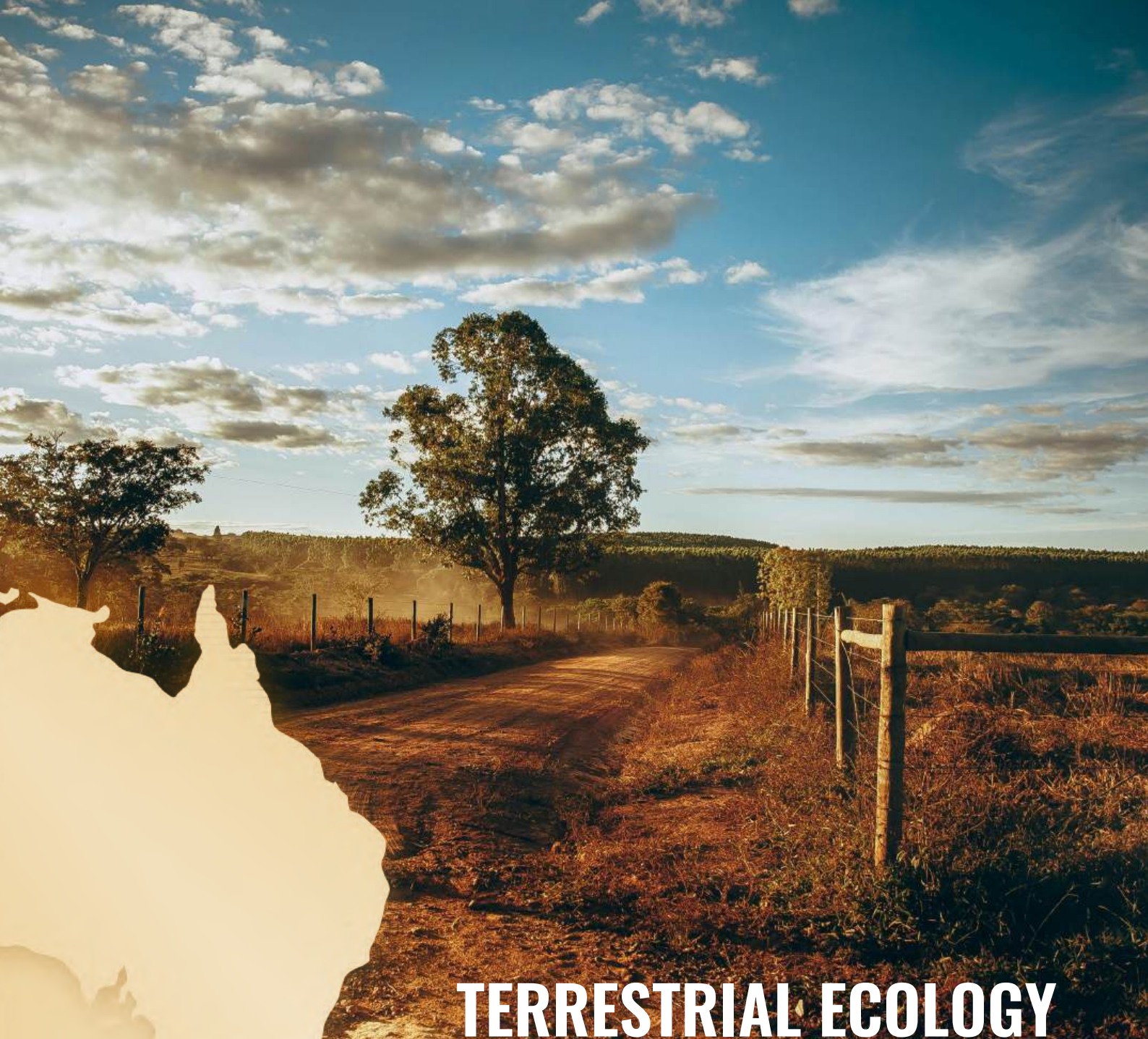




APPENDIX P - TERRESTRIAL ECOLOGY ASSESSMENT



TERRESTRIAL ECOLOGY REPORT

ISAAC DOWNS EXTENSION PROJECT

Trend  | Environmental
Consultants

June
2026

Prepared on behalf of
**STANMORE ID
EXTENSION PTY LTD**



EXECUTIVE SUMMARY

Trend Environmental was engaged by Stanmore ID Extension Pty Ltd to undertake a Terrestrial Ecology Assessment to support the Environmental Impact Statement for the proposed Isaac Downs Extension Project (the Project), an open-cut metallurgical coal mine in the Bowen Basin of central Queensland, approximately 15 kilometres southeast of Moranbah.

The Project is an extension of the existing Isaac Plains Complex and has been designed to leverage existing infrastructure and operations to reduce the extent of new disturbance.

The Terrestrial Ecology Assessment incorporated detailed desktop investigations, Queensland Herbarium-certified Regional Ecosystem mapping, habitat suitability modelling and comprehensive wet and dry season targeted field surveys in accordance with relevant Commonwealth and State survey guidelines. Targeted survey effort was undertaken for all Matters of National Environmental Significance (MNES) recognised under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth; Cth; EPBC Act) and Matters of State Environmental Significance (MSES) recognised under the *Environmental Offsets Act 2014* (Queensland; Qld; EO Act) that were identified as potentially occurring within the Survey area.

Ecological Context

The Survey area, incorporating and surrounding the Project area (the Project's mining lease application areas), occurs within a landscape that has been extensively modified by historical clearing, cattle grazing and mining. Despite this, remnant vegetation, riparian corridors and wetland systems persist and provide habitat for a range of Threatened Ecological Communities (TECs), and threatened and migratory species.

Targeted field surveys confirmed the presence of MNES within the Survey area. MNES verified included TECs, and threatened and migratory species and their habitat.

Four EPBC-listed TECs were verified within the Survey area, consisting of:

- Brigalow (*Acacia harpophylla* dominant and co-dominant) TEC.
- Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin TEC.
- Poplar Box Grassy Woodland on Alluvial Plains TEC.
- Semi-evergreen Vine Thicket in the Brigalow Belt South and Nandewar Bioregions TEC.

A number of Commonwealth-listed threatened and migratory species were also verified within the Survey area, including the Squatter Pigeon (*Geophaps scripta scripta*), Koala (*Phascolarctos cinereus*), Greater Glider (central and southern; *Petauroides volans*), Ornamental Snake (*Denisonia maculata*), and Oriental Cuckoo (*Cuculus optatus*). Habitat suitable for these species, and additional threatened and migratory species that were not detected during targeted surveys, was verified to varying extents within the Survey area. The additional threatened and migratory species that had habitat verified within the Survey area included *Dichanthium queenslandicum* (King Bluegrass), *Dichanthium setosum* (bluegrass), Australian Painted Snipe (*Rostratula australis*), Common Greenshank (*Tringa nebularia*), Sharp-tailed Sandpiper (*Calidris acuminata*) and the Fork-tailed Swift (*Apus pacificus*).

Connectivity of habitat for these species is largely maintained through riparian zones of the Isaac River and Cherwell Creek, and vegetated drainage corridors, although historical clearing and cattle grazing have degraded overall vegetation condition.



The MSES confirmed as present within the Survey area included:

- Regulated vegetation that are prescribed regional ecosystems (REs) that are 'endangered' or 'of concern' REs.
- Regulated vegetation that are prescribed REs that intersect with an area shown as a wetland on the vegetation management wetlands map.
- Regulated vegetation that are prescribed REs located within a defined distance from the defining banks of a relevant watercourse or drainage feature.
- Connectivity Areas.
- Protected wildlife habitat that includes prescribed REs that are areas of essential habitat on the essential habitat map for an EVNT plant or animal, and habitat for an endangered wildlife or vulnerable wildlife or special least concern animal.

Avoidance and Minimisation

Consistent with the Department of Environment, Tourism, Science and Innovation's (DETSI) impact-mitigation hierarchy, avoidance and minimisation were prioritised during the early stages of Project design. The Project layout, Disturbance area and supporting infrastructure were iteratively refined using ecological survey data and mapping outputs to avoid and minimise impacts on MNES and MSES.

Key outcomes of this process included:

- Extensive use of previously disturbed areas for infrastructure to avoid new vegetation clearing.
- Avoidance of direct impacts to the Natural Grasslands TEC, Semi-evergreen Vine Thicket TEC, the Semi-evergreen Vine Thicket in the Brigalow Belt South and Nandewar Bioregions TEC, and a High Ecologically Significant (HES) wetland and Wetland Protection Area (WPA).
- Maintenance of buffers to riparian vegetation along the Isaac River and Cherwell Creek.
- Minimisation of impacts to the Poplar Box Grassy Woodland on Alluvial Plains TEC.
- Limitation of permanent watercourse crossings to two bridge structures only.

Vegetation clearing will be undertaken sequentially, supported by fauna management measures including pre-clearance surveys and Fauna Spotter Catchers, with progressive rehabilitation implemented in accordance with the Progressive Rehabilitation and Closure Plan (PRCP).

Significant Impact Assessment Outcomes

An MNES Significant Impact Assessment was undertaken in accordance with *MNES Significant Impact Guidelines 1.1* (DEWHA, 2013). Despite application of the mitigation hierarchy, including MNES specific management actions to address key threats to each MNES, residual impacts to MNES and MSES remain due to the scale and duration of open-cut mining disturbance. Significant impacts to the following MNES were considered likely:

- 52.72 hectares (ha) of Brigalow (*Acacia harpophylla* dominant and co-dominant) TEC.
- 15.45 ha of Poplar Box Grassy Woodland on Alluvial Plains TEC.
- 334.15 ha of critical habitat for the Squatter Pigeon habitat (comprised on 308.48 ha of breeding habitat, 14.58 ha of foraging habitat and 11.09 ha of dispersal habitat).
- 318.02 ha of critical habitat for the Greater Glider habitat (comprised on 87.26 ha of denning habitat and 230.76 ha of foraging habitat).
- 318.03 ha of critical habitat for the Koala (comprised of 66.81 ha of breeding habitat and 251.22 ha of foraging habitat).
- 75.97 ha of important habitat for the Ornamental Snake habitat (comprised of 56.22 ha of breeding habitat, 19.75 ha of foraging habitat).

These residual impacts to MNES will be addressed through offsets consistent with Commonwealth's *EPBC Act Environmental Offset Policy* (DSEWPaC, 2012a), prioritising land-based offsets and long-term security.



An MSES Significant Residual Impact Assessment was undertaken in accordance with the *Queensland Environmental Offsets Policy - Significant Residual Impact Guideline* (DEHP, 2014a). This assessment identified significant residual impacts were likely for the following MSES (which are not the same or substantially the same as MNES):

- Regulated Vegetation:
 - Prescribed REs that are 'endangered' or 'of concern' REs (9.08 ha of impact to RE11.3.1 [dense/mid-dense], 20.82 ha of impact to RE11.3.2 [sparse], and 40.17 ha of impacts to RE11.3.3 [sparse]).
 - Prescribed RE that is located within a defined distance from the defining banks of a relevant watercourse or drainage feature (4.69 ha of impact to RE11.3.3 [sparse], and 6.38 ha of impact to RE11.3.25 [sparse]).
- Connectivity area (347.55 ha).

These residual impacts to MSES will be addressed through offsets consistent with the State's *EPBC Act Environmental Offset Policy* (DETSI, 2025) prioritising land-based offsets, however where land-based offsets cannot be accommodated within the chosen offset property, financial offsets.

In the regional context, cumulative impacts to MNES and MSES are evident from historical and approved developments; however, this report concludes the incremental contribution of the Project is minor, and the Project is not expected to materially exacerbate cumulative impacts beyond existing regional pressures, particularly with implementation of mitigation and management measures.

Conclusions

The Terrestrial Ecology Assessment has comprehensively assessed the potential terrestrial ecology values that may be impacted by the Project, and proposed avoidance, minimisation, mitigation, management and offset measures to manage risks to ecological values.



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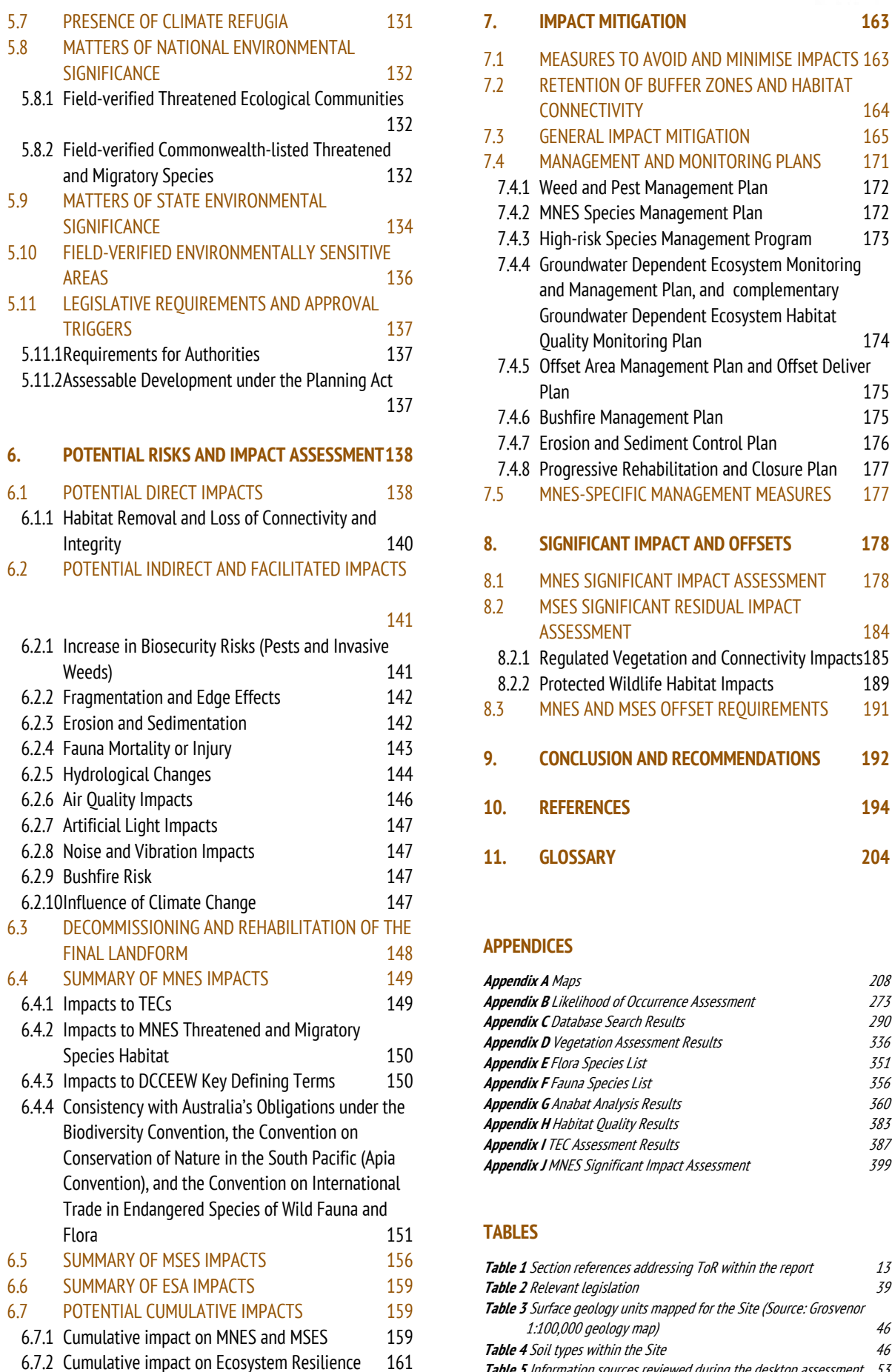




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TABLE OF ABBREVIATIONS

Abbreviation	Definition
AEP	Annual Exceedance Probability
AHD	Australian Height Datum
ALA	Atlas of Living Australia
AU	Assessment Unit
BESS	Battery Energy Storage System
BoM	Bureau of Meteorology
BVG	Broad Vegetation Group
CAMBA	China–Australia Migratory Bird Agreement
CE	Critically endangered under the EPBC Act
CEMP	Construction Environmental Management Plan
CHPP	Coal Handling and Preparation Plant
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
cm	centimetres
CR	Critically endangered under the <i>Nature Conservation Act 1992</i> (Qld)
CSG	Coal Seam Gas
Cth	Commonwealth
DA	Development Application
DAF	Department of Agriculture and Fisheries
DAWR	Department of Agriculture and Water Resources
DCCEEW	Department of Climate Change, Environment, Energy and Water
DEHP	Department of Environment and Heritage Protection
DES	Department of Environment and Science
DETSI	Department of the Environment, Tourism, Science and Innovation
DEWHA	Department of the Environment, Water, Heritage and the Arts
DoR	Department of Resources
DNRME	Department of Natural Resources, Mines and Energy
DPI	Department of Primary Industries
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EN	Endangered
EP Act	<i>Environmental Protection Act 1994</i> (Qld)
EP Regulation	<i>Environmental Protection Regulation 2019</i> (Qld)
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth)
EO	Environmental Officer
EO Act	<i>Environmental Offsets Act 2014</i> (Qld)
ESA	Environmentally Sensitive Area
ESCP	Erosion and Sediment Control Plan
EVNT	Endangered, vulnerable and near threatened
EW	Extinct in wild
EWP	Elevated Work Platform



Abbreviation	Definition
EX	Extinct
FRREMP	Fitzroy Regional Receiving Environment Monitoring Program
GBO	General Biosecurity Obligation
GBRMP	Great Barrier Reef Marine Park
GDE	Groundwater Dependent Ecosystems
GDEMMP	GDE Monitoring and Management Plan
GIS	Geographic Information System
ha	hectare
HES	High Ecologically Significant
HEV	High Ecological Value
IBRA	Interim Biogeographic Regionalisation for Australia
ID	Identification
IDE	Isaac Downs Extension
IDM	Isaac Downs Mine
IESC	Independent Expert Scientific Committee
IIPP	Integrated Isaac Plains Project
IPC	Isaac Plains Complex
IR	Infrared
JAMBA	Japan–Australia Migratory Bird Agreement
km	kilometre
LC	Least Concern
LoM	Life-of-Mine
m	metre
MAR	Map Amendment Request for regional ecosystems (Queensland Herbarium)
MAW	Mine Affected Water
mg	milligrams
MIA	Mining Infrastructure Area
ML	Mining lease
mm	millimetre
MNES	Matters of National Environmental Significance
MRA2C	Mulgrave Resource Access Stage 2 Expansion (South Walker Creek Mine)
MSES	Matters of State Environmental Significance
Mt	Million tonnes
NC	Not a concern
NC Act	<i>Nature Conservation Act 1992</i> (Qld)
NRM	Natural Resource Management
NSW	New South Wales
NT	Near threatened
OAMP	Offset Area Management Plan
OC	Of concern
ODP	Offset Delivery Plan
OEAR	Offset Ecological Assessment Report



Abbreviation	Definition
PMST	Protected Matters Search Tool
PRCP	Progressive Rehabilitation and Closure Plan
Qld	Queensland
RE	Regional Ecosystem
REMP	Receiving Environment Monitoring Program
ROKAMBA	Republic of Korea–Australia Migratory Bird Agreement
RoM	Run-of-Mine
RIDA	Regional Interests Development Approval
RPI Act	<i>Regional Planning Interests Act 2014</i> (Qld)
SEAs	Strategic Environmental Areas
SHMS	Safety and Health Management System
SIA	Significant impact Assessment (MNES)
SLATS	Statewide Landcover and Trees Study
SLC	Special Least Concern
SMP	Species Management Program
SPRAT	Species Profile and Threats Database (Australian Government)
SRI	Significant Residual Impact (MSES)
TEC	Threatened Ecological Community
ToR	Terms of Reference
TSSC	Threatened Species Scientific Committee
VM Act	<i>Vegetation Management Act 1999</i> (Qld)
VU	Vulnerable
WoNS	Weeds of National Significance
WMP	Water Management Plan
WPA	Wetland Protection Area



1. INTRODUCTION

1.1 BACKGROUND TO THE PROJECT

Stanmore ID Extension Pty Ltd (ID Extension, the proponent), a wholly owned subsidiary of Stanmore Resources Limited (Stanmore), proposes to develop the Isaac Downs Extension Project (the Project), an open-cut metallurgical coal mine located in the Bowen Basin of central Queensland. The Project is situated approximately 15 kilometres (km) southeast of Moranbah and 150 km southwest of Mackay. ID Extension has applied for four mining leases (MLs) for the Project - ML700081, ML700082, ML700083 and ML700084 (Map 1, Appendix A).

The Project is an extension of the existing Isaac Plains Complex (IPC), which comprises the Isaac Plains Mine (IPM) and the Isaac Downs Mine (IDM; shown in Map 1, Appendix A). IDM and IPM are operated by wholly owned subsidiaries of Stanmore Resources Limited. The proposed Project will effectively extend the operational life of IDM, ensuring continuity of mining activities and workforce stability across IPC.

The Project will involve the extraction of approximately 46 million tonnes (Mt) of Run-of-Mine (RoM) coal over 15 years, at a production rate of approximately 2–4.5 Mt per annum. ROM coal will be transported to the Coal Handling and Preparation Plant (CHPP) at IPM for processing. The Project will share infrastructure with IDM, including the Mine Infrastructure Area (MIA), water management systems, and access roads.

The proponent will prepare an Environmental Impact Statement (EIS) under the *Environmental Protection Act 1994* (Queensland; Qld; EP Act) for the Project. The EIS will support an environmental authority (EA) and Progressive Rehabilitation and Closure Plan (PRCP) schedule application under the EP Act. The Project's Referral under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth Cth; EPBC Act) is a controlled action (EPBC 2025/10183). The Project's Referral will be assessed by an accredited assessment process, being the EIS required under the under EP Act.

Trend Environmental was commissioned by Stanmore to complete a Terrestrial Ecology Assessment as part of the EIS being prepared for the Project.

This Terrestrial Ecological Assessment Report presents the baseline ecological data collected to date for the Project which establishes a thorough understanding of existing ecological conditions and values, and provides an assessment of potential ecological impacts, and the development of appropriate management and mitigation measures for the Project.

1.2 PURPOSE OF THE TERRESTRIAL ECOLOGICAL ASSESSMENT

The purpose of the Terrestrial Ecological Assessment is to present the comprehensive baseline ecological data collected within the Survey area to date and provide an assessment of potential ecological impacts and appropriate management and mitigation measures for the Project.

The baseline data plays a critical role in informing the terrestrial impact assessment for the EIS, addressing the requirements of the Terms of Reference (ToR) issued for the Project by the Queensland Government in December 2025, and underpinning significant impact assessments used to identify whether the Project may impact on matters of national, state, or local environmental significance.

The findings from these assessments guide the development of appropriate mitigation measures aimed at avoiding and minimising ecological impacts. Where significant residual impacts are unavoidable, the baseline data are used to inform offset requirements, ensuring compliance with relevant environmental legislation and policy frameworks and contributing to the long-term conservation of affected ecological values.

This Terrestrial Ecological Assessment forms the foundation for the Terrestrial Ecology Chapter for the EIS.



1.3 PROJECT OVERVIEW AND RELEVANT LEGISLATION

The Terrestrial Ecological Assessment involved both desktop and field ecological assessments, undertaken in accordance with the methodology provided in the *Terrestrial Ecology - EIS Information Guideline* (DESI, 2024f). The terrestrial ecological values considered relevant were those formally recognised by legislation, policy, plans, and guidelines, and include but are not limited to:

- Matters of National Environmental Significance (MNES), as defined under the EPBC Act.
- Matters of State Environmental Significance (MSES), as defined under the *Environmental Offsets Act 2014* (Qld; EO Act).
- Environmental values defined under the EP Act, including environmentally sensitive areas (ESAs).
- Regional ecosystems (REs), watercourses, wetlands and essential habitat defined under the Vegetation Management Act 1999 (Qld; VM Act).
- Threatened and conservation significant (i.e., special least concern; SLC) flora and fauna species listed under the Nature Conservation Act 1992 (Qld; NC Act).
- Animal breeding places protected under the NC Act.
- Bioregional terrestrial and riparian corridors identified in biodiversity planning assessments.
- Strategic environmental areas under the Regional Planning Interests 2014 (Qld; RPI Act).

In addition to terrestrial ecological values, the presence of weed and pest species defined under the *Biosecurity Act 2015* (Qld; Biosecurity Act) are relevant to impact assessments for a project, where activities can introduce or spread weeds and pests. Assessment of biosecurity risks will assist in fulfilling the proponent's biosecurity obligations under the Act.

1.4 TERMINOLOGY

The following terms have been adopted throughout this report, and shown on the various maps where relevant:

Project: The proposed Isaac Downs Extension Project as described in the EIS Project description.

Project area: The area of the four ML applications for the Project.

Survey area: The Survey area refers to the broader area assessed by ecologists during field surveys. This area extends beyond the defined 'Project area' and 'Disturbance area' to ensure that ecological values in adjacent environments were adequately surveyed. Surveying a wider area enables a more comprehensive evaluation of potential impacts, particularly on surrounding habitats, species, and ecological processes that may be indirectly affected by the Project. The Survey area is shown on Map 1, Appendix A. The Survey area includes portions of four (4) Lots located to the north and south of Cherwell Creek. The north includes 8SP277384, 5GV132 and parts of 9GV33, and to the south is 8SP277384 and parts of 9GV33. All Lots are connected with the Winchester Downs pastoral station.

Disturbance area: The Disturbance area is the sum of the 'Disturbance area on Project MLs' and the 'Additional disturbance area'. The Disturbance area forms the basis for assessing terrestrial ecological impacts. The Survey area encompasses the disturbance area.

Disturbance area on Project MLs: The Disturbance area on the Project MLs represents the subset of the Project area (i.e., the four ML applications for the Project) where disturbance activities associated with the Project will occur (Disturbance area on Project MLs shown in Map 1, Appendix A). This includes all open-cut operations, haul roads, spoil (overburden) dumps, water management infrastructure, and associated mine-related works required for the Project.

Additional disturbance area: The Additional disturbance area includes areas totalling 2.5 hectares (ha) on IDM ML 700046 that require an amendment to the IDM State approvals (EA and PRCP schedule) for connecting linear infrastructure with the Project, in areas not currently authorised for disturbance. The disturbance area to be assessed for the EPBC Referral for the Project includes the 'Disturbance area on Project MLs' + the 'Additional disturbance area'.



Area of Interest: The broader locality within which the Survey area is located, which acts as the buffer area for desktop searches. The Area of interest was considered to be a 20 km buffer area, which provides context to the MNES and MSES within the Survey area.

Region: A 50 km buffer area used exclusively for defining species records in the Likelihood of Occurrence assessment for the Project. This extended buffer area is essential for highly mobile species, such as migratory species, that may not have records directly adjacent to the Survey area but cannot be excluded as potentially occurring in the area if suitable habitat exists. This approach accounts for the occasional presence of such species in the vicinity due to their mobility.

1.5 TERMS OF REFERENCE

The Terms of Reference (ToR; issued December 2025) has outlined specific conditions and sections that are required to be addressed by this report, as seen in Table 1.

Table 1
Section references
addressing ToR
within the report

Terms of Reference	Section reference
Critical – Environmental matters for this Project	
8.13 Critical environmental matters identified for this Project which the EIS must give priority are: c) Flora and fauna, including MNES and MSES.	Flora and fauna, including MNES and MSES have been addressed in this Ecological Assessment Report.
Critical – Objectives and outcomes	
9.67 Conduct the impact assessment in accordance with relevant guidelines, including the latest version of the department's EIS information guidelines that cover terrestrial ecology (ESR/2020/5309; DESI, 2024f), aquatic ecology (ESR/2020/5295; DESI, 2024a), groundwater dependent ecosystems (GDEs); ESR/2020/5301; DESI, 2024c), water (ESR/2020/5312; DESI, 2024e) , MNES (ESR/2020/5304; DESI, 2024d), and biosecurity (ESR/2020/5297; DESI, 2024b).	Terrestrial Ecology Requirements of the NC Act, VM Act, EP Act, EO Act, APEBC Act and Biosecurity Act are addressed in the regulatory framework in Table 2. Methodology for the ecology surveys addressed in <i>Section 3 Methodology</i> which incorporated desktop and field survey methodology. Results for the ecology surveys addressed in <i>Section 4 Desktop Assessment Results</i> and <i>Section 5 Field Assessment Results</i>. Impacts addressed in <i>Section 6 Potential Risks and Impact Assessment</i>. Avoidance and mitigation measures address in <i>Section 7 Impact Mitigation</i>, while Appendix J provides community- and species-specific mitigation measures. Specific MNES are addressed in the <i>Field Results Section 5.8 Matters of National Environmental Significance</i> and the <i>Potential Risks and Impact Mitigation Section 6.4 Summary of MNES Impacts</i>. These will also be addressed in the MNES Chapter. Aquatic Ecology Aquatic ecology impacts are addressed in the <i>Aquatic Ecology Report (Freshwater Ecology, 2026)</i> GDEs GDE impacts are addressed in the <i>GDE Assessment Report (WatermarkEco, 2026b)</i>. Water Water impacts are addressed in the <i>Surface Water Report (Hydrobalance, 2026c)</i>.



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Biosecurity

Requirements of the *Biosecurity Act* and *Isaac Region Biosecurity Plan 2024 -2027* are addressed in the regulatory framework in Table 2.

Biosecurity Zones are address in the Desktop Results *Section 4.6 Biosecurity Zones*

Methods for surveying biosecurity risks are address in the *Methodology Section 3.3 Field Assessment*

Results in the *Field Results Section 5.4 Biosecurity Risks Potential Risks and Impact Assessment Section 6.2.1 Increase in Biosecurity Risks (Pests and Invasive Weeds)* addresses impacts relating to biosecurity.

Table 54 provides general mitigation measures to address the GBO.

Appendix J provides community- and species-specific mitigation measures that also address the GBO.

MNES

Specific MNES are addressed in the *Field Results Section 5.8 Matters of National Environmental Significance* and *Section 6.4 Summary of MNES Impacts*. These will also be addressed in the MNES Chapter.

9.68 Demonstrate that the Project can meet the environmental objectives and performance outcomes in Schedule 8 of the EP Regulation.

Conclusion statement summarises the assessment and demonstrates that the Project can meet the relevant environmental objectives and performance outcomes outlined in Schedule 8 of the EP Regulation, subject to the implementation of the mitigation and management measures.

Biodiversity – Existing environment

9.69 Identify, describe and map all terrestrial, and/ or aquatic (including GDEs) and/ or marine ecological values present or likely to be present within an area potentially affected either directly or indirectly by the Project. Base the description on the desktop assessment, vegetation surveys, plant and animal species surveys, and the assessment of the condition of the vegetation communities and species habitats

Section 4 Desktop Assessment Results identifies and described the mapped ecological values. Desktop mapped ecological values are mapped in Appendix A (Maps 4 – 8)

Section 5 Field Assessment Results identifies and described the results of all terrestrial ecological values verified within the Survey area during targeted surveys that could be potentially affected either directly or indirectly by the Project. All maps of verified terrestrial ecological values are provided in Appendix A (Maps 9 – 24).

GDES have been incorporated into the GDE Assessment Report (Watermark, 2026).

The Survey area is not within a marine environment and as such no marine ecological values are relevant.

9.70 Describe all significant species and ecological communities, prescribed environmental matters listed as MNES and MSES, and all listed flora and fauna species, and REs, on the Project site and in its vicinity.

Section 5 Field Assessment Results addresses all ecological values verified within the Survey area. The following sections address specific aspects:

- *Section 5.1.1 Field-verified Regulated Vegetation* addresses REs.
- *Section 5.1.3 Field-verified Threatened Ecological Communities* addresses TECs.
- *Section 5.2 Flora* addresses flora species habitat, and *Section 5.3 Fauna* addresses fauna species habitat.



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	• <i>Section 5.5 Watercourses and Wetlands</i> addresses watercourses. • <i>Section 5.8 Matters of National Environmental Significance.</i> • <i>Section 5.9 Matters of State Environmental Significance.</i>
9.71 Describe the potential for significant species (e.g. listed threatened, near threatened or SLC species) to occur, or potentially occur, within the area potentially affected either directly or indirectly by the Project. Show the location of significant species found during field surveys on suitable maps and figures and describe their habitat.	<i>Likelihood of Occurrence Assessment completed in Appendix B.</i> <i>Section 5 Field Assessment Results.</i> Significant species verified within the Survey area during targeted field surveys are shown in maps in Appendix A (Maps 12 – 19)
9.72 Include any other environmental value(s) that the desktop studies identified as occurring or potentially occurring in, and adjacent to, the Project area (e.g. wildlife corridors, ESAs) and display them on maps and figures.	<i>Section 4 Desktop Assessment Results</i> describes TECs, MSES, biodiversity corridors, ESAs and Biosecurity Zones
9.73 Describe the connectivity of habitats and the integrity of ecosystems.	<i>Desktop Results Section 4.3.1.7 Connectivity Areas and Integrity of Ecosystems</i>
9.74 Describe, with photographs and detailed mapping at suitable scales, the current extent of REs, species habitat, TECs, GDEs, wetlands and springs at the Project area(s).	<i>Section 5 Field Assessment Results</i> addresses all ecological values verified within the Survey area. The following sections address specific aspects: • <i>Section 5.1.1 Field-verified Regulated Vegetation</i> addresses REs; • <i>Section 5.1.2 Field-verified Vegetation Communities</i> addresses vegetation communities with photographs; • <i>Section 5.1.3 Field-verified Threatened Ecological Communities</i> addresses TECs; • <i>Section 5.2 Flora</i> addresses flora species habitat, <i>Section 5.3 Fauna</i> addresses fauna species habitat; and • <i>Section 5.5 Watercourses and Wetlands</i> addresses watercourses. GDES and surface expression (springs) have been incorporated into the <i>GDE Assessment Report</i> (Watermark, 2026).

Biodiversity – Impact assessment

9.75 Assess, describe, quantify and illustrate all potential direct and indirect significant impacts on terrestrial/aquatic and/or marine ecological values. Assess the impacts on all potentially affected areas, whether on or off the Project site. Include all stages of the Project from initial development through to rehabilitation.	<i>Section 6 Potential Risks and Impact Assessment, with Section 6.2 Potential Indirect and Facilitated Impacts</i> addressing the direct impacts and <i>Section 6.2 Potential Indirect and Facilitated Impacts</i> addressing the indirect impacts. No marine ecological values to be impacted due to distance from the coast. While impacts to aquatic ecological values are addressed in the <i>Surface Water Impact Assessment</i> (Hydrobalance, 2026c) and GDEs are addressed in the <i>GDE Assessment Report</i> (WatermarkEco, 2026b).
9.76 Address in the assessment:	(a) all significant species and ecological communities (MNES, MSES, Matters of Local Environmental Significance (MLES), listed threatened flora and fauna species and REs) <i>Potential Risks and Impact Assessment Section 6.4 Summary of MNES Impacts</i> and <i>Section 6.5 Summary of MSES Impacts</i> addresses the direct impacts to MNES and MSES which includes all significant species and ecological communities and listed threatened flora and fauna species and REs verified within the Survey area.



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	MLES requirements of the <i>Isaac Region Planning Scheme</i> are explained in the regulatory framework in Table 2. The Planning Scheme does not specifically define MLES; however, local ecological values have been addressed through the assessment of MNES, MSES and broader habitat values within the Survey area.
(b) the conservation status of each identified ecological value under the NC Act, VM Act and the EP Act	Conservation status under these Acts are stated within relevant tables in the results section, specifically <i>Table 21 Field-verified REs within the Survey area</i>, <i>Table 42 TECs confirmed present within the Survey area</i>, <i>Table 43 Commonwealth-listed threatened flora species that have suitable habitat verified within the Survey area</i> and <i>Table 44 Commonwealth-listed threatened and migratory species habitat verified within the Survey area</i>. Where MNES and MSES are addressed in <i>Section 6 Potential Risks and Impact Assessment</i>, their conservation status under these Act are also stated, specifically in <i>Table 55 Summary of significant impacts to MNES</i> and <i>Table 56 SRI Assessment for applicable MSES prescribed matters</i>.
(c) the integrity of ecological processes, including habitats of listed threatened, near threatened or SLC species	<i>Desktop Results Section 4.3.1.7 Connectivity Areas and Integrity of Ecosystems</i> provides details on the landscape context of ecosystems, their connectivity to the Survey area and overall integrity. Impacts to connectivity and integrity of ecosystems is addressed in the <i>Potential Risks and Impact Assessment Section</i>, specifically <i>Section 6.1.1 Habitat Removal and Loss of Connectivity</i>.
(d) interactions between terrestrial and aquatic ecosystems (including GDEs and stygofauna)	GDEs are addressed in the GDE Assessment Report (<i>WatermarkEco, 2026b</i>). How GDES interact with terrestrial ecosystems however is provided in the <i>Field Results Section 5.6 Interactions between Aquatic and Terrestrial Ecosystems</i>.
(e) connectivity of habitats and ecosystems	<i>Desktop Assessment Section 4.3.1.7 Connectivity Areas and Integrity of Ecosystems</i> provides details on the landscape context of ecosystems and their connectivity to the Survey area. Impacts to connectivity of ecosystems is addressed in the <i>Potential Risks and Impact Assessment Section 6.1 Potential Direct Impacts</i> specifically <i>Section 6.1.1 Habitat Removal and Loss of Connectivity</i>.
(f) the integrity of landscapes and places, including wilderness and similar natural places	<i>Desktop Assessment Section 4.3.1.7 Connectivity Areas and Integrity of Ecosystems</i> provides details on the integrity of landscapes including wilderness and similar natural places, including protected estates e.g., National Parks. Impacts to landscape connectivity is addressed in the <i>Potential Risks and Impact Assessment Section 6.1 Potential Direct Impacts</i>, specifically <i>Section 6.1.1 Habitat Removal and Loss of Connectivity</i>.
(g) biological diversity	Biological diversity within the Survey area has been assessed through the identification and evaluation of vegetation communities, fauna habitats, species assemblages, and ecological processes. This includes consideration of MNES, MSES, habitat condition, connectivity, and ecosystem integrity, which collectively



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represent biodiversity values at local, regional and national scales.

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| (h) chronic, low-level exposure to contaminants or the bio-accumulation of contaminants | Exposure to contaminants is addressed in the <i>Potential Risks and Impact Assessment Section 6.2.5 Hydrological Changes</i> |
| (i) direct and indirect impacts on terrestrial, aquatic or marine species and ecosystems whether acting individually or in combination. Relevant matters include vegetation clearing, hydrological changes, discharges of contaminants to water, air or land, noise, and the influence of climate change | <p>Impacts are addressed in <i>Section 6 Potential Risks and Impact Assessment</i>. The relevant matters are address in the following subsections:</p> <ul style="list-style-type: none"> • <i>Section 6.1.1 Habitat Removal and Loss of Connectivity and Integrity</i> • <i>Section 6.2.5 Hydrological Changes</i> • <i>Section 6.2.5.1 Discharges of Contaminants to Water and Land</i> • <i>Section 6.2.6 Air Quality Impacts</i> • <i>Section 6.2.8 Noise and Vibration Impacts</i> • <i>Section 6.2.10 Influence of Climate Change</i> |
| (j) impacts of waterway barriers on fish passage in all waterways mapped on the Queensland Waterways for Waterway Barrier Works spatial data layer | Impacts of waterway barriers on fish passage are addressed in the Aquatic Ecology Report (Freshwater Ecology, 2026) |

9.77 Describe any actions of the Project that require an authority under the NC Act, and/or would be assessable development for the purposes of the VM Act, the RPI Act, the *Fisheries Act 1994* (Qld; Fisheries Act) and the *Planning Act 2016* (Qld; Planning Act). Features to consider include REs ESAs, wetlands, nature refuges, protected areas and strategic environmental areas.

Section 2.1 Regulatory Framework discusses potential requirements for authorities under relevant legislation.

Section 5.11 Legislative requirements and approval triggers details the requirements of authorities under relevant legislation and whether the action is considered assessable development under the relevant Acts. These requirements and triggers were based on results from desktop assessments and field surveys, in *Section 4 Desktop Assessment Results* and *Section 5 Field Assessment Results*, including:

- REs in *Field Results Section 5.1.1 Field-verified Regulated Vegetation*,
- ESAs in *Field Results Section 5.10 Field-verified Environmentally Sensitive Areas*,
- Wetlands in *Field Results Section 5.5.2 Wetlands* and
- SEAs in *Desktop Results Section 4.5 Strategic Environmental Areas*.

While *Desktop Results Section 4.2.1 Overview of Matters of State Environmental Significance potentially occurring* addresses protected areas and nature refuges which were not mapped as occurring within or adjacent to the Survey area.

9.78 Specifically address any obligations imposed by State or Commonwealth legislation or policy or international treaty obligations

The Ecological Assessment Report addresses relevant obligations under applicable State and Commonwealth legislation and policy frameworks, and international treaty obligations in *Background Information Section 2.1 Regulatory Framework*.

This includes consideration of MNES protected under the EPBC Act, as well as relevant Queensland legislation including but not limited to the NC Act, VM Act, EP Act and



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other applicable regulatory frameworks, and international treaty obligations relating to migratory species protected under agreements such as the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), Japan–Australia Migratory Bird Agreement (JAMBA), China–Australia Migratory Bird Agreement (CAMBA) and Republic of Korea–Australia Migratory Bird Agreement (ROKAMBA).

9.79 Assess the cumulative impacts on terrestrial ecological values that could potentially occur because of the impacts of the Project added to the past, present and reasonably foreseeable impacts of other activities in the region. Assess cumulative impacts at a local, subregional and bioregional scale and over time.

Impact Mitigation Section 6.7 Potential Cumulative Impacts

Biodiversity – Mitigation Measures

9.80 Propose effective and proven measures to avoid, minimise, mitigate and/or offset direct or indirect impacts on environmental values. In particular, address measures to protect or preserve any listed threatened, near threatened or SLC species. Demonstrate that clearing and the adverse impacts of clearing have been reasonably avoided, or reasonably minimised consistent with Performance Outcome 1 of State Code 16 (Queensland Government 2025a).

Section 7 Impact Mitigation, specifically:

- *Section 7.1 Measures to avoid and minimise impacts* addresses measures to avoid and minimise impacts.
- *Section 7.3 General Impact Mitigation* addresses project wide mitigation measures that will be implemented to mitigate the identified direct and indirect impacts from Section 6 Potential Risks and Impact Assessment.
- Community- and species- specific mitigation measures are provided for TECs and threatened and migratory species likely to be significantly impacted by the Project in Appendix J.
- Rehabilitation and decommissioning is address in *Potential Risks and Impact Assessment Section 6.3 Decommissioning and Rehabilitation of the Final Landform*.
- Where significant impacts remain, offsets have been proposed, as detailed in the *Significant Impact and Offsets Section 8.3 MNES and MSES Offset Requirements*

9.81 Describe the practicality, effectiveness and risks for each avoidance and mitigation measure. Include the timeframes in which the results would be delivered.

Appendix J includes the community- and species- specific mitigation measures for TECs and threatened and migratory species likely to be significantly impacted by the Project.

9.82 Justify how applying all proposed avoidance and management measures would result in acceptable outcomes for terrestrial, aquatic and/ or marine ecology. Describe how achieving the measures successfully will be monitored, measured and audited. Include provisions to regularly evaluate all the mitigation measures so that improvements may be made as new technologies and best practices evolve.

The mitigation framework for each community and species includes the identified risk or threatening process from Conservation advices, Recovery Plans for SPRAT profiles, the proposed avoidance and mitigation measures, the timing, predicted effectiveness, and associated monitoring and adaptive management responses.

Significant impact assessments for MNES and MSES, following the implementation of avoidance, minimisation, mitigation and rehabilitation measures, have been undertaken in Appendix J and *Section 8.2 MSES Significant Residual Impact Assessment* which determines whether the management measures result in an acceptable outcome for terrestrial ecology or whether residual impacts remain and offsets need to be applied.



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There are no proposed impacts to marine ecology due to distance from the coast, and aquatic ecology is addressed in the Aquatic Ecology Report (Freshwater Ecology, 2026).

9.83 Assess the need for buffer zones and the retention, rehabilitation or planting of movement corridors. The assessment must consider the role of buffer zones in maintaining and enhancing riparian vegetation and wetlands to enhance water quality, promote habitat connectivity and provide habitat.

Buffer zones and retention of connectivity, particularly along riparian vegetation is addressed in the *Impact Mitigation Section 7.2 Retention of Buffer Zones and Habitat Connectivity*.

Rehabilitation within these buffer zones is not proposed, however there will be rehabilitation of the diverted Conrock Gully which will provide a buffer to surrounding retained vegetation patches and provide for a movement corridor for fauna. This is discussed in the *Impact Mitigation Section 7.2 Retention of Buffer Zones and Habitat Connectivity* and *Section 7.4.8 Progressive Rehabilitation and Closure Plan*.

Biodiversity - Offsets

9.84 After demonstrating that all reasonable on-site avoidance and mitigation measures are to be applied, identify whether the Project will result in a significant residual impact (SRI) on MSES, requiring an offset with reference to the current versions of the Queensland *Environmental Offsets Policy* (EPP/2015/1658; Department of Environment, Tourism, Science and Innovation; DETSI, 2025) and *Queensland Environmental Offsets Policy - Significant Residual Impact Guideline 2014* (DEHP, 2014a) and the Queensland environmental offsets framework.

Avoidance and mitigation measures are discussed in the *Impact Mitigation Section 7.1 Measures to avoid and minimise impacts, Section 7.3 General Impact Mitigation and Appendix J*.

Significant residual impact assessments for MSES are provided in the *Significant Impacts and Offsets Section 8.2 MSES Significant Residual Impact Assessment*. This SRI assessment has been undertaken in accordance with current versions of the *Environmental Offsets Policy, Environmental Offsets Policy - Significant Residual Impact Guideline 2014* (DEHP, 2014a) and the Queensland environmental offsets framework.

Where significant residual impacts remain following the avoidance and mitigation measures proposed, these are discussed in the *Significant Impacts and Offsets Section 8.3 MNES and MSES Offset Requirements*.

9.85 Propose offsets consistent with the applicable State and Commonwealth legislation or policies for:

- (k) Where a SRI will occur on a prescribed environmental matter as outlined in the EO Act, the offset proposal(s) must demonstrate how any proposed land-based offset sites and their suitability and habitat quality, or alternative offset types, are consistent with the requirements of Queensland's EO Act and the latest version of the Queensland Environmental Offsets Policy (EPP/2015/1658; DETSI, 2025)
- (l) Where a Commonwealth offset policy requires an offset for a significant impact on a MNES, the offset proposal(s) must be consistent with the requirements of the EPBC Act Environmental Offsets Policy (DSEWPaC, 2012a).

Offsets area addressed in the *Offset Area Management Plan* (Commonwealth; Trend Environmental, 2026c) and *Offset Delivery Plan* (State; Trend Environmental, 2026d).

9.86 Provide an offset proposal which outlines the proposed offset delivery approach to address the Project's SRI on MSES and MNES. The document should:

- (m) Address both State and Commonwealth offset obligations and clearly describe and illustrate the



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extent (such as in a map and table) of any SRI overlap between MNES and MSES jurisdictions. (n) For staged offsets, consider the full extent of potential impacts on prescribed environmental matters from the entire proposal as part of the SRI test. (o) For land-based offsets, assess the vulnerability and resilience of an offset site under climate change scenarios (e.g. reduced water availability and increased bushfire risk).	
Biodiversity - Biosecurity	
9.87 Conduct the impact assessment in accordance with the latest version of the department's <i>Biosecurity–EIS information guideline</i> (ESR/2020/5297; DESI, 2024b)	<i>Section 6 Potential Risks and Impact Assessment</i> includes biosecurity matters. Requirements of the <i>Biosecurity–EIS information guideline</i> (ESR/2020/5297; DESI, 2024b), particularly relating to biosecurity impacts from the Project, have been addressed in the following sections: • Biosecurity regulatory frameworks including the <i>Biosecurity Act</i> and <i>Isaac Region Biosecurity Plan 2024–2027</i> are addressed in the regulatory framework section in Table 2. • <i>Potential Risks and Impact Assessment Section 6.2.1 Increase in Biosecurity Risks (Pests and Invasive Weeds)</i> addresses impacts relating to biosecurity risks.
9.88 Describe the current distribution and abundance of pest animals and weeds on the Project area.	<i>Field Results Section 5.4 Biosecurity Risks</i>
9.89 Describe the impact the Project's construction and operation will have on the introduction and spread of pest animals, weed species, diseases and pathogens.	<i>Potential Risks and Impact Assessment Section 6.2.1 Increase in Biosecurity Risks (Pests and Invasive Weeds)</i> addresses impacts relating to biosecurity risks.
9.90 Propose detailed measures to remove, control and limit the spread of pests, weeds, diseases, pathogens and contaminants on the Project site and any areas under the proponent's control. This includes declared plants and animals and restricted areas under Queensland's Biosecurity Act, the Commonwealth <i>Biosecurity Act 2015</i> and weeds of national significance and designated pests under the <i>Queensland Public Health Act 2005</i> . All proposed measures are to be in accordance with biosecurity surveillance or prevention measures authorised under Queensland's Biosecurity Act and aligned with local government pest management priorities.	Weed and pest management and monitoring is addressed in the <i>Weed and Pest Management Plan</i> (Trend Environmental, 2026e).
9.91 Detail a monitoring program that would audit the success of biosecurity measures, identify whether objectives have been met, and describe corrective actions to be used if monitoring indicates objectives are not being met.	
Matters of National Environmental Significance under the EPBC Act	
9.169 The EIS must state and address the controlling provisions and describe the particular aspects of the environment leading to the controlled action declaration under the EPBC Act. Enough information about the Project and its relevant impacts must be provided to allow the Australian Government's Environment	MNES controlling provisions are addressed in the following sections: • <i>Desktop Results Section 4.1 Matters of National Environmental Significance</i>



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Minister to make an informed decision whether to approve the Project under the EPBC Act.

- *Field Results Section 5.8 Matters of National Environmental Significance*
- *Potential Risks and Impact Assessment Section 6.4 Summary of MNES Impacts*
- *Potential Risks and Impact Assessment Section 6.7 Potential Cumulative Impacts*
- *Impact Mitigation Section 7.5 MNES-specific Management Measures*
- *Significant Impacts and Offsets Section 8.1 MNES Significant Impact Assessment*

9.170 The assessment of the potential impacts, mitigation measures and any offsets for residual impacts must be dealt with in a stand-alone section of the EIS that fully addresses the matters relevant to the controlling provisions. This must be consistent with the Department's *MNES-EIS information guideline* (ESR/2020/5304; DESI, 2024d) for additional guidance.

The MNES Chapter will address potential impacts, mitigation measures and offsets for MNES. This Chapter will however be based on MNES information provided in this Terrestrial Ecology Report, specifically:

- *Potential Risks and Impact Assessment Section 6.4 Summary of MNES Impacts,*
- *Impact Mitigation Section 7.5 MNES-specific Management Measures,* and
- *Significant Impact and Offsets Section 8.3 MNES and MSES Offset Requirements*

Appendix 3 ToR for MNES under the EPBC Act – Description of environment

The controlling provisions are:

- listed threatened species and ecological communities (sections 18 and 18A)

MNES controlling provisions are addressed in the following sections:

- *Desktop Results Section 4.1 Matters of National Environmental Significance*
- *Field Results Section 5.8 Matters of National Environmental Significance*
- *Potential Risks and Impact Assessment Section 6.4 Summary of MNES Impacts*
- *Potential Risks and Impact Assessment Section 6.7 Potential Cumulative Impacts*
- *Impact Mitigation Section 7.5 MNES-specific Management Measures*
- *Significant Impacts and Offsets Section 8.1 MNES Significant Impact Assessment*

A3.12 The EIS must include an appendix of occurrence records (both sightings and evidence of presence) for all listed threatened and migratory species identified during field surveys for the proposed Project. This data may be used by the Department to update the relevant species distribution models that underpin the publicly available Protected Matters Search Tool (PMST).

Appendix E Flora Species List includes all flora species recorded. No threatened flora species were recorded within the Survey area.

Appendix F Fauna Species List includes all fauna species recorded, including threatened and migratory species.

A3.13 The species occurrence records must be provided in accordance with DCCEW Guidelines for biological survey and mapped data using DCCEW's Species observation data template. Sensitive ecological data must be identified and treated in accordance with the department's Sensitive Ecological Data (2016) or subsequent revision.

Species occurrence records are provided in DCCEW's Species observation data template.

A3.14 These terms of reference have been set out in a manner that may be adopted as the format for the EIS. However, information for each of the relevant protected matters should

The Terrestrial Ecological Assessment Report has been prepared in a manner consistent with the structure outlined



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be provided in the following order, unless the information can be presented more effectively in an alternative way:

- (a) Description of the environment and MNES:
 - (i) general description of the environment
 - (ii) description of protected matter, including desktop analysis, survey efforts and outcomes, and habitat assessments
- (b) Impacts:
 - (i) relevant impacts
 - (ii) avoidance, mitigation, and management measures
 - (iii) rehabilitation requirements
 - (iv) significant impact assessment
- (c) Consideration of Statutory requirements
- (d) Details of proposed offsets.

A3.15 Please be aware that it is the Department's expectation that you separately discuss the description, existing known location/s, likelihood of occurrence, demonstrated impact, avoidance, mitigation and compensatory measures (including offset) for each MNES triggered. See information requirements under the MNES, Relevant Impacts, Avoidance, mitigation and management measures, Rehabilitation requirements and Offsets sections below.

A3.16 Details of information required for each MNES are specified throughout this ToR. Please be aware that each of the elements must be addressed to meet the requirements of the EPBC Act and Regulations.

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in the ToR for MNES. The report includes the following sections:

- Description of the existing environment and MNES is included in the following sections:
 - *Background Information Section 2.3 Site Description.*
 - Likelihood of occurrence assessment provided in Appendix B.
 - Results of the Likelihood of Occurrence Assessment for MNES provided in *Desktop Results Section 4.1.2 Results of the Threatened Ecological Community Likelihood of Occurrence Assessment* and *Section 4.1.3 Results of the Likelihood of Occurrence Assessment for Commonwealth-listed Threatened and Migratory Species.*
 - *Section 4 Desktop Assessment Results includes Section 4.1 Matters of National Environmental Significance, and Section 3.3.4 Survey Methodology and Survey Effort* which detail the protected matters and survey effort.
 - *Field Results Section 5.1.2 Field-verified Vegetation Communities* contains descriptions of habitat for MNES.
 - *Existing known locations for MNES are provided in Maps in Appendix A, particularly Maps 11, 12, 13, 14, 15, 16, 17, and 19 and are discussed for each MNES in tables within Section 5.2.2 Conservation Significant Flora Species Records and Habitat Verification and Section 5.3.1 Fauna Species Records and Habitat Verification.*
- *Section 6 Potential Risks and Impact Assessment* includes *Section 6.1 Potential Direct Impacts, Section 6.2 Potential Indirect and Facilitated Impacts* and *Section 6.4 Summary of MNES Impacts* which detail all potential impacts from the Project.
- *Section 7 Impact Mitigation* includes *Section 7.1 Measures to avoid and minimise impacts, Section 7.3 General Impact Mitigation, and Section 6.3 Decommissioning and Rehabilitation of the Final Landform* which detail the avoidance, mitigation and management measures for the Project. Appendix J also includes MNES community- and species- specific mitigation measures to mitigate exacerbation of known threats. Significant Impact assessments for MNES are also provided in Appendix J.
- Consideration of statutory requirements has been undertaken throughout, as described in the regulatory framework descriptions in *Table 2 Relevant legislation*. Relevant statutory requirements, including the EPBC Act have been considered, along with supporting policies and guidelines such as the *MNES Significant Impact Guidelines 1.1* (DEWHA, 2013) and the Commonwealth's *EPBC Act Environmental Offset Policy* (DSEWPaC, 2012a).
- Where significant impacts to MNES remain following avoidance and mitigation measures, offsets have been discussed in *Significant Impact and Offsets Section 8.1 MNES Significant Impact Assessment* and *Section 8.3 MNES and MSES Offset Requirements.*



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A3.24 Describe the environment of the Project site and surrounding areas (i.e. adjacent, upstream and downstream from Project site) that may be affected by the Project. At a minimum, this section needs to include details of:	a) the current and historical land uses of the local region and project area, including the existing condition of the overall environment Description of the existing environment is included in <i>Background Information Section 2.3 Site Description</i>, which includes <i>Section 2.3.4 Land Use</i>, <i>Section 2.3.8 Existing Vegetation Communities</i> and <i>Section 2.3.9 Changes to Vegetation in the Survey Area over time</i>.
	b) terrain, topography and elevation of the project site and surrounding areas including a description of any floodplains and significant geological features and structures of the region such as faults relevant to the mine site Description of the existing environment is included in <i>Background Information Section 2.3 Site Description</i>, which includes <i>Section 2.3.7 Terrain, Topography and Elevation</i> which describes geological features and floodplains relevant to the mine site.
	(c) vegetation communities in the local region including the area (in hectares (ha)) they each cover, including the total size (in ha) of vegetation communities ground-truthed as well as map/s showing the size (in ha) of regional ecosystem (RE) patches and native vegetation regrowth • <i>Background Information Section 2.3.8 Existing Vegetation Communities</i> provides context to the existing communities within the Survey area and region. • <i>Table 22 Field-verified vegetation communities</i> provides the area of each vegetation community verified within the Survey area. • Map 10, Appendix A shows the vegetation communities verified within the Survey area. • Map Series 9, Appendix A shows the REs verified within the Survey area. While <i>Table 21 Field-verified REs within the Survey area</i> provides the area of each RE verified within the Survey area.
	(d) important habitat areas, recognised populations and habitat, and aggregations of listed species • Habitat types and Important habitat areas for each verified MNES are shown in Maps in Appendix A, specifically Maps 11, 12, 13, 14, 15, 16, 17, and 19. • Species records showing populations are shown in these maps.
	(e) Area in ha of MNES habitats in the local region including threatened ecological communities Areas of habitat for each MNES are provided in <i>Table 48 Extent of MNES</i>
	(f) terrestrial and aquatic ecosystems including GDEs, key vegetation communities and relevant watercourses • Aquatic ecosystems are addressed in the Aquatic Ecology Report (Freshwater Ecology, 2026). • GDES are addressed in the GDE Assessment Report (<i>WatermarkEco, 2026b</i>). • Terrestrial ecosystems such as vegetation communities are addressed in <i>Table 22 Field-verified vegetation communities</i> • Watercourses are addressed in <i>Field Results Section 5.5 Watercourses and Wetlands</i>
	(j) the distribution and abundance of pest species and weeds. Weeds are to be categorised in accordance with relevant legislation and regulations, from weeds of national significance (WoNS), State listed and those listed by Isaac Regional Council • <i>Field Results Section 5.4 Biosecurity Risks</i> which includes <i>Section 5.4.1 Introduced Flora</i> and <i>Section 5.4.2 Introduced Fauna</i>. • The distribution and abundance of weeds species is discussed further within the <i>Weed and Pest Management Plan</i> (Trend Environmental, 2026e) and includes maps showing the distribution of categorised weeds (e.g., restricted matters, WoNS and weeds recognised by Isaac Regional Council). • <i>Table 38 Priority weed species recorded within the Survey area</i> and



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	<i>Table</i>	39
	<i>Introduced fauna species recorded within the Survey area</i> categorises the weeds in accordance to WoNS, State-listed and those listed by Isaac Regional Council.	
A3.25 For each triggered MNES, include a brief description, status of matter in the region and the key threatening processes. Describe the key threatening processes applicable to each MNES within the proposed Project site/s. For further MNES information requirements, please refer to the MNES section below.	- Appendix J provides an overview of each MNES, including status under the EPBC Act, and key threatening processes known. - Threats for each MNES where impacts are likely to be significant are provided as part of the community- and species-specific management measures and significant impact assessments in Appendix J	

Environmental information required within Project area and surrounds

A3.26 Provide details of the scope, timing (survey season/s) and methodology for studies or surveys used to provide information on the listed species/community/habitat at the site (and in areas that may be impacted by the Project). Surveys should include all areas below, downstream, within and adjacent to the proposed Project area to allow for detailed design and impact minimisation, to provide context, or to increase the likelihood of detection.	<i>Section 3 Methodology which includes the following relevant sections:</i>	
	<i>Section 3.2 Desktop Assessment</i> <i>Section 3.3 Field Assessment</i> <i>Section 3.3.2 Survey Extent and Timing</i>	
A3.28 Describe the vegetation communities within, and adjacent to, the Project area including the area (in ha) they each cover and the percent (%) cover for each vegetation type to an appropriate resolution (provide information on where vegetation communities have been ground-truthed).	<i>Table 22</i>	
	<i>Field-verified vegetation communities</i> including area and percent cover. Map 10, Appendix A shows the vegetation communities verified within the Survey area.	
A3.29 Describe the habitat mapping and the results of surveys, the natural and existing upstream and downstream movement and habitat requirements for relevant terrestrial and aquatic flora and fauna, both native and introduced species (e.g. including weeds and feral animals). Similar species can be grouped and discussed together where practicable.	- Habitat types and Important habitat areas for each verified MNES are shown in Maps in Appendix A, specifically Maps 11, 12, 13, 14, 15, 16, 17, and 19. For MSES species that are not also recognised as MNES, habitat is shown in Map 18, Appendix A. - These maps also provide records of these species detected during the field surveys, or during historical surveys that have taken place within the Survey area. <i>Tables within Field Results Section 5.2 Flora and Section 5.3 Fauna</i> describe the habitat for each species, and landscape connectivity in the area of interest (20 km buffer). - Introduced species habitat descriptions are provided in <i>Field Results Section 5.4 Biosecurity Risks</i>.	
A3.30 Discuss how habitat assessments are informed by desktop searches, including but not limited to examination of: Australasian Virtual Herbarium; Atlas of Living Australia; and Queensland's WildNet resources.	<i>Methodology Section 3.2.1 Database Review</i>	
A3.31 Discuss how habitat assessments are informed by field surveys (in accordance with departmental guidelines or as supported by evidence-based best practice). Habitat assessments should refer to relevant departmental and other documents, which may include approved Conservation Advices; Recovery Plans; survey guidelines; draft referral guidelines and Listing Advices; Species Profile and Threats (SPRAT) Database; and published research.	<i>Methodology Section 3.3 Field Assessment and Section 3.3.4 Survey Methodology and Survey Effort</i> provides details on how habitat assessments were undertaken during field surveys.	
	<i>Table</i>	10
	<i>Descriptions of habitat for each species identified in the Likelihood of Occurrence assessment as potentially occurring, and targeted survey effort implemented for each</i> provides details regarding all habitat descriptions from the approved Conservation Advices; Recovery Plans; survey	



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guidelines; draft referral guidelines and Listing Advices; SPRAT Database; and published research, which were used to verify habitat for TECs, and threatened and migratory species.

Matters of National Environmental Significance

Ensure habitat definitions for listed threatened species are in accordance with definitions available in the EPBC Act Guidelines or other relevant, most recent, statutory documents (e.g., referral guidelines, approved listing advice(s), approved conservation advice(s), recovery plan(s), threat abatement plan(s) or comparable policy guidelines, and information contained in relevant Commonwealth databases such as the SPRAT database). Note that DCCEEW does not endorse habitat definitions in Kerswell, Kaveney, Evans, and Appleby (2020) (see Appendix A) of preferred, suitable and marginal. Ensure that the habitat definitions also take into account all relevant Queensland REs and other available information. The most up to date documentation and/or scientific expert advice must be used.

Assessments must be informed by up-to-date desktop and field surveys and informed by relevant department documents, including but not limited to approved Conservation Advice, Recovery Plans, draft referral guidelines and Listing Advice, the SPRAT Database, published research, and other relevant sources, including but not limited to those outlined in Appendix A.

It is the proponent's responsibility to ensure that any listed threatened and migratory species and ecological communities at the time of the controlled action decision, which will or are likely to be impacted by the Project, are assessed for the Minister or the delegate's consideration. Any listing events (e.g. the listing or up-listing of a species) that occur after the controlled action decision do not affect the assessment and approval process.

A3.32 The MNES chapter must include a detailed assessment of the presence of individuals and suitable habitat for the listed threatened and migratory species and ecological communities which are known to occur, may occur, or are likely to occur below, within and adjacent to the Project area.

A3.33 The MNES chapter must provide information about the habitat for and presence of any MNES identified as potentially being significantly impacted by the proposed Project, including but not limited to the listed threatened species and ecological communities in Appendix B. The assessment should consider the presence of species outside, within and adjacent to the proposed Project area where they have the potential to be impacted.

A3.34 The MNES chapter must also include a detailed presence and habitat assessment for any other listed threatened species and/or ecological community which will, or is likely to, be directly or indirectly impacted by the proposed Project.

Table 10

Descriptions of habitat for each species identified in the Likelihood of Occurrence assessment as potentially occurring, and targeted survey effort implemented for each provides details regarding all habitat descriptions from the approved Conservation Advices; Recovery Plans; survey guidelines; draft referral guidelines and Listing Advices; SPRAT Database; and published research, which were used to verify habitat for TECs, and threatened and migratory species.

Methodology Section 3.2 Desktop Assessment provides details on how desktop assessments were undertaken using relevant department documents to identify likelihood of occurrence of TECs, and threatened and migratory species.

Methodology Section 3.3 Field Assessment and Section 3.3.4 Survey Methodology and Survey Effort provides details on how field assessments were undertaken in accordance with relevant department documents.

Assessments were informed by up to date desktop assessments and field surveys. The results of these assessments surveys are provided in *Section 4 Desktop Assessment Results and Section 5 Field Assessment Results*.

Details provided in the MNES Chapter. The MNES Chapter however is based on information contained within this Terrestrial Ecological Report. The relevant sections include:

- Results of the Likelihood of Occurrence assessment is provided in *Table 13 TECs identified in the PMST and Table 14 Threatened and migratory species identified as potentially occurring in the likelihood of occurrence assessment*
- Habitat types and Important habitat areas for each verified MNES are shown in Maps in Appendix A, specifically Maps 11, 12, 13, 14, 15, 16, 17, and 19.
- These maps also provide records of these species detected during the field surveys, or during historical surveys that have taken place within the Survey area.
- *Tables within Field Results Section 5.2 Flora and Section 5.3 Fauna* describe the habitat for each species, and landscape connectivity in the area of interest (20 km buffer).



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A3.35 Habitat assessment descriptions for listed species must be in accordance with the latest relevant Commonwealth policies and guidelines, and information provided in the SPRAT database (e.g. foraging, breeding, dispersal etc.).

Details provided in the MNES Chapter. The MNES Chapter however is based on information contained within this Terrestrial Ecological Report. The relevant component includes:

- *Table 10 Descriptions of habitat for each species identified in the Likelihood of Occurrence assessment as potentially occurring, and targeted survey effort implemented for each* provides details regarding all habitat descriptions from the approved Conservation Advices; Recovery Plans; survey guidelines; draft referral guidelines and Listing Advices; SPRAT Database; and published research, which were used to verify habitat for TECs, and threatened and migratory species.

A3.36 The MNES Chapter must discuss how statutory documents such as conservation advices, recovery plans and threat abatement plans have been considered in the assessment of each MNES.

Details provided in the MNES Chapter. The MNES Chapter however is based on information contained within this Terrestrial Ecological Report. The relevant component includes:

- *Methodology Section 3.2 Desktop Assessment* provides details on how desktop assessments were undertaken using relevant statutory documents to identify likelihood of occurrence of TECs, and threatened and migratory species.
- *Methodology Section 3.3 Field Assessment and Section 3.3.4 Survey Methodology and Survey Effort* provides details on how field assessments were undertaken in accordance with relevant statutory documents.
- *Table 10 Descriptions of habitat for each species identified in the Likelihood of Occurrence assessment as potentially occurring, and targeted survey effort implemented for each* provides details regarding all habitat descriptions from the approved Conservation Advices; Recovery Plans; survey guidelines; draft referral guidelines and Listing Advices; SPRAT Database; and published research, which were used to verify habitat for TECs, and threatened and migratory species.
- Where communities and species were identified as likely to be significantly impacted, community- and species-specific mitigation measures have been proposed in Appendix J, which utilised statutory documents to target known threats and proposed mitigation actions. The statutory documents used are provided in each Community- and Species-specific Management Measures section for the relevant species.

A3.37 Habitat assessments for species listed in Appendix B must provide estimates for habitat quality for each protected matter. Habitat quality should be assessed using the same approach/scoring mechanism as is used for any offset site (where offsets are required). The method applied must be suitable and targeted for each protected matter.

Habitat quality scoring provided in Appendix H. The resulting habitat quality score for species where there is likely to be a significant impact and habitat quality scoring is required to inform offsets is provided within Tables within *Field Results Section 5.2 Flora* and *Section 5.3 Fauna*.



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A3.38 Identify and describe known historical records of the listed threatened species and ecological communities within the proposed Project area and adjacent area. Where relevant, also identify and describe known and historical records of listed threatened species in the broader region (e.g. highly mobile, transient, or cryptic species). All known records must be supported by an appropriate source (e.g. Commonwealth and State databases, Queensland Government's WildNet, Atlas of Living Australia, published research, publicly available survey reports), and where possible and relevant, state the year of the record and a description of the habitat in which the record was identified.	Records of species verified within the Survey area during targeted surveys or historical surveys within the Survey area are shown within Maps 12 – 19, Appendix A. Insets within each of these species maps show recent and adjacent records within the Area of interest (Maps 12 – 19, Appendix A). All records within maps and records detailed in Tables in within <i>Field Results Section 5.2 Flora</i> and <i>Section 5.3 Fauna</i> are supported by the appropriately source in brackets.
A3.39 MNES chapter is to include map/s of presence/records and habitat areas that may support MNES to a suitable scale, in order to assess the proximity and location of the proposed Project in relation to MNES.	Details provided in the MNES Chapter. The MNES Chapter however is based on information contained within this Terrestrial Ecological Report. The relevant sections include: Habitat types, DCCEEW key defining terms and records of MNES verified within the Survey area during targeted surveys or historical surveys are shown in Maps 11 – 19, Appendix A.
A3.40 Provide detailed mapping of suitable habitat for all listed threatened species and ecological communities which may be impacted by the Project, which:	(a) is specific to the habitat requirements for each listed threatened species and ecological community (i.e. does not only illustrate relevant Queensland REs) Habitat types, DCCEEW key defining terms (definitions provided in the <i>Methodology Section 3.4.2.2 Key Defining Terms used by DCCEEW</i>) and records of MNES verified within the Survey area during targeted surveys or historical surveys are shown in Maps 11 – 19, Appendix A. Habitat types have been verified based on habitat definitions provided in <i>Table 10 Descriptions of habitat for each species identified in the Likelihood of Occurrence assessment as potentially occurring, and targeted survey effort implemented for each</i>. All habitat descriptions are from the approved Conservation Advices; Recovery Plans; survey guidelines; draft referral guidelines and Listing Advices; SPRAT Database; and published research. (b) includes below, downstream, within and adjacent to the proposed Project area Insets within each of the species maps show recent and adjacent records within the Area of interest (Maps 12 – 19, Appendix A). (c) includes the total patch size of habitat, including sections of the patch that fall outside of the Project area (in ha) Habitat patches shown in Maps 12 – 19, Appendix A for each TEC, and threatened and migratory species. Extent of habitat (in ha) is provided in Table 48 Extent of MNES and Table 51 Extent of MSES prescribed matters (d) identifies any specific habitat requirements (e.g. breeding, foraging, dispersal, prey availability, known important habitat, suitable habitats, roosting) Habitat types (e.g., breeding, foraging and dispersal), DCCEEW key defining terms (e.g., known important habitats) and records of MNES verified within the Survey area during targeted surveys or historical surveys are shown in Maps 11 – 19, Appendix A. (e) considers the regional context and describes the connectivity of habitat in the broader landscape Insets within each of the species maps show recent and adjacent records within the Area of interest (Maps 12 – 19, Appendix A).



