

EA APPLICATION SUPPORTING REPORT

SAVANNAH GOLDFIELDS LTD

Appendix 6 Significant Impact Residual Assessment (Ardent Group, 2025)



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SIGNIFICANT RESIDUAL IMPACT ASSESSMENT

SAVANNAH GOLDFIELDS LIMITED

ML 100030 - AGATE CREEK GOLD MINE

NOVEMBER 2025

Document Control Sheet

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1 Introduction

Savannah Goldfields Limited (SVG) are the owners and operators of the Agate Creek Gold Mine (Agate Creek) which is located in the Etheridge region of far north Queensland on Mining Lease (ML) 100030. Agate Creek currently operates under Environmental Authority EPSL03068015 (EA). SVG is currently seeking to expand mining operations within the ML from 45 ktpa to 250 ktpa and the development of additional open cut pits, waste rock dumps and other ancillary infrastructure as shown on **Figure 1**.

1.1 Project Description

Agate Creek currently consists of the following infrastructure and mine features.

- Administration, Camp, Maintenance, Storage and Sewage Treatment Plant (STP) and Irrigation area;
- Run of Mine (ROM) Pad;
- Laydown area;
- Sherwood Open Cut Pit (Pit 6);
- Pit 3 (backfilled);
- Pit 1 and Pit 4;
- Sherwood (Pit 6) waste rock dump (WRD), South West (SW) WRD and North West (NW) WRD;
- Low grade waste rock dump; and
- Haul roads and access tracks.

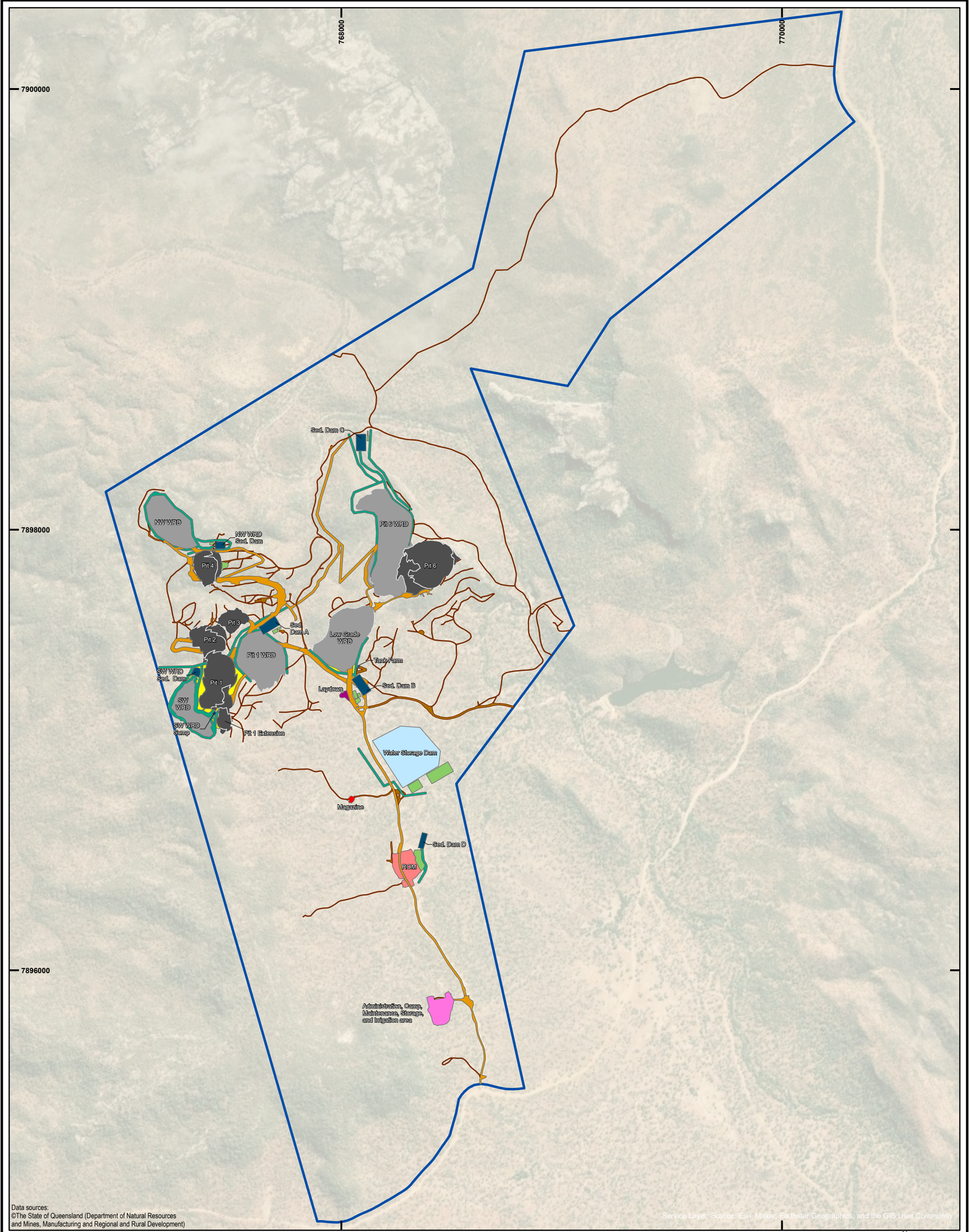
The future proposed operations will include the following (shown in **Figure 1**):

- Four open cut pits (Pit 1, Pit 2, Pit 4 and Pit 6);
- Four temporary waste rock dumps (Pit 1 WRD, Pit 6 WRD, NW WRD, SW WRD);
- One low grade WRD;
- ROM pad;
- Administration, camp, maintenance, storage and irrigation area;
- Explosives magazine;
- Laydown area;
- Mine work areas;
- Water Storage Dam;
- Seven sediment ponds (Sediment Ponds A-D, NW WRD Basin, SW WRD Basin, SW WRD Sump);
- Water diversion drains;
- Tank farm;
- Topsoil stockpiles; and
- Haul roads and access tracks.

Allowance for exploration activities is also proposed.

1.2 Environmental Context

The Agate Creek Gold Mine is located in the Etheridge Shire of northern Queensland, approximately 45 km from the nearest town of Forsyth. It sits on the boundary of the Einasleigh Uplands and the Gulf Plains bioregions. The project area itself is dominated by Mesozoic sandstone ranges of the larger Gregory Range and adjacent Eucalypt woodlands of the Einasleigh Uplands. Sandstone habitats of the Gregory Range includes exposed plateaus, steep slopes, gullies, low hills, and escarpments while adjacent woodlands are dominated by alluvial plains and gullies.



Data sources:
©The State of Queensland (Department of Natural Resources
and Mines, Manufacturing and Regional and Rural Development)

Service Layer: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Sheet No.
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Drawn By: Chris Schlebusch
Requested by: Jacob Arnold
Date: 10/11/2025

Figure 1
Disturbance

ML 100030

Pit

WRD

ROM Pad

Administration, Camp, Maintenance, Storage, and Irrigation area

Explosives Magazine

Laydown

Mine Work Area

Water Storage Dam

Sediment Dam

Diversion Drain

Tank Farm

Topsoil Stockpile

Haul Road

Existing Access Track

Path: S:\Plans\Project_Specific\Ardent\SVG001\PRCP Update Nov 2025\RTPL_ARD_SVG001_PRCMAP_2002_B A3P ML100030 Authorised Disturbance.aprx

1.3 Legislation

The Environmental Offsets Framework requires proponents to avoid impacts to a MSES in the first instance and mitigate where avoidance cannot be achieved (DES, 2021). An administering agency may impose an environmental offset condition on an authority where an impact cannot be avoided or mitigated and where it is satisfied that an activity which is a prescribed activity under the *Environmental Offsets Act 2014* (EO Act) will or is likely to have a significant residual impact on a MSES (DEHP, 2014).

Section 8 of the EO Act defines a significant residual impact as:

‘an adverse impact, whether direct or indirect, of a prescribed activity on all or part of a prescribed environmental matter that-

- (a) remains or will or is likely to remain, (whether temporarily or permanently) despite on-site mitigation measures for the prescribed activity; and*
- (b) is, or will or is likely to be significant.*

The *Significant Residual Impact Guideline* (December 2014) provides the assessment criteria for each of the relevant prescribed activities for the determination of whether or not an impact is significant (DEHP, 2014).

1.3.1 Matters of State Environmental Significance

MSES are those matters defined in Schedule 2 of the *Environmental Offsets Regulation 2014* (EO Regulation) and include the following:

- Regulated vegetation
- Connectivity areas
- Wetlands and watercourses
- Designated precinct in a strategic environmental area
- Protected wildlife habitat
- Protected areas
- Highly protected zones of State marine parks
- Fish habitat areas
- Waterway providing for fish passage
- Marine plants
- Legally secured offset areas.

1.4 Baseline Flora and Fauna Assessment

Flora and fauna studies were conducted by SLR (2021) within the ML in May and November 2020 however, disturbance areas for the mine expansion were not available at the time of the report. The results of the desktop, baseline and ground-truthing surveys of the ML indicate that the following Matters of State Environmental Significance (MSES) and Matters of National Environmental Significance (MNES) may potentially be impacted by the project:

- MSES
 - Regulated vegetation: prescribed regional ecosystem that is located within a defined distance from the defining banks of a watercourse identified on the vegetation

management watercourse map, as defined under the *Vegetation Management Act 1999* (VM Act);

- Connectivity areas: to be considered upon confirmation of the proposed disturbance area
 - Protected wildlife habitat: Five threatened flora species and three threatened fauna species with a likelihood of occurrence of moderate or higher, one threatened species known to occur, and one special least concern species known to occur; and
 - Protected areas: Rungulla National Park (Category A Environmentally Sensitive Area (ESA) under) and Rungulla Resource Reserve (Category C ESA).
- MNES
 - Listed threatened species: One threatened flora species and three threatened fauna species with a likelihood of occurrence of moderate or higher;

These matters require a Significant Residual Impact (SRI) assessment with regard to the proposed mine disturbance (described in the EA Application, dated November 2025). The results of the SRI assessment are provided in this report, along with the detail necessary to support the assessment outcomes. This SRI assessment should be read in conjunction with the Agate Creek Terrestrial Flora and Fauna Baseline Assessment (SLR, 2021) and the additional information provided in the Appendices of this report.

2 Significant Residual Impact Assessment

A desktop assessment of existing documents, reports, mapping layers and legislation was conducted to inform this assessment. The Agate Creek Terrestrial Flora and Fauna Baseline Assessment (SLR, 2021) was undertaken in 2020 and for the purposes of this assessment is considered current. Additional database searches and reports were undertaken to ensure the currency of protected matters records and conservation status (Table 1) findings from that report. A search radius of 50 km was used to ensure all possible significant matters were considered for this assessment (Appendix 1). A likelihood of occurrence assessment was completed based on the criteria in **Table 2** for any species not addressed in the SLR report (**Appendix 2**).

