**Bank stability:** moderately stable
Bed stability: bed stable	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (N), sand (N)
Local catchment erosion: gully (L), rill (L), tunnel (N), sheet (N), bank slumping (L), cattle pugging (L)	



Upstream



Left bank



Downstream



Right bank

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 10 m	**Width of riparian zone on right bank:** 7 m
Bare ground: S	**Grasses/forbs:** M
Shrubs: L	**Trees <10 m:** S
Trees >10m: N	**Exotic riparian species:** M
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** 11.3.1
Vegetation status: regrowth	**Dominant stratum:** tree
Health: average	**Dieback:** 1-10%
EDL height: 9 m	**EDL cover:** 35%
Canopy species: *Eucalyptus coolabah* (D), *Acacia harpophylla* (D)	
Sub-canopy species: *Lysiphyllum carronii* (F), *Terminalia oblongata* subsp. *oblongata* (F), *Acacia harpophylla* (O)	
Shrub species: *Acacia harpophylla* (O), *Acalypha eremorum* (O), *Atalaya hemiglauca* (O), *Geijera parviflora* (O)	
Ground species: *Cenchrus ciliaris** (D), *Parthenium hysterophorus** (O), *Sida* sp. (O), *Enchylaena tomentosa* (O)	
Macrophytes	
Submerged macrophytes: none observed	
Floating macrophytes: none observed	
Emergent macrophytes: none observed	

Aquatic biota
Aquatic macroinvertebrate sampling undertaken: no
Habitat for platypus: unlikely habitat
Habitat for EVNT fish species: unlikely
Fish sampling undertaken: no
Suitable habitat for EVNT turtle species: unlikely
Turtle sampling undertaken: no
Aquatic vertebrates encountered: none observed

Aquatic habitat assessment scoring	
1. Bottom substrate/available cover	2 (Poor)
2. Embeddedness	2 (Poor)
3. Velocity/depth category	0 (Poor)
4. Channel alteration	8 (Good)
5. Bottom scouring and deposition	8 (Good)
6. Pool/riffle, run/bend ratio	5 (Fair)
7. Bank stability	6 (Good)
8. Bank vegetative stability	7 (Good)
9. Streamside cover	9 (Excellent)
Overall score	47 (Fair)
Overall aquatic value: Low	

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT	
Site code: R2	**Location:** Sagittarius Creek
Date: 17/06/2025	**Season:** late wet
Assessor: DM	**Coordinates:** -23.6521; 148.8387 (GDA 2020)
Water level: no flow - dry	**Likely flow nature:** ephemeral
State-mapped watercourse (DLGWV 2025): no, unmapped	
Likely a watercourse: no, likely a drainage feature	
State-mapped waterway providing for fish passage (DAF 2020): yes, Moderate risk of impact	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 0 m	**Bankfull width:** 15 m
Maximum depth: 0 m	**Bankfull height:** 1.5 m
Habitat types: 0% riffle, 0% run, 0% sandy pool, 0% rocky pool, 100% dry	
Variety of habitat: large woody debris	
Habitat attributes: detritus (S), sticks (L), branches (L), logs (L), periphyton (N), moss (N), filamentous algae (N), macrophytes (N), bank overhang (N), trailing bank vegetation (N), blanketing silt (N), substrate anoxia (N)	
Upstream landuse: past vegetation clearing, moderate grazing	
Adjacent landuse (right bank): moderate grazing, past vegetation clearing	
Adjacent landuse (left bank): moderate grazing, past vegetation clearing	
Bed, edge and bank characteristics	
Bed substrates: 60% silt/clay (<0.05 mm), 33% sand (0.05-2 mm), 3% gravel (2-4 mm), 2% pebble (4-64 mm), 1% cobble (64-256 mm), 1% boulder (>256 mm), 0% bedrock	
Edge substrates: 60% silt/clay (<0.05 mm), 35% sand (0.05-2 mm), 3% gravel (2-4 mm), 2% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Bank soils: clay	**Bank stability:** stable
Bed stability: bed stable	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (N), sand (N)
Local catchment erosion: gully (N), rill (L), tunnel (N), sheet (N), bank slumping (L), cattle pugging (L)	



Upstream



Left bank



Downstream



Right bank

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 10 m	**Width of riparian zone on right bank:** 10 m
Bare ground: L	**Grasses/forbs:** E
Shrubs: L	**Trees <10 m:** S
Trees >10m: N	**Exotic riparian species:** M
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** Non-remnant
Vegetation status: regrowth	**Dominant stratum:** tree
Health: poor	**Dieback:** 1-10%
EDL height: 9 m	**EDL cover:** 30%
Canopy species: *Terminalia oblongata* subsp. *oblongata* (D), *Acacia harpophylla* (D), *Lysiphyllum carronii* (O)	
Sub-canopy species: *Acacia harpophylla* (O), *Terminalia oblongata* subsp. *oblongata* (O), *Lysiphyllum carronii* (O)	
Shrub species: *Acacia harpophylla* (O), *Carissa ovata* (O), *Terminalia oblongata* subsp. *oblongata* (O), *Archidendropsis basaltica* (O), *Atalaya hemiglauca* (O)	
Ground species: *Cenchrus ciliaris** (D), *Enchylaena tomentosa* (O), *Bothriochloa bladhii* (O), *Parthenium hysterophorus** (O)	
Macrophytes	
Submerged macrophytes: none observed	
Floating macrophytes: none observed	
Emergent macrophytes: none observed	

Aquatic biota	
Aquatic macroinvertebrate sampling undertaken: no	
Habitat for platypus: unlikely habitat	
Habitat for EVNT fish species: unlikely	
Fish sampling undertaken: no	
Suitable habitat for EVNT turtle species: unlikely	
Turtle sampling undertaken: no	
Aquatic vertebrates encountered: none observed	
Aquatic habitat assessment scoring	
1. Bottom substrate/available cover	2 (Poor)
2. Embeddedness	2 (Poor)
3. Velocity/depth category	0 (Poor)
4. Channel alteration	6 (Fair)
5. Bottom scouring and deposition	8 (Good)
6. Pool/riffle, run/bend ratio	4 (Fair)
7. Bank stability	7 (Good)
8. Bank vegetative stability	8 (Good)
9. Streamside cover	9 (Excellent)
Overall score	46 (Fair)
Overall aquatic value: Low	

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT	
Site code: R2	**Location:** Sagittarius Creek
Date: 20/10/2025	**Season:** dry
Assessor: DM	**Coordinates:** -23.6521; 148.8387 (GDA 2020)
Water level: no flow - dry	**Likely flow nature:** ephemeral
State-mapped watercourse (DLGWV 2025): no, unmapped	
Likely a watercourse: no, likely a drainage feature	
State-mapped waterway providing for fish passage (DAF 2020): yes, Moderate risk of impact	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 0 m	**Bankfull width:** 15 m
Maximum depth: 0 m	**Bankfull height:** 1.5 m
Habitat types: 0% riffle, 0% run, 0% sandy pool, 0% rocky pool, 100% dry	
Variety of habitat: large woody debris	
Habitat attributes: detritus (S), sticks (S), branches (L), logs (L), periphyton (N), moss (N), filamentous algae (N), macrophytes (N), bank overhang (N), trailing bank vegetation (N), blanketing silt (N), substrate anoxia (N)	
Upstream landuse: past vegetation clearing, moderate grazing	
Adjacent landuse (right bank): moderate grazing, past vegetation clearing	
Adjacent landuse (left bank): moderate grazing, past vegetation clearing	
Bed, edge and bank characteristics	
Bed substrates: 60% silt/clay (<0.05 mm), 33% sand (0.05-2 mm), 3% gravel (2-4 mm), 2% pebble (4-64 mm), 1% cobble (64-256 mm), 1% boulder (>256 mm), 0% bedrock	
Edge substrates: 60% silt/clay (<0.05 mm), 35% sand (0.05-2 mm), 3% gravel (2-4 mm), 2% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Bank soils: clay	**Bank stability:** stable
Bed stability: bed stable	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (N), sand (N)
Local catchment erosion: gully (N), rill (L), tunnel (N), sheet (N), bank slumping (L), cattle pugging (L)	



Upstream



Left bank



Downstream



Right bank

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 10 m	**Width of riparian zone on right bank:** 10 m
Bare ground: S	**Grasses/forbs:**M
Shrubs: L	**Trees <10 m:** S
Trees >10m: N	**Exotic riparian species:** M
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** Non-remnant
Vegetation status: regrowth	**Dominant stratum:** tree
Health: poor	**Dieback:** 1-10%
EDL height: 9 m	**EDL cover:** 30%
Canopy species: *Terminalia oblongata* subsp. *oblongata* (D), *Acacia harpophylla* (D), *Lysiphyllum carronii* (O)	
Sub-canopy species: *Acacia harpophylla* (O), *Terminalia oblongata* subsp. *oblongata* (O), *Lysiphyllum carronii* (O)	
Shrub species: *Acacia harpophylla* (O), *Carissa ovata* (O), *Terminalia oblongata* subsp. *oblongata* (O), *Archidendropsis basaltica* (O), *Atalaya hemiglauca* (O)	
Ground species: *Cenchrus ciliaris** (D), *Enchylaena tomentosa* (O), *Bothriochloa bladhii* (O), *Parthenium hysterophorus** (O)	
Macrophytes	
Submerged macrophytes: none observed	
Floating macrophytes: none observed	
Emergent macrophytes: none observed	

Aquatic biota
Aquatic macroinvertebrate sampling undertaken: no
Habitat for platypus: unlikely habitat
Habitat for EVNT fish species: unlikely
Fish sampling undertaken: no
Suitable habitat for EVNT turtle species: unlikely
Turtle sampling undertaken: no
Aquatic vertebrates encountered: none observed

Aquatic habitat assessment scoring	
1. Bottom substrate/available cover	2 (Poor)
2. Embeddedness	2 (Poor)
3. Velocity/depth category	0 (Poor)
4. Channel alteration	6 (Fair)
5. Bottom scouring and deposition	8 (Good)
6. Pool/riffle, run/bend ratio	4 (Fair)
7. Bank stability	7 (Good)
8. Bank vegetative stability	6 (Good)
9. Streamside cover	9 (Excellent)
Overall score	44 (Fair)
Overall aquatic value: Low	

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT	
Site code: R3	**Location:** Taurus Creek
Date: 20/06/2025	**Season:** late wet
Assessor: DM	**Coordinates:** -23.6705; 148.8762 (GDA 2020)
Water level: no flow - isolated	**Likely flow nature:** ephemeral
State-mapped watercourse (DLGWV 2025): yes	
Likely a watercourse: yes - clear channel and bank structure, and clear presence of riparian vegetation structure	
State-mapped waterway providing for fish passage (DAF 2020): yes, Major risk of impact	
Water quality	
Time (EST): 11:00	**Water temperature:** 13.0˚C
Sp. Conductivity: 286 µS/cm	**pH:** 7.0
Dissolved oxygen: 77.0%	**Dissolved oxygen:** 8.10 mg/L
Turbidity: 36.9 NTU	**Ion sample collected:** yes
Observations within 2 m of sampling point	
Shading: 90%	**Water colour:** clear
Water odour: none detected	**Water surface:** normal
Algae on substrate: L	**Algae in water column:** N
Emergent macrophytes: L	**Submerged macrophytes:** N
Floating macrophytes: N	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 6 m	**Bankfull width:** 25 m
Maximum depth: 1 m	**Bankfull height:** 3 m
Habitat types: 0% riffle, 0% run, 100% sandy pool, 0% rocky pool, 0% dry	
Variety of habitat: shallow (<0.5 m), deep (>0.5 m), pool, large woody debris, macrophytes	
Habitat attributes: detritus (S), sticks (S), branches (S), logs (L), periphyton (S), moss (N), filamentous algae (L), macrophytes (L), bank overhang (N), trailing bank vegetation (L), blanketing silt (L), substrate anoxia (N)	
Upstream landuse: past vegetation clearing, moderate grazing, coal mining	
Adjacent landuse (right bank): past vegetation clearing, light grazing	
Adjacent landuse (left bank): past vegetation clearing, light grazing	
Bed, edge and bank characteristics	
Bed substrates: 60% silt/clay (<0.05 mm), 40% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Edge substrates: 60% silt/clay (<0.05 mm), 40% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Bank soils: loamy clay	**Bank stability:** moderately stable
Bed stability: mod. deposition	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (L), sand (L)
Local catchment erosion: gully (N), rill (N), tunnel (N), sheet (N), bank slumping (L), cattle pugging (L)	

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).



Upstream



Left bank



Downstream



Right bank

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 20 m	**Width of riparian zone on right bank:** 20 m
Bare ground: S	**Grasses/forbs:** E
Shrubs: L	**Trees <10 m:** M
Trees >10m: S	**Exotic riparian species:** M
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** 11.3.3/11.3.1
Vegetation status: remnant	**Dominant stratum:** tree
Health: good	**Dieback:** 1-10%
EDL height: 18 m	**EDL cover:** 30%
Canopy species: *Eucalyptus coolabah* (D), *Acacia harpophylla* (F)	
Sub-canopy species: *Acacia harpophylla* (D), *Terminalia oblongata* subsp. *oblongata* (D), *Lysiphyllum hookeri* (F)	
Shrub species: *A. harpophylla* (O), *T. oblongata* (O), *Cryptostegia grandiflora** (O), *Atalaya hemiglauca* (O)	
Ground species: *Megathyrsus maximus** (D), *Bothriochloa bladhii* (A), *Parthenium hysterophorus** (O), *Cyperus bifax* (O), *Sida* sp. (O), *Calyptocarpus vialis** (F)	
Macrophytes	
Submerged macrophytes: none observed	
Floating macrophytes: none observed	
Emergent macrophytes: *Cyperus bifax* (S), *C. betchei* (L), *Persicaria attenuata* (L), *Ludwigia peploides* (L), *Eclipta prostrata** (L), *Echinochloa colona** (L), *Leptochloa digitata* (L)	

Aquatic biota
Aquatic macroinvertebrate sampling undertaken: yes
Habitat for platypus: unlikely habitat (insufficient permanence); no burrows detected
Habitat for EVNT fish species: unlikely
Fish sampling undertaken: yes
Suitable habitat for EVNT turtle species: unlikely
Turtle sampling undertaken: yes
Aquatic vertebrates encountered: *Ambassis agassizii*, *Hypseleotris bucephala*, *Leiopotherapon unicolor*, *Melanotaenia splendida splendida*, *Mogurnda adspersa*, *Nematalosa erebi*, *Neosilurus hyrtlii*

Aquatic habitat assessment scoring	
1. Bottom substrate/available cover	6 (Fair)
2. Embeddedness	3 (Poor)
3. Velocity/depth category	6 (Fair)
4. Channel alteration	5 (Fair)
5. Bottom scouring and deposition	5 (Fair)
6. Pool/riffle, run/bend ratio	6 (Fair)
7. Bank stability	8 (Good)
8. Bank vegetative stability	7 (Good)
9. Streamside cover	9 (Excellent)
Overall score	55 (Fair)
Overall aquatic value: Low	

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT	
Site code: R3	**Location:** Taurus Creek
Date: 22/10/2025	**Season:** dry
Assessor: DM	**Coordinates:** -23.6705; 148.8762 (GDA 2020)
Water level: no flow - isolated	**Likely flow nature:** ephemeral
State-mapped watercourse (DLGWV 2025): yes	
Likely a watercourse: yes - clear channel and bank structure, and clear presence of riparian vegetation structure	
State-mapped waterway providing for fish passage (DAF 2020): yes, Major risk of impact	
Water quality	
Time (EST): 07:15	**Water temperature:** 21.3˚C
Sp. Conductivity: 633 µS/cm	**pH:** 7.5
Dissolved oxygen: 20.5%	**Dissolved oxygen:** 1.82 mg/L
Turbidity: 220 NTU	**Ion sample collected:** yes
Observations within 2 m of sampling point	
Shading: 90%	**Water colour:** turbid
Water odour: none detected	**Water surface:** normal
Algae on substrate: L	**Algae in water column:** L
Emergent macrophytes: L	**Submerged macrophytes:** N
Floating macrophytes: N	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 2 m	**Bankfull width:** 25 m
Maximum depth: 0.2 m	**Bankfull height:** 3 m
Habitat types: 0% riffle, 0% run, 30% sandy pool, 0% rocky pool, 70% dry	
Variety of habitat: shallow (<0.5 m), pool, large woody debris, macrophytes	
Habitat attributes: detritus (M), sticks (S), branches (S), logs (L), periphyton (S), moss (N), filamentous algae (L), macrophytes (L), bank overhang (N), trailing bank vegetation (L), blanketing silt (L), substrate anoxia (N)	
Upstream landuse: past vegetation clearing, moderate grazing, coal mining	
Adjacent landuse (right bank): past vegetation clearing, light grazing	
Adjacent landuse (left bank): past vegetation clearing, light grazing	
Bed, edge and bank characteristics	
Bed substrates: 60% silt/clay (<0.05 mm), 40% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Edge substrates: 60% silt/clay (<0.05 mm), 40% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Bank soils: loamy clay	**Bank stability:** moderately stable
Bed stability: mod. deposition	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (L), sand (L)
Local catchment erosion: gully (N), rill (N), tunnel (N), sheet (N), bank slumping (L), cattle pugging (E)	

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).



Upstream



Left bank



Downstream



Right bank

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 20 m	**Width of riparian zone on right bank:** 20 m
Bare ground: M	**Grasses/forbs:** S
Shrubs: L	**Trees <10 m:** M
Trees >10m: S	**Exotic riparian species:** M
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** 11.3.3/11.3.1
Vegetation status: remnant	**Dominant stratum:** tree
Health: good	**Dieback:** 1-10%
EDL height: 18 m	**EDL cover:** 30%
Canopy species: *Eucalyptus coolabah* (D), *Acacia harpophylla* (F)	
Sub-canopy species: *Acacia harpophylla* (D), *Terminalia oblongata* subsp. *oblongata* (D), *Lysiphyllum hookeri* (F)	
Shrub species: *Acacia harpophylla* (O), *Terminalia oblongata* subsp. *oblongata* (O), *Cryptostegia grandiflora** (O), *Atalaya hemiglauca* (O)	
Ground species: *Megathyrsus maximus** (D), *Bothriochloa bladhii* (A), *Cenchrus ciliaris** (O), *Parthenium hysterophorus** (O), *Cyperus bifax* (O), *Sida* sp. (O), *Calyptocarpus vialis** (O)	
Macrophytes	
Submerged macrophytes: none observed	
Floating macrophytes: none observed	
Emergent macrophytes: *Cyperus bifax* (S), *C. betchei* (L), *Persicaria attenuata* (L), *Ludwigia peploides* (L), *Eclipta prostrata** (L), *Echinochloa colona** (L), *Leptochloa digitata* (L)	
Aquatic biota	
Aquatic macroinvertebrate sampling undertaken: yes	
Habitat for platypus: unlikely habitat (insufficient permanence); no burrows detected	
Habitat for EVNT fish species: unlikely	
Fish sampling undertaken: yes	
Suitable habitat for EVNT turtle species: unlikely	
Turtle sampling undertaken: yes	
Aquatic vertebrates encountered: *Ambassis agassizii*, *Hypseleotris bucephala*, *Leiopotherapon unicolor*, *Melanotaenia splendida splendida*, *Mogurnda adspersa*, *Nematalosa erebi*	

Aquatic habitat assessment scoring	
1. Bottom substrate/available cover	10 (Fair)
2. Embeddedness	3 (Poor)
3. Velocity/depth category	3 (Poor)
4. Channel alteration	5 (Fair)
5. Bottom scouring and deposition	5 (Fair)
6. Pool/riffle, run/bend ratio	6 (Fair)
7. Bank stability	8 (Good)
8. Bank vegetative stability	7 (Good)
9. Streamside cover	9 (Excellent)
Overall score	56 (Fair)
Overall aquatic value: Low	

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).
Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT	
Site code: R4	**Location:** Taurus Creek
Date: 20/06/2025	**Season:** late wet
Assessor: DM	**Coordinates:** -23.6785; 148.8666 (GDA 2020)
Water level: no flow - dry	**Likely flow nature:** ephemeral
State-mapped watercourse (DLGWV 2025): yes	
Likely a watercourse: yes - clear channel and bank structure, and clear presence of riparian vegetation structure	
State-mapped waterway providing for fish passage (DAF 2020): yes, Major risk of impact	
Water quality	
Time (EST): 7:34	**Water temperature:** 11.7˚C
Sp. Conductivity: 187 µS/cm	**pH:** 7.1
Dissolved oxygen: 64.4%	**Dissolved oxygen:** 6.98 mg/L
Turbidity: 394 NTU	**Ion sample collected:** yes
Observations within 2 m of sampling point	
Shading: 100%	**Water colour:** opaque
Water odour: none detected	**Water surface:** normal
Algae on substrate: N	**Algae in water column:** N
Emergent macrophytes: N	**Submerged macrophytes:** N
Floating macrophytes: N	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 2.5 m	**Bankfull width:** 20 m
Maximum depth: 0.8 m	**Bankfull height:** 5 m
Habitat types: 0% riffle, 0% run, 80% sandy pool, 0% rocky pool, 20% dry	
Variety of habitat: shallow (<0.5 m), deep (>0.5 m), pool, large woody debris, macrophytes	
Habitat attributes: detritus (S), sticks (S), branches (S), logs (S), periphyton (N), moss (N), filamentous algae (N), macrophytes (L), bank overhang (L), trailing bank vegetation (L), blanketing silt (L), substrate anoxia (N)	
Upstream landuse: past vegetation clearing, moderate grazing, coal mining	
Adjacent landuse (right bank): past vegetation clearing, light grazing	
Adjacent landuse (left bank): past vegetation clearing, light grazing	
Bed, edge and bank characteristics	
Bed substrates: 90% silt/clay (<0.05 mm), 10% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Edge substrates: 90% silt/clay (<0.05 mm), 10% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Bank soils: loamy clay	**Bank stability:** moderately unstable
Bed stability: mod. deposition	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (S), sand (N)
Local catchment erosion: gully (L), rill (L), tunnel (N), sheet (N), bank slumping (S), cattle pugging (L)	

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).