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Tables within *Field Results Section 5.2 Flora* and *Section 5.3 Fauna* describe the habitat for each species, and landscape connectivity in the area of interest (20 km buffer).

	(f) includes known records of individuals derived from desktop analysis and field surveys	Records of species verified within the Survey area during targeted surveys or historical surveys within the Survey area are shown within Maps 12 – 19, Appendix A. Insets within each of the species maps show recent and adjacent records within the Area of interest (Maps 12 – 19, Appendix A).
	(g) is provided separately as high-resolution attachments.	All maps provided in high-resolution in Appendix A
A3.45 Provide details of the scope, methodology, timing, and effort of field surveys. Surveys are to be undertaken by qualified species experts with demonstrated experience in detecting the relevant species or community. Provide details of:	(a) how surveys were, or will be, undertaken in accordance with relevant Commonwealth, State and/or best practice survey guidelines, including Department of Climate Change, Environment, Energy and Water (DCCEEW) survey guidelines	<i>Section 3 Methodology</i> including <i>Section 3.3.4 Survey Methodology and Survey Effort</i> and <i>Table 9 Survey effort</i> provides details regarding the relevant guidelines used. <i>For targeted survey guidelines:</i> • <i>Table 10 Descriptions of habitat for each species identified in the Likelihood of Occurrence assessment as potentially occurring, and targeted survey effort implemented for each</i> provides details regarding the Commonwealth and State targeted survey methods required per ecological community or species as per the relevant guideline, appropriately referenced. • The targeted survey methods implemented for each community and species is provided within the Tables within <i>Field Results Section 5.2 Flora</i> and <i>Section 5.3 Fauna</i>.
	(b) an assessment of the adequacy of any surveys undertaken (including survey effort and timing), the extent to which the surveys were appropriate for the species and in accordance with Australian Government's relevant survey and policy guidelines, or best practice methods where these are unavailable	A comparison of survey effort implemented vs advised within Commonwealth and State guidelines is provided in <i>Table 10 Descriptions of habitat for each species identified in the Likelihood of Occurrence assessment as potentially occurring, and targeted survey effort implemented for each</i> . The Tables within <i>Field Results Section 5.2 Flora</i> and <i>Section 5.3 Fauna</i> provide an assessment per community or species as to whether the targeted survey guidelines were met.
	(c) if relevant, the justification for divergence from relevant Commonwealth, State and/or best practice survey guidelines	Not relevant. All methods and survey effort implemented were in accordance with relevant Commonwealth, State and/or best practice survey guidelines
	(d) state the total number of records (individuals and evidence of presence) of listed threatened species, migratory species and ecological communities in and within the vicinity of the	The Tables within the <i>Field Results Section 5.2 Flora</i> and <i>Section 5.3 Fauna</i> provide the number of records verified within the Survey area for each threatened and migratory species during targeted surveys or historical surveys within the Survey area. They also provide details of records from the Area of interest.



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proposed Project site, and show in applicable area maps	Records of species verified within the Survey area during targeted surveys or historical surveys within the Survey area are shown within Maps 12 – 19, Appendix A. Insets within each of the species maps show recent and adjacent records within the Area of interest (Maps 12 – 19, Appendix A).
(e) provide maps identifying verified sightings of MNES during studies or surveys, in accordance with DCCEEW mapping guidance	Records of species verified within the Survey area during targeted surveys or historical surveys within the Survey area are shown within Maps 12 – 19, Appendix A. Insets within each of the species maps show recent and adjacent records within the Area of interest (Maps 12 – 19, Appendix A).
(f) any limitations associated with the survey which may have impacted on the results, including (but not limited to) rain events, inaccessible areas, resource limitations (e.g. time, equipment failure), inadequate sampling and/or effort	<i>Methodology Section 3.8 Survey Limitations</i>
(g) how any survey limitations have been addressed.	
A3.46 Attach all relevant ecological surveys referenced in the referral and MNES chapter as supporting documents to the EIS.	Previous ecological surveys are referenced within <i>Background Information Section 2.2 Past Ecological Assessments</i> . These reports are cited because they overlap with all or part of the Survey area and provide additional contextual information. All referenced reports are publicly available. These previous reports have not been relied upon for the impact assessment. Trend Environmental completed full RE verification and baseline and targeted surveys for the Survey area in accordance with relevant Commonwealth and State guidelines. On this basis, the earlier reports have not been appended to the EIS.
A3.47 Where potential habitat for listed threatened species and ecological communities is identified in the Project area, an assessment must be undertaken regardless of whether the species was recorded (i.e. the potential for occurrence of these species and communities must also be considered and assessed).	All MNES threatened and migratory species recorded and whose habitat was verified have been assessed for significance of impacts in Appendix J
A3.48 Wherever practicable, surveys should be undertaken over an ecologically relevant scale and period to adequately determine the likely presence or absence of the target species or environmental value. A precautionary approach should be taken where this is not possible.	<i>Methodology Section 3.3.2 Survey Extent and Timing</i>
A3.49 Identify potential climate change refugia within the proposed Project area and adjacent area for listed threatened and migratory species which may be impacted by the proposed Project. See Characteristics of climate change refugia for Australian biodiversity (Reside et al., 2014) for information on	<i>Section 5.7 Presence of Climate Refugia</i>



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climate change refugia, as well as other more recent and species-specific research where relevant.

Appendix 3 Tor for MNES under the EPBC Act – Relevant impacts

The MNES chapter must include a description of all the relevant impacts of the Project. Relevant impacts are impacts that the Project will have or is likely to have on a matter protected by a controlling provision. The MNES chapter must include a description of all the relevant impacts of the Project. 'Likely' is taken to mean a "real or not remote chance or possibility". Relevant impacts are impacts that the Project will have or is likely to have on a matter protected by a controlling provision.

For each listed threatened species and community, provide the habitat assessment and impact assessment together under a heading of the species' name so potential impacts can be easily understood.

Details provided in the MNES Chapter. The MNES Chapter however is based on information contained within this Terrestrial Ecological Report. The relevant sections include:

- Habitat types and DCCEW key defining terms (e.g., important habitat) for each species is provided in Tables within the *Field Results Section 5.2 Flora* and *Section 5.3 Fauna*.
- Table 48 Extent of MNES provides the impact areas for each MNES.

The MNES Chapter uses this information to provide the habitat assessment and impact assessment together under a heading of the species' name so potential impacts can be easily understood.

A3.50 With consideration of all Project phases, identify and describe which component/s and stage/s of the Project and/or consequential actions are of relevance to each listed threatened species and/or ecological community. All relevant impacts of the Project are to be assessed in accordance with the latest relevant Commonwealth policies and guidelines, and information provided in the SPRAT database, including but not limited to:

- habitat clearance
- habitat inundation
- habitat fragmentation and degradation
- injury or death (such as from vehicle strike or entanglement in structures such as barbed wire fencing)
- disturbance from dust, light, vibration and noise
- behavioural changes
- barriers to fauna movement and edge effects
- changes to prey availability
- introduction, spread and/or increase in pests, weeds and diseases

Community- and species-specific mitigation measures provided in Appendix J for those MNES likely to be significantly impacted have been proposed based on each of the known threats to the MNES which were identified from the latest relevant Commonwealth policies and guidelines, and information provided in the SPRAT database. These tables provide the timing (project phases) in which these impacts are relevant.

A3.51 Describe all relevant impacts of the Project (direct, indirect, cumulative and facilitated), including the magnitude, duration and frequency of the impacts (including any temporary impacts). All stages and components of the Project must be addressed, and the following information provided:

- a detailed assessment of the nature and extent of the likely short-term and long-term relevant impacts, taking into consideration any indirect impacts (e.g. light and dust pollution, noise from operations, construction and explosives, increased risk of predation, edge effects, barrier effects, habitat fragmentation,

Section 6 Potential Risks and Impact Assessment includes *Section 6.1 Potential Direct Impacts*, *Section 6.2 Potential Indirect and Facilitated Impacts* and *Section 6.7 Potential Cumulative Impacts*.



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drawdown, contamination)	
(b) a statement, with supporting evidence, whether any relevant impacts are likely to be unknown, unpredictable or irreversible	Statement provided at the start of <i>Section 6 Potential Risks and Impact Assessment</i>
(c) any technical data and other information used or needed to make a detailed assessment of the relevant impacts, including but not limited to baseline studies, site characterisation, relevant modelling, and surveys undertaken. This should include a discussion of what is included in studies and characterisation assessments and any relevant thresholds used	All technical data and information relied upon has been provided within this Terrestrial Ecology Report, particularly within <i>Section 4 Desktop Assessment Results</i> and <i>Section 5 Field Assessment Results</i>
(d) the geographic extent of impacts and the length of the impact period(s).	The Disturbance area shown in Maps in Appendix A is the expected geographic extent of direct impacts. Where indirect impacts may have a greater geographic extent, these have been detailed within the community- and species-specific mitigation measures tables within Appendix J for each of the communities and species considered likely to result in significant impacts.
(e) an assessment of the likelihood and total quantum (in ha) of the impact of the proposed Project on the ecological functions, populations, habitat (including critical and supporting), species behaviours (foraging, migration and breeding) and known threats of any MNES, including natural values and ecological character of these MNES, within and surrounding the proposed Project area.	• Table 48 Extent of MNES provides the impact areas for each MNES. • Significant impact assessments for each MNES in Appendix J address the likelihood of impact, quantum of impact to ecological functions, populations, habitat and known threats.



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(f) consideration must be given to specific habitat features such as hollow-bearing trees, nest trees, refuge habitat, foraging, breeding and dispersal habitat, sheltering or other microhabitat features relevant to the species and threatened ecological communities within and surrounding the development footprint	Habitat types (e.g., breeding, foraging and dispersal) per MNES verified within the Survey area during targeted surveys or historical surveys are shown in Maps 12 – 19, Appendix A. Significant impact assessments for each MNES in Appendix J address specific habitat features and whether these are likely to be impacted and results in a significant impact to MNES.
(g) an analysis of the significance of the relevant impacts.	Significant impact assessments for each MNES are provided in Appendix J.
A3.52 Provide a detailed assessment of any likely impact that the Project may have on the MNES above at the local, regional, state, and national scale. The assessment of impacts should include a discussion of the overall implication of all relevant impacts on population and sub-population size (including genetic diversity), species recovery, health and species range for each relevant MNES.	Significant impact assessments for each MNES provided in Appendix J assesses the scale at which impacts are likely and whether impacts are likely at a population or sub-population size.
A3.53 The MNES chapter should identify and address cumulative impacts, where potential project impacts are in addition to existing impacts of other activities, including known potential future expansions or developments by the proponent and, to the extent possible, other proponents in the region and vicinity. This should include, but is not limited to: (a) establish and describe clear spatial and temporal boundaries for the assessment of cumulative impacts (b) address the potential cumulative impact of the Project on ecosystem resilience (including GDEs). Where relevant to the potential impact, a risk assessment is to be conducted and documented (c) a discussion of the potential for existing pressures and threats to be exacerbated by the proposed Project (d) a review and analysis of residual impacts of the proposed Project, and of other known proposals, where there may be a spatial or temporal overlap.	Details provided in the MNES Chapter. The MNES Chapter however is based on information contained within this Terrestrial Ecological Report. The relevant sections include: • <i>Potential Risks and Impact Assessment Section 6.7 Potential Cumulative Impacts.</i> • <i>Section 6.7.2 Cumulative impact on Ecosystem Resilience</i> Cumulative impacts were assessed at the bioregion, subregion, local (Area of Interest; 20 km buffer) and Project area scales, using past, current and foreseeable future impacts from the Project, and other adjacent projects likely to clear vegetation in the foreseeable future.
A3.54 The MNES chapter is to identify and assess the cumulative impacts on MNES (terrestrial and aquatic) created by the Project and the activities of other existing and proposed adjacent, upstream and downstream relevant developments, water users and land users. This must include at a minimum, cumulative impacts of other projects impacting on the Greater Glider, Ornamental Snake and other relevant MNES including, but not limited to, the Isaac Downs coal mine project (EPBC 2019/8413), the Bowen Gas Project (EPBC 2012/6377) the	



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Moranbah South Project Coal Mine (EPBC 2012/6337), and any other mines which may interact with the impacts for the proposed action. Details of these projects can be found on DCCEE's EPBC Public Notices website.

A3.55 The MNES chapter is to address the potential impact of the Project on ecosystem resilience where relevant for MNES. This should include consideration of the likely/predicted changes to climate regimes.

A3.56 Where relevant, the MNES chapter should consider the anticipated/predicted future climatic conditions at the site in the assessment of impacts on MNES, and how changes in climate and the frequency and severity of weather events may interact with, exacerbate or reduce the impacts of the proposed Project on MNES over time. This should include, but not be limited to, the:

- (a) loss, fragmentation, and/or drying of potential climate refugia and/or refuges for threatened species or communities as a result of the proposed Project – consider the potential impacts of removing or otherwise impacting these habitats under drier conditions and periods of extreme heat
- (b) increased risk of fire as a result of mining operations under drier conditions and periods of extreme heat
- (c) overtopping of the sediment basin/Mine Affected Water (MAW) dam/s during extreme rain events and the downstream impacts on MNES
- (d) inclusion of different climate scenarios in water modelling.

A3.57 The MNES chapter should also provide a detailed assessment of any potential or likely impacts that the proposed Project may facilitate on threatened species and ecological communities, including but not limited to increased road traffic, increased use of area, etc.

A3.58 The MNES chapter must include an assessment of relevant impacts to habitat from all phases of the proposed Project, including from land clearing, construction, dewatering, and mining. Indirect impacts including those which may arise from changes to hydrological regimes or tidal processes should also be considered. The chapter should characterise the following:

- a) the type of habitat being impacted including species use and ecological characteristics, including whether the habitat:
 - i) is habitat critical to the survival of a species or ecological community
 - ii) supports an important population
- b) the footprint of habitat impacted within the proposed Project area

Details provided in the MNES Chapter. The MNES Chapter however is based on information contained within this Terrestrial Ecological Report. The relevant sections include:

- *Potential Risks and Impact Assessment Section 6.2.10 Influence of Climate Change* which assesses the Projects indirect impact on ecosystem resilience, as a result of loss, fragmentation, and/or drying of potential climate refugia and/or refuges for threatened species or communities as a result of the proposed Project, increased fire risk, overtopping for sediment basins and MAW dams due to extreme rainfall events.

Climate scenarios in water modelling are addressed in the Surface Water Report (Hydrobalance, 2026c).

Details provided in the MNES Chapter. The MNES Chapter however is based on information contained within this Terrestrial Ecological Report. The relevant sections include:

- *Section 6.2 Potential Indirect and Facilitated Impacts* addresses facilitated impacts from the Projects on threatened species and ecological communities, including impact from vehicle strike, in *6.2.4 Fauna Mortality or Injury*, specifically *Section 6.2.4.2 Vehicle Strike*.

Details provided in the MNES Chapter. The MNES Chapter however is based on information contained within this Terrestrial Ecological Report.

Community- and species-specific mitigation measures provided in Appendix J for those MNES likely to be significantly impacted have been proposed. These tables provide the timing (project phases) in which these impacts are relevant, the habitat type being impacted and whether it's habitat critical to the survival of a species or ecological community.

Table 48 Extent of MNES provides the impact areas for each MNES.

Significant impact assessments in Appendix J assess whether impacts to ecological function and adjacent habitat will result.



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c) impacts to the ecological function and characteristics of adjacent habitat, including consideration of whether the surrounding area may be retained, removed, or functionally lost.

A3.59 Provide an assessment of the likelihood, intensity, duration, magnitude and extent of impacts resulting from the pre-construction activities, construction, operation, maintenance, decommissioning and rehabilitation components of the Project on listed threatened species, their habitat and threatened ecological communities in the Project area.

An assessment of the likelihood, intensity, duration, magnitude and extent of impacts has been undertaken as part of the identification and assessment of potential direct and indirect impacts presented in *Section 6 Potential Risks and Impact Assessment*, specifically within *Section 6.1 Potential Direct Impacts* and *Section 6.2 Potential Indirect and Facilitated Impacts*.

The assessment considers potential impacts associated with the relevant Project phases, including pre-construction, construction, operation, maintenance, decommissioning and rehabilitation, where applicable, and their potential effects on listed threatened species, habitat values and threatened ecological communities within the Disturbance area.

General mitigation measures provided in *Section 7.3 General Impact Mitigation* have been developed with consideration of the identified likelihood, intensity, duration, magnitude and spatial extent of potential impacts.

A3.60 For threatened ecological communities, the total direct and indirect impact (in ha) to each identified patch within and adjacent to the Project area must be provided. Further, the impact assessment for ecological communities must include a discussion on the post-impact viability of each individual patch within and adjacent to the Project site to be directly or indirectly impacted from fragmentation as a result of vegetation clearance. Assessment of the impact to threatened ecological communities must include any relevant buffers directly surrounding the patch. Justification must be provided as to the size and form of any buffer applied, or in cases where a buffer is not applied.

Potential Risks and Impact Assessment Section 6.4.1 Impacts to TECs and Table 49 Assessment of direct and indirect impacts to TEC individual patches.

A3.62 Include the potential direct, indirect, facilitated, and cumulative (where possible) loss and/or disturbance on listed threatened species, their habitat and threatened ecological communities as a result of the proposed Project. This must include:

- (a) the quality of the habitat impacted
- (b) quantification of the individuals where relevant
- (c) duration of impact
- (d) habitat area (in ha) to be impacted.

Table 48 Extent of MNES includes the direct habitat area (in ha) to be impacted.

Potential Risks and Impact Assessment Section 6.1 Potential Direct Impacts, Section 6.2 Potential Indirect and Facilitated Impacts and Section 6.7 Potential Cumulative Impacts.

Tables within the *Field Results Section 5.2 Flora* and *Section 5.3 Fauna* provide information on habitat quality, number of individuals recorded during field surveys.

Duration of impact is discussed in the Significant Impact Assessments for each species in Appendix J.

A3.63 Describe, with supporting evidence, how the proposed Project will not be inconsistent with:

- (a) Australia's obligations under the Biodiversity Convention, the Convention on Conservation of Nature in the South Pacific (Apia Convention), and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
- (b) a recovery plan or threat abatement plan.

Section 6.4.4 Consistency with Australia's Obligations under the Biodiversity Convention, the Convention on Conservation of Nature in the South Pacific (Apia Convention), and the Convention on International Trade in Endangered Species of Wild Fauna and Flora



Terms of Reference

Section reference

A3.64 Describe, with supporting evidence, how the proposed Project has taken into account any relevant approved conservation advice for the relevant listed threatened species and threatened ecological communities.

Table 10 Descriptions of habitat for each species identified in the Likelihood of Occurrence assessment as potentially occurring, and targeted survey effort implemented for each describes the habitat type and DCCEEW key defining terms for each MNES which was access from the relevant approved conservation advice or listing advice.

Community- and species-specific mitigation measures provided in Appendix J for those MNES likely to be significantly impacted have been proposed. These tables provide have utilised the relevant approved conservation advice to proposed mitigation measures for each known threat to the MNES.

The Significant Impact Assessments in Appendix J refer to relevant approved Conservation advices where applicable.

A3.65 A risk assessment for all identified risks to threatened species and ecological communities should be conducted and documented.

Section 6 Potential Risks and Impact Assessment describes all direct and indirect impacts from the Project in *Section 6.1 Potential Direct Impacts* and *6.2 Potential Indirect and Facilitated Impacts*

All known risks to threatened species and ecological communities likely to be significantly impacted have been identified and provided in each of the tables detailing the community- and species-specific mitigation measures in Appendix J

A3.66 After consideration of proposed avoidance, mitigation, and management measures, provide an assessment of the likelihood of significant impacts on relevant listed threatened species and ecological communities. Provide the total amount of significant residual impact, if any, for each type of habitat (in ha) in the disturbance footprint for each listed threatened species and ecological community. The significant impact assessment must consider DCCEEW's Significant impact guidelines 1.1.

Significant Impact assessment for listed threatened species and ecological communities provided in Appendix J.

Appendix 3 Tor for MNES under the EPBC Act – Avoidance, mitigation and management measures

Avoidance, minimisation, and mitigation measures are the primary methods of eliminating and reducing significant impacts on MNES. Where possible and practicable, it is best to avoid impacts. If impacts cannot be avoided, then they should be minimised or mitigated as much as possible. Residual impacts should then be managed. Avoidance, minimisation, and mitigation measures must be investigated thoroughly as a part of the assessment and be supported by evidence to demonstrate likely success.

The MNES chapter must provide information on proposed avoidance, minimisation, mitigation, and management measures to deal with the impacts of the Project. Non-committal language (i.e. 'may', 'where possible', 'if required', etc.) must be avoided. Clear language demonstrating commitment must be used (i.e. 'will'), and any commitments by the proponent must be clearly distinguished from recommendations or statements of best practice made by the document author or other technical expert. The proposed measures and the outcomes to be achieved must be provided

Section 7 Impact Mitigation including *Section 7.1 Measures to avoid and minimise impacts* and *Section 7.3 General Impact Mitigation*.

Also, community- and species-specific mitigation measures for each MNES likely to be significantly impacted in Appendix J.

The MNES Chapter uses this information.

The following management plans relevant to MNES are provided as part of the EIS:

- *MNES Species Management Plan* (Trend Environmental, 2026a)
- *OAMP* (Trend Environmental, 2026c)
- *ODP* (Trend Environmental, 2026d)
- *Weed and Pest Management Plan* (Trend Environmental, 2026e).

SMART principle has been addressed through the management actions proposed for each relevant MNES that



Terms of Reference	Section reference
and substantiated and based on best available evidence and practices. The SPRAT Database, conservation advice, recovery plans, and associated statutory and policy documents may provide a starting point for relevant mitigation measures for listed threatened and migratory species and ecological communities. Any management plans required for the mitigation and management of impacts on MNES should be provided either as separate documents attached to the EIS or provided as subsections in the MNES chapter. Attach draft environmental management plans (EMPs) to the MNES chapter to be assessed prior to approval. DCCEEW encourages the proponent to establish, test, and monitor novel methods for avoiding, minimising, and mitigating impacts of the proposed Project on MNES. DCCEEW also encourages the development of scientifically rigorous monitoring programs to measure impacts and assess the effectiveness of mitigation. Mitigation, management and monitoring activities must adhere to the 'S.M.A.R.T' principle: (a) Specific (S) – it is clear what must be done; (b) Measurable (M) – activities have clearly specified performance standards with measurable parameters; (c) Achievable (A) – it is capable of being achieved; (d) Reasonable/relevant (R) – the activity is reasonable and relevant to the protected matter in accord with statutory documents; (e) Time specific (T) – activities have a clear timeframe or specific point in time in which they occur.	is likely to be significantly impacted. Provided in Appendix J
A3.83 Proposed measures must be based on best available practices, appropriate standards, evidence of success for other similar projects and supported by published scientific evidence. All commitments must be drafted using committal language (e.g. 'will' and 'must') when describing the proposed measures. All proposed measures must also be drafted to meet the 'S.M.A.R.T' principle	
A3.84 Describe in detail measures proposed to avoid, mitigate and manage relevant impacts during all stages of the Project on MNES. The proposed measures are to be based on best available practices, appropriate standards and supported by scientific evidence (e.g. outcomes of successful field trials, research papers, other	(a) proposed measures to be undertaken to avoid and mitigate the relevant impacts of the Project on MNES, including those required by other Commonwealth, State and local government approvals. Measures must be specific to the ecology of each affected MNES <i>Section 7 Impact Mitigation</i> including <i>Section 7.1 Measures to avoid and minimise impacts</i> and <i>Section 7.3 General Impact Mitigation</i>. Also, community- and species-specific mitigation measures for each MNES likely to be significantly impacted in Appendix J.



Terms of Reference	Section reference
projects, etc.). The chapter is to include: MNES	
(b) an assessment and evaluation of the predicted effectiveness of the proposed measures supported by scientific evidence including details on how proposed measures meet best practice standards	Community- and species-specific mitigation measures for each MNES likely to be significantly impacted in Appendix J. These tables include an evaluation of predicted effectiveness.
(c) any statutory or policy basis for the proposed measures, including reference to the SPRAT database and relevant approved conservation advices, and a discussion on whether the proposed measures are not inconsistent with relevant and current recovery plans, conservation advices and threat abatement plans	Community- and species-specific mitigation measures for each MNES likely to be significantly impacted in Appendix J. These tables include the statutory basis for the proposed measures
(d) details of ongoing management, including monitoring programs to support an adaptive management approach and determine the effectiveness of the proposed measures	Community- and species-specific mitigation measures for each MNES likely to be significantly impacted in Appendix J. These tables include proposed ongoing management and monitoring
(e) details on measures, if any, proposed to be undertaken by State and local government, including the name of the agency responsible for approving each measure	N/A
(f) information on the timing, frequency and duration of the measures to be implemented	Community- and species-specific mitigation measures for each MNES likely to be significantly impacted in Appendix J. These tables include the timing, frequency and duration of the mitigation measures proposed.



Terms of Reference

Section reference

(g) the outcomes to be achieved for each relevant MNES through the implementation of individual or combined mitigation measures, including details of how these outcomes can be measured

Community- and species-specific mitigation measures for each MNES likely to be significantly impacted in Appendix J. These tables include proposed ongoing monitoring to measure outcomes and the proposed outcomes.

(h) name of the agency responsible for endorsing or approving each mitigation measure or monitoring program.

All mitigation measures proposed specifically for MNES are subject to consideration by DCCEEW, as the relevant agency responsible for approval or endorsement, where required. Responsibility is addressed in the MNES Chapter

A3.85 Describe how habitat fragmentation and patch isolation will be avoided, with consideration of whether avoidance areas will enable species mobility across the Project area and still be connected to habitat in the broader landscape.

Section 7.1 Measures to avoid and minimise impacts

Information sources provided in the MNES chapter

A3.153 For information given in a draft EIS, the draft must state:

- (a) the source of the information
- (b) how recent the information is
- (c) how the reliability of the information was tested
- (d) what uncertainties (if any) are in the information.

Our sourced information has been appropriately referenced throughout including but not limited to:

- Records within maps in Appendix A.
- Tables within *Field Results Section 5.2 Flora* and *Section 5.3 Fauna* that provide information on species records.
- Habitat types, DCCEEW key defining terms and survey guidelines in *Table 10 Descriptions of habitat for each species identified in the Likelihood of Occurrence assessment as potentially occurring, and targeted survey effort implemented for each*

Methodology Section 3.8 Survey Limitations and *Section 3.8.1 Third Party Data* states any uncertainties in information referenced within this report and how the reliability of the information was tested.



2. BACKGROUND INFORMATION

2.1 REGULATORY FRAMEWORK

The relevant Commonwealth and State legislation applicable to the Project are described in Table 2. These legislation provide for the protection of terrestrial ecological values, including MNES, MSES and ESAs.

MNES are protected under Commonwealth legislation, specifically the EPBC Act. MSES and ESAs are protected under State legislation.

MSES are environmental or ecological values protected under the EO Act and various other State environmental legislation. MSES are defined in Schedule 2 of the *Environmental Offsets Regulation 2014* (Qld; EO Regulation). Other potentially relevant legislation, as described in Table 2, includes the NC Act, *Marine Parks Act 2004*, Fisheries Act, EP Act, RPI Act and the VM Act. MSES can include but are not limited to areas of regulated vegetation, connectivity, high ecological value (HEV) wetlands and watercourses, and protected wildlife habitat.

ESAs are also environmental or ecological values, but they are protected under the EP Act and are only relevant to resource activities (e.g., mining and exploration). There are three categories of ESAs: Category A, B and C. The relevance of each category depends on the type of resource activity being undertaken. The ESAs in each category are defined in Schedule 19 of the EP Regulation. ESAs can include but are not limited to National Parks, World Heritage Areas, RAMSAR wetlands, and endangered and of concern REs.

Of relevance to this impact assessment, REs can be considered either or both an MSES or an ESA under different circumstances based on their different protection statuses (VM Act status or biodiversity status). Their VM Act status is used for defining MSES under the EO Act and the other relevant environmental legislation listed above, while the biodiversity status is used for defining some ESAs under the EP Act. Where relevant, this report defines which status has been used to avoid confusion.

Table 2
Relevant
legislation

Type	Regulatory Framework	Purpose
Commonwealth	<i>Environment Protection, Biodiversity Conservation Act 1999</i>	The purpose of the EPBC Act is to protect and manage nationally and internationally important MNES. The EPBC Act recognises nine MNES, including listed threatened species and communities, listed migratory species, RAMSAR wetlands and world heritage properties. International treaty obligations relating to migratory species under agreements such as JAMBA, CAMBA and ROKAMBA are implemented through the listing of migratory species under this Act. A Referral, under the EPBC Act, to the DCCEE is required for all developments (actions) likely to have a significant impact on a MNES. DCCEE then determine if the development is a 'controlled action', requiring Commonwealth approval. A protected matters database search can be conducted which lists all MNES that are considered known or likely to occur within a given area. This search identifies the MNES that are most relevant to the Project which therefore have the potential to be impacted.
	<i>EPBC Act Environmental Offsets Policy</i>	Offsets under the <i>EPBC Act Environmental Offsets Policy</i> (DSEWPaC, 2012a) may apply to compensate for any significant residual impacts of a controlled action on a MNES after avoidance and mitigation measures have been employed. This Policy sets out offset requirements under the EPBC Act.



Type	Regulatory Framework	Purpose
	<i>Australian Weeds Strategy</i>	The Australian Weeds Strategy provides a framework to provide guidance and identify priorities for weed management on a national level, with the aim of minimising the impact of weeds on Australia's environmental, economic, and social assets. Under the Australian Weeds Strategy, 32 WoNs are currently recognised (Department of Agriculture and Water Resources; DAWR, 2012). These weeds have been identified due to their invasiveness, potential for spread, and environmental and socio-economic impacts.
State (Queensland)	<i>Environment Protection Act 1994</i>	The EP Act is administered by the DETSI and was established to protect Queensland's environment, while allowing for development that improves the total quality of life, both now and in the future. The EP Act lists obligations and duties to prevent environmental harm, nuisances, and contamination. The EP Act provides the regulatory framework to help reduce and eliminate pollution into the air, land, and water. The EP Act uses a number of mechanisms to achieve its objectives, including the requirement for mining projects to obtain an Environmental Authority (EA) prior to operation and the requirement for an environmental impact assessment process in support of an EA application. The Act provides maps under the EP Regulation that identify the locations of Wetland Protection Areas (WPA), which are buffer areas that protect High Ecologically Significant (HES) wetlands from high impact earthworks The EP Regulation also lists categories of ESAs protected under the EP Act. ESAs are places designated for special protection due to their ecological, landscape, or historical importance.
	<i>Vegetation Management Act 1999</i>	The purpose of the VM Act is to regulate the clearing of native vegetation in Queensland, to conserve native vegetation, prevent the loss of biodiversity and maintain ecological processes. The VM Act applies to all vegetation, other than that in state forests, national parks and certain other tenures defined under the <i>Forestry Act 1959</i> (Forestry Act) and the NC Act. Approval under the VM Act is not required for activities on a ML, never-the-less the VM Act provides the categorisation of vegetation used in assessments for resource projects on MLs. The Act uses a series of maps to determine what vegetation is regulated and would require assessment should it be cleared for development. Regulated vegetation is categorised by its level of protection, including Category A (Vegetation offsets/compliance notices), Category B (Remnant), Category C (High-value regrowth), Category R (Reef regrowth watercourse), and Category X (Exempt clearing work on Freehold, Indigenous and Leasehold land). Categories containing remnant or regrowth vegetation are classified into protection types for regional ecosystems: endangered, of concern or least concern. For activities not on an ML, the Act also regulates the clearing of vegetation that is considered essential habitat for species of State significance or intersects mapped wetlands and watercourses.
	<i>Nature Conservation Act 1992</i>	The purpose of the NC Act is to protect Queensland's natural areas and biota, through the creation of national parks, reserves, conservation areas and the protection of threatened and special flora and fauna. The NC Act regulates development in protected areas and where protected species have been recorded by upholding a permit and licensing system for the taking and keeping of native wildlife.



Type	Regulatory Framework	Purpose
		The <i>Regulations (Nature Conservation (Animals) and Nature Conservation (Plants) Regulations 2020</i> provide lists of flora and fauna species that are recognised as extinct, extinct in the wild, critically endangered, vulnerable, near threatened, and SLC. Should these species or their habitat be present in the vicinity of any project, this may result in permit requirements under the Act to interfere with them, such as Species Management Programs (SMP) for interfering with animal breeding places or Protected Plant Clearing Permits for clearing protected plants. The NC Act also regulates development within koala habitat areas in South East Queensland through the <i>Nature Conservation (Koala) Conservation Plan 2017</i>, and provides the flora survey trigger mapping, which shows 'high-risk' areas for protected plants (those protected under the Act) within non-protected areas, which is used to assist flora survey and clearing permit requirements for impacted developments.
	<i>Water Act 2000</i>	The purpose of the <i>Water Act 2000</i> (Qld; Water Act) is to sustainably plan, manage and protect the State's water resources. Waters mapped in the watercourse identification map are protected. Activities within 'mapped' waters may require a Riverine Protection Permit, including activities such as destroying vegetation, excavating, or placing fill.
	<i>Fisheries Act 1994</i>	The Fisheries Act is responsible for ensuring Queensland fisheries resources remain economically viable and socially acceptable; and any development is ecologically sustainable. The Fisheries Act regulates development which is likely to impact on marine plants (e.g., mangroves); fish passage when development is considered waterway barrier works; and declared fish habitat areas.
	<i>Biosecurity Act 2014</i>	The Biosecurity Act provides management measures to protect the environment from pests and diseases in Queensland. Under the Biosecurity Act, invasive plants and animals are categorised as either a 'prohibited matter' or 'restricted matter'. Local governments in Queensland are required to develop a Biosecurity Plan to manage the matters that are present within the local area. Proponents preparing an EIS need to address their General Biosecurity Obligation (GBO). All Queenslanders have a general biosecurity obligation under Biosecurity Act (see Chapter 2, Part 1 of the Act). This means that everyone is responsible for managing biosecurity risks that are: • under their control; and • that they know about or should reasonably be expected to know about. Biosecurity risks may arise from pest plants, pest animals, diseases or contaminants, as well as carriers such as soil, vegetation, vehicles, machinery and equipment. Consistent with the requirements of the <i>Biosecurity–EIS information guideline (DES, 2024b)</i>, the Terrestrial Ecology assessment has identified the presence and distribution of pest plants and pest animals within the Survey area and considered the potential for the Project to introduce or spread these species. Management measures are incorporated into the Project's environmental management framework to minimise the risk of introducing, establishing or spreading pest species during construction and operation.



Type	Regulatory Framework	Purpose
	<i>Environmental Offsets Act 2014</i>	Under the EO Act, an environmental offset is defined as an activity undertaken to counterbalance an SRI of a prescribed activity on a prescribed environmental matter. An environmental offset may be required as a condition of an approval under various legislation, where following consideration of avoidance and mitigation measures, a prescribed activity is likely to result in an SRI on a prescribed environmental matter. The EO Act, EO Regulation and the <i>Queensland Environmental Offsets Policy</i> (DETSI, 2025) comprise the Queensland Environmental Offsets Framework. According to this framework, it is necessary to provide offsets for any SRIs on MSES. However, as stated in the EO Act, an offset for a prescribed environmental matter which has been assessed under the EPBC Act is not subject to offset conditions under the <i>EO Act</i>. The EO Regulation lists prescribed environmental matters regulated under the EO Act and specifies the prescribed activities for which offsets may apply. A prescribed environmental matter includes but is not limited to protected areas, endangered or vulnerable wildlife, essential habitat, prescribed REs, connectivity areas, wetlands and watercourses, fish habitat areas, waterways for fish passage and marine plants. SRIs for prescribed activities recognised under the EP Act are determined through the application of criteria outlined in the <i>Queensland Environmental Offsets Policy - Significant Residual Impact Guideline</i> (DEHP, 2014a)
	Queensland Environmental Offsets Policy, version 1.17	The <i>Queensland Environmental Offsets Policy - Significant Residual Impact Guideline</i> (DEHP, 2014a) came into force in June 2016. It provides a single, consistent, whole-of-government policy for the assessment of offset proposals to satisfy offset conditions in Queensland. The Policy details how offset proposals are assessed to meet the requirements of the EO Act.
	Regional Planning Interests Act 2014	The RPI Act regulates resource and other regulated activities within areas of regional interest, including Strategic Environmental Areas (SEAs). SEAs are identified to protect regionally significant environmental values from potential impacts associated with resource activities. Development within an SEA may require a Regional Interests Development Approval (RIDA), unless an exemption applies. The Project has been assessed against mapping of areas of regional interest to determine whether it intersects a Strategic Environmental Area and whether approval requirements under the RPI Act are triggered.
Council	Isaac Regional Council Planning Scheme	The Isaac Regional Planning Scheme is the primary statutory planning instrument guiding land use and development within the Isaac Regional Council area. It establishes assessment benchmarks to ensure that development avoids, minimises and mitigates impacts on environmental values, including biodiversity, vegetation, and waterway health. Isaac Regional Council does not specifically define Matters of Local Environmental Significance (MLES) within its planning framework. However, the Isaac Regional Planning Scheme requires the identification, assessment and protection of environmental values, including MNES and MSES. In the absence of a formal MLES classification, ecological values relevant at the local scale have been considered through the assessment of MNES and MSES, as well as the broader evaluation of remnant and regrowth vegetation, habitat



Type	Regulatory Framework	Purpose
		condition, and species habitat within the Project area. This approach is consistent with the intent of the planning scheme to avoid, minimise and mitigate impacts to biodiversity values at a local and regional level.
	Isaac Region Biosecurity Plan 2024 -2027	The <i>Isaac Region Biosecurity Plan</i> (Liveability and Sustainability, 2024) defines stakeholder roles and responsibilities in the management of pest, plants and animals. Within the focus of this document, pest animals and weeds are described as non-native invasive species that can have, or threaten to have, significantly negative impacts economically, culturally, environmentally, and socially.

2.2 PAST ECOLOGICAL ASSESSMENTS

To date, a number of desktop and field ecological assessments for other nearby projects have been completed within and surrounding the Survey area. These assessments focussed on understanding the ecological values and identifying potential impacts from proposed exploration or mining operations, unrelated to the Project. The following ecological assessments have been completed within parts of the Survey area:

- **2007 – Chapter 10 Nature Conservation. Integrated Isaac Plains Project EIS** (Matrix Consulting, 2007). In 2007, the Integrated Isaac Plains Project (IIPP) underwent an EIS process. The IIPP project was cancelled by its proponent. The IIPP covered an ‘expansion area’ which overlapped with the current Project’s Survey area. As part of the EIS process, MNES within the Survey area were verified.
- **2010 – Flora and Fauna Ecological Assessment, Moranbah South Coal Mine. Environment Protection and Biodiversity Conservation Act 1999. Proposed Seismic Survey, Moranbah South. Prepared for Anglo American Metallurgical Coal Pty Ltd** (Ison Environmental Planners, 2010). A flora and fauna ecological assessment was prepared for Anglo American to inform a seismic exploration survey as part of the Moranbah South Coal Mine Project. The project area for this assessment overlapped with approximately 80% of the current Project’s Survey area. The assessment included a literature review of survey reports from adjacent areas, and desktop and field verification of MNES and habitat that supported MNES.
- **2012 – EIS assessment report under the Environmental Protection Act 1994. Moranbah South Project proposed by Anglo American Metallurgical Coal Pty Ltd** (Statewide Environmental Assessments, 2012). In 2012, the Moranbah South Coal Mine underwent an EIS process. The project is on hold. The southern part of the proposed Moranbah South Coal Mine overlapped with the current Project’s Survey area. As part of the EIS process, MNES within the Moranbah South project area were verified.
- **2020 - Terrestrial Ecology Impact Assessment Report. Isaac Downs Project** (EcoSM, 2020). In 2021, IDM underwent the EIS process. As part of this process, MNES within the IDM project area were verified. This assessment included parts of the current Project’s Survey area, where it lies adjacent to the Isaac River.

These previous ecological assessment reports were reviewed as part of the desktop study for the Project. Where data were relevant (e.g., threatened species records), they have been incorporated into our mapping and results, while other data (such as RE verification) has been refined further during Trend Environmental’s field surveys for the Project.

2.3 SITE DESCRIPTION

2.3.1 Bioregion and Habitat Context

The Project is situated within the Brigalow Belt bioregion, which spans approximately 216,000 km² across central Queensland and northern New South Wales (NSW), extending from Townsville in the north, to Narrabri in the south (Sattler & Williams, 1999b). The bioregion is divided under the Interim Biogeographic Regionalisation for Australia (IBRA) into two IBRA regions: the Brigalow Belt North and Brigalow Belt South. The Project occurs within the Brigalow Belt North bioregion, which spans an area of 135,500 km² and is home to a diverse range of flora and fauna (Young, et al., 1999).



The Brigalow Belt North bioregion is characterised by a complex geological history, including Permian volcanics and Permian–Triassic sediments, as well as Carboniferous, Devonian, and Cambrian/Ordovician rocks and associated Tertiary deposits (Department of Natural Resources, 2018). This bioregion comprises 14 IBRA subregions. The Project occurs within the Northern Bowen Basin subregion.

Vegetation within the bioregion and subregion historically included extensive forests and woodlands dominated by *Acacia harpophylla* (Brigalow) on clay soils. At its peak, *Acacia harpophylla* communities covered around six million hectares across Queensland, but widespread clearing for agriculture has since reduced their extent (Sattler & Williams, 1999b). In addition to remnant *Acacia harpophylla* communities, other ecosystem types typical of the bioregion include:

- Eucalypt forests and woodlands (often dominated by *Eucalyptus crebra* [Narrow-leaved Ironbark], *Eucalyptus populnea* [Poplar Box], and *Eucalyptus cambageana* [Dawson's Gum]).
- Grasslands and open downs.
- Dry rainforest and semi-evergreen vine thickets.
- Cypress pine woodlands.
- Riparian corridors and floodplain communities (often dominated by *Eucalyptus tereticornis* [Queensland Blue Gum] and *Eucalyptus camaldulensis* [River Red Gum]).

These diverse habitat types support a rich assemblage of native flora and fauna, including numerous threatened species and ecological communities protected under the EPBC Act and NC Act.

2.3.2 Catchment Context

The Project is located within the Fitzroy Basin, one of Queensland's largest and most economically significant drainage basins. The Project lies entirely within the Isaac River drainage sub-basin, which forms part of the broader Fitzroy Natural Resource Management (NRM) region. The Isaac River sub-basin spans approximately 22,364 km², encompassing the regional centres of Moranbah, Dysart, and Nebo (DERM, 2011).

Within the sub-basin, the Project falls within the Isaac River and Cherwell Creek catchments, with a dense network of minor tributaries and ephemeral drainage lines intersecting the Survey area. Named watercourses and gullies within the Survey area are shown in Map 1, Appendix A.

The Isaac River, a stream order 6 watercourse, runs adjacent to and in places through the Survey area, flowing in a generally southward direction. Cherwell Creek, a significant tributary of the Isaac River and a stream order 5 watercourse, intersects the Survey area and contributes to the regional drainage pattern. Cherwell Creek flows in an easterly direction, into the Isaac River. Both the Isaac River and Cherwell Creek are recognised as defined watercourses under the Water Act.

Conrock Gully, which has parts that are a defined drainage feature and a defined watercourse under the Water Act, bisects the central part of the Survey area. Conrock Gully flows in an easterly direction, into the Isaac River. Unnamed first and second-order tributaries of the Isaac River, Cherwell Creek, and Conrock Gully are mapped within the Survey area, forming an interconnected network of ephemeral watercourses (unnamed tributaries shown in Map 1, Appendix A).

South of Cherwell Creek is JB Gully, a stream order 1 and 2 watercourse, and also a defined watercourse under the Water Act. JB Gully flows northeast into Cherwell Creek, and intersects the southern portion of the Survey area.

All watercourses within the Survey area are ephemeral (non-perennial), typically flowing only in response to significant rainfall events. Surface water availability across the Survey area is therefore highly variable and seasonally dependent, reflecting the semi-arid climate of the Region.

In addition to watercourses, the Survey area contains GDEs that rely on both surface and subsurface water availability to sustain ecological function, and ephemeral wooded wetlands, including a HES wetland in the south-eastern corner of the Survey area (the HES wetland is shown in Map 1, Appendix A).



2.3.3 Climate

The Project is situated in a semi-arid region characterised by warm, dry winters and hot, humid summers. Climate data from the nearby Moranbah Airport weather station (located approximately 15 km northwest of the Survey area) provides an indication of typical conditions for the area.

Maximum temperatures range from around 24°C in winter (June-July) to 35°C in summer (December-January), while minimum temperatures range from 9°C in July, to 22°C in January (Bureau of Meteorology; BoM, 2025). Rainfall occurs year-round but is typically highest during the summer months (December to February), with January generally being the wettest month, averaging between 88 millimetres (mm) and 104 mm of rainfall.

Evaporation rates are high, particularly in summer, with an average daily evaporation rate of 8.2 mm in January, and 3.6 mm in June. The annual average evaporation rate (2,300 mm) significantly exceeds the mean annual rainfall (613 mm; Moranbah Water Treatment Plant weather station ID034038; BoM, 2025) resulting in a net water deficit, characteristic of semi-arid catchments. This climatic imbalance drives non-perennial flow regimes and limits surface water availability.

Winds in the Region are generally low in velocity (less than 10 km/hour (h)), predominantly from the south and southeast.

2.3.4 Land Use

Livestock grazing is the dominant land use across the Fitzroy NRM region, occupying approximately 121,511 km², or 78% of the total area (Dougall et al., 2014). Other major land uses include dryland cropping (5%), nature conservation (8%), and forestry (6%).

The Region also supports resource extraction and energy production activities, particularly within its northern and western extents, where numerous coal mines, CSG operations, and associated infrastructure are concentrated (Dougall et al., 2014). The Bowen Basin, which underlies much of this area, is one of Australia's most significant coal-producing regions, supplying both thermal and metallurgical coal for domestic and export markets. While this is the case, mining covers <1% of the land use within the Fitzroy NRM region.

Mining within the Fitzroy Basin contributes substantially to the regional and state economy but also represents a key land use with potential implications for surface water and groundwater systems, landscape stability, and ecological integrity. In particular, the Isaac River sub-basin, in which the Project is located, hosts numerous active and proposed mining operations, resulting in a modified catchment with cumulative pressures on water resources, habitat connectivity, and riparian habitat condition.

The Survey area has a long history of cattle grazing, predominantly associated with Winchester Downs Station. The vegetation communities have been subject to historical clearing, fragmentation, and grazing-related modification, with varying levels of regrowth and remnant persistence.

2.3.5 Geology and Soils

2.3.5.1 Geology

Surface geology and weathering intensity mapping assists in determining land zones, which is a critical component to verifying REs within a site. Both surface geology and weathering intensity mapping was utilised to verify land zones for the Project.

The Department of Resources (DoR) surface rock unit Geographic Information Systems (GIS) datasets for the Grosvenor 1:100,000 geology map sheet identified the Survey area as containing coal measures from the late Permian, granitoid intrusions from the Cretaceous, and lithic sandstones of the Rewan Group from the early to middle Triassic.

The Survey area also includes Quaternary alluvial, colluvial, and residual deposits, as well as late Tertiary to Quaternary high-level alluvium, reflecting the sedimentary processes associated with floodplain and residual landform development (Geological Survey of Queensland, 2018), as listed in Table 3.

The geological framework of the Survey area reflects a diverse assemblage of sedimentary, igneous, and unconsolidated deposits that correspond to a range of land zones as defined by the Queensland Herbarium. Extensive Quaternary alluvial



deposits of clay, silt, sand, and gravel associated with the Isaac River and Cherwell Creek floodplains are indicative of Land Zone 3 (recent alluvial systems). Adjacent late Tertiary to Quaternary high-level alluvium represents older terrace formations that are no longer subject to regular inundation, corresponding to Land Zone 4 (older alluvial plains and terraces). Surrounding colluvial and residual deposits derived from weathered sedimentary rocks of the Rewan Group form lower slopes and gently undulating terrain, consistent with Land Zone 5 (colluvial slopes and footslopes). Localised Cretaceous granitoid intrusions within the Survey area give rise to shallow, stony soils and dissected landforms characteristic of Land Zone 8 (igneous hills and rises). Collectively, these geological units and associated land zones provide the foundation for the variation in landform, soil development, and vegetation community patterns observed across the Survey area.

Table 3
Surface geology units mapped for the Site
(Source: Grosvenor 1:100,000 geology map)

Unit Name	Map Symbol	Age	Lithology Description
Qa-QLD	Qa	Quaternary	Clay, silt, sand and gravel; flood-plain alluvium
Qr/b-QLD	Qr\b	Quaternary	Black soil, silt and mud; residual and colluvial deposits (commonly basalt-derived or over limestone in Georgina Basin)
Qr-QLD	Qr	Quaternary	Clay, silt, sand, gravel and soil; colluvial and residual deposits
Rewan Group	Rr	Early Triassic - Middle Triassic	Lithic sandstone, pebbly lithic sandstone, green to reddish brown mudstone and minor volcanolithic pebble conglomerate (at base)
Tb-QLD	Tb	Tertiary	Mostly olivine basalt flows and some plugs; some areas of nephelinite, basanite etc
TQa-QLD	TQa	Late Tertiary - Quaternary	Locally red-brown mottled, poorly consolidated sand, silt, clay, minor gravel; high-level alluvial deposits (generally related to present stream valleys but commonly dissected)
TQr-QLD	TQr	Late Tertiary - Quaternary	Clay, silt, sand, gravel and soil; colluvial and residual deposits (generally on older land surfaces)

Note - Line accuracy within the geology map of 1:100,000 is $\pm 100\text{m}$ and is used only as a guide to determine land zones during field assessments.

2.3.5.2 Soil Types

The Australian Soil Classification classifies soil types which provides on ground indications of vegetation communities, surface characteristics, and topsoil physical properties. Across the Survey area, the predominant soil types were identified as Chromosols, Sodosols, and Vertosols. The physical characteristics of these soil types are summarised in Table 4. This aligns with the findings of the Project's Baseline Soils Assessment (Landloch, 2025).

Table 4
Soil types within the Site

Australian Soil Classification	Properties
Chromosols	- Occurs on mid to upper-slope positions within undulating terrain and along drainage features associated with the Isaac River and Cherwell Creek. - Moderately deep soils with firm and sandy surface textures, often containing ironstone gravel. - Subsoils are light clay over weather material, often hard-setting. - Subsoil sodicity and salinity commonly occur below 30 centimetres (cm) depth, contributing to moderate erosion potential and restricted drainage.
Vertosol	- Occurs on plains and floodplains, particularly over mafic volcanic or alluvial substrates. - Typically brown, grey and black clays with > 35% clay content, and self-mulching surface structure. - Soils may become saline to epihypersodic with depth. - Generally, moderately to well drained, alkaline to strongly alkaline with depth.
Sodosol	- Occurs on alluvial and colluvial deposits, as well as igneous, sedimentary and metamorphic substrates. - Typically texture-contrast (duplex) soils with sodic clay subsoils beneath loamy and sandy surfaces. - Dispersive, hard setting and prone to erosion, with good surface drainage and poor subsoil permeability. - Structural instability and sodicity increase susceptibility to gully and tunnel erosion when disturbed.



2.3.6 Land Zones

The following land zones were mapped as occurring in the Survey area, based on the State Vegetation Management mapping:

- **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.
- **Land Zone 5** – Tertiary-early Quaternary extensive, uniform near level or gently undulating plains with sandy or loamy soils. Includes dissected remnants of these surfaces. Also includes plains with sandy or loamy soils of uncertain origin, and plateau remnants with moderate to deep soils usually overlying duricrust. Excludes recent Quaternary alluvial systems (Land Zone 3), exposed duricrust (Land Zone 7), and soils derived from underlying bedrock (Land Zones 8 to 12). Soils are usually Tenosols and Kandosols, also minor deep sandy surfaced Sodosols and Chromosols. There may be a duricrust at depth.
- **Land Zone 8** – Cainozoic igneous rocks, including basalt, andesite, trachyte, rhyolite, and associated pyroclastic rocks. Typically forms undulating to hilly landscapes with stony rises, shallow rocky soils, and occasional lava flow plains. Includes both extrusive and intrusive igneous formations of volcanic origin. Soils are often shallow, stony Tenosols and Rudosols, with deeper Vertosols, Ferrosols, and Kandosols occurring in colluvial areas and older weathered surfaces. Fertility and profile development vary with age, lithology, and degree of weathering. Excludes deeply weathered or sediment-capped remnants (Land Zone 5) and fine-grained sedimentary rocks (Land Zone 9).
- **Land Zone 9** – Fine-grained sedimentary rocks, including mudstone, siltstone, shale and minor sandstone. Typically forms undulating to hilly landscapes, low ranges and dissected terrain. Soils are commonly shallow to moderately deep Sodosols, Chromosols, Kandosols and Tenosols, with texture-contrast profiles frequent. Fertility and soil depth vary depending on lithology and degree of weathering.

2.3.7 Terrain, Topography and Elevation

The Survey area is characterised by gently undulating to low-relief terrain, with elevations ranging from approximately 201 to 232 m Australian Height Datum (AHD). Elevation varies across the Survey area in response to local drainage features and landform variation. The topography is influenced by the presence of the Isaac River and Cherwell Creek, which form key landscape features and define associated floodplain areas. These floodplains are generally low-lying and subject to periodic inundation, supporting alluvial soils and riparian vegetation communities.

Surrounding areas comprise a mix of slightly elevated landforms and broad alluvial plains, with gradual slopes transitioning toward drainage lines and watercourses. No prominent escarpments or steep terrain features are present within the Survey area.

At a regional scale, the geology is typical of the Bowen Basin, with sedimentary rock sequences underlying the Survey area. No major geological faults or structural features of significance have been identified within the Survey area that would influence the design or operation of the mine.

2.3.8 Existing Vegetation Communities

Vegetation within the Survey area is representative of the broader regional landscape of the Bowen Basin, which has been extensively modified by historical pastoral land use. The vegetation comprises a mix of non-remnant pasture, remnant, dieback remnant and regrowth vegetation at varying stages of structural and floristic recovery. These patterns reflect a long history of cattle grazing, which has shaped the landscape through clearing, modification and ongoing land management.

The vegetation across the Survey area comprise a mix of non-remnant pasture, remnant, dieback remnant and regrowth vegetation at varying stages of structural and floristic recovery. These patterns reflect a long history of pastoral land use, primarily cattle grazing, which has shaped the landscape through clearing, modification, and ongoing land management.



The Survey area contains small mosaic patches of remnant vegetation communities including *Acacia harpophylla* forest and woodland, often occurring in association with *Eucalyptus cambageana*, *Eucalyptus populnea* and *Eucalyptus crebra*, particularly on heavy clay soils and weathered Tertiary surfaces. *Eucalyptus orgadophila* (Mountain Coolibah) woodlands are also present, particularly on loamy and basalt-derived substrates in the northern and southern extents. These communities occur as a mosaic of intact remnant patches, regrowth vegetation at various stages of development, and cleared or disturbed non-remnant pasture.

The central and northern portions of the Survey area support broad sand and clay plains, often interspersed with open pasture, native grasslands, dieback vegetation and open woodlands.

Riparian vegetation occurs along and adjacent to Conrock Gully, the Isaac River and Cherwell Creek. Riparian vegetation along Conrock Gully is generally a mix of *Eucalyptus coolabah* (Coolibah), *Acacia harpophylla* and *Eucalyptus populnea*. While riparian vegetation along the Isaac River and Cherwell Creek is a mix of *Eucalyptus camaldulensis*, *Eucalyptus tereticornis*, *Corymbia clarksoniana* (Clarkson's Bloodwood) and *Corymbia tessellaris* (Moreton Bay Ash). The riparian habitats provide important linear habitat connectivity for fauna species across the Survey area.

Patches of ephemeral wetland habitat also occurs, dominated by *Eucalyptus camaldulensis*, *Eucalyptus tereticornis* and/or *Eucalyptus coolabah*.

Many of the vegetation communities that occur within the Survey area exhibit signs of historical disturbance, including thinning, understorey modification, and pasture grass invasion.

2.3.9 Changes to Vegetation in the Survey Area over time

The Survey area is situated within a rural landscape historically used for cattle grazing, which has been the dominant land use prior to mining and exploration activities. The Survey area has been progressively modified through vegetation clearing, infrastructure development, and pasture improvement, resulting in a mixed landscape comprising remnant vegetation, regrowth communities, and cleared pasture.

Analysis of historical aerial imagery obtained from QImagery and Google Earth reveals the timeline of land use change across the Survey are:

- The **1957** imagery shows the Survey area as being primarily intact with remnant vegetation and limited evidence of pastoral infrastructure, vegetation clearing, or agricultural development (Figure 1).
- By **1978**, the Survey area remained predominantly vegetated, but signs of disturbance were evident, including clearing around the large wetland in the eastern portion of the Survey area and the emergence of tracks suggesting pastoral access (Figure 2).
- By **2003**, there is clear evidence of broadscale clearing, particularly the Brigalow woodlands in the southern portion of the Survey area south of Conrock Gully, and to a lesser extent in areas north of Conrock Gully. This period reflects a significant shift in land use, likely associated with intensified grazing and property development (Figure 3).
- By **2025** (present day), further clearing has occurred in the northern section and thinning of isolated patches to the south of Conrock Gully. Dieback is evident which is primarily associated with *Eucalyptus populnea* woodland which appeared remnant in 2003 (Figure 4 Historic Imagery - 2022 (QImagery 2025)).

The cumulative effect of these land use changes has resulted in a heterogeneous landscape, with areas of intact remnant vegetation, regrowth at varying successional stages, and non-remnant pasturelands. Grazing activities have shaped not only the vegetation structure but also the extent and distribution of weed invasion, groundcover composition, and soil condition. Pastoral infrastructure remains dispersed throughout the Survey area and includes fence lines, access tracks, bores, windmills, water tanks, troughs, and dams. These features reflect historical property management practices and continue to influence landscape condition and ecological connectivity.

Overall, the legacy of grazing and land clearing is evident across the Survey area, particularly in areas with younger regrowth, fragmented vegetation, and modified ground layers, while other portions retain significant ecological value through the presence of intact remnant communities.

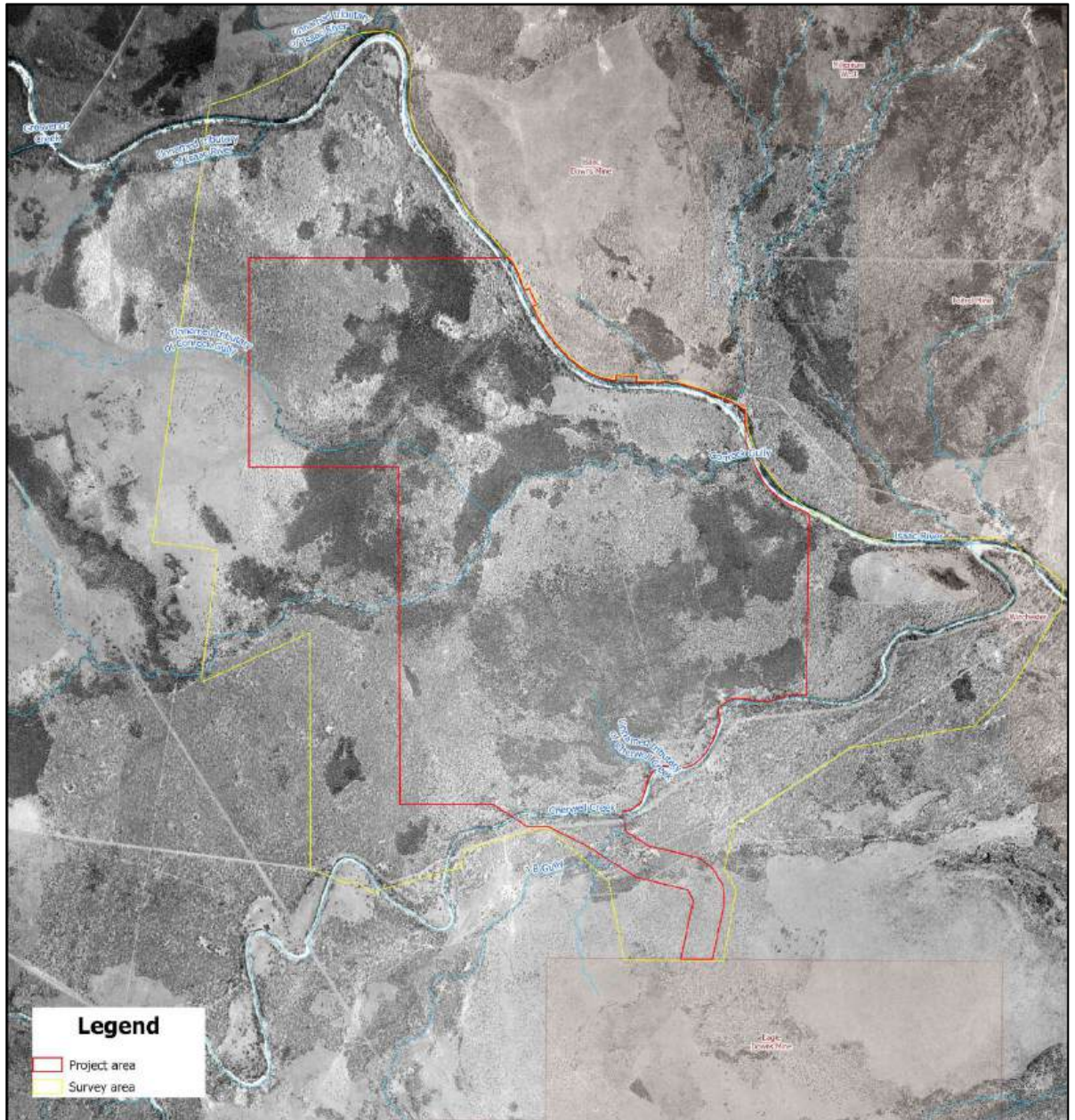


Figure 2 Historic Imagery - 1978 (QImagery 2025)

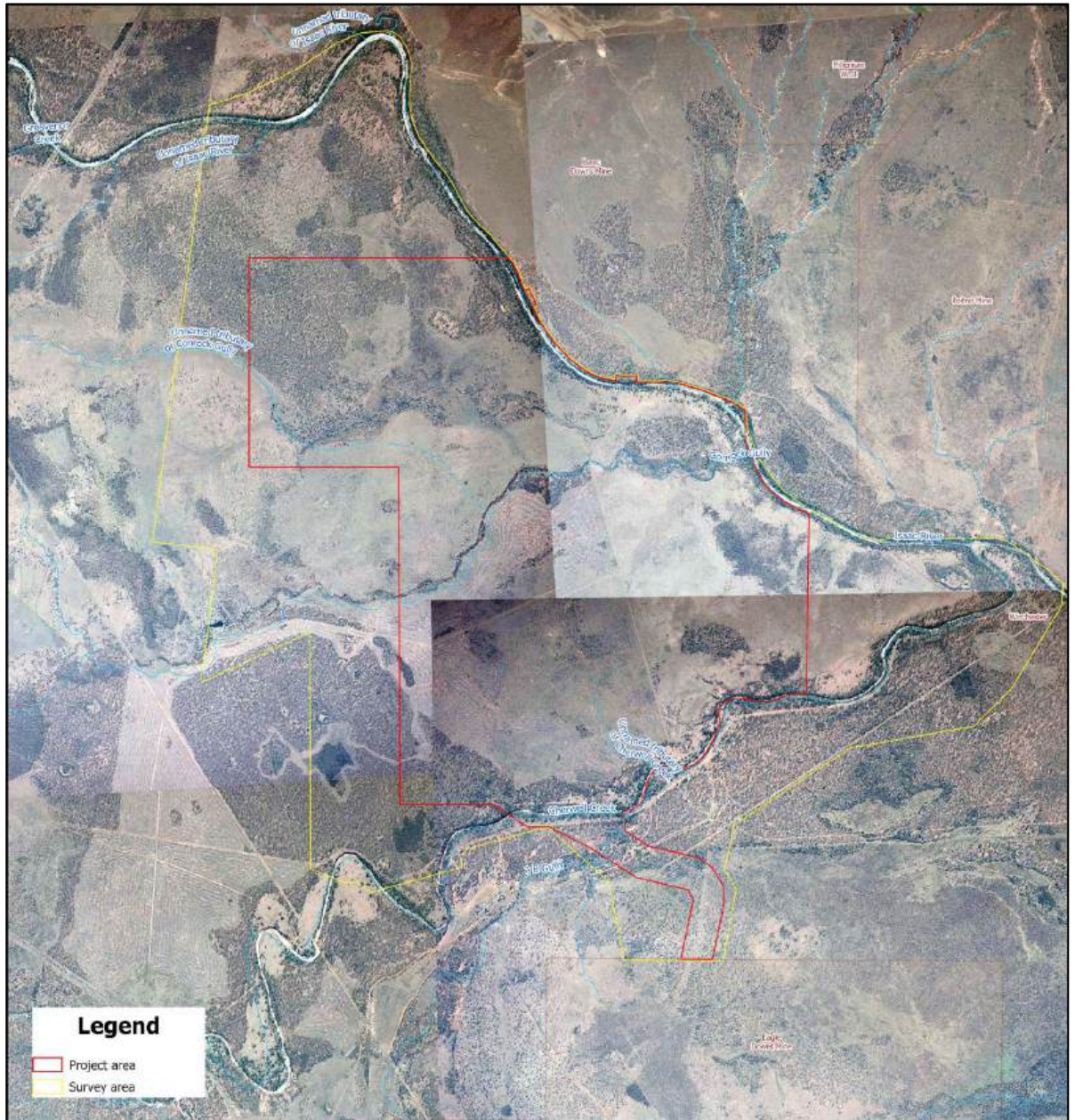


Figure 3 Historic Imagery - 2003 (QImagery 2025)

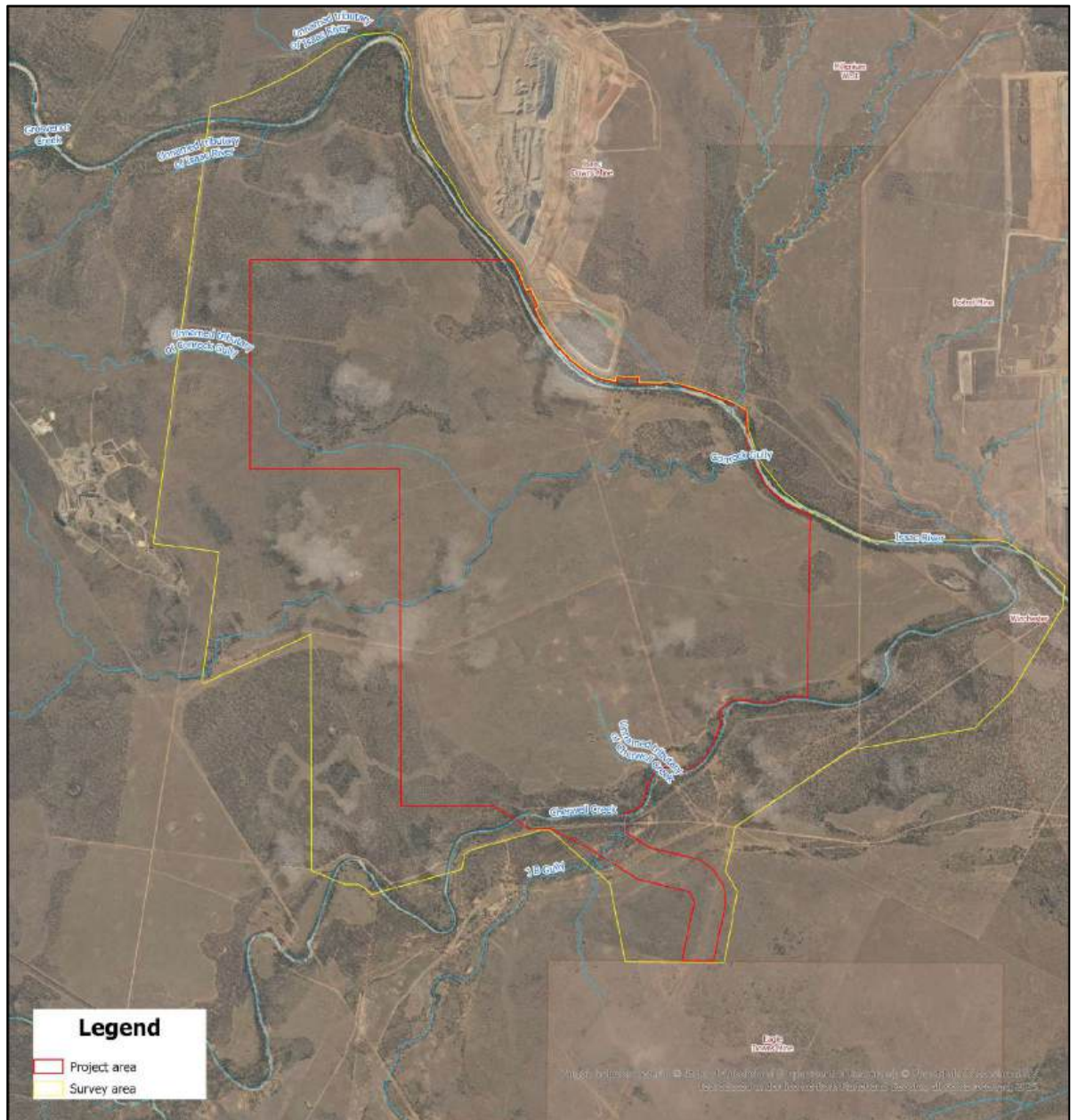


Figure 4 Historic Imagery - 2022 (QImagery 2025)



3. METHODOLOGY

3.1 TAXONOMIC NOMENCLATURE

3.1.1 Flora

Scientific names of flora used in this report follow the *Australian Plant Census* (Council of Heads of Australasian Herbaria, 2025). On first mention in the text, each flora species is referred to by its scientific name, followed by the common name in parentheses, where one exists. For example, *Dichanthium queenslandicum* (King Bluegrass). Subsequent references to the same species use the scientific name only.

Use of an asterisk (*) indicates the species is not native to Australia, e.g., *Lantana camara* (Lantana)*.