Table 1 Databases and searches undertaken to inform the assessment

Search/Tool/Layer	Source	Output
Protected matters search tool (PMST) 50 km buffer radius	https://www.awe.gov.au/environment/epbc/protected-matters-search-tool (Appendix B – EPBC Act Protected Matters Report of SLR, 2021 and Appendix 1 (10 November 2025))	Possible presence of species or species habitats for environmentally significant species
Wildlife online database (WO) 50 km buffer radius	https://apps.des.qld.gov.au/report-request/species-list (Appendix C – Wildlife Online Species List of SLR, 2021)/Repeat 09 September 2025	Point records for species
Atlas of living Australia (ALA) 50 km buffer radius	https://spatial.ala.org.au/	Point records for species
REDD Regional Ecosystems database	https://www.data.qld.gov.au/dataset/regional-ecosystem-description-database	Regional ecosystem descriptions and statuses
Vegetation management regional ecosystem map – version 12.0	https://www.data.qld.gov.au/dataset/vegetation-management-act-series/resource/7fbb5561-7417-405f-8622-a4799687903b	Spatial layer containing regional ecosystems within an area
Vegetation management watercourse and drainage feature map – version 5.0	https://qldspatial.information.qld.gov.au/catalogue/custom/detail.page?fid={6DD57F84-007D-4228-A43E-3B4FA93B0DAC}	Spatial layer containing vegetation management watercourse and drainage features.
Modelled potential habitat for select	https://www.data.qld.gov.au/dataset/modelled-potential-habitat-for-selected-threatened-species-queensland	Spatial layer containing modelled potential habitat for

Search/Tool/Layer	Source	Output
threatened species – Queensland.		threatened flora and fauna species

2.1 Likelihood of Occurrence analysis

Each species of conservation significance was assessed against the criteria as described in **Table 2** to determine the Likelihood of Occurrence (LOO).

Table 2 Likelihood of occurrence criteria

LOO	Definition
Known	Species known to occur from recent reliable records* within the study area.
Likely	Recent reliable records of the species within 1 km of the study area and/or preferred habitat known to be present, and recent reliable records within 5 km. (High probability)
Possible	Species recorded* within 50 km of the study area and/or suitable habitat mapped as present. (Moderate probability)
Unlikely	Species not recorded within 50 km of the study area and suitable habitat not mapped as present.

* Records less than 20 years old and from reputable sources using vetted data (primarily Wildnet)

* May include older and unconfirmed records.

From this assessment of desktop data the following species of conservation significance were considered to be known or likely or possible within the project area. The 2021 LOO assessment is Appendix D of the Agate Creek Terrestrial Flora and Fauna Baseline Assessment and an updated LOO assessment based on the revised footprint and 2025 search fields is in **Appendix 2** of this current document.

Table 3 Likelihood of occurrence outcome summary

EVNT Species	LOO Outcome	Assessment location
PLANTS		
<i>Pluchea punctata</i>	Moderate/Possible	Appendix D
<i>Labichea brassii</i>	High/Likely	Appendix D
<i>Leptospermum pallidum</i>	High/Likely	Appendix D
<i>Dichanthium setosum</i>	Moderate/Possible	Appendix D
<i>Drummondita calida</i>	High/Likely	Appendix D
<i>Solanum carduiforme</i>	High/Likely	Appendix D
<i>Cycas cairnsiana</i>	Possible	Appendix 2
BIRDS		
<i>Ardea ibis</i>	Possible	Appendix 2
<i>Hydroprogne caspia</i>	Possible	Appendix 2
<i>Tringa nebularia</i>	Possible	Appendix 2
<i>Falco hypoleucos</i>	Possible	Appendix 2

EVNT Species	LOO Outcome	Assessment location
<i>Numenius minutus</i>	Possible	Appendix 2
<i>Anseranas semipalmata</i>	Possible	Appendix 2
<i>Merops ornatus</i>	Likely	Appendix 2
<i>Rhipidura rufifrons</i>	Possible	Appendix 2
<i>Haliaeetus leucogaster</i>	Possible	Appendix 2
MAMMALS		
<i>Macroderma gigas</i>	Moderate/Possible	Appendix D
<i>Phascolarctos cinereus</i>	Moderate/Possible	Appendix D
<i>Rhinolophus robersti</i>	Moderate/Possible	Appendix D
<i>Tachyglossus aculeatus</i>	Possible	Appendix 2
REPTILES		
<i>Acanthophis antarcticus</i>	Known	Appendix 2

^ LOO criteria definitions applied to species through SLR (2021) and WTS (2023) assessments are Known = Present; High = Likely; Moderate = Possible; Low = Unlikely, respectively.

2.2 Regulated Vegetation

MSES Regulated Vegetation is defined in Schedule 2(2) of the EO Regulation, as:

- (1) *The prescribed regional ecosystems that are endangered regional ecosystems comprise a matter of State environmental significance.*
- (2) *The prescribed regional ecosystems that are of concern regional ecosystems comprise a matter of State environmental significance.*
- (3) *A prescribed regional ecosystem is a matter of State environmental significance if it is—*
 - (a) *a regional ecosystem that intersects with an area shown as a wetland on the vegetation management wetlands map (to the extent of the intersection); or*
 - (b) *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.*
- (4) *A prescribed regional ecosystem is a matter of State environmental significance, for a prescribed activity mentioned in schedule 1, item 7(e), 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.*
- (5) *A prescribed regional ecosystem is a matter of State environmental significance to the extent the ecosystem is located within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature.*
- (6) *In this section—*

animal that is near threatened wildlife means an animal that is near threatened wildlife under the *Nature Conservation Act 1992*.

defined distance, for a regional ecosystem, means a distance identified in the environmental offsets policy as the relevant distance from the defining banks of a relevant watercourse or relevant drainage feature.

endangered regional ecosystem means a regional ecosystem declared to be an endangered regional ecosystem under the *Vegetation Management Act 1999*, section 22LA.

of concern regional ecosystem means a regional ecosystem declared to be an of concern regional ecosystem under the *Vegetation Management Act 1999*, section 22LB.

plant that is near threatened wildlife means a plant that is near threatened wildlife under the *Nature Conservation Act 1992*.

relevant drainage feature means a drainage feature under the *Water Act 2000*, schedule 4 that is identified on the vegetation management watercourse and drainage feature map.

relevant watercourse means a watercourse identified on the vegetation management watercourse and drainage feature map.

vegetation management watercourse and drainage feature map see the *Vegetation Management Act 1999*, section 20AB.

vegetation management wetlands map see the *Vegetation Management Act 1999*, section 20AA.

Additional relevant definitions outlined in Schedule 2(1) of the EO Act are:

animal that is critically endangered wildlife, endangered wildlife or vulnerable wildlife means an animal that is critically endangered wildlife, endangered wildlife, or vulnerable wildlife, under the *Nature Conservation Act 1992*.

category B area means a category B area within the meaning of the *Vegetation Management Act 1999*, section 20AM.

essential habitat, for protected wildlife, see the *Vegetation Management Act 1999*, section 20AC(2).

essential habitat map see the *Vegetation Management Act 1999*, section 20AC(1).

plant that is critically endangered wildlife, endangered wildlife or vulnerable wildlife means a plant that is critically endangered wildlife, endangered wildlife, or vulnerable wildlife, under the *Nature Conservation Act 1992*.

prescribed regional ecosystem means a regional ecosystem, other than a regional ecosystem mentioned in the *Vegetation Management Act 1999*, section 8(b), located in a category B area on the regulated vegetation management map, to the extent the ecosystem contains remnant vegetation.

regional ecosystem see the *Vegetation Management Act 1999*, schedule.

regulated vegetation management map see the *Vegetation Management Act 1999*, section 20A.

remnant vegetation means vegetation forming the predominant canopy of the vegetation—
(a) covering more than 50% of the undisturbed predominant canopy; and
(b) averaging more than 70% of the vegetation's undisturbed height; and
(c) composed of species characteristic of the vegetation's undisturbed predominant canopy.

undisturbed height, for vegetation, means the height to which the vegetation normally grows.

undisturbed predominant canopy, for vegetation, means the predominant canopy the vegetation normally has.

2.2.1 Presence within Project Area

2.2.1.1 Endangered or Of Concern Regional Ecosystems

There are no prescribed regional ecosystems that are declared to be an endangered or of concern regional ecosystem under the VM Act sections 22LA and 22LB respectively (**Figure 2**).

The Agate Creek Terrestrial Flora and Fauna Baseline Assessment (SLR,2021) reported that all Regional Ecosystems (RE) ground-truthed within the ML are listed as 'least concern' under the VM Act (**Table 4**).

Table 4 Ground-truthed Regional Ecosystems

RE	Short Description	VM Act Class	VM Act Structure Category
2.10.5a	<i>Acacia shirleyi</i> woodland and <i>Triodia pungens</i> hummock grassland on scarps and stony ledges	Least Concern	Sparse
9.3.13	<i>Melaleuca spp.</i> , <i>Eucalyptus camaldulensis</i> and <i>Casuarina cunninghamiana</i> fringing open forest on streams and channels	Least Concern	Mid-dense
9.3.26	Mixed grassland to open grassland including <i>Eragrostis sp.</i> , <i>Aristida sp.</i> , <i>Enneapogon sp.</i> , <i>Iseilema sp.</i> , <i>Chloris sp.</i> or <i>Dichanthium sp.</i> on non-basalt derived alluvial deposits	Least Concern	Woody grassland
9.5.10a	<i>Eucalyptus microneura</i> +/- <i>Terminalia spp.</i> low woodland on sand sheets	Least Concern	Sparse
9.11.16	<i>Eucalyptus crebra</i> +/- <i>Corymbia erythrophloia</i> or <i>C. pocillum</i> woodland on steep to rolling hills	Least Concern	Sparse
9.12.11	<i>Eucalyptus crebra</i> and/or <i>E. whitei</i> +/- <i>Corymbia erythrophloia</i> open woodland on steep to rolling hills on igneous rocks	Least Concern	Very sparse

2.2.1.2 Vegetation Management Wetlands

There are no wetlands mapped on the vegetation management wetlands map (version 9.14) present within the Project area (**Figure 2**).

2.2.1.3 Vegetation Management Essential Habitat

There are no areas of essential habitat mapped on the vegetation management essential habitat map (version 12.14) present within the Project area (**Figure 2**).