Upstream



Left bank



Downstream



Right bank

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 25 m	**Width of riparian zone on right bank:** 25 m
Bare ground: L	**Grasses/forbs:** E
Shrubs: S	**Trees <10 m:** M
Trees >10m: S	**Exotic riparian species:** M
Composition and health	
State-mapped RE: 11.3.2/11.3.25/11.3.1 (50/45/5)	**Verified RE:** 11.3.3
Vegetation status: remnant	**Dominant stratum:** tree
Health: good	**Dieback:** 1-10%
EDL height: 18 m	**EDL cover:** 35%
Canopy species: *Eucalyptus coolabah* (D), *Acacia harpophylla* (O)	
Sub-canopy species: *Acacia harpophylla* (D), *Terminalia oblongata* subsp. *oblongata* (A), *Acacia salicina* (O), *Brachychiton rupestris* (R), *Cryptostegia grandiflora** (O), *Lysiphyllum hookeri* (F)	
Shrub species: *Acalypha eremorum* (F), *Cryptocarya* sp. (O), *Lysiphyllum hookeri* (O), *Acacia harpophylla* (O), *Cryptostegia grandiflora** (O), *Atalaya hemiglauca* (O)	
Ground species: *Megathyrsus maximus** (D), *Cenchrus ciliaris** (F), *Calyptocarpus vialis** (O), *Bryophyllum delagoense** (O), *Bothriochloa bladhii* (O), *Parthenium hysterophorus** (O), *Alternanthera* sp. (O), *Cyperus bifax* (O)	
Macrophytes	
Submerged macrophytes: none observed	
Floating macrophytes: none observed	
Emergent macrophytes: *C. bifax* (L), *Eclipta prostrata** (L)	
Aquatic biota	
Aquatic macroinvertebrate sampling undertaken: yes	
Habitat for platypus: unlikely habitat,no burrows detected	
Habitat for EVNT fish species: unlikely	
Fish sampling undertaken: yes	
Suitable habitat for EVNT turtle species: unlikely	
Turtle sampling undertaken: no	
Aquatic vertebrates encountered: *Ambassis agassizii*, *Hypseleotris bucephala*, *Leiopotherapon unicolor*, *Melanotaenia splendida splendida*, *Mogurnda adspersa*	

Aquatic habitat assessment scoring	
1. Bottom substrate/available cover	3 (Poor)
2. Embeddedness	2 (Poor)
3. Velocity/depth category	6 (Fair)
4. Channel alteration	8 (Good)
5. Bottom scouring and deposition	5 (Fair)
6. Pool/riffle, run/bend ratio	4 (Fair)
7. Bank stability	7 (Good)
8. Bank vegetative stability	3 (Fair)
9. Streamside cover	10 (Excellent)
Overall score	48 (Fair)
Overall aquatic value: Low	

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT

Site code: R4	**Location:** Taurus Creek
Date: 21/10/2025	**Season:** dry
Assessor: DM	**Coordinates:** -23.6785; 148.8666 (GDA 2020)
Water level: no flow - dry	**Likely flow nature:** ephemeral
State-mapped watercourse (DLGWV 2025): yes	
Likely a watercourse: yes - clear channel and bank structure, and clear presence of riparian vegetation structure	
State-mapped waterway providing for fish passage (DAF 2020): yes, Major risk of impact	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 0 m	**Bankfull width:** 20 m
Maximum depth: 0 m	**Bankfull height:** 5 m
Habitat types: 0% riffle, 0% run, 0% sandy pool, 0% rocky pool, 100% dry	
Variety of habitat: large woody debris, macrophytes	
Habitat attributes: detritus (S), sticks (S), branches (S), logs (S), periphyton (N), moss (N), filamentous algae (N), macrophytes (L), bank overhang (N), trailing bank vegetation (N), blanketing silt (N), substrate anoxia (N)	
Upstream landuse: past vegetation clearing, moderate grazing, coal mining	
Adjacent landuse (right bank): past vegetation clearing, light grazing	
Adjacent landuse (left bank): past vegetation clearing, light grazing	
Bed, edge and bank characteristics	
Bed substrates: 90% silt/clay (<0.05 mm), 10% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Edge substrates: 90% silt/clay (<0.05 mm), 10% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Bank soils: loamy clay	**Bank stability:** moderately unstable
Bed stability: mod. deposition	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (S), sand (N)
Local catchment erosion: gully (L), rill (L), tunnel (N), sheet (N), bank slumping (S), cattle pugging (L)	



Upstream



Left bank



Downstream



Right bank

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 25 m	**Width of riparian zone on right bank:** 25 m
Bare ground: L	**Grasses/forbs:** E
Shrubs: S	**Trees <10 m:** M
Trees >10m: S	**Exotic riparian species:** M
Composition and health	
State-mapped RE: 11.3.2/11.3.25/11.3.1 (50/45/5)	**Verified RE:** 11.3.3
Vegetation status: remnant	**Dominant stratum:** tree
Health: good	**Dieback:** 1-10%
EDL height: 18 m	**EDL cover:** 35%
Canopy species: *Eucalyptus coolabah* (D), *Acacia harpophylla* (O)	
Sub-canopy species: *Acacia harpophylla* (D), *Terminalia oblongata* subsp. *oblongata* (A), *Acacia salicina* (O), *Brachychiton rupestris* (R), *Cryptostegia grandiflora** (O), *Lysiphyllum hookeri* (F)	
Shrub species: *Acalypha eremorum* (F), *Cryptocarya* sp. (O), *Lysiphyllum hookeri* (O), *Acacia harpophylla* (O), *Cryptostegia grandiflora** (O), *Atalaya hemiglauca* (O)	
Ground species: *Megathyrsus maximus** (D), *Cenchrus ciliaris** (F), *Calyptocarpus vialis** (O), *Bryophyllum delagoense** (O), *Bothriochloa bladhii* (O), *Parthenium hysterophorus** (O), *Alternanthera* sp. (O), *Argemone mexicana** (O), *Xanthium occidentale** (O)	

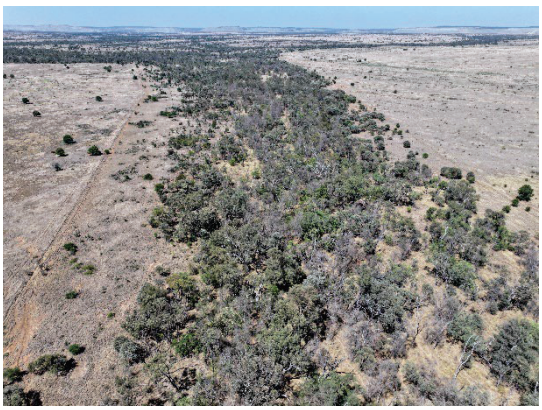
Macrophytes
Submerged macrophytes: none observed
Floating macrophytes: none observed
Emergent macrophytes: *Cyperus bifax* (L), *Eclipta prostrata** (L)
Aquatic biota
Aquatic macroinvertebrate sampling undertaken: yes
Habitat for platypus: unlikely habitat,no burrows detected
Habitat for EVNT fish species: unlikely
Fish sampling undertaken: yes
Suitable habitat for EVNT turtle species: unlikely
Turtle sampling undertaken: no
Aquatic vertebrates encountered: none observed

Aquatic habitat assessment scoring	
1. Bottom substrate/available cover	3 (Poor)
2. Embeddedness	2 (Poor)
3. Velocity/depth category	0 (Poor)
4. Channel alteration	8 (Good)
5. Bottom scouring and deposition	5 (Fair)
6. Pool/riffle, run/bend ratio	4 (Fair)
7. Bank stability	7 (Good)
8. Bank vegetative stability	3 (Fair)
9. Streamside cover	10 (Excellent)
Overall score	42 (Fair)
Overall aquatic value: Low	

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).
Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT	
Site code: R5	**Location:** tributary of Taurus Creek
Date: 18/06/2025	**Season:** late wet
Assessor: DM	**Coordinates:** -23.6924; 148.8523 (GDA 2020)
Water level: no flow - dry	**Likely flow nature:** ephemeral
State-mapped watercourse (DLGWV 2025): no, unmapped	
Likely a watercourse: no, likely a drainage feature	
State-mapped waterway providing for fish passage (DAF 2020): yes, Moderate risk of impact	
Water quality	
Time (EST): 10:21	**Water temperature:** 13.4˚C
Sp. Conductivity: 378 µS/cm	**pH:** 7.6
Dissolved oxygen: 98.4%	**Dissolved oxygen:** 10.27 mg/L
Turbidity: 153 NTU	**Ion sample collected:** no
Observations within 2 m of sampling point	
Shading: 50%	**Water colour:** moderately turbid
Water odour: none detected	**Water surface:** normal
Algae on substrate: N	**Algae in water column:** N
Emergent macrophytes: N	**Submerged macrophytes:** N
Floating macrophytes: N	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 0 m	**Bankfull width:** 10 m
Maximum depth: 0 m	**Bankfull height:** 1 m
Habitat types: 0% riffle, 0% run, 10% sandy pool, 0% rocky pool, 90% dry	
Variety of habitat: macrophytes	
Habitat attributes: detritus (L), sticks (L), branches (N), logs (N), periphyton (N), moss (N), filamentous algae (N), macrophytes (L), bank overhang (N), trailing bank vegetation (N), blanketing silt (N), substrate anoxia (N)	
Upstream landuse: vegetation clearing, moderate grazing, coal mining	
Adjacent landuse (right bank): vegetation clearing, light grazing	
Adjacent landuse (left bank): vegetation clearing, light grazing	
Bed, edge and bank characteristics	
Bed substrates: 65% silt/clay (<0.05 mm), 35% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Edge substrates: 65% silt/clay (<0.05 mm), 35% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Bank soils: clayey loam	**Bank stability:** stable
Bed stability: bed stable	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (N), sand (N)
Local catchment erosion: gully (N), rill (N), tunnel (N), sheet (N), bank slumping (L), cattle pugging (L)	

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).



Upstream



Left bank



Downstream



Right bank

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 20 m	**Width of riparian zone on right bank:** 20 m
Bare ground: L	**Grasses/forbs:** E
Shrubs: L	**Trees <10 m:** S
Trees >10m: L	**Exotic riparian species:** M
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** 11.3.1
Vegetation status: remnant	**Dominant stratum:** tree
Health: average	**Dieback:** 1-10%
EDL height: 10 m	**EDL cover:** 30%
Canopy species: *Acacia harpophylla* (D), *Terminalia oblongata* subsp. *oblongata* (D), *Acacia salicina* (F)	
Sub-canopy species: *Acacia salicina* (O), *Terminalia oblongata* subsp. *oblongata* (O), *Acacia harpophylla* (O), *Eremophila mitchellii* (R)	
Shrub species: *Lysiphyllum hookeri* (O), *Acacia harpophylla* (O), *Terminalia oblongata* subsp. *oblongata* (O), *Acalypha eremorum* (R)	
Ground species: *Cenchrus ciliaris** (D), *Parthenium hysterophorus** (O), *Megathyrsus maximus** (O)	
Macrophytes	
Submerged macrophytes: none observed	
Floating macrophytes: none observed	
Emergent macrophytes: *Cyperus betchei* (L), *Ludwigia octovalvis* (L), *Cyperus difformis* (L), *Echinochloa colona** (L), *Typha domingensis* (L)	
Aquatic biota	
Aquatic macroinvertebrate sampling undertaken: yes	
Habitat for platypus: unlikely habitat	
Habitat for EVNT fish species: unlikely	
Fish sampling undertaken: yes	
Suitable habitat for EVNT turtle species: unlikely	
Turtle sampling undertaken: no	
Aquatic vertebrates encountered: *Ambassis agassizii*, *Leiopotherapon unicolor*	

Aquatic habitat assessment scoring	
1. Bottom substrate/available cover	2 (Poor)
2. Embeddedness	2 (Poor)
3. Velocity/depth category	2 (Poor)
4. Channel alteration	8 (Good)
5. Bottom scouring and deposition	8 (Good)
6. Pool/riffle, run/bend ratio	5 (Fair)
7. Bank stability	8 (Good)
8. Bank vegetative stability	9 (Excellent)
9. Streamside cover	9 (Excellent)
Overall score	53 (Fair)
Overall aquatic value: Low	

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT	
Site code: R5	**Location:** tributary of Taurus Creek
Date: 21/10/2025	**Season:** dry
Assessor: DM	**Coordinates:** -23.6924; 148.8523 (GDA 2020)
Water level: no flow - dry	**Likely flow nature:** ephemeral
State-mapped watercourse (DLGWV 2025): no, unmapped	
Likely a watercourse: no, likely a drainage feature	
State-mapped waterway providing for fish passage (DAF 2020): yes, Moderate risk of impact	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 0 m	**Bankfull width:** 10 m
Maximum depth: 0 m	**Bankfull height:** 1 m
Habitat types: 0% riffle, 0% run, 0% sandy pool, 0% rocky pool, 100% dry	
Variety of habitat: macrophytes	
Habitat attributes: detritus (S), sticks (L), branches (N), logs (N), periphyton (N), moss (N), filamentous algae (N), macrophytes (L), bank overhang (N), trailing bank vegetation (N), blanketing silt (N), substrate anoxia (N)	
Upstream landuse: vegetation clearing, moderate grazing, coal mining	
Adjacent landuse (right bank): vegetation clearing, light grazing	
Adjacent landuse (left bank): vegetation clearing, light grazing	
Bed, edge and bank characteristics	
Bed substrates: 65% silt/clay (<0.05 mm), 35% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Edge substrates: 65% silt/clay (<0.05 mm), 35% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Bank soils: clayey loam	**Bank stability:** stable
Bed stability: bed stable	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (N), sand (N)
Local catchment erosion: gully (N), rill (N), tunnel (N), sheet (N), bank slumping (L), cattle pugging (L)	



Upstream



Left bank



Downstream



Right bank

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 20 m	**Width of riparian zone on right bank:** 20 m
Bare ground: L	**Grasses/forbs:** E
Shrubs: L	**Trees <10 m:** S
Trees >10m: L	**Exotic riparian species:** M
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** 11.3.1
Vegetation status: remnant	**Dominant stratum:** tree
Health: average	**Dieback:** 1-10%
EDL height: 10 m	**EDL cover:** 30%
Canopy species: *Acacia harpophylla* (D), *Terminalia oblongata* subsp. *oblongata* (D), *Acacia salicina* (F)	
Sub-canopy species: *Acacia salicina* (O), *Terminalia oblongata* subsp. *oblongata* (O), *Acacia harpophylla* (O), *Eremophila mitchellii* (R)	
Shrub species: *Lysiphyllum hookeri* (O), *Acacia harpophylla* (O), *Terminalia oblongata* subsp. *oblongata* (O), *Acalypha eremorum* (R)	
Ground species: *Cenchrus ciliaris** (D), *Parthenium hysterophorus** (F)	
Macrophytes	
Submerged macrophytes: none observed	
Floating macrophytes: none observed	
Emergent macrophytes: *Cyperus betchei* (L), *Ludwigia octovalvis* (L), *Cyperus difformis* (L), *Echinochloa colona** (L), *Typha domingensis* (L)	

Aquatic biota	
Aquatic macroinvertebrate sampling undertaken: yes	
Habitat for platypus: unlikely habitat	
Habitat for EVNT fish species: unlikely	
Fish sampling undertaken: no	
Suitable habitat for EVNT turtle species: unlikely	
Turtle sampling undertaken: no	
Aquatic vertebrates encountered: none observed	

Aquatic habitat assessment scoring	
1. Bottom substrate/available cover	2 (Poor)
2. Embeddedness	2 (Poor)
3. Velocity/depth category	0 (Poor)
4. Channel alteration	8 (Good)
5. Bottom scouring and deposition	8 (Good)
6. Pool/riffle, run/bend ratio	5 (Fair)
7. Bank stability	8 (Good)
8. Bank vegetative stability	9 (Excellent)
9. Streamside cover	9 (Excellent)
Overall score	51 (Fair)
Overall aquatic value: Low	

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT	
Site code: R6	**Location:** Taurus Creek flood channel wetland
Date: 18/06/2025	**Season:** late wet
Assessor: DM	**Coordinates:** -23.6963; 148.8660 (GDA 2020)
Water level: no flow - isolated	**Likely flow nature:** episodic
State-mapped watercourse (DLGWV 2025): not applicable	
Likely a watercourse: not applicable	
State-mapped waterway providing for fish passage (DAF 2020): not applicable	
Water quality	
Time (EST): 12:37	**Water temperature:** 13.8˚C
Sp. Conductivity: 234 µS/cm	**pH:** 6.8
Dissolved oxygen: 81.3%	**Dissolved oxygen:** 8.35 mg/L
Turbidity: 217 NTU	**Ion sample collected:** yes
Observations within 2 m of sampling point	
Shading: 20%	**Water colour:** moderately turbid
Water odour: none detected	**Water surface:** normal
Algae on substrate: N	**Algae in water column:** N
Emergent macrophytes: N	**Submerged macrophytes:** N
Floating macrophytes: N	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 10 m	**Bankfull width:** 22 m
Maximum depth: 0.7 m	**Bankfull height:** 2 m
Habitat types: 0% riffle, 0% run, 100% sandy pool, 0% rocky pool, 0% dry	
Variety of habitat: shallow (<0.5 m), deep (>0.5 m), pool, large woody debris, macrophytes	
Habitat attributes: detritus (S), sticks (L), branches (L), logs (L), periphyton (L), moss (N), filamentous algae (N), macrophytes (L), bank overhang (L), trailing bank vegetation (N), blanketing silt (N), substrate anoxia (N)	
Upstream landuse: past vegetation clearing, moderate grazing, coal mining	
Adjacent landuse (right bank): moderate grazing, past clearing	
Adjacent landuse (left bank): moderate grazing, past clearing	
Bed, edge and bank characteristics	
Bed substrates: 90% silt/clay (<0.05 mm), 10% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Edge substrates: 90% silt/clay (<0.05 mm), 10% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Bank soils: clay	**Bank stability:** stable
Bed stability: bed stable	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (N), sand (N)
Local catchment erosion: gully (N), rill (N), tunnel (N), sheet (N), bank slumping (N), cattle pugging (E)	

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).



Upstream



Left bank



Downstream



Right bank

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 15 m	**Width of riparian zone on right bank:** 15 m
Bare ground: L	**Grasses/forbs:** E
Shrubs: L	**Trees <10 m:** M
Trees >10m: L	**Exotic riparian species:** M
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** 11.3.25/11.3.2
Vegetation status: remnant	**Dominant stratum:** tree
Health: average	**Dieback:** 11-25%
EDL height: 15 m	**EDL cover:** 40%
Canopy species: *Eucalyptus tereticornis* (D), *Eucalyptus populnea* (D), *Acacia salicina* (R)	
Sub-canopy species: *Terminalia oblongata* subsp. *oblongata* (D), *Lysiphyllum hookeri* (D), *Acacia harpophylla* (O), *Eremophila mitchellii* (O), *Cassia brewsteri* (O), *Acacia salicina* (O)	
Shrub species: *Lysiphyllum hookeri* (O), *Acacia salicina* (O), *Carissa ovata* (O)	
Ground species: *Megathyrsus maximus** (D), *Cenchrus ciliaris** (D), *Sida* sp. (O), *Basilicum polystachyon* (O)	
Macrophytes	
Submerged macrophytes: none observed	
Floating macrophytes: none observed	
Emergent macrophytes: *Cyperus betchei* (L), *Ludwigia octovalvis* (L), *Eclipta prostrata** (L), *Cyperus pygmaeus* (L), *Persicaria attenuata* (L)	

Aquatic biota
Aquatic macroinvertebrate sampling undertaken: yes
Habitat for platypus: unlikely habitat
Habitat for EVNT fish species: unlikely
Fish sampling undertaken: yes
Suitable habitat for EVNT turtle species: unlikely
Turtle sampling undertaken: yes
Aquatic vertebrates encountered: *Ambassis agassizii*, *Hypseleotris bucephala*, *Leiopotherapon unicolor*

Aquatic habitat assessment scoring	
1. Bottom substrate/available cover	2 (Poor)
2. Embeddedness	2 (Poor)
3. Velocity/depth category	6 (Fair)
4. Channel alteration	12 (Excellent)
5. Bottom scouring and deposition	8 (Good)
6. Pool/riffle, run/bend ratio	4 (Fair)
7. Bank stability	8 (Good)
8. Bank vegetative stability	8 (Good)
9. Streamside cover	9 (Excellent)
Overall score	59 (Fair)
Overall aquatic value: Low	

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT

Site code: R6	**Location:** Taurus Creek flood channel wetland
Date: 21/10/2025	**Season:** dry
Assessor: DM	**Coordinates:** -23.6963; 148.8660 (GDA 2020)
Water level: no flow - isolated	**Likely flow nature:** episodic
State-mapped watercourse (DLGWV 2025): not applicable	
Likely a watercourse: not applicable	
State-mapped waterway providing for fish passage (DAF 2020): not applicable	
Water quality	
Time (EST): 11:40	**Water temperature:** 33.1˚C
Sp. Conductivity: 471 µS/cm	**pH:** 9.3
Dissolved oxygen: 184.0%	**Dissolved oxygen:** 13.17 mg/L
Turbidity: 152 NTU	**Ion sample collected:** yes
Observations within 2 m of sampling point	
Shading: 0%	**Water colour:** turbid
Water odour: none detected	**Water surface:** normal
Algae on substrate: E	**Algae in water column:** E
Emergent macrophytes: N	**Submerged macrophytes:** N
Floating macrophytes: N	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 5 m	**Bankfull width:** 22 m
Maximum depth: 0.2 m	**Bankfull height:** 2 m
Habitat types: 0% riffle, 0% run, 15% sandy pool, 0% rocky pool, 85% dry	
Variety of habitat: shallow (<0.5 m), pool, large woody debris, macrophytes	
Habitat attributes: detritus (L), sticks (L), branches (L), logs (L), periphyton (L), moss (N), filamentous algae (E), macrophytes (L), bank overhang (N), trailing bank vegetation (N), blanketing silt (N), substrate anoxia (N)	
Upstream landuse: past vegetation clearing, moderate grazing, coal mining	
Adjacent landuse (right bank): moderate grazing, past clearing	
Adjacent landuse (left bank): moderate grazing, past clearing	
Bed, edge and bank characteristics	
Bed substrates: 90% silt/clay (<0.05 mm), 10% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Edge substrates: 90% silt/clay (<0.05 mm), 10% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Bank soils: clay	**Bank stability:** stable
Bed stability: bed stable	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (N), sand (N)
Local catchment erosion: gully (N), rill (N), tunnel (N), sheet (N), bank slumping (N), cattle pugging (E)	

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).



Upstream



Left bank



Downstream



Right bank

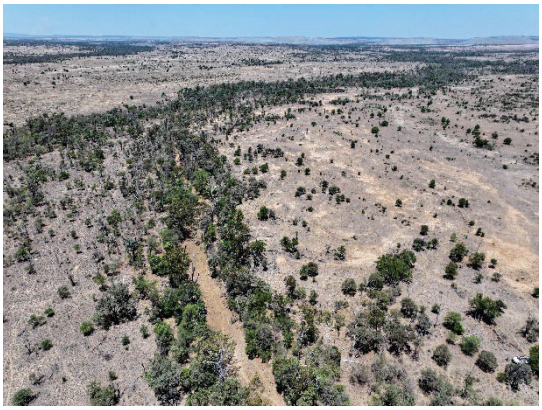
Riparian vegetation	
Cover	
Width of riparian zone on left bank: 15 m	**Width of riparian zone on right bank:** 15 m
Bare ground: L	**Grasses/forbs:** E
Shrubs: L	**Trees <10 m:** M
Trees >10m: L	**Exotic riparian species:** M
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** 11.3.25/11.3.2
Vegetation status: remnant	**Dominant stratum:** tree
Health: average	**Dieback:** 11-25%
EDL height: 15 m	**EDL cover:** 40%
Canopy species: *Eucalyptus tereticornis* (D), *Eucalyptus populnea* (D), *Acacia salicina* (R)	
Sub-canopy species: *Terminalia oblongata* subsp. *oblongata* (D), *Lysiphyllum hookeri* (D), *Acacia harpophylla* (O), *Eremophila mitchellii* (O), *Cassia brewsteri* (O), *Acacia salicina* (O)	
Shrub species: *Lysiphyllum hookeri* (O), *Acacia salicina* (O), *Carissa ovata* (O)	
Ground species: *Megathyrsus maximus** (D), *Cenchrus ciliaris** (D), *Sida* sp. (O), *Basilicum polystachyon* (O), *Glinus lotoides* (O), *Centipeda minima* (O)	
Macrophytes	
Submerged macrophytes: none observed	
Floating macrophytes: none observed	
Emergent macrophytes: *Cyperus betchei* (L), *Ludwigia octovalvis* (L), *Eclipta prostrata** (L), *Cyperus pygmaeus* (L), *Persicaria attenuata* (L)	
Aquatic biota	
Aquatic macroinvertebrate sampling undertaken: yes	
Habitat for platypus: unlikely habitat	
Habitat for EVNT fish species: unlikely	
Fish sampling undertaken: yes	
Suitable habitat for EVNT turtle species: unlikely	
Turtle sampling undertaken: yes	
Aquatic vertebrates encountered: *Ambassis agassizii*, *Hypseleotris bucephala*, *Leiopotherapon unicolor*, *Nematalosa erebi*, *Neosilurus hyrtlii*	

Aquatic habitat assessment scoring	
1. Bottom substrate/available cover	2 (Poor)
2. Embeddedness	2 (Poor)
3. Velocity/depth category	2 (Poor)
4. Channel alteration	12 (Excellent)
5. Bottom scouring and deposition	8 (Good)
6. Pool/riffle, run/bend ratio	4 (Fair)
7. Bank stability	8 (Good)
8. Bank vegetative stability	5 (Fair)
9. Streamside cover	9 (Excellent)
Overall score	52 (Fair)
Overall aquatic value: Low	

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT	
Site code: R7	**Location:** Taurus Creek
Date: 01/07/2025	**Season:** late wet
Assessor: DM	**Coordinates:** -23.7170; 148.8541 (GDA 2020)
Water level: no flow - dry	**Likely flow nature:** ephemeral
State-mapped watercourse (DLGWV 2025): no, unmapped	
Likely a watercourse: yes - clear channel and bank structure, and clear presence of riparian vegetation structure	
State-mapped waterway providing for fish passage (DAF 2020): yes, High risk of impact	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 0 m	**Bankfull width:** 25 m
Maximum depth: 0 m	**Bankfull height:** 3 m
Habitat types: 0% riffle, 0% run, 0% sandy pool, 0% rocky pool, 100% dry	
Variety of habitat: large woody debris	
Habitat attributes: detritus (L), sticks (L), branches (L), logs (S), periphyton (N), moss (N), filamentous algae (N), macrophytes (N), bank overhang (N), trailing bank vegetation (N), blanketing silt (N), substrate anoxia (N)	
Upstream landuse: past vegetation clearing, moderate grazing, coal mining	
Adjacent landuse (right bank): moderate grazing, past vegetation clearing	
Adjacent landuse (left bank): moderate grazing, past vegetation clearing	
Bed, edge and bank characteristics	
Bed substrates: 7% silt/clay (<0.05 mm), 90% sand (0.05-2 mm), 2% gravel (2-4 mm), 1% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Edge substrates: 7% silt/clay (<0.05 mm), 90% sand (0.05-2 mm), 2% gravel (2-4 mm), 1% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Bank soils: sandy clay	**Bank stability:** moderately unstable
Bed stability: moderate deposition	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (L), sand (L)
Local catchment erosion: gully (L), rill (L), tunnel (N), sheet (N), bank slumping (L), cattle pugging (M)	