3.1.2 Fauna

Scientific names of fauna used in this report follow the Commonwealth Australian Faunal Directory (AFD; (DCCEEW, 2022a). On first mention in the text, common names will be used for fauna species, followed by the species scientific name. For example, Koala (*Phascolarctos cinereus*). Following the first in-text reference, fauna species will be referred to by their common name only.

Use of an asterisk (*) indicates the species is not native to Australia, e.g., Feral Pig (*Sus scrofa*)*.

3.2 DESKTOP ASSESSMENT

3.2.1 Database Review

A comprehensive desktop assessment and literature review were undertaken to identify the ecological values that were known or likely to occur within the Survey area. The desktop assessment included Commonwealth and State database searches, the analysis of mapping, aerial satellite images, and aerial photographs, and a review of Conservation Advices, Recovery Plans, Draft Referral Guidelines, Listing Advices, the DCCEEW SPRAT database, and published research.

Where available, historical ecological data and previous ecological reports from the Survey area were also reviewed to provide additional context (as described in *Section 2.2 Past Ecological Assessments*). This review informed the Likelihood of Occurrence assessments for listed flora and fauna (Likelihood of Occurrence results provided in Appendix B).

In addition to the ecological data review, existing survey methodologies and guidelines were examined to inform the design of the targeted field survey program and ensure our survey methods and effort aligned with current Commonwealth and State guidelines.

The databases and documents reviewed during the desktop assessment included those listed in Table 5 .

Table 5
Information sources reviewed during the desktop assessment

Type	Source
Database Searches	DCCEEW EPBC Act Protected Matters Search Tool (PMST), using 20 km search radius
	Department of Natural Resources, Mines and Energy (DNRME) Regulated Vegetation and RE Mapping, including essential habitat, watercourse and wetland, and protected plants flora survey trigger mapping
	DETSI WildNet Conservation Significant species record database
	Atlas of Living Australia (ALA) threatened flora and fauna species records



Type	Source
	DETSI MSES Report
	DETSI ESA mapping
	DETSI mapped wetlands under the Queensland Wetlands Program and the <i>Environmental Protection (Water and Wetland Biodiversity) Policy 2019</i> (i.e. HES and general ecological significance [GES] wetlands) under the EP Regulation.
	DETSI Biodiversity Planning Assessment State and Regional biodiversity corridors
	DoR Detailed Surface Geology Mapping
Conservation and Listing Advice and Recovery Plans	All conservation and listing advice, and recovery plans for TECs and threatened and migratory species, available on the DCCEEW SPRAT database
	DCCEEW SPRAT database
Targeted Survey Guidelines	<i>EPBC Act Survey guidelines for Australia's threatened mammals: Guidelines for detecting mammals listed as threatened under the EPBC Act, 2011</i> (DSEWPac, 2011a).
	<i>EPBC Act Survey guidelines for Australia's threatened reptiles: Guidelines for detecting reptile listed as threatened under the EPBC Act, 2011</i> (DSEWPac, 2011b).
	<i>EPBC Act Survey guidelines for Australia's threatened bats</i> (DEWHA, 2010a).
	<i>EPBC Act Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act, 2010</i> (DEWHA, 2010b).
	<i>EPBC Act Survey guidelines for Australia's threatened frogs</i> (DEWHA, 2010c)
	<i>A review of koala habitat assessment criteria and methods</i> (Youngentob et al., 2021) and the <i>National Recovery Plan for the EPBC Act listed Koala, Phascolarctos cinereus</i> (DAWE, 2022b).
	<i>Guide to Greater Glider Habitat in Queensland</i> (Eyre, Smith, et al., 2022)
	<i>Draft Referral Guidelines for the Nationally Listed Brigalow Belt Reptiles</i> (DCCEEW, 2023).
	<i>Survey Guidelines for the Ornamental Snake (Denisonia maculata)</i> (DCCEEW, 2025b)
	<i>Terrestrial Vertebrate Fauna Survey Guidelines for Queensland</i> (Eyre, Ferguson, et al., 2022)
Other Survey Methodologies	<i>Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland</i> (Neldner et al., 2023)
	<i>Flora Survey Guidelines—Protected Plants</i> (DES, 2020a)
	<i>Guide to determining terrestrial habitat quality—Methods for assessing habitat quality under the Queensland Environmental Offsets Policy v1.3 2020</i> (DES, 2020b)
	<i>BioCondition—A condition assessment framework for terrestrial biodiversity in Queensland. Assessment manual</i> (T. J. Eyre et al., 2015)
	<i>Offsets Assessment Guide, 2012</i> (DCCEEW, 2012)
	<i>How to use the Offsets Assessment Guide</i> (DCCEEW, n.d.)
	<i>EPBC Act Environmental Offsets Policy, 2012</i> (DSEWPac, 2012a)
	<i>Environmental Management Plan Guidelines 2024</i> (DCCEEW, 2024c)
Significant Impact Guidelines	<i>MNES Significant Impact Guidelines 1.1, 2013</i> (DoE, 2013b)
	<i>Queensland Environmental Offsets Policy - Significant Residual Impact Guideline</i> (DEHP, 2014a)
Aerial Imagery	Queensland Globe 2025
	Google Earth Pro 2025
	NearMap 2025



Type	Source
	GeoResGlobe 2025
Existing ecological reports for the Survey area	<i>Chapter 10 Nature Conservation. Integrated Isaac Plains Project Environmental Impact Statement (EIS)</i> (Matrix Consulting, 2007)
	<i>Flora and Fauna Ecological Assessment, Moranbah South Coal Mine. Environment Protection and Biodiversity Conservation Act 1999. Proposed Seismic Survey, Moranbah South. Prepared for Anglo American Metallurgical Coal Pty Ltd</i> (Ison Environmental Planners, 2010)
	<i>EIS assessment report under the Environmental Protection Act 1994 Moranbah South Project proposed by Anglo American Metallurgical Coal Pty Ltd</i> (Statewide Environmental Assessments, 2012)
	<i>Terrestrial Ecology Impact Assessment Report. Isaac Downs Project</i> (EcoSM, 2020)

3.2.2 Likelihood of Occurrence Assessment

A Likelihood of Occurrence Assessment was undertaken as part of the desktop assessment to identify the TECs and threatened and migratory species (both Commonwealth – and State-listed threatened and migratory species), and State-listed SLC species, that have previously been recorded in the vicinity or are considered likely to occur, or may occur, based on location, habitat suitability, and available species records.

The TECs, and threatened, migratory and SLC species identified as occurring (known to occur) or potentially occurring (likely to occur and may occur) through this Assessment represent key ecological constraints to the Project in terms of potential environmental impacts.

To determine habitat preferences and refine likelihood ratings, a literature review of relevant Commonwealth and State documents was undertaken including but not limited to approved Conservation Advices, Recovery Plans, Listing Advices, and Referral Guidelines. The outcomes of the Likelihood of Occurrence assessment were used to focus field survey efforts on those TECs and threatened, migratory and SLC species occurring or potentially occurring within the Project area.

The Likelihood of Occurrence Assessment for the Project was undertaken using the Area of interest (20 km buffer area from the Survey area) and Region (50 km buffer area from the Survey area) for context (the Area of interest and Region are depicted in the inset of Map 1 Appendix A). The TECs, and threatened, migratory and SLC species were identified using results from the EPBC Act PMST, WildNet database, and ALA database (database search result reports are provided in Appendix C).

Each matter was assigned a likelihood category of ‘known to occur’, likely to occur’, ‘may occur’ or ‘unlikely to occur’, based on the definitions provided in Table 6. These definitions were applied as a guide, with professional judgement used to decide likelihood ratings where species-specific ecology or behaviour (e.g., aerial, cryptic or migratory nature) warranted refinement.

Following completion of the field surveys, the Likelihood of Occurrence results were reviewed and updated to incorporate confirmed species records and habitat evidence observed within the Survey area. The final results of the Likelihood of Occurrence assessment are presented in Appendix B.

Table 6
Explanation of
terms used in the
Likelihood of
Occurrence
Assessment

Terms	Definition
Known to occur	Recorded within the Survey area during the targeted field surveys or previously recorded within the Survey area during recent (<10 years) surveys by other Consultants.
Likely to occur	- The Survey area supports the species habitat with associated habitat attributes (e.g., microhabitats), AND recent (<10 years) records occur within the Area of interest OR - For project sites within known distribution areas for the Koala, Greater Glider (central and southern; <i>Petauroides volans</i>; herein referred to as Greater Glider) and Ornamental Snake, these species were considered ‘likely to occur’ irrespective of recent and adjacent records, if the species habitat was likely to occur in accordance with habitat definitions provided in Youngentob et al., (2021), Eyre, Smith et al., (2022) and DCCEEW (2023b) respectively.



May occur	The Survey area supports at least marginally suitable habitat (e.g., dispersal habitat) AND historical records (>10 years) occur within the Area of interest OR recent records (<10 years) occur within the Region.
Unlikely to occur	• The Survey area does not support habitat for the species or associated habitat features, regardless of species records within the Area of interest or within the Region OR • Species habitat occurs within the Survey area, but no records occur within the Area of interest or only historical records within the Region.

3.3 FIELD ASSESSMENT

The field assessment leveraged the insights obtained from the desktop assessment and Likelihood of Occurrence Assessment and was designed to verify all pertinent ecological values within the Survey area while aiming to bridge any significant gaps in existing knowledge.

The objectives of the field assessment were to:

- Verify REs and vegetation communities within the Survey area.
- Verify any TECs within the Survey area.
- Quantify the area of habitat for Commonwealth- and State-listed threatened, migratory and SLC species within the Survey area, and assess the quality and condition of the habitat.
- Use targeted survey techniques to identify the presence of Commonwealth- and State-listed threatened, migratory and SLC species within the Survey area.
- When a Commonwealth- and State-listed threatened, migratory and SLC species was recorded, estimate the population extent and density of the species within the Survey area.
- Record incidental sightings of all flora and fauna species within the Survey area.
- Record and quantify biosecurity risks including weed and pest animal species within the Survey area, in accordance with the *Biosecurity–EIS information guideline* (DESI, 2024b).

The field surveys consisted of:

- A reconnaissance survey; and
- Seasonal targeted surveys (wet and dry season).

3.3.1 Permits

Trend Environmental holds a Scientific Purposes Permit (SUR001598; valid 7 February 2030) and ethics approval (CA 2023/01/1680; valid 7 February 2026, and CA2026/01/2030, valid 7 February 2030) to conduct ecological surveys within non-protected land tenures. The ecological assessments undertaken for this Project were undertaken in accordance with the conditions of these permits.

3.3.2 Survey Extent and Timing

The reconnaissance survey was undertaken to assess the accuracy of the desktop assessment information, particularly the RE mapping, and to assist in planning the targeted field survey program. The reconnaissance survey covered the entire Survey area and ensured that appropriate survey effort and methods were applied in accordance with relevant Commonwealth and State ecological survey guidelines.

The targeted field survey program involved seasonal surveys and covered the entire Survey area. The targeted field survey program was undertaken during applicable seasons (wet and dry) to provide the highest chance of detecting threatened, migrant, and vagrant species likely to occur. Survey timing was planned to align with seasonal peaks in flora reproductive activity and fauna detectability, with field surveys conducted between November 2024 and May 2025.

Late dry-season surveys were undertaken as temperatures began to warm, coinciding with a peak in vertebrate activity with the commencement of the breeding season for many fauna species. Late wet-season surveys were undertaken as temperatures



decreased but before the onset of cold winter nights, coinciding with an active period for dispersal and migration for many fauna species, as well as the growing season for many grass and forb species.

The specific dates for the timing and survey methods of each survey event are summarised in Table 7, along with survey dates.

Table 7 Survey dates, method and summary of methods	Survey Dates	Season	Summary of Survey Methods
	4 - 8 November 2024	Late dry season	Reconnaissance Survey - Verification of REs, vegetation communities and TECs
	18 - 26 November 2024	Late dry season	Targeted Survey - Verification of REs and TECs, Habitat Quality Assessments, Targeted survey methods
	5 - 10 May 2025	Late wet season	Targeted Survey - Verification of REs and TECs, Habitat Quality Assessments, Targeted survey methods
	19 - 24 May 2025	Late wet season	Targeted Survey - Verification of REs and TECs, Habitat Quality Assessments, Targeted survey methods

3.3.3 Climatic Conditions

Figure 5 presents daily rainfall (mm) recorded between September 2024 and June 2025 during which field ecological assessments were completed for the Project. The figure illustrates the distinct dry and wet seasonal patterns typical of the Region. Rainfall was minimal during the dry season (September–November 2024), with only isolated low-intensity rainfall events recorded. The wet season (December 2024–May 2025) showed a marked increase in rainfall frequency and intensity, with several significant rainfall peaks exceeding 20 mm, with two events exceeding 60 mm: at the start of February 2025 and at the end of March 2025. Rainfall declined sharply from April 2025 onward, returning to low levels consistent with the onset of the dry season from June 2025.

A summary of the weather conditions during the field survey events are provided in Table 8. There were four survey events, two in November 2024 to two in May 2025. Weather data was sourced from the BoM at the Moranbah Airport weather station (ID 034035), which is located approximately 15 km north of the Survey area (BoM, 2025).

Conditions were typically dry and sunny during each survey period, with ≤ 1.6 mm recorded during the survey events. Wind speed was variable, from 9–31 km/h. Minimum temperatures ranged from 4.8 – 21.1°C, while maximum temperatures ranged from 24.4 – 39.8°C. Relative humidity was variable, ranging from 19–69% (Table 8).

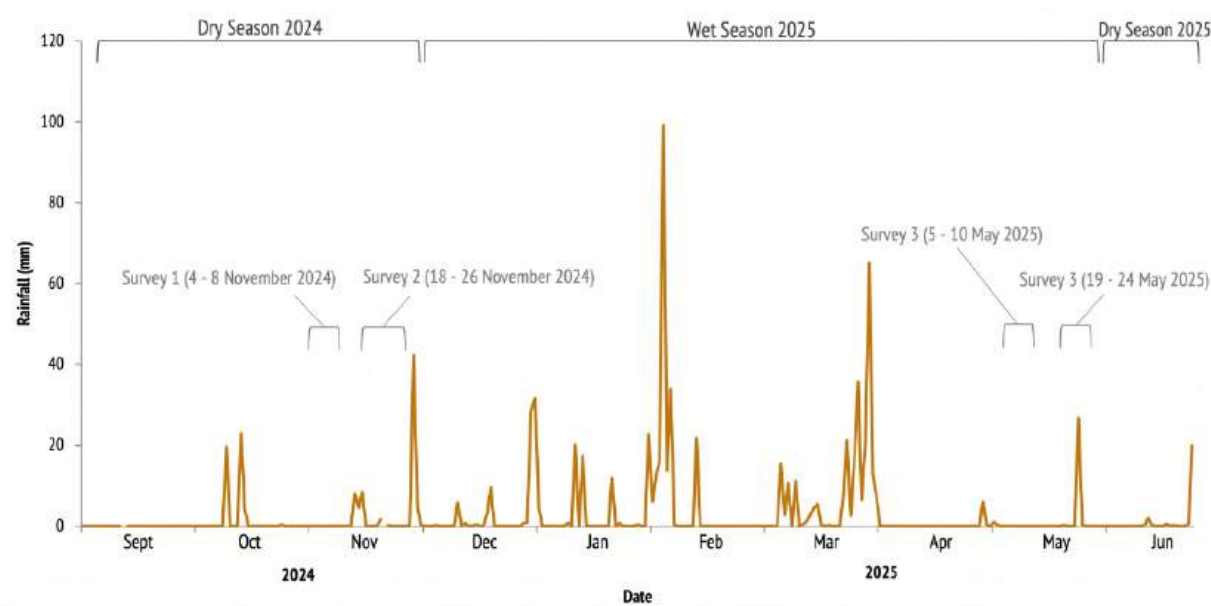


Figure 5
Rainfall during survey periods since September 2024



Table 8
Weather Conditions
during the field
survey

Season	Survey Event	Month	Date	Temperature (°C)		Rainfall (mm)	3pm Relative Humidity (%)	3pm Wind Speed (km/h)
				Min	Max			
Dry Season	4 - 8 November 2024	November 2024	4	16.5	36.2	0	24	19
			5	16.7	37	0	19	11
			6	16.4	37.8	0	22	17
			7	16.5	39.2	0	19	15
			8	21.1	39.8	0	20	9
	18 - 26 November 2024	November 2024	18	18.9	33.8	0	38	17
			19	19.8	33.8	0	33	17
			20	19.3	30.8	0	66	31
			21	20	29.1	1.6	62	31
			22	20.1	32	-	43	24
			23	19.3	32.2	0.2	44	20
			24	18.4	34.7	0	29	17
			25	16.8	35.5	0	33	17
			26	17.9	35.4	0	33	17
Wet Season	5 - 10 May 2025	May 2025	5	16	26	0.2	59	24
			6	16.7	25.6	0	69	20
			7	17.3	27.7	1	55	22
			8	13.1	28.2	0.2	35	28
			9	14.5	27.6	0	43	22
			10	15.3	26.3	0	55	28
	19 - 24 May 2025	May 2025	19	11.7	24.4	0	33	13
			20	4.8	24.9	0	36	15
			21	8.2	26.2	0	42	11
			22	10	27.1	0	42	11
			23	12.5	25.5	0	59	11
			24	16.8	29.6	0	34	7

3.3.4 Survey Methodology and Survey Effort

The desktop Likelihood of Occurrence assessment identified several TECs, and threatened and migratory species recognised as MNES under the EPBC Act, as well as threatened and SLC species, whose habitat is recognised as an MSES under the EO Act. Targeted survey efforts were undertaken to verify the presence, absence, or habitat suitability of these MNES and MSES values within the Survey area. Surveys were designed to align with the relevant Commonwealth and State survey guidelines listed in Table 5, ensuring appropriate survey design, timing, and effort to maximise detectability and data reliability.

In addition to targeted surveys, a range of vegetation and habitat assessments were also conducted. The survey methods and effort applied are detailed in Table 9, with corresponding survey locations shown in the Map Series 2 (Flora survey effort) and Map Series 3 (Fauna survey effort) in Appendix A.

Table 10 details the habitat descriptions used for each TEC, threatened, migratory and SLC species to target survey effort, any known important populations or habitat critical to the survival of each species as defined in approved Listing or Conservation Advice, Recovery Plans, Referral guidelines, the DCCEE SPRAT database, and the Commonwealth and state targeted species guidelines, and the survey effort undertaken for each species within the Survey area, with comparison against the recommended effort within the relevant Commonwealth and State survey guidelines.



Table 9
Survey effort

				Survey Effort		
Survey Type		Target Value	Justification and method	Dry Season 2024	Wet Season 2024	TOTAL
Vegetation Assessments		All remnant and regrowth areas	Vegetation Assessments were undertaken using a combination of Tertiary and Quaternary assessments in accordance with the <i>Methodology for surveying and mapping regional ecosystems and vegetation communities in Queensland v7.0</i> (Neldner et al., 2023). The Tertiary and Quaternary assessments identified the structural composition and the dominant and conspicuous species within a vegetated patch. Verified REs and their corresponding Broad Vegetation Group (BVG) were used to identify and group vegetation communities with similar structural and floristic characteristics within the Survey area.		161	
TEC Verification		Any suspected TEC areas	Suspected TEC patches were evaluated against the key diagnostic criteria and condition thresholds within the relevant DCCEEW Conservation or Listing Advice. These data were then vetted using GIS techniques (e.g., Statewide Landcover and Trees Study (SLATS) Foliage Projection Cover data) to include/exclude areas based on condition and area extent (if relevant).	34, including five for Native Grassland TEC, 18 for Brigalow TEC, and 11 for Poplar Box TEC.		
Habitat Suitability Assessments		All remnant and regrowth areas	Habitat Suitability Assessments were undertaken to assess the potential for vegetation communities to support threatened, migratory and SLC species that were identified as occurring or potentially occurring through the Likelihood of Occurrence assessment in Appendix B. Habitat definitions for the target species used definitions available in the <i>EPBC Act</i> Guidelines or other relevant, most recent, statutory documents (e.g., referral guidelines, approved listing advice(s), approved conservation advice(s), recovery plan(s), threat abatement plan(s) or comparable policy guidelines, and information contained in relevant Commonwealth databases such as the SPRAT database). The habitat definitions have been described per target species in Table 10.		34	
Habitat Quality Assessments		All AUs	Habitat Quality Assessments to assess habitat condition were undertaken in accordance with the State's <i>Guide to determining terrestrial habitat quality v1.3 (DES, 2020b)</i> , and the Commonwealth's <i>How to use the Offsets Assessment Guide</i> (Department of Environment, n.d.). These frameworks are based on the BioCondition Manual (Eyre et al., 2015a).		33	
Weed Detection Sites		N/A	Where high abundances of weed species were detected, particularly those recognised under Commonwealth or State legislation, a Weed Detection assessment was undertaken to record the species and extent of disturbance.		17	
Targeted Methods	Cage Traps	Medium-sized Mammals	Transect containing four traps per trap site open for a minimum of four nights. Each trap was baited with a mixture of peanut butter, oats and honey; or bacon/chicken necks, coated in fish oil. The cage traps were placed in shaded areas with hessian cloth used to cover the exterior to provide shelter and thermal protection during hot periods. Traps were opened in the afternoon of each day and inspected in the early morning. Note, all trap sets ups were in accordance with Trend Environmental's ethics approval.	Four transects, 64 trap nights	Four transects, 64 trap nights	Eight transects 128 trap nights



Survey Type	Target Value	Justification and method	Survey Effort		
			Dry Season 2024	Wet Season 2024	TOTAL
Elliot Traps	Small sized mammals	20 traps at 5 metre (m) intervals along a 100 m transect; open for a minimum four nights in accordance with the <i>Terrestrial Vertebrate Fauna Survey Guidelines for Queensland</i> (T. J. Eyre, Ferguson, et al., 2022). The traps were baited with peanut butter balls, with some coated with fish oil. Traps were placed within shaded areas with suitable microhabitat features within the immediate vicinity. Traps were opened in the afternoon of each day and inspected early in the morning.	Six transects, 480 trap nights	Six transects, 480 trap nights	Twelve transect, 960 trap nights
Pitfall and Funnel Traps	Reptiles and amphibians	Four buckets at 7.5 m intervals on a T-design using 45 m of silt fence; with six funnel traps 3 m from the distal ends of the T-design. Traps were open for a minimum of four nights, in accordance with the <i>Terrestrial Vertebrate Fauna Survey Guidelines for Queensland</i> (T. J. Eyre, Ferguson, et al., 2022). Leaf litter, small sticks and a saturated sponge for moisture were placed in each bucket. White vinegar was used around the outside of the pitfalls where needed as an ant deterrent. Pitfall and funnel traps were inspected early in the morning, with closure of traps during the day.	Four trap sites, 64 trap nights for pitfalls and 96 trap nights for funnels	Four trap sites, 64 trap nights for pitfalls and 96 trap nights for funnels	Eight trap sites, 128 trap nights for pitfalls, and 192 trap nights for funnels
Harp Trap	Bats	Harp traps were set up in restricted flyways in well vegetated areas, such as along creek lines and tracks, placed where fringing vegetation abutted the trap edges on both sides and above. A minimum of two trap nights per sampling site was undertaken. Harp traps were left set in the late afternoon, inspected at dawn, and closed during the day.	Four trap sites, 10 trap nights	Nil	Four trap sites, 10 trap nights
Infrared Camera Traps	All fauna	Infrared camera traps were deployed to capture diurnal and nocturnal fauna. Traps were routinely baited daily. Each trap was baited with cat food; or chicken necks coated in fish oil. Camera traps were randomly placed to gain representative cover within the Survey area. The were place where microhabitat features were suitable e.g., near dams and wetlands, within creek lines, and near dense vegetation stands. A minimum of one trap night per location was undertaken.	3 cameras, 13 trap sites, 30 trap nights	10 cameras, 27 trap sites, 200 trap nights, including 100 surrounding the HES wetland targeting Squatter Pigeon (southern; <i>Geophaps scripta scripta</i> ; herein referred to as Squatter Pigeon) and wetland birds	230 trap nights.
Acoustic Device	Bats	Acoustic bat detection devices were used to identify the presence of threatened bat species. Devices were deployed where suitable habitat features and flyways occurred. A minimum of two trap nights per location was undertaken.	One device, four trap sites, 10 trap nights	Two devices, four trap sites, 20 trap nights	Eight trap sites, 30 trap nights



Survey Type	Target Value	Justification and method	Survey Effort		
			Dry Season 2024	Wet Season 2024	TOTAL
Scat and sign searches	All fauna	Searches included looking for signs of animal activity, such as tracks, scats, scratches, nests, and burrows. Searches were usually conducted during vegetation assessments, fauna habitat assessments and active searches, as well as sporadic, opportunistic searches within suitable habitat. As a result, these search locations have not been shown on Map 3, Appendix A.	~25	~25	~50
Diurnal Active searches	Reptiles and amphibians	Non-destructive diurnal active searches of all microhabitat features within a 50 x 50 m area for 15-minute periods to detect presence of fauna. Where possible, two personnel conducted active searches adjacent to each other, covering a 100 x 100 m area, in accordance with the <i>Terrestrial Vertebrate Fauna Survey Guidelines for Queensland</i> (T. J. Eyre, Ferguson, et al., 2022). Active searches were undertaken at all times of the day, including in the morning when temperatures rise and reptiles are basking and starting to become active. Searches focused on key habitat features such as dense leaf litter and fallen woody debris, soil cracks, rocky areas and crevices, hollow logs and burrows.	6	35	41
Spotlight Transects	Nocturnal fauna	Spotlighting transects were performed by two personnel per spotlighting event, approximately 50 m apart in suitable habitat areas of targeted threatened nocturnal species particularly the Koala, Greater Glider and Ornamental Snake. Spotlighting transects were undertaken in accordance with the <i>Terrestrial Vertebrate Fauna Survey Guidelines for Queensland</i> (T. J. Eyre, Ferguson, et al., 2022). Given the large size of the Survey area, spotlighting transects involved a combination of walking and driven transects, covering anywhere from 2 km to 10 km per spotlighting night. Binoculars and spotlights with red filters were used during the spotlight transects.	Six person hours	Twelve person hours	18 person hours
Bird surveys	Avian species	Standardised bird surveys were undertaken in accordance with the Birdlife Australia methodology, where one personnel undertook a 2 ha/20-minute standardised survey. The observer recorded the number and species of birds observed or heard aurally.	Nine bird surveys, Three person hours	21 bird surveys, Seven person hours	30 bird surveys, Ten person hours
Flushing surveys	Squatter Pigeon (southern)	Two ecologists walked the Survey area conducting flushing surveys for the Squatter Pigeon, in accordance with <i>EPBC Act Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act, 2010</i> (DEWHA, 2010b). Note, flushing surveys are not represented on Map 3, Appendix B as these were incidentally completed when completing all other survey types.	~125 person hours, over ten days, including ~60 hours during reconnaissance survey	~80 person hours, over ten days	~265 person hours, over 25 days
Land-based area searches	Australian Painted Snipe	Land-based area searches surrounding wetland habitat were undertaken to target the Australian Painted Snipe. Note, land-based area searches are not represented on Map 3, Appendix B as these were incidentally completed when completing other survey types surrounding wetland habitats.	Five person hours, over ten days	Seven person hours, over ten days	Twelve person hours, over 20 days



Survey Type	Target Value	Justification and method	Survey Effort		TOTAL
			Dry Season 2024	Wet Season 2024	
Animal Breeding Place Survey	Animal Breeding Places	Animal breeding places were recorded in accordance with the <i>Information Sheet Species Management Program Requirements for tampering with a protected animal breeding place in Queensland</i> (DES, 2020c)	~50 person hours	~50 person hours	~100 person hours
Incidental Observations	All flora and fauna	All fauna observed incidentally within the Survey area were recorded.	N/A		



Table 10
Descriptions of
habitat for each
species
identified in the
Likelihood of
Occurrence
assessment as
potentially
occurring, and
targeted survey
effort
implemented for
each

Family	Scientific Name	Common Name	Status1		Likelihood of Occurrence ²	Key Defining Terms (as defined in <i>Table 11 Key Habitat Terms used by DCCEEW</i>)	Defined Species Habitat Definitions	Targeted Survey Guidelines		Targeted Survey Effort		
			QLD	CTH				QLD	CTH	Dry Season 2024	Wet Season 2025	
THREATENED FLORA												
Poaceae	<i>Dichanthium queenslandicum</i>	King Bluegrass	VU	EN	Likely to occur	None defined	Suitable habitat - Black cracking clay in tussock grasslands, mainly in association with other species of blue grasses (<i>Dichanthium</i> spp. and <i>Bothriochloa</i> spp.) but also with other grasses restricted to this soil type (Fletcher, 2001).	Protected Plant Flora Survey guidelines if Disturbance area is mapped as high-risk (DES, 2020a)	None defined	• Random meanders in suitable habitat areas (RE11.3.21, 11.8.11) • 154 vegetation assessments • Incidental records	• Random meanders in suitable habitat areas (RE11.3.21, 11.8.11) • Seven vegetation assessments • Incidental records	
Poaceae	<i>Dichanthium setosum</i>	Bluegrass	LC	VU	May occur	None defined	Suitable habitat - Associated with heavy basaltic black soils and stony red-brown hard-setting loam with clay subsoil (Ayers et al., 1996) and is found in moderately disturbed areas such as cleared woodland, grassy roadside remnants, grazed land and highly disturbed pasture.	Not protected under Queensland legislation	None defined	• Random meanders in suitable habitat areas (RE11.3.21, 11.8.11) • 154 vegetation assessments • Incidental records	• Random meanders in suitable habitat areas (RE11.3.21, RE11.8.11) • Seven vegetation assessments • Incidental records	
THREATENED ECOLOGICAL COMMUNITIES												
Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant) TEC			-	EN	Known to occur	Areas critical to the survival of the ecological community are all patches that meet the key diagnostic criteria and conditions thresholds in the Approved Conservation advice for the TEC (TSSC, 2013)	As per the key diagnostic criteria and condition thresholds in the Approved Conservation Advice for the TEC (TSSC, 2013).	Not protected under Queensland legislation	Comparison to key diagnostic criteria and conditions thresholds	• 154 vegetation assessments • 15 TEC assessments in suspect Brigalow TEC patches	• Seven vegetation assessments • Three TEC assessments in suspect Brigalow TEC patches	
Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin TEC			-	EN	Known to occur	None defined (TSSC, 2009).	As per the key diagnostic criteria and condition thresholds in the Listing Advice for the TEC (TSSC, 2009).	Not protected under Queensland legislation	Comparison to key diagnostic criteria and conditions thresholds	• 154 vegetation assessments • Three TEC assessment in suspect Natural Grassland TEC patches	• Seven vegetation assessments • Two TEC assessments in suspect Natural Grassland TEC patches	
Poplar Box Grassy Woodland on Alluvial Plains TEC			-	EN	Known to occur	Areas critical to the survival of the ecological community are the best quality, most intact patches of the ecological community (Class A – Highest condition; DoEE, 2019)	As per the key diagnostic criteria and condition thresholds in the Conservation Advice for the TEC (DoEE, 2019)	Not protected under Queensland legislation	Comparison to key diagnostic criteria and conditions thresholds	• 154 vegetation assessments • Ten TEC assessments in suspect Poplar Box TEC patches	• Seven vegetation assessments • Two TEC assessments in suspect Brigalow TEC patches	
Semi-evergreen Vine Thickets of the Brigalow Belt (North and South) and Nandewar Bioregions TEC			-	EN	Known to occur	Areas critical to the survival of the ecological community are all patches that meet the definition of the TEC (DCCEEW, 2023a).	As per the definition Conservation Advice for Semi-evergreen Vine Thickets of the Brigalow Belt (North and South) and Nandewar Bioregions TEC (DCCEEW, 2023a).	Not protected under Queensland legislation	Comparison to TEC definition	• 154 vegetation assessments	• Seven vegetation assessments	
THREATENED BIRDS												
Columbidae	<i>Geophaps scripta scripta</i>	Squatter Pigeon (southern)	VU	VU	Known to occur	No critical habitat for the survival of the species has been defined. And no important habitat has been defined. An important population is defined as the southern boundary of its known distribution (southern Queensland). Therefore, all of the relatively small, isolated and sparsely distributed sub-populations occurring south of the Carnarvon Ranges in Central Queensland (the Project is north of the Carnarvon Ranges) are considered to be important sub-populations of the subspecies (Squatter Pigeon Workshop, 2011). This includes, but is not limited to: • 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 NSW.	Habitat for the Squatter Pigeon was defined as breeding, foraging and dispersal as per the following definitions (DCCEEW, 2025a): • Breeding habitat: Any remnant or regrowth open-forest to sparse, open-woodland or scrub dominated by Eucalyptus, Corymbia, Acacia or Callitris species, on sandy or gravelly soils with patchy perennial tussock grasses or a mix of perennial tussock grasses and low shrubs and forbs, within 1 km from permanent and seasonal water (including but not limited to areas mapped as Queensland land zones 3, 5 or 7). • Foraging habitat: Any remnant or regrowth open-forest to sparse, open-woodland or scrub dominated by Eucalyptus, Corymbia, Acacia or Callitris species, on sandy or gravelly soils with patchy perennial tussock grasses that can include low shrubs and forbs, within 1 – 3 km from permanent and seasonal water (including but not limited to areas mapped as Queensland land zones 3, 5 or 7). • Dispersal habitat: Any forest or woodland occurring between patches of foraging or breeding habitat that facilitates movement between patches of foraging and breeding habitat and/or waterbodies.	None defined	• Flushing surveys (10 hours over 3 days) in areas <50 ha; or • Area searches and transect surveys (15 hours over 3 days) in areas < 50ha (DEWHA, 2010b).	• Nine Bird plot surveys – Three survey hours over multiple days • Flushing surveys - Whole Survey area walked or driven (~125 hours), including ~60 hours during reconnaissance survey • 30 Camera trap nights • 34 Habitat suitability assessments • Incidental records	• 21 Bird plot surveys - seven survey hours over multiple days • Flushing surveys - Whole Survey area to be walked or driven (~80 hours) • 200 Camera trap nights, including 100 surrounding a large wetland • Incidental records	



Family	Scientific Name	Common Name	Status ¹		Likelihood of Occurrence ²	Key Defining Terms (as defined in <i>Table 11 Key Habitat Terms used by DCCEEW</i>)	Defined Species Habitat Definitions	Targeted Survey Guidelines		Targeted Survey Effort	
			QLD	CTH				QLD	CTH	Dry Season 2024	Wet Season 2025
Rostratulidae	<i>Rostratula australis</i>	Australian Painted Snipe	EN	EN, M	Likely to occur	Wetland habitat suitable for breeding is considered habitat that is critical to the species survival (DSEWPaC, 2013b). No important habitat defined for this species.	Habitat for the Australian Painted Snipe was defined as breeding, foraging and dispersal as per the following definitions: • Breeding habitat - Australian Painted Snipe breeding habitat requirements may be quite specific: shallow wetlands with areas of bare wet mud and both upper and canopy cover nearby. Nest records are all, or nearly all, from or near small islands in freshwater wetlands provided that these islands are a combination of very shallow water, exposed mud, dense low cover and sometimes some tall dense cover (Rogers et al., 2005) • Foraging and dispersal habitat – Species does not breed in Australia. Foraging and dispersal habitat includes shallow, permanent or ephemeral, freshwater wetlands which provide areas of bare, exposed wet mud and a mosaic of ground cover (tufted grasses, sedges, small woody plants; Kerswell et. al., 2020). Habitat can include lakes or dams that provide foraging resources and could potentially be used as an individual disperses through the landscape (DSEWPaC, 2013b).	None defined	• Targeted stational observations (10 hours over 5 days in areas <50ha; or • Land-based area searches or line transects (10 hours over 3 days) in areas <50ha (DEWHA, 2010b)	• Nine Bird plot surveys – Three survey hours over multiple days • Five hours land-based area searches surrounding wetland, over multiple days • 34 Habitat suitability assessments • Incidental records	• 21 Bird plot surveys - seven survey hours over multiple days • Seven hours land-based area searches surrounding wetland, over multiple days. • 100 camera trap nights surrounding the HES wetland • Incidental records
Scolopacidae	<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	SLC	VU, Mi, M	May occur	No Critical Habitat as defined under section 207A of the EPBC Act has been identified or included in the Register of Critical Habitat. Important habitats in Australia for migratory shorebirds under the EPBC Act include those recognised as nationally or internationally important. Wetland habitat is considered internationally important if it regularly supports: • 1% of individuals in a population (ecologically significant proportion; 850 individuals for the Sharp-tailed Sandpiper; BirdLife Australia 2020); or • A total abundance of at least 20,000 waterbirds. Wetland habitat is considered nationally important habitat if it regularly supports: • 0.1% of the flyway population of a single species of migratory shorebird (ecologically significant proportion; 85 individuals for the Sharp-tailed Sandpiper; BirdLife Australia 2020); or • 2,000 migratory shorebirds; or • 15 migratory shorebird species. ◦ All internationally or nationally important habitat that exceeds the above thresholds is considered habitat critical to the survival of the species.	Foraging and dispersal habitat – Species does not breed in Australia. Foraging and dispersal habitat includes 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, salt pans and hypersaline salt lakes inland. They also occur in saltworks and sewage farms (DCCEEW, 2024a).	None defined	Observation using telescope from vantage points overlooking suitable foraging or roosting habitat (DEWHA, 2010b)	• Nine Bird plot surveys – Three survey hours over multiple days • Five hours land-based area searches surrounding wetland, over multiple days • 34 Habitat suitability assessments • Incidental records	• 21 Bird plot surveys - seven survey hours over multiple days • Seven hours land-based area searches surrounding wetland, over multiple days. • 100 camera trap nights surrounding a large wetland • Incidental records



Family	Scientific Name	Common Name	Status1		Likelihood of Occurrence ²	Key Defining Terms (as defined in <i>Table 11 Key Habitat Terms used by DCCEEW</i>)	Defined Species Habitat Definitions	Targeted Survey Guidelines		Targeted Survey Effort	
			QLD	CTH				QLD	CTH	Dry Season 2024	Wet Season 2025
Scolopacidae	<i>Tringa nebularia</i>	Common Greenshank	SLC	EN, Mi	May occur	Habitat critical to the survival of Common Greenshank includes a mosaic of feeding and roosting habitat (DCCEEW, 2024b). Important habitats in Australia for migratory shorebirds under the EPBC Act include those recognised as nationally or internationally important. The National Directory of Important Migratory Shorebird Habitat identifies all known feeding and roosting sites of Common Greenshank in Australia as important. During the non-breeding season, important sites have been identified in Australia. In Queensland, the South-east Gulf of Carpentaria, and the Great Sandy Strait are important sites for this species. An Ecologically significant proportion of a population of Common Greenshank is: - Internationally significant – 1,100 individuals (1% of population) - National significant – 110 individuals (0.1% of population; BirdLife Australia 2020)	Foraging and dispersal habitat – Species does not breed in Australia. Foraging and dispersal habitat includes inland wetlands and sheltered coastal habitats. The species uses both permanent and ephemeral terrestrial wetlands, including swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans and saltflats. It will also use artificial wetlands, including sewage farms and saltworks dams, inundated rice crops and bores (DCCEEW, 2024b).	None defined	None defined	- Nine Bird plot surveys – Three survey hours over multiple days - Five hours land-based area searches surrounding wetland, over multiple days 34 Habitat suitability assessments. - Incidental records	21 Bird plot surveys - Seven survey hours over multiple days - Seven hours land-based area searches surrounding wetland, over multiple days. 100 camera trap nights surrounding a large wetland - Incidental records
THREATENED MAMMALS											
Phascolarctidae	<i>Phascolarctos cinereus</i>	Koala	EN	EN	Known to occur	Habitat critical for survival is described as areas that the species relies on to avoid, or halt decline and promote recovery of the species. The Conservation Advice for the Koala states that it is not practical to identify by description or provide spatial information on habitat critical to the survival of the Koala, due to insufficient knowledge and data. In absence of this, habitat critical for survival of the Koala is expected to include habitat occupied and habitat currently unoccupied, areas necessary for population processes and maintenance of genetic diversity and evolutionary potential, and areas required to accommodate future population increase recolonisation, reintroduction, or as climate refugia (DAWE, 2022a). Important habitat not defined for the species. Important population defined as those that are valued for cultural, social and economic reasons. In Queensland, priority areas are identified as SEQ (DAWE, 2022a).	Koala habitat can be broadly defined based on the presence of locally important food trees and ancillary habitat trees as defined in the <i>Review of Koala Habitat Assessment Criteria and Methodology</i> (Youngentob et al., 2021). Koala habitat is further defined however into breeding, foraging and dispersal habitat: Breeding habitat Contiguous remnant <i>Eucalyptus</i> open forest to woodlands on alluvial and/or cracked rock groundwater where palatable food tree species occur frequently (and are usually dominant). Specifically includes stream fringing open forest or woodland on alluvial terraces where <i>E. tereticornis</i> and <i>E. camaldulensis</i> are dominant. Other important food species on the alluvial terraces can include <i>E. coolibah</i>, <i>E. crebra</i>, <i>E. melanophloia</i> and <i>E. populnea</i>. Foraging habitat Habitat that provides food resources or aids to movement for the species including remnant and regrowth Eucalyptus open forest to woodlands with more variable water sources (often seasonal) and that have connectivity to breeding habitat areas. Dispersal habitat All other fragmented and sparsely distributed woodlands and open woodlands, shrub lands and forests, with some food trees.	None defined	Koala occurrence and presence of locally important food trees and ancillary habitat trees is a strong indicator of koala habitat (Youngentob et al., 2021).	34 habitat suitability assessments to identify presence of Koala food and habitat trees - Whole Survey area walked or driven recording incidentals (125 hrs) - Six person hours spotlighting ~25 Scat and sign searches - Incidental records	- Whole Survey area to be walked or driven recording incidentals (80 hr) - Twelve person hours spotlighting ~25 Scat and sign searches - Incidental records
Pseudocheiridae	Petauroides volans	Greater Glider (southern/central)	EN	EN	Known to occur	Habitat critical for survival includes: - Large tracts of contiguous eucalypt forest with suitable tree hollows - Smaller fragmented patches if connected to larger habitat patches - Cool microclimate forests areas (gullies, high elevation and slopes) - Short-term post fire refuges All populations are important (TSSC, 2016d). Important habitat not defined for the species.	Greater Glider habitat was defined as ‘denning’ or ‘foraging’ habitat, in accordance with the <i>Guide to Greater Glider Habitat in Queensland</i> (Eyre et al., 2022). Below describes the habitat that is described under each definition: Denning habitat Remnant, connected eucalypt woodlands with >2 hollow bearing trees/ha, hollows medium-large in size (>10cm), on fertile, wetter soils of riparian zones, used for shelter, diurnal refuge and breeding. Foraging habitat Remnant eucalypt woodlands connected to areas of denning habitat that does not contain >2 hollow bearing trees/ha, medium-large in size (>10 cm). Generally, within 120 m of breeding / denning habitat, reflecting the home range of the species.	None defined	- Define habitat as denning/ foraging that supports suitable Eucalypt species with DBH > 50 cm or > 30 cm respectively (Eyre et al., 2022) - To detect the species - Spotlighting (At least 2 x 200 m transects per 5 ha; DSEWPC, 2011a)	34 habitat suitability assessments to identify presence of suitable Eucalypt species with a DBH > 50 cm or > 30 cm. - Six person hours spotlighting, 4,224m transect length over an 95ha area of habitat.	Twelve person hours spotlighting, 11,614m cumulative transect length over a 350 ha area of habitat



Family	Scientific Name	Common Name	Status1		Likelihood of Occurrence ²	Key Defining Terms (as defined in <i>Table 11 Key Habitat Terms used by DCCEEW</i>)	Defined Species Habitat Definitions	Targeted Survey Guidelines		Targeted Survey Effort	
			QLD	CTH				QLD	CTH	Dry Season 2024	Wet Season 2025
THREATENED REPTILES											
Elapidae	<i>Denisonia maculata</i>	Ornamental Snake	VU	VU	Known to occur	No critical habitat for the survival of the species has been defined. Important habitat is identified as gilgai depressions and mounds (DCCEEW, 2023). Habitat connectivity between gilgais and other suitable habitats is also important. As the Ornamental Snake is difficult to detect and population information is limited, the Department regards important habitat as a surrogate for an important population . Suitable habitat for this species is considered important if it is: - Habitat where the species has been identified during a survey; - Near the limit of the species’ known range; - Large patches of contiguous, suitable habitat and viable landscape corridors (necessary for the purposes of breeding, dispersal or maintaining the genetic diversity of the species over successive generations); or - A habitat type where the species is identified during a survey but was previously thought not to support the species (DCCEEW, 2023).	Breeding habitat - within, or close to, habitat that is favoured by its prey - frogs. The species is known to prefer woodlands and open forests associated with moist areas, particularly gilgai (melon-hole) mounds and depressions in REs, Land Zone 4, but also lake margins and wetlands, specifically RE 11.4.9, 11.4.8, 11.5.3, 11.4.11, 11.3.2 and 11.3.1 (Brigalow Belt Reptiles Workshop, 2010;Wilson & D.G. Knowles, 1988;) DCCEEW, 2025b). Gilgai formations are found where deep-cracking alluvial soils with high clay contents occur (Brigalow Belt Reptiles Workshop, 2010). Foraging habitat – REs that have been historically recorded to contain populations that are adjacent to preferred habitat and contain the following key habitat features for ornamental snake are present or infrequent – soil cracks, wetlands (especially with frogs present), dense tussock grasses, and vegetation in and around water (DCCEEW, 2025b). Dispersal habitat – Areas currently or previously dominated by brigalow or coolibah communities where gilgais or soil cracks are infrequent or are shallow or non-remnant areas where threats are high (high abundance of weed incursion and cattle compacting soils) but the species still have potential to occur, especially in times where water is present and prey abundance (frogs) is high.	None defined.	- One-off diurnal searches (1.5 person hours per ha over 3 days). - Spotlighting (4 per hours per 5 ha, DCCEEW, 2025b) - Opportunistic surveys of roads - Pitfall and funnel trapping (over 4 nights; 2 replicates per habitat type; DCCEEW, 2023)	34 habitat suitability assessments - Six person hours spotlighting - Three replicate pitfall and funnel trapping within suitable habitat - Six active searches (1.5 person hours) - Incidental records	- Twelve person hours spotlighting - Four replicate pitfall and funnel trapping within suitable habitat 35 active searches (nine person hours) - Incidental records
MIGRATORY AND MARINE SPECIES											
Apodidae	<i>Apus pacificus</i>	Fork-tailed Swift	SLC	M, Mi	May occur	No critical habitat for the survival of the species has been defined. Important habitat - Non-breeding habitat only which includes all habitats where it is found in Australia (Commonwealth of Australia, 2015). An ecologically significant proportion of a population of Fork-tailed Swift is: - Internationally significant - 1,000 individuals (1% of population) - Nationally significant – 100 individuals (0.1% of population; Commonwealth of Australia, 2015). The proportion of the Fork-tailed Swift population that is likely to result in a significant impact is 1,000 individuals (1%) and 100 (0.1%; Commonwealth of Australia, 2015). Area thresholds of important habitat likely to result in a significant impact for the Fork-tailed Swift have not been defined due to lack of knowledge (Commonwealth of Australia, 2015).	Foraging and dispersal habitat - The species does not breed in Australia, so only foraging and dispersal habitat for the species can be defined, which includes a range of habitats, from inland open plains to wooded areas (Commonwealth of Australia, 2015).	None defined	There are no standard survey techniques for swifts, however they should be counted by an experienced person from elevated viewpoints (if present) during the Austral summer (Commonwealth of Australia, 2015).	- Nine Bird plot surveys – Three survey hours over multiple days 34 Habitat suitability assessments - Incidental records	21 Bird plot surveys - 7 survey hours over multiple days - Incidental records
Cuculidae	<i>Cuculus optatus</i>	Oriental Cuckoo	SLC	Mi	May occur	No critical habitat for the survival of the species has been defined. Important habitat - Non-breeding habitat only: monsoonal rainforest, vine thickets, wet sclerophyll forest or open Casuarina, Acacia or Eucalyptus woodlands. Frequently at edges or ecotones between habitat types. Riparian forest is favoured habitat in the Kimberley region (Commonwealth of Australia, 2015).	Foraging and dispersal habitat - The species does not breed in Australia, so only foraging and dispersal habitat for the species can be defined, which includes a monsoonal rainforest, vine thickets, wet sclerophyll forest or open Casuarina, Acacia or Eucalyptus woodlands (Commonwealth of Australia, 2015).	None defined	Two-hectare survey in 20 minutes, over sufficient survey plots to estimate a density. Surveys should be undertaken in an appropriate season - spring or summer in southern Australia ¹ (Commonwealth of Australia, 2015).	- Nine Bird plot surveys – Three survey hours over multiple days 34 Habitat suitability assessments - Incidental records	21 Bird plot surveys - seven survey hours over multiple days - Incidental records



Family	Scientific Name	Common Name	Status ¹		Likelihood of Occurrence ²	Key Defining Terms (as defined in <i>Table 11 Key Habitat Terms used by DCCEEW</i>)	Defined Species Habitat Definitions	Targeted Survey Guidelines		Targeted Survey Effort	
			QLD	CTH				QLD	CTH	Dry Season 2024	Wet Season 2025
						An ecologically significant proportion of a population of Oriental Cuckoo is: - o Internationally significant - 10,000 individuals (1% of population) - o Nationally significant-1000 individuals (0.1% of population; Commonwealth of Australia, 2015). The proportion of the Oriental Cuckoo population that is likely to result in a significant impact is 10,000 individuals (1%) and 1,000 (0.1%; Commonwealth of Australia, 2015). Area thresholds of important habitat likely to result in a significant impact to the Oriental Cuckoo is 250,000 ha (Commonwealth of Australia, 2015).					

¹ Queensland Status (NC Act): EX = Extinct, EW = Extinct in Wild, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern; SLC = Special Least Concern.
Commonwealth (Cth) EPBC Act Status: EX = Extinct, EW = Extinct in Wild, CE = Critically Endangered, EN = Endangered, VU = Vulnerable, M = Marine, Mi = Migratory, - not protected under the Act.
² Data in the 'Likelihood of Occurrence' column corresponds to information provided in Appendix B – categories used include known to occur, likely to occur, may occur or unlikely to occur.



3.4 GIS MAPPING

3.4.1 MNES/MSES Mapping

Following the completion of field surveys, mapping for MNES and MSES values known to occur or potentially occurring within the Survey area (inclusive of the Project area and Disturbance area) was undertaken. GIS mapping of the Survey area was undertaken to:

- Show ecological values verified within the Survey area.
- Estimate the extent of MNES and MSES within the Survey area, Project area and Disturbance area.
- Understand the potential impacts to MNES and MSES as a result of the Project.
- Aid the development of specific mitigation measures to avoid, minimise and mitigate impacts.

3.4.2 Threatened Species Habitat Mapping

3.4.2.1 Defining Species Habitat Category Classifications

For species habitat mapping, habitat category classifications (e.g., breeding, foraging and dispersal habitat) were defined in accordance with habitat definitions available in the EPBC Act Guidelines or other relevant, most recent, statutory documents (e.g., referral guidelines, approved listing advice(s), approved conservation advice(s), recovery plan(s), threat abatement plan(s) or comparable policy guidelines, and information contained in relevant Commonwealth databases such as the SPRAT database). The habitat definitions for each target species and ecological community have been described in Table 10, with the targeted survey effort per season detailed for each species.

3.4.2.2 Key Defining Terms used by DCCEEW

DCCEEW defines key terms for MNES under the EPBC Act, for assessing the potential for a significant impact on threatened species and ecological communities, and migratory species. These key terms include 'habitat critical to the survival of the species', 'important habitat', 'important population', 'important habitat for migratory species' and 'ecologically significant proportion of a migratory species population'. General definitions for these terms have been provided below in Table 11. Where specific key terms have been defined for MNES, these have been provided in Table 10.

Table 11
*Key Terms used by
DCCEEW*

Term	Description
Habitat Critical to the Survival of the Species	DCCEEW defines '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. Such habitat may be, but is not limited to, habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community; and/or habitat listed on the Register of Critical Habitat maintained by the minister under the EPBC Act. Where 'habitat critical to the survival of a species or ecological community' is not formally defined, habitat should be assessed against the criteria outlined above to determine whether it meets the relevant thresholds to be considered critical habitat for a species.
Important Habitat for a Species	Instead of 'habitat critical to the survival of a species', some threatened species have identified 'important habitat', particularly listed Brigalow Belt reptiles (as defined in the Draft referral guidelines for the nationally listed Brigalow Belt reptiles; DCCEEW, 2023).



Term	Description
	The difference between ‘habitat critical to the survival of a species’ and ‘important habitat’ is habitat that is essential for the continued existence of a listed threatened species or ecological community, while ‘important habitat’ supports one or more key life stages of a species, or contributes significantly to its ongoing persistence, but may not be considered ‘critical’. When assessing whether an action is likely to have a significant residual impact on a species listed as vulnerable under the EPBC Act, DCCEEW considers nine significant impact criteria within the MNES Significant Impact Guidelines. Four of these criteria relate to impacts on important populations of the listed vulnerable species. However, given that the listed Brigalow Belt reptiles are difficult to detect and population information is limited, DCCEEW regards <i>important habitat as a surrogate for important populations</i> in the assessment of whether an action is likely to have a significant impact on one or more of these species. Suitable habitat for any one of the listed Brigalow Belt reptiles is considered important if it is: • Habitat where the species has been identified during a survey; • Near the limit of the species’ known range; • Large patches of contiguous, suitable habitat and viable landscape corridors (necessary for the purposes of breeding, dispersal or maintaining the genetic diversity of the species over successive generations); or • A habitat type where the species is identified during a survey, but which was previously thought not to support the species. • Important habitat has been identified for the following Brigalow Belt reptiles: Five-clawed worm-skink (<i>Anomalopus mackayi</i>), Yakka Skink (<i>Egernia rugosa</i>), Retro Slider (<i>Lerista allanae</i>), Mount Cooper Striped Lerista (<i>Lerista vittata</i>), Collared Delma (<i>Delma torquata</i>), Ornamental Snake and Dunmall’s Snake (<i>Furina dunmalli</i>).
Important Population of a Species	A ‘population of a species’ is defined under the EPBC Act as an occurrence of the species in a particular area. In relation to critically endangered, endangered or vulnerable threatened species, occurrences include but are not limited to: • A geographically distinct regional population, or collection of local populations, or • A population, or collection of local populations, that occurs within a particular bioregion. An ‘important population’ is one that is necessary for a species’ long-term survival and recovery. This may include populations 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.
Important Habitat for Migratory Species	Migratory species have defined ‘important habitat’. An area of ‘important habitat’ for a migratory species is: • Habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species; and/or • Habitat that is of critical importance to the species at particular life-cycle stages; and/or • 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 Proportion of a Migratory Species Population	‘Population’, in relation to migratory species, means the entire population or any geographically separate part of the population of any species or lower taxon of wild animals, a significant proportion of whose members cyclically and predictably cross one or more national jurisdictional boundaries including Australia. Listed migratory species cover a broad range of species with different life cycles and population sizes.



Term	Description
	Therefore, what is an 'ecologically significant proportion' of the population varies with the species. Some factors that should be considered include the species' population status, genetic distinctiveness and species-specific behavioural patterns (for example, site fidelity and dispersal rates). For species that aggregate in flocks, 1% of the population is considered internationally important, 0.1% as nationally important. The same threshold levels are used here for want of more specific ecological research.

3.4.2.3 GIS Mapping Methodology for Species Habitat

Defined species habitat definitions (e.g., breeding, foraging, dispersal) were first defined for each conservation significant species and ecological community identified as potentially occurring within the Survey area, based on habitat descriptions in approved Listing or Conservation Advice, Recovery Plans, Referral guidelines, the Commonwealth and state targeted species guidelines, and the DCCEEW SPRAT database (defined habitat for each conservation significant species and ecological community provided in Table 10). Where available, DCCEEW key defining terms (e.g. critical habitat, important habitat, important populations and ecologically significant proportions of populations) were identified and applied to each conservation significant species and ecological community to ensure consistency with the significant impact assessment framework (key defining terms for each conservation significant species and ecological community provided in Table 10).

To initially map species habitat to inform targeted surveys, spatial datasets were used including RE mapping (specifically REs that have been notable and historically associated with species habitat as defined within the essential habitat map), aerial imagery, and hydrological features in ArcGIS Pro. Key data sources for these spatial datasets included the Queensland WildNet database, the Protected Matters Search Tool, and species-specific habitat models.

Targeted field assessments were subsequently undertaken to verify and refine the conservation significant species and ecological communities occurring or potentially occurring within the Survey area and the habitat extents for each. This involved assessing vegetation structure, floristic composition, habitat connectivity, and identifying evidence of fauna presence. Key habitat attributes, such as host plant occurrence, hollow-bearing trees, water sources, and species-specific microhabitats, were documented. Observations were cross-referenced with known species records and ecological requirements to ensure accurate habitat suitability assessments.

Following field verification, species habitat and key defining terms for the conservation-significant species and ecological communities that were confirmed (known to occur) or had habitat verified within the Survey area were mapped. Field verified species and ecological community maps are provided in Maps 9 – 19 (Appendix A). These maps contain both species habitat, and where available the key defining terms which informed the MNES significant impact assessment for the Project (provided in Appendix J).

3.5 REGIONAL ECOSYSTEM MAP AMENDMENT REQUEST

An RE Map Amendment Request (MAR) for the Survey area was submitted to the Queensland Herbarium in July 2025. The MAR sought to refine the mapping of regulated vegetation and REs across the Survey area, primarily through minor reattribution of existing RE boundaries and reclassification of specific REs.

The MAR was supported by extensive field survey data, aerial imagery (1964 – present), LiDAR and geomorphic modelling. Approximately 400 ha of vegetation previously mapped as non-remnant was reclassified to remnant RE11.8.5 and RE11.4.13, following confirmation that natural dieback in 2005–2007 had resulted in misclassification.

The proposed amendments were largely accepted by the Queensland Herbarium, with only minor refinements based on available Queensland Herbarium ground-truthing data and imagery interpretation. Final RE allocations were confirmed in accordance with Queensland Herbarium standards and will be incorporated into Version 15 of the State RE mapping.

The Queensland Herbarium approved RE data have been adopted for use in this Terrestrial Ecology Assessment for the EIS. All field-verified mapping is based on the Queensland Herbarium approved RE data.



3.6 DEVELOPMENT OF THE MITIGATION HIERARCHY

The mitigation hierarchy for the Project was developed in accordance with the principles of avoid, minimise, rehabilitate and offset, consistent with Commonwealth and State environmental impact assessment frameworks. The hierarchy was applied iteratively throughout Project planning to ensure impacts to ecological values, including MNES, MSES and ESAs, were reduced to the greatest extent practicable.

Avoidance measures were prioritised during project design and layout refinement. This involved:

- Integration of ecological constraints mapping into mine planning and infrastructure siting;
- Avoidance of confirmed records and high-value habitat for conservation-significant species where practicable;
- Retention of riparian corridors, drainage features and habitat connectivity areas where feasible;
- Consideration of alternative layouts to reduce clearing of important habitat and high quality vegetation.

Design refinements were informed by desktop assessments, field-verified habitat mapping, and species-specific ecological requirements.

Where impacts could not be completely avoided, measures were incorporated to minimise the extent, duration and intensity of impacts. These measures included reducing clearing footprints to the minimum area required for safe and efficient operations, to minimise impacts on TEC and conservation significant species habitat patches.

Following avoidance and minimisation measures, generalised mitigation measures were developed which included but were not limited to the development and implementation of management plans, implementing erosion and sediment control measures to protect adjacent wetlands and waterways, undertaking progressive clearing to reduce the duration of disturbance and including pre-clearing surveys and fauna spotter-catcher protocols.

Where TECs and conservation significant species or their habitat was verified in the Survey area, and management of key threats was required to appropriately manage and reduce the significance of impacts, community- and species-specific mitigation measures were developed specific to the ecology of each affected TEC and species. These specific management actions per species are provided in Appendix J and were proposed based on conservation outcomes defined in the SPRAT database and relevant approved conservation advices, listing advices and recovery plans.

In addition, the avoidance, minimisation and mitigation measures, the Project has developed rehabilitation measures, which will be provided within the Project's approved PRCP.

Where residual significant impacts to MNES or MSES remain following the application of avoidance, minimisation, mitigation and rehabilitation measures, environmental offsets will be considered in accordance with relevant Commonwealth and State offset policies. Offset requirements will be determined based on the extent and significance of residual impacts and will aim to achieve a conservation outcome that improves or maintains the viability of the affected protected matter.

3.7 IMPACT ASSESSMENT

The assessment of potential impacts on ecological values was undertaken in accordance with both State and Commonwealth significance assessment frameworks.

The SRI assessment for MSES was completed in accordance with the *Queensland Environmental Offsets Policy* (EPP/2015/1658; DETSI, 2025) and the *Queensland Environmental Offsets Policy - Significant Residual Impact Guideline* (DEHP, 2014a). These frameworks provide criteria to determine whether impacts on MSES are likely to be significant following the application of all reasonable avoidance and mitigation measures.

The Significant Impact Assessment (SIA) for MNES was undertaken in accordance with the *MNES Significant Impact Guidelines 1.1* (DEWHA, 2013). These guidelines outline the process for determining whether an action is likely to have a significant impact on a matter protected under the EPBC Act.

Both assessments adopted a risk-based approach, combining desktop analyses, spatial assessments, and field verification to evaluate potential residual impacts on MNES and MSES values within the Survey area.



3.8 SURVEY LIMITATIONS

3.8.1 Third Party Data

The content in this report is based on information available at the time the report was prepared. The reliability of the information was tested through cross-checking desktop data sources against field survey observations, verification of mapped ecological values during site inspections, and review of the assessment findings against relevant legislative, policy and technical guidance.

Information has been obtained from third party sources (refer to *Section 3.2.1 Database Review*) and, while due diligence has been taken to ensure the accuracy of these data, Trend Environmental makes no statements regarding the reliability or completeness of these data.

3.8.2 Determining Ecological Values

There is variability in vegetation communities and species distributions which results in inherent limitations in all field surveys. The limitations in undertaking ecological field surveys have been mitigated by applying an extensive targeted field sampling program to target the presence of any habitat that may be suitable for threatened species, during the seasons in which species are more likely to be detected; however, not all threatened species may have been detected or identified.

The ability to detect fauna can be difficult due to mobility or cryptic nature, sensitivity to humans, migration periods, and diurnal and nocturnal movements. The ability to detect plants and accurately identify them to species level also varies greatly depending on season, climate conditions and the presence of reproductive material (i.e., flower, fruit and seed capsules).

Where a species was assessed as having a high likelihood of occurrence but was not detected during targeted surveys, additional survey effort was undertaken where practicable to improve detection probability (e.g. deployment of additional camera traps in proximity to wetland habitats to target wetland-dependent bird species).

Notwithstanding these efforts, it is acknowledged that the absence of detection does not confirm absence of the species. Accordingly, where suitable habitat for a species was verified within the Survey area, the species was conservatively assumed to have the potential to occur within the Project area. This precautionary approach was adopted to ensure that the impact assessment did not underestimate potential risks to conservation-significant species.

3.8.3 Defining Banks of Watercourses

To delineate the defining banks of the watercourses, conservative widths to the defining bank from the centre of the watercourse were recorded during the field surveys. The averaged widths were then applied to the Vegetation Management watercourse centrelines to spatially map the defining banks. The buffers applied include 3 m for Conrock Gully (stream order 2), and 25 m for Cherwell Creek (stream order 5) and the Isaac River (stream order 6).

3.8.4 Other Limitations

No other limitations were identified that would have affected the outcomes of the targeted surveys. No rainfall events occurred that reduced survey quality, all areas were accessible, and no resource limitations, such as time constraints or equipment failure, were encountered. Survey effort was consistent with relevant guideline requirements, as detailed in the tables in the *Field Results Section 5.2 Flora* and *Section 5.3 Fauna* for each threatened and migratory species identified as potentially occurring.



4. DESKTOP ASSESSMENT RESULTS

4.1 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

4.1.1 Overview of Matters of National Environmental Significance potentially occurring

As part of the desktop assessment, MNES with the potential to occur within the Survey area were identified, as these may be impacted by the Project and therefore required verification during field surveys. This assessment was based on the results of a search of the Commonwealth's EPBC Act PMST for the Survey area using a 20 km radius.

The assessment identified the following MNES as potentially occurring within the Survey area, which, other than migratory species, are the controlling provisions for the Project's Referral under the EPBC Act.

- Nationally threatened species and ecological communities; and
- Migratory species
- A water resource

Of relevance to this Terrestrial Ecological Assessment are the nationally threatened species and ecological communities, and migratory species. Table 12 details the relevance of each MNES to the Project and identified where field-verification of the MNES was required to supporting impact assessments. Where an MNES has been greyed out, these were considered not applicable to the Project.

Table 12
MNES Relevance
Assessment

MNES	Description	Relevance to the Project
World Heritage Properties	World Heritage properties are places of such outstanding significance that their qualities make them universally unique and worthy of protection for future generations. A 'declared World Heritage property' is an area that has been included in the World Heritage list or declared by the minister to be a World Heritage property.	Not applicable A search of the EPBC Act PMST database did not identify any World Heritage Places within the Survey area or within a distance likely to be impacted by the Project. This MNES therefore does not apply to the Project. No further assessment required.
National Heritage Properties	The National Heritage List is a list of places of natural, historic, and Indigenous significance that are protected by Australian Government laws.	Not applicable A search of the EPBC Act PMST database did not identify any National Heritage Properties within the Survey area. This MNES therefore does not apply to the Project. No further assessment required.
Wetlands of International Importance (RAMSAR)	Ramsar sites are designated because they meet the criteria for identifying Wetlands of International Importance. They are designated under Article 2 of the Ramsar Convention or declared by the Minister to be a declared Ramsar wetland under section 16 of the EPBC Act. The EPBC Act establishes a framework for managing Ramsar wetlands within Australia.	Not applicable A search of the EPBC Act PMST database did not identify any Wetlands of International Importance within the Survey area or within a downstream distance likely to be impacted by the Project. This MNES therefore does not apply to the Project. No further assessment required.
Nationally threatened species and ecological communities	An action will be considered a controlled action requiring Commonwealth approval if the action has, will have, or is likely to have a significant impact on a species or ecological community listed as extinct in the wild, critically endangered, endangered, or vulnerable.	Applicable A search of the EPBC Act PMST database identified 29 listed threatened species and four TECs with the potential to occur within the Survey area. Field verification required to inform impact assessments.



MNES	Description	Relevance to the Project
Migratory species	An action will be considered a controlled action requiring Commonwealth approval if the action has, will have, or is likely to have a significant impact on a listed migratory species.	Applicable A search of the EPBC Act PMST database identified ten listed migratory species with the potential to occur within the Survey area. Field verification required to inform impact assessments.
Commonwealth marine areas	Marine protected areas are marine areas which are recognised to have high conservation value. Actions in or near marine protected areas, or other areas with high conservation value, have a greater likelihood of significant impacts on the Commonwealth marine environment.	Not applicable The Project is not being undertaken in or adjacent to a Commonwealth marine area. This MNES therefore does not apply to the Project. No further assessment required.
Great Barrier Reef Marine Park	The Great Barrier Reef Marine Park (GBRMP) is an area recognised to have high conservation value, and an action will require approval if it is likely to impact the environment.	Not applicable The GBRMP is approximately 500 km downstream of the Survey area and is unlikely to be impacted by the Project. This MNES therefore does not apply to the Project. No further assessment required.
Nuclear actions	An action will be considered a controlled action requiring Commonwealth approval if it is a nuclear action (including uranium mining) that has, will have, or is likely to have a significant impact on the environment.	Not applicable The Project is not a nuclear action. This MNES therefore does not apply to the Project. No further assessment required.
A water resource	Under the EPBC Act, an action which involves a coal seam gas development, or a large coal mining development will be considered a controlled action requiring Commonwealth approval if the action has, will have, or is likely to have a significant impact on a water resource.	Applicable The Project is a large-scale coal mining development. As such, it will require assessment against the <i>Significant Impact Guidelines 1.3: Coal seam gas and large coal mining developments—Impacts on water resources</i> (DCCEEW, 2022c). While this MNES is relevant to the Project, it is outside of the scope of this Terrestrial Ecology Assessment and therefore, will not be discussed further herein.

Notes – MNES greyed out are not relevant to the Project

4.1.2 Results of the Threatened Ecological Community Likelihood of Occurrence Assessment

A determination of the likely presence of TECs was undertaken by reviewing whether any of the corresponding REs listed within the relevant DCCEEW Conservation or Listing Advice for each of the identified TECs occur within the Survey area. This assessment was completed as part of the Likelihood of Occurrence assessment, the results of which are provided in Appendix B.

Based on the PMST, the Likelihood of Occurrence assessment and the Vegetation Management RE mapping for the Survey area, the desktop assessment revealed four TECs that were considered likely to or may occur within the Survey area (Table 13). These TECs included:

- Brigalow (*A. harpophylla* dominant and co-dominant) TEC.
- Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin TEC.
- Poplar Box Grassy Woodland on Alluvial Plains TEC.
- Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions TEC.

The actual presence of TECs within the Survey area however was verified during the field surveys. Field-verified TECs will be used to assess likely impacts from the Project.



Table 13
TECs
identified in
the PMST

TEC Community	Status ¹	Likelihood of Occurrence	Corresponding REs ²
Brigalow (<i>A. harpophylla</i> dominant and co-dominant) TEC	EN	Likely to occur	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, 11.12.21
Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin TEC	EN	Likely to occur	11.3.21 , 11.4.4, 11.4.11, 11.8.11 , 11.9.3, 11.9.12 and 11.11.17
Poplar Box Grassy Woodland on Alluvial Plains TEC	EN	Likely to occur	11.3.2 , 11.3.17, 11.4.7, 11.4.12 and 12.3.10
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions TEC	EN	May occur	11.2.3, 11.3.11, 11.4.1, 11.8.13 , 11.9.4 and 11.11.18

¹ EPBC Act Status: CE = Critically Endangered, EN = Endangered, VU = Vulnerable.

² Patches of vegetation characterised by these REs are only considered the TEC if they meet the key diagnostic criteria within the relevant Conservation or Listing Advice.

Bolded REs are those that were mapped as occurring within the Survey area, based on Vegetation Management RE mapping.

4.1.3 Results of the Likelihood of Occurrence Assessment for Commonwealth-listed Threatened and Migratory Species

The Likelihood of Occurrence assessment for threatened and migratory species listed under the MNES identified several threatened flora, birds, mammals and reptiles, and migratory species as either 'may occur', 'likely to occur' or 'known to occur', based on presence during previous surveys undertaken within the Survey area, desktop mapped habitat and verified records within the Area of interest or Region. These species included:

- Two threatened flora species - *Dichanthium queenslandicum* and *Dichanthium setosum* (bluegrass).
- Four threatened bird species - Squatter Pigeon (southern subspecies; *Geophaps scripta scripta*), Australian Painted Snipe (*Rostratula australis*), Sharp-tailed Sandpiper (*Calidris acuminata*) and Common Greenshank (*Tringa nebularia*).
- Two threatened mammal species – the Koala and Greater Glider (southern and central).
- One threatened reptile species – the Ornamental Snake.
- Two migratory bird species – the Fork-tailed Swift (*Apus pacificus*) and Oriental Cuckoo (*Cuculus optatus*). The Fork-tailed Swift is listed under international agreements including the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), CAMBA and ROKAMBA. The Oriental Cuckoo is listed under CAMBA, ROKAMBA and JAMBA.