2.2.1.4 Defined Distance from Vegetation Management Watercourse or Drainage Feature

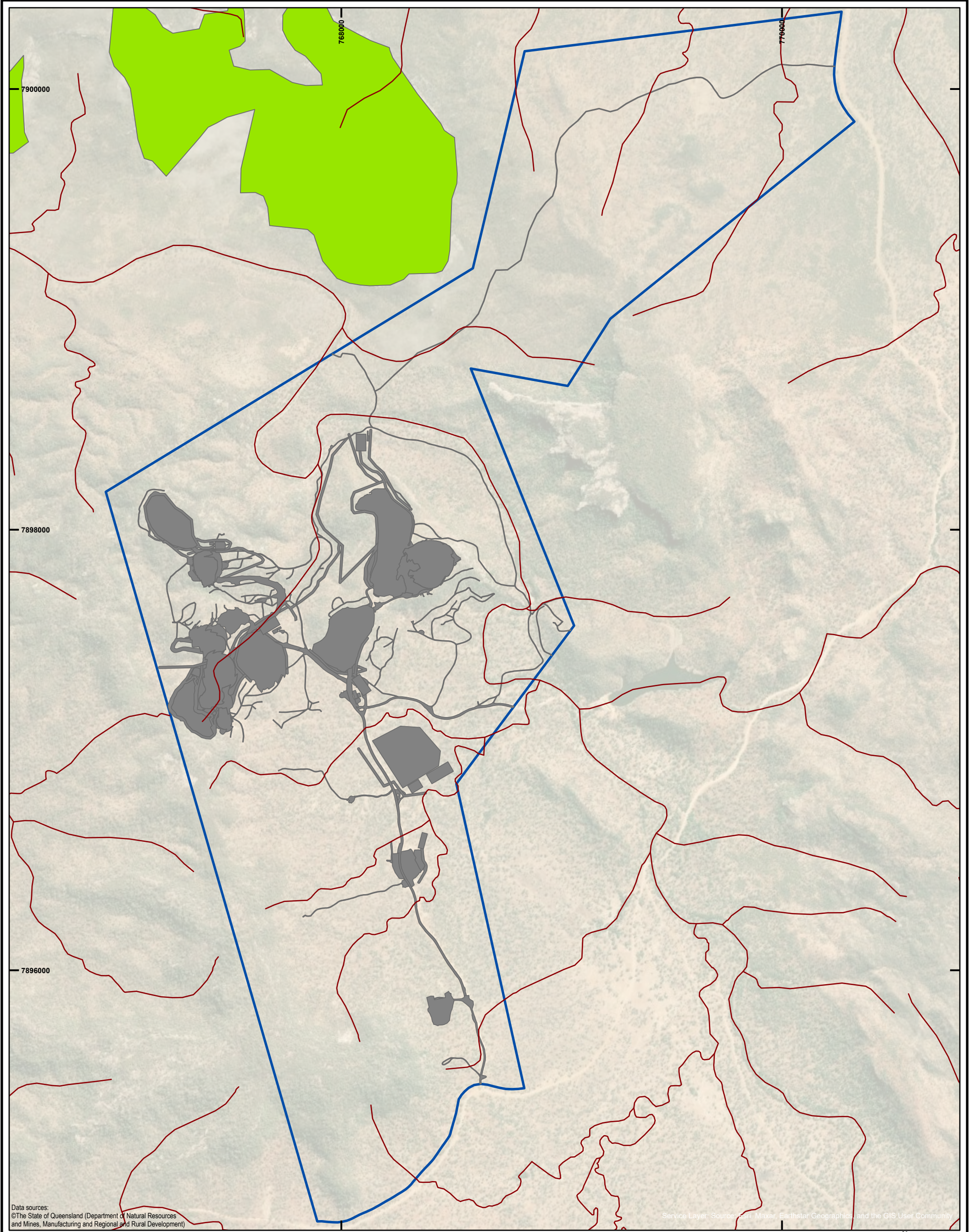
The vegetation management watercourse and drainage feature map (1:100000 and 1:250000 - Queensland except South East Queensland; Version 7.02) indicates that a number of watercourse and/or drainage features are present within the Project area (**Figure 2**). Defining banks have not been ground-truthed and the defined distance has been based on the linear features provided by the mapping. The extent of watercourse/drainage defining bank is unlikely to be supported by ground-truthing at levels over RL470m in this landscape. Modelling of Agate Creek flooding at 0.1%AEP does not indicate seasonal flows beyond Agate Creek or maximum flood water depths of <1m along the mapped drainage line above RL470m. If offsets are required due to resulting impacts, the defined banks of impacted watercourses should be ground-truthed to inform the provision of offsets.

The Queensland Environmental Offsets Policy (version 1.17) provides the following defined distances from the defining bank of a relevant watercourse or relevant drainage feature based on stream order and bioregion (**Table 5**). The Project is situated on the boundary of the non-coastal Einasleigh Uplands (subregion 9.2 – Kidston) and Gulf Plains (subregion 2.9 – Gilberton Plateau) bioregions.

The prescribed regional ecosystem located within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature are shown in **Figure 2**.

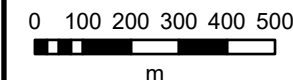
Table 5 Defined Distance for a Prescribed Regional Ecosystem

Watercourse stream order	Distance from the defining bank (m)	
	Coastal bioregions and sub-regions	Non-coastal bioregions and sub-regions
1 or 2	10	25
3 or 4	25	50
5 or greater	50	100



Data sources:
©The State of Queensland (Department of Natural Resources
and Mines, Manufacturing and Regional and Rural Development)

Service Layer: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



SAVANNAH GOLDFIELDS LIMITED

Progressive Rehabilitation and Closure Plan



	ML 100030 MSES Regulated Vegetation	 ML 100030  Proposed Disturbance	 Endangered Category B Remnant Regional Ecosystems (none)  Of Concern Category B Remnant Regional Ecosystems  Wetland (none)  Regulated Vegetation - Essential Habitat (none)  Regulated vegetation - Defined Watercourse
Figure 2 Sheet No. RTPL_ARD_SVG001_PRCMAP_2007_A	Drawn By: Chris Schlebusch Requested by: Jacob Arnold Date: 10/11/2025		

2.2.2 SRI Test – Criteria Table 1

Disturbance associated with proposed mining and associated infrastructure (**Figure 1**) indicate potential impacts to prescribed regional ecosystems located within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature (**Figure 2**).

These disturbance areas relate to the following proposed features and infrastructure:

- Linear infrastructure:
 - 20m wide proposed haul roads with access to Pits 1, 2 and 3 with underlying stream order 1 watercourse with vegetation comprised of RE 9.12.11 (sparse) (disturbance area 1);
- Non-linear infrastructure:
 - 1.42 ha of RE 9.12.11 (sparse) vegetation intersecting a stream order 1 watercourse buffer that underlies, Pit 1 (1.27 ha), the combined Pit 1 and Pit 2 rehabilitation extent (0.15ha) and a southern section of Pit 2 (0.003 ha);
 - 0.24 ha underlying the Sherwood West Waste Rock Dump (SW WRD), including a small portion of the upper most reach of a second stream order 1 watercourse draining west that shares a margin with the SW WRD footprint. RE present is 9.12.11 (sparse) and Pit 1 WRD (0.42ha);
 - 0.2 ha of RE 9.12.11 (sparse) within the buffer of a stream order 1 watercourse relating to proposed disturbance of the Sediment Pond A (0.18ha) and the SW WRD Sump (0.02 ha);

The total proposed area of disturbance of vegetation for non-linear infrastructure associated with mapped watercourses is 2.28 ha.

The mapped drainage from which these areas are derived does not at elevations include the characteristics of bed or banks or a seasonal high water line which represents the point of flooding. The RE for the area has been ground-truthed and no characteristic vegetation zonation was identified in association with the mapped drainage. The Flood Impact Assessment for the project modelled flooding for 0.1%AEP event. The mapped drainage does not show floodplain extent within the unnamed drainage to Agate Creek nor modelled maximum water depths at <1m beyond RL470m. With this extent removed from the calculation, the total area of non-linear infrastructure does not exceed 2.0ha.

Criteria Table 1 of the SRI Guideline details significant residual impact criteria for regulated vegetation. The disturbance areas listed above have been assessed against the significant residual impact test criteria for regulated vegetation in **Table 6**.

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, both criteria 1 and 3 must be exceeded. As criteria 1 and 3 are not exceeded for clearing within an RE that is within the defined distance of a watercourse, no significant impact has been identified.

Table 6 SRI Test for Regulated Vegetation criteria table

Criteria		Clearing in a regional ecosystem that is: <i>endangered, or of concern</i>	Clearing in the portion of a regional ecosystem that lies within a mapped wetland	Clearing in a regional ecosystem that is within the defined distance of a watercourse.
1	For clearing for linear infrastructure: - greater than 25 m wide in a grassland (structural category) regional ecosystem; or - greater than 20 m wide in a sparse (structural category) regional ecosystem; or - greater than 10 m wide in a dense to mid-dense (structural category) regional ecosystem. For clearing other than clearing for linear infrastructure: - area greater than 5 ha where in a grassland (structural category) regional ecosystem; or - area greater than 2 ha where in a sparse (structural category) regional ecosystem; or - area greater than 0.5 ha where in a dense to mid-dense (structural category) regional ecosystem.	No – no endangered or of concern REs present.	No - no mapped wetlands present.	<u>Linear infrastructure</u> Disturbance area 1: Linear infrastructure ~20 m wide in vegetation with sparse vegetation. – Providing disturbance does not exceed 20 m then – No SRI <u>Non-linear infrastructure:</u> Non-linear infrastructure in vegetation with sparse vegetation. – Providing disturbance does not exceed a total of 2 ha then – No SRI
2	Clearing within 50 m of the defining bank	N/A	No - no mapped wetlands present.	N/A
3	Clearing within 5 m of the defining bank	N/A	N/A	Yes – clearing includes areas within 5 m of the mapped watercourse but defining bank not evident at RL470m.

2.3 Connectivity Areas

MSES Connectivity Areas are defined in Schedule 2(3) of the EO Regulation, as:

- (1) *This section applies to a prescribed regional ecosystem—*
 - (a) *to the extent the ecosystem contains remnant vegetation; and*
 - (b) *if the ecosystem contains an area of land that is required for ecosystem functioning (a connectivity area).*
- (2) *The prescribed regional ecosystem is a matter of State environmental significance 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*
 - (b) *the prescribed regional ecosystem will remain despite a threatening process within the meaning of the Nature Conservation Act 1992.*

The Landscape Fragmentation and Connectivity (LFC) tool is used as a decision support tool to assist to identify and quantify any significant impact on connectivity for an individual impact area. It is a GIS tool that measures the extent and arrangement of the current regulated vegetation against the extent that would remain if the prescribed activity were to occur at that impact site.

The LFC tool determines the impact on connectivity areas is significant if either of the following tests are true:

1. The change in the core ecosystem extent at the local scale (post impacts) is greater than a threshold determined by the level of fragmentation at the regional scale (**Table 7**); OR
2. Any core area that is greater than or equal to 1 hectare is lost or reduced to patch fragments (core to non-core).

Table 7 Change thresholds for core remnant ecosystem extent at the local scale

Regional scale extent of core remnant ecosystem (%)	Change threshold for local core scale remnant ecosystem (%)
>90	50
70-90	30
50-70	20
30-50	10
10-30	5
<10	2

2.3.1 SRI Tests for Connectivity

The proposed mining and associated infrastructure disturbance area is approximately 68.46ha. The disturbance areas are located within an area of contiguous remnant vegetation. None of the remnant vegetation present is considered fragmented ecosystem. No essential, suitable, or high-risk habitat mapping is present within the Project area. Ecological connectivity areas such as riparian corridors and sandstone jump ups will largely be avoided or where disturbance occurs, connectivity remains intact.

The following provides the results of the LFC tool tests assessing impacts to connectivity with respect to the disturbance area shown in **Figure 1**.

Test 1 assesses the change in core remnant ecosystem extent at the local scale. If the level of local change is greater than the relevant threshold in **Table 7**, that part of the significant impact test is true. **Table 8** details the results of Test 1, indicating no significant impact.

Table 8 Results of Test 1

	Value
Regional total area (ha)	150256
Regional extent core remnant (ha)	150089
Regional extent core remnant (%)	99.89
Local impact threshold (%)	50
Local extent core (pre impact) (ha)	14415
Local extent core (post impact) (ha)	14166
Percent change (%)	1.73
Significant impact	No

Test 2 assesses the loss or fragmentation of core remnant ecosystem at the site scale. If the number of core areas that are greater than or equal to one hectare in area is greater pre-impact than post-impact, that part of the significant impact test is true. **Table 9** details the results of Test 2, indicating no significant impact.