Upstream



Left bank



Downstream



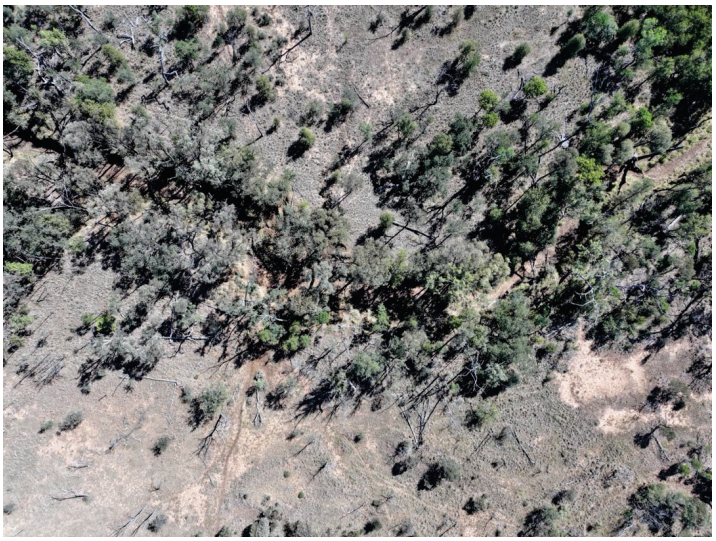
Right bank

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 20 m	**Width of riparian zone on right bank:** 15 m
Bare ground: S	**Grasses/forbs:** E
Shrubs: L	**Trees <10 m:** S
Trees >10m: L	**Exotic riparian species:** S
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** 11.3.1/11.4.9
Vegetation status: regrowth	**Dominant stratum:** tree
Health: average	**Dieback:** 1-10%
EDL height: 9 m	**EDL cover:** 30%
Canopy species: *Acacia harpophylla* (D), *Terminalia oblongata* subsp. *oblongata* (O), *Eucalyptus tereticornis* (O), *Blakella tessellaris* (O)	
Sub-canopy species: *Lysiphyllum hookeri* (D), *Acacia harpophylla* (O), *Terminalia oblongata* subsp. *oblongata* (O), *Eremophila mitchellii* (O)	
Shrub species: *Lysiphyllum hookeri* (O), *Acacia harpophylla* (O), *Carissa ovata* (O), *Harrisia martinii** (O)	
Ground species: *Cenchrus ciliaris** (D), *Megathyrsus maximus** (D), *Chloris* sp. (O), *Parthenium hysterophorus** (O), *Sida* sp. (O), *Bothriochloa bladhii* (O)	
Macrophytes	
Submerged macrophytes: none observed	
Floating macrophytes: none observed	
Emergent macrophytes: none observed	
Aquatic biota	
Aquatic macroinvertebrate sampling undertaken: no	
Habitat for platypus: unlikely habitat	
Habitat for EVNT fish species: unlikely	
Fish sampling undertaken: no	
Suitable habitat for EVNT turtle species: unlikely	
Turtle sampling undertaken: no	
Aquatic vertebrates encountered: none observed	

Aquatic habitat assessment scoring	
1. Bottom substrate/available cover	2 (Poor)
2. Embeddedness	2 (Poor)
3. Velocity/depth category	0 (Poor)
4. Channel alteration	5 (Fair)
5. Bottom scouring and deposition	5 (Fair)
6. Pool/riffle, run/bend ratio	6 (Fair)
7. Bank stability	4 (Fair)
8. Bank vegetative stability	8 (Good)
9. Streamside cover	9 (Excellent)
Overall score	41 (Fair)
Overall aquatic value: Low	

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT	
Site code: R7	**Location:** Taurus Creek
Date: 22/10/2025	**Season:** dry
Assessor: DM	**Coordinates:** -23.7170; 148.8541 (GDA 2020)
Water level: no flow - dry	**Likely flow nature:** ephemeral
State-mapped watercourse (DLGWV 2025): no, unmapped	
Likely a watercourse: yes - clear channel and bank structure, and clear presence of riparian vegetation structure	
State-mapped waterway providing for fish passage (DAF 2020): yes, High risk of impact	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 0 m	**Bankfull width:** 25 m
Maximum depth: 0 m	**Bankfull height:** 3 m
Habitat types: 0% riffle, 0% run, 0% sandy pool, 0% rocky pool, 100% dry	
Variety of habitat: large woody debris	
Habitat attributes: detritus (S), sticks (L), branches (L), logs (S), periphyton (N), moss (N), filamentous algae (N), macrophytes (N), bank overhang (N), trailing bank vegetation (N), blanketing silt (N), substrate anoxia (N)	
Upstream landuse: past vegetation clearing, moderate grazing, coal mining	
Adjacent landuse (right bank): moderate grazing, past vegetation clearing	
Adjacent landuse (left bank): moderate grazing, past vegetation clearing	
Bed, edge and bank characteristics	
Bed substrates: 7% silt/clay (<0.05 mm), 90% sand (0.05-2 mm), 2% gravel (2-4 mm), 1% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Edge substrates: 7% silt/clay (<0.05 mm), 90% sand (0.05-2 mm), 2% gravel (2-4 mm), 1% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Bank soils: sandy clay	**Bank stability:** moderately unstable
Bed stability: moderate deposition	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (L), sand (L)
Local catchment erosion: gully (L), rill (L), tunnel (N), sheet (N), bank slumping (L), cattle pugging (S)	



Upstream



Left bank



Downstream



Right bank

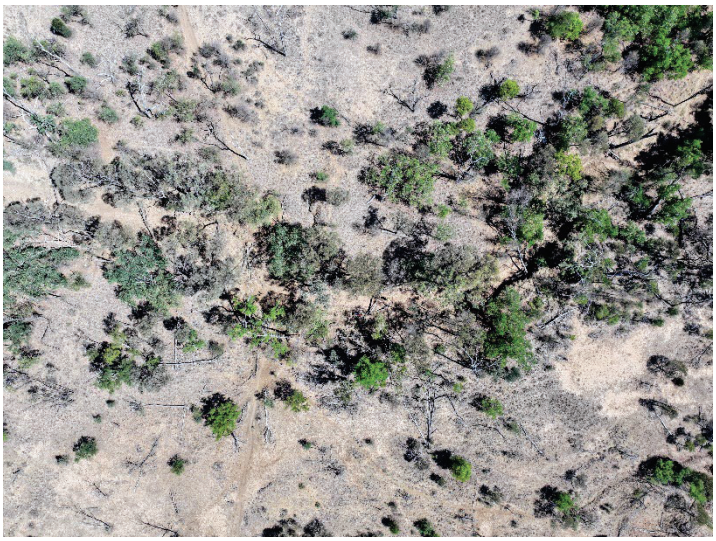
Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 20 m	**Width of riparian zone on right bank:** 15 m
Bare ground: S	**Grasses/forbs:** M
Shrubs: L	**Trees <10 m:** S
Trees >10m: L	**Exotic riparian species:** S
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** 11.3.1/11.4.9
Vegetation status: regrowth	**Dominant stratum:** tree
Health: average	**Dieback:** 1-10%
EDL height: 9 m	**EDL cover:** 30%
Canopy species: *Acacia harpophylla* (D), *Terminalia oblongata* subsp. *oblongata* (O), *Eucalyptus tereticornis* (O), *Blakella tessellaris* (O)	
Sub-canopy species: *Lysiphyllum hookeri* (D), *Acacia harpophylla* (O), *Terminalia oblongata* subsp. *oblongata* (O), *Eremophila mitchellii* (O)	
Shrub species: *Lysiphyllum hookeri* (O), *Acacia harpophylla* (O), *Carissa ovata* (O), *Harrisia martinii** (O)	
Ground species: *Cenchrus ciliaris** (D), *Megathyrsus maximus** (F), *Chloris* sp. (O), *Parthenium hysterophorus** (O), *Sida* sp. (O), *Bothriochloa bladhii* (O)	
Macrophytes	
Submerged macrophytes: none observed	
Floating macrophytes: none observed	
Emergent macrophytes: none observed	

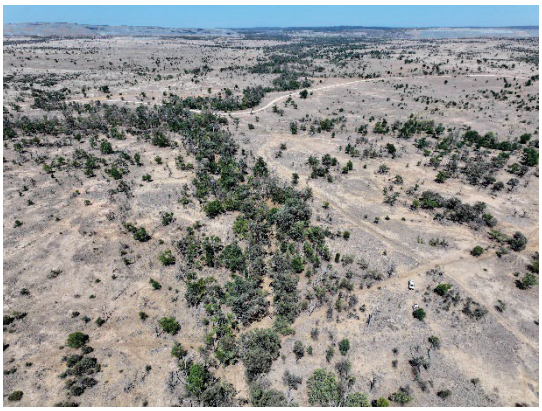
Aquatic biota
Aquatic macroinvertebrate sampling undertaken: no
Habitat for platypus: unlikely habitat
Habitat for EVNT fish species: unlikely
Fish sampling undertaken: no
Suitable habitat for EVNT turtle species: unlikely
Turtle sampling undertaken: no
Aquatic vertebrates encountered: none observed

Aquatic habitat assessment scoring	
1. Bottom substrate/available cover	2 (Poor)
2. Embeddedness	2 (Poor)
3. Velocity/depth category	0 (Poor)
4. Channel alteration	5 (Fair)
5. Bottom scouring and deposition	5 (Fair)
6. Pool/riffle, run/bend ratio	6 (Fair)
7. Bank stability	4 (Fair)
8. Bank vegetative stability	6 (Good)
9. Streamside cover	9 (Excellent)
Overall score	39 (Fair)
Overall aquatic value: Low	

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT	
Site code: R8	**Location:** Two Mile Gully
Date: 01/07/2025	**Season:** late wet
Assessor: DM	**Coordinates:** -23.7319; 148.8734 (GDA 2020)
Water level: no flow - dry	**Likely flow nature:** ephemeral
State-mapped watercourse (DLGWV 2025): no, unmapped	
Likely a watercourse: yes - clear channel and bank structure, and clear presence of riparian vegetation structure	
State-mapped waterway providing for fish passage (DAF 2020): yes, Major risk of impact	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 0 m	**Bankfull width:** 20 m
Maximum depth: 0 m	**Bankfull height:** 2.5 m
Habitat types: 0% riffle, 0% run, 0% sandy pool, 0% rocky pool, 100% dry	
Variety of habitat: macrophytes, large woody debris	
Habitat attributes: detritus (S), sticks (L), branches (L), logs (L), periphyton (N), moss (N), filamentous algae (N), macrophytes (L), bank overhang (N), trailing bank vegetation (N), blanketing silt (S), substrate anoxia (N)	
Upstream landuse: vegetation clearing, moderate grazing, coal mining	
Adjacent landuse (right bank): vegetation clearing, light grazing	
Adjacent landuse (left bank): vegetation clearing, light grazing	
Bed, edge and bank characteristics	
Bed substrates: 10% silt/clay (<0.05 mm), 90% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Edge substrates: 10% silt/clay (<0.05 mm), 90% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Bank soils: sandy clay	**Bank stability:** moderately unstable
Bed stability: moderate deposition	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (S), sand (L)
Local catchment erosion: gully (N), rill (N), tunnel (N), sheet (N), bank slumping (L), cattle pugging (L)	



Upstream



Left bank



Downstream



Right bank

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 10 m	**Width of riparian zone on right bank:** 10 m
Bare ground: S	**Grasses/forbs:** E
Shrubs: M	**Trees <10 m:** S
Trees >10m: L	**Exotic riparian species:** E
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** 11.3.1
Vegetation status: regrowth	**Dominant stratum:** tree
Health: poor	**Dieback:** 1-10%
EDL height: 8 m	**EDL cover:** 30%
Canopy species: *Terminalia oblongata* subsp. *oblongata* (D), *Acacia harpophylla* (F), *Eucalyptus tereticornis* (R), *Blakella tessellaris* (R)	
Sub-canopy species: *Cryptostegia grandiflora** (D), *Lysiphyllum hookeri* (O), *Acacia salicina* (O)	
Shrub species: *Cryptostegia grandiflora** (D), *Terminalia oblongata* subsp. *oblongata* (O), *Acalypha eremorum* (F)	
Ground species: *Megathyrsus maximus** (D), *Cenchrus ciliaris** (D), *Bothriochloa bladhii* (F), *Cyperus bifax* (O)	
Macrophytes	
Submerged macrophytes: none observed	
Floating macrophytes: none observed	
Emergent macrophytes: *Cyperus bifax* (L)	

Aquatic biota
Aquatic macroinvertebrate sampling undertaken: no
Habitat for platypus: unlikely habitat
Habitat for EVNT fish species: unlikely
Fish sampling undertaken: no
Suitable habitat for EVNT turtle species: unlikely
Turtle sampling undertaken: no
Aquatic vertebrates encountered: none observed

Aquatic habitat assessment scoring	
1. Bottom substrate/available cover	2 (Poor)
2. Embeddedness	2 (Poor)
3. Velocity/depth category	0 (Poor)
4. Channel alteration	5 (Fair)
5. Bottom scouring and deposition	5 (Fair)
6. Pool/riffle, run/bend ratio	5 (Fair)
7. Bank stability	5 (Fair)
8. Bank vegetative stability	7 (Good)
9. Streamside cover	8 (Good)
Overall score	39 (Fair)
Overall aquatic value: Low	

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT	
Site code: R8	**Location:** Two Mile Gully
Date: 22/10/2025	**Season:** dry
Assessor: DM	**Coordinates:** -23.7319; 148.8734 (GDA 2020)
Water level: no flow - dry	**Likely flow nature:** ephemeral
State-mapped watercourse (DLGWV 2025): no, unmapped	
Likely a watercourse: yes - clear channel and bank structure, and clear presence of riparian vegetation structure	
State-mapped waterway providing for fish passage (DAF 2020): yes, Major risk of impact	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 0 m	**Bankfull width:** 20 m
Maximum depth: 0 m	**Bankfull height:** 2.5 m
Habitat types: 0% riffle, 0% run, 0% sandy pool, 0% rocky pool, 100% dry	
Variety of habitat: macrophytes, large woody debris	
Habitat attributes: detritus (M), sticks (L), branches (L), logs (L), periphyton (N), moss (N), filamentous algae (N), macrophytes (L), bank overhang (N), trailing bank vegetation (N), blanketing silt (S), substrate anoxia (N)	
Upstream landuse: vegetation clearing, moderate grazing, coal mining	
Adjacent landuse (right bank): vegetation clearing, light grazing	
Adjacent landuse (left bank): vegetation clearing, light grazing	
Bed, edge and bank characteristics	
Bed substrates: 10% silt/clay (<0.05 mm), 90% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Edge substrates: 10% silt/clay (<0.05 mm), 90% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Bank soils: sandy clay	**Bank stability:** moderately unstable
Bed stability: moderate deposition	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (S), sand (L)
Local catchment erosion: gully (N), rill (N), tunnel (N), sheet (N), bank slumping (L), cattle pugging (L)	



Upstream



Left bank



Downstream



Right bank

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 10 m	**Width of riparian zone on right bank:** 10 m
Bare ground: S	**Grasses/forbs:** E
Shrubs: M	**Trees <10 m:** S
Trees >10m: L	**Exotic riparian species:** E
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** 11.3.1
Vegetation status: regrowth	**Dominant stratum:** tree
Health: poor	**Dieback:** 1-10%
EDL height: 8 m	**EDL cover:** 30%
Canopy species: *Terminalia oblongata* subsp. *oblongata* (D), *Acacia harpophylla* (F), *Eucalyptus tereticornis* (R), *Blakella tessellaris* (R)	
Sub-canopy species: *Cryptostegia grandiflora** (D), *Lysiphyllum hookeri* (O), *Acacia salicina* (O)	
Shrub species: *Cryptostegia grandiflora** (D), *Terminalia oblongata* subsp. *oblongata* (O), *Acalypha eremorum* (F)	
Ground species: *Megathyrsus maximus** (D), *Cenchrus ciliaris** (D), *Bothriochloa bladhii* (F), *Cyperus bifax* (O)	
Macrophytes	
Submerged macrophytes: none observed	
Floating macrophytes: none observed	
Emergent macrophytes: *Cyperus bifax* (L)	

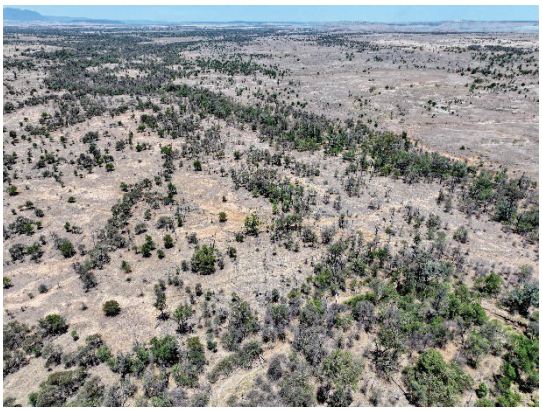
Aquatic biota
Aquatic macroinvertebrate sampling undertaken: no
Habitat for platypus: unlikely habitat
Habitat for EVNT fish species: unlikely
Fish sampling undertaken: no
Suitable habitat for EVNT turtle species: unlikely
Turtle sampling undertaken: no
Aquatic vertebrates encountered: none observed

Aquatic habitat assessment scoring	
1. Bottom substrate/available cover	2 (Poor)
2. Embeddedness	2 (Poor)
3. Velocity/depth category	0 (Poor)
4. Channel alteration	5 (Fair)
5. Bottom scouring and deposition	5 (Fair)
6. Pool/riffle, run/bend ratio	5 (Fair)
7. Bank stability	5 (Fair)
8. Bank vegetative stability	7 (Good)
9. Streamside cover	8 (Good)
Overall score	39 (Fair)
Overall aquatic value: Low	

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT	
Site code: R9	**Location:** Taurus Creek
Date: 18/06/2025	**Season:** late wet
Assessor: DM	**Coordinates:** -23.6941; 148.8688 (GDA 2020)
Water level: no flow - isolated	**Likely flow nature:** ephemeral
State-mapped watercourse (DLGWV 2025): yes	
Likely a watercourse: yes - clear channel and bank structure, and clear presence of riparian vegetation structure	
State-mapped waterway providing for fish passage (DAF 2020): yes, Major risk of impact	
Water quality	
Time (EST): 08:12	**Water temperature:** 11.5˚C
Sp. Conductivity: 159 µS/cm	**pH:** 6.6
Dissolved oxygen: 45.8%	**Dissolved oxygen:** 5.00 mg/L
Turbidity: 289 NTU	**Ion sample collected:** yes
Observations within 2 m of sampling point	
Shading: 100%	**Water colour:** opaque
Water odour: none detected	**Water surface:** normal
Algae on substrate: N	**Algae in water column:** N
Emergent macrophytes: N	**Submerged macrophytes:** N
Floating macrophytes: N	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 3 m	**Bankfull width:** 17 m
Maximum depth: 0.4 m	**Bankfull height:** 5 m
Habitat types: 0% riffle, 0% run, 20% sandy pool, 0% rocky pool, 80% dry	
Variety of habitat: shallow (<0.5 m), deep (>0.5 m), pool, large woody debris, macrophytes	
Habitat attributes: detritus (S), sticks (L), branches (S), logs (S), periphyton (N), moss (N), filamentous algae (N), macrophytes (L), bank overhang (N), trailing bank vegetation (N), blanketing silt (N), substrate anoxia (N)	
Upstream landuse: past vegetation clearing, moderate grazing, coal mining	
Adjacent landuse (right bank): light grazing, past clearing	
Adjacent landuse (left bank): light grazing, past clearing	
Bed, edge and bank characteristics	
Bed substrates: 71% silt/clay (<0.05 mm), 25% sand (0.05-2 mm), 3% gravel (2-4 mm), 1% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Edge substrates: 71% silt/clay (<0.05 mm), 25% sand (0.05-2 mm), 3% gravel (2-4 mm), 1% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Bank soils: clayey loam	**Bank stability:** moderately stable
Bed stability: bed stable	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (N), sand (N)
Local catchment erosion: gully (N), rill (L), tunnel (N), sheet (N), bank slumping (L), cattle pugging (L)	

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).



Upstream



Left bank



Downstream



Right bank

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 20 m	**Width of riparian zone on right bank:** 20 m
Bare ground: S	**Grasses/forbs:** E
Shrubs: L	**Trees <10 m:** M
Trees >10m: S	**Exotic riparian species:** S
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** 11.3.3/11.3.1
Vegetation status: remnant	**Dominant stratum:** tree
Health: good	**Dieback:** 1-10%
EDL height: 15 m	**EDL cover:** 40%
Canopy species: *Eucalyptus coolabah* (D), *Acacia harpophylla* (F), *Eucalyptus populnea* (O)	
Sub-canopy species: *Terminalia oblongata* subsp. *oblongata* (D), *Acacia harpophylla* (D), *Lysiphyllum hookeri* (A), *Brachychiton* sp. (R)	
Shrub species: *Acacia salicina* (O), *Acalypha eremorum* (O), *Acacia harpophylla* (O)	
Ground species: *Megathyrsus maximus** (D), *Bothriochloa bladhii* (F), *Lobelia concolor* (O), *Parthenium hysterophorus** (O)	
Macrophytes	
Submerged macrophytes: none observed	
Floating macrophytes: none observed	
Emergent macrophytes: *Cyperus bifax* (L)	

Aquatic biota
Aquatic macroinvertebrate sampling undertaken: yes
Habitat for platypus: unlikely habitat,no burrows detected
Habitat for EVNT fish species: unlikely
Fish sampling undertaken: yes
Suitable habitat for EVNT turtle species: unlikely
Turtle sampling undertaken: no
Aquatic vertebrates encountered: *Hypseleotris bucephala*, *Melanotaenia splendida splendida*

Aquatic habitat assessment scoring	
1. Bottom substrate/available cover	8 (Fair)
2. Embeddedness	3 (Poor)
3. Velocity/depth category	2 (Poor)
4. Channel alteration	5 (Fair)
5. Bottom scouring and deposition	4 (Fair)
6. Pool/riffle, run/bend ratio	7 (Fair)
7. Bank stability	4 (Fair)
8. Bank vegetative stability	7 (Good)
9. Streamside cover	10 (Excellent)
Overall score	50 (Fair)
Overall aquatic value: Moderate	

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT

Site code: R9	**Location:** Taurus Creek
Date: 21/10/2025	**Season:** dry
Assessor: DM	**Coordinates:** -23.6941; 148.8688 (GDA 2020)
Water level: no flow - dry	**Likely flow nature:** ephemeral
State-mapped watercourse (DLGWV 2025): yes	
Likely a watercourse: yes - clear channel and bank structure, and clear presence of riparian vegetation structure	
State-mapped waterway providing for fish passage (DAF 2020): yes, Major risk of impact	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 0 m	**Bankfull width:** 17 m
Maximum depth: 0 m	**Bankfull height:** 5 m
Habitat types: 0% riffle, 0% run, 0% sandy pool, 0% rocky pool, 100% dry	
Variety of habitat: large woody debris, macrophytes	
Habitat attributes: detritus (M), sticks (L), branches (S), logs (S), periphyton (N), moss (N), filamentous algae (N), macrophytes (L), bank overhang (N), trailing bank vegetation (N), blanketing silt (N), substrate anoxia (N)	
Upstream landuse: past vegetation clearing, moderate grazing, coal mining	
Adjacent landuse (right bank): light grazing, past clearing	
Adjacent landuse (left bank): light grazing, past clearing	
Bed, edge and bank characteristics	
Bed substrates: 71% silt/clay (<0.05 mm), 25% sand (0.05-2 mm), 3% gravel (2-4 mm), 1% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Edge substrates: 71% silt/clay (<0.05 mm), 25% sand (0.05-2 mm), 3% gravel (2-4 mm), 1% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Bank soils: clayey loam	**Bank stability:** moderately stable
Bed stability: bed stable	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (N), sand (N)
Local catchment erosion: gully (N), rill (L), tunnel (N), sheet (N), bank slumping (L), cattle pugging (L)	



Upstream



Left bank



Downstream



Right bank

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 20 m	**Width of riparian zone on right bank:** 20 m
Bare ground: S	**Grasses/forbs:** E
Shrubs: L	**Trees <10 m:** M
Trees >10m: S	**Exotic riparian species:** S
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** 11.3.3/11.3.1
Vegetation status: remnant	**Dominant stratum:** tree
Health: good	**Dieback:** 1-10%
EDL height: 15 m	**EDL cover:** 40%
Canopy species: *Eucalyptus coolabah* (D), *Acacia harpophylla* (F), *Eucalyptus populnea* (O)	
Sub-canopy species: *Terminalia oblongata* subsp. *oblongata* (D), *Acacia harpophylla* (D), *Lysiphyllum hookeri* (A), *Brachychiton rupestris* (R)	
Shrub species: *Acacia salicina* (O), *Acalypha eremorum* (O), *Acacia harpophylla* (O)	
Ground species: *Megathyrsus maximus** (D), *Bothriochloa bladhii* (F), *Parthenium hysterophorus** (O)	
Macrophytes	
Submerged macrophytes: none observed	
Floating macrophytes: none observed	
Emergent macrophytes: *Cyperus bifax* (L)	
Aquatic biota	
Aquatic macroinvertebrate sampling undertaken: no	
Habitat for platypus: unlikely habitat	
Habitat for EVNT fish species: unlikely	
Fish sampling undertaken: no	
Suitable habitat for EVNT turtle species: unlikely	
Turtle sampling undertaken: no	
Aquatic vertebrates encountered: none observed	

Aquatic habitat assessment scoring	
1. Bottom substrate/available cover	2 (Poor)
2. Embeddedness	3 (Poor)
3. Velocity/depth category	0 (Poor)
4. Channel alteration	5 (Fair)
5. Bottom scouring and deposition	4 (Fair)
6. Pool/riffle, run/bend ratio	7 (Fair)
7. Bank stability	4 (Fair)
8. Bank vegetative stability	7 (Good)
9. Streamside cover	10 (Excellent)
Overall score	42 (Fair)
Overall aquatic value: Moderate	