These species, their conservation status under NC Act and EPBC Act, and their assessed likelihood of occurrence are presented in Table 14. These species were targeted during field surveys to verify their presence and determine the extent of habitat available within the Survey area.

Based on the Likelihood of Occurrence assessment, the Squatter Pigeon, Koala, Greater Glider (southern and central), Ornamental Snake were considered 'known to occur' due to previous detections within the Survey area (based on previous surveys, as defined in *Section 2.2 Past Ecological Assessments*), while all other species were considered 'likely to occur' or 'may occur' based on the identification of suitable habitat mapped within the Survey area, and nearby species records (e.g., from the ALA database).

Table 14
Threatened and
migratory species
identified as
potentially occurring
in the likelihood of
occurrence
assessment

Family	Scientific Name	Common Name	Status ¹		Likelihood of Occurrence Result
			QLD	CTH	
THREATENED FLORA					
Poaceae	<i>Dichanthium queenslandicum</i>	King Blue-grass	VU	EN	Likely to occur
Poaceae	<i>Dichanthium setosum</i>	Bluegrass	LC	VU	May occur
THREATENED BIRDS					
Columbidae	<i>Geophaps scripta scripta</i>	Squatter Pigeon (southern subspecies)	VU	VU	Known to occur



Family	Scientific Name	Common Name	Status ¹		Likelihood of Occurrence Result
			QLD	CTH	
Rostratulidae	<i>Rostratula australis</i>	Australian Painted Snipe	EN	EN, Mi	Likely to occur
Scolopacidae	<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	SLC	VU, M, Mi	May occur
Scolopacidae	<i>Tringa nebularia</i>	Common Greenshank	SLC	EN, Mi	May occur
THREATENED MAMMALS					
Phascolarctidae	<i>Phascolarctos cinereus</i>	Koala	EN	EN	Known to occur
Pseudocheiridae	<i>Petauroides volans</i>	Greater Glider (southern and central)	EN	EN	Known to occur
THREATENED REPTILES					
Elapidae	<i>Denisonia maculata</i>	Ornamental Snake	VU	VU	Known to occur
MIGRATORY SPECIES					
Apodidae	<i>Apus pacificus</i>	Fork-tailed Swift	SLC	M, Mi	May occur
Cuculidae	<i>Cuculus optatus</i>	Oriental Cuckoo	SLC	Mi	May occur

¹ Queensland (QLD) Status (NC Act): EX = Extinct, EW = Extinct in Wild, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern; SLC = Special Least Concern.
Commonwealth (Cth) EPBC Act Status: EX = Extinct, EW = Extinct in Wild, CE = Critically Endangered, EN = Endangered, VU = Vulnerable, M = Marine, Mi = Migratory, - not protected under the Act.

4.2 MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE

4.2.1 Overview of Matters of State Environmental Significance potentially occurring

The desktop assessment identified MSES that were potentially occurring within the Survey area based on Vegetation Management regulated vegetation and RE mapping. Table 18 describes all MSES prescribed environmental matters under the EO Act and identifies their relevance to the Project. Where the MSES was not applicable to the Project, they have been greyed out in Table 18.

Table 15
MSES Relevance
Assessment

MSES	Definition	Relevance
Regulated vegetation	Prescribed REs that are endangered REs AND Prescribed REs that are of concern REs	Applicable Endangered or of concern REs (VM Act status) within a Category B (remnant) area, other than grassland REs listed in Schedule 5 of the <i>Vegetation Management Regulation 2012</i> (Qld), are mapped within the Survey area (Map 4, Appendix A). These REs require field verification to inform impact assessments.
	Prescribed REs that intersect with an area shown as a wetland on the vegetation management wetlands map	Applicable REs that intersect an area shown on the vegetation management wetland map are mapped within the Survey area (VM Act wetlands shown in Map 4 Appendix A). These wetlands require field verification per the <i>Queensland Wetland Definition and Delineation Guideline</i> (DES, 2023) to inform impact assessments.
	An area of essential habitat on the essential habitat map for an animal that is critically endangered wildlife, endangered wildlife or vulnerable wildlife or a plant that is critically endangered wildlife, endangered wildlife or vulnerable wildlife AND if the ecosystem is an area of essential habitat	Applicable Essential habitat is mapped within the Survey area (Map 4, Appendix A). These mapped essential habitat areas require field verification according to the essential habitat factors in the essential habitat database to inform impact assessments.



MSES	Definition	Relevance
	on the essential habitat map for an animal that is near threatened wildlife or a plant that is near threatened wildlife	
	To the extent the ecosystem is located within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature	Applicable Prescribed REs (endangered or of concern [VMA status] within a Category B [remnant] area) other than grassland REs listed in Schedule 5 of the <i>Vegetation Management Regulation 2012</i> (Qld) are mapped adjacent to mapped watercourses in the Survey area (VM Act watercourses shown in Map 4, Appendix A). These REs require field verification to inform impact assessments.
Protected Areas	A protected area	Not applicable None present in the Project area or Survey area; hence this MSES is not applicable to the Project.
Highly Protected Zones of State Marine Parks	Highly Protected Zones of State Marine Parks	Not applicable None present in the Project area or Survey area; hence this MSES is not applicable to the Project.
Fish Habitat Area	An area declared under the Fisheries Act to be a fish habitat area	Not applicable None present in the Project area or Survey area; hence this MSES is not applicable to the Project.
Designated precinct in a strategic environmental area	Designated precinct in a strategic environmental area	Not applicable None present in the Project area or Survey area; hence this MSES is not applicable to the Project.
High Ecologically Significant wetlands	A wetland– (i) in a wetland protection area; or (ii) of HES shown on the map of Queensland wetland environmental values	Applicable One HES wetland is mapped within the Survey area (HES wetland shown in Map 5, Appendix A).
High Ecological Values wetlands and watercourses	A wetland or watercourse in HEV	Not applicable No HEV wetlands or watercourses mapped within the Survey area, hence this MSES is not applicable to the Project.
Legally Secured Offset Areas	A legally secured offset area	Not applicable None present in the Survey area; hence this MSES is not applicable to the Project.
Protected Wildlife habitat	A habitat for an animal that is critically endangered wildlife, endangered wildlife or vulnerable wildlife or a SLC animal	Applicable Wildlife habitat (endangered or vulnerable) species is mapped within the Survey area (Map 5, Appendix A). No protected wildlife habitat for SLC species has been mapped within the Survey area.
	An area that is shown as a high risk area on the flora survey trigger map and that contains plants that are critically endangered wildlife, endangered wildlife or vulnerable wildlife is an MSES. OR An area that is not shown as a high risk area on the flora survey trigger map, to the extent the area contains plants that are critically endangered wildlife, endangered wildlife or vulnerable wildlife, is an MSES.	Applicable There are no high-risk areas identified on the flora survey trigger map within the Survey area. However, there is potential for threatened flora species or their habitat to be present. Two threatened flora species were identified as likely to or may occur in Table 14.
	A koala habitat area is a matter of State environmental	Not applicable None present in the Survey area. Survey area not located in South East Queensland; hence this MSES is not applicable to the Project.



MSES	Definition	Relevance
Marine Plants	A marine plant within the meaning of the Fisheries Act	Not applicable None present in the Survey area; hence the MSES is not applicable to the Project.
Waterways providing for fish passage	Any part of a waterway providing for passage of fish is a matter of State environmental significance only if the construction, installation or modification of waterway barrier works carried out under an authority will limit the passage of fish along the waterway.	Applicable Waterways for waterway barrier works are mapped within the Survey area (Map 5, Appendix A). Field-verification of waterways for waterway barrier works is required and is provided as part of the Aquatic Ecology Report for the EIS (Freshwater Ecology, 2026).
Connectivity Areas	Ecosystem contains remnant vegetation; and if the ecosystem contains an area of land that is required for ecosystem functioning (a connectivity area). AND if the administering agency is satisfied, having had regard to criteria in the environmental offsets policy about connectivity areas, that— (a) the connectivity area is of sufficient size or configured in a way that maintains ecosystem functioning; and the prescribed RE will remain despite a threatening process within the meaning of the NC Act.	Applicable There is a mapped state biodiversity corridor within the Survey area (Map 6, Appendix A).

Notes: MSES that are not relevant to the Project have been greyed out.

4.3 APPLICABLE MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE

4.3.1 Regulated Vegetation

4.3.1.1 Regional Ecosystems and Prescribed Regional Ecosystems that are Endangered or Of Concern

Under the VM Act, regulated vegetation is classified into the following categories:

- Category A (Vegetation offsets/compliance notices/VDecs)
- Category B (Remnant)
- Category C (High value regrowth)
- Category R (Reef regrowth watercourse vegetation)
- Category X (Exempt clearing work on freehold, Indigenous and Leasehold land; or non-remnant).

These categories are further refined by the Queensland Herbarium as REs, which are vegetation communities within a bioregion that consistently associate with a particular combination of geology (Sattler & Williams, 1999b).

The REs mapped as present in the Survey area, their corresponding regulated vegetation category, VM Act Class and Biodiversity Status are summarised in Table 16. Map 7 in Appendix A shows the desktop-mapped regulated vegetation areas within the Survey area, while Map 8 shows the desktop-mapped REs within the Survey area. Table 16 also details whether the RE is an MSES prescribed RE that is endangered or of concern which can have implications under the EO Act if impacts to these REs are deemed significant.

Large portions of the Survey area were mapped as Category X (Non-remnant) vegetation, reflecting historical clearing for pastoral purposes (Map 7, Appendix A). However, tracts of Category B (Remnant) vegetation were also mapped, predominantly in the northern portion of the Survey area and associated with the watercourses: Isaac River, Cherwell Creek and Conrock Gully. These Category B (Remnant) areas comprise a mix of least concern, of concern or endangered REs (Map 8, Appendix A), mapped as either homogenous or heterogenous/mixed polygons (containing more than one RE). One small area of Category R (Reef regrowth watercourse vegetation) was also mapped in the southern portion of the Survey area, associated with the unnamed tributary of Cherwell Creek (Map 7, Appendix A).

Under the EO Act, Category B (Remnant) endangered and of concern REs are recognised as MSES due to their ecological significance and limited distribution. However, this MSES excludes grassland REs prescribed in schedule 5 of the *Vegetation*



Management Regulation 2012 (Qld). Accordingly, REs 11.3.21 and 11.8.11, which are of concern REs that occur within the Survey area, are not recognised as MSES. In contrast, REs 11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.4.8, 11.4.9, 11.8.13 and 11.9.5 are endangered or of concern REs within the Survey area that are recognised as MSES under the EO Act (Table 16).

Table 16
Regulated
vegetation mapped
within the Survey
area

RE	Regulated Vegetation Category ¹	Description	VM Act Class ²	VM Act Biodiversity Status ³	MSES
11.3.1	B	<i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> (Belah) open forest on alluvial plains	EN	EN	Prescribed RE that is endangered
11.3.2	B	<i>Eucalyptus populnea</i> woodland on alluvial plains	OC	OC	Prescribed RE that is of concern
11.3.3	B	<i>Eucalyptus coolabah</i> woodland on alluvial plains	OC	OC	Prescribed RE that is of concern
11.3.4	B	<i>Eucalyptus tereticornis</i> and/or <i>Eucalyptus</i> spp. woodland on alluvial plains	OC	OC	Prescribed RE that is of concern
11.3.7	B	<i>Eucalyptus coolabah</i> fringing woodland on alluvial plains	LC	NC	N/A
11.3.21	B	<i>Dichanthium sericeum</i> (Queensland Bluegrass) and/or <i>Astrelba</i> spp. (Mitchell Grass) grassland on alluvial plains.	OC	EN	N/A
11.3.25	B R	<i>Eucalyptus tereticornis</i> or <i>Eucalyptus camaldulensis</i> woodland fringing drainage lines	LC	OC	N/A
11.3.27	B	Freshwater wetlands	LC	OC	N/A
11.4.8	B R	<i>Eucalyptus cambageana</i> woodland to open forest with <i>Acacia harpophylla</i> or <i>Acacia argyrodendron</i> (Blackwood) on Cainozoic clay plains	EN	EN	Prescribed RE that is endangered
11.4.9	B R	<i>Acacia harpophylla</i> shrubby woodland with <i>Terminalia oblongata</i> (Rosewood) on Cainozoic clay plains	EN	EN	Prescribed RE that is endangered
11.4.13	B	<i>Eucalyptus orgadophila</i> open woodland on Cainozoic clay plains	LC	OC	N/A
11.5.3	B R	<i>Eucalyptus populnea</i> +/- <i>Eucalyptus melanophloia</i> (Silver leaved Ironbark) +/- <i>Corymbia clarksoniana</i> woodland on Cainozoic sand plains and/or remnant surfaces	LC	LC	N/A
11.5.12	B	<i>Corymbia clarksoniana</i> woodland and other <i>Corymbia</i> spp. and <i>Eucalyptus</i> spp. on Cainozoic sand plains and/or remnant surfaces	LC	NC	N/A
11.8.5	B	<i>Eucalyptus orgadophila</i> open woodland on Cainozoic igneous rocks	LC	NC	N/A
11.8.11	B	<i>Dichanthium sericeum</i> grassland on Cainozoic igneous rocks	OC	OC	N/A
11.8.13	B	Semi-evergreen vine thicket and microphyll vine forest on Cainozoic igneous rocks	EN	EN	Prescribed RE that is endangered
11.9.2	B	<i>Eucalyptus melanophloia</i> +/- <i>Eucalyptus orgadophila</i> woodland to open woodland on fine-grained sedimentary rocks	LC	NC	N/A
11.9.5	B	<i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open forest to woodland on fine-grained sedimentary rocks	EN	EN	Prescribed RE that is endangered

¹ Regulated vegetation category: Category B (remnant vegetation), Category C (high-value regrowth) Category R (reef regrowth watercourse vegetation) or Category X (non-remnant).

² VM Act Class: EN = Endangered, OC = Of Concern, LC = Least Concern

³ VM Act Biodiversity Status: EN = Endangered, OC = Of Concern, LC = Least Concern, NC = No concern at present.



4.3.1.2 Prescribed REs intersecting VM Act Watercourses and Wetlands

Where REs intersect with VM Act watercourses or wetlands, they are recognised as MSES under the EO Act.

Prescribed REs occurring within 5 m of the defining bank of a VM Act watercourse (defined watercourses) are recognised as an MSES. These were mapped within the Survey area and include REs 11.3.1, 11.3.2, 11.3.3, 11.3.7, 11.3.25, 11.4.9 and 11.5.3 (VM Act watercourses are shown in Map 4, Appendix A).

Similarly, REs occurring within 50 m of the defining bank of a mapped VM Act wetland are recognised as MSES. These were mapped within the Survey area. Table 17 details the mapped VM Act wetlands within the Survey area (including their ID number) and their corresponding REs within 50 m of the defining bank. These REs include 11.3.27b, 11.5.3 and 11.5.3b (VM Act wetlands and their corresponding ID numbers (which have been provided for the purpose of identifying individual wetlands within this Ecological Assessment Report only) are shown in Map 4, Appendix A).

Table 17
VM Act wetlands
within the Survey
area

ID Number	QLD Wetland Area	VM Act Wetland	RE
1	Palustrine wetlands [hydrologically natural]	Mapped	11.3.27b
2	Palustrine wetlands [hydrologically natural]	Mapped	11.3.27b
3	Palustrine wetlands [hydrologically natural]	Mapped	11.3.27b
4	Palustrine wetlands [hydrologically natural]	Mapped	11.3.27b
5	Palustrine wetlands [hydrologically natural]	Mapped	11.5.3b
6	Palustrine wetlands [hydrologically natural]	Mapped	11.5.3b
7	Palustrine wetlands [hydrologically natural]	Mapped	11.5.3

4.3.1.3 Essential Habitat

Essential habitat mapped under the VM Act is recognised as an MSES. Essential habitat is mapped for threatened species where:

- The habitat contains at least three essential habitat factors, including any mandatory essential habitat factors;
- A species habitat models exist, or
- Species records have been buffered (1 km).

The threatened species with essential habitat mapped within the Survey area are listed in Table 18. These include Australian Painted Snipe, Squatter Pigeon, Koala, Greater Glider and Ornamental Snake, Table 18 also describes the essential habitat factors for each species.

Table 18
Essential habitat
factors for identified
threatened species

Common Name	Scientific Name	QLD ¹	Essential Habitat Factors				
			Vegetation Community	Altitude	Soils	Position in landscape	RE (Mandatory)
Australian Painted Snipe	<i>Rostratula australis</i>	VU	Shallow ephemeral and permanent swamps, water meadows and damp lake margins with rushes, long grass and herbage (e.g. lignum, chenopods) in good condition, as well as areas of muddy ground.	None	None	Associated with wetlands	11.3.27
Squatter Pigeon	<i>Geophaps scripta scripta</i>	VU	Dry eucalypt woodland (including Poplar Box, Spotted Gum, Yellow Box, Acacia, and Callitris), with sparse short grass, often on sandy areas near to	N/A	Gravelly ridges, traprock, and river flats	N/A	11.3.1, 11.3.2, 11.3.4, 11.3.4, 11.3.7, 11.3.21, 11.3.25, 11.3.27, 11.4.8, 11.4.9, 11.5.3, 11.5.9



			permanent water, grassy eucalypt woodlands. Nest on ground near or under grass tussocks, logs, or low bushes.				11.5.12, 11.8.5, 11.8.11
Koala	<i>Phascolarctos cinereus</i>	EN	Open forests and woodlands containing Eucalyptus, Corymbia, Lophostemon, or Melaleuca trees with a trunk diameter >10cm at 1.3m height. Tree species used vary across the state.	Sea level to 1000m	None	Riparian areas, plains, hill/escarpment slopes	11.3.1, 11.3.2, 11.3.4, 11.3.4, 11.3.7, 11.3.21, 11.3.25, 11.3.27, 11.4.8, 11.4.9, 11.5.3, 11.5.9, 11.5.12, 11.8.5, 11.8.11, 11.9.2
Greater Glider (Southern and central)	<i>Petauroides volans</i>	VU	Tall mature open wet and dry eucalypt forest (Eucalyptus and/or Corymbia spp.) to low open eucalypt	Sea level to 1300m	Usually on soils of relatively high fertility	None	11.3.1, 11.3.2, 11.3.4, 11.3.4, 11.3.7, 11.3.21, 11.3.25, 11.3.27, 11.4.8, 11.4.9, 11.5.3, 11.5.9, 11.5.12, 11.8.5, 11.8.11, 11.9.2
Ornamental Snake	<i>Denisonia maculata</i>	VU	Riparian woodland/open forest and shrub/woodland including Brigalow <i>Acacia harpophylla</i> ; 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 frequently inundated by freshwater.	11.3.1, 11.3.2, 11.3.3, 11.3.4, 11.3.21, 11.3.25, 11.3.27, 11.4.8, 11.4.9, 11.5.3, 11.8.11

Notes: Only REs within the Survey area have been included in the RE column

¹ Queensland (QLD) Status (NC Act): EX = Extinct, EW = Extinct in Wild, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern; SLC = Special Least Concern.

4.3.1.4 High Ecologically Significant Wetlands

Wetlands of HES are protected under the EP Act. Under the EO Act, a HES wetland in a WPA shown on the map of Queensland wetland environmental values is recognised as an MSES.

A review of the map of Queensland wetland environmental values identified one HES wetland mapped within the Survey area (Map 5, Appendix A). This wetland is located to the southeastern corner of the Survey area and is mapped containing RE11.3.27b. This wetland is included as part of the Aquatic Biodiversity Assessment and Mapping Methodology (AquaBAMM) spatial unit IS_W0026, which is recognised for its ecological values.

Table 19 provides details of the desktop mapped HES wetland within the Survey area. Note, the ID number is consistent for the wetlands provided in Table 17 and as such the HES wetland in the south-eastern corner of the Survey area is also recognised as a VM Act wetland.

Table 19
HES wetlands within the Survey area

ID Number	QLD Wetland Area	HES Wetland	RE
1	Palustrine wetlands [hydrologically natural]	Mapped	11.3.27b

4.3.1.5 Protected Wildlife Habitat

Under the EO Act, protected wildlife habitat is recognised as and MSES where it involves:

- Habitat for an animal that is critically endangered, endangered or vulnerable wildlife;
- Habitat for a SLC animal;
- An area that is shown as a high risk area on the flora survey trigger map and that contains plants that are critically endangered, endangered or vulnerable; or



- An area that is not shown as a high risk area on the flora survey trigger map, to the extent the area contains plants that are critically endangered, endangered or vulnerable.

The Survey area contains mapped protected wildlife habitat for endangered or vulnerable species (Map 5, Appendix A). These habitat areas were generally mapped along watercourses: Isaac River, Cherwell Creek and Conrock Gully. No protected wildlife habitat for SLC species was mapped within the Survey area.

There were no high risk areas identified on the flora survey trigger map within the Survey area, however, there is potential for threatened flora species or their habitat to be present within the Survey area. The Likelihood of Occurrence assessment revealed *Dichanthium queenslandicum* and *Dichanthium setosum* were either likely to or may occur within the Survey area (Table 14).

It should be noted that threatened species are recognised and protected under both Commonwealth and State legislation, specifically the NC Act in Queensland, and the EPBC Act. While both frameworks aim to conserve biodiversity and manage impacts on listed species and their habitats, environmental offsets for MNES and MSES can only be applied under one legislative framework to avoid duplication. Where a project is subject to both Commonwealth and State assessment and approval processes, offsets are generally delivered under the EPBC Act. In such cases, the Commonwealth offset will take precedence, and the Queensland Government will not impose an additional offset for the same impact, ensuring a single, coordinated offset outcome.

For MSES wildlife habitat, all of the threatened species identified as known to occur or considered likely to or may occur within the Survey area determined by the Likelihood of Occurrence assessment; Table 14) are listed as threatened under both the EPBC Act and Nc Act. As a result, while their habitat is recognised as an MSES under Queensland legislation, any offsets for SRIs to these species or their habitats can only be applied under one legislative framework. As the Project is a controlled action under the EPBC Act, Commonwealth offset requirements take precedence, and no additional offset will be imposed under the EO Act for the same, or substantially the same, impact, ensuring consistency and avoiding duplication between State and Commonwealth processes. Where these threatened species or their habitat are verified in the Survey area during the targeted field surveys, this information has been considered to avoid duplication when undertaking Commonwealth and State significant impact assessments.

4.3.1.6 Waterways providing for Fish Passage

Under the EO Act, a waterway providing for fish passage constitutes an MSES, only if the construction, installation, or modification of waterway barrier works under an Authority would limit fish passage. These waterways are protected under the Fisheries Act.

A review of Queensland Globe mapping identified the following waterways providing for fish passage mapped within the Survey area:

- Four green low-risk waterways (unnamed tributaries).
- Two orange moderate-risk waterways (Conrock Gully and J B Gully), and
- Two purple major-risk waterways (Isaac River and Cherwell Creek).

These waterways are shown in Map 5, Appendix A. The aquatic ecology assessment for the Project (Freshwater Ecology, 2026) provides an assessment of impacts to verified waterways providing for fish passage.

4.3.1.7 Connectivity Areas and Integrity of Ecosystems

Landscape connectivity is recognised as an MSES, particularly where vegetation supports ecological functions and integrity beyond the site scale. Areas of remnant vegetation that contribute to or form part of a connectivity area are considered necessary for the functioning of an ecosystem. Specifically, to be considered a connectivity area, an ecosystem patch must be of sufficient size or configuration to support ecological processes and resilience to threatening processes.

Vegetated corridors support habitat contiguity. Corridors may comprise riparian systems, linear linkages, or stepping-stone habitats that facilitate species movement, gene flow, and landscape-scale ecological function. Mapped State and Regional biodiversity corridors traverse the site which can be recognised as connectivity areas (shown in Map 6, Appendix A), including:



- The Isaac River is identified as a State-significant biodiversity corridor due to its extensive riparian habitat, remnant vegetation coverage, and role in linking regional habitat patches.
- Cherwell Creek is identified as a Regionally significant connectivity feature, which provides mid-catchment linkage and supports a range of terrestrial and aquatic species movements across the local landscape.

In addition to facilitating movement, these corridors contribute to the integrity of ecosystems and landscapes by maintaining ecological processes such as nutrient cycling, hydrological function, recruitment, and species interactions. Intact riparian and woodland systems support higher structural complexity, habitat diversity, and condition, which underpin ecosystem resilience and the capacity to recover from disturbance.

The concept of ecosystem integrity is also closely linked to landscape condition, which reflects the degree to which ecosystems remain relatively undisturbed and functionally intact. Within the Survey area, ecosystem integrity is generally reduced due to historical clearing for grazing and mining; however, remnant vegetation associated with the Isaac River, Cherwell Creek and tributary systems retains comparatively higher integrity and ecological function at a local scale.

Wilderness and natural areas, including protected estates such as national parks contribute to maintaining ecosystem integrity at a regional scale by conserving large, relatively intact areas of habitat. The nearest protected area is Dipperu National Park, located approximately 50 km east of the Survey area. There is no direct habitat connectivity between the Project area and Dipperu National Park, and as such, the Project area does not form part of a broader intact corridor linking to formally protected areas. Consequently, connectivity values within the Survey area are primarily important at a local to regional scale, particularly in maintaining linkages between fragmented remnant vegetation patches rather than supporting landscape-scale connectivity to protected areas.

4.4 ENVIRONMENTALLY SENSITIVE AREAS

ESAs are environmental values protected under the EP Act. They are relevant to resource activities controlled by the EP Act (e.g., mining and exploration). There are three categories of ESAs: Category A, B and C. The relevance of each category depends on the type of resource activity being undertaken. The ESAs in each category are defined in Schedule 19 of the EP Regulation. ESAs can include, but are not limited to, National Parks, World Heritage Areas, RAMSAR wetlands, and endangered and of concern REs (Biodiversity status).

Table 20 lists the ESAs and their relevance to the Project (i.e., whether they are mapped within the Survey area or Area of interest). Where an ESA is greyed out in Table 20 this means it is not applicable to the Project. The only applicable ESA was Category B ESA endangered (Biodiversity status) REs (remnant and regrowth). None of the other ESAs occurred within the Survey area or Area of interest, and as such were considered irrelevant to the Project due to distance from the Survey area.

Table 20
ESAs within the Survey
area

Category	ESA	Relevance
A	Protected areas under the <i>NC Act</i>	Not applicable The closest Conservation Park is Dipperu National Park (Scientific) approximately 50 km east of the Survey area.
	A National Park	
	A National Park (Aboriginal land)	
	A National Park (Torres Strait Islander land)	
	A National Park (Cape York Peninsula Aboriginal land)	
	A Conservation Park	Not applicable There are no Conservation Parks within the Area of interest.
	A Special Wildlife Reserve	Not applicable There are no Special Wildlife Reserves within the Area of interest.



Category	ESA	Relevance
	A Forest Reserve	Not applicable There are no forest reserves within the Area of interest.
	The wet tropics area under the Wet Tropics World Heritage Protection and Management Act 1993;	Not applicable The wet tropics area is 500km north of the Survey area.
	The Great Barrier Reef Region under the Great Barrier Reef Marine Park Act 1975 (Cth);	Not applicable The Isaac River joins the Fitzroy River, which discharges into the Great Barrier Reef, approximately 500 km downstream from the Survey area.
	A marine park under the Marine Parks Act 2004, other than a part of the park that is a general use zone under that Act.	Not applicable The Survey area is >130 km from the coast where marine parks are present
B	Any of the following areas under the NC Act – (i) a coordinated conservation area; (ii) an area of critical habitat or major interest identified under a conservation plan; (iii) an area subject to an interim conservation order;	Not applicable None of these areas are mapped within the Area of interest.
	An area subject to the following conventions to which Australia is a signatory – (i) the 'Convention on the Conservation of Migratory Species of Wild Animals' (Bonn, 23 June 1979); (ii) the 'Convention on Wetlands of International Importance, especially as Waterfowl Habitat' (Ramsar, Iran, 2 February 1971); (iii) the 'Convention Concerning the Protection of the World Cultural and Natural Heritage' (Paris, 23 November 1972);	Not applicable None of these areas are mapped within the Area of interest.
	A zone of a marine park under the Marine Parks Act 2004 that is within a general use zone of the marine park under that Act;	Not applicable The Survey area is >130 km from the coast where marine parks are present.
	An area to the seaward side of the highest astronomical tide;	Not applicable The Survey area is not on the seaward side of the highest astronomical tide.
	The following under the Queensland Heritage Act 1992 – (i) a place of cultural heritage significance; (ii) a Queensland heritage place, unless there is an exemption certificate issued under that Act;	Not applicable None of these areas are mapped within the Area of interest.
	An area recorded in the Aboriginal Cultural Heritage Register established under the Aboriginal Cultural Heritage Act 2003, section 46, other than the area known as the 'Stanbroke Pastoral Development Holding', leased under the Land Act 1994 by lease number PH 13/5398;	Not applicable None of these areas are mapped within the Area of interest.
	A feature protection area, State forest park or scientific area under the Forestry Act 1959;	Not applicable None of these areas are mapped within the Area of interest.
	A declared fish habitat area under the Fisheries Act	Not applicable No declared fish habitat areas are present within the Area of interest
	A place in which a marine plant under the Fisheries Act is situated;	Not applicable No marine plants would occur within the Area of interest due to the distance from the coast (>130 km).



Category	ESA	Relevance
B	An endangered RE identified in the database known as the 'RE description database' published on the department's website.	Applicable Endangered REs are mapped as occurring within the Survey area
C	Nature Refuges and Resource Reserves	Not applicable There are no Nature Refuges within the Area of interest.
	Declared Catchment Areas, Declared Irrigation and Irrigation Project Areas, and Water Reservoirs and Drainage Areas	Not applicable There are no catchment or drainage areas within the Area of interest.
	River Improvement Areas	Not applicable There are no river improvement areas in the Area of interest
	Designated Landscape Area (e.g. Stanbroke Pastoral Holding)	Not applicable There are no Designated Landscape Areas in the Area of interest.
	Historic Mining Sites	Not applicable There are no historic mining sites in the Area of interest.
	State Forest or Timber Reserves	Not applicable There are no state forests within the Area of interest.
	DPI Research Sites	Not applicable There are no DPI Research Sites within the Area of interest.
	Critical Areas and Public Purpose Reserves	Not applicable There are no Critical Areas and Public Purpose Reserves within the Area of interest.
	Areas under Coastal Management Plans and Control Districts	Not applicable There are no Areas under Coastal Management Plans and Control Districts within the Area of interest.
	An area subject to a State Planning Policy that the policy declares is in need of environmental protection.	Not applicable There are no areas subject to a State Planning Policy that the policy declares is in need of environmental protection within the Area of interest.
	Erosion Prone Areas and Coastal Management Control Districts	Not applicable There are no Erosion Prone Areas and Coastal Management Control Districts within the Area of interest.
	Areas of land occupied by the Bureau of Sugar Experiment Stations to conduct research	Not applicable There are no areas of land occupied by the Bureau of Sugar Experiment Stations to conduct research within the Area of interest.

Notes – Greyed out ESAs were considered irrelevant to the Project due to distance from the Survey area.

4.5 STRATEGIC ENVIRONMENTAL AREAS

SEAs are protected under the RPI Act and are recognised as an MSES under the EO Act. SEAs are mapped areas intended to protect regionally significant environmental values from impacts of resource activities. No SEAs were mapped as occurring within the Survey area.



4.6 BIOSECURITY ZONES

A review of the Department of Agriculture and Fisheries (DAF) biosecurity zones identified the following within the Area of interest:

- **Cattle tick infested zone** - This zone regulates livestock movement into cattle tick free areas.
- **Sugarcane biosecurity zone 3** - This zone regulates the movement of Sugarcane plant material between zones and requires Sugarcane machinery to be cleaned and inspected if being moved between zones.
- **State Grape Phylloxera zone** - This zone regulates movement from Grape Phylloxera risk zones into exclusion zones.

As of July 2025, the Fire Ant Biosecurity Zone was expanded into localities within the Area of interest, including Moranbah and Coppabella. The closest Fire Ant Biosecurity Zone 1 is approximately 6 km northeast of the Survey area. Zone 1 indicates scheduled treatment for fire ant detections as well as restrictions in movement of earth material outside of the designated zone.



5. FIELD ASSESSMENT RESULTS

5.1 ECOLOGICAL CONTEXT

5.1.1 Field-verified Regulated Vegetation

Regulated vegetation and REs under the VM Act were verified within the Survey area during the field ecological surveys. The field-verified REs within the Survey area are shown in Map Series 9, Appendix A. These REs have been certified by the Queensland Herbarium, through the MAR.

Table 21 lists the field-verified REs that were identified within the Survey area during the field ecological surveys. The total Survey area is 5,227.55 ha in size. This is made up of 2,578.06 ha of Category B (Remnant) vegetation and 2,649.49 ha of Category X (Non-remnant) vegetation. This represents 49.32 % remnant, and 50.68 % non-remnant vegetation within the Survey area.

The REs verified consist of least concern, of concern and endangered REs under the VM Act. Some of these REs are recognised as MSES under the EO Act, where they are endangered and of concern (VM Act Class). Field-verified MSES Prescribed REs that are endangered and of concern are described in *Section 5.9 Matters of State Environmental Significance*. REs that are MSES prescribed REs in the Survey area include RE11.3.1, 11.3.2, 11.3.3, 11.4.8, 11.4.9 and 11.8.13. Note, RE11.3.21 and 11.8.11 are not considered MSES prescribed REs despite their of concern status as they are grassland ecosystems listed in Schedule 5 of the *Vegetation Management Regulation 2012* (Qld) which are excluded from being prescribed REs.

Some of these REs also represent ESAs, where they are the Category B regulated vegetation category, and have an endangered Biodiversity status. REs that represent ESAs within the Survey area include 11.3.1, 11.3.21, 11.4.8, 11.4.9 and 11.8.13.

Table 21 Field-verified REs within the Survey area	Regulated Vegetation Category ¹		Description	VM Act Class ²	Biodiversity Status ³
	RE				
	11.3.1	B	<i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open forest on alluvial plains	EN	EN
	11.3.2	B	<i>Eucalyptus populnea</i> woodland on alluvial plains	OC	OC
	11.3.3	B	<i>Eucalyptus coolabah</i> woodland on alluvial plains	OC	OC
	11.3.4	B	<i>Eucalyptus tereticornis</i> and/or <i>Eucalyptus</i> spp. woodland on alluvial plains	OC	OC
	11.3.7	B	<i>Corymbia</i> spp. open woodland on alluvial plains	LC	OC
	11.3.21	B	<i>Dichanthium sericeum</i> and/or <i>Astreblla</i> spp. grassland on alluvial plains. Cracking clay soils	OC	EN
	11.3.25	B	<i>Eucalyptus tereticornis</i> or <i>Eucalyptus camaldulensis</i> woodland fringing drainage lines	LC	OC
	11.3.27b	B	Freshwater wetlands	LC	OC
	11.4.8	B	<i>Eucalyptus cambageana</i> woodland to open forest with <i>Acacia harpophylla</i> or <i>Acacia argyrodendron</i> on Cainozoic clay plains	EN	EN
	11.4.9	B	<i>Acacia harpophylla</i> shrubby woodland with <i>Terminalia oblongata</i> on Cainozoic clay plains	EN	EN
	11.4.13	B	<i>Eucalyptus orgadophila</i> open woodland on Cainozoic clay plains	LC	OC



RE	Regulated Vegetation Category ¹	Description	VM Act Class ²	Biodiversity Status ³
11.5.3	B	<i>Eucalyptus populnea</i> +/- <i>Eucalyptus melanophloia</i> +/- <i>Corymbia clarksoniana</i> woodland on Cainozoic sand plains and/or remnant surfaces	LC	NC
11.5.3b	B	<i>Eucalyptus populnea</i> woodland on closed depressions. Occurs on closed depressions in sandplains.	LC	NC
11.5.9	B	<i>Eucalyptus crebra</i> and other <i>Eucalyptus</i> spp. and <i>Corymbia</i> spp. woodland on Cainozoic sand plains and/or remnant surfaces	LC	NC
11.5.9b	B	<i>Eucalyptus crebra</i> , <i>Eucalyptus tenuipes</i> , <i>Lysicarpus angustifolius</i> +/- <i>Corymbia</i> spp. woodland. Occurs on Cainozoic sandplains formed on plateaus and broad crests of hills and ranges. Soils are generally deep red earths.	LC	NC
11.5.12	B	<i>Corymbia clarksoniana</i> woodland and other <i>Corymbia</i> spp. and <i>Eucalyptus</i> spp. on Cainozoic sand plains and/or remnant surfaces	LC	NC
11.8.5	B	<i>Eucalyptus orgadophila</i> open woodland on Cainozoic igneous rocks	LC	NC
11.8.11	B	<i>Dichanthium sericeum</i> grassland on Cainozoic igneous rocks	OC	OC
11.8.13	B	Semi-evergreen vine thicket and microphyll vine forest on Cainozoic igneous rocks	EN	EN
Non-remnant	X	-	-	-

¹ Regulated vegetation category: Category B (Remnant vegetation), Category C (High-value regrowth) Category R (Reef regrowth watercourse vegetation) or Category X (Non-remnant).

² VM Act Class: EN = Endangered, OC = Of Concern, LC = Least Concern.

³ VM Act Biodiversity Status: EN = Endangered, OC = Of Concern, LC = Least Concern, NC = No concern at present.

5.1.2 Field-verified Vegetation Communities

The Project, situated within a historically grazed and partially cleared landscape, supports a complex mosaic of remnant vegetation and cleared pasturelands. These patterns reflect past and ongoing land use associated with cattle grazing, which has influenced the structure, floristics, and condition of vegetation across the Survey area.

Map 10 in Appendix A shows the vegetation communities verified as occurring within the Survey area during the field ecological assessments. The majority of extant native vegetation across the Survey area comprises Eucalypt open forests and woodlands on a range of landforms including Cainozoic sandplains, alluvial flats, and basalt-derived substrates. Riparian and fringing communities occur along Isaac River, Cherwell Creek, Conrock Gully, and their tributaries, and clay-soil Brigalow forests and woodlands occur in patches.

The most degraded vegetation communities were clay-soil Brigalow forests and woodlands. These patches were often less than 100 m wide and subject to intense edge effects from adjoining *Cenchrus ciliaris* (Buffel Grass)* dominant pastures, inappropriate fire regimes, weed encroachment, and grazing impacts, including evidence of stock camping under denser canopy remnants and using the seasonal water holes.

Ephemeral wetland communities were also verified within the Survey area, with a particular association with the alluvial plains and flood-prone features adjacent to the Isaac River. These likely fill during flood events. These wetlands are seasonal, retaining water only for short periods following rainfall. All are subject to grazing impacts with observed signs of pugging, trampling, and weed incursion.

Although ground layers across much of the Survey area have been modified by introduced pastures, especially *Cenchrus ciliaris**, many areas retain structurally intact canopy communities that continue to provide ecological function, particularly along riparian corridors and in remnant woodland patches.

The dominant Broad Vegetation Groups (BVGs) verified within the Survey area included:

- BVG 7 – Semi-evergreen to deciduous microphyll vine thicket.
- BVG 9 – Moist to dry eucalypt open forests to woodlands, usually on coastal lowlands and ranges.



- BVG 11 – Moist to dry eucalypt open forests to woodlands, mainly on basalt areas.
- BVG 16 – *Eucalyptus*-dominated open forests and woodlands along drainage lines and alluvial plains.
- BVG 17 – *Eucalyptus populnea*, *Eucalyptus melanophloia* (Silver-leaved Ironbark), or *Eucalyptus whitei* (White's Ironbark) dry woodlands to open woodlands on sandplains and depositional plains.
- BVG 18 - Dry eucalypt woodlands to open woodlands primarily on sandplains or depositional plains.
- BVG 25 – *Acacia harpophylla*, sometimes with *Casuarina cristata* open forests to woodlands on heavy clay soils.
- BVG 30 – *Astrebla* spp. and *Dichanthium* spp. tussock grasslands.
- BVG 34 – Wetlands associated with permanent and ephemeral lakes, swamps, claypans; includes fringing woodland and shrubland vegetation

These BVGs were used to group vegetation communities with similar structural and floristic characteristics within the Survey area. The verified vegetation communities within the Survey area are described in Table 22. Table 22 also provides details on the corresponding REs, whether the vegetation community provides suitable habitat for conservation significant species, and whether the vegetation community had the ability to conform to a listed TEC.

The vegetation communities verified within the Survey area (Map 10) included:

- **Semi-evergreen to deciduous microphyll vine thicket.**
- **Eucalypt woodlands on lowlands and ranges** (Moist to dry eucalypt open forests to woodlands, usually on coastal lowlands and ranges).
- **Eucalypt woodlands on basalt plains** (Moist to dry eucalypt open forests to woodlands, mainly on basalt areas).
- **Wet eucalypt woodlands on alluvial plains and drainage lines** (*Eucalyptus*-dominated open forests and woodlands along drainage lines and alluvial plains).
- **Dry to moist woodlands on sandy plains** (Dry woodlands to open woodlands on sandplains and depositional plains).
- **Brigalow woodlands** (*Acacia harpophylla*, sometimes with *Casuarina cristata* open forests to woodlands on heavy clay soils).
- **Native Tussock Grasslands** (*Astrebla* spp. (Mitchell Grass) and *Dichanthium* spp. (Bluegrass) tussock grasslands).
- **Ephemeral wetlands** (Wetlands associated with permanent and ephemeral lakes, swamps, claypans; includes fringing woodland and shrubland vegetation).
- **Cleared areas/ exotic grasslands.**



Table 22
Field-verified
vegetation
communities

Vegetation Community	Type	Description
Semi-evergreen to deciduous microphyll vine thicket	Description of vegetation communities	The Semi-evergreen to deciduous microphyll vine thicket vegetation community occurred as a small open woodland dominated by <i>Acacia harpophylla</i> (T1, 10 m, 8–12 m height range, 5% cover). A secondary canopy layer (T2) to 8 m included <i>Flindersia dissosperma</i> (Scrub Leopardwood), <i>Eremophila mitchellii</i> (False Sandalwood), <i>Lysiphyllum hookeri</i> (White Bauhinia), <i>Owenia acidula</i> (Emu Apple), and <i>Atalaya hemiglauca</i> (Whitewood), with a midstorey (S1, 3 m, 10% cover) of <i>Flindersia dissosperma</i>, <i>Eremophila mitchellii</i>, <i>Cassia brewsteri</i> (Brewster's Cassia), <i>Acacia salicina</i> (Cooba), and <i>Geijera parviflora</i> (Wilga). The ground layer was largely absent (65 % bare ground), with weed encroachment occurring near the patch edges. The structure and floristics were consistent with semi-evergreen vine thicket mature regrowth on Cainozoic igneous substrates.
	Corresponding REs	RE 11.8.13 (BVG 7a)
	Area in Survey area (% coverage)	13.18 ha (0.25 %)
	Threatened flora suitable habitat	None
	Threatened fauna suitable habitat	None
	Migratory or Conservation Significant Species	Fork-tailed Swift, Short-beaked Echidna (<i>Tachyglossus aculeatus</i>)
	Potential to conform to a TEC	Semi-evergreen Vine Thicket
Eucalypt woodlands on lowlands and ranges (Moist to dry eucalypt open forests to woodlands, usually on coastal lowlands and ranges)	Description of vegetation communities	The Eucalypt woodlands on lowlands and ranges vegetation community occurred on quaternary alluvial and sandy plains, with an open canopy (T1, 20–28 m, 17% cover) dominated by <i>Corymbia tessellaris</i>, <i>Corymbia dallachiana</i> (Dallachy's Gum), and <i>Corymbia Clarksoniana</i>. A well-defined subcanopy (T2, 13–17 m, 15% cover) was present, which included <i>Eucalyptus populnea</i> and <i>Corymbia tessellaris</i>. The understorey was sparse, comprising <i>Acacia salicina</i> in the lower tree (T3) and shrub (S1, 6 m, 10% cover) layers, with the occasional <i>Lysiphyllum hookeri</i>. The ground layer was moderately disturbed (65% cover), dominated by exotic species including <i>Cenchrus ciliaris</i>*, <i>Ricinus communis</i> (Castor Bean)*, <i>Bidens pilosa</i> (Cobbler's Pegs)*, <i>Sida cordifolia</i> (Flannel Weed)*, <i>Megathyrsus maximus</i>*(Guinea Grass). Evidence of grazing and pasture modification was apparent throughout this vegetation community.
	Corresponding REs	11.3.7, 11.5.12 (BVG 9e)
	Area in Survey area (% coverage)	77.83 ha (1.49 %)
	Threatened flora suitable habitat	None
	Threatened fauna suitable habitat	Koala, Greater Glider, Squatter Pigeon
	Migratory or Conservation Significant Species	Fork-tailed Swift, Short-beaked Echidna
	Potential to conform to a TEC	None
Eucalypt woodlands on basalt plains (Moist to dry eucalypt open forests to woodlands, mainly on basalt areas)	Description of vegetation communities	The Eucalypt woodlands on basalt plains vegetation community occurred across both Cainozoic clay plains and igneous rises, with an open canopy (T1, 10–18 m, 5–15% cover) dominated by <i>Eucalyptus orgadophila</i> and occasionally <i>Acacia harpophylla</i>. A sparse subcanopy (T2, 3–12 m, 5–15%) included <i>Acacia salicina</i> and regrowth <i>Eucalyptus orgadophila</i>, with some transects recording <i>Cassia brewsteri</i>, <i>Pandorea pandorana</i> (Wonga Wonga Vine), and <i>Terminalia oblongata</i>. The shrub layer (S1, 2–3 m, 5–20%) was composed of <i>Cassia brewsteri</i>, <i>Geijera parviflora</i>, <i>Carissa ovata</i> (Currant Bush), and <i>Lysiphyllum hookeri</i>. The ground layer was moderately to densely covered (55–90%), dominated by a mix of native and exotic grasses including <i>Panicum queenslandicum</i>, <i>Heteropogon contortus</i> (Black-spear Grass), <i>Themeda triandra</i> (Kangaroo Grass), <i>Dichanthium sericeum</i>, and exotics such as <i>Cenchrus ciliaris</i>, <i>Melinis repens</i> (Red Natal)*, and <i>Sida hackettiana</i> (Spiked Sida)*. Evidence of historic clearing and ongoing grazing pressure was apparent, with some sites containing dead canopy individuals (from dieback) and high weed presence.
	Corresponding REs	11.4.13, 11.8.5 (BVG 11a)
	Area in Survey area (% coverage)	201.04 ha (3.85 %)
	Threatened flora suitable habitat	None
	Threatened fauna suitable habitat	Koala, Greater Glider, Squatter Pigeon
	Migratory or Conservation Significant Species	Fork-tailed Swift and Short-beaked Echidna
	Potential to conform to a TEC	None

Plate





Vegetation Community	Type	Description	Plate
Wet eucalypt woodlands on alluvial plains and drainage lines (<i>Eucalyptus</i> -dominated open forests and woodlands along drainage lines and alluvial plains)	Description of vegetation communities	The Wet eucalypt woodlands on alluvial plains and drainage lines vegetation community occurred mainly on alluvial plains or levees with clay or sometimes textured contrast soils. Canopy composition varied between sites, with <i>Eucalyptus tereticornis</i> (28–36 m, 20% cover) or <i>Eucalyptus coolabah</i> (16–24 m, 25% cover) dominating, often with <i>Corymbia clarksoniana</i> in mixed stands. The sub-canopy (10–18 m) included <i>Eucalyptus tereticornis</i> , <i>Eucalyptus coolabah</i> , <i>Allocasuarina cunninghamii</i> (River Oak) and <i>Corymbia clarksoniana</i> , with cover ranging from 15–40%. The mid strata supported <i>Acacia harpophylla</i> , <i>Lysiphyllum carronii</i> (Ebony Tree), <i>Owenia acidula</i> , <i>Psyrax odorata</i> (Shiny-leaved Canthium) and <i>Carissa ovata</i> , with sparse cover (≤5%). The ground layer was grassy and well-developed, ranging from 65–75% cover, dominated by <i>Panicum queenslandicum</i> , <i>Heteropogon contortus</i> and <i>Cenchrus ciliaris</i> * with occasional <i>Sida hackettiana</i> , <i>Themeda triandra</i> and forbs.	
	Corresponding REs	11.3.25 (BVG 16a), 11.3.3 (BVG 16c), 11.3.4 (BVG 16c)	
	Area in Survey area (% coverage)	469.15 ha (8.98 %)	
	Threatened flora suitable habitat	None	
	Threatened fauna suitable habitat	Koala, Greater Glider, Squatter Pigeon and Ornamental Snake (11.3.3 only)	
	Migratory or Conservation Significant Species	Fork-tailed Swift and Short-beaked Echidna	
Dry to moist woodlands on sandy plains (Dry woodlands to open woodlands on sandplains and depositional plains)	Description of vegetation communities	The Dry to moist woodlands on sandy plains vegetation community occurred on flat to gently undulating sandplains, closed depressions and alluvial plains on Cainozoic sediments, with deep texture-contrast soils, sandy surface horizons and deep red earths. The canopy was dominated by <i>Eucalyptus populnea</i> (11–16 m, 5–20% cover), occasionally with <i>Eucalyptus melanophloia</i> , <i>Corymbia clarksoniana</i> , <i>Corymbia dallachiana</i> , <i>Eucalyptus cambageana</i> , <i>Eucalyptus brownii</i> (Brown's Box) or <i>Eucalyptus crebra</i> . The sub-canopy (4–12 m, 2–15% cover) included <i>Eucalyptus populnea</i> , <i>Corymbia clarksoniana</i> , <i>Eremophila mitchellii</i> , <i>Geijera parviflora</i> , <i>Cassia brewsteri</i> , <i>Allocasuarina luehmannii</i> (Buloke) and <i>Ventilago viminalis</i> (Supplejack). Mid-shrubs to 4 m (≤5% cover) contained <i>Carissa ovata</i> , <i>Erythroxylum australe</i> (Cocaine Tree) and <i>Capparis lasiantha</i> (Nepine). The low shrub layer (3–4 m, 5–15% cover) featured <i>Grewia savannicola</i> (Dysentry Bush), <i>Grewia latifolia</i> (Dog's Balls), <i>Lysiphyllum hookerii</i> and <i>Geijera parviflora</i> . The ground layer was grassy and well-developed (65% cover), dominated by <i>Chloris</i> spp.*, <i>Enteropogon</i> spp., and <i>Aristida</i> spp., with scattered forbs.	
	Corresponding REs	11.3.2 (BVG 17a), 11.5.3 (BVG 17a), 11.5.3b (BVG 17a), 11.5.9b (BVG 18a)	
	Area in Survey area (% coverage)	1,458.74 ha (27.91 %)	
	Threatened flora suitable habitat	None	
	Threatened fauna suitable habitat	Koala, Greater Glider and Squatter Pigeon	
	Migratory or Conservation Significant Species	Fork-tailed Swift and Short-beaked Echidna	
Brigalow woodlands (<i>Acacia harpophylla</i> , sometimes with <i>Casuarina cristata</i> open forests to woodlands on heavy clay soils)	Description of vegetation communities	The Brigalow woodlands vegetation community was made up of scattered isolated patches throughout the Survey area. This community was dominated by a canopy of <i>Acacia harpophylla</i> ranging from 10-18m and 30-80% cover with a shrubby midstorey containing vine forest species including <i>Santalum lanceolatum</i> (Desert Quandong), <i>Eremophila mitchellii</i> , <i>Erythroxylum australe</i> , <i>Carissa ovata</i> and <i>Lysiphyllum hookerii</i> . The groundcover consisted of a mix of native and exotic species including <i>Acacia salicina</i> , <i>Bothriochloa bladhii</i> (Forest Bluegrass), <i>Chloris divaricata</i> (Slender Chloris), <i>Chloris gracilis</i> , <i>Cymbopogon refractus</i> (Barbed-wire Grass), <i>Dactyloctenium radulans</i> (Button Grass), <i>Digitaria brownii</i> (Cotton Grass), <i>Enchylaena tomentosa</i> (Ruby Saltbush), <i>Enneapogon lindleyanus</i> (Conetop Nineawn), <i>Panicum queenslandicum</i> , <i>Parsonsia lanceolata</i> (Rough Silkpod), <i>Cenchrus ciliaris</i> *, <i>Harrisia martinii</i> * (Harrisia cactus), <i>Melinis repens</i> *, <i>Sida cordifolia</i> * and <i>Urochloa mosambicensis</i> * (Sabi Grass).	
	Corresponding REs	11.3.1, 11.4.8, 11.4.9, (BVG 25a)	
	Area in Survey area (% coverage)	139.48 ha (2.67 %)	
	Threatened flora suitable habitat	None	
	Threatened fauna suitable habitat	Squatter Pigeon may occur where predominantly native groundcover is present. Ornamental Snake was considered unlikely to occur due to the lack of suitable contiguous habitat. All Brigalow polygons were isolated and restricted in size within the Survey area.	
	Migratory or Conservation Significant Species	Fork-tailed Swift and Short-beaked Echidna	
	Potential to conform to a TEC	Brigalow TEC	



Vegetation Community	Type	Description	Plate
Native Tussock Grasslands <i>(Astrebla</i> spp. [Mitchell Grass] and <i>Dichanthium</i> spp. [Bluegrass] tussock grasslands)	Description of vegetation communities	The Native Tussock Grasslands vegetation community was dominated by native perennial grass species including <i>Dichanthium sericeum</i> , <i>Aristida leptopoda</i> (White Speargrass), <i>Aristida latifolia</i> (Feathertop Wiregrass), <i>Themeda triandra</i> , <i>Heteropogon contortus</i> , <i>Bothriochloa bladhii</i> , <i>Neptunia gracilis</i> (Low Sensitive Plant), <i>Thellungia advena</i> (Coolibah Grass) and <i>Hibiscus sturtii</i> (Hill Hibiscus). There was a distinct lack of a tree or shrub canopy layer. No evidence of clearing in historical imagery since 1957 (earliest available imagery). 25-30% weed cover present including <i>Bothriochloa pertusa</i> * (Indian Bluegrass), <i>Melinis repens</i> * and <i>Parthenium hysterophorus</i> * (Parthenium Weed).	
	Corresponding REs	RE11.3.21 (BVG 30a), 11.8.11 (BVG 30b)	
	Area in Survey area (% coverage)	200.89 (3.84 %)	
	Threatened flora suitable habitat	Alluvial native grassland would provide suitable habitat for <i>Dichanthium queenslandicum</i> and <i>Dichanthium setosum</i> .	
	Threatened fauna suitable habitat	Due to a lack of tree canopy cover, the native grasslands would not be suitable for most threatened fauna other than: • Squatter Pigeon may utilise the native grasslands for breeding, foraging or dispersal. • Aerial species such as the Fork-tailed Swift may utilise the native grasslands for foraging.	
	Migratory or Conservation Significant Species	Fork-tailed Swift, Short-beaked Echidna	
Ephemeral wetlands (Wetlands associated with permanent and ephemeral lakes, swamps, claypans; includes fringing woodland and shrubland vegetation)	Description of vegetation communities	The Ephemeral wetlands vegetation community occurred around permanent and ephemeral lakes, swamps and claypans, typically as fringing woodlands on billabongs with palustrine vegetation. The canopy is dominated by <i>Eucalyptus tereticornis</i> (28–35 m, 15% cover), with a sub-canopy of <i>Eucalyptus tereticornis</i> and <i>Corymbia tessellaris</i> , <i>Eucalyptus coolabah</i> and <i>Eucalyptus populnea</i> (20–28 m, 10% cover). A sparse low shrub layer (2 m, 15% cover) contains <i>Acacia salicina</i> . The ground layer was grassy and well-developed (75% cover), with aquatic and semi-aquatic species often present nearby, including <i>Potamogeton</i> spp., <i>Myriophyllum verrucosum</i> (Red Water-milfoil), <i>Nymphaea violacea</i> (Blue Lily), <i>Nymphoides indica</i> (Water Snowflake), <i>Cyperus difformis</i> (Variable Flatsedge) and <i>Vallisneria caulescens</i> (Branching Val).	
	Corresponding REs	11.3.27b (BVG 34d)	
	Area in Survey area (% coverage)	17.63 ha (0.34 %)	
	Threatened flora suitable habitat	None	
	Threatened fauna suitable habitat	Koala, Greater Glider and Squatter Pigeon. There is potential that the Ornamental Snake will use the vegetation community for foraging where it adjoins preferred habitat areas.	
	Migratory or Conservation Significant Species	Fork-tailed Swift, Short-beaked Echidna	
Cleared areas/exotic grasslands	Description of vegetation communities	Cleared areas/ exotic grasslands were present in non-remnant areas, and near farm infrastructure (tanks and water troughs). The community was characterised by a high density of weeds including <i>Melinis repens</i> *, <i>Bothriochloa pertusa</i> *, <i>Cenchrus ciliaris</i> * and <i>Megathyrsus maximus</i> *. This vegetation community generally lacked a tree and shrub layer.	
	Corresponding REs	None	
	Area in Survey area (% coverage)	2,648.93 ha (50.68 %)	
	Threatened flora suitable habitat	Limited potential to provide suitable habitat for threatened flora species due to lack of canopy structure and cattle disturbance.	
	Threatened fauna suitable habitat	Limited potential to provide suitable habitat for threatened fauna species due to lack of canopy structure and cattle disturbance. Where native grasses occur near remnant or regrowth woodland, these could provide foraging or dispersal habitat for the Squatter Pigeon. Some aerial species such as the Fork-tailed Swift may utilise the exotic grasslands for foraging.	
	Migratory or Conservation Significant Species	Some aerial species such as the Fork-tailed Swift may utilise the exotic grasslands for foraging.	
Cleared areas/exotic grasslands	Potential to conform to a TEC	None	



5.1.3 Field-verified Threatened Ecological Communities

5.1.3.1 Overview of TECs verified within the Survey Area

TEC Assessments within all patches of vegetation that had the potential to conform to a TEC were undertaken during the field ecological assessments (refer to survey effort in Table 9). This included verifying whether each patch met the TEC definition or key diagnostic criteria and condition thresholds (where available) contained in approved conservation or listing advices for these TECs.

The results of each TEC Assessment are provided Appendix I. Details of how each TEC was verified (e.g., against the definition or key diagnostic criteria and condition thresholds) is provided in *Section 5.1.3.2 Results of each TEC Assessment*.

Table 23 outlines the TECs confirmed present within the Survey area during field surveys. All four TECs identified in the Likelihood of Occurrence assessment were confirmed present within the Survey area. The TECs that were confirmed included:

- Brigalow (*Acacia harpophylla* dominant and co-dominant) TEC (listed endangered under the EPBC Act).
- Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin TEC (listed endangered under the EPBC Act).
- Poplar Box Grassy Woodland on Alluvial Plains TEC (listed endangered under the EPBC Act).
- Semi-evergreen Vine Thicket in the Brigalow Belt South and Nandewar Bioregions TEC (listed endangered under the EPBC Act).

Where a patch met the definition or criteria and condition thresholds for these TECs they have been mapped within Map 11 (Appendix A). The following

Table 23
Listed TECs
confirmed present
within the Survey
area

Threatened Ecological Community	Quality Rating within the Survey Area	Analogous REs	EPBC Status ¹
Brigalow (<i>A. harpophylla</i> dominant and co-dominant) TEC	N/A	11.3.1, 11.4.8, 11.4.9	EN
Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin TEC	Best Quality	11.3.21, 11.8.11	EN
Poplar Box Grassy Woodland on Alluvial Plains TEC	Category C	11.3.2	EN
Semi-evergreen Vine Thicket in the Brigalow Belt South and Nandewar Bioregions TEC	N/A	11.8.13	EN

¹ EPBC Act Status: CE = Critically endangered, EN = Endangered, VU = Vulnerable.

Notes – where TECs were not confirmed present within the Survey area, these have been greyed out.

5.1.3.2 Results of each TEC Assessment

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

Acacia harpophylla communities in the Survey area were assessed against the key diagnostic characteristics and condition thresholds in the *Approved Conservation Advice for the Brigalow (Acacia harpophylla dominant and co-dominant) TEC* (TSSC, 2013) to determine whether they qualified as the TEC.

According to the Queensland Herbarium, twelve REs in the Brigalow Belt bioregion are potentially representative of the TEC. Within the Survey area, patches of RE 11.3.1, 11.4.8, and 11.4.9 were identified as potentially corresponding to the Brigalow (*Acacia harpophylla* dominant and co-dominant) TEC (herein referred to as the Brigalow TEC).

The TEC assessment for Brigalow TEC focussed on determining whether *Acacia harpophylla* was the dominant or co-dominant canopy species (key diagnostic criteria) and whether each patch met size requirements and weed cover thresholds (condition thresholds) for Brigalow TEC (TSSC, 2013). The results of each TEC assessment for Brigalow TEC are provided Appendix I.

Following Butler (2007), degraded remnant or regrowth patches were excluded from classification as the TEC where:

- They had been comprehensively cleared (not just thinned) within the last 15 years;



- Were smaller than 0.5 ha; and/or
- Contained more than 50 % exotic perennial plant cover within a minimum 0.5 ha sampling area (100 × 50 m).

Across the Survey area, 18 Brigalow TEC assessments were undertaken in patches of RE11.3.1, 11.4.8, and 11.4.9 (survey effort shown in Map 2, Appendix A).

Map 11 (Appendix A) presents the patches of Brigalow that met the key diagnostic criteria and condition thresholds for the TEC within the Survey area. There are no defined Condition Classes for the Brigalow TEC, the patches were either Brigalow TEC or not Brigalow TEC based on the key diagnostic criteria and condition thresholds.

The patches that did not meet the key diagnostic characteristics were where RE11.3.1 formed part of a heterogenous polygon with RE11.3.3. These patches were excluded due to *Acacia harpophylla* being sub-dominated within the canopy.

The Brigalow TEC was assigned a habitat quality score of 6 (Habitat quality scoring provided in Appendix H).

5.1.3.2.2 *Natural Grasslands of the Queensland Central Highlands and Northern Fitzroy Basin TEC*

Natural grassland communities in the Survey area were assessed against the key diagnostic characteristics and condition thresholds in the *Listing Advice for the Natural Grasslands of the Queensland Central Highlands and Northern Fitzroy Basin TEC* (TSSC, 2009) to determine whether they qualified as the Natural Grasslands of the Queensland Central Highlands and Northern Fitzroy Basin TEC (herein referred to as the Natural Grasslands TEC).

The TEC is characterised by a dominant ground layer of native perennial tussock grasses, a sparse to absent shrub layer, and typically no tree canopy.

The Commonwealth Listing Advice for this TEC identifies three key diagnostic criteria

- *Distribution*: It occurs within the Brigalow Belt North and South subregions, which are largely within the Central Highlands and northern Fitzroy River Basin regions of Queensland;
- *Tree canopy absent or sparse (< 10% projective crown cover)*: If it can be demonstrated, beyond reasonable doubt, that the grassland was derived from cleared woodland then it is not part of the national ecological community; and,
- *A dominance of perennial native grasses*, including at least three indicator grass species (indicator grass species listed in the Listing Advice).

In Queensland, the TEC can be defined within the RE framework, with seven REs considered analogous where the key diagnostic criteria and condition thresholds are met. These 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, 2009).

There are two recognised Condition Classes for the Natural Grasslands TEC: Good and Best quality, as described in Table 24. To qualify as the TEC, a patch must meet one of these condition thresholds.

The results of each TEC assessment within the Natural Grasslands TEC are provided Appendix I. A total of five TEC assessments were undertaken within grassland patches potentially representative of the TEC; two within RE 11.8.11 which identified good quality TEC, and three within RE 11.3.21 which identified best quality TEC (Map 11, Appendix A). The grasslands were dominated by *Dichanthium sericeum*, *Dichanthium fecundum* (Curly Bluegrass) *Iseilema membranaceum* (Small Flinders Grass), *Astrelia pectinata* (Barley Mitchell Grass), *Digitaria brownii* and *Eriochloa crebra* (Spring Grass), with minimal invasion by *Cenchrus ciliaris** and *Bothriochloa pertusa**. The soils ranged from alluvial to basalt soils.

While the patches of Natural Grassland TEC occurred within the Survey area, these patches were outside of the Project area and Disturbance area.

Table 24
Condition Classes
for Natural
Grasslands TEC

Condition Criteria	Good Quality	Best Quality
Patch size	At least 1 ha; and	At least 5 ha; and
Grasses	At least 4 native perennial grass species from the list of perennial native grass indicator species; and	At least 3 native perennial grass species from the list of perennial native grass indicator species; and
Tussock Cover	At least 200 native grass tussocks; and	At least 200 native grass tussocks; and



Condition Criteria	Good Quality	Best Quality
Wood shrub¹ cover	Total projected canopy cover of shrubs is less than 30%; and	Total projected canopy cover of shrubs is less than 50%; and
Introduced species	Perennial non-woody introduced species are less than 5% of the total projected perennial plant cover	Perennial non-woody introduced species are less than 30% of the total projected perennial plant cover.

¹ The shrub layer is typically absent. However, where shrubs are present, they are defined as woody plants, more than 0.5 m tall that occupy the mid vegetation layer. The upper, or tree canopy layer, also is typically absent but may comprise scattered trees to less than 10% projective crown cover.

Sampling should be based upon a quadrat size of 0.1 ha (e.g. 50 x 20 m) selected in an area with the most apparent native perennial grass species. Unless exceptional circumstances apply, to maximise the assessment of condition, sites must be assessed during a good season, two months after cessation of disturbance (fire/grazing/mowing/slashing) and within two months of effective rain.

5.1.3.2.3 Poplar Box Grassy Woodland on Alluvial Plains TEC

Eucalyptus populnea communities in the Survey area were assessed against the key diagnostic characteristics and condition thresholds in the *Conservation Advice for the Poplar Box Grassy Woodland on Alluvial Plains TEC* (DoEE, 2019) to determine whether they qualified as the Poplar Box Grassy Woodland on Alluvial Plains TEC (herein referred to as the Poplar Box TEC).

The Poplar Box TEC typically occurs on flat to gently undulating alluvial plains within the Brigalow Belt bioregion and is dominated in the canopy by *Eucalyptus populnea*. The ground layer is well-developed and grassy, with a range of perennial native grasses and forbs, and a sparse to moderate shrub layer (DoEE, 2019).

In the Brigalow Belt bioregion, the TEC is associated with the following REs: 11.3.2, 11.3.17, 11.4.7 and 11.4.12 (Queensland Herbarium, 2019).

The key diagnostic criteria for the Poplar Box TEC consists of location and physical environment features and structure features. The location and physical environment features include:

- Occurs in the Brigalow Belt North, Brigalow Belt South, Southeast Queensland, Cobar Peneplains, Darling Riverine Plains, NSW South Western 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.

The structure features include:

- 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 are capable of reaching 10 m or more in height;
 - *Eucalyptus populnea* must be present in the canopy and is the dominant tree species;
 - Where hybrids of *Eucalyptus populnea* 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 list of diagnostic native plant species and some of the key native fauna that make up the ecological community is given at Appendix A; although particular species may be abundant or rare, or not necessarily present, at every location.

There are four recognised Condition Classes for the Poplar Box TEC: Category A1, A2, B and C, as described in Table 25.

The results of each TEC assessment are provided Appendix I. Twelve patches of RE11.3.2 were assessed against the key diagnostic criteria and condition thresholds to confirm their classification as the TEC. Two of the assessed sites returned the



Category C Condition Class (Map 11, Appendix A. The remaining ten patches did not satisfy the required native cover and diversity diagnostic criteria due to historical clearing and pastoral influence.

The Poplar Box TEC was assigned a habitat quality score of 5 (Habitat quality scoring provided in Appendix H).

Table 25
Condition categories and thresholds for the Poplar Box Grassy Woodland on Alluvial Plains ecological community.

Category and Rationale	Native Cover and Diversity Thresholds	Minimum Patch Size Thresholds*
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 $\geq 10\%$ AND $\geq 90\%$ of perennial vegetation cover in the ground layer** is native AND ≥ 30 native plant species per patch in the ground layer	≥ 1 ha
Category A2. A large patch with low perennial weeds and diverse native understorey	The crown cover of canopy trees in the patch is $\geq 10\%$ AND $\geq 70\%$ 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 $\geq 10\%$ AND $\geq 50\%$ 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 $\geq 30\text{cm}$ diameter at breast height (DBH)*** (and/or hollows)	≥ 5 ha
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 $\geq 10\%$ 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 $\geq 30\text{cm}$ DBH*** (and/or hollows) AND smaller trees+, saplings or seedlings suggestive of periodic recruitment	≥ 5 ha
* 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 refers to the tree diameter measured at 1.3 m above the ground.		
+ Trees – Refers to <i>Eucalyptus populnea</i> (Poplar Box) and/or hybrids of Poplar Box with other <i>Eucalyptus</i> species (for instance Coolibah).		

5.1.3.2.4 Semi-evergreen Vine Thickets of the Brigalow Belt (North and South) and Nandewar Bioregions TEC

Vine thicket communities in the Survey area were assessed against the definition of the TEC within the Approved Conservation Advice for the Semi-evergreen Vine Thickets of the Brigalow Belt (North and South) and Nandewar Bioregions TEC (DCCEEW, 2023a) to determine whether they qualified as the Thickets of the Brigalow Belt (North and South) and Nandewar Bioregions TEC (herein referred to as the Semi-evergreen Vine Thicket TEC).

The TEC represents a dry seasonal subtropical rainforest community that occurs on fertile basaltic and fine-grained sedimentary soils. The vegetation is typically characterised by microphyllous foliage, an uneven canopy 4–9 m high with emergent *Brachychiton australis* (Broad Leaved Bottle Tree) and *Brachychiton rupestris* (Narrow-leaved Bottle Tree), and a dense mid-storey of vines and twining species.



This community aligns with several REs, including RE 11.3.11, 11.4.1, 11.8.13, 11.11.18, 11.2.3, 11.9.4. While no formal key diagnostic criteria or condition thresholds have been published for this TEC (hence no TEC results provided in Appendix I for Semi-evergreen Vine-thickets TEC), the confirmation of the TEC relies on assessing the floristic composition, canopy structure, and overall integrity against the definition for the TEC provided in the Approved Conservation Advice (DCCEEW, 2023a).

Two patches of RE 11.8.13 were confirmed within the Survey area. These patches lacked an ecologically dominant layer (EDL) typical of the TEC's definition, however, exhibited characteristic vine thicket structure and floristics, including dense understorey composition, and marginal exotic cover. Therefore, the patches were considered representative of the TEC (shown in Map 11, Appendix A. While the patches occurred within the Survey area, both patches were outside of the Project area and Disturbance area.