Table 9 Results of Test 2

	Value
Core remnant areas (pre impact)	1
Core remnant areas (post impact)	1
Significant impact	No

2.4 Wetlands and Watercourses

MSES Wetlands and Watercourses are defined in Schedule 2(4) of the EO Regulation, as:

- (1) *Each of the following matters is a matter of State environmental significance—*
 - (a) *a wetland—*
 - (i) *in a wetland protection area; or*
 - (ii) *of high ecological significance shown on the map of Queensland wetland environmental values;*
 - (b) *a wetland or watercourse in high ecological value waters.*
- (2) *In this section—*

high ecological value waters see the *Environmental Protection (Water and Wetland Biodiversity) Policy 2019*, schedule 2.

map of Great Barrier Reef wetland protection areas see the *Environmental Protection Regulation 2019*, schedule 19, part 2.

map of Queensland wetland environmental values see the *Environmental Protection (Water and Wetland Biodiversity) Policy 2019*, schedule 2.

watercourse see the *Environmental Protection Regulation 2019*, schedule 19, part 1, section 10.

wetland means an area shown as a wetland on the map of Queensland wetland environmental values.

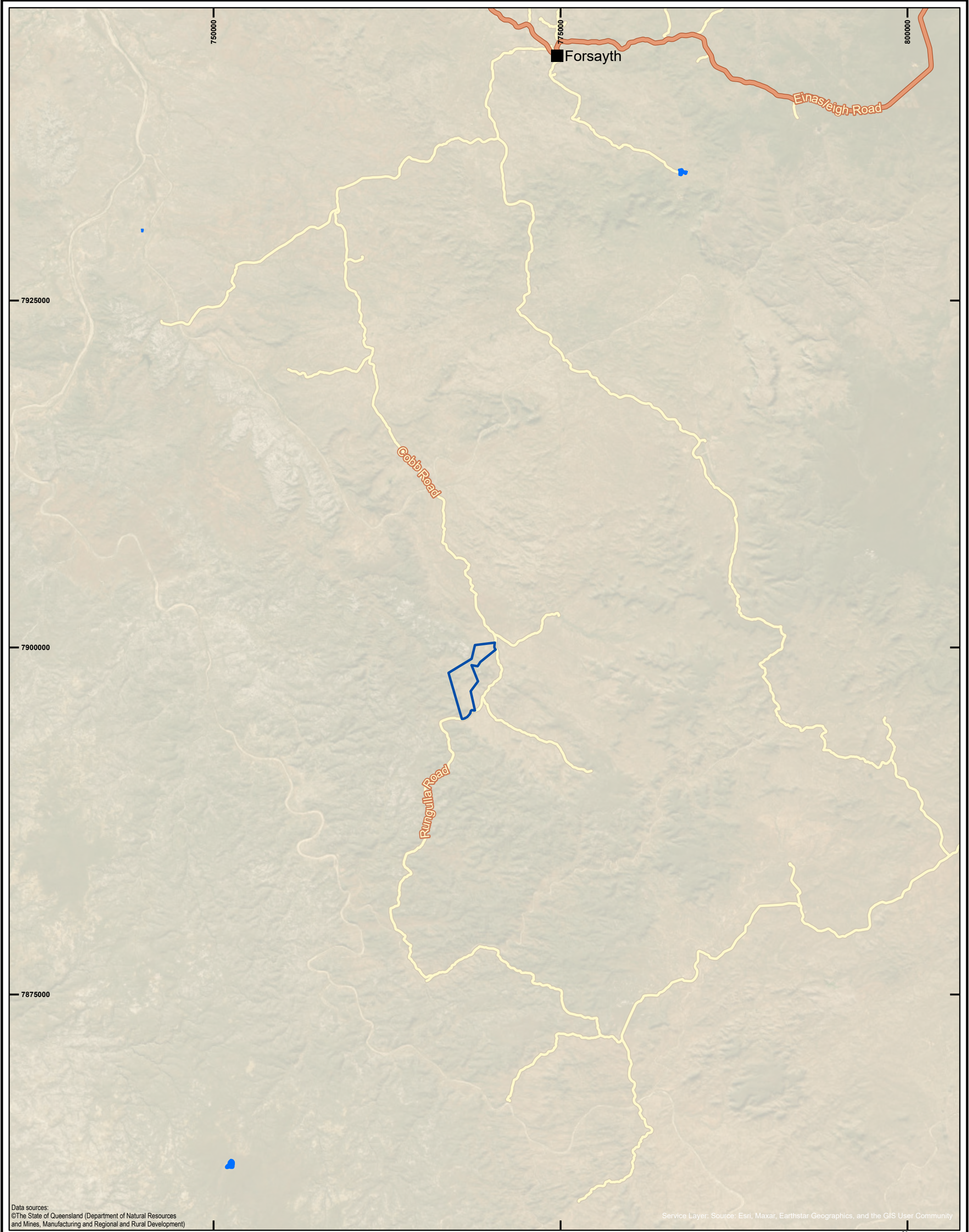
wetland protection area means an area shown as a wetland protection area on the map of Great Barrier Reef wetland protection areas.

2.4.1 Presence within Project Area

There are no wetlands as shown on the map of Queensland wetland environmental values present within the Project Area. In addition, there are no watercourses in high ecological value waters present within the Project area (Figure 3).

2.4.2 SRI Criteria

No MSES wetlands or watercourses are present within the Project Area, therefore no significant residual impacts on prescribed wetlands or watercourses are likely.



Data sources:
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Service Layer: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

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GDA2020, MGA Zone 54

ARDENT GROUP PTY LTD	ML 100030 Wetlands and high ecological value waters		ML 100030 High Ecological Significance Wetland Declared high ecological value waters - Watercourse (none) Declared high ecological value waters - Wetlands (none) Wetland Protection Area - Trigger area (none)
	Figure 3 Sheet No. RTPL_ARD_SVG001_PRCMAP_2008_A		
	Drawn By: Chris Schlebusch		
	Requested by: Jacob Arnold		
Date: 10/11/2025			

2.5 Designated Precinct in a Strategic Environmental Area

MSES Designated Precinct in a Strategic Environmental Area (SEA) are defined in Schedule 2(5) of the EO Regulation, as:

- (1) *A designated precinct in a strategic environmental area is a matter of State environmental significance.*
- (2) *In this section—*
designated precinct, in a strategic environmental area, see the *Regional Planning Interests Regulation 2014*, schedule 2, section 15(3).

2.5.1 Presence within Project Area

There are no Designated Precincts in a Strategic Environmental Area present within or near to the Project area.

2.5.2 SRI Assessment

No MSES Designated Precincts in a SEA are present within the Project Area, therefore no significant residual impacts on Designated Precincts in a SEA are likely.

2.6 Protected Wildlife Habitat

MSES Protected Wildlife Habitat is defined in Schedule 2(6) of the EO Regulation, as:

- (1) *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 a matter of State environmental significance.*
- (2) *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 a matter of State environmental significance.*
- (3) *A koala habitat area is a matter of State environmental significance.*
- (4) *A habitat for an animal that is critically endangered wildlife, endangered wildlife or vulnerable wildlife or a special least concern animal is a matter of State environmental significance.*
Examples of habitat— an area of land used by an animal for foraging, roosting, nesting or breeding
- (5) *In this section—*
flora survey trigger map see the *Nature Conservation (Plants) Regulation 2020*, section 135.
koala habitat area see the *Nature Conservation (Koala) Conservation Plan 2017*, section 7B(1).
special least concern animal means the following animals that are least concern wildlife under the *Nature Conservation Act 1992*—
 - (a) an echidna (*Tachyglossus aculeatus*);
 - (b) a platypus (*Ornithorhynchus anatinus*).

2.6.1 Presence within Project Area

2.6.1.1 High Risk Areas for Protected Plants

There are no high risk area on the flora survey trigger map mapped within ML 100030 and no protected plants were recorded during the surveys (**Figure 4**).

2.6.1.2 Koala Habitat Area

There are no koala habitat areas mapped within ML 100030 (**Figure 4**).

2.6.1.3 Habitat for Conservation Significant Fauna

Flora and fauna studies were conducted by SLR (2021) within the ML in May and November 2020. The results of the desktop (searches in 2021, 2023 and 2025), baseline and ground-truthing surveys of the ML indicate that the following MSES and MNES may potentially be impacted by the project:

- MSES
 - Protected wildlife habitat: seven threatened flora species and five threatened fauna species with a likelihood of occurrence of moderate or higher, one threatened species known to occur, and one special least concern species known to occur; and
- MNES
 - Listed threatened species: Two threatened flora species and three threatened fauna species with a likelihood of occurrence of moderate or higher;

As some species are listed as threatened under both the *Nature Conservation Act 1992* (NC Act or NCA) and the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) the following is the consolidated list for consideration and assessment:

- Threatened Flora:
 - *Cycas cairnsiana* – vulnerable (EPBC Act, NC Act);
 - *Dichanthium setosum* – vulnerable (EPBC Act);
 - *Drummondita calida* – vulnerable (NC Act);
 - *Labichea brassii* – near threatened (NC Act);
 - *Leptospermum pallidum* – near threatened (NC Act);
 - *Pluchea punctata* - endangered (NC Act); and
 - *Solanum carduiforme* – vulnerable (NC Act).
- Threatened Fauna:
 - Common death adder (*Acanthophis antarcticus*) – vulnerable (NC Act);
 - Ghost bat (*Macroderma gigas*) – endangered (NC Act), vulnerable (EPBC Act);
 - Grey falcon (*Falco hypoleucos*) – vulnerable (EPBC Act, NCA Act);
 - Koala (*Phascolarctos cinerus*) – endangered (NC Act), endangered (EPBC Act); and
 - Large-eared horseshoe bat (*Rhinolophus robertsi*) – endangered (NC Act), vulnerable (EPBC Act).
- Special Least Concern Fauna:
 - Short-beaked echidna – (*Tachyglossus aculeatus*) – special least concern (NC Act).
- Listed Migratory Species:
 - Caspian tern (*Hydroprogne caspia*) – migratory (EPBC Act), special least concern (NC Act);
 - Common greenshank – (*Tringa nebularia*) – migratory wetland, overfly marine area (EPBC Act), special least concern (NC Act);
 - Little curlew (*Numenius minutus*) - migratory wetland, overfly marine area (EPBC Act), special least concern (NC Act);
 - Rufous fantail (*Rhipidura rufifrons*) - migratory, overfly marine area (EPBC Act), special least concern (NC Act); and
 - White-bellied Sea-Eagle (*Haliaeetus leucogaster*) - migratory, overfly marine area (EPBC Act), special least concern (NC Act).
- Listed Marine Species:
 - Cattle Egret (*Ardea ibis*) – overfly marine area (EPBC Act);
 - Magpie goose (*Anseranas semipalmata*) - overfly marine area (EPBC Act); and
 - Rainbow bee-eater (*Merops ornatus*) - overfly marine area (EPBC Act);

During the July 2025 update to SRI assessment, the PMST (**Appendix 1**) and Wildlife online searches were repeated to bring to currency the relevant matters. It was noted that five additional threatened species were listed: the squatter pigeon (southern) (*Geophaps scripta scripta*), the greater glider (northern) (*Petauroides minor*); Mertens' Water Monitor (*Varanus mertensi**); Freshwater Sawfish (*Pristis pristis**) and *Macroptherathes montana**. These species were assessed for likelihood of occurrence completed by Wulguru Technical Services (June 2023) and Ardent Group 2025 (*) reproduced as **Appendix 2** and determined to be unlikely to occur and therefore not discussed further.