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT

Site code: R10	**Location:** Deep Creek – proposed crossing location
Date: 21/10/2025	**Season:** dry
Assessor: DM	**Coordinates:** -23.7201; 148.8459 (GDA 2020)
Water level: no flow - dry	**Likely flow nature:** ephemeral
State-mapped watercourse (DLGWV 2025): no, unmapped	
Likely a watercourse: no, likely a drainage feature	
State-mapped waterway providing for fish passage (DAF 2020): yes, Moderate risk of impact	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 0 m	**Bankfull width:** 25 m
Maximum depth: 0 m	**Bankfull height:** 3.5 m
Habitat types: 0% riffle, 0% run, 0% sandy pool, 0% rocky pool, 100% dry	
Variety of habitat: large woody debris, macrophytes	
Habitat attributes: detritus (S), sticks (L), branches (L), logs (S), periphyton (N), moss (N), filamentous algae (N), macrophytes (L), bank overhang (N), trailing bank vegetation (N), blanketing silt (N), substrate anoxia (N)	
Upstream landuse: past vegetation clearing, light grazing, coal mining	
Adjacent landuse (right bank): light grazing, past clearing	
Adjacent landuse (left bank): light grazing, past clearing	
Bed, edge and bank characteristics	
Bed substrates: 10% silt/clay (<0.05 mm), 55% sand (0.05-2 mm), 10% gravel (2-4 mm), 1% pebble (4-64 mm), 2% cobble (64-256 mm), 2% boulder (>256 mm), 10% bedrock	
Edge substrates: 10% silt/clay (<0.05 mm), 55% sand (0.05-2 mm), 10% gravel (2-4 mm), 1% pebble (4-64 mm), 2% cobble (64-256 mm), 2% boulder (>256 mm), 10% bedrock	
Bank soils: sandy clay	**Bank stability:** unstable
Bed stability: moderate deposition	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (N), sand (N)
Local catchment erosion: gully (L), rill (L), tunnel (N), sheet (L), bank slumping (S), cattle pugging (L)	



Upstream



Left bank



Downstream



Right bank

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 10 m	**Width of riparian zone on right bank:** 10 m
Bare ground: L	**Grasses/forbs:** E
Shrubs: L	**Trees <10 m:** L
Trees >10m: L	**Exotic riparian species:** S
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** regrowth 11.3.1
Vegetation status: regrowth	**Dominant stratum:** tree
Health: average	**Dieback:** 1-10%
EDL height: 9 m	**EDL cover:** 15%
Canopy species: *Acacia harpophylla* (D), *Terminalia oblongata* subsp. *oblongata* (O)	
Sub-canopy species: *Lysiphyllum hookeri* (D), *Acacia salicina* (O),	
Shrub species: *Lysiphyllum hookeri* (O), *A. salicina* (O), *A. harpophylla* (O)	
Ground species: *Cenchrus ciliaris** (D), *Bothriochloa bladhii* (O), *Chloris* sp. (O), *Sida* sp. (O), *Parthenium hysterophorus** (O)	
Macrophytes	
Submerged macrophytes: none observed	
Floating macrophytes: none observed	
Emergent macrophytes: *Cyperus bifax* (L)	

Aquatic biota
Aquatic macroinvertebrate sampling undertaken: no
Habitat for platypus: unlikely habitat, no burrows detected
Habitat for EVNT fish species: unlikely
Fish sampling undertaken: no
Suitable habitat for EVNT turtle species: unlikely
Turtle sampling undertaken: no
Aquatic vertebrates encountered: none observed

Aquatic habitat assessment scoring	
1. Bottom substrate/available cover	6 (Fair)
2. Embeddedness	4 (Poor)
3. Velocity/depth category	0 (Poor)
4. Channel alteration	7 (Fair)
5. Bottom scouring and deposition	7 (Fair)
6. Pool/riffle, run/bend ratio	5 (Fair)
7. Bank stability	2 (Poor)
8. Bank vegetative stability	7 (Good)
9. Streamside cover	9 (Excellent)
Overall score	47 (Fair)
Overall aquatic value: Low	

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT

Site code: R11	**Location:** Taurus Creek – proposed crossing location
Date: 21/10/2025	**Season:** dry
Assessor: DM	**Coordinates:** -23.7320; 148.8561 (GDA 2020)
Water level: no flow - dry	**Likely flow nature:** ephemeral
State-mapped watercourse (DLGWV 2025): no, unmapped	
Likely a watercourse: no, likely a drainage feature	
State-mapped waterway providing for fish passage (DAF 2020): yes, High risk of impact	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 0 m	**Bankfull width:** 20 m
Maximum depth: 0 m	**Bankfull height:** 3 m
Habitat types: 0% riffle, 0% run, 0% sandy pool, 0% rocky pool, 100% dry	
Variety of habitat: large woody debris	
Habitat attributes: detritus (S), sticks (L), branches (L), logs (L), periphyton (N), moss (N), filamentous algae (N), macrophytes (N), bank overhang (N), trailing bank vegetation (N), blanketing silt (N), substrate anoxia (N)	
Upstream landuse: past vegetation clearing, light grazing, coal mining	
Adjacent landuse (right bank): light grazing, past clearing	
Adjacent landuse (left bank): light grazing, past clearing	
Bed, edge and bank characteristics	
Bed substrates: 15% silt/clay (<0.05 mm), 68% sand (0.05-2 mm), 10% gravel (2-4 mm), 1% pebble (4-64 mm), 1% cobble (64-256 mm), 2% boulder (>256 mm), 3% bedrock	
Edge substrates: 15% silt/clay (<0.05 mm), 68% sand (0.05-2 mm), 10% gravel (2-4 mm), 1% pebble (4-64 mm), 1% cobble (64-256 mm), 2% boulder (>256 mm), 3% bedrock	
Bank soils: clayey sand	**Bank stability:** unstable
Bed stability: moderate deposition	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (N), sand (N)
Local catchment erosion: gully (L), rill (L), tunnel (N), sheet (L), bank slumping (L), cattle pugging (L)	



Upstream



Left bank



Downstream



Right bank

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 10 m	**Width of riparian zone on right bank:** 10 m
Bare ground: S	**Grasses/forbs:** E
Shrubs: L	**Trees <10 m:** S
Trees >10m: L	**Exotic riparian species:** S
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** regrowth 11.3.1
Vegetation status: regrowth	**Dominant stratum:** tree
Health: average	**Dieback:** 1-10%
EDL height: 7 m	**EDL cover:** 25%
Canopy species: *Terminalia oblongata* subsp. *oblongata* (D), *Acacia harpophylla* (O), *Eucalyptus tereticornis* (R), *Blakella tessellaris* (R)	
Sub-canopy species: *Lysiphyllum hookeri* (D), *Acacia salicina* (O), *Brachychiton* sp. (R)	
Shrub species: *Carissa ovata* (O), *Acacia salicina* (O), *Lysiphyllum hookeri* (O), *Harrisia martinii** (O), *Terminalia oblongata* subsp. *oblongata* (O)	
Ground species: *Cenchrus ciliaris** (D), *Megathyrsus maximus** (O), *Sida* sp. (O), *Parthenium hysterophorus** (O), *Cynodon dactylon* (O)	

Macrophytes
Submerged macrophytes: none observed
Floating macrophytes: none observed
Emergent macrophytes: none observed

Aquatic biota
Aquatic macroinvertebrate sampling undertaken: no
Habitat for platypus: unlikely habitat, no burrows detected
Habitat for EVNT fish species: unlikely
Fish sampling undertaken: no
Suitable habitat for EVNT turtle species: unlikely
Turtle sampling undertaken: no
Aquatic vertebrates encountered: none observed

Aquatic habitat assessment scoring	
1. Bottom substrate/available cover	3 (Poor)
2. Embeddedness	3 (Poor)
3. Velocity/depth category	0 (Poor)
4. Channel alteration	5 (Fair)
5. Bottom scouring and deposition	5 (Fair)
6. Pool/riffle, run/bend ratio	4 (Fair)
7. Bank stability	2 (Poor)
8. Bank vegetative stability	8 (Good)
9. Streamside cover	9 (Excellent)
Overall score	39 (Fair)
Overall aquatic value: Moderate	

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT

Site code: R12	**Location:** Taurus Creek
Date: 23/10/2025	**Season:** dry
Assessor: DM	**Coordinates:** -23.6662; 148.8851 (GDA 2020)
Water level: no flow - dry	**Likely flow nature:** ephemeral
State-mapped watercourse (DLGWV 2025): yes	
Likely a watercourse: yes - clear channel and bank structure, and clear presence of riparian vegetation structure	
State-mapped waterway providing for fish passage (DAF 2020): yes, Major risk of impact	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 0 m	**Bankfull width:** 25 m
Maximum depth: 0 m	**Bankfull height:** 3 m
Habitat types: 0% riffle, 0% run, 0% sandy pool, 0% rocky pool, 100% dry	
Variety of habitat: large woody debris, macrophytes	
Habitat attributes: detritus (S), sticks (L), branches (S), logs (S), periphyton (N), moss (N), filamentous algae (N), macrophytes (L), bank overhang (N), trailing bank vegetation (N), blanketing silt (N), substrate anoxia (N)	
Upstream landuse: past vegetation clearing, moderate grazing, coal mining	
Adjacent landuse (right bank): moderate grazing, past clearing	
Adjacent landuse (left bank): moderate grazing, past clearing	
Bed, edge and bank characteristics	
Bed substrates: 20% silt/clay (<0.05 mm), 80% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Edge substrates: 20% silt/clay (<0.05 mm), 80% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Bank soils: clayey loam	**Bank stability:** moderately stable
Bed stability: moderate deposition	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (N), sand (N)
Local catchment erosion: gully (N), rill (L), tunnel (N), sheet (L), bank slumping (L), cattle pugging (E)	



Upstream



Left bank



Downstream



Right bank

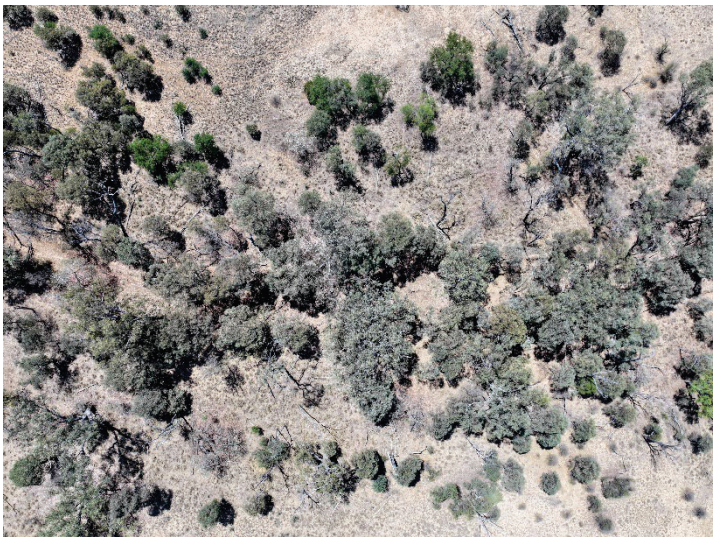
Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 20 m	**Width of riparian zone on right bank:** 20 m
Bare ground: M	**Grasses/forbs:** S
Shrubs: L	**Trees <10 m:** S
Trees >10m: M	**Exotic riparian species: L**
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** 11.3.3/11.3.1
Vegetation status: remnant	**Dominant stratum:** tree
Health: average	**Dieback:** 1-10%
EDL height: 20 m	**EDL cover:** 55%
Canopy species: *Eucalyptus coolabah* (D), *Acacia harpophylla* (F)	
Sub-canopy species: *Acacia harpophylla* (D), *Terminalia oblongata* subsp. *oblongata* (O), *Lysiphyllum hookeri* (O), *Lysiphyllum carronii* (O)	
Shrub species: *Terminalia oblongata* subsp. *oblongata* (O), *Acacia harpophylla* (O), *Harrisia martinii** (O)	
Ground species: *Cenchrus ciliaris** (D), *Parthenium hysterophorus** (F), *Enchylaena tomentosa* (O), *Atriplex* sp. (O), *Sida* sp. (O), *Argemone mexicana** (O),	
Macrophytes	
Submerged macrophytes: none observed	
Floating macrophytes: none observed	
Emergent macrophytes: *Leptochloa digitata* (L), *Cyperus bifax* (L)	

Aquatic biota
Aquatic macroinvertebrate sampling undertaken: no
Habitat for platypus: unlikely habitat, no burrows detected
Habitat for EVNT fish species: unlikely
Fish sampling undertaken: no
Suitable habitat for EVNT turtle species: unlikely
Turtle sampling undertaken: no
Aquatic vertebrates encountered: none observed

Aquatic habitat assessment scoring	
1. Bottom substrate/available cover	2 (Poor)
2. Embeddedness	2 (Poor)
3. Velocity/depth category	0 (Poor)
4. Channel alteration	8 (Good)
5. Bottom scouring and deposition	4 (Fair)
6. Pool/riffle, run/bend ratio	5 (Fair)
7. Bank stability	6 (Good)
8. Bank vegetative stability	5 (Fair)
9. Streamside cover	9 (Excellent)
Overall score	41 (Fair)
Overall aquatic value: Moderate	

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT	
Site code: L1	**Location:** Farm dam on Sagittarius Creek
Date: 17/06/2025	**Season:** late wet
Assessor: DM	**Coordinates:** -23.6417; 148.8591 (GDA 2020)
Water level: moderate (= watermark)	**Likely flow nature:** semi-permanent waterbody on ephemeral waterway
State-mapped watercourse (DLGWV 2025): no, unmapped	
Likely a watercourse: no, likely a drainage feature	
State-mapped waterway providing for fish passage (DAF 2020): yes, Moderate risk of impact	
Water quality	
Time (EST): 13:51	**Water temperature:** 14.1˚C
Sp. Conductivity: 196 µS/cm	**pH:** 6.2
Dissolved oxygen: 88.5%	**Dissolved oxygen:** 9.10 mg/L
Turbidity: 9.6 NTU	**Ion sample collected:** yes
Observations within 2 m of sampling point	
Shading: 100%	**Water colour:** clear
Water odour: none detected	**Water surface:** normal
Algae on substrate: S	**Algae in water column:** N
Emergent macrophytes: M	**Submerged macrophytes:** N
Floating macrophytes: N	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 70 m	**Bankfull width:** 100 m
Maximum depth: 2+ m	**Bankfull height:** 3+ m
Habitat types: 0% riffle, 0% run, 100% sandy pool, 0% rocky pool, 0% dry	
Variety of habitat: shallow (<0.5 m), deep (>0.5 m), pool, macrophytes	
Habitat attributes: detritus (S), sticks (N), branches (N), logs (N), periphyton (S), moss (N), filamentous algae (S), macrophytes (E), bank overhang (N), trailing bank vegetation (E), blanketing silt (N), substrate anoxia (N)	
Upstream landuse: vegetation clearing, moderate grazing	
Adjacent landuse (right bank): moderate grazing, vegetation clearing	
Adjacent landuse (left bank): moderate grazing, vegetation clearing	
Bed, edge and bank characteristics	
Bed substrates: 90% silt/clay (<0.05 mm), 10% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Edge substrates: 90% silt/clay (<0.05 mm), 10% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Bank soils: clay	**Bank stability:** moderately stable
Bed stability: bed stable	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (N), sand (N)
Local catchment erosion: gully (N), rill (L), tunnel (N), sheet (N), bank slumping (N), cattle pugging (N)	

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).



Upstream



Left bank



Downstream



Right bank

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 3 m	**Width of riparian zone on right bank:** 3 m
Bare ground: L	**Grasses/forbs:** E
Shrubs: L	**Trees <10 m:** L
Trees >10m: N	**Exotic riparian species:** L
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** Non-remnant
Vegetation status: cleared	**Dominant stratum:** wetland
Health: average	**Dieback:** 1-10%
EDL height: 2.5 m	**EDL cover:** 90%
Canopy species: *Acacia salicina* (R), *Terminalia oblongata* subsp. *oblongata* (R), *Acacia harpophylla* (R)	
Shrub species: *Acacia salicina* (R), *Acacia harpophylla* (R), *Lysiphyllum carronii* (R)	
Ground species: *Typha domingensis* (D), *Persicaria attenuata* (A), *Cyperus exaltatus* (O), *Cenchrus ciliaris** (O), *Basilicum polystachyon* (O), *Bothriochloa bladhii* (O)	

Macrophytes
Submerged macrophytes: none observed
Floating macrophytes: none observed
Emergent macrophytes: *Typha domingensis* (E), *Persicaria attenuata* (M), *Cyperus exaltatus* (L), *Eclipta prostrata** (L), *Cyperus pygmaeus* (L)
Aquatic biota
Aquatic macroinvertebrate sampling undertaken: yes
Habitat for platypus: unlikely habitat
Habitat for EVNT fish species: unlikely
Fish sampling undertaken: yes
Suitable habitat for EVNT turtle species: unlikely
Turtle sampling undertaken: yes
Aquatic vertebrates encountered: *Ambassis agassizii*, *Anguilla reinhardtii*, *Gambusia holbrooki**, *Hypseleotris bucephala*, *Leiopotherapon unicolor*, *Mogurnda adspersa*, *Porochilus rendahli*
Overall aquatic value: Moderate

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT

Site code: L1	**Location:** Farm dam on Sagittarius Creek
Date: 20/10/2025	**Season:** dry
Assessor: DM	**Coordinates:** -23.6417; 148.8591 (GDA 2020)
Water level: low (< watermark)	**Likely flow nature:** semi-permanent waterbody on ephemeral waterway
State-mapped watercourse (DLGWV 2025): no, unmapped	
Likely a watercourse: no, likely a drainage feature	
State-mapped waterway providing for fish passage (DAF 2020): yes, Moderate risk of impact	
Water quality	
Time (EST): 15:07	**Water temperature:** 28.6˚C
Sp. Conductivity: 210 µS/cm	**pH:** 9.7
Dissolved oxygen: 170.5%	**Dissolved oxygen:** 13.15 mg/L
Turbidity: 13.2 NTU	**Ion sample collected:** yes
Observations within 2 m of sampling point	
Shading: 0%	**Water colour:** clear
Water odour: none detected	**Water surface:** normal
Algae on substrate: S	**Algae in water column:** L
Emergent macrophytes: M	**Submerged macrophytes:** E
Floating macrophytes: N	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 50 m	**Bankfull width:** 100 m
Maximum depth: 2+ m	**Bankfull height:** 3+ m
Habitat types: 0% riffle, 0% run, 100% sandy pool, 0% rocky pool, 0% dry	
Variety of habitat: shallow (<0.5 m), deep (>0.5 m), pool, macrophytes	
Habitat attributes: detritus (S), sticks (N), branches (N), logs (N), periphyton (S), moss (N), filamentous algae (S), macrophytes (E), bank overhang (N), trailing bank vegetation (E), blanketing silt (N), substrate anoxia (N)	
Upstream landuse: vegetation clearing, moderate grazing	
Adjacent landuse (right bank): moderate grazing, vegetation clearing	
Adjacent landuse (left bank): moderate grazing, vegetation clearing	
Bed, edge and bank characteristics	
Bed substrates: 90% silt/clay (<0.05 mm), 10% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Edge substrates: 90% silt/clay (<0.05 mm), 10% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Bank soils: clay	**Bank stability:** moderately stable
Bed stability: bed stable	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (N), sand (N)
Local catchment erosion: gully (N), rill (L), tunnel (N), sheet (N), bank slumping (N), cattle pugging (N)	

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).



Upstream



Left bank



Downstream



Right bank

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 3 m	**Width of riparian zone on right bank:** 3 m
Bare ground: L	**Grasses/forbs:** E
Shrubs: L	**Trees <10 m:** L
Trees >10m: N	**Exotic riparian species:** L
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** Non-remnant
Vegetation status: cleared	**Dominant stratum:** wetland
Health: average	**Dieback:** 1-10%
EDL height: 2.5 m	**EDL cover:** 90%
Canopy species: *Acacia salicina* (R), *Terminalia oblongata* subsp. *oblongata* (R), *Acacia harpophylla* (R)	
Shrub species: *Acacia salicina* (R), *Acacia harpophylla* (R), *Lysiphyllum carronii* (R)	
Ground species: *Typha domingensis* (D), *Persicaria attenuata* (A), *Cyperus exaltatus* (O), *Cenchrus ciliaris** (O), *Bothriochloa bladhii* (O), *Chloris* sp. (O)	

Macrophytes
Submerged macrophytes: *Potamogeton crispus* (E)
Floating macrophytes: none observed
Emergent macrophytes: *Typha domingensis* (E), *Persicaria attenuata* (M), *Cyperus exaltatus* (L), *Eclipta prostrata** (L), *Cyperus pygmaeus* (L)
Aquatic biota
Aquatic macroinvertebrate sampling undertaken: yes
Habitat for platypus: unlikely habitat
Habitat for EVNT fish species: unlikely
Fish sampling undertaken: yes
Suitable habitat for EVNT turtle species: unlikely
Turtle sampling undertaken: yes
Aquatic vertebrates encountered: *Ambassis agassizii*, *Gambusia holbrooki**, *Hypseleotris bucephala*, *Leiopotherapon unicolor*, *Melanotaenia splendida splendida*, *Mogurnda adspersa*, *Porochilus rendahli*, *Emydura macquarii krefftii*
Overall aquatic value: Moderate

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT

Site code: L2	**Location:** Farm dam on unnamed tributary of Two Mile Gully
Date: 30/06/2025	**Season:** late wet
Assessor: DM	**Coordinates:** -23.7141; 148.8778 (GDA 2020)
Water level: moderate (= watermark)	**Likely flow nature:** semi-permanent waterbody on ephemeral waterway
State-mapped watercourse (DLGWV 2025): no, unmapped	
Likely a watercourse: no, likely a drainage feature	
State-mapped waterway providing for fish passage (DAF 2020): yes, Low risk of impact	

Water quality

Time (EST): 15:57	**Water temperature:** 17.2˚C
Sp. Conductivity: 628 µS/cm	**pH:** 7.6
Dissolved oxygen: 83.7%	**Dissolved oxygen:** 7.92 mg/L
Turbidity: 11.2 NTU	**Ion sample collected:** yes
Notes: Impacted by coal fines in runoff from Cook CHPP upstream	

Observations within 2 m of sampling point

Shading: 90%	**Water colour:** clear
Water odour: none detected	**Water surface:** normal
Algae on substrate: N	**Algae in water column:** N
Emergent macrophytes: N	**Submerged macrophytes:** N
Floating macrophytes: E	

Reach observations (100 m reach, or 10 x modal width)

Mean wetted width: 80 m	**Bankfull width:** 100 m
Maximum depth: 2+ m	**Bankfull height:** 3.5+ m

Habitat types: 0% riffle, 0% run, 100% sandy pool, 0% rocky pool, 0% dry

Variety of habitat: shallow (<0.5 m), deep (>0.5 m), pool, large woody debris, macrophytes

Habitat attributes: detritus (L), sticks (L), branches (L), logs (L), periphyton (L), moss (N), filamentous algae (L), macrophytes (S), bank overhang (N), trailing bank vegetation (S), blanketing silt (E), substrate anoxia (L)

Upstream landuse: past vegetation clearing, moderate grazing, Cook CHPP

Adjacent landuse (right bank): moderate grazing, past clearing

Adjacent landuse (left bank): moderate grazing, past clearing

Bed, edge and bank characteristics

Bed substrates: 95% silt/clay (<0.05 mm), 5% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock

Edge substrates: 95% silt/clay (<0.05 mm), 5% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock

Bank soils: clay	**Bank stability:** stable
Bed stability: bed stable	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt or sand (N)

Local catchment erosion: gully (N), rill (N), tunnel (N), sheet (N),

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).