5.2 FLORA

5.2.1 Flora Species Records and Habitat Verification

Both native and introduced flora species were recorded during the field ecological surveys. A full list of the flora species recorded in the Survey area is provided in Appendix E.

The Survey area has been subject to historical disturbance, primarily through cattle grazing and associated land management practices. Large areas have been cleared for pasture and are now dominated by exotic grasses, particularly *Cenchrus ciliaris**. Despite these modifications, the Survey area retains a mosaic of remnant and regrowth vegetation, particularly along the major watercourses within the Survey area: Isaac River and Cherwell Creek, which provides habitat values for flora and fauna species.

There were a total of 170 flora species from 48 families, consisting of 134 native species, and 36 introduced species recorded within the Survey area (Appendix E). All native flora species were least concern species under the NC Act or not listed under the EPBC Act. No Commonwealth- and State-listed threatened flora species were recorded within the Survey area.

Habitat values for flora species within the Survey area consists of:

- Native tussock grassland communities providing structure, ground cover, and species diversity;
- Cracking clay soils and gilgai microrelief supporting moisture retention and niche floral assemblages;
- Patches of open woodland and scattered trees contributing to shading, leaf litter accumulation, and microhabitats;
- Riparian and ephemeral drainage features supplying moisture availability and seasonally variable floral niches; and
- Areas of intact native groundcover that support recruitment, regeneration, and floristic diversity.

5.2.2 Conservation Significant Flora Species Records and Habitat Verification

Habitat for threatened flora species was verified within the Survey area for the *Dichanthium queenslandicum* and *Dichanthium setosum*. *Dichanthium queenslandicum* is listed as endangered under the EPBC Act and vulnerable under the NC Act, while *Dichanthium setosum* is listed as vulnerable under the EPBC Act but least concern under the NC Act.

Habitat for these species was verified within native grassland areas (RE11.3.21 and RE11.8.11; Map 12, Appendix A), in the north-western portion of the Survey area. While the habitat areas occurred within the Survey area, they were outside of the Project area and Disturbance area.

An assessment of habitat suitability for the threatened flora species detected has been provided below in *Section 5.2.2.1 Dichanthium queenslandicum (King Bluegrass)* and *Section 5.2.2.2 Dichanthium setosum (bluegrass)*.

5.2.2.1 *Dichanthium queenslandicum (King Bluegrass)*

Dichanthium queenslandicum is a perennial, tufted, erect grass growing to around 80 centimetres (cm) in height and is endemic to Queensland. Its main distribution is centred around the Emerald district, with disjunct populations extending from Hughenden, Nebo to Monto, Clermont, Rolleston and south to the Darling Downs (Queensland Herbarium, 2009). The



species occurs on fertile black cracking clay soils within tussock grasslands, often in association with other *Dichanthium* spp. and *Bothriochloa* spp. (Fletcher, 2001). The species is strongly associated with the distribution of the Natural Grasslands TEC.

Dichanthium queenslandicum is listed as endangered under the EPBC Act and vulnerable under the NC Act. Table 26 provides a summary of the habitat requirements, key threats, recorded presence within the Survey area and Area of interest, and our compliance with targeted survey requirements for the species.

Table 26
Dichanthium
queenslandicum
occurrence details

<i>Dichanthium queenslandicum</i>	
Targeted Survey Guidelines met	Yes No Commonwealth survey guidelines are defined for this flora species, while the <i>Flora Survey Guidelines – Protected Plants</i> (DES, 2020a) defines State survey requirements within mapped high-risk trigger areas for protected plants. No high-risk trigger areas were mapped within the Survey area; hence flora survey requirements were not triggered for the Project. Instead, the following survey effort was completed for conservation significant flora species: • Random meanders were undertaken, in both the wet and dry season survey events, within suitable habitat areas for the species (RE11.3.21 and 11.8.11; habitat areas shown in Map 12, Appendix A). • 164 vegetation assessments to verify REs and vegetation communities. • 34 Habitat suitability assessments to verify habitat suitability for conservation significant flora species. • Incidental records. Flora survey effort is shown in Map Series 2, Appendix A. Survey effort was completed during both seasons (spring and summer) to cover the flowering and fruiting periods for each of the threatened flora species identified in the Likelihood of Occurrence assessment (Table 14).
Occurrence	Survey area <i>Dichanthium queenslandicum</i> was not verified as occurring within the Survey area during field ecological surveys, despite random meanders throughout suitable habitat (native tussock grassland vegetation community; suitable habitat shown in Map 12, Appendix A) during the species' flowering period (typically during the warmer months, following wet season rains; Queensland Herbarium, 2009). The species has not previously been recorded within the Survey area during historical ecological surveys completed (EcoSM, 2020).
	Area of Interest Historical records identified the species' presence approximately 5 km west of the Survey area within the Moranbah South mining lease in 2013 (EcoSM, 2013; see record locations in inset of Map 12, Appendix A). An additional record occurred to the west of the Survey area in 2012, as recorded within the WildNet database (records shown in inset of Map 12, Appendix A).
Habitat Availability	<i>Dichanthium queenslandicum</i> prefers native grassland communities on black cracking clay soils. The suitable REs within the Survey area are RE11.3.21 and 11.8.11 which occur in the north-eastern portion of the Survey area (field-verified REs shown in Map 10, Appendix A). While habitat occurred in the Survey area, no habitat occurs within the Project area or Disturbance area.
Critical Habitat Availability	As described in Table 10, habitat critical to the survival of <i>Dichanthium queenslandicum</i> has not been defined by the Commonwealth. Despite this, it is likely that the habitat mapped within the Survey area for <i>Dichanthium queenslandicum</i> would be considered critical for the species, as it supports values essential for the species' long-term maintenance, genetic diversity, evolutionary development, and potential future recovery or reintroduction.
Likelihood of Occurrence after targeted survey	May occur No individuals or population confirmed within the Survey area during targeted field surveys. While suitable habitat for the species was verified within the Survey area, the species likelihood of occurrence was downgraded to 'may occur' from 'likely to occur' from the Likelihood of Occurrence assessment due to the lack of sightings during targeted survey methods and the small number of individuals recorded within the Area of interest.



Dichanthium queenslandicum

Threats	No Recovery Plan for the species occurs, but threats to the species are listed in the Conservation Advice (DSEWPaC, 2013a). These threats include: • Loss of habitat through agricultural and mining activities, road construction and other infrastructure developments. • Cultivation and crop production within blue-grass grasslands and this species which is a component of these ecological communities (Butler, 2007). • Cattle grazing. The species is known to be of good fodder value (Simon, 1982) and cannot tolerate continual heavy stocking regimes (Fensham, 1999). • Invasion from weeds such as <i>Parthenium hysterophorus</i>* and <i>Parkinsonia aculeata</i> (Parkinsonia)*.
MNES Significant Impact Assessment required?	Yes , <i>Dichanthium queenslandicum</i> was not confirmed present within the Survey area during targeted surveys, however suitable habitat for the species does occur within the Survey area, hence an MNES significant impact assessment was considered necessary for the species.
Species-species management measures required?	No , considering the species was not confirmed within the Survey area, all habitat occurs outside of the Disturbance area, and threats to the species e.g., weed invasion will be appropriately managed through generalised mitigation measures (e.g., implementation of a Weed and Pest Management Plan) as detailed in <i>Section 7 Impact Mitigation</i> .

5.2.2.2 *Dichanthium setosum* (bluegrass)

Dichanthium setosum is an erect perennial grass growing to approximately 1 m in height. The species occurs widely across Queensland, including the Brigalow Belt, Cape York Peninsula, Desert Uplands, Einasleigh Uplands, North West Highlands and South East Queensland bioregions. It is generally associated with heavy cracking clay soils or alluvial plains, often within gilgai depressions, and is found in grasslands or open woodlands dominated by *Acacia harpophylla*, *Eucalyptus* spp. and other grassy communities (DEWHA, 2008). The species is strongly associated with the distribution of the Natural Grasslands TEC.

Dichanthium setosum is listed as vulnerable under the EPBC Act but least concern under the NC Act Table 27 provides a summary of the habitat requirements, key threats, recorded presence within the Survey area and Area of interest, and our compliance with targeted survey requirements for the species.

Table 27
Dichanthium setosum occurrence details

<i>Dichanthium setosum</i>	
Targeted Survey Guidelines met	Yes No Commonwealth survey guidelines are defined for this flora species, while the <i>Flora Survey Guidelines – Protected Plants</i> (DES, 2020a) defines State survey requirements within mapped high-risk trigger areas for protected plants. No high-risk trigger areas were mapped within the Survey area; hence flora survey requirements were not triggered for the Project. Instead, the following survey effort was completed for conservation significant flora species: • Random meanders were undertaken, in both the wet and dry season survey events, within suitable habitat areas for the species (RE11.3.21 and 11.8.11; habitat areas shown in Map 12, Appendix A). • 164 vegetation assessments to verify REs and vegetation communities. • 34 Habitat suitability assessments to verify habitat suitability for conservation significant flora species. • Incidental records. Flora survey effort shown in Map Series 2, Appendix A. Survey effort was completed during all two seasons (spring and summer) to cover the flowering and fruiting periods for each of the threatened flora species identified in the likelihood of occurrence assessment (Table 14).
Occurrence	Survey area <i>Dichanthium setosum</i> was not verified as occurring within the Survey area during field ecological surveys, despite random meanders throughout suitable habitat (native tussock



Dichanthium setosum

	grassland vegetation community; suitable habitat shown in Map 12, Appendix A; Table 10) during the species' flowering period (typically during summer; Harden, 1992). The species has not previously been recorded within the Survey area during historical ecological surveys completed (EcoSM, 2020).
Area of Interest	Historical records indicate the species occurs approximately 45 km south of the Survey area within the Saraji East Mining Lease (recorded in 2023; AECOM, 2024; see records in inset of Map 12, Appendix A). An additional record occurred approximately 5km to the west of the Survey area in 2012, as recorded within the WildNet database (records shown in inset of Map 12, Appendix A).
Habitat Availability	This species prefers native grassland communities on black cracking clay soils. The suitable REs within the Survey area are 11.3.21 and 11.8.11 which occur in the north-eastern portion of the Survey area (field-verified REs shown in Map 10, Appendix A). While habitat occurred in the Survey area, no habitat occurs within the Project area or Disturbance area.
Critical Habitat Availability	As described in Table 10, the habitat critical to the survival of <i>Dichanthium setosum</i> has not been defined by the Commonwealth. Despite this, it is likely that the habitat mapped within the Survey area for <i>Dichanthium setosum</i> would be considered critical for the species, as it supports values essential for the species' long-term maintenance, genetic diversity, evolutionary development, and potential future recovery or reintroduction.
Likelihood of Occurrence after targeted survey	May occur No individuals or population confirmed within the Survey area during targeted field surveys. Only a small number of scattered records occur from the Area of interest. While suitable habitat for the species was verified within the Survey area, the species was considered 'may occur' due to the lack of sightings during random meanders and the small number of individuals recorded within the Area of interest.
Threats	No Recovery Plan for the species occurs, but threats to the species are listed in the Conservation Advice (DEWHA, 2008). These threats include: • Heavy grazing by domestic stock. • Loss of habitat through clearing for pasture improvement and cropping. • Frequent fires, especially regular burning for agricultural purposes. • Weed invasion by introduced grasses, such as <i>Hyparrhenia hirta</i> (Coolatai Grass)*, <i>Phyla canescens</i> (Lippia)* and <i>Eragrostis curvula</i> (African Lovegrass)*. • Road widening.
MNES Significant Impact Assessment Required	Yes , <i>Dichanthium setosum</i> was not confirmed present within the Survey area during targeted surveys, however suitable habitat for the species does occur within the Survey area, hence an MNES significant impact assessment was considered necessary for the species.
Species-species management measures required?	No , considering the species was not confirmed within the Survey area, all habitat occurs outside of Disturbance area, and threats to the species e.g., weed invasion and bushfire will be appropriately managed through generalised mitigation measures (e.g., implementation of a <i>Weed and Pest Management Plan</i> and <i>Bushfire Management Plan</i>) as detailed in <i>Section 7</i> Impact Mitigation.

5.3 FAUNA

5.3.1 Fauna Species Records and Habitat Verification

Both native and introduced fauna species were recorded during the field ecological surveys. A full list of fauna species recorded in the Survey area is provided in Appendix F.

The search of the WildNet database of the Area of Interest identified 449 species (25 Amphibians, 247 Bird, 26 Fish, 85 Mammal, and 92 Reptilia). Through the dry and wet season surveys spanning from November 2024 to May 2025, a total of



106 fauna species, from 61 families were recorded in the Survey area (seven amphibians, 54 birds, 31 mammals, and 14 reptile species; Appendix F).

Most native fauna species were least concern species under the NC Act and not listed under the EPBC Act. However, five conservation significant fauna species were recorded within the Survey area during Trend Environmental's targeted field surveys. These conservation significant fauna species included Squatter Pigeon, Koala, and the Greater Glider which are listed threatened species, the migratory Oriental Cuckoo and the SLC Short-beaked Echidna. In addition, the Ornamental Snake, while not detected during Trend Environmental's targeted field surveys, has previously been recorded within the Survey area in 2019 (EcoSM, 2020). These conservation significant fauna species are discussed in more detail in *Section 5.3.2 Conservation Significant Fauna Species Records and Habitat Verification*.

The Survey area has been subject to historical disturbance, primarily through cattle grazing and associated land management practices. Large areas have been cleared for pasture and are now dominated by exotic grasses, particularly *Cenchrus ciliaris**. Despite these modifications, remnant and high-value regrowth vegetation communities provide important fauna habitat values for the threatened, migratory and SLC fauna species. Remnant and high-value regrowth vegetation communities particularly occur along riparian corridors associated with the Isaac River and Cherwell Creek. These areas support primarily Eucalypt open forests and woodlands with a structurally complex canopy and understorey, offering shelter, breeding sites, and foraging resources for a range of fauna species. Patches of *Acacia harpophylla* woodland, *Eucalyptus populnea* woodland, and vine thicket vegetation also provide potential habitat for species of conservation significance, including listed threatened, migratory and SLC fauna.

In more intact remnant areas of the Survey area, microhabitat features such as hollow-bearing trees, coarse woody debris, and seasonal wetlands enhance ecological values for fauna. However, throughout much of the landscape, ongoing grazing pressure, selective clearing, and the spread of invasive pasture grasses and weeds have reduced native groundcover diversity and contributed to edge effects within remnant patches.

The following sections describes the habitat available within the Survey area for each fauna group and details the specific habitat availability for each of the conservation significant fauna species that were detected within the Survey area, or for which suitable habitat was confirmed.

5.3.1.1 Amphibians

Seven native amphibian species were recorded within the Survey area (Appendix F). These species included:

- Striped Burrowing Frog (*Ranoidea alboguttata*)
- Common Green Treefrog (*Litoria caerulea*)
- Eastern Dwarf Green Treefrog (*Litoria fallax*)
- Broad-palmed Rocket Frog (*Litoria latopalmata*)
- Ornate Burrowing Frog (*Platyplectrum ornatum*)
- Salmon Striped Frog (*Limnodynastes salmini*)

All amphibian species were least concern species under the NC Act and were not listed under the EPBC Act. One exotic amphibian was also recorded, the Cane Toad (*Rhinella marina*)*.

These amphibians were captured in a diverse range of vegetation communities, including Eucalypt woodlands on lowlands and ranges, Eucalypt woodlands on basalt plains, wet eucalypt woodlands on alluvial plains and drainage lines, dry to moist woodlands on sandy plains, Brigalow woodlands and ephemeral wetlands, with the largest abundance captures in Brigalow woodlands and ephemeral wetlands communities (vegetation communities within the Survey area shown in Map 10, Appendix A). The watercourses, ground crevices, log piles, leaf litter and grass tussocks of these vegetation communities provide suitable microhabitat for amphibian species within the Survey area.

The amphibian species were primarily observed during spotlighting, pitfall trapping, and from opportunistic audible observations.



5.3.1.2 Birds

A total of 54 bird species were recorded within the Survey area. The majority of the bird species recorded were least concern species under the NC Act and were not listed under the EPBC Act. The exception being two conservation significant species, the threatened Squatter Pigeon and the migratory Oriental Cuckoo. These conservation significant bird species are discussed in more detail in *Section 5.3.2 Conservation Significant Fauna Species Records and Habitat Verification*.

Bird species were recorded during targeted bird surveys, spotlighting, camera trap deployment and opportunistic sightings. Sufficient shelter for foraging and roosting occurs throughout remnant and high-value regrowth areas of the Survey area, with permanent and seasonal water sources (watercourses, wetlands and farm dams) available.

Extensive habitat for bird species also occurs throughout the landscape, where there is intact remnant vegetation along watercourses, within protected areas and on properties that have not been subject to modification for agriculture or mining. Least concern bird species may occur throughout the Survey area, utilising it for foraging or dispersal.

5.3.1.3 Mammals

There were 30 mammal species recorded within the Survey area, predominantly represented by Micro Bats (Vespertilionidae) and Macropods (Macropodidae). The majority of the mammal species recorded were least concern species under the NC Act and were not listed under the EPBC Act. The exception being three conservation significant species, the threatened Koala and Greater Glider, and the SLC Short-beaked Echidna. These conservation significant mammal species are discussed in more detail in *Section 5.3.2 Conservation Significant Fauna Species Records and Habitat Verification*.

These mammals were recorded through spotlighting, camera trap deployment, Anabat deployment and opportunistic sightings.

Native mammal diversity within the Survey area is considered low, particularly for small, ground-dwelling marsupials and rodents. The apparent absence of this fauna group is likely influenced by a combination of factors, including extensive habitat fragmentation, high predator pressure (native and introduced), limited availability of shelter and refuge due to sparse or poorly structured understorey vegetation, and ongoing or historic grazing impacts.

The remnant and high-value regrowth habitat areas within the Survey area provide suitable shelter, hollow-bearing trees, and foraging resources for native mammals. These areas are relatively well-connected through riparian corridors, enhancing habitat continuity and facilitating fauna movement across the landscape.

5.3.1.4 Reptiles

There were 14 reptile species recorded within the Survey area during targeted surveys. All reptile species recorded were least concern species under the NC Act and were not listed under the EPBC Act. While this is the case, the Ornamental Snake has been recorded historically within the Survey area (in 2019; EcoSM, 2020; record shown in Map 19, Appendix A), within the Brigalow and Coolabah ephemeral wetland areas adjacent to the Isaac River. The Ornamental Snake is discussed in more detail in *Section 5.3.2 Conservation Significant Fauna Species Records and Habitat Verification*.

These reptiles were recorded during active searches, opportunistic surveys, spotlighting and recorded as incidentals.

Suitable microhabitat features for reptiles occurs within remnant and high-value regrowth areas of the Survey area, including leaf litter, Giglia depressions, peeling bark, grass tussocks and woody debris.

5.3.2 Conservation Significant Fauna Species Records and Habitat Verification

Five conservation significant fauna species were recorded within the Survey area during Trend Environmental's targeted field surveys: the Squatter Pigeon, Koala and Greater Glider which are listed as threatened, one migratory species, the Oriental Cuckoo, and one SLC species, the Short-beaked Echidna.

The Squatter Pigeon is listed as vulnerable under both the EPBC Act and NC Act with records shown in Map 13, Appendix A. The Koala and Greater Glider are listed as endangered under both the EPBC Act and NC Act with records shown in Maps 16 and 17 respectively. The Oriental Cuckoo is listed as migratory under the EPBC Act and SLC under the NC Act with records



shown in Map 15, Appendix A. While the Short-beaked Echidna is recognised as SLC under the NC Act but not listed under the EPBC Act, with records shown in Map 18, Appendix A.

In addition to these threatened and SLC species, the Ornamental Snake was previously recorded within the Survey area in 2019 by EcoSM (EcoSM, 2020; record shown in Map 19 Appendix A). The Ornamental Snake, however, was not detected by Trend Environmental, despite targeted surveys for the species in accordance with the *Survey guidelines for the ornamental snake (Denisonia maculata; DCCEEW, 2025b)*. The Ornamental Snake is listed as vulnerable under both the EPBC Act and NC Act.

Threatened and migratory fauna habitat for the above detected conservation significant fauna species, and other threatened and migratory species was verified within the Survey area. Breeding, foraging and dispersal habitat for the Squatter Pigeon is shown in Map 13, Appendix A. Breeding and foraging habitat for the Koala is shown in Map 16, Appendix A. Denning and foraging habitat for the Greater Glider is shown in Map 17, Appendix A. Foraging and dispersal habitat for the Oriental Cuckoo is shown in Map 15, Appendix A. Suitable habitat for the Short-beaked Echidna is shown in Map 18, Appendix A. Breeding, and foraging and dispersal habitat for the Ornamental Snake is shown in Map 19, Appendix A.

Additional species, which were not recorded, but had breeding, foraging and/or dispersal habitat verified within the Survey areas included threatened wetland bird species, the Australian Painted Snipe, Sharp-tailed Sandpiper and Common Greenshank (Breeding and/or foraging and dispersal habitat for wetland bird species are shown in Map 14, Appendix A), and the migratory Fork-tailed Swift (Map 15 Appendix A).

The Australian Painted Snipe is listed as endangered and migratory under the EPBC Act and endangered under the NC Act. The Sharp-tailed Sandpiper is listed as vulnerable, marine and migratory under the EPBC Act and SLC under the NC Act. The Common Greenshank is listed as endangered and migratory under the EPBC Act and SLC under the NC Act. The Fork-tailed Swift is listed as migratory under the EPBC Act and SLC under the NC Act.

Detailed assessments of habitat suitability for the conservation significant fauna species detected or for which suitable habitat was confirmed within the Survey area is provided below.

5.3.2.1 Conservation Significant Bird Species

5.3.2.1.1 Squatter Pigeon (southern subspecies)

The Squatter Pigeon is listed as vulnerable under both the EPBC Act and NC Act. The species is a ground-dwelling bird occurs across central and southern Queensland, ranging from the Burdekin–Lynd divide south to the Darling Downs, west to Charleville and Longreach, and east to the coast between Proserpine and Gladstone. Subpopulations south of the Carnarvon Ranges are considered particularly important due to their isolation (DCCEEW, 2025).

This species occupies grassy understoreys of *Eucalyptus*, *Acacia*, or *Callitris* woodlands, as well as disturbed areas with remnant or regrowth tree cover. In Queensland, foraging and breeding habitat is known to be associated with the soil landscapes of Land Zone 5 (well drained sandy or loamy soils on undulating plains and foothills) and Land Zone 7 (lateritic soils on low jump-ups and escarpments) (Squatter Pigeon Workshop, 2011). Breeding habitat is within 1 km of suitable waterbodies, whereas foraging can occur up to 3 km from such waterbodies. Waterbodies that are suitable for the species occur on the lower, gentle slopes and plateaus of sandstone ranges (equivalent to Land Zone 10), alluvial clay soils on river or creek flats (represented by Land Zone 3) or non-alluvial clay soils on flats or plains which are not associated with current alluvial deposits (represented by Land Zone 4). Where natural foraging or breeding habitat occurs (i.e. on Land Zones 5 and 7), the Squatter Pigeon may be found in vegetation types growing on the above soil types (Squatter Pigeon Workshop, 2011). Dispersal habitat for this species is any forest or woodland occurring between patches of foraging or breeding habitat, and suitable waterbodies.

Table 28 provides a summary of the habitat requirements, key threats, recorded presence within the Survey area and Area of interest, and our compliance with targeted survey requirements for the species.



Table 28
Squatter
Pigeon
occurrence
details

Squatter Pigeon

Targeted Survey Guidelines met	Yes Commonwealth <i>Survey Guidelines for Australia's Threatened Birds (DEWHA, 2010b)</i> defines targeted surveys for the Squatter Pigeon as area searches (15 hours over three days) or flushing surveys (10 hours over three days) in areas <50 ha. No Queensland targeted survey guidelines for this species have been defined. The following survey effort was completed for the Squatter Pigeon: • 30 Bird plot surveys (ten survey hours over multiple days during dry and wet season). • Flushing surveys - whole Survey area walked or driven (~265 hours). • 230 Camera trap nights. • 34 Habitat suitability assessments. • Incidental records. Fauna survey effort shown in Map Series 3, Appendix A.
Occurrence	Survey area The Squatter Pigeon was recorded multiple times within the Survey area (records shown in Map 13, Appendix A). During the dry and wet season surveys, 37 observations were recorded across the Survey area, and adjacent areas, primarily associated with farm dams, riparian areas, and water troughs (Map 13, Appendix A). Historically, there are records of the Species within the Survey area, recorded by EcoSM (2018; 2020) and an ALA record from 2002, also shown in Map 9, Appendix A.
	Area of Interest Multiple records for the species exist within the Area of interest, confirming a local presence of the species (records shown in the inset of Map 13, Appendix A). Essential habitat for the Squatter Pigeon was also mapped within the Survey area on the Vegetation Management Supporting Map (refer to Map 4, Appendix A for essential habitat mapping).
Habitat	The Survey area contains vegetation communities that support breeding, foraging, and dispersal habitat for the Squatter Pigeon. Wet woodlands, riparian corridors (Isaac River, Cherwell Creek, Conrock Gully) and associated wetlands and farm dams provide suitable water sources. Eucalypt dry woodlands and floodplain woodlands offer grassy habitat suitable for breeding and foraging habitat. Habitat for the species within the Survey area is provided in Map 13, Appendix A. These habitat areas are concentrated in the northwest of the Survey area, and along riparian habitat areas of the Isaac River, Cherwell Creek and Conrock Gully, with much of the central Project area lacking habitat for this species due to agricultural clearing. Although some habitat areas are degraded from cattle grazing and <i>Cenchrus ciliaris</i>* invasion, the habitat remains suitable to support key life-cycle requirements, including breeding and foraging.
Habitat Quality Score	5 - Habitat quality scoring provided in Appendix H
Connectivity of Habitat	The Squatter Pigeon relies on the daily availability of water resources for drinking, alongside sufficient areas of native grassland for foraging. Connectivity of habitat for this species is critical, as it enables movement between water sources and feeding grounds, supporting the species' survival in fragmented landscapes. Connectivity pathways for the Squatter Pigeon in the Region occur through riparian habitat along watercourses, with much of the adjacent habitat areas being fragmented, due to historical clearing for agriculture and mining.
Likelihood of Occurrence after targeted survey	Known to occur The species was recorded on multiple occasions during field surveys within the Survey area and adjacent areas. Hence the species likelihood after field surveys was 'known to occur'.
Availability of areas critical to the species survival, important habitat or important populations	Habitat critical for the survival of the species, or important habitat has not been defined for this species (as detailed in Table 10). The species does however have a defined important population, which is the population within the southern boundary of its known distribution (southern Queensland). The population within the Survey area, due to its location, would not be considered an important population for the Squatter Pigeon.



Squatter Pigeon

Where 'habitat critical to the survival of a species or ecological community' is not formally defined, habitat is to be assessed against the below criteria to determine whether it meets the relevant thresholds to be considered critical habitat for a species. Critical habitat is defined 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.

The habitat for the Squatter Pigeon within the Survey area would be utilised for foraging, breeding, and dispersal (as mapped within Map 13, Appendix A).

While there remains extensive habitat for this species within the local landscape, large tracts have been cleared for agriculture and large-scale mining projects. With ongoing vegetation clearance and fragmentation an identified key threat to the species (TSSC, 2015b), the breeding, foraging and dispersal habitat areas within the Survey area could be considered necessary for these key life stages and as such could potentially be considered critical for the species survival, particularly within the Bowen Basin region (critical habitat for the species shown in Map 13, Appendix A).

Threats	No Recovery Plan for the species occurs, but threats to the species are listed in the Conservation Advice (TSSC, 2015b). The listed threats include: • Vegetation clearing and fragmentation of habitat for agriculture. • Overgrazing of pastures by cattle during times of drought which increases weed invasion and reduces native groundcovers required for foraging. • Trampling of nests by domestic stock. • Inappropriate fire regimes. • Predation by feral cats and foxes.
Significant Impact Assessment Required	Yes, the Squatter Pigeon was confirmed present within the Survey area during targeted surveys. Suitable breeding, foraging and dispersal habitat was verified within the Survey area, and intact areas constituting breeding, foraging and dispersal habitat could be considered habitat that is critical for the species survival. Therefore, an MNES SIA was considered necessary for the species. An MSES SRI assessment would also ordinarily be required for this species; however, the MNES SIA is considered to adequately address the relevant impact pathways. This approach is consistent with the Commonwealth–Queensland legislative frameworks for offsets, which seeks to avoid duplication of offset requirements across jurisdictions where the same, or substantially the same, matter is assessed.
Species-species management measures required?	Yes, the species has been confirmed within the Survey area, and the Project will directly impact breeding, foraging and dispersal habitat. These habitat types may constitute habitat critical to the survival of the species. In addition, there is potential for the Project to exacerbate existing threats (vegetation clearing, fire and predation) within retained habitat areas. Accordingly, species-specific management measures are required to reduce the risk of impacts and mitigate the potential for further decline.

5.3.2.1.2 Threatened Wetland Bird Species - Australian Painted Snipe, Sharp-tailed Sandpiper and Common Greenshank

Breeding and/or foraging and dispersal habitat areas for the Australian Painted Snipe, Sharp-tailed Sandpiper and Common Greenshank were confirmed within the Survey area, these are shown in Map 14, Appendix A. These species are all associated with wetland environments and therefore share common habitat characteristics within the Survey area.



Australian Painted Snipe

The Australian Painted Snipe is listed as endangered and migratory under the EPBC Act and endangered under the NC Act. This species is known to breed within Australia but is a rare and cryptic wader recorded across all states of Australia. The highest concentration of records are from eastern Australia, including scattered sites in Queensland, NSW, Victoria and South Australia (DSEWPaC, 2013b). Records are irregular and typically associated with ephemeral wetlands following rainfall events.

The species' national population is estimated to be fewer than 3,000 individuals, and it is considered at risk due to its fragmented distribution and dependence on temporary wetland habitats (DSEWPaC, 2013b). The species inhabits shallow freshwater wetlands such as lakes, swamps, claypans and inundated gilgai depressions. It also uses waterlogged grasslands and modified habitats like dams, sewage ponds and irrigated fields (Rogers et al., 2005). Habitat typically includes shallow water and exposed mudflats with dense low vegetation (sedges, rushes or grasses) with some taller cover nearby. Breeding occurs within Australia, in wetlands within this habitat mosaic, often on or near small islands with very shallow water.

Table 29 provides a summary of the habitat requirements, key threats, recorded presence within the Survey area and Area of interest, and our compliance with targeted survey requirements for the species.

Table 29
Australian Painted
Snipe occurrence
details

Australian Painted Snipe

Targeted Survey Guidelines met	Yes No State targeted survey guidelines for this species have been defined. The Commonwealth's <i>Survey Guidelines for Australia's Threatened Birds</i> (DEWHA, 2010b) however defines the following methods for the species: • Targeted stational observations (10 hours over 5 days in areas <50 ha); or • Land-based area searches or line transects (10 hours over 3 days) in areas <50 ha (DEWHA, 2010b). Suitable freshwater habitat occurs within the Survey area, particularly the HES wetland in the south-eastern corner of the Survey area. The following survey effort was completed for the Australian Painted Snipe: • 30 Bird plot surveys (ten survey hours over multiple days during dry and wet season) • Twelve land-based area searches surrounding the HES wetland, over multiple days. • 230 Camera trap nights, 100 of which were surrounding a large wetland during the wet season. • 34 Habitat suitability assessments • Incidental records Fauna survey effort shown in Map Series 3, Appendix A.
Occurrence	Survey area The Australian Painted Snipe has not been recorded within the Survey area during historical or recent targeted surveys. Area of Interest The species has been recorded approximately 5km southwest of the Survey area: a sighting at a dam associated with JB Gully by DPM Envirosiences in 2018 (DPM Envirosiences, 2018a) and another record by BirdLife Australia in 2018 near the same dam (records shown in the inset of Map 14, Appendix A). Within the Area of interest, the species has other records available within the ALA database (see records in inset of Map 14, Appendix A). These records indicate that the species has occupied wetland habitats in the local vicinity, at least prior to 2018.
Habitat	Habitat for this species has been defined as permanent or semi-permanent inland and coastal freshwater or saline habitats. Breeding, foraging and dispersal habitat for the Australian Painted Snipe within the Survey area is restricted to the HES wetland (verified as RE11.3.27b) in the southeastern corner of the Survey area, marshy habitat surrounding the farm dam in the central west portion of the Survey area, and scattered ephemeral palustrine wetlands and gilgai



Australian Painted Snipe

depressions adjacent to the Isaac River and Cherwell Creek (also verified as RE11.3.27b). Habitat areas for the species are shown in Map 14, Appendix A.

Most of these habitat areas are in poor ecological condition, characterised by frequent cattle disturbance, limited structural vegetation cover, and small patch sizes. The exception is the HES wetland in the southeastern corner of the Survey area, which provides suitable canopy and ground cover for the species during wet season months. Other verified habitats are likely to offer temporary foraging opportunities following rainfall and may function as dispersal stopover sites for the species; however, they do not meet the specific requirements for breeding habitat (e.g. shallow mudflats with dense low cover).

Connectivity of Habitat

The Australian Painted Snipe relies on wetland habitats for foraging and roosting, with connectivity between wetlands essential to support seasonal movements and ensure access to suitable feeding grounds as water levels and resource availability fluctuate.

Connectivity pathways for the Australian Painted Snipe are highly fragmented, due to historical clearing for agriculture within the Region. The connectivity pathways that remain include a network of small ephemeral palustrine wetlands and farm dams within the Survey area, linking fragmented habitat within the Area of interest.

Likelihood of Occurrence after targeted survey

May occur

No individuals or population were confirmed within the Survey area during field surveys; however, records occur within the Area of interest (records shown in inset of Map 14, Appendix A). Hence, it was considered that the species may occur at least on occasion within the Survey area.

Availability of areas critical to the species survival, important habitat or important populations

Habitat critical for the survival of the species has been defined for the Australian Painted Snipe, in which wetland habitat suitable for breeding is considered critical (DSEWPac, 2013b; as detailed in Table 10).

Based on this definition, it is likely that the HES wetland in the southeastern corner of the Survey area would be considered critical habitat for the species, but not other wetland areas in the Survey area (critical habitat for the species shown in Map 14, Appendix A).

Threats

No Recovery Plan for the species occurs, but threats are listed in the Conservation Advice (DSEWPac, 2013b). These threats include:

- Loss and degradation of wetlands, through drainage and the diversion of water for agriculture and reservoirs (Garnett et al., 2011).
- Grazing and the associated trampling of wetland vegetation/nests, nutrient enrichment and disturbance to substrate by livestock (Rogers et al., 2005).
- Predation by feral animals (e.g. nest predation by Foxes (*Vulpes vulpes*)* or Feral Cats (*Felis catus*)*).
- Coastal port and infrastructure development, shale oil mining near autumn-winter sites for this species on the central Queensland coast (Houston & Black pers comms. 2012).
- Replacement of native wetland vegetation by invasive weeds (Rogers et al., 2005).

Significant Impact Assessment Required

Yes, the Australian Painted Snipe, while not confirmed present within the Survey area during targeted surveys, has foraging and dispersal habitat verified within the Survey area. Therefore, an MNES SIA was considered necessary for the species.

An MSES SRI assessment would also ordinarily be required for this species; however, the MNES SIA is considered to adequately address the relevant impact pathways. This approach is consistent with the Commonwealth–Queensland legislative frameworks for offsets, which seeks to avoid duplication of offset requirements across jurisdictions where the same, or substantially the same, matter is assessed.



Australian Painted Snipe

Species-species management measures required?	No , considering the species was not confirmed within the Survey area, the HES wetland which may provide breeding habitat and habitat that is critical to the survival of the species has been avoided by design of the Disturbance area and is some 2 km from the Disturbance area, and threats to the species e.g., weed invasion and predation will be appropriately managed through generalised mitigation measures (e.g., implementation of a Weed and Pest Management Plan) as detailed in <i>Section 7 Impact Mitigation</i> .
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Sharp-tailed Sandpiper

The Sharp-tailed Sandpiper is listed as vulnerable, marine and migratory under both the EPBC Act and SLC under the NC Act. This species breeds in the tundra of north-eastern Siberia and migrates annually to Australia for the non-breeding season. In Australia, it is widespread across inland and coastal wetlands, with significant concentrations in Queensland, NSW and Victoria (DCCEEW, 2024a). Although not threatened in Australia, its international status is of concern due to reliance on the East Asian–Australasian Flyway, hence it has been given the vulnerable status under the EPBC Act.

The Sharp-tailed Sandpiper inhabits shallow, ephemeral or permanent freshwater wetlands, floodplains, marshes and sewage ponds. It forages on exposed mudflats and shallow margins, feeding on aquatic invertebrates, seeds and detritus. Habitat suitability depends on water depth and the availability of bare mud for feeding.

Table 30 provides a summary of the habitat requirements, key threats, recorded presence within the Survey area and Area of interest, and our compliance with targeted survey requirements for the species.

Table 30
Sharp-tailed
Sandpiper
occurrence details

Sharp-tailed Sandpiper

Targeted Survey Guidelines met	Yes No State targeted survey guidelines for this species have been defined. Commonwealth <i>Survey Guidelines for Australia's Threatened Birds (DEWHA, 2010b)</i> defines targeted surveys for the Sharp-tailed Sandpiper as observations using a telescope from vantage points overlooking suitable foraging or roosting habitat (DEWHA, 2010b). The following survey effort was completed for the Sharp-tailed Sandpiper: • 30 Bird plot surveys (ten survey hours over multiple days during dry and wet season). • Twelve land-based area searches surrounding wetland, over multiple days. • 230 Camera trap nights, 100 of which were surrounding a large wetland during the wet season. • 34 Habitat suitability assessments • Incidental records Fauna survey effort shown in Map Series 3, Appendix A.
Occurrence	Survey area The Sharp-tailed Sandpiper has not been recorded within the Survey area during historical or recent surveys.
	Area of Interest The species has been recorded in the Area of interest: a sighting 18km south of the Survey area in 2001, based on records available within the ALA database (see records in inset of Map 14, Appendix A). The species has also been recorded in the Region: a sighting 40 km north of the Survey area in 2018, based on records available within the ALA database. These records indicate that the species has occasionally occupied wetland habitats in the local vicinity, at least prior to 2018.
Habitat	No breeding habitat for this species occurs within Australia with the species breeding in Siberia. Foraging and dispersal habitat for the Sharp-tailed Sandpiper however is restricted to the HES wetland (verified as RE11.3.27b) in the southeastern corner of the Survey area, marshy habitat surrounding the farm dam in the central west portion of the Survey area and scattered ephemeral wetlands and gilgai depressions adjacent to the Isaac River and Cherwell Creek (also verified as RE11.3.27b). Habitat areas for the species are shown in Map 14, Appendix A.



Sharp-tailed Sandpiper

As described for the Australian Painted Snipe, most of these habitat areas are in poor ecological condition and are likely to provide only temporary foraging opportunities following rainfall and short-term dispersal stopover sites for the species. The HES wetland is better ecological condition, providing suitable canopy and ground cover for the species during wet season months.

Connectivity of Habitat

The Sharp-tailed Sandpiper relies on wetland habitats for foraging and roosting, with connectivity between wetlands essential to support seasonal movements and ensure access to suitable feeding grounds as water levels and resource availability fluctuate.

Connectivity pathways for the Sharp-tailed Sandpiper are highly fragmented, due to historical clearing for agriculture within the Region. The connectivity pathways that remain include a network of small ephemeral wetlands and farm dams within the Survey area, linking fragmented habitat within the Area of interest.

Likelihood of Occurrence after targeted survey

May occur

No individuals or population were confirmed within the Survey area during field surveys; however, an isolated record occurs within the Area of interest (see records in inset of Map 14, Appendix A). Hence, it was considered that the species may occur at least on occasion within the Survey area.

Availability of areas critical to the species survival, important habitat or important populations

Habitat critical for the survival of the species has not been formally defined for the Sharp-tailed Sandpiper (Table 10). Important habitats in Australia for migratory shorebirds under the *EPBC Act* however include those recognised as nationally or internationally important.

Wetland habitat is considered internationally important if it regularly supports 1% of individuals in a population (ecologically significant proportion; 850 individuals for the Sharp-tailed Sandpiper; BirdLife Australia 2020); or a total abundance of at least 20,000 waterbirds. Wetland habitat is considered nationally important habitat if it regularly supports: 0.1% of the flyway population of a single species of migratory shorebird (ecologically significant proportion; 85 individuals for the Sharp-tailed Sandpiper; BirdLife Australia 2020) or 2,000 migratory shorebirds or 15 migratory shorebird species. All internationally or nationally important habitat that exceeds the above thresholds is considered habitat critical to the survival of the species.

While foraging and dispersal habitat for the Sharp-tailed Sandpiper has been verified within the Survey area, these habitats are not recognised as nationally or internationally important, as they would not support an ecologically significant proportion of the species population to be considered critical habitat.

Threats

No Recovery Plan for the species occurs, but threats to the species are listed in the Conservation Advice (DCCEW, 2024a). The listed threats in Australia include:

- Direct and indirect habitat loss.
- Habitat degradation.
- Direct mortality.

Significant Impact Assessment Required

Yes, the Sharp-tailed Sandpiper, while not confirmed present within the Survey area during targeted surveys, has foraging and dispersal habitat verified within the Survey area. Therefore, an MNES significant impact assessment was considered necessary for the species.

An MSES SRI assessment would also ordinarily be required for this species; however, the MNES SIA is considered to adequately address the relevant impact pathways. This approach is consistent with the Commonwealth–Queensland legislative frameworks for offsets, which seeks to avoid duplication of offset requirements across jurisdictions where the same, or substantially the same, matter is assessed.



Sharp-tailed Sandpiper

Species-species management measures required?	No , considering the species was not confirmed within the Survey area, most of the wetland habitats are in poor ecological condition, the HES wetland which is in better condition has been avoided by design of the Disturbance area and is some 2 km from the Disturbance area, and threats to the species e.g., habitat degradation will be appropriately managed through generalised mitigation measures (e.g., implementation of a Weed and Pest Management Plan) as detailed in <i>Section 7 Impact Mitigation</i> .
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Common Greenshank

The Common Greenshank is listed as endangered and migratory under the EPBC Act, and SLC under the NC Act. The Common Greenshank breeds in northern Europe and Siberia and migrates to Australia in the non-breeding season, where it is widely distributed across coastal estuaries, mudflats and inland wetlands during the non-breeding season.

The Common Greenshank is a common but dispersed summer migrant, with small numbers using inland habitats across Queensland (DoE, 2015b). This species inhabits a wide range of wetland habitats, from tidal flats and estuaries to inland lakes, claypans and floodplain wetlands. It forages along the edges of shallow waterbodies, typically on mud, sand or clay substrates, feeding on aquatic invertebrates and small fish (DCCEEW, 2024b).

Table 31 provides a summary of the habitat requirements, key threats, recorded presence within the Survey area and Area of interest, and our compliance with targeted survey requirements for the species.

Table 31
Common
Greenshank
occurrence details

Common Greenshank	
Targeted Survey Guidelines met	Yes No State or Commonwealth targeted survey guidelines for this species have been defined. The following survey effort was completed for the Common Greenshank: • 30 Bird plot surveys (ten survey hours over multiple days during dry and wet season) • Twelve land-based area searches surrounding wetland, over multiple days. • 230 Camera trap nights, 100 of which were surrounding a large wetland during the wet season. • 34 Habitat suitability assessments • Incidental records Fauna survey effort shown in Map Series 3, Appendix A.
Occurrence	Survey area The Common Greenshank has not been recorded within the Survey area during historical or recent surveys.
	Area of Interest The species has been recorded in the Area of interest historically: a sighting to the west of the Survey area in 1978, and one to the south in 1999, based on records available within the Atlas of Living Australia database (see records in inset of Map 14, Appendix A). These records indicate that the species has occupied wetland habitats in the local vicinity, at least historically, prior to 1999.
Habitat	
Foraging and dispersal habitat for the Common Greenshank is restricted to the HES wetland (verified as RE11.3.27b) in the southeastern corner of the Survey area, marshy habitat surrounding the farm dam in the central west portion of the Survey area and scattered ephemeral wetlands and gilgai depressions adjacent to the Isaac River and Cherwell Creek (also verified as RE11.3.27b). Habitat areas for the species are shown in Map 14, Appendix A. As described for the Australian Painted Snipe, most of these habitat areas are in poor ecological condition and are likely to provide only temporary foraging opportunities following rainfall and short-term dispersal stopover sites for the species. The HES wetland is better ecological	



Common Greenshank

	condition, providing suitable canopy and ground cover for the species during wet season months.
Connectivity of Habitat	The Common Greenshank relies on wetland habitats for foraging and roosting, with connectivity between wetlands essential to support seasonal movements and ensure access to suitable feeding grounds as water levels and resource availability fluctuate. Connectivity pathways for the Common Greenshank are highly fragmented, due to historical clearing for agriculture within the Region. The connectivity pathways that remain include a network of small ephemeral wetlands and farm dams within the Survey area, linking fragmented habitat within the Area of interest.
Likelihood of Occurrence after targeted survey	May occur No individuals or population confirmed within the Survey area during field surveys, however historical records occur within the Area of interest. Hence, it was considered that the species may occur at least on occasion within the Survey area.
Availability of areas critical to the species survival, important habitat or important populations	Habitat critical for the survival of the species has been formally defined for the Common Greenshank, in which a mosaic of feeding and roosting habitat (DCCEEW, 2024b) is considered critical (Table 10). While foraging and dispersal habitat for the Common Greenshank has been verified within the Survey area, these habitats are mostly in poor ecological condition, and the species has only been recorded historically within the Area of Interest. Also, the wetland habitats are not recognised as nationally or internationally important, and do not support an ecologically significant proportion of the species population (1,100 individuals [1% of the population] and 110 individuals [0.1% of the population]) to be considered critical habitat. Hence, it was considered unlikely that the foraging and dispersal habitat within the Survey area would be considered critical habitat for this species.
Threats	No Recovery Plan for the species occurs, but threats to the species are listed in the Conservation Advice (DCCEEW, 2024b). The listed threats include: • Habitat loss caused by residential and commercial development (* threat occurs mostly outside Australia). • Habitat loss caused by industrial aquaculture (* threat occurs mostly outside Australia). • Downstream effects of large dams (* threat occurs mostly outside Australia). • Disturbance at feeding and roosting sites (* threat occurs mostly outside Australia). • Sea level rise (climate change) (* threat occurs mostly outside Australia). • Invasion of mudflats and coastal saltmarshes by mangroves and <i>Spartina alterniflora</i> (Cordgrass) (* threat occurs mostly outside Australia). • Hunting (* threat occurs mostly outside Australia). • Fishing bycatch (* threat occurs mostly outside Australia). • Chronic and acute pollution.
Significant Impact Assessment Required	Yes, the Common Greenshank, while not confirmed present within the Survey area during targeted surveys, has foraging and dispersal habitat verified within the Survey area. Therefore, an MNES significant impact assessment was considered necessary for the species. An MSES SRI assessment would also ordinarily be required for this species; however, the MNES SIA is considered to adequately address the relevant impact pathways. This approach is consistent with the Commonwealth–Queensland legislative frameworks for offsets, which seeks to avoid duplication of offset requirements across jurisdictions where the same, or substantially the same, matter is assessed.



Common Greenshank

Species-species management measures required?	No , considering the species was not confirmed within the Survey area and is only known historically from the Area of interest, most of the wetland habitats are in poor ecological condition, the HES wetland which is in better condition has been avoided by design of the Disturbance area and is some 2 km from the Disturbance area, and threats to the species generally occur outside of Australia, it is expected that generalised mitigation measures will appropriate mitigated impacts to this species, as detailed in <i>Section 7 Impact Mitigation</i> .
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5.3.2.1.3 Migratory Bird Species –Fork-tailed Swift and Oriental Cuckoo

Fork-tailed Swift

The Fork-tailed Swift is listed as migratory under the EPBC Act and SLC under the NC Act. The Fork-tailed Swift breeds in Siberia and migrates to Australia between October and April, which is the non-breeding season for the species. The species is almost entirely aerial, foraging over a wide variety of habitats including inland plains, riparian woodlands, open farmland, coastal foothills and even urban areas (Commonwealth of Australia, 2015).

Table 32 provides a summary of the habitat requirements, key threats, recorded presence within the Survey area and Area of interest, and our compliance with targeted survey requirements for the species.

Table 32
Fork-tailed Swift
occurrence details

Fork-tailed Swift	
Targeted Survey Guidelines met	Yes No State targeted survey guidelines for this species have been defined. Commonwealth <i>Draft referral guideline for 14 birds listed migratory under the EPBC Act (Commonwealth of Australia, 2015)</i> defines there are no standard survey techniques for swifts, however they should be counted by an experienced person from elevated viewpoints (if present) during the Austral summer. The following survey effort was completed for the Fork-tailed Swift: • 30 Bird plot surveys (ten survey hours over multiple days during dry and wet season) • 34 Habitat suitability assessments • Incidental records Fauna survey effort shown in Map Series 3, Appendix A.
Occurrence	Survey area
	The Fork-tailed Swift has not been recorded within the Survey area during historical or recent surveys.
	Area of Interest
	The species has been recorded in the Area of interest historically: a sighting to the east of Moranbah in 2012 (20km north of the Survey area), based on records available within the ALA database (see records in inset of Map 15, Appendix A). This record indicates the occasional use of the airspace in the Region, and that the species likely forages in the local vicinity, at least historically, prior to 2012.
Habitat	No breeding habitat for the species occurs as it breed outside of Australia. Foraging and dispersal habitat for the Fork-tailed Swift has been verified within all remnant and high-value regrowth areas in the Survey area (Map 15, Appendix A). Suitable habitat occurs broadly across the Survey area as the species is aerial and can utilise airspace over remnant and non-remnant vegetation (habitat areas shown in Map 15, Appendix A). All mapped remnant vegetation has been considered suitable habitat, though these areas are fragmented.



Fork-tailed Swift

Connectivity of Habitat	The Fork-tailed Swift relies on intact habitats for foraging and roosting. Connectivity pathways for the species are highly fragmented, due to historical clearing for agriculture within the Region. The connectivity pathways that remain include riparian habitat along watercourses.
Likelihood of Occurrence after targeted survey	May occur No individuals or population confirmed within the Survey area during field surveys, however an isolated record occurs within the Area of interest. Hence, it was considered that the species may occur at least on occasion within the Survey area.
Availability of areas critical to the species survival, important habitat or important populations	Habitat critical for the survival of the species has not been formally defined for the Fork-tailed Swift (Table 10). Important habitat however has been defined as non-breeding habitat only, which includes all habitats where it is found in Australia (Commonwealth of Australia, 2015). As the species has not been confirmed within the Survey area and has not been confirmed within the Area of interest since 2012, the foraging and dispersal habitat verified within the Survey area is unlikely to be considered important habitat for the species. The Survey area would also not support an ecologically significant proportion of a population of the Fork-tailed Swift (1,000 individuals [1% of the population] and 100 individuals [0.1% of the population]).
Threats	No Recovery Plan for the species occurs, and no Conservation Advice for the species occurs. The SPRAT profile for the species, however, lists the following threats for the species: • Habitat destruction from development. • Predation from feral species such as the Feral Cat*.
Significant Impact Assessment Required	Yes , the Fork-tailed Swift, while not confirmed present within the Survey area during targeted surveys, has foraging and dispersal habitat verified within the Survey area. Therefore, an MNES significant impact assessment was considered necessary for the species. An MSES SRI assessment would also ordinarily be required for this species; however, the MNES SIA is considered to adequately address the relevant impact pathways. This approach is consistent with the Commonwealth–Queensland legislative frameworks for offsets, which seeks to avoid duplication of offset requirements across jurisdictions where the same, or substantially the same, matter is assessed.
Species-species management measures required?	No , considering the species was not confirmed within the Survey area and is only known historically from the Area of interest, and threats to the species e.g., predation will be appropriately managed through generalised mitigation measures (e.g., implementation of a Weed and Pest Management Plan) as detailed in <i>Section 7 Impact Mitigation</i> .

Oriental Cuckoo

The Oriental Cuckoo is listed as migratory under the EPBC Act and SLC under the NC Act. The Oriental Cuckoo breeds in northern Asia and migrates to Australia during the non-breeding season. It inhabits open Eucalypt woodlands, monsoonal rainforest, vine thickets, wet sclerophyll forests, and Casuarina or Acacia woodlands. It forages on insects and caterpillars and is typically solitary (Marchant & Higgins, 1990).

Table 33 provides a summary of the habitat requirements, key threats, recorded presence within the Survey area and Area of interest, and our compliance with targeted survey requirements for the species.

Table 33
Oriental Cuckoo
occurrence details

Oriental Cuckoo	
Targeted Survey Guidelines met	Yes No State targeted survey guidelines for this species have been defined. Commonwealth <i>Draft referral guideline for 14 birds listed migratory under the EPBC Act (Commonwealth of Australia, 2015)</i> defines survey effort to be two-hectare surveys in 20 minutes, over sufficient survey



Oriental Cuckoo

plots to estimate a density. Surveys should be undertaken in an appropriate season - spring or summer in southern Australia.

The following survey effort was completed for the Oriental Cuckoo:

- 30 Bird plot surveys (ten survey hours over multiple days during dry and wet season)
- 34 Habitat suitability assessments
- Incidental records

Fauna survey effort shown in Map Series 3, Appendix A.

Occurrence	Survey area	During the wet season survey the species was audibly recorded within riparian habitat of the Isaac River (record shown in Map 15, Appendix A). The species has not previously been recorded within the Survey area.
	Area of Interest	The species has previously been recorded approximately 15 km south of the Survey area in 2023, based on records available within the ALA database (see records in inset of Map 15, Appendix A).
Habitat		No breeding habitat for the species occurs as it breed outside of Australia. Foraging and dispersal habitat for the Oriental Cuckoo has been verified within wet woodlands and riparian areas in the Survey area (Map 15, Appendix A).
Connectivity of Habitat		Connectivity pathways for the Oriental Cuckoo in the Region occur within riparian habitat along watercourses, with much of the remaining habitat areas being fragmented, due to historical clearing for agriculture and mining.
Likelihood of Occurrence after targeted survey	Recorded	The species was recorded audibly on one occasion during field surveys within the Survey area.
Availability of areas critical to the species survival, important habitat or important populations		Habitat critical for the survival of the species has not been formally defined for the Oriental Cuckoo (Table 10). Important habitat however has been defined as non-breeding habitat only: monsoonal rainforest, vine thickets, wet sclerophyll forest or open Casuarina, Acacia or Eucalyptus woodlands. Frequently at edges or ecotones between habitat types. Riparian forest is favoured habitat in the Kimberley region (Commonwealth of Australia, 2015). As the species has been confirmed within the Survey area, the foraging and dispersal habitat for the species could be considered important habitat for the species, however the Survey area would not support an ecologically significant proportion of a population of Oriental Cuckoo (10,000 individuals [1% of the population] and 1,000 individuals [0.1% of the population]).
Threats		No Recovery Plan for the species occurs, and no Conservation Advice for the species occurs. No threats to the species have been listed for Australian wintering grounds by Birdlife Australia.
Significant Impact Assessment Required		Yes, the Oriental Cuckoo was confirmed present within the Survey area during targeted surveys. Suitable foraging and dispersal habitat was verified within the Survey area. Therefore, an MNES significant impact assessment was considered necessary for the species. An MSES SRI assessment would also ordinarily be required for this species; however, the MNES SIA is considered to adequately address the relevant impact pathways. This approach is consistent with the Commonwealth–Queensland legislative frameworks for offsets, which seeks to avoid duplication of offset requirements across jurisdictions where the same, or substantially the same, matter is assessed.
Species-species management measures required?		No , no key threats are identified for the species within Australia. Accordingly, it is considered that the implementation of general mitigation measures will be sufficient to avoid or minimise impacts to the remaining habitat and manage potential risks to the species.



5.3.2.2 Conservation Significant Mammals

The majority of the mammal species recorded were least concern species under the NC Act and were not listed under the EPBC Act. The exception being three conservation significant species, the threatened Koala and Greater Glider, and the SLC Short-beaked Echidna. Records within the Survey area for these three species are shown in Maps 16, 17 and 18 respectively in Appendix A.

Habitat for these conservation significant mammal species was verified within the Survey area during field surveys. Breeding and foraging habitat for the Koala is shown in Map 16, Appendix A. Dening and foraging habitat for the Greater Glider is shown in Map 17, Appendix A. And breeding and foraging habitat for the Short-beaked Echidna is shown in Map 18, Appendix A.

An assessment of habitat suitability for these conservation significant mammal species is provided below.

5.3.2.2.1 Koala

The Koala is listed as endangered under both the EPBC Act and the NC Act. The Koala has one of the widest distributions of any terrestrial threatened species in eastern Australia, ranging from north Queensland through NSW and into Victoria. Within Queensland, populations are patchily distributed across coastal and inland forests and woodlands (DAWE, 2022b). Despite still being relatively widespread, populations have declined significantly due to habitat loss, fragmentation, vehicle strike, disease and climate impacts. These ongoing pressures led to its conservation status being uplisted from vulnerable to endangered in 2022 for the combined populations of Queensland, NSW and the Australian Capital Territory (ACT; DAWE, 2022a).

Koalas inhabit eucalypt forests and woodlands but may also occur in regrowth or shrubland if it contains emergent food trees. They can persist in modified landscapes where suitable food trees remain. Food trees generally belong to the genera *Eucalyptus*, *Corymbia*, *Angophora*, *Lophostemon* and *Melaleuca* (DoE, 2014b).

Table 34 provides a summary of the habitat requirements, key threats, recorded presence within the Survey area and Area of interest, and our compliance with targeted survey requirements for the species.

Table 34
Koala occurrence
details

Koala	
Targeted Survey Guidelines met	Yes The Commonwealth recognises the <i>Review of Koala Habitat Assessment Criteria and Methods</i> (Youngentob et al., 2021) as the most current guiding document for determining whether an area is likely to be Koala habitat. Other supporting targeted methods such as spotlighting and infrared drone surveys can assist with determining whether a koala population occurs. Targeted survey effort employed for the Survey area included: • Whole Survey area walked or driven recording incidentals (~205 hrs). • 34 Habitat suitability assessments, to determine habitat suitability based on presence of locally important food trees in accordance with the <i>Review of Koala Habitat Assessment Criteria and Methods</i> (Youngentob et al., 2021). • 18 person hours spotlighting. • 50 Scat and sign searches. • Incidental records. These targeted efforts confirmed both the presence of breeding and foraging habitat for the Koala within the Survey area. Fauna survey effort shown in Map Series 3, Appendix A.
Occurrence	Survey area The Koala was recorded during field surveys within the ephemeral wetland in the south-eastern corner of the Survey area. The species has also previously been recorded within the Survey by EcoSM in 2019, adjacent to the Isaac River in the northern portion of the Survey area (EcoSM, 2020; records shown in Map 16, Appendix A).
	Area of Interest Multiple recent records are present in the Area of interest (shown in the inset of Map 16, Appendix A), include observations along the Isaac River and associated tributaries, as well as adjacent mining lease areas (E2M, 2021; AECOM, 2024). Essential habitat for the species has also been mapped



Koala	across parts of the Survey area within the Vegetation Management Supporting Map (refer to Map 4, Appendix A for essential habitat mapping).
Habitat	The Survey area supports a mosaic of breeding and foraging Koala habitat, with higher-value breeding habitat concentrated along the Isaac River and Cherwell Creek, and foraging habitat in adjacent remnant and high-value regrowth patches (habitat shown in Map 16, Appendix A). These areas contain suitable densities of food trees (as defined in Youngentob et al., 2021) and provide important breeding, foraging and dispersal opportunities. While some habitat is degraded from historical clearing, edge effects, cattle grazing and <i>Cenchrus ciliaris</i> * invasion, these riparian corridors continue to function as key movement pathways and refuges for the species.
Habitat Quality Score	6 - Habitat quality scoring provided in Appendix H
Connectivity of Habitat	Connectivity pathways for the Koala are highly fragmented, due to historical clearing for agriculture within the Region. The connectivity pathways that remain include riparian habitat along the Isaac River and Cherwell Creek. Koalas rely on well-connected habitats to access food, shelter, and breeding opportunities, with habitat linkages essential for maintaining gene flow and population resilience.
Likelihood of Occurrence after targeted survey	Known to occur The species was recorded during field surveys within the Survey area, hence was given the 'known to occur' likelihood of occurrence following targeted field surveys.
Availability of areas critical to the species survival, important habitat or important populations	Habitat critical for survival of the Koala includes areas that the species relies on to avoid, or halt decline and promote recovery of the species. The Conservation Advice for the Koala states that it is not practical to identify by description or provide spatial information on habitat critical to the survival of the Koala, due to insufficient knowledge and data. In absence of this, habitat critical for survival of the Koala is expected to include habitat occupied and habitat currently unoccupied, areas necessary for population processes and maintenance of genetic diversity and evolutionary potential, and areas required to accommodate future population increase recolonisation, reintroduction, or as climate refugia (DAWE, 2022a). An important population has also been defined by the Commonwealth, as those that are valued for cultural, social and economic reasons. In Queensland, priority areas are identified as SEQ (DAWE, 2022a). As such, the population verified within the Survey area would not be considered an important population. Based on the habitat definition, habitat critical for the survival of the Koala is likely to occur within all verified breeding and foraging habitat areas within the Survey area (habitat critical for the survival of the Koala shown in Map 16, Appendix A).
Threats	The <i>National Recovery Plan for the Koala</i> (DAWE, 2022b) lists the threats to the species as: • Heavy fragmentation and degradation of suitable koala habitat and locally important Koala trees and habitat loss to grazing land. • Lack of suitable permanent water sources. • Potential disease (e.g., Chlamydia). • Fire and drought. • Wild Dog (<i>Canis familiaris</i>)*predation.
Significant Impact Assessment Required	Yes , the Koala was confirmed present within the Survey area during targeted surveys. Suitable breeding and foraging habitat were verified within the Survey area, and this habitat would be considered habitat that is critical for the species survival. Therefore, an MNES significant impact assessment was considered necessary for the species. An MSES SRI assessment would also ordinarily be required for this species; however, the MNES SIA is considered to adequately address the relevant impact pathways. This approach is consistent with the Commonwealth–Queensland legislative frameworks for offsets, which seeks to avoid duplication of offset requirements across jurisdictions where the same, or substantially the same, matter is assessed.



Koala

Species-species management measures required?	Yes , the species has been confirmed within the Survey area, and the Project will directly impact breeding and foraging habitat, which constitute habitat critical to the survival of the species. In addition, there is potential for the Project to exacerbate existing threats (fragmentation and degradation of habitat, fire and predation) within retained habitat areas. Accordingly, species-specific management measures are required to reduce the risk of impacts and mitigate the potential for further decline.
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5.3.2.2.2 Greater Glider (central and southern)

The Greater Glider is listed as endangered under both the EPBC Act and the NC Act. The Greater Glider is a nocturnal marsupial restricted to eastern Australia, ranging from north Queensland through NSW to central Victoria. Populations are patchily distributed, with higher abundances in taller, moist eucalypt forests. The species is highly sensitive to habitat fragmentation and vegetation clearing, with declines linked to the loss of large hollow-bearing trees. Greater Gliders are folivores, feeding primarily on the leaves and flowers of eucalypts (TSSC, 2016d).

Table 35 provides a summary of the habitat requirements, key threats, recorded presence within the Survey area and Area of interest, and our compliance with targeted survey requirements for the species.

Table 35
Greater Glider
occurrence details

Greater Glider	
Targeted Survey Guidelines met	Yes. The Commonwealth recognises the <i>Guide to Greater Glider Habitat in Queensland</i> (Eyre, Smith, et. al. 2022) as the most current guiding document for determining whether an area is likely to be Greater Glider habitat. Other supporting targeted methods such as spotlighting in accordance with the <i>Survey Guidelines for Australia's Threatened Mammals</i> (DSEWPaC, 2011a) can assist with determining whether a Greater Glider population occurs. Targeted survey effort included: 34 Habitat suitability assessments, to determine habitat suitability based on presence of trees used by Greater Gliders for shelter and foraging in accordance with the <i>Guide to Greater Glider Habitat in Queensland</i> (Eyre, Smith, et. al. 2022). 18 person hours spotlighting (15,838 m cumulative transect length over a 450 ha area of habitat) These targeted efforts confirmed both the presence of denning and foraging habitat for the Greater Glider within the Survey area. Fauna survey effort shown in Map Series 3, Appendix A.
Occurrence	Survey area The Greater Glider was recorded extensively throughout the Survey area, with Trend Environmental field surveys recording the species 31 times in 2024 and 2025 (records shown in Map 17, Appendix A). The species was frequently detected in mature Eucalypt forest supporting a high density of hollow-bearing trees, consistent with its known reliance on structurally complex, relatively undisturbed vegetation. The highest abundances were observed within riparian habitats associated with the Isaac River and Cherwell Creek, where continuous canopy cover and large-diameter eucalypts provide optimal foraging and denning resources. This species has also previously been recorded within the Survey area by DPM Envirosciences, with eight records in 2018 (DPM Envirosciences, 2018a), and by EcoSM with 47 records in 2020 (EcoSM, 2020). These records were also concentrated within the riparian habitat for the Isaac River and Cherwell Creek (records shown in Map 17, Appendix A).
	Area of Interest The species has been recorded extensively within the broader Area of interest (see records within inset of Map 17, Appendix A).
Habitat	The Survey area supports a mosaic of denning and foraging habitat for the species, with higher-value breeding habitat concentrated along the Isaac River and Cherwell Creek, and foraging habitat in adjacent remnant and high-value regrowth patches (habitat shown in Map 17, Appendix A). These areas contain suitable densities of hollow-bearing trees and foraging resources for the species. While some habitat is degraded from historical clearing, edge effects, cattle grazing and <i>Cenchrus ciliaris</i>* invasion, these riparian corridors continue to function as key movement pathways and refuges for the species.



Greater Glider	
Habitat Quality Score	5 - Habitat quality scoring provided in Appendix H
Connectivity of Habitat	Connectivity pathways for the Greater Glider are highly fragmented, due to historical clearing for agriculture within the Region. The connectivity pathways that remain include riparian habitat along the Isaac River and Cherwell Creek. Greater Gliders rely on continuous, well-connected tree cover, as their ability to disperse is limited by a maximum gliding distance of around 100 m (Kehl & Borsboom, 1984), making breaks in canopy a significant barrier to movement and gene flow.
Likelihood of Occurrence after targeted survey	Known to occur The species was recorded during field surveys within the Survey area and as such was given the 'known to occur' likelihood of occurrence following targeted field surveys.
Availability of areas critical to the species survival, important habitat or important populations	Habitat critical for the survival of the species includes large tracts of contiguous eucalypt forests with mature hollow-bearing trees, cool microclimate forests and short-term post fire refuges. Most of the habitat within the Survey area is fragmented, except for the riparian habitat areas along Isaac River and Cherwell Creek, which supports mature hollow-bearing trees. An important population has been defined by the Commonwealth, with all populations being recognised as important (TSSC, 2016d). Based on these habitat definitions, habitat critical for the survival of the Greater Glider is likely to occur within all verified breeding and foraging habitat areas within the Survey area (critical habitat areas shown in Map 17, Appendix A), and the population that occurs within the Survey area would be recognised as an important population.
Threats	No Recovery Plan for the species occurs, but threats to the species are listed in the Conservation Advice (TSSC, 2016d), which include: • Inappropriate fire regimes. • Habitat clearing and fragmentation. • Timber harvesting. • Barbed wire fencing in agricultural areas. • Climate change. • Predation by Feral Cats and European Red Foxes.
Significant Impact Assessment Required	Yes , the Greater Glider was confirmed present within the Survey area during targeted surveys. Suitable breeding and foraging habitat were verified within the Survey area, and this habitat would be considered habitat that is critical for the species survival, and the population considered an important population. Therefore, an MNES significant impact assessment was considered necessary for the species. An MSES SRI assessment would also ordinarily be required for this species; however, the MNES SIA is considered to adequately address the relevant impact pathways. This approach is consistent with the Commonwealth–Queensland legislative frameworks for offsets, which seeks to avoid duplication of offset requirements across jurisdictions where the same, or substantially the same, matter is assessed.
Species-species management measures required?	Yes , the species has been confirmed within the Survey area, and the Project will directly impact breeding and foraging habitat, which constitute habitat critical to the survival of the species. In addition, there is potential for the Project to exacerbate existing threats (fragmentation of habitat, fire, barbed wire fencing and predation) within retained habitat areas. Accordingly, species-specific management measures are required to reduce the risk of impacts and mitigate the potential for further decline.

5.3.2.2.3 *Short-beaked Echidna*

The Short-beaked Echidna is listed as SLC under the NC Act due to its cultural significance. The Short-beaked Echidna is Australia's most widespread native mammal, occurring across all states and territories, including Tasmania. It is highly adaptable and inhabits a broad range of habitats, from arid deserts to coastal heath, forests, and woodlands (Australian Museum, 2018). Short-beaked Echidnas are solitary and wide-ranging, with overlapping home ranges of up to 50 ha (Augee, Gooden & Musser, 2006). They primarily feed on ants and termites, accessing them with a long extensile tongue and strong forelimbs adapted for digging. Shelter sites are varied and include hollow logs, rock crevices, burrows, and dense ground vegetation, which provide protection from predators and extreme temperatures.



Table 36 provides a summary of the habitat requirements, key threats, recorded presence within the Survey area and Area of interest, and our compliance with targeted survey requirements for the species.

Table 36
Short-beaked
Echidna occurrence
details

Short-beaked Echidna

Targeted Survey Guidelines met	No State of Commonwealth targeted survey guidelines have been defined for this species. Targeted survey effort employed for the Short-beaked Echidna in the Survey area included: • Whole Survey area walked or driven recording incidentals (205 hrs). • 34 Habitat suitability assessments, to determine habitat suitability based on presence of microhabitat features. • 18 person hours spotlighting. • Incidental records. Fauna survey effort shown in Map Series 3, Appendix A.
Occurrence	Survey Area Within the Survey area, the Short-beaked Echidna was recorded through the presence of scats observed in Brigalow woodland habitat along riparian corridors of the Isaac River (Map 18, Appendix A). Area of Interest The species has extensive records within the broader Area of interest (see inset of Map 18, Appendix A). These records are primarily associated with mining lease areas and major arterial roads that have been subject to survey effort and frequent traffic.
Habitat	Potential habitat was identified throughout remnant and high-value regrowth areas of the Survey area (habitat shown in Map 18, Appendix A). In particular, the Brigalow riparian areas provide an abundance of foraging opportunities due to abundant termite populations and provide refuge areas within coarse woody debris, soil burrows, and dense understory patches.
Likelihood of Occurrence after targeted survey	Known to occur The Short-beaked Echidna was confirmed within the Survey area during field surveys, hence was given the 'known to occur' likelihood of occurrence following targeted field surveys.
Threats	The threats to the species within the Survey area include (Australian Wildlife Conservancy, 2025): • Feral dogs, cats and foxes can take young. • Often killed by cars on roads. • Habitat loss or degradation.
Significant Impact Assessment Required	Yes , The Short-beaked Echidna was confirmed present within the Survey area during targeted surveys. This species is not recognised as an MNES under the EPBC Act, but its habitat is recognised as an MSES under the <i>EO Act</i> . Therefore, an MSES SRI assessment was considered necessary for the species habitat (MSES protected wildlife habitat).
Species-species management measures required?	No, the Short-beaked Echidna is a SLC species and is not at risk of decline to threatened status. The species is widespread and adaptable to a range of habitat types. Accordingly, the implementation of generalised mitigation measures (e.g., implementation of a Weed and Pest Management Plan, staged clearing, pre-clearing inspections and fauna management procedures) as detailed in <i>Section 7 Impact Mitigation</i> is considered sufficient to avoid or minimise impacts to individuals and remaining habitat. Species-specific management measures are therefore not required.