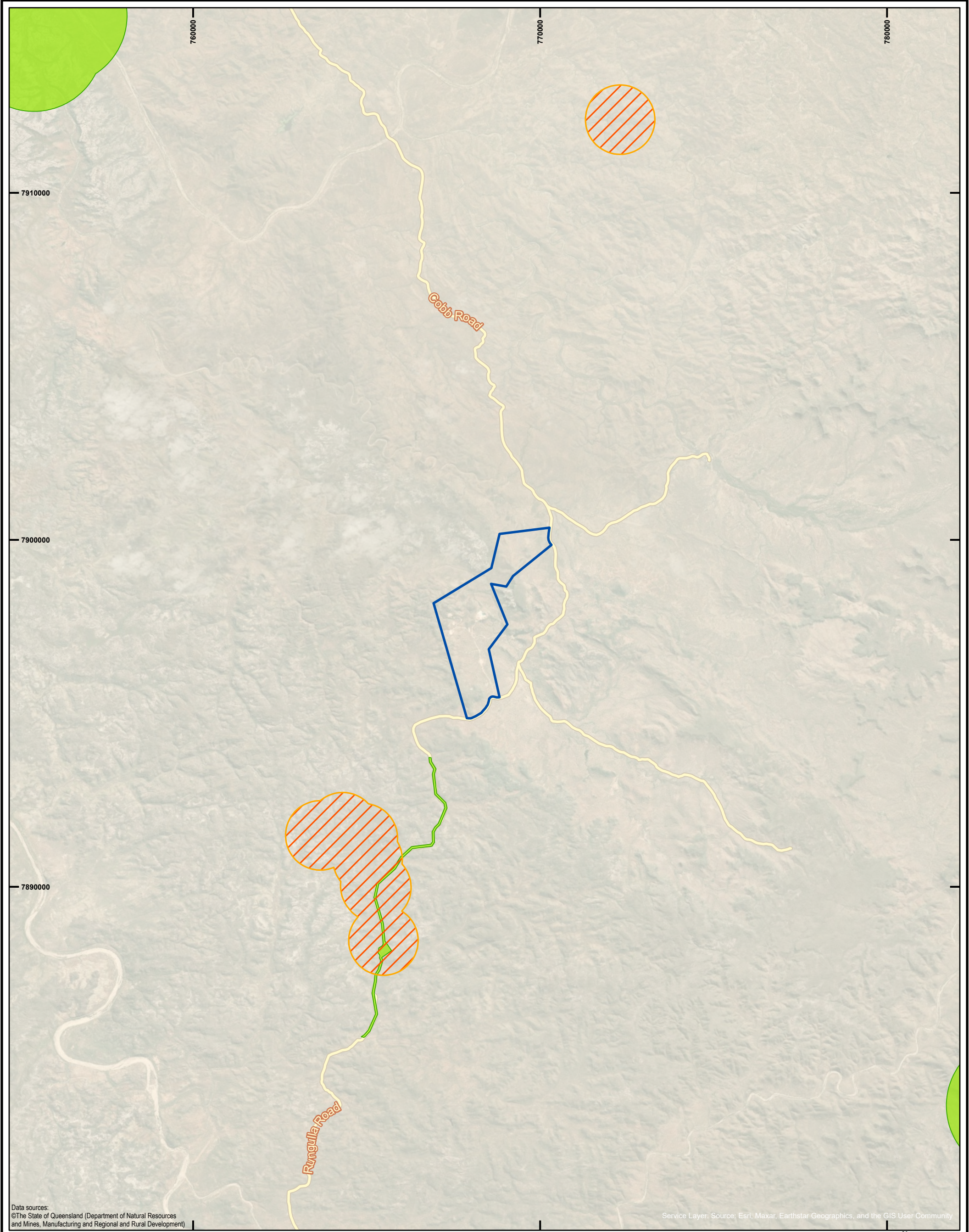
2.6.2 SRI Assessment

No mapped high-risk areas on the flora survey trigger map or koala habitat areas are present within the Project Area, therefore no significant residual impacts on high-risk areas on the flora survey trigger map or koala habitat areas are likely.

The SRI assessment for habitat for the conservation significant fauna identified in section 2.6.1.3 has been attached as **Appendix 3**. The SRI outcomes have been summarised in **Table 10**.

Table 10 Habitat for Conservation Significant Fauna SRI Summary

Common Name	Scientific Name	EPBC Act Status	NC Act Status	SRI
Flora				
Zamia Palm	<i>Cycas cairnsiana</i>	V	V	No SRI
	<i>Dichanthium setosum</i>	V		No SRI
	<i>Drummondita calida</i>		V	No SRI
	<i>Labichea brassii</i>		NT	No SRI
	<i>Leptospermum pallidum</i>		NT	No SRI
	<i>Pluchea punctata</i>		E	No SRI
	<i>Solanum carduiforme</i>		V	No SRI
Fauna				
Common death adder	<i>Acanthophis antarcticus</i>		V	No SRI
Ghost bat	<i>Macroderma gigas</i>	V	E	No SRI
Grey falcon	<i>Falco hypoleucos</i>	V	V	No SRI
Koala	<i>Phascolarctos cinerus</i>	E	E	No SRI
Large-eared horseshoe bat	<i>Rhinolophus robertsi</i>	V	E	No SRI
Short-beaked echidna	<i>Tachyglossus aculeatus</i>		SLC	No SRI
Caspian tern	<i>Hydroprogne caspia</i>	M	SLC	No SRI
Common greenshank	<i>Tringa nebularia</i>	M/Ma	SLC	No SRI
Little curlew	<i>Numenius minutus</i>	M/Ma	SLC	No SRI
Rufous fantail	<i>Rhipidura rufifrons</i>	M/Ma	SLC	No SRI
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	M/Ma	SLC	No SRI
Cattle Egret	<i>Ardea ibis</i>	Ma		No SRI
Magpie goose	<i>Anseranas semipalmata</i>	Ma		No SRI
Rainbow bee-eater	<i>Merops ornatus</i>	Ma		No SRI



Data sources:
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GDA2020, MGA Zone 54

ARDENT GROUP PTY LTD	ML 100030 High risk area for protected plants and Koala habitat area		ML 100030 Wildlife Habitat - Endangered or Vulnerable Wildlife Wildlife Habitat - Special Least Concern Animal (none) Wildlife Habitat - Koala Habitat (none) Flora Survey Trigger Map for Clearing Protected Plants
	Drawn By: Chris Schlebusch		
	Requested by: Jacob Arnold		
	Date: 10/11/2025		
Figure 4 Sheet No. RTPL_ARD_SVG001_PRCMAP_2009_A			

2.7 Protected Areas

Schedule 2(7) of the EO Regulation prescribes a protected area as a matter of State environmental significance. Protected areas are declared under the NC Act for the conservation of Queensland's natural and cultural resources. The classes of protected areas to which the NC Act applies are:

- (a) national parks (scientific);
- (b) national parks;
- (c) national parks (Aboriginal land)
- (d) national parks (Torres Strait Islander land);
- (e) national parks (Cape York Peninsula Aboriginal land);
- (f) conservation parks;
- (g) resources reserves;
- (h) special wildlife reserves; and
- (i) nature refuges.

Note that a coordinated conservation area under the NC Act is excluded by the EO Act, definition *protected area*.

2.7.1 Presence within Project Area

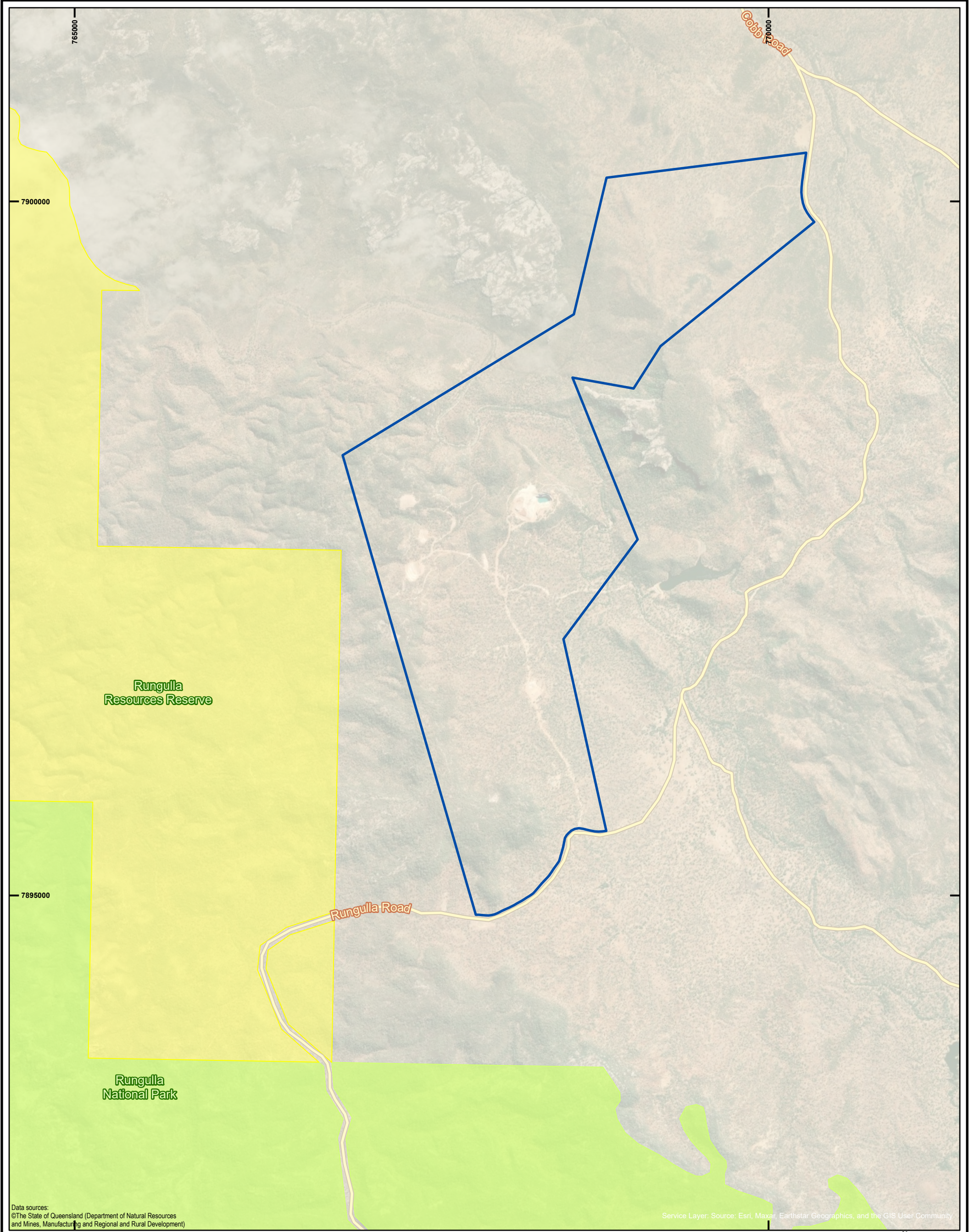
There are no protected areas located within the Project area (**Figure 5**). However, the Rungulla National Park is located approximately 2 km to the west of the Project area and 1 km at its nearest edge on the southern-most corner of ML 100030. The Rungulla Resources Reserve occupies the area between the Rungulla National Park and ML 100030 (**Figure 5**).