Upstream



Left bank



Downstream



Right bank

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 10 m	**Width of riparian zone on right bank:** 10 m
Bare ground: L	**Grasses/forbs:** E
Shrubs: L	**Trees <10 m:** S
Trees >10m: L	**Exotic riparian species:** S
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** Non-remnant
Vegetation status: regrowth	**Dominant stratum:** wetland
Health: average	**Dieback:** 1-10%
EDL height: 2 m	**EDL cover:** 20%
Canopy species: *Acacia salicina* (D), *Eucalyptus populnea* (O), *Terminalia oblongata* subsp. *oblongata* (O), *Acacia harpophylla* (O)	
Shrub species: *Acacia salicina* (O), *Opuntia tomentosa** (O), *Typha domingensis* (D), *Santalum* sp. (O), *Geijera parviflora* (O), *Eremophila mitchellii* (O)	
Ground species: *Cenchrus ciliaris** (D), *Typha domingensis* (D), *Ludwigia peploides* subsp. *montevidensis* (A), *Megathyrsus maximus** (A), *Parthenium hysterophorus** (O), *Cynodon dactylon** (O)	

Macrophytes
Submerged macrophytes: *Najas tenuifolia* (L), *Potamogeton crispus* (L)
Floating macrophytes: *Lemna aequinoctialis* (L), *Azolla pinnata* (L)
Emergent macrophytes: *Typha domingensis* (S), *Ludwigia peploides* subsp. *montevidensis* (S), *Nymphoides indica* (S), *Cyperus* sp. (L), *Echinochloa colona** (L), *Eclipta prostrata** (L), *Juncus usitatus* (L), *Cyperus difformis* (L), *Schoenoplectus validus* (L)
Aquatic biota
Aquatic macroinvertebrate sampling undertaken: yes
Habitat for platypus: unlikely habitat
Habitat for EVNT fish species: unlikely
Fish sampling undertaken: yes
Suitable habitat for EVNT turtle species: unlikely
Turtle sampling undertaken: yes
Aquatic vertebrates encountered: *Ambassis agassizii*, *Anguilla reinhardtii*, *Hypseleotris bucephala*, *Leiopotherapon unicolor*, *Melanotaenia splendida splendida*, *Mogurnda adspersa*, *Emydura macquarii krefftii*
Overall aquatic value: Low

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT

Site code: L2	**Location:** Farm dam on unnamed tributary of Two Mile Gully
Date: 22/10/2025	**Season:** dry
Assessor: DM	**Coordinates:** -23.7141; 148.8778 (GDA 2020)
Water level: no flow – isolated	**Likely flow nature:** semi-permanent waterbody on ephemeral waterway
State-mapped watercourse (DLGWV 2025): no, unmapped	
Likely a watercourse: no, likely a drainage feature	
State-mapped waterway providing for fish passage (DAF 2020): yes, Low risk of impact	
Water quality	
Time (EST): 12:46	**Water temperature:** 29.1˚C
Sp. Conductivity: 786 µS/cm	**pH:** 8.2
Dissolved oxygen: 91.6%	**Dissolved oxygen:** 7.02 mg/L
Turbidity: 19.2 NTU	**Ion sample collected:** yes
Notes: Impacted by coal fines in runoff from Cook CHPP upstream	
Observations within 2 m of sampling point	
Shading: 0%	**Water colour:** clear
Water odour: none detected	**Water surface:** normal
Algae on substrate: N	**Algae in water column:** N
Emergent macrophytes: N	**Submerged macrophytes:** M
Floating macrophytes: S	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 65 m	**Bankfull width:** 100 m
Maximum depth: 2+ m	**Bankfull height:** 3.5+ m
Habitat types: 0% riffle, 0% run, 100% sandy pool, 0% rocky pool, 0% dry	
Variety of habitat: shallow (<0.5 m), deep (>0.5 m), pool, large woody debris, macrophytes	
Habitat attributes: detritus (L), sticks (L), branches (L), logs (L), periphyton (L), moss (N), filamentous algae (L), macrophytes (S), bank overhang (N), trailing bank vegetation (S), blanketing silt (E), substrate anoxia (L)	
Upstream landuse: past vegetation clearing, moderate grazing, Cook CHPP	
Adjacent landuse (right bank): moderate grazing, past clearing	
Adjacent landuse (left bank): moderate grazing, past clearing	
Bed, edge and bank characteristics	
Bed substrates: 95% silt/clay (<0.05 mm), 5% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Edge substrates: 95% silt/clay (<0.05 mm), 5% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Bank soils: clay	**Bank stability:** stable
Bed stability: bed stable	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt or sand (N)
Local catchment erosion: gully (N), rill (N), tunnel (N), sheet (N), bank slumping (N), cattle pugging (S)	

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).



Upstream



Left bank



Downstream



Right bank

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 10 m	**Width of riparian zone on right bank:** 10 m
Bare ground: S	**Grasses/forbs:** M
Shrubs: L	**Trees <10 m:** S
Trees >10m: L	**Exotic riparian species:** S
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** Non-remnant
Vegetation status: regrowth	**Dominant stratum:** wetland
Health: average	**Dieback:** 1-10%
EDL height: 2 m	**EDL cover:** 20%
Canopy species: *Acacia salicina* (D), *Eucalyptus populnea* (O), *Terminalia oblongata* subsp. *oblongata* (O), *Acacia harpophylla* (O)	
Shrub species: *Acacia salicina* (O), *Opuntia tomentosa** (O), *Typha domingensis* (D), *Santalum* sp. (O), *Geijera parviflora* (O), *Eremophila mitchellii* (O)	
Ground species: *Cenchrus ciliaris** (D), *Typha domingensis* (F), *Megathyrsus maximus** (F), *Cynodon dactylon** (F), *Ludwigia peploides* subsp. *montevidensis* (O), *Parthenium hysterophorus** (O)	

Macrophytes
Submerged macrophytes: *Potamogeton crispus* (M), *Najas tenuifolia* (L)
Floating macrophytes: *Lemna aequinoctialis* (L), *Azolla pinnata* (S)
Emergent macrophytes: *Typha domingensis* (S), *Ludwigia peploides* subsp. *montevidensis* (L), *Nymphoides indica* (L), *Cyperus exaltatus* (L), *Eclipta prostrata** (L), *Juncus usitatus* (L), *Schoenoplectus validus* (L)
Aquatic biota
Aquatic macroinvertebrate sampling undertaken: yes
Habitat for platypus: unlikely habitat
Habitat for EVNT fish species: unlikely
Fish sampling undertaken: yes
Suitable habitat for EVNT turtle species: unlikely
Turtle sampling undertaken: yes
Aquatic vertebrates encountered: *Ambassis agassizii*, *Anguilla reinhardtii*, *Hypseleotris bucephala*, *Leiopotherapon unicolor*, *Melanotaenia splendida splendida*, *Mogurnda adspersa*, *Porochilus rendahli*, *Emydura macquarii krefftii*
Overall aquatic value: Low

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT	
Site code: L3	**Location:** Taurus Dam
Date: 3/07/2025	**Season:** late wet
Assessor: DM	**Coordinates:** -23.7454; 148.8470 (GDA 2020)
Water level: no flow – isolated	**Likely flow nature:** mine water dam on ephemeral waterway
State-mapped watercourse (DLGWV 2025): no, unmapped	
Likely a watercourse: no, likely a drainage feature	
State-mapped waterway providing for fish passage (DAF 2020): yes, High risk of impact	
Water quality	
Time (EST): 9:13	**Water temperature:** 13.9˚C
Sp. Conductivity: 5124 µS/cm	**pH:** 8.4
Dissolved oxygen: 76.6%	**Dissolved oxygen:** 7.78 mg/L
Turbidity: 37.6 NTU	**Ion sample collected:** yes
Observations within 2 m of sampling point	
Shading: 0%	**Water colour:** moderately turbid
Water odour: none detected	**Water surface:** normal
Algae on substrate: S	**Algae in water column:** L
Emergent macrophytes: N	**Submerged macrophytes:** N
Floating macrophytes: N	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 400 m	**Bankfull width:** 600 m
Maximum depth: 2+ m	**Bankfull height:** 4+ m
Habitat types: 0% riffle, 0% run, 100% sandy pool, 0% rocky pool, 0% dry	
Variety of habitat: shallow (<0.5 m), deep (>0.5 m), pool, large woody debris, macrophytes	
Habitat attributes: detritus (L), sticks (L), branches (L), logs (L), periphyton (S), moss (N), filamentous algae (L), macrophytes (L), bank overhang (N), trailing bank vegetation (S), blanketing silt (S), substrate anoxia (S)	
Upstream landuse: coal mining	
Adjacent landuse (right bank): coal mining	
Adjacent landuse (left bank): coal mining	
Bed, edge and bank characteristics	
Bed substrates: 100% silt/clay (<0.05 mm), 0% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Edge substrates: 100% silt/clay (<0.05 mm), 0% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Bank soils: clay	**Bank stability:** stable
Bed stability: severe deposition	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (E), sand (N)
Local catchment erosion: gully (N), rill (N), tunnel (N), sheet (N), bank slumping (N), cattle pugging (N)	

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).



Upstream



Left bank



Downstream



Right bank

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 5 m	**Width of riparian zone on right bank:** 5 m
Bare ground: L	**Grasses/forbs:** E
Shrubs: L	**Trees <10 m:** L
Trees >10m: N	**Exotic riparian species:** L
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** Non-remnant
Vegetation status: cleared	**Dominant stratum:** wetland
Health: poor	**Dieback:** 1-10%
EDL height: 1 m	**EDL cover:** 30%
Canopy species: *Acacia salicina* (F), *Acacia* sp. (O), *Lysiphyllum hookeri* (R)	
Shrub species: *Acacia salicina* (F), *Acacia harpophylla* (O), *Typha domingensis* (F), *Sesbania cannabina* (O)	
Ground species: *Cynodon dactylon** (D), *Parthenium hysterophorus** (O), *Chloris* sp. (O), *Eriochloa pseudoacrotricha* (O), *Panicum* sp. (O)	

Macrophytes
Submerged macrophytes: none observed
Floating macrophytes: none observed
Emergent macrophytes: *Typha domingensis* (L), *Schoenoplectus vallidus* (L), *Persicaria attenuata* (L), *Leptochloa digitata* (L), *Persicaria lapathifolia* (L), *Echinochloa colona** (L)
Aquatic biota
Aquatic macroinvertebrate sampling undertaken: no
Habitat for platypus: unlikely habitat
Habitat for EVNT fish species: unlikely
Fish sampling undertaken: no
Suitable habitat for EVNT turtle species: unlikely
Turtle sampling undertaken: no
Aquatic vertebrates encountered: none observed
Notes: Partly de-silted within last year. Mine water being pumped into it at the time of assessment.
Overall aquatic value: Low

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT	
Site code: L3	**Location:** Taurus Dam
Date: 20/10/2025	**Season:** dry
Assessor: DM	**Coordinates:** -23.7454; 148.8470 (GDA 2020)
Water level: no flow – isolated (higher than last time)	**Likely flow nature:** mine water dam on ephemeral waterway
State-mapped watercourse (DLGWV 2025): no, unmapped	
Likely a watercourse: no, likely a drainage feature	
State-mapped waterway providing for fish passage (DAF 2020): yes, High risk of impact	
Water quality	
Time (EST): 10:04	**Water temperature:** 29.4˚C
Sp. Conductivity: 4951 µS/cm	**pH:** 9.1
Dissolved oxygen: 29.4%	**Dissolved oxygen:** 10.29 mg/L
Turbidity: 85.3 NTU	**Ion sample collected:** yes
Observations within 2 m of sampling point	
Shading: 0%	**Water colour:** moderately turbid
Water odour: anoxia	**Water surface:** normal
Algae on substrate: E	**Algae in water column:** M
Emergent macrophytes: N	**Submerged macrophytes:** N
Floating macrophytes: N	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 420 m	**Bankfull width:** 600 m
Maximum depth: 2+ m	**Bankfull height:** 4+ m
Habitat types: 0% riffle, 0% run, 100% sandy pool, 0% rocky pool, 0% dry	
Variety of habitat: shallow (<0.5 m), deep (>0.5 m), pool, large woody debris, macrophytes	
Habitat attributes: detritus (L), sticks (L), branches (L), logs (L), periphyton (S), moss (N), filamentous algae (M), macrophytes (L), bank overhang (N), trailing bank vegetation (S), blanketing silt (S), substrate anoxia (S)	
Upstream landuse: coal mining	
Adjacent landuse (right bank): coal mining	
Adjacent landuse (left bank): coal mining	
Bed, edge and bank characteristics	
Bed substrates: 100% silt/clay (<0.05 mm), 0% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Edge substrates: 100% silt/clay (<0.05 mm), 0% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Bank soils: clay	**Bank stability:** stable
Bed stability: severe deposition	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (E), sand (N)
Local catchment erosion: gully (N), rill (N), tunnel (N), sheet (N), bank slumping (N), cattle pugging (N)	

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).



Upstream



Left bank



Downstream



Right bank

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 5 m	**Width of riparian zone on right bank:** 5 m
Bare ground: L	**Grasses/forbs:** E
Shrubs: L	**Trees <10 m:** L
Trees >10m: N	**Exotic riparian species:** L
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** Non-remnant
Vegetation status: cleared	**Dominant stratum:** wetland
Health: poor	**Dieback:** 1-10%
EDL height: 1 m	**EDL cover:** 30%
Canopy species: *Acacia salicina* (F), *Acacia* sp. (O), *Lysiphyllum hookeri* (R)	
Shrub species: *Acacia salicina* (F), *Acacia harpophylla* (O), *Typha domingensis* (F), *Sesbania cannabina* (O)	
Ground species: *Cynodon dactylon** (D), *Parthenium hysterophorus** (O), *Chloris* sp. (O), *Eriochloa pseudoacrotricha* (O), *Panicum* sp. (O)	

Macrophytes
Submerged macrophytes: none observed
Floating macrophytes: none observed
Emergent macrophytes: *Typha domingensis* (L), *Schoenoplectus vallidus* (L), *Persicaria attenuata* (L), *Leptochloa digitata* (L), *Persicaria lapathifolia* (L), *Echinochloa colona** (L)
Aquatic biota
Aquatic macroinvertebrate sampling undertaken: no
Habitat for platypus: unlikely habitat
Habitat for EVNT fish species: unlikely
Fish sampling undertaken: no
Suitable habitat for EVNT turtle species: unlikely
Turtle sampling undertaken: no
Aquatic vertebrates encountered: none observed
Overall aquatic value: Low

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

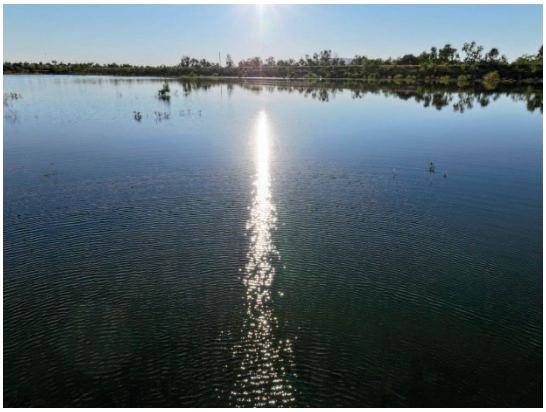
AQUATIC HABITAT ASSESSMENT	
Site code: L4	**Location:** Deep Creek Dam
Date: 3/07/2025	**Season:** late wet
Assessor: DM	**Coordinates:** -23.7216; 148.8217 (GDA 2020)
Water level: no flow – isolated	**Likely flow nature:** mine water dam on ephemeral waterway
State-mapped watercourse (DLGWV 2025): no, unmapped	
Likely a watercourse: no, likely a drainage feature	
State-mapped waterway providing for fish passage (DAF 2020): yes, Low risk of impact	
Water quality	
Time (EST): 7:47	**Water temperature:** 14.5˚C
Sp. Conductivity: 965 µS/cm	**pH:** 8.9
Dissolved oxygen: 94.8%	**Dissolved oxygen:** 9.63 mg/L
Turbidity: 16.5 NTU	**Ion sample collected:** yes
Observations within 2 m of sampling point	
Shading: 0%	**Water colour:** clear
Water odour: none detected	**Water surface:** normal
Algae on substrate: L	**Algae in water column:** N
Emergent macrophytes: N	**Submerged macrophytes:** N
Floating macrophytes: N	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 300 m	**Bankfull width:** 400 m
Maximum depth: 1 m	**Bankfull height:** 3 m
Habitat types: 0% riffle, 0% run, 100% sandy pool, 0% rocky pool, 0% dry	
Variety of habitat: shallow (<0.5 m) and deep pool, macrophytes	
Habitat attributes: detritus (S), sticks (L), branches (N), logs (N), periphyton (L), moss (N), filamentous algae (L), macrophytes (L), bank overhang (N), trailing bank vegetation (M), blanketing silt (L), substrate anoxia (N)	
Upstream landuse: coal mining	
Adjacent landuse (right bank): coal mining	
Adjacent landuse (left bank): coal mining	
Bed, edge and bank characteristics	
Bed substrates: 100% silt/clay (<0.05 mm), 0% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Edge substrates: 100% silt/clay (<0.05 mm), 0% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Bank soils: clay	**Bank stability:** stable
Bed stability: severe deposition	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (M), sand (N)
Local catchment erosion: gully (N), rill (N), tunnel (N), sheet (N), bank slumping (N), cattle pugging (N)	



Upstream



Left bank



Downstream



Right bank

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 2 m	**Width of riparian zone on right bank:** 2 m
Bare ground: L	**Grasses/forbs:** E
Shrubs: L	**Trees <10 m:** L
Trees >10m: N	**Exotic riparian species:** S
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** Non-remnant
Vegetation status: cleared	**Dominant stratum:** wetland
Health: poor	**Dieback:** 1-10%
EDL height: 1 m	**EDL cover:** 15%
Canopy species: *Acacia harpophylla* (O)	
Shrub species: *Acacia harpophylla* (O), *Sesbania cannabina* (F), *Acacia salicina* (O), *Cryptostegia grandiflora** (R), *Sclerolaena* sp. (O), *Vachellia farnesiana** (R), *Tamarix aphylla** (R)	
Ground species: *Cynodon dactylon** (D), *Parthenium hysterophorus** (O), *Sporobolus* sp. (O), *Melinis repens** (O), *Enchylaena tomentosa* (O), *Trianthema portulacastrum** (O)	

Macrophytes
Submerged macrophytes: *Nitella* sp. (L)
Floating macrophytes: none observed
Emergent macrophytes: *Leptochloa digitata* (L), *Persicaria attenuata* (L), *Echinochloa colona** (L), *Persicaria lapathifolia* (L), *Polygonum minuta* (L)
Aquatic biota
Aquatic macroinvertebrate sampling undertaken: no
Habitat for platypus: unlikely habitat
Habitat for EVNT fish species: unlikely
Fish sampling undertaken: no
Suitable habitat for EVNT turtle species: unlikely
Turtle sampling undertaken: no
Aquatic vertebrates encountered: none observed
Notes: De-silted in late 2024
Overall aquatic value: Low

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

AQUATIC HABITAT ASSESSMENT

Site code: L4	**Location:** Deep Creek Dam
Date: 20/10/2025	**Season:** dry
Assessor: DM	**Coordinates:** -23.7216; 148.8217 (GDA 2020)
Water level: no flow – isolated (lower than last time)	**Likely flow nature:** mine water dam on ephemeral waterway
State-mapped watercourse (DLGWV 2025): no, unmapped	
Likely a watercourse: no, likely a drainage feature	
State-mapped waterway providing for fish passage (DAF 2020): yes, Low risk of impact	
Water quality	
Time (EST): 9:21	**Water temperature:** 25.2˚C
Sp. Conductivity: 1403 µS/cm	**pH:** 8.5
Dissolved oxygen: 83.8%	**Dissolved oxygen:** 6.88 mg/L
Turbidity: 42.7 NTU	**Ion sample collected:** yes
Observations within 2 m of sampling point	
Shading: 0%	**Water colour:** moderately turbid
Water odour: none detected	**Water surface:** normal
Algae on substrate: N	**Algae in water column:** N
Emergent macrophytes: N	**Submerged macrophytes:** N
Floating macrophytes: N	
Reach observations (100 m reach, or 10 x modal width)	
Mean wetted width: 200 m	**Bankfull width:** 400 m
Maximum depth: 0.5 m	**Bankfull height:** 3 m
Habitat types: 0% riffle, 0% run, 100% sandy pool, 0% rocky pool, 0% dry	
Variety of habitat: shallow (<0.5 m) and deep pool, macrophytes	
Habitat attributes: detritus (S), sticks (L), branches (N), logs (N), periphyton (L), moss (N), filamentous algae (L), macrophytes (L), bank overhang (N), trailing bank vegetation (L), blanketing silt (L), substrate anoxia (N)	
Upstream landuse: coal mining	
Adjacent landuse (right bank): coal mining	
Adjacent landuse (left bank): coal mining	
Bed, edge and bank characteristics	
Bed substrates: 100% silt/clay (<0.05 mm), 0% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Edge substrates: 100% silt/clay (<0.05 mm), 0% sand (0.05-2 mm), 0% gravel (2-4 mm), 0% pebble (4-64 mm), 0% cobble (64-256 mm), 0% boulder (>256 mm), 0% bedrock	
Bank soils: clay	**Bank stability:** stable
Bed stability: severe deposition	**Bank shape:** concave
Channel shape: U shaped	**Recent deposits:** silt (M), sand (N)
Local catchment erosion: gully (N), rill (N), tunnel (N), sheet (N), bank slumping (N), cattle pugging (N)	

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001).



Upstream



Left bank



Downstream



Right bank

Riparian vegetation	
Cover	
Width of riparian zone on left bank: 1 m	**Width of riparian zone on right bank:** 1 m
Bare ground: L	**Grasses/forbs:** S
Shrubs: L	**Trees <10 m:** L
Trees >10m: N	**Exotic riparian species:** S
Composition and health	
State-mapped RE: Non-remnant	**Verified RE:** Non-remnant
Vegetation status: cleared	**Dominant stratum:** wetland
Health: poor	**Dieback:** 1-10%
EDL height: 0.3 m	**EDL cover:** 15%
Canopy species: *Acacia harpophylla* (O)	
Shrub species: *Acacia harpophylla* (O), *Sesbania cannabina* (F), *Acacia salicina* (O), *Cryptostegia grandiflora** (R), *Sclerolaena* sp. (O), *Vachellia farnesiana** (R), *Tamarix aphylla** (R)	
Ground species: *Cynodon dactylon var. dactylon** (D), *Parthenium hysterophorus** (O), *Sporobolus* sp. (O), *Melinis repens** (O), *Enchylaena tomentosa* (O)	

Macrophytes
Submerged macrophytes: none observed
Floating macrophytes: none observed
Emergent macrophytes: *Leptochloa digitata* (L), *Persicaria attenuata* (L), *Echinochloa colona** (L), *Persicaria lapathifolia* (L), *Polygonum minuta* (L), *Myriophyllum verrucosum* (L)
Aquatic biota
Aquatic macroinvertebrate sampling undertaken: no
Habitat for platypus: unlikely habitat
Habitat for EVNT fish species: unlikely
Fish sampling undertaken: no
Suitable habitat for EVNT turtle species: unlikely
Turtle sampling undertaken: no
Aquatic vertebrates encountered: none observed
Notes: De-silted in late 2024
Overall aquatic value: Low

A



B



C



A: Aerial photograph from 100 m above ground level; upstream (left) to downstream (right)
B: Aerial photograph from 100 m above ground, looking upstream
C: Aerial photograph from 100 m above ground, looking downstream

Notes: Aquatic cover categories: None detected (N), Little (L; 1-10%), Some (S; 10-50%), Moderate (M; 50-75%), Extensive (E; >75%), as per DNRM (2001). Terrestrial cover categories: Dominant (D), Abundant (A), Frequent (F), Occasional (O), Rare (R).