5.3.2.3 Conservation Significant Reptiles

Ornamental Snake

This small, nocturnal and venomous snake is endemic to central Queensland. It is typically olive to brown in colour, with a black crown and distinctively barred lips. The species is a habitat specialist strongly associated with cracking clay soils (gilgai microrelief), particularly within Brigalow and Coolabah communities, as well as around wetlands and low-lying floodplain habitats (WWF and QMDC, 2008).

The Ornamental Snake is known to inhabit gilgai systems which provide both refuge and foraging habitat. When inundated, gilaig support frog species such as *Litoria caerulea* (Green Tree Frog) and *Cyclorana alboguttata* (Green Stripe Frog), which



form its primary prey base. As conditions dry, the deep soil cracks provide daytime and drought refuge, making gilgais a critical habitat feature (Kerswell et al., 2020).

The species has a capacity to persist in disturbed, or regrowth Brigalow provided gilgai features remain intact, but habitat quality is generally reduced where grazing, trampling and pasture modification are extensive.

The Ornamental Snake is listed as vulnerable under both the EPBC Act and NC Act. The Ornamental Snake occurs in open-forests to woodlands associated with gilgai formations and wetlands. These are commonly mapped as REs 11.3.3, 11.4.3, 11.4.6, 11.4.8, 11.4.9, 11.5.16 or mapped as cleared but where these REs formerly occurred (DoE, 2014a).

Table 37 provides a summary of the habitat requirements, key threats, recorded presence within the Survey area and Area of interest, and our compliance with targeted survey requirements for the species.

Table 37
Ornamental Snake
occurrence details

Ornamental Snake	
Targeted Survey Guidelines met	Yes The Commonwealth's <i>Draft referral guidelines for the nationally listed Brigalow Belt reptiles (DCCEEW, 2023)</i> defines one-off diurnal searches (1.5 person hours per ha over 3 days), spotlighting (1.5 person hours per ha over 3 days), opportunistic surveys of roads, and pitfall and funnel trapping (over 4 nights; 2 replicates per habitat type). Targeted survey effort employed for the Ornamental Snake in the Survey area included: • 34 Habitat suitability assessments • 18 person hours spotlighting. • Seven replicate pitfall and funnel trap sites. • 41 active searches. • Incidental records. Fauna survey effort shown in Map 4, Appendix A.
Occurrence	No individuals of the Ornamental Snake were recorded within the Survey area during field surveys conducted by Trend Environmental. Previously however, the Ornamental Snake was recorded by EcoSM in 2020 within a wetland area within the Survey area surrounded by Brigalow and Coolabah vegetation communities (EcoSM, 2020; Map 19, Appendix A).
Survey area	
Area of Interest	Multiple regional surveys have confirmed the species is present in the broader landscape, including at Winchester South Mine, 5 km to the southeast of the Survey area (13 individuals recorded in Brigalow regrowth within gilgais during 2019–2020 surveys; E2M, 2021) and Olive Downs Mine, 15 km to the southeast of the Survey area (nine records across gilgai clays, wetlands, and Acacia woodlands; DPM Envirosiences, 2018). These frequent observations highlight the persistence of the Ornamental Snake across gilgai-bearing Brigalow habitats in the local landscape.
Habitat	Breeding, foraging and dispersal habitat for the Ornamental Snake has been confirmed within the Survey area, albeit highly fragmented (Map 19, Appendix A). Breeding habitat occurs within Brigalow communities associated with gilgai formations, particularly along Conrock Gully and near ephemeral wetlands, adjacent to the Isaac River. Foraging habitat occurs in fragmented gilgai-bearing clay systems within Brigalow patches typically adjacent to wetland features. While dispersal habitat occurs in regrowth Brigalow areas providing some linkage to breeding or foraging habitat.
Habitat Quality Score	5 - Habitat quality scoring provided in Appendix H
Connectivity of Habitat	The connectivity of habitat for the Ornamental Snake within the Survey area is highly fragmented. The species relies on large areas of connected gilgai habitat with cracking clay soils to sustain viable populations. When habitat availability is this limited, opportunities for dispersal, access to prey and shelter, and genetic exchange are effectively absent, making the persistence of the species in such a small, isolated patch highly improbable. This species was recorded within the Survey area by EcoSM in 2020 (EcoSM, 2020), however was not recorded by Trend Environmental during targeted surveys, which suggests that either



Ornamental Snake

	the species may occur at low densities, there was a decline in local occurrence since 2020 and/or that current detectability was constrained by the species' cryptic behaviour.
Likelihood of Occurrence after targeted survey	Known to occur As described above, the species has previously been recorded within the Survey area by EcoSM in 2020 (EcoSM, 2020), and breeding, foraging and dispersal habitat, albeit highly fragmented, was confirmed within the Survey area. Hence the species was given the 'known to occur' likelihood of occurrence.
Availability of areas critical to the species survival, important habitat or important populations	No critical habitat for the survival of the species has been defined. Important habitat however has been identified as gilgai depressions and mounds (DCCEEW, 2023). Habitat connectivity between gulgais and other suitable habitats is also important. As the Ornamental Snake is difficult to detect and population information is limited, the Department regards important habitat as a surrogate for an important population. Suitable habitat for this species is considered important if it is: • Habitat where the species has been identified during a survey; • Near the limit of the species' known range; • Large patches of contiguous, suitable habitat and viable landscape corridors (necessary for the purposes of breeding, dispersal or maintaining the genetic diversity of the species over successive generations); or • A habitat type where the species is identified during a survey but was previously thought not to support the species (DCCEEW, 2023). Given the previous record within the Survey area by EcoSM (2019), the verified breeding and foraging habitat for the species within the Survey area would be considered important habitat (important habitat areas shown in Map 19, Appendix A). Dispersal habitat has not been considered important habitat for this species due to its highly fragmented and isolated nature within the Survey area. As important habitat is a surrogate for an important population, the population that occurs within the Survey area would be considered an important population.
Threats	No Recovery Plan for the species exists, however threats are listed in the Conservation Advice (DoE, 2014a). These threats include: • Continued legacy of past broadscale land clearing and habitat degradation. • Destruction of wetland habitat by Feral Pigs*, associated destruction of frog habitat and direct competition for their food source (frogs; WWF and QMDC, 2008) • Poisoning resulting from the ingestion of Cane Toads* (Phillips et al., 2003).
Significant Impact Assessment Required	Yes, while the Ornamental Snake was not confirmed present within the Survey area during targeted surveys. Breeding habitat and foraging and dispersal habitat were verified within the Survey area, with breeding and foraging habitat being considered important habitat, and the population considered an important population. Therefore, an MNES significant impact assessment was considered necessary for the species. An MSES SRI assessment would also ordinarily be required for this species; however, the MNES SIA is considered to adequately address the relevant impact pathways. This approach is consistent with the Commonwealth–Queensland legislative frameworks for offsets, which seeks to avoid duplication of offset requirements across jurisdictions where the same, or substantially the same, matter is assessed.
Species-species management measures required?	Yes, the species has been confirmed within the Survey area, and the Project will directly impact breeding and foraging habitat, which constitute important habitat for the species. In addition, there is potential for the Project to exacerbate existing threats (habitat degradation and predation) within retained habitat areas. Accordingly, species-specific management measures are required to reduce the risk of impacts and mitigate the potential for further decline.



5.4 BIOSECURITY RISKS

5.4.1 Introduced Flora

A total of 36 introduced flora species were recorded within the Survey area during field surveys. Introduced flora were concentrated in non-remnant areas of the Survey area; however, weed species were also recorded within the ground and shrub layers of remnant and regrowth polygons.

Of these introduced species, twelve are listed as Category 3¹ restricted matters under the Biosecurity Act (as listed in Schedule 2, Part 2) and eight species are identified as WoNS. Accounting for overlap between these legislative and policy frameworks, a total of 14 weed species are recognised as priority weeds, as listed in Table 38.

Under Part 1 of the Biosecurity Act, all individuals and organisations have a GBO to take all reasonable and practical measures to minimise biosecurity risks under their control. This includes preventing the introduction and spread of declared pest plants and managing existing infestations in a way that is consistent with recognised management practices.

The *Isaac Region Biosecurity Plan 2024–2027* (Liveability and Sustainability, 2024) also identifies priority weed species of environmental, economic, or social concern within the Region. Twelve of the weed species recorded within the Survey area are listed as priority species under this Plan (Table 38).

Table 38
Priority weed
species recorded
within the Survey
area

Scientific Name	Common Name	WoNS ¹	Biosecurity Matter ²	Isaac Region Biosecurity Plan – Priority weeds
<i>Bryophyllum daigremontianum</i>	Mother of Millions	-	Restricted Category 3	Yes
<i>Cryptostegia grandiflora</i> *	Rubber Vine	Yes	Restricted Category 3	Yes
<i>Harrisia martinii</i> *	Harrisia Cactus	-	Restricted Category 3	Yes
<i>Hymenachne amplexicaulis</i> *	Hymenachne	Yes	Restricted Category 3	Yes
<i>Jatropha gossypifolia</i> *	Bellyache Bush	Yes	Restricted Category 3	Yes
<i>Lantana camara</i> *	Lantana	Yes	Restricted Category 3	Yes
<i>Lantana montevidensis</i> *	Creeping Lantana	-	Restricted Category 3	-
<i>Leucaena leucocephala</i> *	Leucaena	-	-	Yes
<i>Opuntia tomentosa</i> *	Velvety Prickly Pear	Yes	Restricted Category 3	Yes
<i>Opuntia stricta</i> *	Prickly Pear	Yes	Restricted Category 3	Yes
<i>Neptunia oleracea</i>	Water Mimosa	-	Restricted Category 2, 3, 4, 5	-
<i>Parthenium hysterophorus</i> *	Parthenium Weed	Yes	Restricted Category 3	Yes
<i>Vachellia nilotica</i> *	Prickly Acacia	Yes	Restricted Category 3	Yes
<i>Vachellia farnesiana</i> *	Mimosa Bush	-	-	Yes

¹ WoNS = Weed of National Significance

² A biosecurity matter refers to matters which are listed under the Biosecurity Act. A 'Prohibited' matter is a biosecurity matter that is not currently present in Queensland, but would have a significant adverse impact on social, economic, health or environment if it entered the state. A 'Restricted matter' refers to a biosecurity matter found in Queensland which has a significant impact on social, economic, health or environment.

5.4.2 Introduced Fauna

Eight introduced and restricted vertebrate fauna species were recorded within the Survey area during field surveys. These included Cane Toad*, Wild Dog*, European Fox*, Feral Cat*, and Feral Deer (*Cervus elaphus*)*, European Rabbit (*Oryctolagus cuniculus*)*, Feral Pig* and Domestic Cattle (*Bos taurus*)*. Several of these species are recognised as restricted matters under the Biosecurity Act and/or listed as priority pest species under the *Isaac Region Biosecurity Plan 2024–2027* (Table 39).

¹ Under the Biosecurity Act, a Category 3 restricted matter is defined as restricted biosecurity matter that must not be distributed (e.g., selling, giving away, trading, supplying or releasing into the environment) unless authorised under the Biosecurity Regulation 2026 (Qld) or by a permit.



While these species were not strongly associated with a specific habitat type within the Survey area, Cane Toads* were observed in higher concentrations across alluvial and wetland areas, and Feral Cats* and Wild Dogs* were recorded where there was adequate canopy cover within remnant and regrowth polygons. The presence of these introduced fauna species has the potential to contribute to ongoing ecological pressures through predation, grazing, competition with native fauna, and habitat disturbance.

Table 39
Introduced fauna
species recorded
within the Survey area

Type	Species	Biosecurity Matter ¹	Isaac Region Biosecurity Plan – Priority Pests	Habitat Suitability
Pest Amphibians	Cane Toad, <i>Rhinella marina</i>	-	-	All habitat types, particularly riparian corridors and fringing vegetation, and wetlands and ephemeral drainage features
Pest Mammals	Wild Dog, <i>Canis familiaris</i>	Restricted Matter (Category 3,4,6)	Priority Pest	All habitat types
	Fox, <i>Vulpes vulpes</i>	Restricted Matter (Category 3,4,5,6)	-	All habitat types
	Feral Cat, <i>Felis catus</i>	Restricted Matter (Category 3,4,6)	Priority Pest	All habitat types
	Feral Deer, <i>Cervus elaphus</i>	Restricted Matter (Category 3,4,6)	Priority Pest	All habitat types
	European Rabbit, <i>Oryctolagus cuniculus</i>	Restricted Matter (Category 3,4,5,6)	-	All habitat types
	Feral Pig, <i>Sus scrofa</i>	Restricted Matter (Category 3,4,6)	Priority Pest	All habitat types
	Domestic Cattle, <i>Bos taurus</i>	-	-	Cleared pastoral areas

¹Biosecurity matter refer to matters which are listed under the Biosecurity Act. 'Prohibited' matters are biosecurity matter that are not currently present in Queensland, but would have a significant adverse social, economic, health or environment impact on if it entered the state. 'Restricted matter' refers to biosecurity matter found in Queensland which have a significant impact on social, economic, health or environmental issues.

5.5 WATERCOURSES AND WETLANDS

5.5.1 Watercourses

Named watercourses throughout the Survey area include the Isaac River, Cherwell Creek, Conrock Gully and J B Gully (shown in Map 1, Appendix A). Five other unnamed water features occur within the Survey area, hereon referred to as two unnamed tributaries of the Isaac River, unnamed tributary of Conrock Gully, unnamed tributary of Cherwell Creek and unnamed tributary of J B Gully (shown in Map 20, Appendix A).

These watercourses and water features are recognised under various legislation, specifically the VM Act, Water Act and Fisheries Act. Under the VM Act all named and unnamed water features are recognised as watercourses (watercourse recognised under the VM Act are shown in Map 7, Appendix A).

Under the Water Act, the Isaac River, Cherwell Creek and the portion of Conrock Gully near the confluence with the Isaac River are recognised as defined watercourses, while all other water features are recognised as drainage features or are 'unmapped' (watercourses, drainage features and 'unmapped' water features recognised under the Water Act shown in Map 20, Appendix A).

Under the Fisheries Act, waterways are recognised for fish passage for waterway barriers works. The waterways recognised within the Survey area include:

- Two purple (major risk) waterways (the Isaac River and Cherwell Creek).
- Two amber (moderate risk) waterway (Conrock Gully and J B Gully)
- Five green (low risk) waterways (two unnamed tributaries of the Isaac River, the unnamed tributary of Conrock Gully, the unnamed tributary of Cherwell Creek and the unnamed tributary of J B Gully).



These waterways for fish passage within the Survey area are shown in Map 22, Appendix A.

All named and unnamed watercourses in the Survey area are ephemeral, flowing only following large rainfall events, typically during wet season months. The riparian habitat associated with these watercourses provide ecological corridors between viable patches of vegetation.

During the dry season, these watercourses are mostly empty of water, with some standing water within pocket depressions. During the wet season, the watercourses contained braided stream systems within the bed of the watercourses and drainage lines containing standing water within pocket depressions.

Table 40 provides details of the named and unnamed watercourses within the Survey area, their classification under different Queensland legislation, and their condition during dry and wet seasons.

Table 40
Watercourses
and drainage
lines within the
Survey area

	Water Act Classification	VM Act Stream Order	Fisheries Act WWBW ¹ Risk Rating	Riparian vegetation (Corresponding REs)
ISAAC RIVER	Watercourse	6	Purple (Major Risk)	11.3.25, 11.3.4
	Dry Season	Wet Season		
				
	Description: The Isaac River within the confines of the Survey area is an ephemeral watercourse. The channel is well-defined, exhibiting a bankfull width of approximately 100 m and a bankfull height of around 8 m. Evidence of local catchment erosion was observed, with significant deposition of sands within the channel resulting from upstream erosion processes. The bed substrate comprised sand and gravel. No notable in-stream habitat features were identified. Upstream land use includes coal mining activities as well as moderate cattle grazing on predominantly cleared lands. Adjacent land use within the Survey area is also dominated by moderate cattle grazing on mostly cleared agricultural land. These activities likely contributing to sediment inputs and erosion evident within the channel.			
	Reference in Aquatic Ecology Report: AQ1, AQ9 and AQ10 (Freshwater Ecology, 2026)			



CHERWELL CREEK	Watercourse	5	Purple (Major Risk)	11.3.25
	Dry Season	Wet Season		
				
	Description: Cherwell Creek is an ephemeral watercourse. The channel is well-defined, exhibiting a bankfull width of approximately 100 m and a bankfull height of 7 m. Evidence of local catchment erosion was observed, with significant deposition of sands within the channel resulting from upstream erosion processes. The bed substrate comprised sand and gravel. No notable in-stream habitat features were identified. Upstream land use includes coal mining activities as well as moderate cattle grazing on predominantly cleared lands. Adjacent land use within the Survey area is also dominated by moderate cattle grazing on cleared agricultural land. These activities are likely contributing to sediment inputs and erosion evident within the channel. Reference in Aquatic Ecology Report: AQ3, AQ4 and AQ5 (Freshwater Ecology, 2026)			
CONROCK GULLY	Drainage Feature and watercourse	2	Amber (Medium Risk)	11.3.1, 11.3.2, 11.3.3, 11.3.4 and 11.5.3
	Dry Season	Wet Season		
				
	Description: Conrock Gully is an ephemeral second order watercourse and drainage line; it was observed to contain small pools of standing water throughout the dry and wet season surveys; it contains well-defined bed and banks; with evidence of local catchment erosion, as a result of immediate clearing within the defined bank area and its surroundings. The bankfull width is approximately 12 m and bankfull height 2.5 m. Natural in-stream habitat features are likely buried by deposited sand. The banks are composed of sand and silty clays and bed substrates comprised silt/clay. Upstream land use includes moderate cattle grazing on predominantly cleared land. While adjacent land use includes grazing on cleared land along the right bank and the left bank. Reference in Aquatic Ecology Report: AQ6, AQ7, AQ* and AQ11 (Freshwater Ecology, 2026)			



J B GULLY	Watercourse	2	Amber (Medium Risk)	11.3.2, 11.3.25 and 11.5.3
	Description: JB Gully is an ephemeral second order drainage line. It was observed to be dry during both the wet and dry season surveys. The Gully contains well-defined bed and banks with little evidence of local catchment erosion, but substantial deposition of sand from upstream catchments. The bankfull width is approximately 25 m and bankfull height 0.8 m. Natural in-stream habitat features are likely buried by deposited sand. The banks are composed of sand and light clays. Bed substrates are comprised of sand and silt/clay. Upstream land use includes moderate cattle grazing on predominantly cleared land. While adjacent land use includes grazing on cleared land along the right bank and remnant vegetation beyond the left bank.			
	Reference in Aquatic Ecology Report: AH5 (Freshwater Ecology, 2026)			
2x UNNAMED TRIBUTARIES OF THE ISAAC RIVER	One Drainage Feature, one unmapped	1	Green (Low Risk)	11.3.1, 11.3.2, 11.3.7 and 11.3.25
	Description: Ephemeral first order drainage line with evidence of shallow isolated pools during the dry and wet season survey, however no discernible flow was observed. Well defined bed and banks with some local catchment erosion, moderate deposition of sands and a minor deposition of silt/clays. Bed substrates are variable, comprised of boulders, gravel, sands and silt/clays. Bankfull width was approximately 5 m and bankfull height 4.5 m. Upstream land use includes moderate cattle grazing on predominantly cleared land.			
	Reference in Aquatic Ecology Report: Nil and AH1 (Freshwater Ecology, 2026)			
UNNAMED TRIBUTARY OF CONROCK GULLY	Drainage Feature	1	Green (Low Risk)	11.3.21/11.8.11 and 11.5.
	Description: Ephemeral first order drainage line with a dense cover of native grasses, and exotic grasses and forbs. During the dry and wet season surveys no water was observed within the bed of the stream. The bed and banks are defined with some clear erosion as a result of lack of riparian cover. Bed substrates consisted of black silt and clays. The bankfull width was approximately 10m and bankfull height 0.2 m. Upstream land use includes moderate cattle grazing and quarry activity on predominantly clear land. Downstream the natural flow towards Conrock Gully has been modified as a result of a farm dam which collects the water from the watercourse.			
	Reference in Aquatic Ecology Report: AH3 (Freshwater Ecology, 2026)			
UNNAMED TRIBUTARY OF CHERWELL CREEK	Unmapped	1	Green (Low Risk)	11.3.2, 11.5.3 and 11.3.25
	Description: Ephemeral first order drainage line with a lack of riparian cover. During the dry and wet season surveys no water was observed within the bed of the stream. The bed and banks are defined with some clear erosion as a result of lack of riparian cover. Bed substrates consisted of silt and clays. The bankfull width was approximately 3.5m and bankfull height 1m. Upstream land use include moderate cattle grazing on predominantly clear land.			
	Reference in Aquatic Ecology Report: Nil (Freshwater Ecology, 2026)			



UNNAMED TRIBUTARY OF J B GULLY	Unmapped	1	Green (Low Risk)	11.5.3
	Description: Ephemeral first order drainage line with a lack of riparian cover along most of its length. During the dry and wet season surveys no water was observed within the bed of the stream. The bed and banks are defined with some clear erosion as a result of lack of riparian cover.			
	Bed substrates consisted of silt and clays. The bankfull width was approximately 3.5m and bankfull height 1m. Upstream land use include moderate cattle grazing on predominantly clear land.			
	Reference in Aquatic Ecology Report: AH6 (Freshwater Ecology, 2026)			

¹ WWBW = Waterway Barrier Works, as recognised under the Fisheries Act . Waterways providing for fish passage are shown in Map 18, Appendix A.

5.5.2 Wetlands

Through the application of the *Queensland Wetland Definition and Delineation Guideline* (DES, 2023) the VM Act and HES wetlands were assessed. This assessment identified three field-verified wetlands and gilgais areas, and four seasonally inundated depressions within the Survey area, which was subsequent verified by the Aquatic Ecology Assessment (Freshwater Ecology, 2026).

The verified wetlands and depressions are shown in Map 20, Appendix A. The HES wetland (AQUABAMM unit IS_W0026) is located in the south-eastern portion of the Survey area

The field-verified wetlands were palustrine systems associated with RE11.3.27b, while the field-verified depressions were associated with RE11.3.27b, 11.4.9, 11.5.3b or non-remnant areas. The field-verified wetlands and depressions are hydrologically natural and occur as ephemeral systems.

The field-verified wetlands provide ecological functions including seasonal refuges which supports wetland-dependent flora and fauna when inundated. During the dry season, the wetlands were devoid of surface water and impacted by cattle grazing, whereas during the wet season, they supported shallow marshes with ephemeral inundation, and fringing vegetation characteristic of RE 11.3.27b. During the wet season, the wetlands provide foraging and breeding habitat for a high diversity of amphibians and waterbirds, including species dependent on seasonal wetlands for their life cycles. They also attract introduced fauna species such as the Cane Toad*, which were recorded in high numbers, highlighting both the ecological value of these systems and the threats posed by pest species.

The seasonally inundated depressions featured low to no presence of aquatic macrophytes, relatively shallow depth during wet season surveys, and were primarily occupied by grassland or sparse woodlands (Freshwater Ecology, 2026).

Table 41 provides details of the field-verified VM Act wetlands within the Survey area.

Table 41
Field verified
wetlands
within the
Survey area

ID	QLD Wetland Area	VM Act Wetland	HES Wetland	GTRE
1	Palustrine wetlands [hydrologically natural]	Verified	Mapped	11.3.27b
Dry Season		Wet Season		
				



ID	QLD Wetland Area	VM Act Wetland	HES Wetland	GTRE
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Wetland Determination: Represents a palustrine wetland characterised by permanent to periodic inundation, as evidenced by the presence of open water and a diverse assemblage of aquatic and emergent macrophytes including *Potamogeton crispus*, *Myriophyllum verrucosum*, *Chara spp.*, *Nitella spp.*, *Nymphaea violacea*, *Ottelia ovalifolia*, *Nymphoides indica*, *N. crenata*, *Potamogeton tricarinatus*, *Cyperus difformis*, *Vallisneria caulescens* and *Hydrilla verticillata*, with fringing woodland of *eucalyptus tereticornis* and *eucalyptus populnea*. Soils comprise predominantly clay loam with evidence of prolonged saturation and compacted clay in the lithic profile, indicating low permeability and anaerobic conditions conducive to sustained ponding. Based on the presence of wetland hydrology, wetland-adapted biota and hydric soil/substratum characteristics, the area meets the criteria for a wetland under the Queensland Wetland Definition Guidelines.

Reference in Aquatic Ecology Report: AQ2 (Freshwater Ecology, 2026)

2	Palustrine wetlands [hydrologically natural]	Verified	No	11.3.27b
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Dry Season



Wet Season



Wetland Determination: Represents a palustrine wetland characterised by permanent to periodic inundation, as evidenced by the presence of open water and a diverse assemblage of aquatic and emergent macrophytes including *Potamogeton crispus*, *Myriophyllum verrucosum*, *Chara spp.*, *Nitella spp.*, *Nymphaea violacea*, *Ottelia ovalifolia*, *Nymphoides indica*, *N. crenata*, *Potamogeton tricarinatus*, *Cyperus difformis*, *Vallisneria caulescens* and *Hydrilla verticillata*, with fringing woodland of *eucalyptus tereticornis* and *eucalyptus populnea*. Soils comprise predominantly clay loam with evidence of prolonged saturation and compacted clay in the lithic profile, indicating low permeability and anaerobic conditions conducive to sustained ponding. Based on the presence of wetland hydrology, wetland-adapted biota and hydric soil/substratum characteristics, the area meets the criteria for a wetland under the Queensland Wetland Definition Guidelines.

Reference in Aquatic Ecology Report: AH11 (Freshwater Ecology, 2026)



3	Palustrine wetlands [hydrologically natural]	Mapped	No	11.3.27b
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Dry Season



Wet Season



Wetland Determination: Represents a palustrine wetland characterised by permanent to periodic inundation, as evidenced by the presence of open water and a diverse assemblage of aquatic and emergent macrophytes including *Potamogeton crispus*, *Myriophyllum verrucosum*, *Chara spp.*, *Nitella spp.*, *Nymphaea violacea*, *Ottelia ovalifolia*, *Nymphoides indica*, *N. crenata*, *Potamogeton tricarlinatus*, *Cyperus difformis*, *Vallisneria caulescens* and *Hydrilla verticillata*, with fringing woodland of *eucalyptus tereticornis* and *eucalyptus populnea*. Soils comprise predominantly clay loam with evidence of prolonged saturation and compacted clay in the lithic profile, indicating low permeability and anaerobic conditions conducive to sustained ponding. Based on the presence of wetland hydrology, wetland-adapted biota and hydric soil/substratum characteristics, the area meets the criteria for a wetland under the Queensland Wetland Definition Guidelines.

Reference in Aquatic Ecology Report: AH12 (Freshwater Ecology, 2026)

4	Depression	Verified	No	11.3.27b
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Dry Season



Wet Season



Wetland Determination: The mapped depressions exhibit limited evidence of sustained or periodic inundation and do not support vegetation communities adapted to or dependent on wet conditions, with plant assemblages dominated by terrestrial species rather than aquatic or hydrophytic taxa. Soil is predominantly sandy, indicating high permeability and poor water retention, which limits the capacity for prolonged saturation, ponding, or the development of anaerobic (hydric) conditions within the soil profile. In the absence of supporting wetland biota and hydric soil or substratum characteristics, these features do not satisfy the hydrology, biotic or soil criteria outlined in the Queensland Wetland Definition Guidelines and are therefore not considered wetlands.

Reference in Aquatic Ecology Report: AH2 (Freshwater Ecology, 2026)



5	Depression	Not verified	No	11.4.9
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Dry Season



Wet Season

No wet season photo monitoring point taken.

Wetland Determination: The mapped depressions exhibit limited evidence of sustained or periodic inundation and do not support vegetation communities adapted to or dependent on wet conditions, with plant assemblages dominated by terrestrial species rather than aquatic or hydrophytic taxa. Soils are predominantly sandy, indicating high permeability and poor water retention, which limits the capacity for prolonged saturation, ponding, or the development of anaerobic (hydric) conditions within the soil profile. In the absence of supporting wetland biota and hydric soil or substratum characteristics, these features do not satisfy the hydrology, biotic or soil criteria outlined in the Queensland Wetland Definition Guidelines and are therefore not considered wetlands

Reference in Aquatic Ecology Report: Nil (Freshwater Ecology, 2026)

6	Depression	Not verified	No	11.5.3b
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Dry Season



Wet Season



Wetland Determination: (no photos) The mapped depressions exhibit limited evidence of sustained or periodic inundation and do not support vegetation communities adapted to or dependent on wet conditions, with plant assemblages dominated by terrestrial species rather than aquatic or hydrophytic taxa. Soils are predominantly sandy, indicating high permeability and poor water retention, which limits the capacity for prolonged saturation, ponding, or the development of anaerobic (hydric) conditions within the soil profile. In the absence of supporting wetland biota and hydric soil or substratum characteristics, these features do not satisfy the hydrology, biotic or soil criteria outlined in the Queensland Wetland Definition Guidelines and are therefore not considered wetlands.

Reference in Aquatic Ecology Report: AH9 (Freshwater Ecology, 2026)



7	Depression	Not verified	No	Non-remnant
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Wetland Determination: (no photos) The mapped depressions exhibit limited evidence of sustained or periodic inundation and do not support vegetation communities adapted to or dependent on wet conditions, with plant assemblages dominated by terrestrial species rather than aquatic or hydrophytic taxa. Soil is predominantly sandy, indicating high permeability and poor water retention, which limits the capacity for prolonged saturation, ponding, or the development of anaerobic (hydric) conditions within the soil profile. In the absence of supporting wetland biota and hydric soil or substratum characteristics, these features do not satisfy the hydrology, biotic or soil criteria outlined in the Queensland Wetland Definition Guidelines and are therefore not considered wetlands.

Reference in *Aquatic Ecology Report*: Nil (Freshwater Ecology, 2026)

5.6 INTERACTIONS BETWEEN AQUATIC AND TERRESTRIAL ECOSYSTEMS

Aquatic ecosystems within the Survey area include rivers, creeks, wetlands, alluvial systems and GDEs. Aquatic ecosystem values are addressed in the Aquatic Ecology Report (Freshwater Ecology, 2026), while GDEs are addressed in the *GDE Assessment Report* (WatermarkEco, 2026b). However, these systems are intrinsically linked to terrestrial ecosystems, and any impacts to aquatic environments have the potential to influence the condition, function and integrity of terrestrial habitats.

Within the Survey area, aquatic ecosystems are primarily associated with the Isaac River, Cherwell Creek and their tributaries, as well as ephemeral drainage features and floodplain depressions. These systems facilitate important interactions between aquatic and terrestrial environments by maintaining soil moisture availability, supporting vegetation condition during dry periods, and influencing the distribution and persistence of riparian and floodplain vegetation communities. GDEs form a component of these interactions, particularly within alluvial and riparian zones of the Isaac River and Cherwell Creek where perched groundwater in river sands supports terrestrial vegetation condition and resilience.

In turn, terrestrial vegetation communities contribute to aquatic ecosystem function by providing shading, organic matter inputs, bank stability, and habitat for species that utilise both terrestrial and aquatic environments. These linkages support ecological connectivity, nutrient cycling, and overall ecosystem function across the landscape.

While detailed assessment of aquatic ecosystems, including GDEs, is provided separately, these systems play a critical role in maintaining habitat quality, connectivity, and the overall integrity and resilience of terrestrial ecosystems within the Survey area.

5.7 PRESENCE OF CLIMATE REFUGIA

Potential climate change refugia within the proposed Project area and adjoining landscape were considered for listed threatened and migratory species that may be impacted by the Project. Consistent with Reside et al., (2014) climate change refugia are places that are likely to buffer species from climatic change, support persistence over time, reduce adverse species interactions, and remain available and accessible to species under threat.

The assessment considered the extent to which the Survey area and adjacent land contain characteristics commonly associated with climate change refugia, including:

- Relatively intact native vegetation and habitat continuity
- Local topographic and microclimatic variability
- Access to moisture-retaining landforms or riparian/wetland habitats
- Structural habitat complexity
- Landscape connectivity that may facilitate species movement and persistence under changing climatic conditions.

During field surveys, habitat features typically associated with potential refugia were assessed, including vegetation condition and structural complexity, presence of riparian or wetland habitats, topographic variation, microclimatic shelter, and landscape connectivity. These features were evaluated in the context of habitat requirements for threatened and migratory species identified as having potential to occur within the Project area.



The field assessment identified that areas of relatively intact native vegetation, particularly where associated with drainage features and denser vegetation structure of the Isaac River and Cherwell Creek, may provide localised microclimatic buffering and habitat resources that could function as potential climate change refugia at a local scale. These areas may provide relatively stable environmental conditions, shelter, and foraging resources that could support fauna during periods of climatic stress.

However, no large or regionally significant climate change refugia were identified within the Project area. Habitat features with potential refugia characteristics were generally limited to patches of retained native vegetation and habitat associated with drainage lines and wetter microhabitats. These features occur within a broader landscape that retains additional areas of native vegetation, which may also contribute to refugia values and facilitate movement of species in response to changing climatic conditions.

Where practicable, the retention of native vegetation and maintenance of habitat connectivity within the Project area will assist in maintaining these localised refugia functions for threatened and migratory species potentially occurring in the surrounding landscape.

5.8 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

5.8.1 Field-verified Threatened Ecological Communities

There were four TECs verified within the Survey area during the field surveys. These are listed in Table 42, shown in Map 11, Appendix A. The four TECs and their extents within the Survey area are:

- 149.47 ha of Brigalow (*Acacia harpophylla* dominant and co-dominant) TEC.
- 198.00 ha of Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin TEC.
- 39.42 ha of Poplar Box on Alluvial Plains TEC.
- 13.17 ha of Semi-evergreen Vine Thicket TEC

These TECs are recognised as MNES under the EPBC Act.

Table 42
TECs confirmed
present within the
Survey area

Threatened Ecological Community	Quality Rating	Analogous REs	Status ¹	Extent within the Survey area (ha)
Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant) TEC	Not applicable	11.3.1, 11.4.8, 11.4.9	EN	149.47
Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin TEC	Best and Good Quality	11.3.21, 11.8.11	EN	198.00
Poplar Box Grassy Woodland on Alluvial Plains TEC	Category C	11.3.2	EN	39.42
Semi-evergreen Vine Thickets of the Brigalow Belt (North and South) and Nandewar Bioregions TEC	N/A	11.8.13	EN	13.17

¹ Status under the EPBC Act: CE = Critically Endangered, EN = Endangered, VU = Vulnerable.

5.8.2 Field-verified Commonwealth-listed Threatened and Migratory Species

5.8.2.1 Commonwealth-listed Threatened Flora Species Presence and Habitat

No Commonwealth-listed threatened flora species were recorded within the Survey area during field surveys. However, suitable habitat for two threatened flora species was verified within the Survey area.

Suitable habitat was verified for *Dichanthium queenslandicum* (listed as endangered under the EPBC Act and vulnerable under the NC Act) and *Dichanthium setosum* (listed as vulnerable under the EPBC Act and not listed under the NC Act; Table 43; habitat shown in Map 12, Appendix A). Suitable habitat for these flora species was verified within the Native tussock grassland vegetation community. The extent of area for each species habitat was 198.00 ha within the Survey area.



Table 43
Commonwealth-listed threatened flora species that have suitable habitat verified within the Survey area

Family	Scientific Name	Common Name	Status		Vegetation Community	Extent within the Survey area (ha)
			QLD ¹	CTH ²		
THREATENED FLORA						
Poaceae	<i>Dichanthium queenslandicum</i>	King Bluegrass	VU	EN	Native tussock grasslands	198.00
Poaceae	<i>Dichanthium setosum</i>	Bluegrass	LC	VU	Native tussock grasslands	198.00

¹ Queensland Status (NC Act): EX = Extinct, EW = Extinct in Wild, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern, SLC = Special Least Concern.

² Commonwealth Status (EPBC Act): EX = Extinct, EW = Extinct in the Wild, CE = Critically Endangered, EN = Endangered, VU = Vulnerable.

5.8.2.2 Commonwealth-listed Threatened and Migratory Fauna Species Presence and Habitat

Targeted surveys were conducted within available habitat for the identified Commonwealth-listed threatened and migratory species considered potentially occurring within the desktop Likelihood of Occurrence assessment (results provided in Table 14). The following Commonwealth-listed threatened and migratory species were recorded within the Survey area by during Trend Environmental's field surveys:

- Squatter Pigeon, listed vulnerable under both the EPBC Act and NC Act.
- Koala, listed endangered under both the EPBC Act and NC Act.
- Greater Glider, listed endangered under both the EPBC Act and NC Act.
- Oriental Cuckoo, listed migratory under the EPBC Act.

In addition to these species, the Ornamental Snake (listed vulnerable under both the EPBC Act and NC Act has previously been recorded within the Survey area, by EcoSM in 2020 (EcoSM, 2020). And while not detected during targeted surveys by Trend Environmental or other consultants, the following Commonwealth-listed threatened and migratory species had habitat verified within the Survey area:

- Australian Painted Snipe, listed as endangered and migratory under the EPBC Act, and endangered under the NC Act.
- Sharp-tailed Sandpiper, listed as vulnerable and migratory under the EPBC Act.
- Common Greenshank, listed as endangered and migratory under the EPBC Act.
- Fork-tailed Swift, listed as migratory under the EPBC Act.

These verified Commonwealth-listed threatened and migratory species are listed in Table 44, along with reference to the corresponding habitat map for each species in Appendix A, and the verified extent of each habitat type within the Survey area.

Within the Survey area, the Squatter Pigeon, Koala, Greater Glider and Oriental Cuckoo have habitat that is primarily associated with eucalypt woodland communities, including lowland/range woodlands, basalt-plain woodlands, wet alluvial/riparian eucalypt woodlands, and dry to moist woodlands on sandy plains. Ephemeral wetlands represent an important secondary habitat for these species, with the potential to also support wetland specialists such as the Australian Painted Snipe, Sharp-tailed Sandpiper and Common Greenshank. Brigalow woodlands provide key habitat for the Ornamental Snake, while highly mobile species such as the Fork-tailed Swift may utilise all vegetation communities within the Survey area.

Table 44
Commonwealth-listed threatened and migratory species habitat verified within the Survey area

Family	Common Name	Scientific Name	Status ¹		Vegetation Community	Extent within the Survey area (ha)	Map reference
			QLD	CTH			
THREATENED BIRDS							
Columbidae	Squatter Pigeon (southern subspecies)	<i>Geophaps scripta scripta</i>	VU	VU	Eucalypt woodlands on lowlands and ranges, Eucalypt woodlands on basalt plains, Wet eucalypt woodlands on alluvial plains and drainage lines, Dry to moist woodlands on sandy plains, Brigalow woodlands, Native Tussock Grasslands and Ephemeral wetlands	Breeding habitat: 2,049.55 Foraging habitat: 409.25 Dispersal habitat: 106.15	Map 13, Appendix A



Family	Common Name	Scientific Name	Status ¹		Vegetation Community	Extent within the Survey area (ha)	Map reference
			QLD	CTH			
Rostratulidae	Australian Painted Snipe	<i>Rostratula australis</i>	EN	EN, Mi	Ephemeral wetlands	Breeding habitat: 11.50 Foraging and dispersal habitat: 19.63	Map 14, Appendix A
Scolopacidae	Sharp-tailed Sandpiper	<i>Calidris acuminata</i>	SLC	VU, M, Mi		Foraging and dispersal habitat: 31.13	
Scolopacidae	Common Greenshank	<i>Tringa nebularia</i>	SLC	EN, Mi			
THREATENED MAMMALS							
Phascolarctidae	Koala	<i>Phascolarctos cinereus</i>	EN	EN	Eucalypt woodlands on lowlands and ranges, Eucalypt woodlands on basalt plains, Wet eucalypt woodlands on alluvial plains and drainage lines, Dry to moist woodlands on sandy plains and Ephemeral wetlands	Breeding habitat: 742.96 Foraging habitat: 1,479.54	Map 16, Appendix A
Pseudocheiridae	Greater Glider (southern and central)	<i>Petauroides volans</i>	EN	EN		Breeding habitat: 859.85 Foraging habitat: 1,362.65	Map 17, Appendix A
THREATENED REPTILES							
Elapidae	Ornamental Snake	<i>Denisonia maculata</i>	VU	VU	Brigalow woodlands and Ephemeral wetlands	Breeding habitat: 152.08 Foraging habitat: 34.81 Dispersal habitat: 16.41	Map 19, Appendix A
MIGRATORY SPECIES							
Apodidae	Fork-tailed Swift	<i>Apus pacificus</i>	SLC	M, Mi	All vegetation communities	Foraging and dispersal habitat 2,578.13	Map 15, Appendix A
Cuculidae	Oriental Cuckoo	<i>Cuculus optatus</i>	SLC	Mi	Eucalypt woodlands on lowlands and ranges, Wet eucalypt woodlands on alluvial plains and drainage lines, Dry to moist woodlands on sandy plains and Ephemeral wetlands	Foraging and dispersal habitat 931.91	

¹ Queensland Status (NC Act): EX = Extinct, EW = Extinct in Wild, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern; SLC = Special Least Concern.

Commonwealth (Cth) EPBC Act Status: EX = Extinct, EW = Extinct in Wild, CE = Critically Endangered, EN = Endangered, VU = Vulnerable, M = Marine, Mi = Migratory, - not protected under the Act.

5.9 MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE

The field surveys verified the MSES that occur within the Survey area. Table 45 describes all MSES prescribed environmental matters under the EO Act that were verified within the Survey area, and their extent within the Survey area. Field-verified MSES prescribed environmental matters are shown in Map 21 and 22, Appendix A.



Table 45
Verified MSES
within the Survey
area

MSES	Definition	Survey area (ha)
Regulated vegetation	Prescribed REs that are endangered or of concern REs	Endangered or of concern REs (VM Act status) within Category B (Remnant) regulated vegetation areas are recognised as MSES Regulated Vegetation. The prescribed REs that were endangered and of concern within the Survey area include (noting these exclude Grassland REs listed in Schedule 5 of the <i>Vegetation Management Regulation 2012</i>; Qld): • 54.54 ha of endangered RE11.3.1 (mid-dense) • 363.52 ha of of concern RE11.3.2 (sparse) • 63.80 ha of of concern RE11.3.3 (sparse) • 54.28 ha of of concern RE11.3.4 (sparse) • 29.49 ha of endangered RE11.4.8 (sparse) • 55.45 ha of endangered RE11.4.9 (sparse) • 127.18 ha of of concern RE11.8.11 (grassland) • 13.17 ha of endangered RE11.8.13 (dense) These prescribed REs are shown in Map 21, Appendix A.
	Prescribed REs that intersect with an area shown as a wetland on the vegetation management wetlands map	21.90 ha of RE11.3.27b intersects with field-verified VM Act wetlands within the Survey area (shown in Map 21, Appendix A).
	An area of essential habitat on the essential habitat map for an animal that is critically endangered wildlife, endangered wildlife or vulnerable wildlife or a plant that is critically endangered wildlife, endangered wildlife or vulnerable wildlife AND if the ecosystem is an area of essential habitat on the essential habitat map for an animal that is near threatened wildlife or a plant that is near threatened wildlife	Essential habitat for the following species was verified within the Survey area (shown in Map 21, Appendix A): • Australian Painted Snipe • Squatter Pigeon • Koala • Greater Glider • Ornamental Snake The total area of verified essential habitat in the Survey area was 1,957.40 ha.
	To the extent the ecosystem is located within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature	The following field-verified REs were verified to be within a defined distance to a defined bank of a watercourses or drainage feature within the Survey area (noting these exclude Grassland REs listed in Schedule 5 of the <i>Vegetation Management Regulation 2012</i>; Qld): • 4.2 ha of RE11.3.1 (mid-dense) • 1.03 ha of RE11.3.2 (sparse) • 6.23 ha of RE11.3.3 (sparse) • 0.2 ha of RE11.3.4 (sparse) • 111.32 ha of RE11.3.25 (sparse) • 3.38 ha of RE11.5.3 (sparse) REs within a defined distance of a defining bank are shown in Map 17, Appendix A.
HES wetlands	A wetland— (i) in a wetland protection area; or (ii) of HES shown on the map of Queensland wetland environmental values	One HES wetland was verified within the Survey area, occupying 11.5 ha (shown in Map 20, Appendix A).
Protected Wildlife habitat	A habitat for an animal that is critically endangered wildlife, endangered wildlife or vulnerable wildlife or a SLC animal	The field survey verified MSES wildlife habitat (endangered or vulnerable) within the Survey area, which included Squatter Pigeon, Australian Painted Snipe, Common Greenshank, Sharp-tailed Sandpiper Koala, Greater Glider and Ornamental Snake (shown in Map 22, Appendix A). The field survey also verified MSES wildlife habitat (special least concern), which included the Short-beaked Echidna. These species were also considered MNES, with habitat areas provided in Table 44. As offsets cannot be secured under



Table 45
Verified MSES
within the Survey
area

MSES	Definition	Survey area (ha)
Waterways providing for fish passage	Any part of a waterway providing for passage of fish is a matter of State environmental significance only if the construction, installation or modification of waterway barrier works carried out under an authority will limit the passage of fish along the waterway.	multiple jurisdictions for the same impact, any offset requirements associated with habitat for these species will therefore be addressed under the EPBC Act framework. The following mapped waterways for waterway barrier works were verified within the Survey area: - Two purple (major risk) waterways (the Isaac River and Cherwell Creek). - Two amber (moderate risk) waterway (Conrock Gully and J B Gully) - Five green (low risk) waterways (two unnamed tributaries of the Isaac River, the unnamed tributary of Conrock Gully, the unnamed tributary of Cherwell Creek and the unnamed tributary of J B Gully). Waterways for waterway barrier works are shown in Map 22, Appendix A.
Connectivity Areas	Ecosystem contains remnant vegetation; and if the ecosystem contains an area of land that is required for ecosystem functioning (a connectivity area), AND if the administering agency is satisfied, having had regard to criteria in the environmental offsets policy about connectivity areas, that— (a) the connectivity area is of sufficient size or configured in a way that maintains ecosystem functioning; and the prescribed RE will remain despite a threatening process within the meaning of the NC Act.	There is a mapped state biodiversity corridor within the Survey which is analogous with the riparian habitat associated with the Isaac River and Cherwell Creek (Map 22, Appendix A).

5.10 FIELD-VERIFIED ENVIRONMENTALLY SENSITIVE AREAS

The field-verified RE mapping was used to determine the presence of ESA Category B endangered REs within the Survey area. Where an endangered RE (Biodiversity status) is associated within a heterogeneous polygon, the entire polygon was mapped as an ESA in Map 23, Appendix A. Table 46 lists the field-verified REs with an endangered biodiversity status that are considered Category B ESAs within the Survey area. These REs include 11.3.1, 11.3.21, 11.4.8, 11.4.9 and 11.8.13.

Table 46
Field-verified ESAs
within the Survey area

RE	ESA Category	Description	VM Act Class ¹	Biodiversity Status ²
11.3.1	B	<i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> open forest on alluvial plains	EN	EN
11.3.21	B	<i>Dichanthium sericeum</i> and/or <i>Astrebla</i> spp. grassland on alluvial plains. Cracking clay soils	OC	EN
11.4.8	B	<i>Eucalyptus cambageana</i> woodland to open forest with <i>Acacia harpophylla</i> or <i>A. argyrodendron</i> on Cainozoic clay plains	EN	EN
11.4.9	B	<i>Acacia harpophylla</i> shrubby woodland with <i>Terminalia oblongata</i> on Cainozoic clay plains	EN	EN
11.8.13	B	Semi-evergreen vine thicket and microphyll vine forest on Cainozoic igneous rocks	EN	EN

¹ VM Act Class: EN = Endangered, OC = Of Concern, LC = Least Concern

² VM Act Biodiversity Status: EN = Endangered, OC = Of Concern, LC = Least Concern, NC = No concern at present.



5.11 LEGISLATIVE REQUIREMENTS AND APPROVAL TRIGGERS

Based on the outcomes of the field surveys and assessment, the Project will require certain authorities however will not constitute assessable development under the Planning Act as all activities occur on a mining lease with approval under the EP Act.

5.11.1 Requirements for Authorities

Under the NC Act and associated regulation, a high-risk SMP will be required where clearing activities are likely to impact the breeding place of State-listed threatened fauna.

No protected plants were identified within the Survey area, and no trigger areas were present; therefore, a Protected Plants Clearing Permit under this Act is not required. No other authorities under this Act were triggered.

No SEAs were identified within the Survey area. On that basis, the Project is not expected to require a regional interests development approval under the RPI Act, in relation to SEAs.

5.11.2 Assessable Development under the Planning Act

The Project will involve the clearing of native vegetation that is regulated vegetation under the VM Act.

As the Project is being assessed through an EIS under the EP Act, the assessment of vegetation clearing and other relevant matters will be undertaken through the EIS process and reflected in the EIS Assessment Report and subsequent EA for the Project.

Accordingly, the Project is not expected to be assessed through a standard development application against State development assessment provisions (e.g. State code 16). Instead, the EIS process provides the primary mechanism for assessment of these matters, with subsequent EA and PRCP schedule approvals and conditions to be informed by the outcomes of the EIS Assessment Report.



6. POTENTIAL RISKS AND IMPACT ASSESSMENT

Potential Impacts associated with the Project are likely to be direct and indirect. These impacts are described in detail in the following sections. Relevant impacts were characterised having regard to their likelihood, intensity, duration, magnitude and extent, to provide a consistent basis for evaluating the nature and significance of potential impacts on ecological values.

No relevant impacts are expected to be unknown, unpredictable or irreversible. This conclusion is supported by the detailed baseline ecological assessments completed for the Survey area, including habitat mapping, RE verification, targeted flora and fauna surveys, and impact assessment undertaken in accordance with relevant Commonwealth and State guidelines. These surveys provide a robust understanding of the ecological values present, the habitats likely to be affected, and the nature and extent of potential Project impacts. Predicted impacts are therefore well characterised and can be assessed with a reasonable level of confidence.

In addition, impacts are largely associated with the clearing and disturbance of identified habitat within a defined disturbance footprint, and can be avoided, minimised and managed through the application of mitigation measures, rehabilitation, and offsetting where required. On this basis, impacts are not considered unknown or unpredictable. While vegetation clearing is permanent at the impact site and therefore irreversible at that location in the short to medium term, the affected values are known, the extent of impact has been quantified, offsets have been proposed for significant residual impacts, and the consequences have been assessed through the impact assessment process.

6.1 POTENTIAL DIRECT IMPACTS

Potential direct impacts from the Project consist of:

- Vegetation clearing
- Habitat removal and loss of connectivity.
- The following sections detail these potential direct impacts. Vegetation Clearing

The Project will require progressive vegetation clearing to facilitate open cut mining operations and associated disturbance activities. The Disturbance area for the Project is 2,083.43 ha, which includes a combination of historically cleared, non-remnant vegetation (1,749.23 ha; represents 83.96 %) and remnant vegetation (334.20 ha; represents 16.04 %).

The majority of vegetation within the Disturbance area has been previously cleared and modified through cattle grazing and agricultural use, with remnant vegetation generally restricted to riparian areas, alluvial plains, and scattered patches within the Disturbance area. These remnant areas provide important ecological values and were systematically ground-truthed during field surveys to confirm RE types and condition.

Vegetation clearing will occur progressively across the life of the mine (anticipated 15 years) and will be sequenced in line with mine development, haul road construction, and associated disturbance areas. Where practical, vegetation clearing will be staged to minimise the area of open disturbance at any one time, and rehabilitation will be undertaken progressively in accordance with the Project's rehabilitation milestones in the PRCP.

The Disturbance area used to calculate vegetation clearing impacts incorporates all areas required for mining and associated activities. The Disturbance area is shown maps in Appendix A. The final siting of mining infrastructure and activities will also aim to minimise impacts to sensitive ecological features where practicable. This allows for some flexibility in the location of mining infrastructure and activities whilst remaining within the Disturbance area. In total, these components represent the



full Disturbance area of 2,083.43 ha, which has been used to calculate vegetation clearing impacts across both remnant and non-remnant vegetation communities, as provided in Table 47.

Table 47
Impacts to
vegetation
communities

Vegetation Community	RE	Regulated Vegetation Category ¹	VM Act Class ²	Extent in Survey area (ha)	Extent in Project area (ha)	Extent in Disturbance Area			
						Disturbance area on Project MLs (ha)	Additional disturbance area (ha)	TOTAL	% of total impact compared to Survey area
Semi-evergreen vine thicket	11.8.13	B	EN	13.17	0	0	0	0	0
Eucalypt woodlands on lowlands and ranges	11.3.7	B	LC	48.50	0	0	0	0	0
	11.5.12	B	LC	29.33	0	0	0	0	0
Eucalypt woodlands on basalt plains	11.8.5	B	LC	95.23	22.06	4.46	0	4.46	4.7
	11.4.13	B	LC	105.81	8.55	1.83	0	1.83	1.7
Wet eucalypt woodlands on alluvial plains and drainage lines	11.3.3	B	OC	63.80	57.70	44.17	0	44.17	69.2
	11.3.4	B	LC	54.28	15.30	0	0	0	0
	11.3.25	B	LC	351.07	98.27	25.44	1.48	26.92	7.7
Dry to moist woodlands on sandy plains	11.3.2	B	OC	363.52	60.43	33.44	0	33.44	9.2
	11.5.3	B	LC	1071.43	389.87	185.19	0	185.19	17.3
	11.5.3b	B	LC	5.10	0	0	0	0	0
	11.5.9b	B	LC	18.89	18.89	0	0	0	0
Brigalow woodland	11.3.1	B	EN	54.54	39.20	22.53	0	22.53	41.3
	11.4.8	B	EN	29.49	1.34	0	0	0	0
	11.4.9	B	EN	55.45	16.38	14.35	0	14.35	25.9
Native tussock grassland	11.3.21	B	OC	73.71	38.32	0	0	0	0
	11.8.11	B	OC	127.18	0	0	0	0	0
Ephemeral wetlands	11.3.27b	B	LC	17.63	2.39	1.31	0	1.31	7.4
Cleared areas/exotic grasslands	Non-remnant	X	-	2648.93	1940.93	1748.18	1.05	1749.23	66
Total Remnant (ha)				2578.13	768.70	332.72	1.48	334.20	
% Remnant				49.32	28.37	15.99	58.50	16.04	
Total Non-remnant (ha)				2648.93	1940.93	1748.18	1.05	1749.23	
% Non-remnant				50.68	71.63	84.01	41.50	83.96	
TOTALS (ha)				5227.06	2709.63	2080.90	2.53	2083.43	

¹Regulated vegetation category: Category B (remnant vegetation), Category C (high-value regrowth) Category R (reef regrowth watercourse vegetation) or Category X (non-remnant).

²VM Act Class: EN = Endangered, OC = Of Concern, LC = Least Concern, NC = No concern at present.

Note, where REs occurred within a heterogeneous polygon, the area calculated was based on when the RE was dominant only



6.1.1 Habitat Removal and Loss of Connectivity and Integrity

The Project will result in the progressive removal of flora and fauna habitat across the Disturbance area, which totals approximately 2,083.43 ha. This footprint includes both historically cleared pasture (1,749.23 ha) and remnant vegetation (334.20 ha) confirmed during the survey. In addition to habitat loss, the Project will alter the structure, function and integrity of ecosystems within the Disturbance area through vegetation clearing, fragmentation and modification of ecological processes.

Field surveys identified nine vegetation communities that provide key habitat types within the Survey area, which contribute to local and regional biodiversity values. The vegetation communities present within the Project area however include:

- Eucalypt dry woodlands and open forests on sandy plains and basaltic rises – These communities provide habitat for threatened arboreal mammals such as the Greater Glider and Koala, and foraging habitat for woodland birds, including the threatened Squatter Pigeon.
- Brigalow and associated acacia woodlands on clay soils – These communities are often associated with gilgai formations, which support threatened reptiles such as the Ornamental Snake.
- Wet eucalypt woodlands on alluvial plains and drainage lines along Isaac River, Cherwell Creek, and associated tributaries – These alluvial communities function as major ecological linkages and provide movement corridors, denning habitat, and refuge areas for a variety of fauna.
- Wetlands and ephemeral drainage features, including floodplain depressions – These communities support amphibians, wetland birds, and associated prey species during wet periods, including providing foraging and dispersal habitat for migratory wetland bird species.
- Cleared pasture dominated by *Cenchrus ciliaris** – This community is degraded and provides minimal foraging habitat for fauna species. It usually supports higher abundances of pest fauna.

These vegetation communities collectively support ecosystem integrity within the Survey area by maintaining habitat structure, species composition, ecological processes (e.g. recruitment, nutrient cycling), and connectivity across the landscape.

The majority of the Disturbance area is comprised of low ecological value cleared pasture; however, further clearing of remnant woodlands and riparian vegetation will result in direct loss of higher value fauna habitat. The removal of these areas will also reduce ecosystem integrity by simplifying vegetation structure, reducing availability of key habitat features (e.g. hollow-bearing trees), and disrupting ecological processes.

Clearing for linear infrastructure (e.g., bridges) is expected to create some areas of fragmentation along riparian corridors associated with the Isaac River and Cherwell Creek that currently function as key movement pathways across the Survey area. Fragmentation of these systems may reduce ecosystem integrity by altering microclimates, increasing edge effects, facilitating weed invasion, and reducing the resilience of vegetation communities to disturbance.

While some fauna will be able to disperse into adjacent habitats, the surrounding landscape is already fragmented by historical clearing for grazing and mining, limiting the extent of suitable high-quality refuge areas. Species dependent on large hollow-bearing trees or intact woodland interiors, including those that are threatened (e.g. Greater Glider and Koala) will be affected by fauna habitat loss. This loss of structural complexity and habitat continuity further contributes to a decline in ecosystem integrity.

The Isaac River and Cherwell Creek form important regional ecological linkages, facilitating connectivity between fragmented remnant vegetation patches. These corridors are also recognised as habitat for threatened and migratory species. While mine planning has actively sought to avoid disturbance to the riparian areas of Isaac River and Cherwell Creek in the first instance, some unavoidable clearing will reduce local connectivity for fauna. Secondary linkages through smaller tributaries (e.g., Conrock and J B Gully) and stepping stone habitat will also be impacted, reducing dispersal opportunities for fauna populations. Disturbance to these linkages will degrade ecosystem integrity at a local scale by weakening ecological function, reducing habitat condition, and limiting the capacity of the landscape to support viable and resilient fauna populations. At a regional scale however, degradation of ecosystem integrity is not expected as habitat within the Disturbance area represents a relatively small component of the broader landscape and connectivity network and does not form part of a continuous linkage to larger, intact remnant vegetation patches or patches retained within protected estates.



6.2 POTENTIAL INDIRECT AND FACILITATED IMPACTS

Potential indirect impacts associated with the Project include a number of secondary impact pathways, some of which may also be considered facilitated impacts where Project activities create the conditions for those impacts to occur or increase. In particular, increased pest and invasive weed spread, fauna injury or mortality from vehicle strike, and elevated bushfire risk may be facilitated by disturbance, access, vehicle movement and increased human activity associated with the Project.

Potential indirect and facilitated impacts associated with the Project activities include:

- Increase in pest and invasive weeds
- Fragmentation and edge effects
- Fauna mortality or injury during vegetation clearing or from vehicle strike
- Erosion and sedimentation
- Hydrological changes to water quality, flooding impacts and impacts to GDEs
- Air quality
- Light impacts
- Noise and vibration impacts
- Bushfire risk
- Influence of Climate Change.

Each indirect impact is discussed in more detail below.

6.2.1 Increase in Biosecurity Risks (Pests and Invasive Weeds)

Field surveys confirmed the presence of several introduced fauna species within the Survey area, including the Cane Toad*, Domestic Cattle*, Wild Dog*, Feral Cat*, Rabbit*, Feral Pig* and Feral Deer*. Many of these species are listed as restricted matters under the Biosecurity Act and/or are identified as priority pest species under the *Isaac Region Biosecurity Plan 2024 – 2027* (Liveability and Sustainability, 2024).

These introduced fauna species were not strongly tied to particular habitat types within the Survey area but were recorded across a range of habitats. Cane Toads* were particularly concentrated in alluvial areas, consistent with their association with wetlands and riparian habitats. Signs of Feral Pigs* and European Rabbits* were observed throughout cleared pastures, as well as remnant regrowth vegetation communities, while Feral Cats* and Wild Dogs* were generally recorded in remnant vegetation patches where sufficient canopy cover was present.

Feral Cats* and Wild Dogs* pose a predation risk to threatened fauna, particularly the Koala, Greater Glider and Squatter Pigeon. While Cane Toads* may be taken as incidental prey by the Ornamental Snake.

Mining activities, including vegetation clearing, water management, and the construction of infrastructure, have the potential to create new resources and refuges for pest species (e.g., standing water in dams for Cane Toads* and Feral Pigs* and an increase in refuge). While their populations are already established in the Region, Project disturbance could exacerbate their abundance and distribution without management controls.

Introduced flora species were recorded within the Survey area, including species listed as WoNS and restricted matters under the Biosecurity Act, as well as species prioritised in the *Isaac Region Biosecurity Plan 2024 - 2027* (Liveability and Sustainability, 2024). The priority weed species within the Survey area recognised under these regulatory frameworks include:

- *Bryophyllum daigremontianum* (Mother of Millions)*
- *Cryptostegia grandiflora* (Rubber Vine)*
- *Harrisia martinii* (Harrisia cactus)*
- *Hymenachne amplexicaulis* (Hymenachne)*
- *Jatropha gossypifolia* (Bellyache Bush)*
- *Lantana camara* and *L. montevidensis* (Lantana)*
- Feral *Leucaena leucocephala* (Leucaena)*



- *Opuntia tomentosa* (Velvety Prickly Pear)*
- *Opuntia stricta* (Prickly Pear)*
- *Parthenium hysterophorus**
- *Vachellia nilotica* (Prickly Acacia)*
- *Vachellia farnesiana* (Mimosa Bush)*

Weeds were widely distributed across disturbed areas within the Survey area, particularly cleared pastures and road verges, but they also occurred to a lesser extent within remnant and regrowth vegetation areas and riparian zones.

Weed spread is typically facilitated by ground disturbance, grazing pressure, altered fire regimes, and the through the movement of vehicles and equipment. Without appropriate management controls, Project-related disturbance has the potential to increase the spread of weed propagules both within and beyond the Disturbance area.

6.2.2 Fragmentation and Edge Effects

Edge effects occur when previously intact remnant vegetation is partially cleared, exposing new habitat boundaries to external disturbances. These effects can manifest as increased weed invasion, colonisation by aggressive native fauna species (particularly birds), incursion of pest fauna, altered microclimatic conditions (greater sunlight, wind penetration, reduced humidity), and increased fire susceptibility. Collectively, these processes reduce the effective area of intact habitat and increase competition for resources, often leading to the exclusion of more sensitive flora and fauna species that rely on interior habitat conditions.

The Project already supports a highly modified landscape, with extensive clearing for grazing and historical disturbances having created fragmented vegetation patches amongst higher quality riparian habitat linkages. As a result, many vegetation patches within the Survey area are already subject to edge-related pressures. The proposed Project will nonetheless create new vegetation edges, particularly where vegetation clearing occurs adjacent to intact remnant communities such as the Eucalypt riparian woodlands along the Isaac River and Cherwell Creek, and Brigalow patches associated with gilgai systems.

Ground-dwelling fauna are particularly vulnerable to edge effects, as increased exposure at vegetation boundaries raises predation risk from Feral Cats*, Wild Dogs*, and other pest species. Weed invasion can also intensify along new disturbance margins, particularly in sandy and alluvial areas where invasive species such as *Parthenium hysterophorus** and *Lantana camara** are already established.

Given the existing fragmentation of habitat and the edge-relating processes already occurring within the Survey area, any additional edge effects are expected to compound existing localised pressures rather than introduce new landscape-scale processes.

Accordingly, while unmanaged edge effects could further influence vegetation structure and condition within individual patches (e.g. increased weed abundance or minor shifts in species dominance), they are unlikely to fundamentally alter vegetation composition at a local regional scale as a direct consequence of the Project. The regional floristic assemblage and ecosystem representation would remain broadly consistent with existing patterns.

Nevertheless, these edge-related impacts can locally reduce habitat quality, particularly for threatened species dependent on intact interior habitats (e.g., Koalas, Greater Glider and Squatter Pigeon).

6.2.3 Erosion and Sedimentation

Soil erosion may occur in areas disturbed by Project-related activities. Where such disturbances occur on dispersive soils and/or sloping land, sediment may be mobilised and transported into nearby watercourses. Potential impacts on aquatic ecosystems are assessed in the Aquatic Ecology Report (Freshwater Ecology, 2026).

Erosion can also result in the loss of topsoil, the most productive component of the soil profile, which may significantly limit the capacity for natural regeneration of vegetation communities post disturbance, unless the topsoil is appropriately stockpiled for later reuse. Areas most susceptible to erosion include floodplain and riparian environments associated with the Isaac River, Cherwell Creek and Conrock Gully, as well as vegetation communities occurring on erosive sand or silt land zones.



Topsoil resources can be protected by removing topsoil from areas subject to high levels of disturbance and setting it aside for reuse during rehabilitation. Where topsoil is retained *in situ* within disturbed areas, erosion and sediment control measures are required to minimise topsoil loss.

If left unmanaged, erosion and sediment mobilisation associated with Project disturbance may result in the progressive loss of topsoil resources, degradation of soil structure and reduced soil fertility within disturbed and adjoining areas. The loss of topsoil may substantially limit the capacity for natural regeneration and compromise rehabilitation outcomes by reducing seed bank viability, soil organic matter and microbial function. Sediment transport into adjacent watercourses may also increase turbidity, alter channel morphology and smother instream and riparian habitats, thereby exacerbating impacts to aquatic ecosystems. Over time, unmanaged erosion could lead to gully formation, bank instability and the expansion of disturbed areas beyond the original Project footprint, compounding both terrestrial and aquatic environmental impacts.

6.2.4 Fauna Mortality or Injury

6.2.4.1 Vegetation Clearing Activities

Fauna inhabiting habitats within the Disturbance area are at risk of injury or mortality during vegetation clearing activities. Individuals that are unable to disperse ahead of active clearing machinery, such as small reptiles, amphibians, and less mobile and arboreal mammals, are particularly vulnerable.

Progressive, staged clearing will be undertaken to minimise these risks, supported by targeted pre-clearance surveys and Fauna Spotter Catcher supervision to identify and relocate fauna from hollow-bearing trees, ground logs, and other habitat features. While some individual mortality may occur, most mobile species (e.g. birds and larger mammals) are expected to disperse into surrounding habitats. Given the fragmented nature of habitats across the Disturbance area, the capacity of adjacent habitats to absorb displaced fauna is variable, but no reduction in local population viability is anticipated when management controls are implemented.

Project activities have the potential to result in indirect impacts to animal breeding places. The loss or degradation of breeding places, such as nests, hollows, burrows or refuge sites, may disrupt breeding behaviour, reduce reproductive success and lead to the abandonment of breeding areas. These impacts are most likely to occur during construction activities and may be more pronounced if works coincide with key breeding periods for fauna species. While impacts are expected to be localised and short term, injury or mortality of breeding individuals may temporarily reduce local population viability where breeding places are limited or where species exhibit site fidelity.

Additional risks to fauna include entrapment in open trenches, excavations, or water storages during construction and operation. These features can act as inadvertent pitfall traps, particularly for reptiles, small mammals, and amphibians. Standard mitigation measures such as daily trench inspections, escape ramps, and covering or backfilling of trenches where possible need to be implemented to reduce these risks.

While fauna mortality and injury cannot be entirely avoided, the risks are expected to be localised and manageable with appropriate mitigation measures. No populations of conservation significant fauna are considered likely to be restricted to the Disturbance area, and therefore impacts are unlikely to threaten the persistence of species at a local or regional scale.

6.2.4.2 Vehicle Strike

Vehicle and machinery movement during construction and operation present an additional risk of fauna injury or mortality. Vehicle strike is most likely to affect species that rely on linear riparian corridors or watercourses for movement, such as the threatened Koala, Greater Glider and Squatter Pigeon, as well as wide-ranging number of least concern macropod species and ground-dwelling birds and reptiles. Roads traversing remnant habitat areas or in close proximity to watercourses and associated riparian woodland pose the greatest risk of fauna collision.

The Project is not expected to increase traffic volumes on public roads above existing levels, as it represents an extension and replacement of existing mining activities at the Isaac Plains Complex. Accordingly, no facilitated impacts associated with increased traffic are anticipated.



Mitigation measures need to include speed limits, driver awareness training, and fauna signage at key crossing points to reduce potential strike incidents.

6.2.5 Hydrological Changes

6.2.5.1 *Discharges of Contaminants to Water and Land*

The Project's proposed water management system will manage runoff, sediment-laden water, and mine-affected water within designated containment and diversion structures to prevent uncontrolled releases to the receiving environment. The mine affected water system has been designed to prevent uncontrolled releases. The sediment water system has been designed in accordance with the *Best Practice Erosion and Sediment Control Guidelines and Queensland regulatory standards* (IECA, 2008).

Under normal operating conditions, no uncontrolled discharges of mine-affected water are predicted. Controlled releases, where required, are expected to comply with relevant water quality objectives and EA conditions, ensuring that downstream water quality continues to protect environmental values.

Chronic, low-level exposure to contaminants and the potential for bioaccumulation within terrestrial ecosystems are not expected to result in significant impacts. The handling, storage and use of hydrocarbons and chemicals associated with the Project will be undertaken in accordance with applicable State regulatory requirements and standard environmental management controls, which are designed to prevent uncontrolled releases to the environment. As such, the likelihood of persistent contamination of surface water, or subsequent uptake and bioaccumulation of contaminants within ecological receptors, is considered low.

Overflows from sediment basins may occur during extreme rainfall events, in accordance with the design criteria for sediment basins. Modelling indicates that such overflows will be of low salinity and unlikely to measurably affect downstream water quality (Hydrobalance, 2026c). During construction and operation, potential risks to surface water quality include elevated sediment loads from disturbed soils, and accidental hydrocarbon or chemical spills. These risks will be mitigated through:

- The implementation of erosion and sediment controls;
- Stormwater diversion structures to separate sediment water systems from clean and mine water systems;
- Containment and bunding around fuel and chemical storage areas; and
- Progressive rehabilitation of disturbed areas.