2.7.2 SRI Criteria

Section 8(2) of the EO Act outlines the significant residual impact criteria for protected areas. Section 8(2) of the EOA has been considered in **Table 11** where it has been determined that there is unlikely to be a significant residual impact on protected areas.

Table 11 Significant Residual Impact Assessment for Protected Areas

Does the activity result, will or is likely to result in?	Response
The authorised clearing or inundation of all or part of the protected area for the construction of private or publicly owned infrastructure on the area.	The project disturbance footprint does not occupy any of the area within a 2 km buffer of Rungulla National Park. The nearest proposed mine infrastructure is located approximately 312 m from the nearest boundary of Rungulla Resources Reserve.
The exclusion of, or reduction in, the public use or enjoyment of all or part of the protected area.	The proposed mining activities and infrastructure do not inhibit access to or use of the protected areas.
A reduction in the natural or cultural values, within the meaning of the <i>Nature Conservation Act 1992</i> , of all or part of the protected area.	The proposed mining activities and infrastructure will not result in a reduction in the natural or cultural values of any parts of the protected areas.



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ARDENT GROUP PTY LTD			ML 100030 Protected Areas			ML 100030 National Park Resources Reserve		
Figure 5 Sheet No. RTPL_ARD_SVG001_PRCMAP_2010_A			Drawn By: Chris Schlebusch Requested by: Jacob Arnold Date: 10/11/2025					

2.8 Highly Protected Zones of State Marine Parks

MSES Highly Protected Zones of State Marine Parks are defined in Schedule 2(8) of the EO Regulation, as:

(1) *A highly protected area of a relevant Queensland marine park is a matter of State environmental significance.*

(2) *In this section—*

highly protected area means—

(a) *a zone classified, under the Marine Parks Act 2004, as a conservation park zone, marine national park zone or preservation zone; or*

(b) *another area prescribed under a regulation or zoning plan, under the Marine Parks Act 2004, as a highly protected area.*

relevant Queensland marine park means any of the following marine parks declared under the Marine Parks Act 2004—

(c) *the Great Barrier Reef Coast Marine Park;*

(d) *the Moreton Bay Marine Park;*

(e) *the Great Sandy Marine Park.*

zone, for a marine park, see the Marine Parks Act 2004, schedule.

Marine parks are declared under the *Marine Parks Act 2004* over Queensland state waters to protect and conserve the values of the marine environment while allowing for its sustainable use. Zoning plans for each marine park are the primary tool used for managing the marine parks, with these zones used to manage different activities and separate potentially conflicting uses, while maintaining each park's unique biodiversity values. Each marine park zone has specific management objectives. Only works that are compatible with the management objectives of the zone within which they are proposed, may be considered for approval. The highly protected zones of the marine parks are defined as a prescribed environmental matter and therefore permissions for works within these zones are subject to offset considerations. These highly protected zones are:

- preservation zones
- marine national park zones
- scientific research zones
- buffer zones
- conservation park zones.

2.8.1 Presence within Project Area

There are no mapped highly protected zones of State Marine Parks present within or near to the Project area. The Project is located more than 250km from the nearest coastline.

2.8.2 SRI Criteria

No highly protected zones of State Marine Parks are present within or near to the Project Area, therefore no significant residual impacts on highly protected zones of State Marine Parks are likely.

2.9 Fish Habitat Areas

Schedule 2(9) of the EO Regulation prescribes an area declared under the *Fisheries Act 1994* to be a fish habitat area as a matter of State environmental significance.

Fish Habitat Areas (FHAs) are declared under the Fisheries Act for the protection and management of high value fish habitat along the Queensland coast. A two-tiered management approach is applied in declared FHAs, management A or B. Management A is the higher, more restrictive management level whereas management B is applied in locations where existing or planned uses require a more flexible management approach. Only works that are for a prescribed FHA development purpose, listed in the *Fisheries Regulation 2008*, may be considered for approval within an FHA. All FHAs are defined as a prescribed environmental matter and therefore approvals for works within an FHA are subject to offset considerations.

2.9.1 Presence within Project Area

There are no mapped FHAs present within or near to the Project area. The Project is located more than 250km from the nearest coastline.

2.9.2 SRI Criteria

No FHAs are present within or near to the Project Area, therefore no significant residual impacts on FHAs are likely.

2.10 Waterway Providing for Fish Passage

MSES waterways for fish passage are defined in Schedule 2(10) of the EO Regulation, as:

- (1) 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.
- (2) In this section—
 - fish** means fish regulated under the *Fisheries Act 1994*.
 - passage**, for fish, means the natural movement patterns of fish species required to maintain the biological integrity of the species.
 - waterway** includes a river, creek, stream, watercourse or inlet of the sea.
 - waterway barrier works** means a dam, weir or other barrier across a waterway.

Many Australian fish need free fish passage along waterways in order to complete seasonal and flow related migration and movements to access seasonally available food sources or breeding habitat. Stream connectivity and habitat diversity are crucial components of healthy waterways. Waterway barriers (such as dams, weirs and stream crossings) fragment fish habitat and hamper fish movement through the creation of physical barriers and alterations to local hydrology and and/or water quality.

Increased water depth upstream of barriers can result in loss of in-stream plants, leading to reduced food supply or loss of breeding habitat. Barriers to fish passage also result in indirect impacts such as alteration of local flow conditions and water quality up and or downstream.

Barriers to fish passage can restrict and/or isolate fish communities, preventing access to, and benefits of fish habitats otherwise available to them. Poorly designed structures can injure or kill fish moving over or around them, or fish may become stranded and subjected to inappropriate water quality, lack of food, increased predation, crowding or other conditions that impact on their health, wellbeing and productivity.

2.10.1 Presence within Project Area

The Department of Agriculture and Fisheries (DAF) has prepared mapping which classifies all waterways in Queensland in relation to the level of risk that waterway barrier works could pose to fish movement and fish communities. The mapping indicates that waterway barrier works would pose a major risk to fish passage within Agate Creek (**Figure 6**).

An Aquatic Vertebrate Assessment (C&R Consulting, 2022) was undertaken for the Agate Creek Gold Mine which assessed the aquatic vertebrate fauna communities that have the potential to inhabit the ML 100030 as well as the upstream Agate Creek catchment area, providing a baseline description of the communities present. The study identified four species of fish inhabiting the project site, with a further five expected to inhabit the upper catchment of Agate Creek. Two species of freshwater turtle also have the potential to utilise the Agate Creek catchment area, although none were found inhabiting the project site and suitable habitats were not present within ML 100030. No listed species were identified as inhabiting or within the potential to inhabit the Agate Creek catchment area.

2.10.2 SRI Test

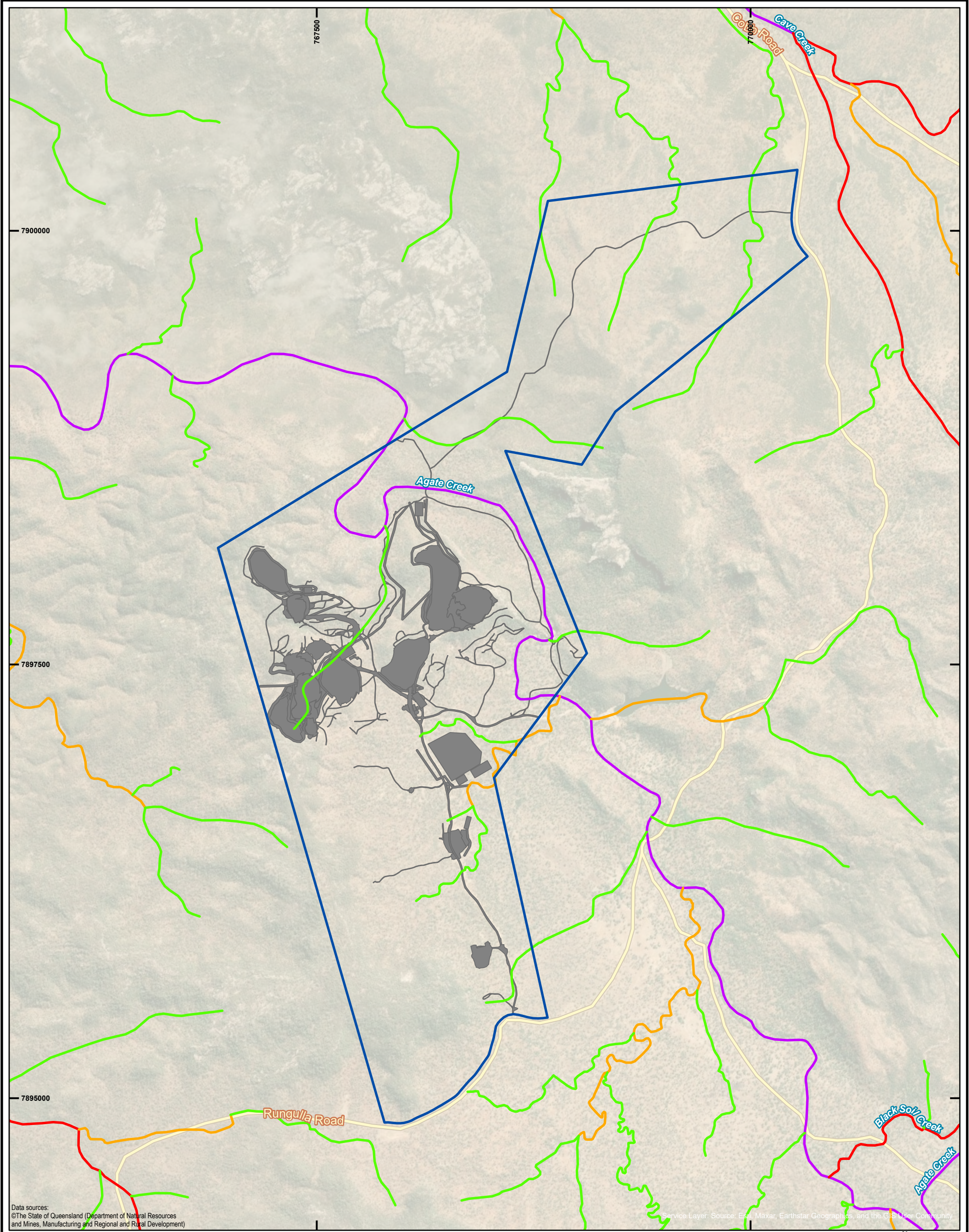
The proposed expansion operations do not include any proposed activities within Agate Creek or its associated riparian zone, with one sediment dam only proposed along one of the minor drainage lines

(mapped as a low waterway for waterway barrier works) that leaves site, entering Agate Creek further downstream. The upper catchment of Agate Creek has a paucity of dry-season refugia with none observed on this unnamed drainage line (C&R, 2022). Further, the main potential impacts from the proposed expansion activities are associated with increased sediment-laden water runoff from disturbed areas. However, any risks associated with this runoff can be easily reduced through the adoption of best-practice soil erosion and sediment control measures required for all mines within Queensland. Therefore, C&R Consulting (2022) concluded that the proposed project is not expected to have any significant impacts on the aquatic ecology values identified within this assessment.