Appendix C: Bores Considered for Stygofauna Sampling

Registered bore	Other name	Drilled date	Depth (mbgl)	Screened interval (m)	Screen aperture (mm)	Lithology	Logged SWL (mbgl)	Mean pH	Mean EC (µS/cm)	Data points (n)	WHC notes	Suitable?	Can it be accessed?	DPM would like to seek access	DPM notes
RN 190142	BWMMB03_01	27/09/2020	12	8-11	1	Sand and gravel	Unknown	Unknown	Unknown	0		Potential	Yes	Yes	
RN 190143	BWMMB03_02	27/09/2020	41	35-41	1	Sandstone	12.5	7.7	34100	1		x	Yes	x	
RN 158688	MB16	28/08/2012	59.2	50.2-59.2	1	Siltstone	33.0	Unknown	6500	1	Would require a land access agreement	Potential	Possibly	x	Outside of State-mapped aquifer
RN 158687	MB17	28/08/2012	50	38.2-47.2	1	Sandstone	22	Unknown	30000	1	Would require a land access agreement	x	Possibly	x	
RN 132783	MB9	29/11/2011	13	9-12	1	Sand	Unknown	Unknown	Unknown	0	Would require a land access agreement	Potential	Possibly	Yes	
RN 132781	MB6	29/11/2011	41	32-41	1	Siltstone	8.35	Unknown	20000	1	Would require a land access agreement	x	Possibly	x	
RN 132782	MB10	29/11/2011	10	6-9	1	Sand	Unknown	Unknown	Unknown	0	Would require a land access agreement	Potential	Possibly	Yes	
RN 158306	MB8	30/05/2012	438	NA	NA	Coal	Unknown	Unknown	Unknown	0	Would require a land access agreement	x	Possibly	x	
RN 132780	MB11	29/11/2011	53	44-53	1	Siltstone	Unknown	Unknown	26000	1	Would require a land access agreement	x	Possibly	x	
RN 158305	MB7	9/04/2012	434	NA	NA	Coal	Unknown	Unknown	Unknown	0	Would require a land access agreement	x	Possibly	x	
RN 158304	MB3R	14/03/2012	65	59-65	1	Sandstone/siltstone	Unknown	Unknown	Unknown	0	Would require a land access agreement	x	Possibly	x	
RN 132785	MB3	29/11/2011	65	59-65	1	Siltstone	Unknown	Unknown	Unknown	0	Would require a land access agreement	x	Possibly	x	
RN 132784	MB5	29/11/2011	47	42-45	1	Siltstone	Unknown	Unknown	17500	1	Would require a land access agreement	x	Possibly	x	
RN 158024	MB15	14/12/2011	23	20-23	1	Siltstone	Unknown	Unknown	22000	1	Would require a land access agreement	x	Possibly	x	
RN 132778	MB14A	23/11/2011	35	32-35	1	Siltstone	Unknown	Unknown	12700	1	Would require a land access agreement	x	Possibly	x	
RN 132779	MB14B	23/11/2011	23	20-23	1	Sandstone	Unknown	Unknown	26200	1	Would require a land access agreement	x	Possibly	x	
RN 132776	MB4	29/11/2011	33	27-33	1	Siltstone	Unknown	Unknown	16900	1	Would require a land access agreement	x	Possibly	x	
RN 132777	MB2	27/11/2011	226	220-226	2	Coal	Unknown	Unknown	Unknown	0	Would require a land access agreement	x	Possibly	x	
RN 158263	MB1	30/11/2011	269	NA	NA	Coal	Unknown	Unknown	Unknown	0	Would require a land access agreement	x	Possibly	x	
RN 132775	MB12	29/11/2011	9.5	6.5-9.5	1	Sand	Unknown	Unknown	Unknown	0	Would require a land access agreement	Potential	Possibly	Yes	
RN 132773	MB13A	26/11/2011	16	12.3-15.3	1	Siltstone	Unknown	Unknown	Unknown	0	Would require a land access agreement	Potential	Possibly	Yes	
RN 132774	MB13B	29/11/2011	9	6.0-9.0	1	Sand	Unknown	Unknown	Unknown	0	Would require a land access agreement	Potential	Possibly	Yes	
RN 190464	-	10/11/2020	30	21.0-30.0	0.4	Siltstone	Unknown	Unknown	Unknown	0	Would require a land access agreement	x	Possibly	x	
RN 190459	-	6/11/2020	51	42.0-51.0	0.4	Siltstone	Unknown	Unknown	Unknown	0	Would require a land access agreement	x	Possibly	x	
RN 165940	MB19BWM02A	13/11/2019	15	12.0-15.0	1	Clay/sand	7.61	Unknown	Brackish	1		Potential	Yes	Yes	
RN 165971	MB19BWM01P	13/11/2019	171	168-171	1	Coal	13.6	8.2	27350	1		x	Yes	x	
RN 165972	MB19BWM04R	15/11/2019	80	71-80	1	Sandstone/siltstone	36.7	Unknown	Salty	1		x	Yes	x	
RN 165945	MB19BWM05A	9/11/2019	15	9-15	1	Claystone	Unknown	Unknown	Unknown	0		Potential	Yes	Yes	Within ML
RN 165941	MB19BWM03P	8/11/2019	234	221-230	1	Siltstone/coal	200	Unknown	Brackish	1		x	Yes	x	
RN 165947	MB19BWM06P	7/11/2019	186	180-186	1	Siltstone/coal	25.8	Unknown	20410	1	Would require a land access agreement	x	Possibly	x	
RN 165973	MB19BWM27P	18/12/2019	189	180-189	4	Coal	25	Unknown	Salty	1		x	Yes	x	
RN 165951	MB19BWM26P	7/12/2019	191	Unknown	Unknown	Siltstone/coal	11.5	Unknown	Salty	1		x	Yes	x	
RN 165950	PB19BWM01P	3/12/2019	198	Unknown	Unknown	Siltstone/coal	30	Unknown	Salty	1		x	Yes	x	
RN 165949	MB19BWM25P	30/11/2019	20	17-20	1	Sandstone	13.8	8.7	4441	1		✓	Yes	Yes	Within ML
RN 165948	MB19BWM07A	29/11/2019	7	4-7	4	Sand and gravel	4	8.7	4400	1		✓	Yes	Yes	Within ML
RN 190679	-	14/09/2021	25	Unknown	1	-	-	Unknown	Unknown	0		x	Yes	x	
RN 165946	MB19BWM09A	4/12/2019	15	Grouted	Unknown	-	-	Unknown	Unknown	0		x	Yes	x	
RN 165936	MB19BWM08P	19/10/2019	190	184-190	1	Sandstone/coal	21.5	8.0	5507	1		x	Yes	x	
RN 209136	C1424W	23/11/2023	176	NA	NA	Coal	Unknown	Unknown	Unknown	0	Would require a land access agreement	x	Possibly	x	
RN 47668	-	1/01/1978	19.2	15.2-19.2	open	Mudstone/shale/silt	Unknown	Unknown	Unknown	0	Abandoned and destroyed	x	No	x	
RN 208478	C1419W	21/07/2024	10	12-15; 17-23	1	Sandstone/siltstone	10	Unknown	Unknown	1	Would require a land access agreement	Potential	Possibly	x	Outside of State-mapped aquifer
RN 205177	C1423W	22/07/2023	27	18-27	1	Sandstone	17	Unknown	Unknown	1	Would require a land access agreement	Potential	Possibly	x	Outside of State-mapped aquifer

Registered bore	Other name	Drilled date	Depth (mbgl)	Screened interval (m)	Screen aperture (mm)	Lithology	Logged SWL (mbgl)	Mean pH	Mean EC (µS/cm)	Data points (n)	WHC notes	Suitable?	Can it be accessed?	DPM would like to seek access	DPM notes
RN 208477	C1420W	21/07/2024	30	18-27	1	Sandstone/siltstone	7	Unknown	Unknown	1	Would require a land access agreement	**Potential**	**Possibly**	**x**	Outside of State-mapped aquifer
RN 208476	C1421W	21/07/2024	23.5	17.5-23.5	1	Sandstone/siltstone	16	Unknown	Unknown	1	Would require a land access agreement	**Potential**	**Possibly**	**x**	Outside of State-mapped aquifer
RN 23022	HPP GEMINI 3	28/08/1980	444	Unknown	Unknown	-	-	Unknown	Unknown	0	Would require a land access agreement	**x**	**Possibly**	**x**	
RN 205176	C1422W	22/07/2023	30	21-30	1	Sandstone	-	Unknown	Unknown	0	Dry during drilling	**x**	**No**	**x**	
RN 23021	HPP GEMINI 2	17/08/1980	443	Unknown	Unknown	-	-	Unknown	Unknown	0	Would require a land access agreement	**x**	**Possibly**	**x**	
RN 23020	HPP GEMINI 4	3/08/1980	465	Unknown	Unknown	-	-	Unknown	Unknown	0	Would require a land access agreement	**x**	**Possibly**	**x**	
RN 23023	HPP GEMINI 1	8/09/1980	609	Unknown	Unknown	-	-	Unknown	Unknown	0	Would require a land access agreement	**x**	**Possibly**	**x**	

Selection criteria:

1. Not a dry bore
2. At least 6 months old
3. Screened interval no deeper than 60 mbgl, and ideally shallower than 50 mbgl (stygofauna rarely found deeper than this due to lack of dissolved organic carbon)
4. Screen aperture 1 mm or greater (exceptions can be made, but non-detection is inconclusive)
5. EC ideally <5,000 uS/cm, although exceptions can be made
6. pH ideally 6.5-8.5, although not as important
7. not purged in the last 1-3 months

Colour coding:

Green cells = likely suitable
Orange cells = marginal, or unknown and potentially suitable
Red cells = not suitable

Appendix D: Water Sampling Analytical Results

CERTIFICATE OF ANALYSIS

Work Order	: **EB2523359**	Page	: 1 of 6
Client	: **DPM ENVIROSCIENCES PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MR DAVID MOORE	Contact	: Customer Services EB
Address	: 12 LAUREN DRIVE BUDERIM 4556	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3552-8685
Project	: DPM25005 Blackwater North Project	Date Samples Received	: 07-Jul-2025 14:30
Order number	: ----	Date Analysis Commenced	: 07-Jul-2025
C-O-C number	: ----	Issue Date	: 14-Jul-2025 14:48
Sampler	: DAVID MOORE		
Site	: ----		
Quote number	: EN/333		
No. of samples received	: 19		
No. of samples analysed	: 19		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Ionic Balance out of acceptable limits due to analytes not quantified in this report.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: **WATER**
(Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	L1	R5	R6	R9	R3
				Sampling date / time	17-Jun-2025 00:00	18-Jun-2025 00:00	18-Jun-2025 00:00	19-Jun-2025 00:00	20-Jun-2025 00:00
					EB2523359-001	EB2523359-002	EB2523359-003	EB2523359-004	EB2523359-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**93**	**171**	**92**	**78**	**110**
Total Alkalinity as CaCO3	----	1	mg/L		**93**	**171**	**92**	**78**	**110**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		<1	**4**	**8**	**2**	**5**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**8**	**18**	**15**	**7**	**24**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**16**	**37**	**19**	**15**	**23**
Magnesium	7439-95-4	1	mg/L		**6**	**8**	**6**	**4**	**8**
Sodium	7440-23-5	1	mg/L		**19**	**39**	**22**	**12**	**23**
Potassium	7440-09-7	1	mg/L		**5**	**4**	**6**	**5**	**7**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**2.08**	**4.01**	**2.43**	**1.80**	**2.98**
ø Total Cations	----	0.01	meq/L		**2.25**	**4.30**	**2.55**	**1.73**	**2.98**
ø Ionic Balance	----	0.01	%		**----**	**3.56**	**----**	**----**	**----**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	R4	L2	RN165940	RN165949	MB06
			Sampling date / time	20-Jun-2025 00:00	30-Jun-2025 00:00	01-Jul-2025 00:00	01-Jul-2025 00:00	02-Jul-2025 00:00
Compound	CAS Number	LOR	Unit	EB2523359-006	EB2523359-007	EB2523359-008	EB2523359-009	EB2523359-010
				Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	78	121	438	788	280
Total Alkalinity as CaCO3	----	1	mg/L	78	121	438	788	280
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	7	99	502	240	604
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	10	40	13100	1290	7230
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	15	32	995	59	454
Magnesium	7439-95-4	1	mg/L	5	13	1040	26	248
Sodium	7440-23-5	1	mg/L	16	48	6420	1100	3870
Potassium	7440-09-7	1	mg/L	6	9	9	4	15
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	1.99	5.61	389	57.1	222
ø Total Cations	----	0.01	meq/L	2.01	4.98	415	53.0	212
ø Ionic Balance	----	0.01	%	----	5.88	3.23	3.72	2.38

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MP1	MP2	RN132773	L3	L4
			Sampling date / time	02-Jul-2025 00:00	02-Jul-2025 00:00	02-Jul-2025 00:00	03-Jul-2025 00:00	03-Jul-2025 00:00
Compound	CAS Number	LOR	Unit	EB2523359-011	EB2523359-012	EB2523359-013	EB2523359-014	EB2523359-015
				Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	52	11
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	90	249	299	578	149
Total Alkalinity as CaCO3	----	1	mg/L	90	249	299	630	161
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3	<1	1000	537	110
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	12	20	16900	1160	161
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	15	73	1350	31	35
Magnesium	7439-95-4	1	mg/L	4	15	1290	40	14
Sodium	7440-23-5	1	mg/L	18	19	8850	1000	140
Potassium	7440-09-7	1	mg/L	5	5	12	10	6
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	2.20	5.54	504	56.5	10.0
ø Total Cations	----	0.01	meq/L	2.00	----	----	----	----
ø Total Cations	----	0.01	meq/L	----	5.83	559	48.6	9.14
ø Ionic Balance	----	0.01	%	----	2.57	5.20	7.52	4.72

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	MP3	MP4	MP5	RN190143	----
			Sampling date / time	03-Jul-2025 00:00	03-Jul-2025 00:00	03-Jul-2025 00:00	03-Jul-2025 00:00	----
Compound	CAS Number	LOR	Unit	EB2523359-016	EB2523359-017	EB2523359-018	EB2523359-019	--------
				Result	Result	Result	Result	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**117**	**600**	**125**	**48**	----
Total Alkalinity as CaCO3	----	1	mg/L	**117**	**600**	**125**	**48**	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**3**	**2**	**2**	<1	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**25**	**30**	**23**	**12700**	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	**28**	**178**	**30**	**2240**	----
Magnesium	7439-95-4	1	mg/L	**9**	**38**	**9**	**132**	----
Sodium	7440-23-5	1	mg/L	**18**	**24**	**18**	**5970**	----
Potassium	7440-09-7	1	mg/L	**6**	**12**	**7**	**11**	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	**3.10**	**12.9**	**3.19**	**359**	----
ø Total Cations	----	0.01	meq/L	**3.07**	**13.4**	**3.20**	**383**	----
ø Ionic Balance	----	0.01	%	**0.50**	**1.85**	**0.18**	**3.15**	----

QUALITY CONTROL REPORT

Work Order	: **EB2523359**	Page	: 1 of 6
Client	: **DPM ENVIROSCIENCES PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MR DAVID MOORE	Contact	: Customer Services EB
Address	: 12 LAUREN DRIVE BUDERIM 4556	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3552-8685
Project	: DPM25005 Blackwater North Project	Date Samples Received	: 07-Jul-2025
Order number	: ----	Date Analysis Commenced	: 07-Jul-2025
C-O-C number	: ----	Issue Date	: 14-Jul-2025
Sampler	: DAVID MOORE		
Site	: ----		
Quote number	: EN/333		
No. of samples received	: 19		
No. of samples analysed	: 19		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 6702966)									
EB2523359-012	MP2	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	249	248	0.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	249	248	0.6	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 6705412)									
EB2522984-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	76	72	4.1	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	76	72	4.1	0% - 20%
EB2523359-010	MB06	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	280	279	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	280	279	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 6705427)									
EB2523450-004	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	32	36	13.7	0% - 20%
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	280	278	0.4	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	311	315	1.1	0% - 20%
EB2523359-017	MP4	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	600	601	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	600	601	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 6708262)									
EB2523603-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	152	164	7.5	0% - 20%
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	644	634	1.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	796	798	0.2	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 6705160)									
EB2523302-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	10	10	0.0	0% - 50%
EB2523359-005	R3	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	5	4	0.0	No Limit
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 6709712)									
EB2523450-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1110	1120	0.8	0% - 20%
EB2523359-018	MP5	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2	2	0.0	No Limit
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 6714744)									
EB2523359-011	MP1	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3	3	0.0	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 6705161)									
EB2523302-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	<1	<1	0.0	No Limit
EB2523359-005	R3	ED045G: Chloride	16887-00-6	1	mg/L	24	24	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 6709709)									
EB2523450-005	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	4730	4810	1.8	0% - 20%
EB2523359-018	MP5	ED045G: Chloride	16887-00-6	1	mg/L	23	23	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 6714745)									
EB2523359-011	MP1	ED045G: Chloride	16887-00-6	1	mg/L	12	13	0.0	0% - 50%
ED093F: Dissolved Major Cations (QC Lot: 6703163)									
EB2523114-006	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	15	15	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	12	12	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	282	281	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	4	4	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 6703172)									
EB2523040-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	<1	<1	0.0	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
EB2523241-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	24	25	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1	1	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	14	14	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.0	No Limit
ED093F: Dissolved Major Cations (QC Lot: 6703173)									
EB2523359-004	R9	ED093F: Calcium	7440-70-2	1	mg/L	15	15	0.0	0% - 50%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED093F: Dissolved Major Cations (QC Lot: 6703173) - continued									
EB2523359-004	R9	ED093F: Magnesium	7439-95-4	1	mg/L	4	4	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	12	12	0.0	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	5	5	0.0	No Limit
EB2523359-014	L3	ED093F: Calcium	7440-70-2	1	mg/L	31	31	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	40	40	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1000	1010	0.8	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	10	10	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 6702966)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	50 mg/L	109	80.0	120
ED037P: Alkalinity by PC Titrator (QCLot: 6705412)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	98.2	80.0	120
ED037P: Alkalinity by PC Titrator (QCLot: 6705427)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	104	80.0	120
ED037P: Alkalinity by PC Titrator (QCLot: 6708262)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	92.1	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6705160)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	94.7	85.0	118
				<1	100 mg/L	108	85.0	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6709712)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.6	85.0	118
				<1	100 mg/L	104	85.0	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6714744)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	97.5	85.0	118
				<1	100 mg/L	103	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 6705161)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	112	90.0	115
				<1	1000 mg/L	105	90.0	115
ED045G: Chloride by Discrete Analyser (QCLot: 6709709)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	113	90.0	115
				<1	1000 mg/L	110	90.0	115
ED045G: Chloride by Discrete Analyser (QCLot: 6714745)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	110	90.0	115
				<1	1000 mg/L	107	90.0	115
ED093F: Dissolved Major Cations (QCLot: 6703163)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	103	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	103	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	102	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	99.5	70.0	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED093F: Dissolved Major Cations (QCLot: 6703172)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	99.6	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	103	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	100	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.6	70.0	130
ED093F: Dissolved Major Cations (QCLot: 6703173)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	110	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	113	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.0	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	100.0	70.0	130

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6705160)							
EB2523302-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6709712)							
EB2523450-006	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 6714744)							
EB2523401-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	89.6	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 6705161)							
EB2523302-002	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	112	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 6709709)							
EB2523450-006	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2523359**	Page	: 1 of 7
Client	: **DPM ENVIROSCIENCES PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MR DAVID MOORE	Telephone	: +61-7-3552-8685
Project	: DPM25005 Blackwater North Project	Date Samples Received	: 07-Jul-2025
Site	: ----	Issue Date	: 14-Jul-2025
Sampler	: DAVID MOORE	No. of samples received	: 19
Order number	: ----	No. of samples analysed	: 19

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, where applicable to the methodology, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2523302--002	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2523450--006	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EB2523450--006	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED037P: Alkalinity by PC Titrator						
Clear Plastic Bottle - Natural						
L1	----	----	----	09-Jul-2025	01-Jul-2025	**8**
Clear Plastic Bottle - Natural						
R5, R6	----	----	----	09-Jul-2025	02-Jul-2025	**7**
Clear Plastic Bottle - Natural						
R9	----	----	----	09-Jul-2025	03-Jul-2025	**6**
Clear Plastic Bottle - Natural						
R3, R4	----	----	----	09-Jul-2025	04-Jul-2025	**5**
ED093F: Dissolved Major Cations						
Clear Plastic Bottle - Natural						
RN165940, RN165949	----	----	----	11-Jul-2025	08-Jul-2025	**3**
Clear Plastic Bottle - Natural						
MP1	----	----	----	10-Jul-2025	09-Jul-2025	**1**
Clear Plastic Bottle - Natural						
MB06, MP2, RN132773	----	----	----	11-Jul-2025	09-Jul-2025	**2**
Clear Plastic Bottle - Natural						
L3, L4, MP3, MP4, MP5, RN190143	----	----	----	11-Jul-2025	10-Jul-2025	**1**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) RN165940, RN165949	**01-Jul-2025**	**----**	----	----	**09-Jul-2025**	15-Jul-2025	✓
Clear Plastic Bottle - Natural (ED037-P) MP2, RN132773	**02-Jul-2025**	**----**	----	----	**08-Jul-2025**	16-Jul-2025	✓
Clear Plastic Bottle - Natural (ED037-P) MB06	**02-Jul-2025**	**----**	----	----	**09-Jul-2025**	16-Jul-2025	✓
Clear Plastic Bottle - Natural (ED037-P) MP1	**02-Jul-2025**	**----**	----	----	**10-Jul-2025**	16-Jul-2025	✓
Clear Plastic Bottle - Natural (ED037-P) L3, L4, MP3, MP4, MP5, RN190143	**03-Jul-2025**	**----**	----	----	**09-Jul-2025**	17-Jul-2025	✓
Clear Plastic Bottle - Natural (ED037-P) L1	**17-Jun-2025**	**----**	----	----	**09-Jul-2025**	01-Jul-2025	×
Clear Plastic Bottle - Natural (ED037-P) R5, R6	**18-Jun-2025**	**----**	----	----	**09-Jul-2025**	02-Jul-2025	×
Clear Plastic Bottle - Natural (ED037-P) R9	**19-Jun-2025**	**----**	----	----	**09-Jul-2025**	03-Jul-2025	×
Clear Plastic Bottle - Natural (ED037-P) R3, R4	**20-Jun-2025**	**----**	----	----	**09-Jul-2025**	04-Jul-2025	×
Clear Plastic Bottle - Natural (ED037-P) L2	**30-Jun-2025**	**----**	----	----	**09-Jul-2025**	14-Jul-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) RN165940, RN165949	**01-Jul-2025**	**----**	----	----	**08-Jul-2025**	29-Jul-2025	✓
Clear Plastic Bottle - Natural (ED041G) MB06, MP2, RN132773	**02-Jul-2025**	**----**	----	----	**08-Jul-2025**	30-Jul-2025	✓
Clear Plastic Bottle - Natural (ED041G) MP1	**02-Jul-2025**	**----**	----	----	**12-Jul-2025**	30-Jul-2025	✓
Clear Plastic Bottle - Natural (ED041G) L3, L4, MP3, MP4, MP5, RN190143	**03-Jul-2025**	**----**	----	----	**10-Jul-2025**	31-Jul-2025	✓
Clear Plastic Bottle - Natural (ED041G) L1	**17-Jun-2025**	**----**	----	----	**08-Jul-2025**	15-Jul-2025	✓
Clear Plastic Bottle - Natural (ED041G) R5, R6	**18-Jun-2025**	**----**	----	----	**08-Jul-2025**	16-Jul-2025	✓
Clear Plastic Bottle - Natural (ED041G) R9	**19-Jun-2025**	**----**	----	----	**08-Jul-2025**	17-Jul-2025	✓
Clear Plastic Bottle - Natural (ED041G) R3, R4	**20-Jun-2025**	**----**	----	----	**08-Jul-2025**	18-Jul-2025	✓
Clear Plastic Bottle - Natural (ED041G) L2	**30-Jun-2025**	**----**	----	----	**08-Jul-2025**	28-Jul-2025	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G) RN165940, RN165949	**01-Jul-2025**	**----**	----	----	**08-Jul-2025**	29-Jul-2025	✓
Clear Plastic Bottle - Natural (ED045G) MB06, MP2, RN132773	**02-Jul-2025**	**----**	----	----	**08-Jul-2025**	30-Jul-2025	✓
Clear Plastic Bottle - Natural (ED045G) MP1	**02-Jul-2025**	**----**	----	----	**12-Jul-2025**	30-Jul-2025	✓
Clear Plastic Bottle - Natural (ED045G) L3, L4, MP3, MP4, MP5, RN190143	**03-Jul-2025**	**----**	----	----	**10-Jul-2025**	31-Jul-2025	✓
Clear Plastic Bottle - Natural (ED045G) L1	**17-Jun-2025**	**----**	----	----	**08-Jul-2025**	15-Jul-2025	✓
Clear Plastic Bottle - Natural (ED045G) R5, R6	**18-Jun-2025**	**----**	----	----	**08-Jul-2025**	16-Jul-2025	✓
Clear Plastic Bottle - Natural (ED045G) R9	**19-Jun-2025**	**----**	----	----	**08-Jul-2025**	17-Jul-2025	✓
Clear Plastic Bottle - Natural (ED045G) R3, R4	**20-Jun-2025**	**----**	----	----	**08-Jul-2025**	18-Jul-2025	✓
Clear Plastic Bottle - Natural (ED045G) L2	**30-Jun-2025**	**----**	----	----	**08-Jul-2025**	28-Jul-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F) RN165940, RN165949	**01-Jul-2025**	**----**	----	----	**11-Jul-2025**	08-Jul-2025	×
Clear Plastic Bottle - Natural (ED093F) MP1	**02-Jul-2025**	**----**	----	----	**10-Jul-2025**	09-Jul-2025	×
Clear Plastic Bottle - Natural (ED093F) MB06, MP2, RN132773	**02-Jul-2025**	**----**	----	----	**11-Jul-2025**	09-Jul-2025	×
Clear Plastic Bottle - Natural (ED093F) L3, L4, MP3, MP4, MP5, RN190143	**03-Jul-2025**	**----**	----	----	**11-Jul-2025**	10-Jul-2025	×
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F) L1	**17-Jun-2025**	**----**	----	----	**11-Jul-2025**	15-Jul-2025	✓
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F) R5, R6	**18-Jun-2025**	**----**	----	----	**11-Jul-2025**	16-Jul-2025	✓
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F) R9	**19-Jun-2025**	**----**	----	----	**11-Jul-2025**	17-Jul-2025	✓
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F) R3, R4	**20-Jun-2025**	**----**	----	----	**11-Jul-2025**	18-Jul-2025	✓
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F) L2	**30-Jun-2025**	**----**	----	----	**11-Jul-2025**	28-Jul-2025	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	6	36	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	5	39	**12.82**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	5	34	**14.71**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	5	38	**13.16**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	36	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	6	39	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	34	**8.82**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	6	38	**15.79**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chloride by Discrete Analyser	ED045G	3	39	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	34	**8.82**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	3	38	**7.89**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	3	38	**7.89**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030E. This method is compliant with NEPM Schedule B(3)

Environmental Division
Brisbane
Work Order Reference
EB2523359

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Ph: 08 8359 0890 E: adelaide@alsglobal.com
BRISBANE 2 Byth Street Stafford QLD 4053
ALS Laboratory: please tick → Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
GLADSTONE 48 Callemondah Drive Gladstone QLD 4680
Ph: 07 4976 7942 E: ALSEnviro.Gladstone@alsglobal.com
MACKAY Unit 2 20 Caterpillar Drive Paget QLD 4740
Ph: 07 4952 5700 E: ALSEnviro.Mackay@alsglobal.com
MELBOURNE 2-4 Westall Road Springvale VIC 3171
Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
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Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
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Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
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Ph: 07 4773 0000 E: ALSEnviro.Townsville@alsglobal.com
WOLLONGONG 1/19-21 Ralph Black Drive, Nth Wollongong NSW
Ph: 02 4225 3125 E: wollongong@alsglobal.com