6.2.5.2 *Changes to Surface Flows*

The diversion of Conrock Gully through the central section of the Disturbance area will modify local hydrology. The Gully's catchment represents approximately 2% of the upstream Isaac River catchment, and its diversion approximately 3 km upstream of the existing confluence is predicted to have a negligible influence on Isaac River flows. (Reach Environment, 2025) While the downstream reach of Conrock Gully will experience reduced local runoff, backwater flooding from the Isaac River will continue providing intermittent surface flows to these areas, including for a 50 % annual exceedance probability (AEP) (1 in 2 year) flow event (Hydrobalance, 2026b).

One small, palustrine wetland occurs within the Disturbance area adjacent to the Isaac River (Wetland ID2; Table 41 and Map 20, Appendix A). Other verified wetlands in the Survey area occur outside of the Disturbance area and are therefore not expected to be directly affected by changes in rainfall runoff or flow, and ecological function is anticipated to remain particularly with appropriate management actions to be implemented to reduce the risk habitat degradation of remaining remnant patches.

6.2.5.3 *Flooding Impacts*

Changes to local hydrological conditions associated with the Project have the potential to influence flooding behaviour within the Survey area and downstream environments, which may in turn impact ecological function.



Detailed hydraulic and hydrology modelling for a range of AEP events has been completed for the Project for the operational and closure periods, inclusive of all Project structures and landforms with the potential to alter hydrology and geomorphology (Hydrobalance, 2026b). The design of infrastructure with the potential to alter hydrology and geomorphology has been undertaken to minimise impacts (e.g. locating the Isaac River levee approximately 100–400 m from the high bank; bridge designs with minimal interference with flows; and a temporary dragline crossing). In addition, hydraulic and hydrology modelling has been completed for five cross sections through the Isaac River and adjoining floodplain upstream, adjacent and downstream of the Project, with the five cross sections representing areas of potential ecological value, containing REs, TECs and GDEs. This modelling has identified:

- The Project will have negligible impact on hydrology and geomorphology (e.g. flood levels, velocity, bed shear stress and stream power) for more frequent flood events (e.g. 10% AEP or 1:10 year flood event)
- The Project will have negligible to minor impact on hydrology and geomorphology for less frequent flood events (e.g. 1% AEP or 1:100 year flood event) during operations.
- Post mining, with the decommissioning and rehabilitation of the crossing infrastructure and the Isaac River levee, and restoration of the associated floodplain, the Project will have negligible impact on hydrology and geomorphology.
- The Project will result in almost no change in the duration for which flood events will occur (less than 1 hour change in duration for all AEP events), as measured at the nominated cross section locations.
- The proposed design of Conrock Gully diversion will be hydraulically and geomorphically stable, with revegetation to a native ecosystem, and will be similar to the existing Gully.
- The final void is located outside the 0.1% AEP (1:1,000) year flood event.

Based on the findings from the flooding assessment (Hydrobalance, 2026b) impacts to vegetation in floodplains, riparian habitat and vegetation condition from changes to hydrology, hydraulics and geomorphology are expected to be negligible.

6.2.5.4 Groundwater Dependent Ecosystems

Changes to groundwater quality and quantity have the potential to indirectly affect ecosystems surrounding the Disturbance area, particularly those that are dependent, or partially dependent, on groundwater (i.e., GDEs). Potential impacts may arise where Project activities result in groundwater drawdown or changes to groundwater quality within aquifers that support vegetation or aquatic ecosystems.

Mining activities typically reduce groundwater levels in surrounding groundwater units, with the spatial extent of influence dependent on the hydraulic properties of the aquifers and aquitards. This area of influence is referred to as the zone of drawdown, with drawdown generally greatest in proximity to active mining areas and progressively decreasing with distance from operations.

The GDE Assessment (WatermarkEco, 2026b) determined that riparian vegetation fringing the Isaac River, lower reaches of Cherwell Creek and HES wetland utilises a discontinuous and seasonally variable perched groundwater system that is associated with active alluvial deposits. Field data indicates that GDEs rely on this perched groundwater system rather than deeper alluvial aquifer. The perched groundwater system is not subject to drawdown from the Project or other resource projects. As GDEs demonstrate a reliance on the perched groundwater system rather than the deeper alluvial aquifer, groundwater drawdown associated with the Project or other resource projects (i.e. cumulative drawdown) is unlikely to impact GDEs. Therefore, adverse impacts to groundwater-dependent vegetation are not expected.

6.2.5.5 Terrestrial impacts resulting from the Diversion of Conrock Gully

Map 24 in Appendix A illustrates Conrock Gully within the Survey area and its upstream extent outside of the Survey area. This map also shows the distribution of remnant vegetation within and adjacent to Conrock Gully and the location of State and Regional biodiversity corridors. State and Regional biodiversity corridors are designated, interconnected, or continuous strips of native vegetation that link fragmented habitats and ecosystems, allowing for the safe movement, migration, and genetic exchange of flora and fauna.



Conrock Gully is not recognised as a State or regional biodiversity corridor. Within the Survey area, much of the gully line and associated floodplain vegetation comprises non-remnant vegetation, fragmented remnant patches and areas of regrowth, reflecting historical clearing and land use practices. In contrast, vegetation associated with Conrock Gully upstream of the Survey area exhibits comparatively greater connectivity, with more continuous remnant vegetation occurring along the drainage line and within adjacent areas to the north and south. The Project will not alter the upstream connectivity of Conrock Gully with surrounding vegetated areas.

The proposed diversion of Conrock Gully will involve temporary isolation of the gully from the Isaac River during construction. While this may result in short-term changes to local surface water flow and soil moisture conditions within the immediate construction footprint, terrestrial impacts upstream of the diversion are expected to be negligible. This is because upstream vegetation communities are not hydrologically dependent on direct connectivity to the Isaac River for persistence, and soil moisture regimes in these areas are primarily driven by local rainfall, overland flow and shallow subsurface processes rather than backwatering from the Isaac River. Furthermore, with the establishment of the diversion with a rehabilitated native vegetation outcome, the diversion will allow for connectivity.

Given the existing fragmented condition of vegetation within the Survey area and the absence of a formal corridor designation for Conrock Gully, the diversion is not expected to result in a measurable reduction in habitat connectivity at a local or regional scale. Upstream terrestrial ecosystems are therefore expected to retain their existing structure, function and connectivity during and following construction.

6.2.6 Air Quality Impacts

Dust deposition associated with construction and operational activities has the potential to impact vegetation communities within and adjacent to the Disturbance area. Excessive dust on foliage can reduce photosynthesis, respiration, transpiration, and subsequent growth rates (Thompson et al., 1984). In some cases, dust accumulation may also increase the penetration of phytotoxic gases, further reducing plant health (Farner, 1993).

The potential effects of dust deposition on vegetation are determined by a number of factors including:

- The characteristics of leaf surfaces, such as surface roughness, influencing the rate of dust deposition on vegetation
- Concentration and size of dust particles in the ambient air and its associated deposition rates
- Local meteorological conditions and the degree of penetration of dust into vegetation.

The greatest risk of dust generation will be from vegetation clearing and earthworks, vehicle and machinery movements, and exposed surfaces associated with haul roads, stockpiles, and active mine landforms. Localised dust deposition is expected in areas immediately adjacent to these disturbance zones. During construction, dust may arise from activities such as establishment of access roads, site facilities, and the development of the mine and associated infrastructure.

Vegetation adjacent to dust sources may be temporarily coated with particulate matter, potentially reducing growth rates where deposition is sustained. However, the dominant remnant vegetation types within and surrounding the Project area, mixed eucalypt and Brigalow woodlands, as well as native grasslands, are generally resilient to dust. Sclerophyllous foliage of Eucalypts and Acacias is typically pendulous and covered by a thick cuticle, reducing particle retention, while grasses offer limited surface area for deposition.

The broader landscape surrounding the Project is already heavily modified and subject to dust from grazing activities, unsealed roads, and existing mining operations. As such, vegetation communities in the Region are already exposed to dust and have not shown widespread degradation attributable to deposition. Seasonal rainfall is also expected to naturally reduce the accumulation of dust by washing foliage and stimulating new growth.

Dust control measures, including dust suppression on haul roads and stockpiles, progressive rehabilitation of disturbed areas, and erosion and sediment management, will be implemented. These measures are expected to minimise the risk of long-term ecological impacts from dust deposition. Overall, while some short-term localised effects may occur, the Project is unlikely to result in significant dust-related impacts on surrounding vegetation or fauna habitat.



6.2.7 Artificial Light Impacts

Indirect impacts to fauna may arise from the introduction of artificial lighting during both the construction and operational phases of the Project. Artificial light can alter natural light regimes and disrupt the behaviour of fauna, particularly nocturnal and crepuscular species. Fauna may avoid illuminated areas, as artificial light can be perceived as a threat or increase perceived predation risk, potentially resulting in displacement from preferred foraging, sheltering or movement corridors.

Some acclimatisation to artificial lighting is expected to occur over the medium to long term for certain fauna species. Many of the species identified within the Survey area are known to persist in environments subject to existing sources of anthropogenic disturbance, including noise, lighting and general human activity. However, the capacity to habituate varies between species, with light-sensitive taxa generally more vulnerable to disturbance.

Consistent with the DCCEEW *National Light Pollution Guidelines for Wildlife* (DCCEEW, 2023c) artificial lighting has the potential to affect fauna through changes to movement patterns, feeding behaviour, predator-prey interactions, reproduction and circadian rhythms. In particular, poorly directed or high-intensity lighting may contribute to habitat fragmentation by creating illuminated barriers that restrict fauna movement, or by increasing exposure to predators.

Overall, some level of disturbance to fauna is expected as a result of artificial lighting across the Survey area. Short-term impacts may include disruption to feeding and resting behaviour, which may temporarily affect animal condition and health. It is also possible that fauna species that are particularly sensitive to artificial light may avoid illuminated areas or become locally displaced.

6.2.8 Noise and Vibration Impacts

Construction and operational activities associated with the Project have the potential to generate noise and vibration, which may disturb local fauna populations. These disturbances are most relevant during vegetation clearing, establishment of surface infrastructure, and the movement of heavy machinery.

Noise generated during clearing, construction, and vehicle operation can cause temporary displacement of fauna. Many animals will avoid noisy areas as they perceive noise and vibration as a potential threat. For species more tolerant to disturbance, acclimatisation to elevated noise levels is expected over time. Sensitive fauna may avoid areas of higher noise intensity, which can result in changes to foraging, breeding, or sheltering behaviour. However, given the already fragmented and grazed nature of much of the landscape, it is anticipated that the majority of fauna present in the Project area will either adapt to, or move away from, short-term noise disturbance.

Vibration associated with blasting is not expected to cause long-term ecological impacts, though some species may exhibit short-term flight behaviour or avoidance of directly disturbed areas.

6.2.9 Bushfire Risk

Accidental ignition sources within the Disturbance area may include the operation of machinery, vehicle accidents or collisions, uncontrolled scheduled burns, hot works, spontaneous combustion of coal, and the incorrect disposal of flammable materials. Such ignition events have the potential to result in uncontrolled bushfires, which could cause significant impacts to vegetation communities and fauna habitat within and adjacent to the Project area.

Notwithstanding these potential risks, the Project is not expected to increase bushfire risk across the surrounding landscape with the implementation of appropriate bushfire mitigation and management measures.

6.2.10 Influence of Climate Change

Future climatic conditions at the site, including increased temperatures, changes in rainfall patterns, more frequent and prolonged drought, and an increase in the frequency and severity of extreme weather events such as heatwaves and intense rainfall, have the potential to interact with Project-related disturbances over time, noting that operations are expected to cease by 2043 followed by the rehabilitation and closure phase. Therefore, medium to long term changes to the climate would occur post operations and during the period when rehabilitation is either in progress or completed. Climate changes



may exacerbate existing pressures on terrestrial ecosystems, including habitat fragmentation, edge effects, altered hydrological function, erosion risk and reduced ecosystem resilience.

Climate change may also reduce the availability and function of potential climate refugia and refuges for threatened species and ecological communities. Riparian corridors, drainage lines, groundwater-supported habitats and other relatively sheltered or moisture-retaining areas are likely to become increasingly important under drier conditions and periods of extreme heat. Project-related disturbance to these areas could contribute to the loss, fragmentation or drying of potential refugia and may reduce the capacity of these habitats to support threatened species and communities during periods of climatic stress; noting that key areas that may act as refugia, such as watercourse crossings, are proposed to be rehabilitated to a riparian ecosystem post mining. Given the defined Disturbance area, the retention of surrounding habitat and the implementation of mitigation measures such as rehabilitation, a substantial reduction in the availability or function of climate refugia for relevant ecological values is not expected.

Drier conditions and periods of extreme heat may also increase the likelihood, intensity and spread of fire in remnant and regrowth vegetation and may increase the vulnerability of habitat for threatened species and ecological communities. Mining activities may introduce ignition sources and may alter fuel structure or access within the landscape. This has the potential to exacerbate fire-related impacts on ecological values if not appropriately managed. With the implementation of fire management measures, operational controls and standard risk mitigation measures, material increases in fire-related impacts on ecological values are not expected.

Modelling of the influence of climate change on the Project's water management systems (Hydrobalance, 2026c) demonstrates no material change in risk associated with water management controls due to climate change during the operational life of the Project.

Modelling of the influence of climate change on hydrology during operations and in the post mining landform (Hydrobalance, 2026b) demonstrates that there is negligible change in risk during operations and post mining due to the design of infrastructure and the final landform.

Overall, climate change may intensify background environmental pressures at the site and may increase the sensitivity of habitats and species to disturbance. However, Project impacts are confined to a defined disturbance footprint, with operations occurring within the short to medium term, followed by rehabilitation in the long-term, and are not expected to result in a substantial reduction in ecosystem resilience for relevant ecological values beyond the identified and quantified direct impacts. Mitigation measures, rehabilitation and offsets, where required, would further reduce the potential for adverse long-term effects on the resilience of relevant ecological values.

6.3 DECOMMISSIONING AND REHABILITATION OF THE FINAL LANDFORM

The post-mining landform will be shaped and progressively rehabilitated over the 15-year mine life and during the closure period. Rehabilitation will primarily focus on establishing pasture, in accordance with existing land use practices, but will include woodland patches, including riparian habitat along watercourses. This landform design aims to restore ecological function while supporting post-mining land use consistent with the surrounding Region.

A residual void will remain following mine closure. This void will act as permanent groundwater sinks (i.e. will not discharge to the broader environment), capturing rainfall runoff and drawing in groundwater from the surrounding strata. Modelling demonstrates that water within the void will remain suitable for the proposed post mining land uses, including the supply of water for pastoral activities (Hydrobalance, 2026c).

At decommissioning, mine infrastructure will be removed, and disturbed areas rehabilitated to integrate with the final landform. Direct disturbance during this phase will be minimal, though there is potential for indirect impacts including dust, noise, light, erosion, or the potential spread of weeds and pests. These risks will be managed in the same manner as during operations.

Progressive rehabilitation will be guided by a PRCP, which will describe milestones for rehabilitation and ensure final landform stability and ecological function of proposed post mining land uses. Measures will include:

- Establishing vegetation cover through pasture and native woodland plantings.



- Constructing a permanent, stable diversion of Conrock Gully to reduce erosion and sedimentation.
- Progressive rehabilitation of elevated landforms (e.g. waste rock emplacements).
- Maintaining remnant vegetation not directly affected by mining as important ecological features within the final landscape.

Rehabilitation areas comprising pasture areas and restored woodland are expected to provide habitat values for common fauna species and increase landscape stability. The residual void will remain as permanent sinks, with its hydrological isolation and long term water quality suitability for post mining land uses meaning that it is unlikely to impact regional water resources or surrounding ecological values.

6.4 SUMMARY OF MNES IMPACTS

6.4.1 Impacts to TECs

The total extent of each verified MNES species habitat within the Survey area, Project area and Disturbance area is provided in Table 48. The Disturbance area includes all areas subject to the Referral for the Project.

Key results from Table 48 indicated the following impacts to TECs:

- 52.72 ha of Brigalow TEC will be disturbed. This impact however will occur to fragmented patches and represents approximately 41 % of the total extent of Brigalow TEC within the Survey area.
- There will be no direct impact to the Natural Grassland TEC and Semi-evergreen Vine Thicket TEC, with these occurring outside of the Disturbance area. There will also be no direct impact to threatened flora species habitat (*Dichanthium queenslandicum* and *Dichanthium setosum*).

TECs were assessed at the individual patch scale within the Survey area (patch IDs shown in Map 11, Appendix A). For each mapped patch of TEC, the assessment quantifies the area subject to direct impact from vegetation clearing and the area subject to indirect impact associated with edge effects and fragmentation (Table 49).

Patches 1-8, 13-14, and 19-25 of the Brigalow TEC, patch 27 of the Poplar Box TEC, patches 28 and 29 of the Natural Grassland TEC and patches 30 and 31 of the Semi-evergreen Vine Thickets TEC will be fully retained and are not subject to direct clearing (Table 49). Where the Project does not create a new edge adjacent to these patches, and the patch will remain contiguous with surrounding remnant vegetation and existing disturbance already defines the local edge condition, no indirect impact will occur, and therefore no buffer is applied (given N/A in Table 49). On this basis, these patches are not expected to experience a material reduction in condition, connectivity or function as a result of the Project, and its post-impact viability is expected to remain unchanged.

Patches 9-12 and 15-18 of the Brigalow TEC, and patch 26 of the Poplar Box TEC will be fully or partially cleared by the Project. Of these, patches 9 -12, and 16-17 of the Brigalow TEC will be fully cleared and hence are already included in the direct impact Disturbance area. Patches 15 and 18 of the Brigalow TEC and patch 26 of the Poplar Box TEC partially cleared (Table 49). In addition to the direct impact footprint, an indirect impact buffer of 20 - 50 m will be applied to the retained edges of the partially cleared patches to account for edge effects that may arise from the creation of new boundaries, including increased light penetration, weed invasion, pest access, altered fire behaviour and reduced structural integrity at the patch margin. The selected buffer width is considered appropriate having regard to the scale of disturbance, the creation of a new exposed edge, and the need to conservatively account for localised degradation of vegetation condition adjacent to the Disturbance area.

Despite fragmentation, the retained portions of the partially cleared patches are expected to remain viable post-impact because they retain sufficient area, remain connected to adjacent remnant vegetation, and are of a size and configuration capable of sustaining the defining floristic and structural characteristics of the TEC. The retained edges will be subject to appropriate management to maintain ecological condition.

In all cases, the assessment found that no residual indirect impact would occur beyond the direct clearing footprint, and buffer areas and management actions were appropriate to mitigate indirect impacts to retained and partially retained patches.



6.4.2 Impacts to MNES Threatened and Migratory Species Habitat

The total extent of each verified MNES species habitat within the Survey area, Project area and Disturbance area is provided in Table 48. The Disturbance area includes all areas subject to the Referral for the Project.

Key results from Table 48 indicated the impacts to threatened and migratory species habitat are variable:

- The proportional impact analysis indicates that, for most listed values, the Disturbance area represents a relatively small proportion of the available habitat within the Survey area. This is due to the Disturbance area being proactively designed to avoid areas of ecological value where possible.
- For highly mobile species such as the Fork-tailed Swift and Oriental Cuckoo, impacts are approximately 11–13 % of mapped habitat within the Survey area, reflecting the broad extent of foraging and dispersal habitat within the Survey area.
- Impacts to arboreal mammals are moderate, with approximately 9 % of Koala breeding habitat and 17% of foraging habitat affected, and 10% of Greater Glider denning and 17 % of foraging habitat impacted.
- Squatter Pigeon habitat loss ranges from approximately 4–15 % depending on habitat function, with impacts to breeding habitat representing the highest proportion of impact.
- Ornamental Snake habitat loss within the Survey area is approximately 31 – 57 % depending on habitat function, reflecting the small extent and highly fragmented nature of this species habitat within the Survey area.

Higher proportional impacts are predicted for Ornamental Snake habitat (approximately 31 – 57 %) compared to other threatened and migratory species, reflecting the more limited extent of these MNES within the Survey area. In contrast, listed flora species habitat will not be directly impacted. Overall, while impacts are localised within the Disturbance area, the majority of ecological values retain a substantial proportion of habitat within the Survey area.

6.4.3 Impacts to DCCEEW Key Defining Terms

Table 50 summarises the correspondence between DCCEEW Key Defining Terms for MNES and quantifies the extent of impact within mapped critical habitat and important habitat areas, or whether an important population may be affected. The following describes the proposed impacts to DCCEEW Key Defining Terms:

- Brigalow TEC patches were identified as habitat that is critical to the community's survival based on the definition in the approved conservation advice (TSSC, 2013; critical habitat shown in Map 11, Appendix A). There will be 52.72 ha of impact to this critical habitat within the Disturbance area.
- There is no defined habitat that is critical to the communities survival for the Natural Grassland TEC. Regardless, all direct impacts to this TEC have been avoided (Map 11, Appendix A).
- Habitat that is critical to the survival of Poplar Box TEC is the best quality patches, and the most intact patches of the ecological community (Class A – Highest condition; DoEE, 2019). The patches within the Survey area were categorised as Category C – Moderate Quality (Map 11, Appendix A) and hence were not considered habitat that was critical to the community's survival. While no critical habitat for this TEC will be impacted by the Disturbance area, Category C – Moderate Quality TEC will be impacted and a determination of whether this impact is significant has been undertaken in Appendix J.
- Semi-evergreen Vine Thickets TEC patches were identified as habitat that is critical to the communities survival based on the definition within the conservation advice (DCCEEW, 2023a; critical habitat shown in Map 11, Appendix A), however all patches of this TEC have been avoided by design of the Disturbance area and as such will not be directly impacted by the Project.
- There is no defined habitat that is critical to the species survival for threatened flora species, *Dichanthium queenslandicum* and *Dichanthium setosum*. These species were not detected during targeted field surveys within the Survey area (Map 12, Appendix A) and, accordingly, no areas have been categorised as critical habitat for these species in relation to the Project.
- There is no formally defined habitat that is critical to the species survival for the Squatter Pigeon, however all breeding, foraging and dispersal habitat meets the generalised thresholds for critical habitat (e.g., critical for activities such as foraging, breeding, roosting, or dispersal) and as such these habitat types within the Survey area have been categorised as habitat critical to the species survival (Map 13, Appendix A). It is proposed that 308.48 ha of breeding



habitat, 14.58 ha of foraging habitat and 11.09 ha of dispersal habitat that is recognised as critical habitat for the Squatter Pigeon will be directly impacted by the Project.

- Breeding habitat for the Australian Painted Snipe is recognised as habitat that is critical to the survival of the species (DSEWPoC, 2013b). Breeding habitat has been verified within the Survey area, within the HES wetland (Map 14, Appendix A), however this wetland will be avoided by the design of the Disturbance area and as such no impacts are proposed to critical habitat for this species.
- Important habitat for migratory shorebirds is generally recognised where sites support a nationally or internationally important population, defined as areas where an ecologically significant proportion of the population occurs, or where a minimum total abundance of 2,000 waterbirds or 15 migratory shorebird species is regularly recorded. The Common Greenshank and Sharp-tailed Sandpiper have not been recorded within the Survey area and are represented by only isolated records within the Area of Interest and broader Region, suggesting that they occur intermittently and not in significant numbers. On this basis, no important habitat for these species has been identified within the Survey area. Habitat that is critical to the survival of the Common Greenshank is recognised as a mosaic of feeding and roosting habitat (DCCEEW, 2024b). While foraging and dispersal habitat was verified within the Survey area, these areas largely comprise low-quality wooded wetlands and farm dams. Given the limited regional records and absence of evidence that the Survey area supports an ecologically significant proportion of the population, these habitats were not considered to constitute habitat critical to the survival of the Common Greenshank. No critical habitat has been defined for the Sharp-tailed Sandpiper
- Breeding (or denning) and foraging habitat for the Koala and Greater Glider has been identified as habitat that is critical to the survival of the species (Map 16 and Map 17, Appendix A, respectively). And as all populations of the Greater Glider are considered important (TSSC, 2016d), the population identified within the Survey area was considered an important population. It is proposed that 66.81 ha of breeding habitat and 251.22 ha of foraging habitat for the Koala that is recognised as critical habitat will be directly impacted by the Project. It is proposed that 87.26 ha of denning habitat and 230.76 ha of foraging habitat for the Greater Glider that is recognised as critical habitat will be directly impacted by the Project
- Important habitat for the Ornamental Snake is identified as gilgai depressions and mounds (DCCEEW, 2023; Map 19, Appendix A). Habitat connectivity between gulgais and other suitable habitats is also important. Habitat for this species is considered important if it is habitat where the species has been identified during a survey (DCCEEW, 2023). With one confirmed record of this species within the Survey area, the breeding and foraging habitat within the Survey area was considered important in accordance with the definition (important habitat shown in Map 19, Appendix A). Also, as important habitat for the Ornamental Snake is a surrogate for an important population, it was considered that an important population occurs within the Survey area. It is proposed that 75.97 ha of important habitat, comprised of 56.22 ha of breeding and 19.75 ha of foraging habitat for the Ornamental Snake will be directly impacted by the Project.
- Important habitat for the two migratory species, the Fork-tailed Swift and Oriental Cuckoo has been defined (definitions provided in Table 10), however neither were identified within the Survey area due to a lack of sightings for the Fork-tailed Swift, and limited good quality habitat monsoonal rainforest, vine thicket and wet sclerophyll habitat for the Oriental Cuckoo.

The presence of these key defining terms and associated impacts have implications for the significant impact assessments for MNES provided in Appendix J.

6.4.4 Consistency with Australia's Obligations under the Biodiversity Convention, the Convention on Conservation of Nature in the South Pacific (Apia Convention), and the Convention on International Trade in Endangered Species of Wild Fauna and Flora

Based on the findings of this impact assessment, the Project is not considered to be inconsistent with Australia's obligations under the Convention on Biological Diversity, the Convention on Conservation of Nature in the South Pacific (Apia Convention), or the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The assessment identified that the Project may result in localised impacts to some ecological values within the Disturbance area; however, these impacts are not of a scale or nature that would undermine the conservation status, ecological function or long-term persistence of listed threatened species or threatened ecological communities in a manner contrary to Australia's



obligations under these international agreements. The assessment has been informed by field survey, habitat assessment and impact evaluation, and has identified avoidance, mitigation and management measures to reduce potential impacts on biodiversity values.

Relevant recovery plans, conservation advices and threat abatement plans have also been considered, where applicable to threatened species and ecological communities known or considered likely to occur within the Survey area. This includes consideration of the key threats and management intent relevant to those matters, such as habitat loss, fragmentation, weed invasion, pest animal impacts and other disturbance-related processes. The Project is not considered to be inconsistent with the intent of any applicable recovery plan or threat abatement plan, as it does not preclude the implementation of recovery objectives at a local or broader scale and incorporates measures to avoid or minimise impacts to ecological values. Accordingly, the Project is not expected to conflict with the conservation outcomes sought under relevant recovery planning and threat abatement frameworks.



Table 48
Extent of MNES

Type	MNES	Status				Extent in Survey area (ha)	Extent in Project area (ha)	Extent in Disturbance Area				
		QLD ¹	CTH ²	Likelihood of Occurrence	Habitat Type			Disturbance area on Project MLs (ha)	Additional disturbance area (ha)	% of total impact compared to Survey area		
										TOTAL		
TEC	Brigalow TEC	-	EN	Known to occur	-	149.47	68.74	52.72	0	52.72	41.40	
	Natural Grassland TEC	-	EN	Known to occur	-	198.00	38.32	0	0	0	0	
	Poplar Box TEC	-	EN	Known to occur	-	39.42	31.55	15.45	0	15.45	39.20	
	Semi-evergreen Vine Thickets TEC	-	EN	Known to occur	-	13.17	0	0	0	0	0	
Threatened Species	Flora	<i>Dichanthium queenslandicum</i>	VU	EN	Likely to occur	-	200.89	38.32	0	0	0	0
		<i>Dichanthium setosum</i>	LC	VU	May occur	-	200.89	38.32	0	0	0	0
	Birds	Squatter Pigeon	VU	VU	Known to occur	Breeding	2049.55	668.83	307.00	1.48	308.48	15.1
						Foraging	409.25	78.66	14.58	0	14.58	3.6
						Dispersal	106.15	21.20	11.09	0	11.09	10.5
		Australian Painted Snipe	SLC	EN, Mi	May occur	Breeding	11.50	0	0	0	0	0
						Foraging and dispersal	19.63	15.89	1.31	0	1.31	6.7
		Common Greenshank	SLC	EN, Mi	May occur	Foraging and dispersal	31.13	15.89	1.31	0	1.31	4.2
		Sharp-tailed Sandpiper	SLC	VU, Mi, M	May occur	Foraging and dispersal	31.13	15.89	1.31	0	1.31	4.2
	Mammals	Koala	EN	EN	Known to occur	Breeding	742.96	160.61	65.33	1.48	66.81	9.0
						Foraging	1479.54	535.35	251.22	0	251.22	17.0
		Greater Glider	EN	EN	Known to occur	Denning	859.85	202.04	85.78	1.48	87.26	10.1
						Foraging	1362.65	493.93	230.76	0	230.76	16.9
	Reptiles	Ornamental Snake	VU	VU	Likely	Breeding	152.08	86.42	56.22	0	56.22	36.9
						Foraging	34.81	21.09	19.75	0	19.75	56.7
						Dispersal	16.41	7.12	5.08	0	5.08	31.0
Migratory Species	Fork-tailed Swift	SLC	M, Mi	Likely	Foraging and dispersal	2578.13	768.70	331.24	1.48	332.72	12.9	
	Oriental Cuckoo	SLC	M, Mi	May occur	Foraging and dispersal	931.91	242.59	106.87	1.48	108.35	11.6	

¹ Queensland (Qld) Status (NC Act): EX = Extinct, EW = Extinct in Wild, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern, SLC = Special Least Concern, - not protected.

² Commonwealth (Cth) Status (EPBC Act): EX = Extinct, EW = Extinct in the Wild, CE = Critically Endangered, EN = Endangered, VU = Vulnerable



Table 49
Assessment of
direct and indirect
impacts to TEC
individual patches

TEC	Patch ID	Patch size (ha)	Direct impact (ha)	Indirect impact (ha)	Buffer applied (m) 1, 2
Brigalow TEC	1	8.13	0	0	N/A
	2	6.89	0	0	N/A
	3	1.19	0	0	N/A
	4	7.65	0	0	N/A
	5	6.88	0	0	N/A
	6	1.67	0	0	N/A
	7	0.62	0	0	N/A
	8	1.37	0	0	N/A
	9	0.92	0.92	0	0
	10	0.97	0.97	0	0
	11	5.08	5.08	0	0
	12	11.74	11.74	0	0
	13	1.45	0	0	N/A
	14	4.18	0	0	N/A
	15	24.99	16.5	0	50
	16	9.26	9.26	0	0
	17	5.34	5.34	0	0
	18	3.59	2.59	0	20
	19	3.58	0	0	N/A
	20	1.08	0	0	N/A
	21	14.38	0	0	N/A
	22	8.42	0	0	N/A
	23	6.09	0	0	N/A
	24	6.86	0	0	N/A
	25	5.66	0	0	N/A
Poplar Box TEC	26	31.55	15.5	0	50
	27	7.88	0	0	N/A
Natural Grassland TEC	28	73.71	0	0	0
	29	127.18	0	0	0
Semi-evergreen Vine Thickets TEC	30	3.33	0	0	0
	31	9.84	0	0	0

1: N/A - not required as no direct or indirect impact

2: where 0 ha buffer is listed this is because a buffer is not required as the whole patch size is either within or outside the Disturbance area



Table 50
Corresponding
DCCEEW Key
Defining Terms for
MNES and
proposed impacts

Type	MNES		Status (Cth) ²	Likelihood of Occurrence	Habitat Type	DCCEEW Key Defining Terms ³	Extent of impact to Defining Terms
TEC	Brigalow TEC		EN	Known to occur	-	Critical Habitat (Map 11, Appendix A)	52.72
	Natural Grassland TEC		EN	Known to occur	-	-	-
	Poplar Box TEC		EN	Known to occur	-	-	-
	Semi-evergreen Vine Thickets TEC		EN	Known to occur	-	Critical Habitat (Map 11, Appendix A)	0
Threatened Species	Flora	<i>Dichanthium queenslandicum</i>	EN	Likely to occur	-	-	-
		<i>Dichanthium setosum</i>	VU	May occur	-	-	-
	Birds	Squatter Pigeon	VU	Known to occur	Breeding	Critical Habitat (Map 13, Appendix A)	308.48
					Foraging		14.58
					Dispersal		11.09
		Australian Painted Snipe	EN, Mi	May occur	Breeding	Critical Habitat (Map 14, Appendix A)	0
					Foraging and dispersal		-
							-
		Common Greenshank	EN, Mi	May occur	Foraging and dispersal	-	-
		Sharp-tailed Sandpiper	VU, Mi, M	May occur	Foraging and dispersal	-	-
	Mammals	Koala	EN	Known to occur	Breeding	Critical Habitat (Map 16, Appendix A)	66.81
					Foraging		251.22
		Greater Glider	EN	Known to occur	Denning	Critical Habitat and Important Population (Map 17, Appendix A)	87.26
					Foraging		230.76
		Reptiles	Ornamental Snake	VU	Likely	Breeding	Important Habitat and Population surrounding the species record (Map 19, Appendix A)
	Foraging					19.75	
	Dispersal					-	
Migratory Species	Fork-tailed Swift	M, Mi	Likely	Foraging and dispersal	-	-	
	Oriental Cuckoo	M, Mi	May occur	Foraging and dispersal	-	-	

¹ Queensland (Qld) Status (NC Act): EX = Extinct, EW = Extinct in Wild, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern, SLC = Special Least Concern,

² Commonwealth (Cth) Status (EPBC Act): EX = Extinct, EW = Extinct in the Wild, CE = Critically Endangered, EN = Endangered, VU = Vulnerable

³ DCCEEW Key Defining Terms include 'habitat critical to the survival of the species or community', 'important habitat', 'important population', 'ecologically significant proportion of the population'.

Notes – Where no DCCEEW Defining Term has been defined or there was none present within the Disturbance area, the MNES have been greyed out.



6.5 SUMMARY OF MSES IMPACTS

The total extent of each verified MSES prescribed matter within the Survey area, Project area and Disturbance area is provided in Table 51. The Disturbance area impacts have been split between Disturbance area on Project MLs and Additional disturbance area to differentiate between the impacts subject to the EA application for the Project's MLs (Disturbance area on Project MLs) and the impacts subject to a future amendment of the IDM EA (Additional disturbance area). A total impact area however has also been included.

The following impacts to MSES were calculated within the Disturbance area on Project MLs:

- Impacts to MSES Regulated vegetation that are prescribed REs that are 'endangered' or 'of concern' REs include 26.50 ha of dense and mid-dense REs made up solely of RE11.3.1, 88.23 ha of sparse REs made up of RE11.3.2, RE11.3.3 and RE11.4.9, and Nil grassland REs within the Disturbance area on Project MLs.
- Impacts to MSES Regulated vegetation that are prescribed REs that intersect with an area shown as a wetland on the vegetation management wetlands map includes 1.18 ha within the Disturbance area on Project MLs.
- Impacts to MSES Regulated vegetation that is a prescribed RE that is located within a defined distance from the defining banks of a relevant watercourse or drainage feature include 2.52 ha within dense and mid-dense REs (RE11.3.1), and 11.88 ha within sparse REs in the Disturbance area on Project MLs (RE11.3.2, 11.3.3, 11.3.25 and 11.5.3).
- A total of 347.55 ha of connectivity areas will be impacted within the Disturbance area on Project MLs.
- No impacts to HES wetlands.
- 263.39 ha of impacts to MSES Protected Wildlife Habitat that are prescribed REs that are areas of essential habitat on the essential habitat map for an EVNT plant or animal.
- Most impacts to MSES Protected Wildlife Habitat that is habitat for an endangered wildlife or vulnerable wildlife or SLC animal has been assessed under the MNES impacts in Table 48, the exception being the SLC Short-beaked Echidna, where impacts include 331.24 ha in the Disturbance area on Project MLs.

The following impacts to MSES were calculated within the Additional disturbance area:

- 1.48 ha of impacts to MSES Protected Wildlife Habitat that is habitat for an SLC animal, being the Short-beaked Echidna, in the Additional disturbance area.



Table 51
Extent of
MSES
prescribed
matters

Prescribed Matters							Extent in Disturbance Area				
							Disturbance area on Project MLs (ha)	Additional disturbance area (ha)	TOTAL	% of total impact compared to Survey area	
Regulated Vegetation	Prescribed REs that are 'endangered' or 'of concern' REs	Dense/ mid dense	11.3.1 (EN)	25a	54.54	39.20	26.50	0	26.50	48.6	
		Sparse	11.3.2 (OC)	17a	363.52	60.43	36.26	0	36.26	10.0	
			11.3.3 (OC)	16c	63.80	57.70	40.17	0	40.17	63.0	
			11.4.8 (EN)	25a	29.49	1.34	0	0	0	0	
			11.4.9 (EN)	25a	55.45	16.38	11.80	0	11.80	21.3	
		Grassland	11.8.11 (OC)	30b	127.18	0	0	0	0	0	
	Prescribed REs that intersect with an area shown as a wetland on the vegetation management wetlands map	Sparse	11.3.27b (LC)	34d	13.58	1.21	1.18	0	1.18	8.7	
	Prescribed RE that is located within a defined distance from the defining banks of a relevant watercourse or drainage feature	Dense/ mid dense	11.3.1 (EN)	25a	4.1	3.76	2.52	0	2.52	61.5	
		Sparse	11.3.2 (OC)	17a	1.03	0.04	0.05	0	0.05	4.9	
			11.3.3 (OC)	16c	6.23	5.2	4.69	0	4.69	75.3	
			11.3.25 (LC)	16c	111.32	25.62	6.38	0	6.38	5.7	
			11.5.3 (LC)	17a	3.38	1.83	0.77	0	0.77	22.8	
	Connectivity Areas	Prescribed REs that contains an area of land that is remnant vegetation required for ecosystem functioning (a connectivity area). The Landscape Fragmentation and Connectivity Tool has been processed to determine disturbance to connectivity.				NA	NA	347.55	0	347.55	N/A
	Wetlands and Watercourses	HES wetlands				11.50	0	0	0	0	0



							Extent in Disturbance Area						
Prescribed Matters		Structural Category	RE (Status)	BVG	Extent in Survey area (ha)	Extent in Project area (ha)	Disturbance area on Project MLs (ha)	Additional disturbance area (ha)	TOTAL	% of total impact compared to Survey area			
Protected Habitat	Wildlife	Prescribed REs that are areas of essential habitat on the essential habitat map for an EVNT plant or animal.				1957.40	540.50	263.39	0	263.39	13.5		
		A habitat for an endangered wildlife or vulnerable wildlife or SLC animal				Squatter (VU)	Pigeon	Refer to Table 48					
						Australian Snipe (EN)	Painted	Refer to Table 48					
						Koala (EN)		Refer to Table 48					
						Greater Glider (EN)		Refer to Table 48					
						Ornamental Snake (VU)		Refer to Table 48					
						Common Greenshank (SLC)		Refer to Table 48					
						Sharp-tailed Sandpiper (SLC)		Refer to Table 48					
						Fork-tailed Swift (SLC)		Refer to Table 48					
						Oriental Cuckoo (SLC)		Refer to Table 48					
						Short-beaked Echidna (SLC)		2578.13	768.70	331.24	1.48	332.72	12.9



6.6 SUMMARY OF ESA IMPACTS

The total extent of field verified ESAs in the Survey area, Project area and Disturbance area are summarised in Table 52.

The Project will result in a total of 78.47 ha of impacts to Category B ESAs, being endangered REs within the Disturbance area on Project MLs. There will be no direct impact to Category B ESAs within the Additional disturbance area.

Table 52
Impact area
calculations for
applicable ESAs

ESA Category ¹	RE	VM Act Class ²	Biodiversity Status ³	Extent in Survey area (ha)	Extent in Project area (ha)	Extent in Disturbance Area		TOTAL
						Disturbance area on Project MLs (ha)	Additional disturbance area (ha)	
B	11.3.1	EN	EN	114.22	94.3	64.12	0	64.12
	11.3.21	OC	EN	73.71	38.32	0	0	0
	11.4.8	EN	EN	29.49	1.34	0	0	0
	11.4.9	EN	EN	55.45	16.38	14.35	0	14.35
	11.8.13	EN	EN	13.17	0	0	0	0
Totals				286.09	149.02	78.47	0	78.47

¹ ESA Category

² VM Act Class: EN = Endangered, OC = Of Concern, LC = Least Concern, NC = No concern at present.

³ VM Act Biodiversity Status: EN = Endangered, OC = Of Concern, LC = Least Concern, NC = No concern at present.

6.7 POTENTIAL CUMULATIVE IMPACTS

6.7.1 Cumulative impact on MNES and MSES

The landscape surrounding the Project is part of a developed mining and grazing precinct within the northern Bowen Basin, where cumulative disturbance has resulted from multiple existing and proposed mining operations, pastoral activities and associated infrastructure corridors. Despite these pressures in the Region, relatively intact tracts of remnant vegetation remain within the Carborough Range, Dipperu NP, Denham Range, Burton Range, Kerlong Range, and Cherwell Range, which collectively provide key climate refugia and regional connectivity for flora and fauna.

The Project area predominantly occurs within historically cleared and modified landscapes, with remnant vegetation largely confined to riparian corridors and alluvial plains along the Isaac River and Cherwell Creek. The Project will contribute approximately 2,083 ha of additional disturbance, comprising 334 ha of clearing of remnant vegetation and 1,749 ha of disturbance to non-remnant land.

Cumulative ecological pressures are primarily associated with the progressive loss and fragmentation of Brigalow and Poplar Box woodlands, and riparian corridors. While the Project adds incrementally to these pressures, its proportional contribution is small relative to the extent of comparable vegetation and fauna habitat in the broader Brigalow Belt North bioregion. Large contiguous areas within the nearby ranges and conservation estates continue to maintain regional biodiversity and connectivity.

A cumulative impact assessment was undertaken at the bioregion, subregion and local scales to assess the likely cumulative impact of the Project on MNES and MSES in the context of past, present and reasonably foreseeable future disturbance (Table 53).

The bioregion scale was defined as the Brigalow Belt North bioregion, the subregion scale as the Northern Bowen Basin subregion, and the local scale as the Area of Interest, defined as a 20 km buffer surrounding the Survey area. These scales can be seen in Maps 25 and 26 in Appendix A which show the pre-clearing ecosystems (PAST), and current (PRESENT) ecosystem extents.

To quantify past disturbance, the extent of MNES and MSES was mapped and calculated using pre-clearing Vegetation Management mapping. Current extent was derived from field-verified RE mapping within the Survey area and the current



Vegetation Management vegetation mapping outside the Survey area. Reasonably foreseeable future disturbance included the Project Disturbance area and impacts associated with six approved projects located within the vicinity of the Survey area that are either under development or likely to proceed in the foreseeable future. These projects include:

- Peak Downs Coal Mine Continuation, under assessment (EPBC 2022/09350) located 6 km to the south of the Survey area.
- Winchester South Coal Mine, approved in 2019 (EPBC 2019/8460) located 4 km to the south of the Survey area.
- Olive Downs Metallurgical Coal Mine, approved in 2017 (EPBC 2017/7867, 2017/7868, 2017/7869, and 2017/787) located 21 km to the south-east of the Survey area.
- Moranbah South Coal Mine, approved in 2013 (EPBC 2013/6337) but currently on hold, located 5 km to the north-west of the Survey area
- Eagle Downs Coal Mine approved in 2008 (EPBC 2008/3945) but yet to be constructed, located 2 km south of the Survey area.
- Moranbah Solar and BESS (Grupa Cobra), approved in 2024, located 25 km to the northeast of the Survey area

Note that the disturbance associated with IDM, which is operational, is included in the existing (current) disturbance areas, and hence has not been included in the future foreseeable impacts component of this cumulative impact assessment. In addition, the Bowen Gas Project (EPBC 2012/6377) has not been included in the cumulative assessment of future foreseeable impacts, as it comprises discrete clearing across a broad area and the full extent and spatial distribution of potential impacts is not sufficiently defined to enable meaningful comparison.

MNES and MSES with no or low direct impacts that are unlikely to result in a significant impact from the Project (e.g., Natural Grassland TEC, Semi-evergreen Vine-thickets TEC, threatened flora species habitat and HES wetlands) have been omitted from this cumulative impact assessment to ensure the assessment is proportionate and focused on values where meaningful cumulative effects may occur. Including matters with negligible or non-significant direct impacts would not materially alter the cumulative impact conclusions and may obscure the assessment of values that are more sensitive to habitat loss, fragmentation or landscape-scale change. The cumulative assessment therefore concentrates on MNES and MSES for which the Project contributes a measurable impact and where additive or interactive effects with past, present or reasonably foreseeable future disturbance are plausible.

To provide nominal habitat area estimates within the bioregion, subregion and local scales, the corresponding REs for each MNES TEC and species, and MSES species, defined in the relevant TECs conservation advices or the essential habitat database, were applied. For other MSES, mapping was applied as per the MSES mapping methodology (e.g., for defining banks). This approach allowed for consistent comparison of available habitat extent relative to the predicted direct impacts of the foreseeable future impacts.

Table 53 presents the past and present extent of habitat at the bioregion, subregion and local scales, together with the impact area associated with each reasonably foreseeable future project, including the IDE Project. Cumulative impacts have been calculated based on the percentage contribution of the IDE Project to the total cumulative loss of habitat for MNES and MSES.

When considered in a bioregional context, the Project's contribution to cumulative impacts is expected to be very low, due to:

- The Disturbance area being positioned to avoid most remnant vegetation areas and hence occurring mainly within previously cleared and modified areas (as can be seen in Map 26, Appendix A).
- The limited extent of remnant vegetation clearing relative to regional availability (as can be seen in Map 26, Appendix A).
- The retention of key riparian and vegetated corridors within the Project area (other than infrastructure crossings); and
- The implementation of progressive rehabilitation and offset commitments to address any residual losses.

The cumulative impact assessment for the bioregional scale revealed that the IDE Project's contribution to cumulative impacts is negligible, ranging from 0.003% – 0.011 % for MNES and 0% - 0.018% for MSES. At the subregion scale, the IDE



Project's contribution to cumulative impacts remain very low, ranging from 0.022% - 0.13% for MNES and 0% - 0.305% for MSES.

At the local scale, the IDE Project's contribution to cumulative impacts are proportionally higher than at the bioregional and subregional scales, but still low, ranging from 0.091% - 0.817% for MNES and 0.004% - 1.735% for MSES. This is because the local-scale assessment is calculated against a substantially smaller area of currently available habitat within the 20 km buffer. However, this contribution remains low in absolute terms and does not materially alter the overall cumulative impact conclusions for MNES and MSES.

Overall, the incremental contribution of the IDE Project is negligible to minor in a bioregional, sub-regional and local context. The Project is therefore not expected to materially exacerbate cumulative impacts beyond those already established within the regional landscape, particularly when considered alongside the availability of remaining habitat and the implementation of mitigation and management measures.

6.7.2 Cumulative impact on Ecosystem Resilience

The potential cumulative impact of the Project on ecosystem resilience has been considered in the context of existing and reasonably foreseeable disturbance within the surrounding landscape. Ecosystem resilience, in this context, refers to the capacity of ecological communities, habitats and associated species populations to persist, recover and continue to function in the presence of disturbance. Key factors relevant to resilience include the extent and condition of retained habitat, patch size and configuration, connectivity to the broader landscape, regenerative capacity, and exposure to ongoing pressures such as weed invasion, pest animals, altered fire regimes, grazing pressure and hydrological change. At the bioregion, subregion and local scales, the cumulative impact of the Project represents an insignificant proportion of the currently available extent of most ecological values and is therefore not expected to materially diminish ecosystem resilience at those broader scales.

A risk-based assessment indicates that the principal pathways by which cumulative impacts may affect ecosystem resilience are through reduction in habitat extent, increased fragmentation, edge effects and the interaction of the Project with other existing stressors in the local landscape. However, the Project has incorporated avoidance and mitigation measures intended to maintain resilience, including minimisation of the disturbance footprint, retention of habitat linkages where practicable, management of weeds and pest animals, fire management, erosion and sediment controls, and progressive rehabilitation. On this basis, the cumulative risk to ecosystem resilience is considered negligible to low at the bioregion, subregion and local scales. Overall, the Project is not expected to result in a cumulative reduction in ecosystem resilience at a scale that would compromise the ongoing function and persistence of ecological values in the broader landscape.



Table 53
Cumulative
direct impacts
to relevant
MNES at the
bioregion,
subregion and
local scales

PAST AND PRESENT HABITAT			TOTAL AREA (ha)	MNES (ha)						MSES (ha)					
				Brigalow TEC	Poplar TEC	Box Squatter Pigeon	Greater Glider	Koala	Ornamental Snake	Regulated Vegetation (ha)				Protected Wildlife habitat (ha)	
										Cat B EN REs	Cat B OC REs	REs intersecting a VMA wetland	REs intersecting a VMA watercourse	Essential Habitat ²	Short-beaked Echidna
	Bioregion (Brigalow Belt North) available habitat	PAST	13,641,283	2,191,863	527,042	8,302,310	7,009,948	8,393,091	3,265,617	2,853,945	7,022,903	3,257,105	263,589	11,658,708	13,641,283
		PRESENT		278,222	211,123	2,947,490	4,022,024	4,976,340	601,505	709,001	1,625,652	150,718	185,931	5,320,051	6,834,843
	Subregion (Northern Bowen Basin subregion) available habitat	PAST	1,316,957	275,820	70,844	827,433	852,283	979,759	193,438	314,863	354,460	321,085	20,229	1,173,197	1,316,900
		PRESENT		41,120	36,420	577,691	585,573	682,396	41,827	82,597	196,582	9,848	15,735	717,454	821,206
	Local (Area of Interest – 20 km buffer) available habitat	PAST	157,105	61,755	15,450	79,288	77,957	96,557	47,156	17,615	79,459	31,636	2,175	143,813	157,105
		PRESENT		3,621	6,936	44,724	40,996	51,797	3,901	8,506	9,045	3,182	1,579	55,378	60.21

FORESEEABLE FUTURE IMPACTS	Project	Approval Date	EPBC Act Number	Proximity to Project												
	Peak Downs Coal Mine Continuation (ERM, 2022)	2022	2022/09350	6 km south	N/A	N/A	N/A	N/A	N/A	N/A	Interim 548.1	Interim 874.4	-	Interim 103.4	Interim 2,822.8	N/A
	Winchester South Coal Mine (Whitehaven Coal, 2021)	2019	2019/8460	4 km south	-	9.6	261.2	167.1	314.5	1,834.2	107.7	56.3	-	4.5	1834.2	2471
	Olive Downs Metallurgical Coal Mine ²	2017	2017/7867, 2017/7868, 2017/7869, 2017/7870	21 km southeast	13	-	5,610	5,583.5	5,583.5	7,666	139.5	865.5	49.8	126.2	N/A	16,294
	Moranbah South Coal Mine (Statewide Environmental Assessments, 2012)	2013	2013/6337	5 km northwest	11	-	483	-	111	2	11.2	42.2	-	N/A	N/A	242.6
	Eagle Downs Coal Mine (DERM, 2010)	2008	2008/3945	2 km south	31	-	-	-	-	-	N/A	N/A	N/A	N/A	N/A	N/A
	Moranbah Solar and BESS (Grupa Cobra)	-	-	30 km northeast	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	IDE (Disturbance area)				52.72	15.45	334.15	318.02	318.03	81.05	38.30	76.43	1.18	14.4	263.39	332.72

CUMULATIVE IMPACT	Cumulative foreseeable impact	107.72	25.05	6,688.35	6,068.62	6,327.03	9,583.25	844.80	1,914.83	50.98	248.50	4,920.39	19,340.32
	Bioregion Scale – Total Lost (current + foreseeable) (ha)	1,913,696	315,929	5,361,174	2,993,675	3,422,760	2,673,614	2,145,751	5,399,089	3,106,437	77,892	6,343,314	6,825,448
	Bioregion Scale – IDE Project's contribution to the loss	0.003 %	0.005 %	0.006 %	0.011 %	0.009 %	0.003 %	0.002 %	0.001 %	0.000 %	0.018 %	0.004 %	0.005 %
	Subregion Scale – Total Lost (current + foreseeable) (ha)	234,755	34,434	256,096	272,461	303,372	161,113	233,073	159,716	311,287	4,728	460,400	514,702
	Subregion Scale – IDE Project's contribution to the loss	0.022 %	0.045 %	0.130 %	0.117 %	0.105 %	0.050 %	0.016 %	0.048%	0.000 %	0.305 %	0.057 %	0.065 %
	Local Scale – Total Lost (current + foreseeable) (ha)	58,189	8,524	40,918	42,712	50,769	52,757	9,916	72,252	28,504	830	93,092	176,052
	Local Scale – IDE Project's contribution to the loss	0.091 %	0.181 %	0.817 %	0.745 %	0.626 %	0.154 %	0.386 %	0.106 %	0.004 %	1.735 %	0.283 %	0.189 %

N/A = data not publicly available.

² Multiple references used including: (DPM Envirosciences, 2018c; DPM Envirosciences, 2018a; DPM Envirosciences, 2018b)



7. IMPACT MITIGATION

7.1 MEASURES TO AVOID AND MINIMISE IMPACTS

Consistent with DETSI's impact-mitigation hierarchy, avoidance and minimisation have been the primary focus during the design phase of the Project. Substantial effort was directed toward refining the Project layout, Disturbance area and supporting infrastructure to reduce both direct and indirect impacts to MNES and MSES wherever practicable.

Table 47 provides the extent of vegetation communities and ground truthed REs within the Survey area, Project area and Disturbance area. Remnant and non-remnant vegetation comprise 343.20 ha and 1,749.23 ha of the 2083.43 ha Disturbance area, or 16.4% and 83.96%, respectively. The high proportion of non-remnant vegetation is partially a result of the proponent reducing the Disturbance area, where possible, to avoid remnant vegetation areas. By comparison remnant vegetation comprises 28.37% of the Project area.

From Table 47 it is evident that the placement of the Disturbance area has managed to avoid and reduce impacts to higher quality habitats (e.g., semi-evergreen vine thickets and wetlands habitats). In particular, there will be no impacts to Semi-evergreen vine thicket, Eucalypt woodlands on lowlands and ranges, or Natural grassland communities. Impacts to ephemeral wetlands have been minimised to 1.31 ha, representing only 7.4 % of available wetlands within the Survey area.

Table 48 provides the extent of MNES (TECs and habitat for listed threatened and migratory species) within the Survey area, Project area and Disturbance area. As is evident from Table 48, the placement of the Disturbance area has managed to avoid and reduce impacts on habitat for listed threatened species and TECs in the Project area. In particular:

- All Natural Grassland and Semi-evergreen Vine Thickets TECs, and habitat for *Dichanthium queenslandicum* and *Dichanthium setosum* has been avoided. Similarly, breeding habitat for the Australian Painted Snipe has been avoided.
- Only 1.31 ha of habitat for threatened wetland birds (Australian Painted Snipe, Sharp-tailed Sandpiper and Common Greenshank) will be impacted, which represents 4.2 – 6.7% of available habitat for each species within the Survey area.
- For most other threatened and migratory species, direct impacts are in the range of 9.0 – 17% of available habitat within the Survey area.

The Project design was progressively refined using detailed ecological field survey results, Queensland Herbarium-certified RE mapping and habitat suitability modelling. These inputs were applied iteratively to inform mine planning and infrastructure placement, with the explicit objective of reducing the spatial extent of disturbance and avoiding areas of higher ecological value.

The following measures have been incorporated into the Project design to avoid and minimise impacts on terrestrial ecology:

- Integration with existing operations – The Project has been designed as an extension to IPC, utilising existing MIA, CHPP, haul roads, water management systems and power infrastructure to minimise the extent of new disturbance.
- Optimised disturbance area – The Disturbance area has been reduced to ~2,083 ha through detailed mine-planning refinements to avoid vegetation clearing and habitat loss.
- Avoidance and minimisation of high ecological value areas – Layout refinement avoided or minimised the following impacts:
 - Direct disturbance to riparian vegetation along the Isaac River and Cherwell Creek (other than infrastructure crossings), with buffers maintained to preserve corridor connectivity (Map 9, Appendix A).
 - Direct disturbance to the Natural Grassland and Semi-evergreen Vine Thicket TECs (Map 11, Appendix A).
 - Direct disturbance to the HES wetland (Map 20, Appendix A).
 - Direct disturbance to the field-verified wetland to the north of the Project area (Map 20, Appendix A).



- Minimised impacts to all MNES and MSES by designing the Disturbance area within mostly cleared areas as opposed to remnant vegetation that contains MNES and MSES.
- Minimised impacts on Poplar Box TEC, with only one patch being partially impacted (Map 11, Appendix A).
- Implementation of drainage and erosion controls – The clean-water and sediment-water control network will be designed to manage erosion and sedimentation to maintain water quality in receiving environments.
- Implementation of fauna-sensitive design – Infrastructure crossings of watercourses have been minimised with two permanent crossings: one bridge crossing of Isaac River to provide access between the RoM coal pad and existing haul roads at IDM, and one bridge crossing of Cherwell Creek to provide a secondary access route to be utilised intermittently when access to IDM is constrained; with one temporary crossing for the dragline walk route.
- Sequential clearing to be implemented – Vegetation clearing will be undertaken progressively in line with mining sequences to minimise the area of concurrent disturbance.
- Progressive rehabilitation – Rehabilitation will commence as soon as areas become available in accordance with the PRCP. Disturbed areas will be reshaped, top-soiled and revegetated with locally sourced native species to reinstate ecological function and minimise long-term residual impacts.

Habitat fragmentation and patch isolation have been avoided and minimised through the iterative design of the Disturbance area, which has sought to reduce the extent of vegetation clearing, avoid sensitive habitat where practicable, and retain vegetation linkages between retained habitat patches and the broader surrounding landscape. In particular, the Project has, where practicable, avoided severing contiguous areas of remnant vegetation and habitat critical to the survival of listed species and TECs, so that retained patches are not left isolated within the Survey area. Avoidance areas have been configured to maintain connectivity between retained habitat within the Survey area and adjoining remnant vegetation beyond the Project boundary, thereby supporting continued species movement, dispersal and access to foraging, sheltering and breeding resources. While some localised fragmentation will occur where direct impacts cannot be avoided, the Project layout, disturbance limits and patch retention measures have been designed to ensure retained habitat remains connected, or capable of functioning as part of the broader habitat network, rather than persisting as isolated remnants. On this basis, avoidance areas are expected to continue to enable species mobility across the Project area and maintain functional ecological connectivity with habitat in the broader landscape.

Where avoidance was not practicable, impacts were minimised, with further management controls in the form of mitigation measures also proposed in the subsequent sections, and through the implementation of appropriate management plans (Sections *7.2 Retention of Buffer Zones and Habitat Connectivity* and *7.4 Management and Monitoring Plans*).

7.2 RETENTION OF BUFFER ZONES AND HABITAT CONNECTIVITY

The Project design has incorporated avoidance measures that retain areas of native vegetation within the Project area, such that the Disturbance area does not encompass the entire Project area. As a result, discrete patches of remnant and non-remnant vegetation will be retained as buffer zones established between the Disturbance area and retained patches of vegetation.

These buffer zones provide an important function in:

- maintaining habitat connectivity across the landscape;
- supporting fauna movement between retained habitat patches;
- protecting retained vegetation from edge effects associated with construction and operation (e.g. dust, noise, weed incursion);
- maintaining and enhancing the function of riparian vegetation and wetlands, where present; and
- contributing to the protection of water quality by reducing sedimentation and runoff into adjacent ecological features.

Where riparian areas or drainage features occur, buffers will assist in maintaining bank stability, filtering surface runoff, and preserving vegetation structure and composition, thereby supporting both aquatic and terrestrial ecological values. Buffer zones along riparian corridors will include separation between levee structures and the high bank.



The Project design incorporates buffer zones around retained TEC patches (Brigalow and Poplar Box) to minimise indirect impacts (e.g. edge effects, sedimentation and disturbance), thereby avoiding significant indirect impacts. In areas where infrastructure such as the dragline crossing and bridges are proposed across the Isaac River and Cherwell Creek; the defined Disturbance area has been conservatively delineated to allow flexibility in final infrastructure placement. However, the full extent of the Disturbance area at these crossings will not be impacted. As a result, adequate buffer zones to adjacent riparian habitats will be retained, supporting the maintenance of water quality, bank stability and habitat function.

Rehabilitation within these buffer zones is not required as vegetation will be retained. Rehabilitation of the diverted Conrock Gully will be undertaken, which will provide a vegetated buffer to surrounding retained vegetation patches and facilitate a movement corridor for fauna. This approach supports habitat connectivity and contributes to maintaining ecological function across the Project area.

The need for and extent of buffer zones has been considered in the context of the Project layout and the distribution of ecological values. While buffer widths may vary depending on infrastructure type, local constraints and habitat type, the retention of vegetation outside the Disturbance area provides a practical and effective mechanism to minimise edge effects and maintain ecological function.

Overall, the retention of vegetation and incorporation of buffer zones within the Project area is expected to contribute to maintaining habitat connectivity and ecological function at the local scale.

7.3 GENERAL IMPACT MITIGATION

Generalised mitigation measures have been proposed to reduce the impacts from the Project, taking into consideration the likelihood, intensity, duration and magnitude and extent of disturbance associated within the Project.

. These are detailed in Table 54. Of particular importance to managing Project impacts are the *Coal Mining Safety and Health Act 1999* (CMSH Act) and the *Coal Mining Safety and Health Regulation 2017*, which govern coal mining operations in Queensland. The Act establishes obligations to ensure coal mines operate at an acceptable level of risk and requires the development and implementation of a Safety and Health Management System (SHMS) based on the systematic identification and management of hazards at the mine. Adherence to the requirements of the CMSH Act and Regulation is relevant to mitigation matters relating to bushfire management, vehicle speeds and dust suppression which are applicable to the management of impacts to MNES and MSES.

In addition to the generalised mitigation measures outlines in Table 54, community- and species-specific mitigation measures have been developed for MNES that are likely to be significantly impacted by the Project. These measures have been tailored to the ecology and known threat profiles of the affected MNES and are informed by relevant statutory and policy guidance, including the SPRAT database and applicable approved conservation advices, recovery plans and threat abatement plans. The specific mitigation measures are provided in Appendix J, alongside the significant impact assessments for each MNES.

Table 54 Project mitigation measures	Potential Impact	Mitigation Measures	Performance Outcomes
	Vegetation Clearing (direct)	- Infrastructure will be sited in accordance with the State and Commonwealth approval conditions. - Areas requiring vegetation removal will be clearly delineated to ensure disturbance to areas being retained is avoided. Limits of clearing are to be delineated using barricading or temporary fencing and signage prior to works commencing. Exclusion areas are to be clearly shown and labelled on all operational and management drawings and plans. GIS shapefiles will be provided to clearing personnel and/or contractors prior to the commencement of clearing operations. - The Environmental Officer (EO) or delegate will routinely inspect the disturbance limit boundaries to ensure that no clearing or disturbance of vegetation or habitat beyond the approved limits has taken place.	- No clearing outside of approved Disturbance area. - Rehabilitation of disturbed areas in accordance with the PRCP.



Potential Impact	Mitigation Measures	Performance Outcomes
	- Limit clearing at any one time to the minimum area required for safe construction and operations. - Undertake vegetation clearing progressively, sequenced with mine development to reduce open disturbance areas. - Salvage felled timber, logs, rocks, and other habitat structures for reuse in rehabilitation areas. - An internal 'Permit to Disturb' system will be used by the EO to ensure that all clearing activities are authorised prior to disturbance. Conditions listed in the Permit to Disturb must be implemented. - Rehabilitation to occur in accordance with the PRCP.	
Habitat Removal and Loss of Connectivity (direct)	- Permanent water sources for retention such as farm dams outside of the Disturbance area will be clearly delineated and shown and labelled on all operational and management drawings and plans which will be made available to all personnel. - Sequentially clear vegetation towards retained habitat to allow fauna to disperse naturally. - Avoid where possible and within the constraints of the mining schedule, impacting on MNES and MSES habitat during breeding periods through considering the timing of clearing and watercourse / creek disturbance activities to avoid the main breeding season of impacted MNES (i.e., mid dry season to wet season for Squatter Pigeon). - Prior to entry to the site, all site personnel including contractors shall be made aware via toolbox talks and site information sheets, of the sensitive environs they will be working in and around and be advised of specific limitations to construction works being undertaken in or adjacent to MNES and MSES habitat. All staff and contractors will be required to report sightings of MNES and MSES fauna in the activity area to the EO immediately. - Temporary stockpile sites for soil and equipment, access routes, laydown areas and other associated infrastructure will, as far as reasonably practical, be located in cleared areas and will not be situated in areas of MNES and MSES habitat. - Prior to construction activities commencing, signage, including speed limits, will be erected in the vicinity of exclusion areas to warn of the potential presence of MNES and MSES species in the area. - Pre-clearance surveys will be undertaken by a suitably qualified ecologist using approved State and Commonwealth survey guidelines within 48 hours before clearing activities commence. - The pre-clearance survey will be undertaken in order to: - Record the location of all hollow bearing trees, log piles and nests using a GPS, with features of tree hollows (diameter, number and whether active/inactive) to be recorded in the Environmental Register; and - Relocate all captured non-breeding animals to suitable habitat adjacent to the Disturbance area. - A Fauna Spotter Catcher will supervise all clearing activities and will conduct a walk-through survey prior to commencement of clearing and prior to clearing works each day to check vegetation and other fauna habitats. - The Fauna Spotter will reinspect the area of cleared vegetation immediately after clearing to locate any potentially injured fauna that should then be taken to a wildlife carer or veterinarian. - Vegetation clearing will be undertaken progressively and trees will be felled in the direction of the clearance zone to avoid impacts to adjoining retained vegetation and habitat.	- Clearing of habitat for MNES and MSES does not occur outside of the approved Disturbance area. - No net loss of habitat for MNES and MSES habitat outside of the approved Disturbance area - No net loss of permanent water sources for the Squatter Pigeon outside of approved Disturbance area.



Potential Impact	Mitigation Measures	Performance Outcomes
	- Hollow bearing trees will be clearly flagged and surrounding vegetation removed with the hollow bearing tree left standing for at least one night to encourage fauna to relocate on its own accord. Hollow bearing trees will be inspected to determine if hollows are occupied. - If after one night the resident fauna have not moved on, the hollow entrance will be blocked with a towel or similar and the hollow removed by cutting with a chainsaw below the hollow section. The hollow with the animal inside will then be installed in nearby similar and adjoining vegetation to be retained at a similar height and orientation, with the entrance unblocked at dusk. - If the procedure described above is not possible for any reason, hollow-bearing trees will be felled using a tree grab or similar that can remove the tree in a controlled fashion. If possible and safe to do so, hollow trees will be felled at dusk to allow fauna the opportunity to disperse during their normal activity period. These trees will be felled away from hollow openings. The tree will be knocked at the base several times prior to felling to encourage fauna to relocate of their own accord. Once the tree is felled, it will be inspected by the Fauna Spotter for any fauna and any injured fauna rescued and taken to a wildlife carer or veterinarian. - Any fauna that is captured will be relocated into the adjacent habitat at least 200 m from the clearing area if clearing works are yet to be completed. - Where MNES or MSES fauna is identified and delaying the clearing of area is not feasible, a 50 m exclusion zone will be established, and the area must not be disturbed for a minimum of 24 hours while clearing is undertaken around the exclusion zone. After 24 hours, a Fauna Spotter Catcher may relocate the breeding animal to suitable habitat at least 200 m away from the disturbance area. Where survival of young or eggs is unlikely as a result of the disturbance, these are to be handed over to a previously identified wildlife carer or veterinarian. - Koalas will be managed in accordance with the <i>Nature Conservation (Koala) Conservation Plan 2017</i> (Qld), NC Act, and Nature Conservation (Animals) Regulation 2020 (Qld) as follows: - If a Koala is observed within the clearing area, a 30 m buffer of vegetation around the Koala tree, in addition to a corridor of vegetation to the nearest vegetated area will be retained until the Koala moves out of the Project area on its own accord. - No felling of any tree that has the potential to fall on or near the tree the Koala is residing in. - Monitoring the Koala's location and its visible stress levels. If the Koala is appearing visibly stressed and agitated, the clearing front will be moved away from the animal. - Allowing the Koala to self-relocate of its own volition. - Koalas will not to be interfered with unless they have been injured. - Approval and implementation of a SMP (High-risk of Impacts) under the NC Act prior to clearing to manage interference with animal breeding places that cannot be avoided during clearing works. - Incorporate coarse woody debris and retained logs into rehabilitated habitat zones.	
Biosecurity risks (Introduced Fauna Species and Invasive Weeds)	To minimise these risks and meet the GBO under the Biosecurity Act, the Project will implement a range of management measures prepared with reference to the <i>Biosecurity – EIS information guidelines</i> (DESI, 2024b), including: - Weeds will be managed in accordance with the Project's <i>Weed and Pest Management Plan</i> (Trend Environmental, 2026e). The Plan includes the following: - A site induction program that provides weed management information to staff, contractors and visitors.	No new weed species are established in areas of MNES or MSES habitat areas based on baseline data.



Potential Impact	Mitigation Measures	Performance Outcomes
	- o Detailed control measures aimed at eradicating where possible or otherwise reducing the extent of weeds in accordance with the Queensland DAF guidelines and the requirements of the Biosecurity Act. - o Weed washdown procedures for all vehicles brought to site that will be traveling beyond the site office carpark. - o Targeted weed control measures within the Project area. - o Undertake routine monitoring to verify control effectiveness and detect new weed and pest incursions. • Pest animals will be managed in accordance with the Weed and Pest Management Plan. The Plan includes requirements for: - o Appropriate waste management and waste disposal. - o A reporting framework to ensure sightings of pest animals are recorded. - o Site inductions to include information of pest animals including control requirements, importance of appropriate waste management and reporting requirements when pest animals are observed within the site during construction and operation activities. - o Control of pest animals. • Pest management actions outlined in the Weed and Pest Management Plan will primarily focus on those pest animals identified within the Survey area and include Cane Toads, Feral Cats, Wild Dogs, Feral Pigs, Feral Deer and European Rabbits. • Pest management includes a range of best management practice actions including shooting, trapping, fencing and baiting in and will be undertaken in accordance with site safety and health requirements, and DAF guidelines and the requirements of the Biosecurity Act and as permitted under the SHMS.	• Spread of weeds does not occur as in areas of retained MNES and MSES habitat compared to baseline habitat quality surveys. • No new pest animal species are established in areas of MNES or MSES habitat in comparison to baseline data. • Reduction in pest animal numbers in areas of habitat for MNES and MSES below baseline levels.
Fragmentation and Edge Effects	• Areas of MNES habitat to be retained adjacent to the Disturbance area will be clearly delineated and shown and labelled on all operational and management drawings and plans. GIS shapefiles will be provided to clearing personnel and/or contractors prior to the commencement of clearing operations. • Site access is only to occur along designated site access tracks. No unauthorised access is permitted. • Prior to entry to the site, all site personnel including contractors shall be made aware via toolbox talks and site information sheets, of the sensitive environs they will be working in and around and be advised of specific limitations to construction and/or operational works being undertaken in or adjacent to MNES and MSES habitat. • Implementation of dust suppression techniques in accordance with the Dust Management Plan (Katestone, 2026) and the <i>CMSH Act</i>. • Maintenance of existing fences to prevent unauthorised vehicle or stock access into retained vegetation. • Maintenance of existing water management infrastructure and erosion and sediment control devices. • Pest animals and weeds will be managed in accordance with the Project's <i>Weed and Pest Management Plan</i> (Trend Environmental, 2026e).	• Maintain habitat quality scores within the retained MNES and MSES habitat in relation to baseline habitat quality scores. • Rehabilitation of disturbed areas will be rehabilitated in accordance with the PRCP.
Erosion and Sedimentation	• Implement erosion and sediment control measures in accordance with Best Practice Erosion and Sediment Control (IECA, 2008). • Install sediment fences, diversion drains and sediment dams prior to ground disturbance. • Stage earthworks to minimise the extent of exposed soils at any one time. • Stabilise disturbed areas as soon as practicable using mulching, erosion control matting or revegetation.	• Erosion and sediment controls implemented in accordance with best practice.