Section 10.1 of the SRI Guideline outlines the significant residual impact criteria for a waterway providing for fish passage. These criteria have been considered in Table 12 where it has been determined that there is unlikely to be a significant residual impact on waterways providing for fish passage.

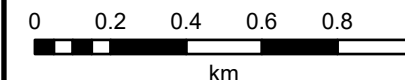
Table 12 Significant Residual Impact Assessment for Waterways Providing for Fish Passage

Does the action have a real possibility that it will:	Response
Result in the mortality or injury of fish.	The majority of the operations will occur on the western side of Agate Creek, there will be minimal development around (or through) the creek itself, with no crossings proposed. Therefore, there is unlikely to be a real possibility of: • Mortality or injury to fish; • Altered conditions that result in substantially increased risks to the health, wellbeing or productivity of fish seeking passage; • Reduced extent, frequency or duration of fish passage previously found at the site; • Substantially modified, destroyed or fragmented areas of fish habitat necessary for the breeding and/or survival of fish; or • A substantial or measurable change to the hydrological regime for the mapped waterways.
Result in conditions that substantially increase risks to the health, wellbeing and productivity of fish seeking passage such as through the depletion of fishes energy reserves, stranding, increased predation risks, entrapment or confined schooling behaviour in fish.	
Reduce the extent, frequency or duration of fish passage previously found at a site.	
Substantially modify, destroy or fragment areas of fish habitat (including, but not limited to in-stream vegetation, snags and woody debris, substrate, bank or riffle formations) necessary for the breeding and/or survival of fish.	
Result in a substantial and measurable change in the hydrological regime of the waterway, for example, a substantial change to the volume, depth, timing, duration and frequency of flows.	
Lead to significant changes in water quality parameters such as temperature, dissolved oxygen, pH and conductivity that provide cues for movement in local fish species.	The establishment of the proposed sediment ponds (as well as other standard best-practice soil erosion and sediment control measures typically adopted within the mining industry) will limit the potential for sediment-laden waters to enter the receiving environment. Waterways in the Project area will also be subject to ongoing surface water monitoring and the Receiving Environment Monitoring Program (REMP).



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Service Layer: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



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	ML 100030 Waterway for providing Fish Passage	ML 100030 Proposed Disturbance	Fish Passage Attribute Major High Moderate Low
Figure 6 Sheet No. RTPL_ARD_SVG001_PRCMAP_2011_A	Drawn By: Chris Schlebusch Requested by: Jacob Arnold Date: 10/11/2025		

2.11 Marine Plants

Schedule 2(11) of the EO Regulation prescribes a marine plant within the meaning of the *Fisheries Act 1994* as a matter of State environmental significance.

Marine plants are part of the mosaic of fish habitats, and are an integral and usually highly visible feature of the coastline. Queensland has a very high diversity of marine plant species, including mangroves, seagrass, saltcouch, algae, samphire (succulent) vegetation and adjacent plants, such as melaleuca (paper barks) and casuarina (coastal she-oaks). Effective management and protection of all marine plants and adjacent coastal areas is important in ensuring sustainable fish habitats and fisheries production.

Marine plants are protected under the *Fisheries Act 1994*. Marine plants are vital natural resources that provide shelter, food and nursery areas to about 75% of fish species caught in Queensland. Marine plants are a fundamental part of fish habitats in Queensland, as they help sustain fish for the future of commercial, traditional and recreational fishing. Marine plants provide a range of important environmental services including shoreline stability and protection from coastal conditions.

2.11.1 Presence within Project Area

The Project is located more than 250km from the nearest coastline, therefore marine plants are not likely to be present within the Project area.

2.11.2 SRI Test

No marine plants are present within or near to the Project Area, therefore no significant residual impacts on marine plants are likely.

2.12 Legally Secured Offset Areas

Schedule 2(12) of the EO Regulation prescribes a legally secured offset area as a matter of State environmental significance.

Legally secured offset areas are any areas declared as an environmental offset protection area, high nature conservation value under the VM Act or another area prescribed under a regulation.

2.12.1 Presence within Project Area

There are no legally secured offset areas present within the Project Area.

2.12.2 SRI Test

No legally secured offset areas are present within the Project Area, therefore no significant residual impacts to legally secured offset areas are likely.

3 Conclusions and Recommendations

Baseline flora and fauna surveys were conducted by SLR (2021) and additional desktop searches and analyses were undertaken by WTS and Ardent Group to inform this assessment. Each matter was assessed against the relevant significant impact guidelines. The results of the assessment conclude that for each of the following relevant matters there would be No Significant Residual Impact as a result of the Agate Creek Gold Mine expansion project as detailed in **Table 13** below.

It should be noted that potential habitat for some of the listed threatened flora and fauna species are present within the site and the relevant level of diligence should be undertaken with respect to the preclearance of areas prior to disturbance to ensure the project meets the condition for environmental harm.

Table 13 Significant Residual Impact Assessment Summary: MSES

MSES	Presence within Project Area	Significant Residual Impact Identified
Regulated vegetation: Endangered or Of Concern REs	Present	No. Project activities are unlikely to result in an SRI to REs listed as Of Concern under the VM Act. The thresholds for the sparse (RE 9.12.11) structure categories have not exceeded the thresholds listed within the <i>Queensland Environmental Offsets Policy: Significant Residual Impact Guideline</i> (State of Queensland, 2014) where the absence of defining banks or high water line which represents the point of flooding are excluded from the calculation.
Regulated vegetation: intersecting a watercourse or within 100m of a Vegetation Management wetland	Not present	Not applicable. An SRI assessment was not completed as this MSES was not identified as present during desktop or field assessments within the Study Area or Disturbance Footprint.
Regulated vegetation: defined distance to a VM Act watercourse	Not present	Not applicable. An SRI assessment was not completed as this MSES was not identified as present during desktop or field assessments within the Study Area or Disturbance Footprint.
Connectivity areas	Present	No. Project activities are unlikely to result in an SRI to connectivity areas. The output of the LFC tool determined that an SRI did not apply to the areas of remnant vegetation identified within the disturbance footprint.
A wetland or watercourse within: High Ecological Value waters Wetland Protection Area High Ecological Significance	Not present	Not applicable. An SRI assessment was not completed as this MSES was not identified as present during desktop or field assessments within the Study Area or Disturbance Footprint.
Designated precinct in a strategic environmental area	Not present	Not applicable. An SRI assessment was not completed as this MSES was not identified as present during desktop or field assessments within the Project area.

MSES	Presence within Project Area	Significant Residual Impact Identified
Protected wildlife habitat: Protected Plants Flora Survey Trigger Map high-risk areas	Not present	Not applicable. An SRI assessment was not completed as this MSES was not identified as present during desktop or field assessments within the Project area.
Protected wildlife habitat: koala habitat area	Not present	Not applicable. An SRI assessment was not completed as this MSES was not identified as present during desktop or field assessments within the Study Area or Disturbance Footprint.
Protected wildlife habitat: Essential Habitat	Present	Not applicable. An SRI assessment was not completed as this MSES was not identified as present during desktop or field assessments within the Study Area or Disturbance Footprint.
Protected wildlife habitat: Endangered, Vulnerable or Special Least Concern wildlife	Present	No. Seven flora and five listed threatened fauna species and one Special Least Concern (non-migratory) and eight migratory/marine species were assessed against the criteria within the <i>Queensland Environmental Offsets Policy: Significant Residual Impact Guideline</i> (State of Queensland, 2014). As part of this assessment it was determined that Project activities are unlikely to result in an SRI to listed threatened species that are known or have a high or moderate likelihood of occurring (Appendix 3).
Protected areas (National Parks, Conservation Reserves, Resources Reserves, Special Wildlife Reserves, Nature Refuges)	Not present	No. While this MSES was not identified as present during desktop or field assessments within the Project area, due to the Project's proximity to Rungulla National Park and the Rungulla Resources Reserve the significant residual impact criteria outlined in section 8(2) of the <i>EO Act</i> for protected areas was considered. It was determined that there is unlikely to be a significant residual impact on protected areas.
Highly Protected Zones of State Marine Parks	Not present	Not applicable. An SRI assessment was not completed as this MSES was not identified as present during desktop or field assessments within the Project area.
Fish Habitat Areas	Not present	Not applicable. An SRI assessment was not completed as this MSES was not identified as present during desktop or field assessments within the Project area.

MSES	Presence within Project Area	Significant Residual Impact Identified
Waterways providing for fish passage	Present	No. Project activities are unlikely to result in an SRI to waterways providing for fish passage. The majority of the operations will occur on the western side of Agate Creek, there will be minimal development around (or through) Agate Creek itself, with no crossings proposed. Low risk waterway which provides no dry season refugia will have a single sediment pond constructed in the upper reaches.
Marine Plants	Not present	Not applicable. An SRI assessment was not completed as this MSES was not identified as present during desktop or field assessments within the Project area.
Legally Secured Offset Areas	Not present	Not applicable. An SRI assessment was not completed as this MSES was not identified as present during desktop or field assessments within the Project area.

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**SIGNIFICANT RESIDUAL IMPACT ASSESSMENT
SAVANNAH GOLDFIELDS LIMITED**

Appendix 1 Protected Matters Search Tool over ML100030 + 50km buffer



Australian Government

Department of Climate Change, Energy,
the Environment and Water

EPBC Act Protected Matters Report

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

Report created: 10-Nov-2025

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	25
Listed Migratory Species:	14

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	20
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	11
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	2
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Species

[Resource Information]

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Chloebia gouldiae listed as Erythrura gouldiae Gouldian Finch [90091]	Endangered	Species or species habitat known to occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area	In feature area
Neochmia ruficauda ruficauda Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area	In buffer area only
Tyto novaehollandiae kimberli Masked Owl (northern) [26048]	Vulnerable	Species or species habitat may occur within area	In feature area
MAMMAL			
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat may occur within area	In feature area
Macroderma gigas Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Mesembriomys gouldii rattoides Black-footed Tree-rat (north Queensland), Shaggy Rabbit-rat [87620]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Petauroides minor Greater Glider (northern), Greater Glider (north-eastern Queensland) [92008]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In buffer area only
Rhinolophus robertsi Large-eared Horseshoe Bat, Greater Large-eared Horseshoe Bat [87639]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Saccolaimus saccolaimus nudicluniatus Bare-rumped Sheath-tailed Bat, Bare-rumped Sheathtail Bat [66889]	Vulnerable	Species or species habitat may occur within area	In feature area
PLANT			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Cycas cairnsiana a cycad [5780]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Cycas platyphylla a cycad [55796]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Euphorbia carissoides [12431]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Macropteranthes montana [9003]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only

REPTILE			
Varanus mertensi Mertens' Water Monitor [1568]	Endangered	Species or species habitat may occur within area	In feature area

SHARK			
Pristis pristis Largetooth Sawfish, Freshwater Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Endangered	Species or species habitat may occur within area	In buffer area only

Listed Migratory Species		[Resource Information]	
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area

Migratory Marine Species			
Pristis pristis Largetooth Sawfish, Freshwater Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Endangered	Species or species habitat may occur within area	In buffer area only

Migratory Terrestrial Species			
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]	
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area overfly marine area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may occur within area overfly marine area	In buffer area only
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat may occur within area	In feature area
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area overfly marine area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area overfly marine area	In buffer area only
Reptile			
Crocodylus johnstoni			
Freshwater Crocodile, Johnston's Crocodile, Johnstone's Crocodile [1773]		Species or species habitat may occur within area	In feature area

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Bellfield	Nature Refuge	QLD	In buffer area only
Canyon	Resources Reserve	QLD	In buffer area only
Cobbold Gorge	Nature Refuge	QLD	In buffer area only
Gilberton	Nature Refuge	QLD	In buffer area only
Granite Creek	Nature Refuge	QLD	In buffer area only
Newcastle Range-The Oaks	Nature Refuge	QLD	In buffer area only
North Head	Nature Refuge	QLD	In buffer area only
Rungulla	National Park	QLD	In feature area
Rungulla	Resources Reserve	QLD	In feature area
South Head	Nature Refuge	QLD	In buffer area only
Stuarts Spring	Nature Refuge	QLD	In buffer area only

EPBC Act Referrals				[Resource Information]	
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status	
Not controlled action					
Forsayth Wind Farm, QLD	2014/7393	Not Controlled Action	Completed	In buffer area only	
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area	

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

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

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

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

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

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

Please feel free to provide feedback via the [Contact us](#) page.