CHAIN OF CUSTODY

Telephone : + 61-7-3552-668

CLIENT: DPM Enviroscience Pty Ltd	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☐ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Buderim		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes
PROJECT: Blackwater North Project — PROJECT NO.: DPM25005	ALS QUOTE NO.: EN/333/20	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes
ORDER NUMBER: N/A — PURCHASE ORDER NO.: N/A	COUNTRY OF ORIGIN: Australia	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt:
PROJECT MANAGER: David Moore — CONTACT PH: 0427 694 433		OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: David Moore — SAMPLER MOBILE: 0427 694 433	RELINQUISHED BY: DAVID MOORE	RECEIVED BY: [signature] 7/7/25	RELINQUISHED BY:
COC Emailed to ALS? (YES / NO) — EDD FORMAT (or default):	DATE/TIME: 7/7/2025 14:30	DATE/TIME: 1430	DATE/TIME:
Email Reports to (will default to PM if no other addresses are listed): dmoore@dpm-enviro.com.au			RECEIVED BY:
Email Invoice to (will default to PM if no other addresses are listed): dmoore@dpm-enviro.com.au			DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	Cations & Anions: Major (Ca, Mg, Na, K, Cl, SO_4, Alkalinity) + Ionic Balance (Suite NT-1 & NT-2)								Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	L1	17/06/2025	W	P, N	2	✓								
2	R5	18/06/2025	W	P, N	2	✓								
3	R6	18/06/2025	W	P, N	2	✓								
4	R9	19/06/2025	W	P, N	2	✓								
5	R3	20/06/2025	W	P, N	2	✓								
6	R4	20/06/2025	W	P, N	2	✓								
7	L2	30/06/2025	W	P, N	2	✓								
8	RN165940	1/07/2025	W	P	1	✓								
9	RN165949	1/07/2025	W	P	1	✓								
10	MB06	2/07/2025	W	P	1	✓								
11	MP1	2/07/2025	W	P	1	✓								
12	MP2	2/07/2025	W	P	1	✓								
				TOTAL	19									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

CHAIN OF CUSTODY

ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
BRISBANE 2 Byth Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
GLADSTONE 46 Callemondah Drive Gladstone QLD 4680 Ph: 07 4979 7944 E: ALSEnviro.Gladstone@alsglobal.com
MACKAY Unit 2/20 Gallaghar Drive Paget QLD 4740 Ph: 07 4955 5795 E: ALSEnviro.Mackay@alsglobal.com
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TOWNSVILLE 13 Carlton Street Kirwan QLD 4817 Ph: 07 4773 5500 E: ALSEnviro.Townsville@alsglobal.com
WOLLONGONG 1/19-31 Ralph Black Drive, Unit Wollongong NSW 2500 Ph: 02 4225 3125 E: wollongong@alsglobal.com

ALS Laboratory: please tick →

CLIENT: DPM Enviroscience Pty Ltd	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Standard TAT (List due date):	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: Buderim		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: Blackwater North Project **PROJECT NO.:** DPM25005	**ALS QUOTE NO.:** EN/333/20	**COC SEQUENCE NUMBER (Circle)**	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: N/A **PURCHASE ORDER NO.:** N/A	**COUNTRY OF ORIGIN:** Australia	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: David Moore **CONTACT PH:** 0427 694 433		OFF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: David Moore **SAMPLER MOBILE:** 0427 694 433	**RELINQUISHED BY:** DAVID MOORE	**RECEIVED BY:** DM 7/7/25	**RELINQUISHED BY:** **RECEIVED BY:**
COC Emailed to ALS? (YES / NO) **EDD FORMAT (or default):**	DATE/TIME: 7/7/2025 14:30	DATE/TIME: 1430	DATE/TIME: DATE/TIME:
Email Reports to (will default to PM if no other addresses are listed): dmoore@dpm-enviro.com.au			
Email Invoice to (will default to PM if no other addresses are listed): dmoore@dpm-enviro.com.au			

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL BOTTLES	Cations & Anions: Major (Ca, Mg, Na, K, Cl, SO_4, Alkalinity) + Ionic Balance (Suite NT-1 & NT-2)								Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
13	RN132773	2/07/2025	W	P	1	✓								
14	L3	3/07/2025	W	P	1	✓								
15	L4	3/07/2025	W	P	1	✓								
16	MP3	3/07/2025	W	P	1	✓								
17	MP4	3/07/2025	W	P	1	✓								
18	MP5	3/07/2025	W	P	1	✓								
19	RN190143	3/07/2025	W	P	1	✓								
				TOTAL	7									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

CERTIFICATE OF ANALYSIS

Work Order	: **EB253995D**	Page	: 1 of 5
Client	: **PMV ENi IROSCIENCES MTY LTP**	Laboratory	: Environmental Division Brisbane
Contact	: MR DAVID MOORE	Contact	: Customer Services EB
Address	: 12 LAUREN DRIVE BUDERIM 4556	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3552-8685
Project	: DPM25005 Blackwater North Project	Date Samples Received	: 28-Oct-2025 11:15
Order number	: ----	Date Analysis Commenced	: 29-Oct-2025
C-O-C number	: ----	Issue Date	: 04-Nov-2025 15:54
Sampler	: DAVID MOORE		
Site	: ----		
Quote number	: EN/333		
No. of samples received	: 14		
No. of samples analysed	: 14		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Addtrtoal f tarrorp lrtoa herrtaean ro rstw rehorn btff ue rogad ta rse roffobtac wehl rl re lrrl Qsp earw: y gl ftn Coarrof Rehorrl y Aw C Cop hftl aQe Awwewwp ean ro lwwtwn b trs y gl ftn Re. teb l ad Sl p hfe ReQethnNortrtQl rtoa^

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
6 = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- ED045G: The presence of Thiocyanate, Thiosulfate and Sulfite can positively contribute to the chloride result, thereby may bias results higher than expected. Results should be scrutinised accordingly.

Analytical Results

Sub-Matrix: WATER 0Matrix: WATER4			Sample ID	L(	L3	LD	RN (15) D-	R1
			Sampling date / time	28-Oct-2025 00:00	28-Oct-2025 00:00	28-Oct-2025 00:00	28-Oct-2025 00:00	28-Oct-2025 00:00
Compound	CAS Number	LOR	Unit	EB253995D7- - (	EB253995D7- - 2	EB253995D7- - 3	EB253995D7- - D	EB253995D7- - 5
				Result	Result	Result	Result	Result
EA- 15: Torl f Hl rdaewwl wCl CO3								
Torl f Hl rdaewwl wCl CO3	----	1	mg/L	31	223	(x(	135-	xx
EP- 39M: Afkl ftatn u, MC Ttrrl ror								
H, dro8tde Afkl ftatn l wCl CO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Cl ruoal re Afkl ftatn l wCl CO3	3812-32-6	1	mg/L	(5	(D	<1	<1	9
BtQl ruoal re Afkl ftatn l wCl CO3	71-52-3	1	mg/L	5D	Dxx	( ) x	D- (	(D9
Torl f Afkl ftatn l wCl CO3	----	1	mg/L	1)	5- 2	( ) x	D- (	(55
EP- D(G: Sgfrhre 0Tgrutdtp enrtQ4l wSOD 27u, PA								
Sgfrhre l wSOD 7Tgrutdtp enrtQ	14808-79-8	1	mg/L	<1	352	(52	D) 1	D
EP- D5G: Csfortde u, PtwQrere Aal f, wer								
Csfortde	16887-00-6	1	mg/L	(2	) Dx	232	((9- -	Dx
EP-) 3F: Ptwwof. ed V l jor Cl rtoaw								
Cl fQtgp	7440-70-2	1	mg/L	x	25	3x	x) 9	(9
V l caewtgp	7439-95-4	1	mg/L	D	3)	2(	)))	((
Sodtgp	7440-23-5	1	mg/L	21	) 3)	22x	5) 2-	5D
Morl wwtgp	7440-09-7	1	mg/L	D	((	9	)	)
EN- 55: loatQBl fl aQe								
ø Torl f Aatoaw	----	0.01	meq/L	(^92	DD^(	(3^9	3Dx	D^53
ø Torl f Cl rtoaw	----	0.01	meq/L	(^) 1	D5^1	(3^9	3x5	D^33
ø loatQBl fl aQe	----	0.01	%	7777	(^15	- ^2-	D^) 1	2^29

Analytical Results

Sub-Matrix: WATER 0Matrix: WATER4			Sample ID	L2	RN (15) D)	R3	RN ( ) - (D3	V M(
			Sampling date / time	28-Oct-2025 00:00	28-Oct-2025 00:00	28-Oct-2025 00:00	28-Oct-2025 00:00	28-Oct-2025 00:00
Compound	CAS Number	LOR	Unit	EB253995D7- - 1	EB253995D7- - 9	EB253995D7- - x	EB253995D7- -)	EB253995D7- (-
				Result	Result	Result	Result	Result
EA- 15: Torl f Hl rdaewwl wCl CO3								
Torl f Hl rdaewwl wCl CO3	----	1	mg/L	(92	(x(	(9-	5D9-	32D
EP- 39M: Afkl ftatn u, MC Ttrrl ror								
H, dro8tde Afkl ftatn l wCl CO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1
Cl ruoal re Afkl ftatn l wCl CO3	3812-32-6	1	mg/L	<1	(2	<1	<1	<1
BtCl ruoal re Afkl ftatn l wCl CO3	71-52-3	1	mg/L	(D5	92D	(1D	3)	35-
Torl f Afkl ftatn l wCl CO3	----	1	mg/L	(D5	931	(1D	3)	35-
EP- D(G: Sgfrhre 0Tgrutdtp errtQ4l wSOD 27u, PA								
Sgfrhre l wSOD 7Tgrutdtp errtQ	14808-79-8	1	mg/L	(((	(19	2	<1	<1
EP- D5G: Csfortde u, PtwQrere Aal f, wer								
Csfortde	16887-00-6	1	mg/L	1x	) 23	x9	(23- -	(5
EP-) 3F: Ptwwof. ed V l jor Cl rtoaw								
Cl fQtgp	7440-70-2	1	mg/L	3(	D(	D-	( ) 1-	) 2
V l caewtgp	7439-95-4	1	mg/L	23	( )	(9	(D(	23
Sodtgp	7440-23-5	1	mg/L	) 1	) (5	5x	59x-	25
Morl wwtgp	7440-09-7	1	mg/L	(-	3	(D	(-	)
EN- 55: loatQBl fl aQe								
ø Torl f Aatoaw	----	0.01	meq/L	9'(3	DD'2	5'99	3Dx	9'D2
ø Torl f Cl rtoaw	----	0.01	meq/L	9^x9	D3'5	1'2x	31(	9^x-
ø loatQBl fl aQe	----	0.01	%	D') 9	- ^xD	D'(x	(^xx	2'53

Analytical Results

Sub-Matrix: WATER
0Matrix: WATER4

			Sample ID	VM3	VB-1	VB(3A	VM5	7777
			Sampling date / time	28-Oct-2025 00:00	28-Oct-2025 00:00	28-Oct-2025 00:00	28-Oct-2025 00:00	----
Compound	CAS Number	LOR	Unit	EB253995D7-((	EB253995D7-(2	EB253995D7-(3	EB253995D7-(D	77777777
				Result	Result	Result	Result	----
EA-15: Torl f Hl rdaewwl wCl CO3								
Torl f Hl rdaewwl wCl CO3	----	1	mg/L	(59	2(x-	9)3-	(33	7777
EP-39M: Afkl ftatn u, MC Ttrrl ror								
H, dro8tde Afkl ftatn l wCl CO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	7777
Cl ruoal re Afkl ftatn l wCl CO3	3812-32-6	1	mg/L	<1	<1	<1	<1	7777
BtCl ruoal re Afkl ftatn l wCl CO3	71-52-3	1	mg/L	(9x	25(	21)	(19	7777
Torl f Afkl ftatn l wCl CO3	----	1	mg/L	(9x	25(	21)	(19	7777
EP-D(G: Sgfrhre 0Tgrutdtp enrtQ4l wSOD27u, PA								
Sgfrhre l wSOD7Tgrutdtp enrtQ	14808-79-8	1	mg/L	<1	599	)52	D	7777
EP-D5G: Csfortde u, PtwQrere Aal f, wer								
Csfortde	16887-00-6	1	mg/L	(1	9()-	(12--	(5	7777
EP-)3F: Ptwwof. ed Vl jor Cl rtoaw								
Cl fQtgp	7440-70-2	1	mg/L	D3	D1(	((x-	35	7777
Vl caewtgp	7439-95-4	1	mg/L	(2	2D)	(2(-	((	7777
Sodtgp	7440-23-5	1	mg/L	2-	D-(-	x2D-	(D	7777
Morl wwtgp	7440-09-7	1	mg/L	9	(3	(2	)	7777
EN-55: loatQBl fl aQe								
ø Torl f Aatoaw	----	0.01	meq/L	D^(	22-	Dx2	3^xD	7777
ø Torl f Cl rtoaw	----	0.01	meq/L	D^(x	2(x	5(9	3^D)	7777
ø loatQBl fl aQe	----	0.01	%	2^(3	-^31	3^5-	D^x-	7777

QUALITY CONTROL REPORT

Work Order	: **EB253995D**	Page	: 1 of 5
Client	: **MPV ENSIRO0 CIENCE0 PTY LTM**	Laboratory	: Environmental Division Brisbane
Contact	: MR DAVID MOORE	Contact	: Customer Services EB
Address	: 12 LAUREN DRIVE BUDERIM 4556	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3552-8685
Project	: DPM25005 Blackwater North Project	Date Samples Received	: 28-Oct-2025
Order number	: ----	Date Analysis Commenced	: 29-Oct-2025
C-O-C number	: ----	Issue Date	: 04-Nov-2025
Sampler	: DAVID MOORE		
Site	: ----		
Quote number	: EN/333		
No. of samples received	: 14		
No. of samples analysed	: 14		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Beatriz Llarinas	Senior Chemist	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EM739P: Alkalinity by PC Titrator (QC Lot: 6) 65D4) 1									
EB2537745-001	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	94	94	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	94	94	0.0	0% - 20%
EB2537745-017	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	93	90	3.8	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	93	90	3.8	0% - 20%
EM739P: Alkalinity by PC Titrator (QC Lot: 6) 65D) 71									
EB2537754-011	MP3	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	178	180	0.8	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	178	180	0.8	0% - 20%
EM7D8G: 0ulfate (Turbidimetric1as 0OD2- by MA (QC Lot: 6) 654) 81									
EB2537761-015	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	33	33	0.0	0% - 20%
EB2537754-002	L3	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	352	349	0.8	0% - 20%
EM7D8G: 0ulfate (Turbidimetric1as 0OD2- by MA (QC Lot: 6) 654) 21									
EB2537754-012	MB06	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	577	582	0.8	0% - 20%
EB2537952-006	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	29	28	0.0	0% - 20%
EM7D5G: Chloride by Miscrete Analyser (QC Lot: 6) 654441									
EB2537761-015	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	25	26	0.0	0% - 20%
EB2537754-002	L3	ED045G: Chloride	16887-00-6	1	mg/L	948	972	2.5	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EM7D5G: Chloride by Miscrete Analyser (QC Lot: 6) 6544) 1									
EB2537754-012	MB06	ED045G: Chloride	16887-00-6	1	mg/L	7190	7270	1.0	0% - 20%
EB2537952-006	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	72	72	0.0	0% - 20%
EM7) 3F: Missolved V ajor Cations (QC Lot: 6) 636681									
EB2537528-009	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	28	29	3.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	18	18	0.0	0% - 50%
		ED093F: Sodium	7440-23-5	1	mg/L	106	107	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	23	23	0.0	0% - 20%
EB2537754-004	RN 165940	ED093F: Calcium	7440-70-2	1	mg/L	897	936	4.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	999	1030	2.7	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	5920	6080	2.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	9	9	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EM739P: Alkalinity by PC Titrator (QCLot: 6) 65D4) 1								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	92.4	80.0	120
EM739P: Alkalinity by PC Titrator (QCLot: 6) 65D) 71								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	50 mg/L	91.8	80.0	120
EM7D8G: 0 ulfate (Turbidimetric1as 0 OD 2- by MA (QCLot: 6) 654) 81								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	95.0	85.0	118
				<1	100 mg/L	89.2	85.0	118
EM7D8G: 0 ulfate (Turbidimetric1as 0 OD 2- by MA (QCLot: 6) 654) 21								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	91.5	85.0	118
				<1	100 mg/L	91.0	85.0	118
EM7D5G: Chloride by Miscrete Analyser (QCLot: 6) 654441								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	115	90.0	115
				<1	1000 mg/L	101	90.0	115
EM7D5G: Chloride by Miscrete Analyser (QCLot: 6) 6544) 1								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	114	90.0	115
				<1	1000 mg/L	102	90.0	115
EM7) 3F: Missolved V ajor Cations (QCLot: 6) 636681								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	99.6	70.0	130
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	103	70.0	130
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	96.8	70.0	130
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	94.8	70.0	130

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EM7D8G: 0 ulfate (Turbidimetric1as 0 OD 2- by MA (QCLot: 6) 654) 81							
EB2537761-013	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EM7D8G: 0ulfate (Turbidimetric1as 0OD2- by MA (QCLot: 6) 654) 21							
EB2537754-013	MB13A	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
EM7D5G: Chloride by Miscrete Analyser (QCLot: 6) 654441							
EB2537761-013	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	109	70.0	130
EM7D5G: Chloride by Miscrete Analyser (QCLot: 6) 6544) 1							
EB2537754-013	MB13A	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2537754**	Page	: 1 of 5
Client	: **DPM ENVIROSCIENCES PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: MR DAVID MOORE	Telephone	: +61-7-3552-8685
Project	: DPM25005 Blackwater North Project	Date Samples Received	: 28-Oct-2025
Site	: ----	Issue Date	: 04-Nov-2025
Sampler	: DAVID MOORE	No. of samples received	: 14
Order number	: ----	No. of samples analysed	: 14

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, where applicable to the methodology, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2537761--013	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2537754--013	MB13A	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EB2537754--013	MB13A	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA065: Total Hardness as CaCO3							
Clear Plastic Bottle - Natural (ED093F) MP1, MP3, MB06, MB13A, MP5	**28-Oct-2025**	**----**	----	----	**03-Nov-2025**	04-Nov-2025	✓
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F) L1, L3, L4, RN 165940, R6, L2, RN 165949, R3, RN 190143	**28-Oct-2025**	**----**	----	----	**03-Nov-2025**	25-Nov-2025	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
L1, L3, L4, RN 165940, R6, L2, RN 165949, R3, RN 190143, MP1, MP3, MB06, MB13A, MP5	**28-Oct-2025**	**----**	----	----	**31-Oct-2025**	11-Nov-2025	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
L1, L3, L4, RN 165940, R6, L2, RN 165949, R3, RN 190143, MP1, MP3, MB06, MB13A, MP5	**28-Oct-2025**	**----**	----	----	**29-Oct-2025**	25-Nov-2025	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
L1, L3, L4, RN 165940, R6, L2, RN 165949, R3, RN 190143, MP1, MP3, MB06, MB13A, MP5	**28-Oct-2025**	**----**	----	----	**29-Oct-2025**	25-Nov-2025	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
MP1, MP3, MB06, MB13A, MP5	**28-Oct-2025**	**----**	----	----	**03-Nov-2025**	04-Nov-2025	✓
Clear Plastic Bottle - Nitric Acid; Filtered (ED093F)							
L1, L3, L4, RN 165940, R6, L2, RN 165949, R3, RN 190143	**28-Oct-2025**	**----**	----	----	**03-Nov-2025**	25-Nov-2025	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected	Evaluation	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	3	23	**13.04**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	32	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	32	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	23	**8.70**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	32	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	32	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chloride by Discrete Analyser	ED045G	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. Auto Titrator) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030E. This method is compliant with NEPM Schedule B(3)

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com

MUDGEE 1/29 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com

NEWCASTLE 5/585 Maitland Road Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com

NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 02 4423 2063 E: nowra@alsglobal.com

PERTH 26 Rigali Way Wangara WA 6065 Ph: 08 9406 1301 E: samples.perth@alsglobal.com

SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

TOWNSVILLE 13 Carlton Street Kirwan QLD 4817 Ph: 07 4773 0000 E: ALSEnviro.Townsville@alsglobal.com

WOLLONGONG 1/19-21 Ralph Black Drive, Nth Wollongong NSW 2500 Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT: DPM Enviroscience Pty Ltd	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Standard TAT (List due date):	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: Buderim		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: Blackwater North Project **PROJECT NO.:** DPM25005	**ALS QUOTE NO.:** EN/333/20	**COC SEQUENCE NUMBER (Circle)**	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: N/A **PURCHASE ORDER NO.:** N/A	**COUNTRY OF ORIGIN:** Australia	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: David Moore **CONTACT PH:** 0427 694 433		OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: David Moore **SAMPLER MOBILE:** 0427 694 433	**RELINQUISHED BY:** DAVID MOORE	**RECEIVED BY:** 28/10/25	**RELINQUISHED BY:** **RECEIVED BY:**
COC Emailed to ALS? (YES / NO) **EDD FORMAT (or default):**	DATE/TIME: 28/10/2025 11:15	DATE/TIME: 1115	DATE/TIME: DATE/TIME:
Email Reports to (will default to PM if no other addresses are listed): dmoore@dpm-enviro.com.au			
Email Invoice to (will default to PM if no other addresses are listed): dmoore@dpm-enviro.com.au			

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE *(refer to codes below)*	TOTAL BOTTLES	Anions: Major (Cl, SO_4, Alkalinity) (Suite NT-2)	Cations: Major (Ca, Mg, Na, K), Hardness (Suite NT-1D)							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	L1	20/10/2025	W	P, N	2	✓	✓							
2	L3	20/10/2025	W	P, N	2	✓	✓							
3	L4	20/10/2025	W	P, N	2	✓	✓							
4	RN 165940	20/10/2025	W	P, N	2	✓	✓							
5	R6	21/10/2025	W	P, N	2	✓	✓							
6	L2	22/10/2025	W	P, N	2	✓	✓							
7	RN 165949	22/10/2025	W	P, N	2	✓	✓							
8	R3	22/10/2025	W	P, N	2	✓	✓							
9	RN 190143	23/10/2025	W	P, N	2	✓	✓							
10	MP1	25/10/2025	W	P	1	✓	✓							
11	MP3	25/10/2025	W	P	1	✓	✓							
12	MB06	25/10/2025	W	P	1	✓	✓							
13	MB13A	25/10/2025	W	P	1	✓	✓							
14	MP5	25/10/2025	W	P	1	✓	✓							
				TOTAL	23									

Environmental Division
Brisbane
Work Order Reference
EB2537754

Telephone : +61-7-3552-8666

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

Appendix E: Aquatic Macroinvertebrate Data

DPM25005 - Blackwater North Project - June 2025

Sample picked by			DM	CP	DM	CP	DM	CP	DM	CP	DM	CP	CP	CP
Date sampled			20/06/2025	20/06/2025	20/06/2025	20/06/2025	18/06/2025	18/06/2025	18/06/2025	18/06/2025	19/06/2025	19/06/2025	17/06/2025	30/06/2025
Sample processed by			CP	CP	CP	CP	CP	CP	CP	CP	CP	CP	CP	CP
Date processed			07/07/2025	07/07/2025	07/07/2025	07/07/2025	25/06/2025	27/06/2025	25/06/2025	25/06/2025	25/06/2025	24/06/2025	08/07/2025	07/07/2025
Site name			R3	R3	R4	R4	R5	R5	R6	R6	R9	R9	L1	L2
Habitat type	SIGNAL 2	AUSRIVAS	EDGE	BED	EDGE	BED	EDGE	BED	EDGE	BED	EDGE	BED	COMP	COMP
ph. Porifera	4	IA019999												
cl. Hydrozoa														
Clavidae	3	IB029999												
Hydridae	2	IB019999												
ph. Nematoda	3	II999999											4	3
ph. Nemertea	3	IH999999												
ph. Nematomorpha	6	IJ999999												
Gordiidae	5	IJ019999												
ph. Platyhelminthes														
Dalyelliidae														
Dugesiidae	2	IF619999												
Provorticidae														
cl. Temnocephalidea	5	IF419999			1					2		2		
s.c. Hirudinea														
Erpobdellidae	1	LH059999												
Glossiphoniidae	1	LH019999												
Hirudinidae	4	LH999999	1											
ph. Annelida														
s.c. Oligochaeta	2	LO999999	4	13		2	5	8					3	1
cl. Bivalvia														
Corbiculidae	4	KP029999												
Hyriidae	5	KP019999												
Sphaeriidae	5	KP039999												
cl. Gastropoda														
Ancylidae	4	KG069999												1
Bithyniidae	3	KG039999												
Glacidorbidae	5	KG099999												
Hydrobiidae	4	KG029999												
Lymnaeidae	1	KG059999												2
Physidae	1	KG089999												1
Planorbidae	2	KG079999											3	2
Thiaridae	4	KG049999												
Viviparidae	4	KG019999												
cl. Arachnida														
s.c. Acarina	6	MM999999					1	3	3	5			19	13
o. Araneae	-	-												
s.c. Branchiura	1	OK999999												
o. Cladocera	-	OG999999	14	9	12	37	6		17	22	7	50	14	8
s.c. Copepoda	-	OJ999999	18	50	23	50	41	21	19	50	15	50	28	18
o. Conchostraca	1	OF999999												
cl. Ostracoda	-	OH999999	4	8			4	1	12	2	6	1	5	4
o. Amphipoda														
Corophiidae	4	OP059999												
Hyalidae	3	-												
Paramelitidae	4	OP069999												
Talitridae	3	OP019999												
o. Isopoda														
Cirolanidae	2	OR129999												
Scyphacidae	2	OR259999												
Sphaeromatidae	1	OR139999												
su.o. Syncarida														
Psammaspididae	-	ON059999												
o. Decapoda														
Atyidae	3	OT019999	9	1							2		8	1
Palaemonidae	4	OT029999	1	4	17	15	3	3	2		1	5	1	1
Parastacidae	4	OV019999	1		2					3	1	1	1	
s.c. Collembola	1	QA999999												
o. Lepidoptera														
Crambidae	2	QL999999											1	2
o. Megaloptera														
Corydalidae	7	QM019999												
Sialidae	5	QM029999												
o. Neuroptera														
Sisyridae	3	QN059999												
o. Coleoptera														
Carabidae	3	QC059999												
Chrysomelidae	2	QCAH9999												3
Curculionidae	2	QCAN9999												
Dytiscidae	2	QC099999	23	15	10	7	8	9	12	7	14	4	17	12
Elmidae	7	QC349999												
Georissidae	-	-												
Gyrinidae	4	QC109999	4	4										