Potential Impact	Mitigation Measures	Performance Outcomes
Fauna Mortality or Injury	- Inspect erosion and sediment controls regularly and following rainfall events and maintain or repair as required. - Avoid disturbance of soils during wet weather where practicable - All staff and contractors will be required to report sightings of MNES and MSES fauna to the EO. - Prior to construction, signage, including speed limits, will be erected to warn of the potential presence of threatened fauna in the area. - Posters will be developed and displayed in meeting areas that reminds staff and contractors about the MNES and MSES present in the Project area. - Where exclusion fencing is required, consideration shall be given to fauna movement, current land uses and worker safety requirements. - Environmental awareness training will be provided to all workers as part of site induction and will include specific topics on MNES and MSES, risks and protective measures, and identification of the MNES. - Pre-clearance surveys will be undertaken within 48 hours prior to clearing activities to assess the presence of MNES and MSES within the disturbance area to be cleared. - At least one qualified Fauna Spotter Catcher will be present during clearing activities. - Where tree hollows that are suspected as being used by Greater Gliders are identified from within the Disturbance area, they are to be salvaged to the greatest extent possible and relocated within retained vegetation. As far as practical, the site of the relocation is to be within retained vegetation and replicate the height and orientation of the original breeding or nesting structure. Sections of hollow branch or log will be secured in the new location by mechanical means deemed appropriate by the Fauna Spotter/Catcher (e.g. bolts, metal bands). Relocation is to be undertaken under the supervision of a spotter/catcher. - Selected trees and/or logs will be salvaged and reused as fauna habitat to enhance retained vegetation habitat values (e.g. within Conrock Gully diversion). Trees and other habitat features to be salvaged will be identified and flagged by the Fauna Spotter/Catcher during the walk-through survey and/or clearance activities. - If an occupied tree hollow cannot be relocated the breeding habitat should be replaced nearby and in retained vegetation (but at least 200 m away from the Disturbance area) in undisturbed habitat, with an artificial nesting structure at a ratio of 1:1 using current best practice nest box design. - A wildlife carer will be called to take any injured fauna. - Speed limits of 60 km/hr will be set and enforced on all internal roads including haul roads. - Vehicles must abide by vehicle speed limits and access to any restricted areas or exclusion zones must be limited to critical site-specific activities to minimise threats to MNES and MSES. - All injured fauna encountered during the construction and operation of the activity will be taken to a wildlife carer/facility or veterinarian. - Where injured fauna is encountered, and it is unsafe to handle the animals, the following should be undertaken: - The location of the injured animal will be identified so it can be located again. - The species of animal will be identified if possible and its sex and approximate size determined. - The type of injury sustained will be identified if possible. - The EO shall immediately contact Queensland's DETSI and report the animal and arrange for its capture and transportation to a wildlife carer or veterinarian.	- Ensure vehicle speed limits are enforced. - Ensure conditions of high-risk SMP are adhered to. - No mortality or injury to MNES or MSES as a result of Project activities (e.g. from clearing activities, vehicle strikes etc).



Potential Impact	Mitigation Measures	Performance Outcomes
	- Where possible, avoid additional barriers to fauna movement such as fencing or continuous bunds. - Approval and implementation of a SMP (High-risk of Impacts) under the NC Act prior to clearing to manage interference with animal breeding places that cannot be avoided during clearing works. - Daily trench inspections, escape ramps, and covering or backfilling of trenches to reduce the risk of fauna entrapment. - Remove roadkill promptly to avoid attracting predators.	
Hydrological Changes	- Site stormwater management will be undertaken in accordance with the Fitzroy Regional Receiving Environment Monitoring Program (FRREMP), Water Management Plan (WMP) and an Erosion and Sediment Control Plan (ESCP; Hydrobalance, 2026a). - The site specific WMP, FRREMP and ESCP will be implemented by suitably qualified persons. - Required management plans will be implemented with the aim of minimising alterations to receiving environment water quality erosion, minimising mobilisation of sediments and minimising erosion related disturbances to the current hydrological regime. - The maintenance and cleaning of any vehicles, plant or equipment must not be carried out in areas from which contaminants can be released into any receiving waters. - Spillage of wastes, contaminants or other materials must be cleaned up as quickly as practicable to minimise the release of wastes, contaminants or materials to any stormwater drainage system or receiving waters. - Construct Conrock Gully diversion in accordance with engineering design for a long term geomorphically stable structure. - Progressively rehabilitate disturbed riparian areas in accordance with the PRCP. - Avoid placement of spoil or stockpiles within mapped waterways or wetland buffer zones.	- Water quality, as a result of the Project, does not exceed the receiving waters trigger levels listed in the EA. - Water quality monitoring is undertaken in accordance with the FRREMP
Air Quality	- Dust suppression will be undertaken in accordance with the <i>CMSH Act</i> and include the following actions: - Staging vegetation clearing to minimise areas of disturbed and bare ground. - Progressively rehabilitating disturbed areas. - Removal and dumping of overburden as soon as reasonably practical following blasting activities - Regular watering of haul roads and access tracks in accordance with the <i>CMSH Act and Regulation</i>. - Dust suppression spraying of stockpiles. - Limiting grading and/or dozing in high dust generating areas. - Limiting overburden drilling. - Enforcing speed limits in accordance with the requirements of the <i>Coal Mining Safety and Health Act 1999</i> and the <i>Coal Mining Safety and Health Regulation 2017</i>.	- Dust deposition does not exceed 120 milligrams (mg) per square metre (m²) per day, averaged over one month when measured at any sensitive receptor. - Dust is monitored in accordance with the EA.
Artificial Light	- Lights will be directed to the open cut pit to minimise light spill. - The use of low wattage lighting with spill guards. - Implement lighting controls and monitoring in accordance with relevant DCCEEW light impact guidelines.	Artificial lighting associated with the Project does not result in measurable adverse effects on the behaviour, movement, breeding success or habitat use of native fauna



Potential Impact	Mitigation Measures	Performance Outcomes
Noise and Vibration	- Regularly maintaining and servicing all plant equipment to minimise machinery noise. - All engine covers will be kept closed while equipment is operating. - Blasting will only occur during EA prescribed day periods. - Manage noise and vibration levels in accordance with regulatory limits.	When measured, noise and vibration levels at sensitive receptors do not exceed criteria set out in the EA.
Bushfire Risk	- Fire management for coal mining operations in Queensland is governed by the <i>CMSH Act and Regulation</i>, with the Regulation prescribing management of fires for coal mines. - Section 37 of the <i>CMSH Regulation</i> prescribes that the coal mines SHMS must include standard operating procedures for action to be taken when a fire is discovered at the mine. - Buffers will be maintained around potential ignition sources such as plant and machinery, haul roads and infrastructure areas. - Prior to site entry, all relevant site personnel, including contractors, will be made aware of fire safety and risks. - Fuel loads will be minimised and managed through the weed control measures outlined in the <i>Weed and Pest Management Plan</i> (Trend Environmental, 2026e). - Implement a <i>Bushfire Management Plan</i> (provided as an appendix to the Project's EIS) consistent with relevant fire authority requirements. - Maintain firebreaks and asset protection zones around infrastructure and high-risk areas. - Restrict hot works during periods of high fire danger and implement permit systems where required. - Ensure firefighting equipment is readily available on-site and personnel are trained in its use. - Dispose of flammable waste materials appropriately and prohibit uncontrolled ignition sources on-site. - Suspend high-risk activities during extreme fire weather conditions where practicable.	No uncontrolled fires within the Project area resulting from Project related activities.

7.4 MANAGEMENT AND MONITORING PLANS

Environmental management and monitoring plans will be prepared for the Project to ensure the effective implementation of mitigation measures during the construction, operational, and rehabilitation phases. These plans will provide the framework for compliance with approval conditions and continuous environmental performance improvement through the operational life of mine (LoM).

The following plans will guide environmental management for the Project, particularly as it relates to impacts to terrestrial ecology:

- Weed and Pest Management Plan
- MNES Species Management Plan
- SMP (High-risk of Impacts)
- GDE Monitoring and Management Plan, complemented by the GDE Habitat Quality Monitoring Plan.
- Offset Area Management Plan and Offset Delivery Strategy
- Bushfire Management Plan
- ESCP
- PRCP

Details on each Plan are provided below.



7.4.1 Weed and Pest Management Plan

The *Weed and Pest Management Plan* (Trend Environmental, 2026e) provides a framework for preventing the introduction, spread, and establishment of invasive flora and fauna within the Project area, including Disturbance area, access roads, rehabilitation areas, and adjacent lands.

In accordance with the ToR and the *EIS Guideline – Biosecurity* (DESI, 2024b), the Weed and Pest Management Plan includes:

- Measurable objectives for determining the success of risk management measures.
- Monitoring actions, and a schedule for implementing them.
- Corrective actions if monitoring finds that risk management measures are not succeeding or have failed.

The Plan's measures and strategies align with relevant Commonwealth, State and local biosecurity strategies, plans and priorities including:

- *Australian Pest Animal Strategy 2017–2027*.
- *Australian Weeds Strategy 2017–2027*.
- Biosecurity surveillance or prevention measures authorised under Queensland's Biosecurity Act.
- Nationally significant pest animals, weeds and diseases under the Commonwealth *Biosecurity Act 2015* framework.
- Local government and regional biosecurity plans, specifically the *Isaac Regional Council Biosecurity Plan 2024–2027 (Liveability and Sustainability, 2024)*.

The Plan includes, but is not limited to:

- A site induction program that provides weed management information to staff, contractors and visitors.
- Detailed control measures aimed at eradicating where possible or otherwise reducing the extent of weeds in accordance with the Queensland DAF guidelines and the requirements of the Biosecurity Act.
- Weed washdown procedures for all vehicles brought to site that will be traveling beyond the site office carpark.
- Targeted weed control measures within the Project area.
- Undertaking routine monitoring to verify control effectiveness and detect new weed and pest incursions.
- Appropriate waste management and waste disposal.
- A reporting framework to ensure sightings of pest animals are recorded.
- Site inductions to include information of pest animals including control requirements, importance of appropriate waste management and reporting requirements when pest animals are observed within the site during construction and operation activities.
- Control of pest animals.

Monitoring and review components of the Plan include:

- Regular inspections of haul roads, infrastructure areas, overburden areas, rehabilitation zones, and soil stockpiles.
- Weed mapping and density recording using GIS to inform adaptive management.
- Annual review of Plan effectiveness, with updates following new incursions or changes to legislation or policy.
- Trigger thresholds (e.g. increases in infestation extent or density) to initiate corrective management actions.

7.4.2 MNES Species Management Plan

The MNES Species Management Plan (Trend Environmental, 2026a) provides a framework for avoiding, minimising, and managing potential impacts to protected and threatened flora and fauna species recognised as MNES within the Project Area, including the Disturbance area, access roads, rehabilitation areas, and adjacent habitats.

In accordance with the ToR and the *EIS Guideline – Terrestrial Ecology* (DESI, 2024f), the MNES Species Management Plan includes:

- Measurable objectives for assessing the effectiveness of avoidance and mitigation measures.
- Monitoring actions and an implementation schedule.



- Corrective actions to be implemented where monitoring indicates that management measures are not effective or have failed.

The Plan aligns with relevant Commonwealth legislation, policies, and guidelines, including:

- The EPBC Act.
- Relevant recovery plans, conservation advices, and threatened species guidelines
- Conditions of approval arising from the EIS process

The objectives of the MNES Species Management Plan include:

- Avoiding and minimising impacts to MNES threatened species and their habitats.
- Managing construction and operational activities to reduce the risk of injury, mortality, or habitat degradation.
- Ensuring compliance with relevant legislative requirements and approval conditions.

Management measures proposed within the Plan relate to limiting and avoiding loss of MNES and/or habitat for MNES, prevention of habitat degradation and a decline in habitat values, minimising risk of weed introduction and spread, reducing habitat degradation by pest animals, minimising impact of dust deposition on MNES habitat, minimising noise and vibration impacts, minimising degradation of habitat from bushfire, minimising alteration of habitat resulting from changes to hydrology and water quality, and minimising potential for mortality or injury of MNES.

The Plan includes, but is not limited to:

- Provision of species-specific measures to protect and mitigate impacts on MNES threatened flora and fauna species during construction and operations, consistent with the EPBC Act.
- Implementation of protocols for pre-clearance surveys, Fauna Spotter Catcher/relocation, habitat feature salvage (e.g. hollows, logs), and monitoring to support population persistence and resilience.
- Definition of trigger thresholds and adaptive management responses.
- Maintenance of detailed records of fauna interactions, relocations, injuries, mortalities, and monitoring outcomes to meet regulatory reporting requirements and inform continual improvement of management measures.
- Refinement of disturbance boundaries and establishment of clearly marked exclusion zones around sensitive habitats prior to commencement of works.
- Timing of vegetation clearing to avoid key breeding, nesting, or flowering periods where practicable.
- Progressive vegetation clearing, with Fauna Spotter Catcher presence during clearing activities.
- Implementation of speed limits, lighting controls, and noise management measures to minimise disturbance to fauna.
- Management of artificial water points, trenches, and excavations to prevent fauna entrapment.
- Delivery of workforce awareness and training programs through site inductions and toolbox talks to ensure compliance with species management requirements.

The monitoring and review components of the Plan include:

- Monitoring of known and potential habitat areas adjacent to disturbance zones.
- Recording and reporting of fauna encounters, injuries, and mortalities.
- Post-clearing inspections to verify the effectiveness of mitigation measures.
- Review and update of the Plan where monitoring identifies exceedances, new species records, or changes to regulatory requirements.

7.4.3 High-risk Species Management Program

An SMP (High-risk of Impacts) is required under Section 335 of the *Nature Conservation (Animals) Regulation 2020* (Qld) where breeding places of protected fauna are to be tampered with. The purpose of this SMP (High-risk of Impacts) is to address requirements under *Section 335 (3)(c) of the Nature Conservation (Animals) Regulation 2020* (Qld), which specifies that a person must not tamper with a protected animal's breeding place unless the removal or tampering is part of an approved Species Management Program for the animal.



The SMP (High-risk of Impacts) will provide targeted, species-specific measures to avoid, minimise, and manage potential impacts on high-risk and highly sensitive flora and fauna species within the Project area during construction and operation. The Program will apply to the threatened species known to occur within the Project area i.e., Squatter Pigeon and Greater Glider, as well as least concern fauna species that have breeding places within the Survey area.

The Program will be developed in accordance with the *Information sheet—Species Management Program requirements for tampering with a protected animal breeding place* (DES, 2020c).

The objectives of the SMP (High-risk of Impacts) will be to:

- Avoid and minimise impacts on animal breeding places.
- Ensure compliance with legislative requirements.
- Maintain population viability and habitat function for fauna species, including those of conservation significance.

Management measures will include, but not be limited to:

- Implementation of pre-clearance surveys and clearing supervision by experienced and permitted Fauna Spotter endorsed under a DETSI Rehabilitation Permit (Spotter Catcher).
- Use of staged and progressive clearing methods.
- Targeted habitat feature identification, retention, and salvage, including tree hollows, logs, and refugia.
- Species-specific clearing protocols, handling, relocation, and release procedures.
- Implementation of temporal restrictions on works in sensitive areas during key breeding or dispersal periods where practicable.
- Enhanced controls on vehicle speed, lighting, and noise in areas of high-risk species habitat.
- Management of artificial water points, trenches, and excavations to prevent fauna entrapment.

7.4.4 Groundwater Dependent Ecosystem Monitoring and Management Plan, and complementary Groundwater Dependent Ecosystem Habitat Quality Monitoring Plan

The GDE Monitoring and Management Plan (GDEMMP; WatermarkEco, 2026) provides a framework to assess, monitor, and manage potential groundwater drawdown and water quality impacts on GDEs within and surrounding the Project area.

The Plan was informed by regional hydrogeological modelling, and ecological surveys, and supports the protection of groundwater dependent vegetation communities and habitats that may be influenced by Project-related groundwater drawdown.

The objectives of the GDEMMP are to:

- Establish a monitoring framework to detect changes in groundwater levels and quality that may affect groundwater dependent vegetation communities or habitats.
- Define performance criteria, trigger thresholds, and response measures to prevent significant impacts to GDEs within and adjacent to the Project Area.
- Ensure adaptive management of groundwater resources consistent with baseline ecological data and regional hydrogeological assessments.

To complement the GDEMMP, the GDE Habitat Quality Monitoring Plan (Trend Environmental, 2026a) establishes a monitoring framework for detecting change in groundwater dependent vegetation communities that may be the result of changes in groundwater levels and quality.

The GDE Habitat Quality Monitoring Plan includes:

- A monitoring methodology to assess habitat quality within groundwater dependent vegetation communities.
- The establishment of baseline ecological condition within groundwater dependent vegetation communities prior to Project-related groundwater disturbance.
- Procedures for ongoing monitoring of habitat quality within groundwater dependent vegetation communities throughout the Project to detect changes over time and assess the effectiveness of management measures.
- Definition of trigger thresholds for habitat quality changes, and indicators of vegetation stress.



- Implementation of corrective and contingency actions where trigger thresholds are exceeded, which may include modification of groundwater extraction practices, targeted revegetation, supplementary watering where appropriate, or biodiversity offsets.

7.4.5 Offset Area Management Plan and Offset Deliver Plan

Where residual impacts to MNES and MSES cannot be avoided or adequately mitigated, Offset Management and Delivery Plans will be prepared in accordance with the ToR and relevant Commonwealth and State offset policies and guidelines.

The Offset Area Management Plan (OAMP; Trend Environmental, 2026c) provides the framework for securing, delivering, managing, and monitoring offsets to compensate for residual impacts to MNES. While the Offset Delivery Plan (ODP; Trend Environmental, 2026d) provides the framework for securing, delivering, managing, and monitoring offsets to compensate for residual impacts to MSES.

Offsets will be designed to achieve outcomes that are consistent with the conservation objectives of the impacted MNES and MSES and to meet approval conditions arising from the Project's approvals process.

The objectives of the OAMP and ODP are to:

- Compensate for residual impacts to MNES and MSES in accordance with applicable offset requirements.
- Ensure offsets deliver measurable, additional, and enduring conservation outcomes.
- Provide transparency and accountability in the delivery and management of offset obligations.

Management measures include, but aren't limited to:

- Identification of offset requirements in accordance with approved offset assessment methodologies.
- Selection of suitable offset sites that provide equivalent or improved conservation outcomes for the impacted MNES and MSES.
- Securing offset sites through appropriate legal mechanisms to ensure long-term protection and management.
- Implementation of management actions to improve or maintain the conservation values of offset sites.
- Development of performance criteria, monitoring programs, and reporting requirements to demonstrate offset effectiveness.
- Implementation of corrective actions where monitoring indicates offset performance objectives are not being achieved.

Monitoring and review requirements include offset sites being monitored in accordance with defined performance indicators and timeframes. Monitoring results will be used to assess progress toward offset outcomes and inform adaptive management. The OAMP and ODP will be reviewed and updated as required to ensure ongoing compliance with approval conditions and offset policy requirements.

7.4.6 Bushfire Management Plan

Fire management for coal mining operations in Queensland is governed by the *CMSH Act and Regulation*, with the Regulation prescribing management of fires for coal mines. Section 37 of the Regulation prescribes that the coal mines SHMS must include standard operating procedures for action to be taken when a fire is discovered at the mine.

The Bushfire Management Plan (provided as an appendix to the Project's EIS) has been developed to identify, manage, and reduce bushfire risks associated with Project activities, including mine infrastructure, stockpiles, access tracks, and vegetated buffer areas, while maintaining safe operational and environmental outcomes.

The Plan was developed in consultation with relevant emergency management authorities and aligns with applicable fire management legislation, guidelines, and regional fire management arrangements.

The objectives of the Bushfire Management Plan are to:

- Delineate the potential bushfire hazards that may affect the Project.
- Provide the principles of the Project's fire management to minimise the risk of bushfire generation and propagation.
- Describe the roles and responsibilities associated with the Project's fire management, including bushfires.



- Outline the Project's arrangements for the management of fires and bushfires through prevention, preparedness, response and recovery.
- Protect people and property.

Management measures within the Bushfire Management Plan include, but are not limited to:

- Establishment and ongoing maintenance of firebreaks along mine lease boundaries, haul roads, and around critical infrastructure.
- Management of fuel loads within buffer zones through vegetation slashing, mulching, or controlled burning where appropriate and approved.
- Maintenance of emergency access tracks suitable for firefighting and evacuation purposes.
- Development and implementation of emergency response procedures in consultation with Queensland Fire and Emergency Services and local rural fire brigades.
- Storage of flammable and hazardous materials in compliant, bunded facilities located away from vegetated areas.
- Inclusion of bushfire risk awareness and response procedures in staff inductions and operational training programs.

The Plan will be reviewed and updated at least annually, and following any bushfire incident or significant change to Project activities, to ensure ongoing effectiveness and regulatory compliance.

7.4.7 Erosion and Sediment Control Plan

Erosion and sediment management for the Project will be implemented through the ESCP (Hydrobalance, 2026a), which has been developed to manage the risks of soil erosion, sediment mobilisation and downstream water quality impacts associated with Project activities. The ESCP provides the framework for planning, installing, maintaining and monitoring erosion and sediment controls for disturbance areas, haul roads, stockpiles, drainage lines, rehabilitation areas and other Project infrastructure, with the aim of minimising off-site sediment discharge and protecting receiving environmental values.

The ESCP has been prepared having regard to the nature and scale of the Project disturbance, local landform and soil conditions, drainage characteristics, and the potential for rainfall-driven erosion and sediment transport. The Plan is intended to support compliance with relevant environmental obligations and to ensure that erosion and sediment controls are implemented in accordance with best practice principles throughout construction, operation and rehabilitation.

The objectives of the ESCP are to:

- minimise soil erosion and sediment generation from disturbed areas;
- prevent sediment-laden runoff from leaving the Disturbance area and entering surrounding land, watercourses and habitat areas;
- maintain the stability of disturbed surfaces, drainage structures and stockpiles;
- protect downstream water quality and ecological values, including retained habitat, TEC patches and GDEs where relevant; and
- define roles, responsibilities, monitoring and corrective actions for erosion and sediment management.

Management measures within the ESCP include, but are not limited to:

- staging and sequencing disturbance to minimise the area of exposed soil at any one time;
- installation and maintenance of erosion and sediment controls such as diversion drains, sediment fences, check dams, sediment dams, bunding and stabilised drainage lines, as appropriate to the risk profile of each area;
- stabilisation of exposed surfaces, batters, stockpiles and rehabilitation areas through contouring, compaction, surface treatment, mulch, vegetation establishment or other suitable methods;
- separation of clean water and sediment-laden runoff where practicable to reduce the volume of water requiring treatment;
- progressive rehabilitation of disturbed areas to reduce the duration of erosion risk;
- routine inspection and maintenance of controls, including following significant rainfall events, to ensure continued effectiveness; and



- implementation of corrective actions where monitoring identifies control failure, sediment release, scour, rilling or other signs of instability.

The ESCP will be reviewed and updated as required to reflect changes in disturbance extent, site conditions, Project activities or monitoring outcomes, and following any significant erosion or sediment incident, to ensure the Plan remains effective and fit for purpose.

7.4.8 Progressive Rehabilitation and Closure Plan

Rehabilitation for the Project will be undertaken to achieve a stable, non-polluting landform and the establishment of self-sustaining vegetation communities that are consistent with pre-disturbance conditions and appropriate for the surrounding landscape.

Rehabilitation will be undertaken in accordance with the PRCP schedule which will describe the rehabilitation milestones to achieve intended post mining land uses, including native vegetation along the diversion and at riparian crossing areas.

The PRCP schedule rehabilitation milestones will guide the progressive rehabilitation of disturbed areas to ensure they are safe, stable, non-polluting, and capable of supporting the approved post-mining land use.

Rehabilitation management measures within the PRCP include, but are not limited to:

- Implementation of progressive rehabilitation throughout the life of the mine.
- Stripping, stockpiling, and separate management of topsoil and growth media for reuse in rehabilitation.
- Salvage and reuse of coarse woody debris, hollow logs, and rock material for habitat reconstruction in areas with a native vegetation post mining land use.
- Establishment of vegetation using locally and regional sourced native seed mixes reflective of pre-clearing regional ecosystem composition.
- Development and application of rehabilitation milestone criteria addressing vegetation cover, structure, species diversity, and landform stability.
- Regular monitoring of rehabilitation performance, with adaptive management responses implemented where completion criteria are not met.
- Incorporation of erosion control and sediment containment measures during and following revegetation.

The final landform will be designed to support grazing and woodland habitat consistent with surrounding land uses. Retained and rehabilitated areas of native vegetation will be configured to maintain ecological connectivity across the landscape and support long-term rehabilitation success.

7.5 MNES-SPECIFIC MANAGEMENT MEASURES

MNES-specific management measures have been developed for those MNES identified as likely to experience significant impacts as a result of the Project (refer *Section 8.1 MNES Significant Impact Assessment*). These MNES include the Brigalow TEC, Poplar Box TEC, Squatter Pigeon, Greater Glider, Koala and Ornamental Snake.

The management measures proposed for these ecological communities and species are expected to avoid, minimise and mitigate direct and indirect impacts associated with the Project. Implementation of these measures will also provide indirect benefits to habitat values for other MNES for which significant impacts are not predicted, through broader controls on vegetation clearing, habitat fragmentation, invasive species, fire regimes and other disturbance processes.

The MNES-specific management measures have been developed specific to the ecology of each affected MNES and have incorporated statutory or policy basis for the proposed measures, including reference to the SPRAT database and relevant approved conservation advices, recovery plans and threat abatement plans.

The MNES-specific management measures are provided as part of the Significant Impact Assessments for each TEC and threatened species, which are provided in Appendix J.



8. SIGNIFICANT IMPACT AND OFFSETS

8.1 MNES SIGNIFICANT IMPACT ASSESSMENT

In accordance with the *MNES Significant Impact Guidelines 1.1* (DEWHA, 2013) an assessment has been undertaken for each MNES known to, likely to or may occur within the Project area.

The assessment evaluated potential impacts to MNES values following the implementation of all reasonable avoidance and mitigation measures, as outlined in *Section 7 Impact Mitigation and any community- or species specific management actions proposed in Appendix J*. Where the assessment determined that significant residual impacts are likely to remain, these values have been identified as requiring offsets under the EPBC Act.

Detailed SIAs for each MNES are provided in Appendix J. The results of the SIAs indicate that the Project is likely to result in significant impacts on several MNES, primarily due to direct impacts from vegetation clearing, habitat removal and loss of connectivity. A summary of the results of the MNES SIAs are provided in Table 55. For the MNES SIAs, impact areas have been quantified for the full Disturbance area (Disturbance area on Project MLs + Additional disturbance area), as all disturbance is subject to assessment under the EPBC Act.

Table 55
Summary of
significant impacts
to MNES

Family	Scientific Name	Common Name	CTH Status ¹	Likelihood of Occurrence ²	Summary of Significant Impact Assessment
THREATENED ECOLOGICAL COMMUNITIES					
Brigalow	<i>(A. harpophylla</i> dominant and co-dominant) TEC		EN	Known to occur	Likely to be significant Fragmented patches of Good Condition Brigalow TEC were verified within the Survey area, all of which were identified as habitat that was critical to the survival of the community (Map 11, Appendix A). 52.72 ha of Brigalow TEC is expected to be cleared as a result of the Project. This impact will reduce the extent of the ecological community, will result in further fragmentation of the ecological community at the local scale, have adverse impacts on 52.72 ha of habitat critical to the survival of the ecological community and has the potential to interfere with the recovery of the ecological community. As a result, the Project is likely to have a significant impact on the Brigalow TEC.
Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin	TEC		EN	Known to occur	Unlikely to be significant One continuous patch of the Natural Grassland TEC was verified within the Project area, made up of RE11.3.21 and 11.8.11 (Map 11, Appendix A). This patch was combination of good and best quality TEC.



Family	Scientific Name	Common Name	CTH Status ¹	Likelihood of Occurrence ²	Summary of Significant Impact Assessment
					The Natural Grassland TEC has been avoided by design of the Disturbance area and as such no direct impacts to the Natural Grassland TEC will occur as a result of the Project. With no direct impact to this TEC proposed, impacts from the Project are unlikely to be significant with the Project not likely to meet any of the significant impact criteria for endangered ecological communities.
Poplar Box on Alluvial Plains TEC			EN	Known to occur	Likely to be significant Two fragmented patches of the Poplar Box TEC were verified within the Survey area, with one intersecting the Disturbance area (Map 11, Appendix A). The Project will result in 15.45 ha of 'Category C' Poplar Box TEC being directly impacted as a result of the Project. Category C patches are not recognised as habitat that is critical to the survival of this ecological community (DoEE, 2019). This impact will reduce the extent of the ecological community, will result in further fragmentation of the ecological community at the local scale and potentially interfere with the recovery of the ecological community. As a result, the Project is likely to have a significant impact on the Poplar Box TEC.
Semi-evergreen Vine-thickets TEC			EN	Known to occur	Unlikely to be significant Two patches of Semi-evergreen Vine thicket TEC were verified within the Survey area but not within the Project area (Map 11, Appendix A). The Semi-evergreen Vine-thickets TEC has been avoided by design of the Disturbance area and as such no direct impacts to this TEC will occur as a result of the Project. With no direct impact to this TEC proposed, impacts from the Project are unlikely to be significant, with the Project not likely to meet any of the significant impact criteria for endangered ecological communities.

THREATENED FLORA

Poaceae	<i>Dichanthium queenslandicum</i>	King Blue-grass	EN	Likely to occur	Unlikely to be significant Neither <i>Dichanthium queenslandicum</i> nor <i>Dichanthium setosum</i> were detected within the Survey area despite targeted surveys for these species. The natural grassland patch that provides habitat for these two threatened grass species (refer to Map 12, Appendix A) has been avoided through the design of the Disturbance area. As such, no habitat for these threatened flora species is proposed to be cleared as a result of the Project. Given that no direct impacts to habitat are proposed and no individuals of these species were detected
Poaceae	<i>Dichanthium setosum</i>	Bluegrass	VU	May occur	



Family	Scientific Name	Common Name	CTH Status ¹	Likelihood of Occurrence ²	Summary of Significant Impact Assessment
					within the Survey area, impacts from the Project are not considered likely to be significant. Accordingly, the Project is not expected to meet any of the significant impact criteria for these two threatened flora species.
THREATENED BIRDS					
Columbidae	<i>Geophaps scripta</i>	Squatter Pigeon (southern subspecies)	VU	Known to occur	Likely to be significant Wet and dry season surveys confirmed the presence of Squatter Pigeon within and adjacent to the Survey area, supported by historical observations from EcoSM (2020) and ALA records (records shown in Map 13, Appendix A). Habitat assessments verified the occurrence of suitable breeding, foraging, and dispersal habitat for the Squatter Pigeon within the Survey area (habitat types shown in Map 13, Appendix A). Approximately 308.48 ha of breeding habitat, 14.58 ha of foraging habitat, and 11.09 ha of dispersal habitat will be directly impacted as a result of the Project, all of which has been identified as habitat that is critical to the species' survival. Although no formal critical habitat has been defined for this species and the local population is not designated as <i>important</i> under the DCCEEW key defining terms, the confirmed breeding, foraging and dispersal use of the area, combined with regional pressures from extensive agricultural and mining land use, indicates that these habitats support key life stages and contribute to the species' persistence within the Bowen Basin. As such all breeding, foraging and dispersal habitat verified within the Survey area could be considered critical to the species' survival (critical habitat shown in Map 13, Appendix A). The proposed impact to this species habitat represents a measurable loss of breeding, foraging and dispersal habitat which could be considered critical to the species' survival. As a result, it was considered likely the Project will have a significant impact on the Squatter Pigeon.
Rostratulidae	<i>Rostratula australis</i>	Australian Painted Snipe	EN, Mi	Likely to occur	Unlikely to be significant These species are all associated with wetland environments and therefore share common habitat characteristics.
Scolopacidae	<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	VU, M, Mi	May occur	The Survey area contains some breeding, foraging and dispersal habitat for the Australian Painted Snipe, and some foraging and dispersal habitat for the Sharp-tailed Sandpiper and Common Greenshank (Map 14, Appendix A).
Scolopacidae	<i>Tringa nebularia</i>	Common Greenshank	EN, Mi	May occur	



Family	Scientific Name	Common Name	CTH Status ¹	Likelihood of Occurrence ²	Summary of Significant Impact Assessment
					Most of this habitat is isolated and lacks connectivity with high-quality wetland habitats that these species rely on for critical life stages. The HES wetland in the southeastern corner of the Survey area provides higher quality habitat which was verified as breeding habitat (and important habitat) for the Australian Painted Snipe and foraging and dispersal habitat for the Sharp-tailed Sandpiper and Common Greenshank. This HES wetland is some 2 km from the proposed Disturbance area and will not be directly impacted by the Project None of these three wetland species were recorded within the Survey area during targeted surveys, and each only have isolated, and mostly historical records in the Area of Interest and Region suggesting they may occur on occasion within the region however do not occur in large numbers, most likely the result of highly fragmented wetland habitat. The Project will impact on 1.31 ha of foraging and dispersal habitat for these three species, all of which is poor quality wetland habitat that is not recognised as important habitat for the species and is unlikely to support ecologically significant proportions of each species populations. It was considered unlikely this small extent of impact to poor-quality wetlands would result in a significant impact, particularly considering the limited number of records for each species in the region.

THREATENED MAMMALS

Phascolarctidae	<i>Phascolarctos cinereus</i>	Koala	EN	Known to occur	Likely to be significant The Koala has been recorded within the Survey area, confirming its presence and use of local habitat areas. While records are limited, eucalypt woodland and riparian habitats, particularly along the Isaac River and Cherwell Creek, provide breeding and foraging habitat for the Koala (Map 16, Appendix A). Approximately 66.81 ha of breeding habitat and 251.22 ha of foraging habitat for the Koala will be directly impacted as a result of the Project, both of which have been identified as habitat that is critical to the species' survival (critical habitat shown in Map 16, Appendix A). Therefore, a total of 318.03 of habitat identified as critical to the species' survival will be directly impacted. Given the direct impacts to habitat identified as critical to the species' survival, and the potential to interfere with the recovery of the species, it was considered likely to the Project will have a significant impact of the Koala.
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Family	Scientific Name	Common Name	CTH Status ¹	Likelihood of Occurrence ²	Summary of Significant Impact Assessment
Pseudocheiridae	<i>Petauroides volans</i>	Greater Glider (southern and central)	EN	Known to occur	Likely to be significant The Greater Glider has been recorded extensively within the Survey area (Map 17, Appendix A). Surveys conducted between 2018 and 2025 recorded over 170 individuals across the Isaac River and Cherwell Creek corridors, highlighting the persistence of a local population despite historical disturbance. This population would be considered an important population under the DCCEEW key terms (TSSC, 2016d). Approximately 87.26 ha of denning habitat and 230.76 ha of foraging habitat will be cleared as part of the Project, which has been identified as habitat critical to the species' survival (critical habitat shown in Map 17, Appendix A). Therefore, a total of 318.02 ha of habitat identified as critical to the species' survival will be directly impacted as a result of the Project. Given the direct impacts to habitat identified as critical to the species' survival, the presence of an important population, and the potential to interfere with the recovery of the species, it was considered likely to the Project will have a significant impact of the Greater Glider.

THREATENED REPTILES

Elapidae	<i>Denisonia maculata</i>	Ornamental Snake	VU	Known to occur	Likely to be significant The Ornamental Snake has not been recorded within the Survey area during recent surveys conducted by Trend Environmental, although previous surveys in 2019 confirmed its presence on one occasion within the Project area (records shown in Map 19, Appendix A). Habitat assessments identified 56.22 ha of breeding habitat, 19.75 ha of foraging habitat, and 5.08 ha of dispersal habitat for the species that will be directly impact by the Project. Habitat critical to the species' survival has not been formally defined, however important habitat includes gilgai depressions and mounds and habitat connectivity between gulgais and other suitable habitats is important (DCCEEW, 2023b). Suitable habitat for this species is considered important if it is habitat where the species has been identified during a survey. Based on this, and the lone record within the Survey area, breeding and foraging habitat within the Survey area has been identified as important habitat for the species (important habitat shown in Map 19, Appendix A). As such, it is expected the Project will result in 75.97 ha of direct impacts to important habitat, which is made up of 56.22 ha of breeding and 19.75 ha of foraging habitat.
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Family	Scientific Name	Common Name	CTH Status ¹	Likelihood of Occurrence ²	Summary of Significant Impact Assessment
					Also, as detection rates for the Ornamental Snake are typically low and population data remain limited, important habitat is considered a reliable surrogate for important populations. As such, it has been concluded that the population within the Survey area is an important population occurs within the Disturbance area. The Department's draft threshold for a high likelihood of significant impact to the Ornamental Snake is ≥ 2 ha of important habitat (DCCEEW, 2023b). Given 75.97 ha of important habitat will be cleared as a result of the Project, it was considered likely the Project will have a significant impact on the Ornamental Snake.

MIGRATORY SPECIES

Apodidae	<i>Apus pacificus</i>	Fork-tailed Swift	M, Mi	May occur	Unlikely to be significant The Fork-tailed Swift has not been recorded within the Project area or immediate surrounds, with the nearest confirmed record located approximately 20 km north near Moranbah (ALA, 2012; Map 15, Appendix A). Despite the absence of observations, suitable foraging and dispersal habitat has been verified across the Survey area, acknowledging the species' highly mobile and aerial nature. Approximately 332.72 ha of foraging (airspace) habitat coincides with the Disturbance area. However, this habitat type is widespread and non-specialised, providing transient foraging opportunities only. The Fork-tailed Swift does not breed in Australia, and no areas of habitat critical to its survival have been identified. Important habitat is defined as all non-breeding areas where the species may occur, with an ecologically significant proportion of the population being $\geq 1,000$ individuals (international) or ≥ 100 individuals (national). Based in this and the limited records from the Region, it was considered unlikely that important habitat or an ecologically significant proportion of the population of Fork-tailed Swift occur within the Survey area Under the <i>MNES Significant Impact Guidelines 1.1</i> (DEWHA, 2013) a significant impact to a migratory species may result if the action seriously disrupts the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species, results in invasive species becoming established in an area of important habitat or substantially modifies important habitat. Given the absence of important habitat or an ecologically significant proportion of a population,
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Family	Scientific Name	Common Name	CTH Status ¹	Likelihood of Occurrence ²	Summary of Significant Impact Assessment
					it was considered unlikely the Project would result in a significant impact on the Fork-tailed Swift.
Cuculidae	<i>Cuculus optatus</i>	Oriental Cuckoo	Mi	Known to occur	Unlikely to be significant The Oriental Cuckoo was recorded on one occasion within the Survey area during targeted field surveys (Map 15, Appendix A). The next closest confirmed record occurs approximately 13 km west of the Survey area, within intact riparian and alluvial systems that provide the wetter habitats typically preferred by the species. Foraging and dispersal habitat has been verified within the Survey area (Map 15, Appendix A). Approximately 108.35 ha of foraging and dispersal habitat for the Oriental Cuckoo will be directly impacted from the Project. The species has no defined habitat critical to its survival, but important habitat is recognised as non-breeding areas such as monsoonal rainforest, vine thicket, wet sclerophyll forest, or open Casuarina, Acacia or Eucalyptus woodlands. An ecologically significant proportion of the population is defined as 10,000 individuals (internationally significant, 1 % of population) or 1,000 individuals (nationally significant, 0.1 % of population) (Commonwealth of Australia, 2015). Based on the limited good quality habitat monsoonal rainforest, vine thicket or wet sclerophyll habitat within the Survey area it was considered unlikely important habitat occurs for the species and based on the limited records within the Region it was considered unlikely an ecologically significant proportion of the population occurs. Given the absence of important habitat or an ecologically significant proportion of a population, it was considered unlikely the Project would result in a significant impact on the Oriental Cuckoo.

¹ Commonwealth (Cth) EPBC Act Status: EX = Extinct, EW = Extinct in Wild, CE = Critically Endangered, EN = Endangered, VU = Vulnerable, M = Marine, Mi = Migratory

² Likelihood of occurrence status is within the Survey area.

Note: A species or ecological community has been greyed out if impacts were deemed unlikely to be significant.

8.2 MSES SIGNIFICANT RESIDUAL IMPACT ASSESSMENT

In accordance with the Queensland Environmental Offsets Policy (EPP/2015/1658), *Queensland Environmental Offsets Policy – Significant Residual Impact Guideline* (DEHP, 2014a) and the Queensland environmental offsets framework, an SRI assessment has been undertaken for all MSES known to, likely to or may occur within the Survey area, unless the matter has already been assessed under the MNES SIA (e.g., a species for which protected wildlife habitat occurs within the Survey area; as per those listed in Table 55). This is to avoid duplication of impact assessments and eventual offset conditions between jurisdictions. Table 56 contains the SRI assessment for MSES. For the MSES SRI Assessment, impact areas have been quantified for the Disturbance area on Project MLs only, as this disturbance is subject to approval of the EA for the Project's mining leases.



The assessment evaluated potential impacts to MSES values following the implementation of all reasonable avoidance and mitigation measures, as outlined in *Section 7 Impact Mitigation*. Where the assessment determined that significant residual impacts are likely to remain, these values have been identified as requiring offset consideration under the EO Act and associated *Environmental Offsets Policy* (DESI, 2024).

The results of the SRI assessment indicate that the Project will likely result in an SRI for several prescribed environmental matters, primarily associated with the clearing of Category B regulated vegetation that are endangered REs within the Disturbance area. These impacts are considered unavoidable due to the location of the resource and operational requirements of the open-cut mining method.

8.2.1 Regulated Vegetation and Connectivity Impacts

The results of the SRI assessment for MSES Regulated vegetation and connectivity are presented in Table 56.



Table 56
SRI
Assessment
for applicable
MSES
prescribed
matters

Prescribed Matters		Significant Impact Criteria	Structural Category	RE (Status)	BVG	Disturbance area on Project MLs (ha) ¹	Disturbance not already subject under EPBC Act ²	SRI threshold	Result	
Regulated Vegetation	Prescribed REs that are 'endangered' or 'of concern' REs	The SRI assessment for impacts to regulated vegetation are assessed under the following criteria's: - Criteria 1: impact threshold per RE structure, as follows – 0.5 ha for dense and mid-dense, 2ha for sparse and very sparse, and 5ha for grasslands. - Criteria 2: clearing within 50 m of the defining bank and is relevant only to REs that intersect areas on the Vegetation Management Wetlands map. - Criteria 3: clearing occur within 5 m of the defining bank” and is relevant only to REs that are within the defined distance of a watercourse defined under the VM Act.	Dense/ mid dense	11.3.1 (EN)	25a	26.50	9.08	0.5 ha	SRI	
			Sparse	11.3.2 (OC)	17a	36.26	20.82	2 ha	SRI	
				11.3.3 (OC)	16c	40.17	40.17		SRI	
				11.4.8 (EN)	25a	0.00	0		No	
			11.4.9 (EN)	25a	11.80	0	No			
	Prescribed REs that intersect with an area shown as a wetland on the vegetation management wetlands map	Grassland	11.8.11 (OC)	30b	0	0	5 ha	No		
		Sparse	11.3.27b (LC)	34d	1.18	1.18	2 ha	No		
		Prescribed RE that is located within a defined distance from the defining banks of a relevant watercourse or drainage feature	NOTES: For a prescribed activity to have a significant residual impact on a regional ecosystem that lies within a mapped wetland, criteria 1 and 2 must be exceeded. For a prescribed activity to have a significant residual impact on a regional ecosystem that is within the defined distance of watercourses, criteria 1 and 3 must be exceeded. The values of the wetland and watercourses themselves are not covered in this section (only the vegetation associated with these natural features) –the values of the wetland and watercourses themselves are considered in section 5.	Dense/ mid dense	11.3.1 (EN)	25a	2.52	0.41	0.5 ha	No
				Sparse	11.3.2 (OC)	17a	0.05	0.05	2 ha	No
					11.3.3 (OC)	16c	4.69	4.69	2 ha	SRI
11.3.25 (LC)	16c				6.38	6.38	2 ha	SRI		
11.5.3 (LC)	17a				0.76	0.76	2 ha	No		

NOTES: For a prescribed activity to have a significant residual impact on a regional ecosystem that lies within a mapped wetland, criteria 1 and 2 must be exceeded. For a prescribed activity to have a significant residual impact on a regional ecosystem that is within the defined distance of watercourses, criteria 1 and 3 must be exceeded. The values of the wetland and watercourses themselves are not covered in this section (only the vegetation associated with these natural features) –the values of the wetland and watercourses themselves are considered in section 5.



Prescribed Matters		Significant Impact Criteria	Significance Test	Disturbance area on Project MLs (ha)	Disturbance not already subject under EPBC Act ¹	SRI threshold	Result
Connectivity Areas	Analysing impact on connectivity areas using the LFC Tool	A development impact on connectivity areas is determined to be significant if either of the following tests are true: 1. The change in the core remnant ecosystem extent at the local scale (post impact) is greater than a threshold determined by the level of fragmentation at the regional scale (see table below); or	SIGNIFICANCE TEST ONE The regional total area is 170434.14 The regional extent of core remnant is 52969.96 The regional extent of core remnant is 31.08 percent This level of regional fragmentation sets a local impact threshold of 10.0 percent	347.55	347.55	10% for local scale remnant RE	No
		2. Any core area that is greater than or equal to 1 hectare is lost or reduced to patch fragments (core to noncore).	SIGNIFICANCE TEST TWO The number of core remnant areas occurring on the site: 3 The number of core remnant areas remaining on the site post impact: 1 (Only core polygons greater than or equal to 1 hectare are included)			≥1 ha	SRI
This analysis has determined a SIGNIFICANT impact on connectivity areas (A significant reduction in core remnant at the local scale is False OR a change from core to non-core remnant at the site scale is True) (Total area of RVM Cat B clearing is 347.55 hectares)							
Prescribed Matters		Significant Impact Criteria	Species	Disturbance area on Project MLs (ha)	Disturbance not already subject under EPBC Act ¹	Result	
Protected Wildlife Habitat	Prescribed REs that are areas of essential habitat on the essential habitat map for an EVNT plant or animal	Endangered and vulnerable wildlife habitat (including essential habitat): 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; or • reduce the extent of occurrence of the species; or • fragment an existing population; or	Per species listed below.	263.39	0	Assessment of whether impacts on essential habitat for the species are significant has been considered in the assessment of impacts on protected wildlife habitat	
			Squatter Pigeon	Refer to Table 55. Impacts already assessed as MNES.			
	A habitat for an endangered wildlife or vulnerable wildlife or SLC animal.		Australian Painted Snipe	Refer to Table 55. Impacts already assessed as MNES.			
			Common Greenshank	Refer to Table 55. Impacts already assessed as MNES.			



- result in genetically distinct populations forming as a result of habitat isolation; or
- result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat; or
- introduce disease that may cause the population to decline, or
- interfere with the recovery of the species; or
- cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species.

Special least concern (non-migratory) animal wildlife habitat:

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; or
- a reduced extent of occurrence of the species; or
- fragmentation of an existing population; or
- result in genetically distinct populations forming as a result of habitat isolation; or
- disruption to ecologically significant locations (breeding, feeding or nesting sites) of a species.

Sharp-tailed Sandpiper	Refer to Table 55. Impacts already assessed as MNES.
Koala	Refer to Table 55. Impacts already assessed as MNES.
Greater Glider	Refer to Table 55. Impacts already assessed as MNES.
Ornamental Snake	Refer to Table 55. Impacts already assessed as MNES.
Fork-tailed Swift	Refer to Table 55. Impacts already assessed as MNES.
Oriental Cuckoo	Refer to Table 55. Impacts already assessed as MNES.
Short-beaked Echidna	Refer to Table 57

¹ Note that where a prescribed RE occurred within a heterogeneous polygon, the mapped percentage of that RE within the polygon was used to calculate the impact area.

² Disturbance not already subject under EPBC Act are the areas where MSES offsets may be required. These areas were calculated by excluding disturbance areas already being offset under the EPBC Act, consistent with the Queensland Environmental Offsets Policy, which seeks to avoid duplication of offset requirements for the same or substantially the same prescribed impact and environmental values. Accordingly, polygons or portions of heterogeneous polygons proposed to be offset as TECs under the EPBC Act were not included in the calculation of MSES impacts requiring offsets where the same or substantially the same ecological values were being addressed through the Commonwealth offset (for example polygons or portions of polygons that were RE11.3.1 and RE11.4.9 where these polygons also met the key diagnostic criteria and conditions thresholds for Brigalow TEC were not included in the impact areas for MSES offsets).



8.2.2 Protected Wildlife Habitat Impacts

8.2.2.1 Short-beaked Echidna, *Tachyglossus aculeatus*

The Short-beaked Echidna is a SLC species protected under the NC Act. Table 57 provides an assessment against the threshold criteria in the *Significant Residual Impact Guideline* (DEHP, 2014a).

Avoidance, minimisation, mitigation and remediation measures have been considered to manage impacts to this SLC species. After considering these management measures, it was deemed **UNLIKELY** that the Project will result in a significant residual impact to this species.

Table 57
Assessment of
significance of
impacts to the
Short-beaked
Echidna

Short-beaked Echidna	
Criteria	Response
Lead to a long-term decrease in the size of a local population	Unlikely The Short-beaked Echidna is found throughout Australia, including Tasmania. The species is a habitat generalist, inhabiting a diverse range of environments, including forests, woodlands, heath, grasslands and arid environments where it requires rocky outcrops, fallen timber and hollow logs for shelter. The species is prevalent in urban and rural landscapes and is tolerant of disturbance. Most remnant and regrowth vegetation within the Project provides suitable habitat for this species, with the exception of non-remnant areas, though these areas may be used on occasion for the species to disperse to other remnant or regrowth REs throughout the region. This species was recorded near the Isaac River in the central part of the Project area during field surveys (Map 18, Appendix A). As a result, it is likely that the species occurs within the Disturbance area at least on occasion, utilising it either for breeding, foraging or dispersal. Given the mobility of this species, it is anticipated that the Short-beaked Echidna will continue to utilise surrounding suitable habitat within and adjacent to the Disturbance area. While individuals may be temporarily displaced during vegetation clearing activities, suitable habitat is widespread in the surrounding landscape, and the species is expected to readily relocate to nearby remnant and regrowth vegetation. Mitigation measures have been proposed to manage potential interactions with the species during vegetation clearing works, as described in Table 54. Any individuals present during clearing activities are expected to self-relocate once clearing activities commence. To further mitigate the risk of injury, Fauna Spotter Catchers will undertake pre-clearance surveys and supervise vegetation clearing. Accordingly, while the Project may result in short-term disturbance or displacement of individuals, it is not expected to result in a reduction in the size of the local population, nor lead to a long-term decrease in the population of the Short-beaked Echidna.
Reduce the extent of occurrence of the species	Unlikely All remnant and regrowth vegetation within the Project area provides breeding and foraging habitat for this species (Map 18, Appendix A). Approximately 332.72 ha of Short-beaked Echidna habitat will be directly impacted within the Disturbance area (Table 51). Short-beaked Echidnas have large home ranges, reported to be up to approximately 400 ha, and are capable of travelling several kilometres in search of food (Spring, 2018). The proposed clearing of up to 332.72 ha of habitat within the Disturbance area is not expected to reduce the extent of occurrence of the Short-beaked Echidna. The Short-beaked Echidna is widely distributed across Australia and occurs throughout the region. Extensive suitable habitat remains within and surrounding the Survey area, including remnant and regrowth vegetation beyond the Disturbance area. The clearing represents



Short-beaked Echidna

approximately 13% of the available habitat within the Survey area and a substantially smaller proportion of habitat within the broader Area of Interest and regional context.

The Project will not introduce permanent barriers to movement, and the species is highly mobile, with large home ranges (up to approximately 400 ha) and the capacity to travel several kilometres. Individuals temporarily displaced during clearing are expected to relocate to adjacent suitable habitat, which is abundant in the surrounding landscape.

Accordingly, while the Project will result in localised habitat loss, it will not reduce the geographic distribution of the species or constrain its regional occurrence. The extent of occurrence of the Short-beaked Echidna will therefore not be reduced as a result of the Project.

Fragment an existing population

Unlikely

The Project area is surrounded by extensive suitable habitat for the Short-beaked Echidna that will not be impacted by the Project.

While the proposed clearing will result in some localised loss and minor fragmentation of habitat within the Project area, it is not expected to disrupt landscape-scale connectivity or restrict movement of the species across the region. The Short-beaked Echidna is highly mobile and tolerant of disturbance and is known to traverse cleared and modified environments.

Vegetation clearing within and adjacent to the Isaac River and Cherwell Creek will be limited in extent and will not create barriers to movement. Accordingly, the Project is not expected to fragment an existing population of the Short-beaked Echidna or result in isolation of individuals or sub-populations.

Result in genetically distinct populations forming as a result of habitat isolation

Unlikely

The Project will not introduce permanent barriers to movement, and the species is highly mobile, with large home ranges (up to approximately 400 ha; Spring, 2018) and the capacity to travel several kilometres.

The Project will cause minimal habitat fragmentation with vegetation clearing within and adjacent to the Isaac River and Cherwell Creek will be limited in extent. Hence, connectivity of habitat throughout the region will not be impacted. The Project unlikely to cause genetically distinct populations forming as a result of isolation.

Disrupt ecologically significant locations (breeding, feeding or nesting sites) of a species

Unlikely

Short-beaked Echidnas breed under rocky overhangs, grass tussocks, hollows at the base of trees, rotten tree stumps, hollow logs and in burrows or depressions in the ground. Habitat features (e.g., hollow logs) present within the Survey area would provide suitable breeding habitat for this species. It is also likely the Project area is used for foraging and dispersal of the species throughout the region. However, it is unlikely the Project provides habitat that is ecologically significant.

Regardless, the marginal clearing proposed compared to the species habitat throughout the Survey area (~13 %) would be deemed negligible on the species.

Assessment Outcome

UNLIKELY to result in a significant residual impact on the species, with none of the significant residual impact criteria being met



8.3 MNES AND MSES OFFSET REQUIREMENTS

Following the application of all reasonable avoidance and mitigation measures, the Project is expected to result in significant impacts on MNES and MSES. These impacts have been identified through the MNES SIAs in Appendix J, with results summarised in Table 55, and the MSES SRI assessment provided in Table 56 and Table 57.

Offsets will be required to address these residual impacts in accordance with the *EPBC Act Environmental Offsets Policy* (DSEWPac, 2012a) and the *Queensland Environmental Offsets Policy* (EPP/2015/1658, DETSI, 2025). The IDE OAMP; Trend Environmental, 2026a) will define the offset requirements for MNES, delivery framework, and mechanisms for achieving a conservation outcome that aligns with the Commonwealth offset framework. While the IDE ODP will define the offset requirements for MSES, delivery framework, and mechanisms for achieving a conservation outcome that aligns with the State offset frameworks (Trend Environmental, 2026d).

Offsets will be developed to:

- Compensate for the loss of MNES and MSES values that cannot be avoided or mitigated;
- Maintain or improve the ecological function and connectivity of offset areas relative to the impacted values;
- Ensure consistency with the principles of additionality, equivalence, and long-term security; and
- Where practicable, deliver coordinated offsets that address both MNES and MSES values within a single offset package.

Land-based offsets have been prioritised to achieve direct conservation gains through management, rehabilitation, and long-term protection of ecologically comparable vegetation communities and habitat.

Further details on offset site selection, delivery mechanisms, and governance are provided in the IDE OAMP (Trend Environmental, 2026c) and IDE ODP (Trend Environmental, 2026d).



9. CONCLUSION AND RECOMMENDATIONS

The Terrestrial Ecology Assessment for the Project combined desktop analysis and targeted field surveys to verify ecological values, assess potential impacts, and inform avoidance, minimisation, mitigation, and offset strategies for the Project. Targeted field surveys were undertaken in accordance with relevant Commonwealth and State survey guidelines.

The findings confirmed that while large portions of the Project area have been historically cleared and modified for grazing, remnant vegetation remains within riparian zones, alluvial plains, and basaltic rises, supporting MSES and MNES values.

Flora and Vegetation Communities

Field-verified flora and vegetation communities verified within the Survey area consisted of:

- Regulated vegetation including multiple REs, that are recognised as endangered and of concern under the VM Act.
- Four TECs listed under the EPBC Act, including Brigalow, Natural Grasslands, Poplar Box, and Semi-evergreen Vine Thickets TECs.
- Habitat for threatened flora species protected under both the EPBC Act and NC Act.

Collectively, these communities represent key biodiversity features within the regional landscape. Remnant vegetation is primarily associated with drainage lines and riparian corridors along Isaac River, Cherwell Creek, and Conrock Gully. These areas provide ecological connectivity through the broader landscape and serve as habitat for several threatened and migratory fauna species. Non-remnant areas are dominated by pasture species such as *Cenchrus ciliaris** and exhibit limited ecological function.

Fauna and Habitat

Targeted fauna surveys undertaken in accordance with relevant State and Commonwealth guidelines confirmed the presence of four MNES threatened species, the Squatter Pigeon, Koala, Greater Glider and Ornamental Snake, and one migratory species, the Oriental Cuckoo. These species utilise a range of habitat types present within the Survey area, including Eucalypt woodlands, Brigalow/Acacia communities, and gilgai microhabitats on cracking clay soils.

In addition, habitat for threatened and migratory species recognised under the EPBC Act and NC Act was verified within the Survey area. This included habitat for the Australian Painted Snipe, Sharp-tailed Sandpiper, Common Greenshank and Fork-tailed Swift. Habitat for the SLC species, Short-beaked Echidna, recognised under the NC Act was also verified.

Habitat connectivity across the Survey area is largely maintained through riparian zones and vegetated drainage corridors. However, fragmentation from historical clearing and ongoing grazing pressure has reduced overall landscape function. The Project design has incorporated avoidance and minimisation measures to protect key habitats and maintain movement corridors.

Impacts Assessment, Mitigation and Provision of Offsets

Impact mitigation has been employed through the application of the mitigation hierarchy (avoid, minimise, mitigate, rehabilitate, offset). Despite these measures however, it is likely the Project will result in significant impacts to MNES and MSES.

These impacts will be offset through a combination of direct land-based offsets and other environmental outcomes consistent with both State and Commonwealth offset frameworks. Details regarding offset site selection, delivery mechanisms, and governance are provided in the IDE OAMP (Trend Environmental, 2026c) and IDE ODP (Trend



Environmental, 2026d). The offset strategy has been designed to achieve no net loss of environmental values over the medium to long term.

Cumulative Impacts

The assessment of cumulative impacts indicated that the Project is not expected to exacerbate impacts to MSES or MNES, with contribution to a long-term decline in ecological function or landscape integrity considered negligible.

Regulatory Compliance

The Project has been assessed against the relevant environmental objectives and performance outcomes outlined in Schedule 8 of the EP Regulation. The findings of this Ecological Assessment Report demonstrate that the Project has been designed and will be implemented in a manner that seeks to avoid and minimise impacts to environmental values, including flora, fauna and associated habitats.

The assessment has considered the presence of vegetation communities, fauna habitat and the potential occurrence of threatened species and ecological communities. Where potential impacts have been identified, appropriate mitigation and management measures have been recommended to reduce risks to biodiversity values, including where relevant community- and species-specific mitigation measures.

Based on the investigations and assessments presented in this report, the Project is considered capable of meeting the relevant environmental objectives and performance outcomes of Schedule 8 of the EP Regulation, subject to the implementation of the management and mitigation measures.



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11. GLOSSARY

Table 58
Glossary of
key terms

Term	Description
Additional disturbance area:	Areas totalling 2.5 ha on IDM ML 700046 that require an amendment to the IDM State approvals (EA and PRCP schedule) for connecting linear infrastructure with the Project, in areas not currently authorised for disturbance. The EPBC Referral for the Project includes the 'additional disturbance area'.
Area of Interest	A defined term for the likelihood of occurrence assessment. The broader locality within which the Project is located (i.e., Moranbah), which acted as the buffer area for desktop searches. The Area of interest was typically considered to be a 20 km buffer area, which provides context to the MSES and MNES within the Project area.
Assessment Unit	Assessment units are defined within the BioCondition Manual (Eyre et al., 2015a) as relatively homogenous units defined by a unique RE and broad condition state (i.e. 'remnant' versus 'regrowth' versus 'non-remnant'). Units of assessment are used to determine where and how many monitoring sites are needed to adequately assess the condition of the survey area.
BioCondition assessment	Queensland condition assessment framework used to evaluate vegetation structure, composition and function for biodiversity values. Methods for assessment are provided in the BioCondition Manual (Eyre et al., 2015a).
Broad Vegetation Group	Broad Vegetation Groups are a higher-level grouping of vegetation communities. Queensland encompasses a wide variety of landscapes across temperate, wet and dry tropics and semi-arid to arid climatic zones. Broad vegetation groups provide an overview of vegetation communities across the state or a bioregion and allow comparison with other states.
Breeding Habitat	Habitat that supports reproduction and rearing of young, including required resources such as shelter, nesting/denning sites and food close to these sites (as defined per species in Table 10).
Commonwealth-listed threatened and migratory species	Species listed under the EPBC Act as threatened or migratory.
Conservation significant species	Flora or fauna species listed as threatened under the EPBC Act and/or NC Act, migratory under the EPBC Act, or SLC under the NC Act.
DCCEEW Key defining terms	DCCEEW defined key terms for MNES under the EPBC Act, used for assessing the potential for a significant impact on threatened species and ecological communities, and migratory species. These key terms include 'habitat critical to the survival of the species', 'important habitat', 'important population', 'important habitat for migratory species' and 'ecologically significant proportion of a migratory species population'.
Defining Bank	A defining bank is the bank that confines seasonal flows but can be inundated by flooding. It is a specific term used in the context of Queensland's environmental regulations, particularly within documents like the MSES Significant Residual Impact Guideline (DEHP, 2014a).



Term	Description
Denning Habitat (Greater Glider)	Remnant connected eucalypt woodland or forest with a high availability of tree hollows used for shelter, diurnal refuge and breeding. A species-specific definition for the Greater Glider is provided in Table 10.
Desktop Assessment	Pre-field assessment including database searches, literature review, habitat evaluation and likelihood of occurrence ratings.
Dispersal Habitat	Habitat used for movement between higher-quality patches, often more fragmented or lower condition but still providing connectivity. Species-specific definitions are described in Table 10.
Disturbance Area	Disturbance area: The disturbance area is the sum of the ‘disturbance area on Project MLs’ and the ‘additional disturbance area’. The disturbance area forms the basis for assessing terrestrial ecological impacts. The Survey area encompasses the disturbance area. <i>Disturbance area on Project MLs:</i> The disturbance area on the Project MLs represents the subset of the Project area (i.e., the 4 ML applications for the Project) where disturbance activities associated with the Project will occur (shown in Map 2, Appendix A). This includes all open-cut operations, haul roads, spoil (overburden) dumps, water management infrastructure, and associated mine-related works required for the Project. <i>Additional disturbance area:</i> Areas totalling 2.5 ha on IDM ML 700046 that require an amendment to the IDM State approvals (EA and PRCP schedule) for connecting linear infrastructure with the Project, in areas not currently authorised for disturbance. The EPBC Referral for the Project includes the ‘additional disturbance area’. Subset of the Project area where direct Project disturbance will occur. Includes all mining and supporting infrastructure.
Disturbance area on Project MLs:	The disturbance area on the Project MLs represents the subset of the Project area (i.e., the 4 ML applications for the Project) where disturbance activities associated with the Project will occur (shown in Map 2, Appendix A). This includes all open-cut operations, haul roads, spoil (overburden) dumps, water management infrastructure, and associated mine-related works required for the Project.
Environmentally Sensitive Area	Areas defined under Schedule 19 of the <i>Environmental Protection Regulation 2019</i> (Qld).
Essential Habitat	Essential habitat identifies the habitat of endangered, vulnerable or near-threatened wildlife (protected wildlife) prescribed under the <i>NC Act</i> Also defined under section 20AC of the <i>VM Act</i>
Field Assessment	On-ground surveys verifying vegetation communities, REs, TECs, threatened and migratory species habitat and presence, watercourses, wetland, weeds/pests, and habitat condition.
Foraging Habitat	Habitat providing food resources and supporting movement between breeding/denning areas. Species-specific definitions are described in Table 10.
GIS Mapping	Spatial analysis and map production used to quantify and present ecological values and impact extents
Habitat Critical to the Survival of a Species	Habitat Critical to the Survival of a Species as defined in the Commonwealth’s statutory documents (e.g., referral guidelines, approved listing advice(s), approved conservation advice(s), recovery plan(s), threat abatement plan(s) or comparable policy guidelines,



Term	Description
	and information contained in relevant Commonwealth databases such as the SPRAT database.
Habitat Suitability Assessment	Habitat Suitability Assessments were undertaken to assess the potential for vegetation to support threatened, migratory and conservation significant species that were identified through the likelihood of occurrence assessment in Appendix B.
High Ecological Significance Wetland	wetlands of high ecological significance (HES) as mapped on the Map of Queensland wetland environmental values as defined in the <i>Environmental Protection (Water and Wetland Biodiversity) Policy 2019</i> (Qld). These wetlands are recognised as MSES under the EO Act.
Important Habitat	Important Habitat as defined in the Commonwealth's statutory documents (e.g., referral guidelines, approved listing advice(s), approved conservation advice(s), recovery plan(s), threat abatement plan(s) or comparable policy guidelines, and information contained in relevant Commonwealth databases such as the SPRAT database.
Important Population	Important Population as defined in the Commonwealth's statutory documents (e.g., referral guidelines, approved listing advice(s), approved conservation advice(s), recovery plan(s), threat abatement plan(s) or comparable policy guidelines, and information contained in relevant Commonwealth databases such as the SPRAT database.
Likelihood of Occurrence	A rating applied to threatened ecological communities and threatened, and migratory species based on habitat suitability and known records. Categories used are known to occur, likely to occur, may occur and unlikely to occur, as defined in Table 6.
Matters of National Environmental Significance	Protected matters under the EPBC Act, including Commonwealth-listed threatened ecological communities, threatened species, and migratory species.
Matters of State Environmental Significance	Prescribed environmental matters under the Queensland EO Act.
Offset	A measurable conservation outcome required to compensate for significant impacts to MNES or significant residual impacts to MSES.
Progressive Rehabilitation and Closure Plan for mined land	A Progressive Rehabilitation and Closure Plan for mined land requires an EA holder to plan for how and where activities will be carried out on the land in a way that maximises the progressive rehabilitation of the land to a stable condition. The plan consists of two parts: a rehabilitation planning part and a PRCP schedule.
Project area	The area of the 4 ML applications for the Project.
Protected Matters Search Tool	Commonwealth online database used to identify Commonwealth-listed matters under the EPBC Act potentially present in an area.
Region	A defined term for the likelihood of occurrence assessment. A 50 km buffer zone was used exclusively for defining species records in the likelihood of occurrence assessment for the Project. This extended buffer is essential for highly mobile species, such as migratory species, that may not have records directly adjacent to the Project area but cannot be excluded as potentially occurring in the area if suitable habitat exists. This approach accounts for the occasional presence of such species in the vicinity due to their mobility.
Regional Ecosystem	A vegetation community recognised under Queensland's Vegetation Management framework, defined by bioregion, land zone and dominant species.
Regulated Vegetation	Vegetation regulated through Queensland's Planning Act and VM act



Term	Description
Remnant Vegetation	Vegetation mapped as Category B under the VM Act retaining the structural and floristic characteristics of the RE.
High-value Regrowth Vegetation	Vegetation mapped as Category C under the VM Act. This vegetation is re-establishing following historical clearing.
Region (desktop assessment)	A 50 km buffer zone was used exclusively for defining species records in the likelihood of occurrence assessment for the Project. This extended buffer is essential for highly mobile species, such as migratory species, that may not have records directly adjacent to the Project area but cannot be excluded as potentially occurring in the area if suitable habitat exists. This approach accounts for the occasional presence of such species in the vicinity due to their mobility.
Significant Impact	An impact remaining after avoidance and mitigation that triggers an offset under The Commonwealth's <i>EPBC Act Environmental Offset Policy</i> .
Significant Residual Impact	An impact remaining after avoidance and mitigation that triggers an offset under The Queensland <i>Environmental Offsets Act 2014</i> .
Survey Area	The survey area refers to the broader area assessed by ecologists during field surveys. This area extends beyond the defined Project area to ensure that ecological values in adjacent environments were adequately captured. Surveying a wider area enables a more comprehensive evaluation of potential impacts, particularly on surrounding habitats, species, and ecological processes that may be indirectly affected by the Project. The Survey area is shown on Maps 1 and 2, Appendix A. The Survey area includes portions of four (4) Lots located to the north and south of Cherwell Creek. The north includes 8SP277384, 5GV132 and 9GV33, to the south is 8SP277384 and 9GV33.
Targeted Survey	Survey effort specifically designed to detect nominated threatened species or TECs, aligned with relevant statutory guidelines.
Threatened Ecological Community	An ecological community listed as threatened under the EPBC Act.
Trap night	Trap-night refers to one functional trap (e.g., cage, Elliott, or pitfall trap) operated for one night. The total trapping effort is expressed as the sum of all trap-nights, calculated by multiplying the number of traps by the number of nights they are deployed. For example, ten traps opened for five consecutive nights equates to 50 trap-nights.
Vegetation Community	A vegetation community is a collection of plant species that grow together in a specific area, forming a relatively uniform patch of vegetation, and generally corresponding to a recognised RE under the VM Act.
Wetland Protection Area	A buffer area that protects HES wetlands in GBR catchments, as shown on the Map of Queensland wetland environmental values.