Sample picked by			DM	CP	DM	CP	DM	CP	DM	CP	DM	CP	CP	CP
Date sampled			20/06/2025	20/06/2025	20/06/2025	20/06/2025	18/06/2025	18/06/2025	18/06/2025	18/06/2025	19/06/2025	19/06/2025	17/06/2025	30/06/2025
Sample processed by			CP	CP	CP	CP	CP	CP	CP	CP	CP	CP	CP	CP
Date processed			07/07/2025	07/07/2025	07/07/2025	07/07/2025	25/06/2025	27/06/2025	25/06/2025	25/06/2025	25/06/2025	24/06/2025	08/07/2025	07/07/2025
Site name			R3	R3	R4	R4	R5	R5	R6	R6	R9	R9	L1	L2
Habitat type	SIGNAL 2	AUSRIVAS	EDGE	BED	EDGE	BED	EDGE	BED	EDGE	BED	EDGE	BED	COMP	COMP
Haliplidae	2	QC069999												
Heteroceridae	1	QC369999												
Hydraenidae	3	QC139999	31	14	8	11	31		12		10	8	1	5
Hydrochidae	4	QCAO9999	13	1		1	2	1	4		1		6	23
Hydrophilidae	2	QC119999	8			1	3						2	5
Hygrobiidae	1	QC079999												
Limnichidae	4	QC359999												
Nanophyidae	3	-												
Noteridae	4	QC089999	1						7					3
Psephenidae	6	QC379999												
Ptilodactylidae	10	QC399999												
Scirtidae	6	QC209999									3	1		
Spercheidae	2	-												
Sphaeriusidae	7	-												
Staphylinidae	3	QC189999												
o. Diptera														
Athericidae	8	QD229999												
Blephariceridae	10	QD049999												
Ceratopogonidae	4	QD099999	2	10					1				18	10
Chaoboridae	2	QD059999				1		12				3		
s.f. Aphroteniinae	8	QDAA9999												
s.f. Chironominae	3	QDAJ9999	49	42			7	4	12	6			23	26
s.f. Orthocladiinae	4	QDAF9999								1			1	
s.f. Tanypodinae	4	QDAE9999	2	5				4	2	2			5	14
Corethrellidae	-	-												
Culicidae	1	QD079999	2	4		11	1	1			1	1	1	
Dixidae	7	QD069999												
Dolichopodidae	3	QD369999												
Empididae	5	QD359999												
Ephydridae	2	QD789999				2								
Muscidae	1	QD899999												
Pelecorhynchidae	10	QD209999												
Psychodidae	3	QD129999												
Sciomyzidae	2	QD459999												
Simuliidae	5	QD109999												
Stratiomyidae	2	QD249999												
Syrphidae	2	QD439999												
Tabanidae	3	QD239999											2	
Tanyderidae	6	QD039999												
Thaumaleidae	7	QD119999												
Tipulidae	5	QD019999	2						1					
o. Ephemeroptera														
Ameletopsidae	7	QE049999												
Baetidae	5	QE029999	1	5			1						27	9
Caenidae	4	QE089999												
Leptophlebiidae	8	QE069999												
Teloganodidae	9	QE079999												
o. Hemiptera														
Aphelocheiridae	-	-												
Belostomatidae	1	QH629999												
Corixidae	2	QH659999	1	1			1							
Dipsocoridae	-	-												
Gelastocoridae	5	QH649999												
Gerridae	4	QH579999	9		2		5		1		17			
Hebridae	3	QH539999												
Hydrometridae	3	QH549999	6		2									
Leptopodidae	-	QH589999												
Mesoveliidae	2	QH529999												4
Micronectidae	2	-					19	2	8		2		1	1
Naucoridae	2	QH669999												
Nepidae	3	QH619999	1							2				
Notonectidae	1	QH679999	25	11	14	10	13	16	5	1	25	13		1
Ochteridae	2	QH639999												
Pleidae	2	QH689999	3				1						6	17
Saldidae	1	QH609999												
Veliidae	3	QH569999	11		23	3	20	2	29		22	6		3
s.o. Zygoptera														
Argiolestidae	5	-												
Calopterygidae	-	QO109999												
Chlorocyphidae	-	-												
Chorismagrionidae	-	QO189999												
Coenagrionidae	2	QO029999	3										2	13
Diphlebiidae	6	QO099999												
Hemiphlebiidae	-	QO019999												

Sample picked by			DM	CP	DM	CP	DM	CP	DM	CP	DM	CP	CP	CP
Date sampled			20/06/2025	20/06/2025	20/06/2025	20/06/2025	18/06/2025	18/06/2025	18/06/2025	18/06/2025	19/06/2025	19/06/2025	17/06/2025	30/06/2025
Sample processed by			CP	CP	CP	CP	CP	CP	CP	CP	CP	CP	CP	CP
Date processed			07/07/2025	07/07/2025	07/07/2025	07/07/2025	25/06/2025	27/06/2025	25/06/2025	25/06/2025	25/06/2025	24/06/2025	08/07/2025	07/07/2025
Site name			R3	R3	R4	R4	R5	R5	R6	R6	R9	R9	L1	L2
Habitat type	SIGNAL 2	AUSRIVAS	EDGE	BED	EDGE	BED	EDGE	BED	EDGE	BED	EDGE	BED	COMP	COMP
Isostictidae	3	QO039999												
Lestidae	1	QO059999												
Lestoideidae	9	QO069999												
Platycnemididae	4	QO049999												
Synlestidae	7	QO089999												
s.o. Epiprocta														
Aeshnidae	4	QO129999	1										1	2
Archipetaliidae	-	QO199999												
Austrocorduliidae	10	QO279999												
Austropetaliidae	-	QO209999												
Brachytronidae	-	-												
Cordulephyidae	5	QO289999												
Corduliidae	5	QO169999												
Gomphidae	5	QO139999							1	1				
Gomphomacromiidae	-	QO249999												
Hemicorduliidae	5	QO309999	1				1							1
Libellulidae	4	QO179999											2	5
Lindeniidae	3	QO229999												2
Macromiidae	8	QO269999												
Oxygastridae	-	QO299999												
Petaluridae	-	QO159999												
Pseudocorduliidae	-	QO259999												
Synthemistidae	2	QO239999												
Telephlebiidae	9	QO219999												
o. Plecoptera														
Gripopterygidae	8	QP039999												
o. Trichoptera														
Antipodoeciidae	8	QT169999												
Atriplectididae	7	QT239999												
Calamoceratidae	7	QT249999												
Calocidae	9	QT189999												
Conoesucidae	7	QT159999												
Dipseudopsidae	9	QT269999												
Ecnomidae	4	QT089999												
Glossosomatidae	9	QT029999												
Helicophidae	10	QT199999												
Helicopsychidae	8	QT069999												
Hydrobiosidae	8	QT019999												
Hydropsychidae	6	QT179999												
Hydroptilidae	4	QT039999												
Kokiriidae	3	QT209999												
Leptoceridae	6	QT259999	14	6									1	5
Limnephilidae	8	QT109999												
Odontoceridae	7	QT229999												
Oeconesidae	8	QT129999												
Philopotamidae	8	QT049999												
Philorheithridae	8	QT219999												
Plectrotarsidae	-	QT119999												
Polycentropodidae	7	QT079999												
Psychomyiidae	-	QT099999												
Stenopsychidae	-	QT059999												
Tasimiidae	8	QT139999												
Notes														
Taxa count			**31**	**18**	**11**	**13**	**20**	**14**	**18**	**13**	**15**	**13**	**28**	**34**
Taxa count (per site)			**31**		**17**		**22**		**22**		**17**		**28**	**34**
No. Individuals			**265**	**203**	**114**	**151**	**173**	**87**	**148**	**104**	**127**	**145**	**203**	**221**
PET taxa			**2**	**2**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**2**	**2**
Plecoptera			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
% Plecoptera			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Ephemeroptera			**1**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**1**
% Ephemeroptera			**3**	**6**	**0**	**0**	**5**	**0**	**0**	**0**	**0**	**0**	**4**	**3**
Trichoptera			**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**
% Trichoptera			**3**	**6**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**3**
% Other taxa			**94**	**89**	**100**	**100**	**95**	**100**	**100**	**100**	**100**	**100**	**93**	**94**
SIGNAL 2 average (Family)			**3.32**	**3.20**	**3.22**	**2.36**	**3.00**	**2.83**	**3.60**	**3.70**	**3.08**	**3.10**	**3.24**	**3.06**
Tolerant taxa (SIGNAL2≤3)			**14**	**8**	**5**	**9**	**11**	**8**	**6**	**4**	**7**	**6**	**14**	**19**
% tolerant taxa			**50**	**53**	**56**	**82**	**65**	**67**	**40**	**40**	**58**	**60**	**56**	**61**

DPM25005 - Blackwater North Project - October 2025

Sample picked by			DM	CP	DM	CP	CP	CP
Date sampled			22/10/2025	22/10/2025	21/10/2025	21/10/2025	20/10/2025	22/10/2025
Sample processed by			DM	DM	DM	DM	DM	DM
Date processed			05/11/2025	06/11/2025	04/11/2025	04/11/2025	05/11/2025	06/11/2025
Site name			R3	R3	R6	R6	L1	L2
Habitat type	SIGNAL 2	AUSRIVAS	EDGE	BED	EDGE	BED	COMP	COMP
ph. Porifera	4	IA019999						
cl. Hydrozoa								
Clavidae	3	IB029999						
Hydridae	2	IB019999						
ph. Nematoda	3	II999999					1	
ph. Nemertea	3	IH999999						
ph. Nematomorpha	6	IJ999999						
Gordiidae	5	IJ019999						
ph. Platyhelminthes								
Dalyelliidae								
Dugesiidae	2	IF619999						
Provorticidae								
cl. Temnocephalidea	5	IF419999						
s.c. Hirudinea								
Erpobdellidae	1	LH059999						
Glossiphoniidae	1	LH019999						
Hirudinidae	4	LH999999						
ph. Annelida								
s.c. Oligochaeta	2	LO999999	2	7	1	3	4	
cl. Bivalvia								
Corbiculidae	4	KP029999						
Hyriidae	5	KP019999						
Sphaeriidae	5	KP039999						
cl. Gastropoda								
Ancylidae	4	KG069999						
Bithyniidae	3	KG039999						
Glacidorbidae	5	KG099999						
Hydrobiidae	4	KG029999						
Lymnaeidae	1	KG059999						
Physidae	1	KG089999	6	7				7
Planorbidae	2	KG079999	8		1			17
Thiaridae	4	KG049999		1				3
Viviparidae	4	KG019999		2				
cl. Arachnida								
s.c. Acarina	6	MM999999			6	13	29	15
o. Araneae	-	-						
s.c. Branchiura	1	OK999999						
o. Cladocera	-	OG999999				10		1
s.c. Copepoda	-	OJ999999	3	12	5	10	4	2
o. Conchostraca	1	OF999999						
cl. Ostracoda	-	OH999999	2		9	15		1
o. Amphipoda								
Corophiidae	4	OP059999						
Hyalidae	3	-						
Paramelitidae	4	OP069999						
Talitridae	3	OP019999						
o. Isopoda								
Cirolanidae	2	OR129999						
Scyphacidae	2	OR259999						
Sphaeromatidae	1	OR139999						
su.o. Syncarida								
Psammaspididae	-	ON059999						
o. Decapoda								

Sample picked by			DM	CP	DM	CP	CP	CP
Date sampled			22/10/2025	22/10/2025	21/10/2025	21/10/2025	20/10/2025	22/10/2025
Sample processed by			DM	DM	DM	DM	DM	DM
Date processed			05/11/2025	06/11/2025	04/11/2025	04/11/2025	05/11/2025	06/11/2025
Site name			**R3**	**R3**	**R6**	**R6**	**L1**	**L2**
Habitat type	**SIGNAL 2**	**AUSRIVAS**	**EDGE**	**BED**	**EDGE**	**BED**	**COMP**	**COMP**
Atyidae	3	OT019999	1					
Palaemonidae	4	OT029999	16	12	2		5	5
Parastacidae	4	OV019999	1	1	1	1	1	
s.c. Collembola	1	QA999999						
o. Lepidoptera								
Crambidae	2	QL999999						7
o. Megaloptera								
Corydalidae	7	QM019999						
Sialidae	5	QM029999						
o. Neuroptera								
Sisyridae	3	QN059999						
o. Coleoptera								
Carabidae	3	QC059999						
Chrysomelidae	2	QCAH9999						
Curculionidae	2	QCAN9999						
Dytiscidae	2	QC099999	27	11	21	18	16	27
Elmidae	7	QC349999						
Georissidae	-	-						
Gyrinidae	4	QC109999	5	1		1		
Haliplidae	2	QC069999						
Heteroceridae	1	QC369999						
Hydraenidae	3	QC139999	11	6	4	4	3	6
Hydrochidae	4	QCAO9999	5		21	15	8	19
Hydrophilidae	2	QC119999	1		2			3
Hygrobiidae	1	QC079999						
Limnichidae	4	QC359999						
Nanophyidae	3	-						
Noteridae	4	QC089999	3		8			5
Psephenidae	6	QC379999						
Ptilodactylidae	10	QC399999						
Scirtidae	6	QC209999						
Spercheidae	2	-						
Sphaeriusidae	7	-						
Staphylinidae	3	QC189999						
o. Diptera								
Athericidae	8	QD229999						
Blephariceridae	10	QD049999						
Ceratopogonidae	4	QD099999	3	1	12	10	6	4
Chaoboridae	2	QD059999						
s.f. Aphroteniinae	8	QDAA9999				1		
s.f. Chironominae	3	QDAJ9999	12	44	8	8	13	3
s.f. Orthocladiinae	4	QDAF9999			1			
s.f. Tanypodinae	4	QDAE9999	2	8	25	46	12	6
Corethrellidae	-	-						
Culicidae	1	QD079999			4	1		1
Dixidae	7	QD069999						
Dolichopodidae	3	QD369999						
Empididae	5	QD359999						
Ephydridae	2	QD789999						
Muscidae	1	QD899999						
Pelecorhynchidae	10	QD209999						
Psychodidae	3	QD129999						
Sciomyzidae	2	QD459999						
Simuliidae	5	QD109999						
Stratiomyidae	2	QD249999						

Sample picked by			DM	CP	DM	CP	CP	CP
Date sampled			22/10/2025	22/10/2025	21/10/2025	21/10/2025	20/10/2025	22/10/2025
Sample processed by			DM	DM	DM	DM	DM	DM
Date processed			05/11/2025	06/11/2025	04/11/2025	04/11/2025	05/11/2025	06/11/2025
Site name			**R3**	**R3**	**R6**	**R6**	**L1**	**L2**
Habitat type	**SIGNAL 2**	**AUSRIVAS**	**EDGE**	**BED**	**EDGE**	**BED**	**COMP**	**COMP**
Syrphidae	2	QD439999						
Tabanidae	3	QD239999	5					
Tanyderidae	6	QD039999						
Thaumaleidae	7	QD119999						
Tipulidae	5	QD019999						
o. Ephemeroptera								
Ameletopsidae	7	QE049999						
Baetidae	5	QE029999					2	
Caenidae	4	QE089999						
Leptophlebiidae	8	QE069999						
Teloganodidae	9	QE079999						
o. Hemiptera								
Aphelocheiridae	-	-						
Belostomatidae	1	QH629999					4	2
Corixidae	2	QH659999	1		10	1		
Dipsocoridae	-	-						
Gelastocoridae	5	QH649999						
Gerridae	4	QH579999	14	1	2		3	
Hebridae	3	QH539999			1			
Hydrometridae	3	QH549999			1			
Leptopodidae	-	QH589999						
Mesoveliidae	2	QH529999						
Micronectidae	2	-			10	31		
Naucoridae	2	QH669999						2
Nepidae	3	QH619999	2		2		1	1
Notonectidae	1	QH679999	12	13	14	12		1
Ochteridae	2	QH639999						18
Pleidae	2	QH689999	7	1	3	3	2	
Saldidae	1	QH609999						
Veliidae	3	QH569999	22		5	1		
s.o. Zygoptera								
Argiolestidae	5	-						
Calopterygidae	-	QO109999						
Chlorocyphidae	-	-						
Chorismagrionidae	-	QO189999						
Coenagrionidae	2	QO029999					4	6
Diphlebiidae	6	QO099999						
Hemiphlebiidae	-	QO019999						
Isostictidae	3	QO039999						
Lestidae	1	QO059999						
Lestoideidae	9	QO069999						
Platycnemididae	4	QO049999						
Synlestidae	7	QO089999						
s.o. Epiprocta								
Aeshnidae	4	QO129999						
Archipetaliidae	-	QO199999						
Austrocorduliidae	10	QO279999						
Austropetaliidae	-	QO209999						
Brachytronidae	-	-						
Cordulephyidae	5	QO289999						
Corduliidae	5	QO169999						
Gomphidae	5	QO139999		1	2			4
Gomphomacromiidae	-	QO249999						
Hemicorduliidae	5	QO309999						
Libellulidae	4	QO179999	1			1	1	2

Sample picked by			DM	CP	DM	CP	CP	CP
Date sampled			22/10/2025	22/10/2025	21/10/2025	21/10/2025	20/10/2025	22/10/2025
Sample processed by			DM	DM	DM	DM	DM	DM
Date processed			05/11/2025	06/11/2025	04/11/2025	04/11/2025	05/11/2025	06/11/2025
Site name			**R3**	**R3**	**R6**	**R6**	**L1**	**L2**
Habitat type	**SIGNAL 2**	**AUSRIVAS**	**EDGE**	**BED**	**EDGE**	**BED**	**COMP**	**COMP**
Lindeniidae	3	QO229999						
Macromiidae	8	QO269999						
Oxygastridae	-	QO299999						
Petaluridae	-	QO159999						
Pseudocorduliidae	-	QO259999						
Synthemistidae	2	QO239999						
Telephlebiidae	9	QO219999						4
o. Plecoptera								
Gripopterygidae	8	QP039999						
o. Trichoptera								
Antipodoeciidae	8	QT169999						
Atriplectididae	7	QT239999						
Calamoceratidae	7	QT249999						
Calocidae	9	QT189999						
Conoesucidae	7	QT159999						
Dipseudopsidae	9	QT269999						
Ecnomidae	4	QT089999						
Glossosomatidae	9	QT029999						
Helicophidae	10	QT199999						
Helicopsychidae	8	QT069999						
Hydrobiosidae	8	QT019999						
Hydropsychidae	6	QT179999						
Hydroptilidae	4	QT039999						
Kokiriidae	3	QT209999						
Leptoceridae	6	QT259999	2		2	1	3	
Limnephilidae	8	QT109999						
Odontoceridae	7	QT229999						
Oeconesidae	8	QT129999						
Philopotamidae	8	QT049999						
Philorheithridae	8	QT219999						
Plectrotarsidae	-	QT119999						
Polycentropodidae	7	QT079999						
Psychomyiidae	-	QT099999						
Stenopsychidae	-	QT059999						
Tasimiidae	8	QT139999						
Notes								
Taxa count			**26**	**17**	**28**	**22**	**20**	**27**
Taxa count (per site)			**29**		**32**		**20**	**27**
No. Individuals			**174**	**129**	**183**	**206**	**122**	**172**
PET taxa			**1**	**0**	**1**	**1**	**2**	**0**
Plecoptera			**0**	**0**	**0**	**0**	**0**	**0**
% Plecoptera			**0**	**0**	**0**	**0**	**0**	**0**
Ephemeroptera			**0**	**0**	**0**	**0**	**1**	**0**
% Ephemeroptera			**0**	**0**	**0**	**0**	**5**	**0**
Trichoptera			**1**	**0**	**1**	**1**	**1**	**0**
% Trichoptera			**4**	**0**	**4**	**5**	**5**	**0**
% Other taxa			**96**	**100**	**96**	**95**	**90**	**100**
SIGNAL 2 average (Family)			**3.08**	**3.19**	**3.19**	**3.42**	**3.47**	**3.08**
Tolerant taxa (SIGNAL2≤3)			**14**	**7**	**15**	**10**	**9**	**15**
% tolerant taxa			**58**	**44**	**58**	**53**	**47**	**63**

Appendix F: Terrestrial GDE assessment raw field data

Date	Site no.	Soil samples				Rationale	Leaf samples										Distance to channel (m)	Tree intercepting water
		ID	Texture	Reading (Mpa)	Notes	State-mapped	ID	Time (HH:MM)	Tree species	DBH (cm)	Tree height (mAGL)	Sample height (mAGL)	Reading (Mpa)	Latitude (GDA 94)	Longitude (GDA 94)		
20/06/25	TGDE1				Isolated pools in channel	Low confidence	TGDE1-1	4:55		92	18	6	-0.74	-23.6844	148.8627	0	Unlikely
							TGDE1-2	5:02		57	18	4	-0.55	-23.6842	148.8625	25	Yes
							TGDE1-3	5:07	Eucalyptus coolabah	124	20	4	-1.25	-23.6843	148.8621	55	Unlikely
							TGDE1-4	5:12		63	12	6	-0.06	-23.6846	148.8626	5	Yes
							TGDE1-5	5:16		77	13	4	-0.32	-23.6840	148.8630	13	Yes
							TGDE1-6	5:20	Eucalyptus coolabah	60	18	1	-0.29	-23.6845	148.8627	0	Yes
		TGDE1-A-1m	Gravelly clay	-0.02													
		TGDE1-B-1m	Sandy clay	-6.53													
		TGDE1-B-2m	Sandy clay	-3.56													
20/06/25	TGDE2				Isolated pools in channel	Low confidence	TGDE2-1	6:14		79	18	1	-0.58	-23.6784	148.8666	1	Unlikely
							TGDE2-2	6:12		60	22	8	-0.64	-23.6785	148.8663	15	Unlikely
							TGDE2-3	6:07	Eucalyptus coolabah	67	22	7	-0.72	-23.6781	148.8660	30	Unlikely
							TGDE2-4	6:10		70	21	6	-1.10	-23.6777	148.8664	5	Unlikely
							TGDE2-5	5:50		44	19	5	-0.67	-23.6784	148.8661	10	Unlikely
							TGDE2-6	5:53	Eucalyptus coolabah	44	13	4	-0.09	-23.6784	148.8658	30	Yes
		TGDE2-A-1m	Sandy clay	-0.01													
		TGDE2-B-1m	Clay	-2.96													
		TGDE2-B-2m	Sandy clay	-1.08													
24/10/25	TGDE1				Dry channel	Low confidence	TGDE1-1	3:46		92	18	10	-1.60	-23.6844	148.8627	0	Unlikely
							TGDE1-2	3:36		57	18	9	-0.73	-23.6842	148.8625	25	Unlikely
							TGDE1-3	3:56	Eucalyptus coolabah	124	20	5	-1.36	-23.6843	148.8621	55	Unlikely
							TGDE1-4	3:51		63	12	6	-1.00	-23.6846	148.8626	5	Unlikely
							TGDE1-5	3:29		77	13	5	-0.84	-23.6840	148.8630	13	Unlikely
							TGDE1-6	3:41	Eucalyptus coolabah	60	18	2	-1.61	-23.6845	148.8627	0	Unlikely
							TGDE1-7	3:58		73	18	4	-2.16	-23.6841	148.8629	2	Unlikely
							TGDE1-8	3:32		31	10	2	-1.73	-23.6839	148.8629	20	Unlikely
							TGDE1-9	3:27	Eucalyptus melanophloia	53	10	5	-2.25	-23.6839	148.8618	25	Unlikely
							TGDE1-10	4:04		50	11	4	-1.19	-23.6839	148.8627	35	Unlikely
							TGDE1-11	4:01	Eucalyptus populnea	62	12	3	-1.32	-23.6838	148.8629	32	Unlikely
		TGDE1-A-1m	Gravelly clay	-2.44													
		TGDE1-A-2m	Sandy clay	-3.21													
		TGDE1-B-1m	Sandy clay	-5.12													
		TGDE1-B-2m	Sandy clay	-4.22													
24/10/25	TGDE2				Dry channel	Low confidence	TGDE2-1	2:48		79	18	10	-1.10	-23.6784	148.8666	1	Unlikely
							TGDE2-2	2:58		60	22	8	-0.78	-23.6785	148.8663	15	Unlikely
							TGDE2-3	2:40	Eucalyptus coolabah	67	22	6	-1.51	-23.6781	148.8660	30	Unlikely
							TGDE2-4	2:50		70	21	6	-1.84	-23.6777	148.8664	5	Unlikely
							TGDE2-5	2:55		44	19	6	-1.24	-23.6784	148.8661	10	Unlikely
							TGDE2-6	3:00	Eucalyptus coolabah	44	13	5	-0.86	-23.6784	148.8658	30	Unlikely
		TGDE2-A-1m	Sandy clay	-5.99													
		TGDE2-A-2m	Sandy clay	-7.85													
		TGDE2-B-1m	Clay	-3.58													
		TGDE2-B-2m	Sandy clay	-4.19													