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SIGNIFICANT RESIDUAL IMPACT ASSESSMENT
SAVANNAH GOLDFIELDS LIMITED

Appendix 2 Likelihood of Occurrence Assessment for Additional Species

Flora

Family	Name	Status NCA	Status EPBC	Source*	Preferred Habitat	Likelihood
Combretaceae	<i>Macropteranthes montana</i>	V	V	PM	This species occurs in shallow soil in low woodland or vine thicket (Pedley, 1990) and occurs within the Northern Gulf and Wet Tropics (Queensland) Natural Resource Management Regions.	Unlikely – habitat may occur extent does not extend to the project area. Located in buffer area.
Cycadaceae	<i>Cycas cairnsiana</i> (Zamia palm)	V	V	PM/WO/ ALA	<i>Cycas cairnsiana</i> is known from gritty, skeletal soils on siliceous granite. It occurs in exposed areas, among large boulders, shrubs, or open Eucalypt woodland (Hill, 1996; DEWHA, 2008c). Nearby records are part of a significant population unit.	Possible – Some nearby records exist and habitat within the project area may be suitable to this species. However, it has not been recorded within the project area, despite being a large and conspicuous species of cycad.
Cycadaceae	<i>Cycas couttsiana</i>	V		MPH	<i>Cycas couttsiana</i> has been recorded in open grassy woodlands on red sandy soils derived from basalt or dolerite (Department of Environment and Science, 2022).	Unlikely – Suitable habitat is not present within the ML and nearest records are south of Blackbraes NP.
Euphorbiaceae	<i>Euphorbia carrisoides</i>		V	PM	<i>Euphorbia carrisoides</i> has been recorded on rocky granite outcrops in the Georgetown region and north east to towards Mareeba (Atlas of Living Australia, 2022).	Unlikely – Not recorded within 50km of the AOI. Habitat within the AOI may be suitable, though well outside known range.

Family	Name	Status NCA	Status EPBC	Source*	Preferred Habitat	Likelihood
Leguminosae	<i>Acacia armitii</i>	NT		WO	<i>Acacia armitii</i> is endemic to northern Australia in two disjunct populations in the NT and the Forsayth area in Qld. It prefers the sandy soils of riparian woodlands and drainage lines. (Department of Environment and Science, 2022)	Unlikely – Suitable habitat does occur within the ML however the nearest records occur east of Forsayth and to the west on a tributary of the Yappar River.
Leguminosae	<i>Acacia crombiei</i>	V	V	MPH	<i>Acacia crombiei</i> occurs in isolated populations in central QLD from Muttaborra to just north of Richmond and Hughenden generally occurring on basalts and heavier loamy soils (Department of the Environment, Water, Heritage and the Arts, 2008).	Unlikely – Habitat is not present within the ML and the nearest records are well south of the region.
Solanaceae	<i>Solanum angustum</i>	CR	NL	WO	Poorly known with only a few specimens recorded, this herbaceous resprouter appears to favour shrubby eucalypt woodlands associated with granitic hills or outcrops.	Unlikely – No nearby records and not seen in any location since around 2009. Habitat similar to known locations is unlikely to exist within the project area.

*PM – Protected matters search; WO – Wildlife Online search; ALA – Atlas of living Australia; MPH – Modelled potential habitat

Fauna

Name	Status NCA	Status EPBC	Source*	Preferred Habitat	Likelihood
Birds					
Barn swallow <i>(Hirundo rustica)</i>	SL	M, Ma	PM	Favours areas with large amounts of artificial structures such as bridges, buildings, and sheds, for nesting and resting. Also found in cliff cavities, rock shelves, cavernous dead trees, and overhung banks. \\	Unlikely – No records nearby and suitable habitat is unconfirmed to exist within the study area.
Black-eared Cuckoo <i>(Chalcites osculans)</i>	LC	Ma	PM	Inhabits drier woodlands, scrublands, mallee, mulga, saltmarsh, and riverside thickets (Pizzey and Knight 2012).	Unlikely – No records nearby and suitable habitat is unconfirmed to exist within the study area. Lack of availability of permanent water is a limiting factor.
Black-throated finch <i>(Poephila cincta cincta)</i>	E	E	WO	This rare species occupies various habitats including grassy scrublands, woodlands and pandanus forests. Like many finches, it has a high association with water and is usually found nearby (Pizzey and Knight, 2012).	Unlikely - Generally, the southern subspecies is not known this far inland and it is possible the WO records represent the northern subspecies (<i>Poephila cincta atropygialis</i>) which is not considered endangered (Pizzey and Knight, 2012).

Name	Status NCA	Status EPBC	Source*	Preferred Habitat	Likelihood
Cattle Egret (<i>Ardea ibis</i>)	LC	Ma	PM/ALA	Typically inhabit stock paddocks, agricultural land, garbage tips, wetlands, tidal areas, drains (Pizzey and Knight, 2012).	Possible – Some records nearby, probably limited by access to permanent water and suitable habitat.
Caspian tern (<i>Hydroprogne caspia</i>)	SL	M, Ma	WO/ALA	General found along the coast, less frequently occurring around inland lakes, reservoirs and other water bodies (Pizzey and Knight, 2012).	Possible – Some records nearby, probably limited by access to permanent water and suitable habitat.
Common Greenshank (<i>Tringa nebularia</i>)	SL	M, Ma	PM/ALA	Inhabits mudflats, estuaries, saltmarshes, lake and pond margins, wetlands. Generally found in coastal environments, but present inland where habitat is suitable. Widespread summer migrant, with some overwintering. (Pizzey and Knight 2012).	Possible – Some records nearby, probably limited by access to permanent water and suitable habitat, which are not evident within the project area.
Common Sandpiper (<i>Actitis hypoleucos</i>)	SL	M, Ma	PM	Typically occur in sandy, pebbly, or muddy edges of streams or rivers, either coastal or inland. Also found near dams, tidal flats, mud flats, mangroves, beaches, riverside lawns, drains, and street gutters. Strong association with water. Widespread but uncommon summer migrant. (Pizzey and Knight 2012).	Unlikely – No records nearby and suitable habitat is unconfirmed to exist within the study area. Lack of availability of permanent water is a limiting factor.

Name	Status NCA	Status EPBC	Source*	Preferred Habitat	Likelihood
Eastern star finch <i>(Neochmia r. ruficauda)</i>	E	E	PM	This species complex generally has a high association with water, and inhabits dense, low vegetation such as grass, reeds, cane and low shrubs (Pizzey and Knight, 2012).	Unlikely - The status of this extremely rare star finch subspecies is apparently unclear, being listed by different sources as either endangered, critically endangered or probably extinct (Garnett et al., 2005). Due to this reliance on water and dense low vegetation, and its apparent extreme rarity, the eastern star finch is very unlikely to occur within the site.
Fork-tailed Swift <i>(Apus pacificus)</i>	SL	M, Ma	PM	Widespread across Australia. Scattered records from throughout the Gulf of Carpentaria and Cape York. Almost exclusively aerial, have been recorded in most habitats across Australia (Pizzey and Knight 2012).	Unlikely - No records nearby. Aerial affiliation limits significance of terrestrial habitat.
Grey falcon (<i>Falco hypoleucos</i>)	V	V	PM/ALA	The grey falcon exists in a variety of habitats, from inland plains and deserts to well-timbered watercourses. It is considered rare and probably exists in low densities throughout most of its range (Pizzey and Knight, 2012).	Possible - Some records nearby, probably limited by access to permanent water and suitable habitat. Normally exists at low densities.

Name	Status NCA	Status EPBC	Source*	Preferred Habitat	Likelihood
Grey Wagtail <i>(Motacilla cinerea)</i>	SL	M, Ma	PM	Distribution suggests this species favours coastal regions with higher rainfall. Typically found near running water in sandy or rocky streams in escarpments and rainforests, sometimes in disused quarries. Also found near sewage ponds, agricultural/cropping areas, and airfields (Pizzey and Knight 2012).	Unlikely - No records nearby and suitable habitat is unconfirmed to exist within the study area
Latham's Snipe <i>(Gallinago hardwickii)</i>	SL	M, Ma	PM	Typically inhabits soft wet ground, including shallow waters with vegetation and wet parts of paddocks, seepage, irrigation, and similar habitats. Mostly found in coastal regions of eastern Australia but exhibits strong inland movements in certain areas (Pizzey and Knight 2012).	Unlikely – No records nearby and suitable habitat is unconfirmed to exist within the study area. Lack of availability of permanent water is a limiting factor.
Little curlew <i>(Numenius minutus)</i>	SL	M, Ma	WO/ALA	Edges of dry grasslands and swamps, floodplains, crops, and mudflats. Predominantly coastal but does enter inland areas (Pizzey and Knight 2012).	Possible - Some records nearby, probably limited by access to permanent water and suitable habitat, which are mostly not evident within the project area.
Magpie goose <i>(Anseranas semipalmata)</i>	LC	Ma	PM/ALA	Seasonal wetlands, floodplains, dams, and similar large waterbodies, usually with significant vegetation (Pizzey and Knight 2012).	Possible - Some records nearby, probably limited by access to permanent water and suitable habitat, which are mostly not evident within the project area.

Name	Status NCA	Status EPBC	Source*	Preferred Habitat	Likelihood
Oriental Cuckoo <i>(Cuculus optatus)</i>	SL	Ma	PM	Typically found in monsoon forest, rainforest edges, large trees in agricultural areas, river flats, roadside, mangroves. Spatial distribution suggests this species favours coastal areas of higher rainfall. Non-breeding migrant to Australia September-May. (Pizzey and Knight 2012).	Unlikely – No records nearby and suitable habitat is unconfirmed to exist within the study area. Lack of availability of permanent water is a limiting factor.
Oriental Pratincole <i>(Glareola maldivarum)</i>	SL	M, Ma	PM	This species generally migrates to Australia from Nov- Feb, and inhabits plains, shallow edges of wetlands, mudflats, beaches. Nomadic, follows rainfall, appearing in large companies before moving on (Pizzey and Knight 2012).	Unlikely – No records nearby and suitable habitat is unconfirmed to exist within the study area. Lack of availability of permanent water is a limiting factor.
Pectoral Sandpiper <i>(Calidris melanotos)</i>	SL	M, Ma	PM	Typically inhabit shallow fresh water, often with grasses or other herbage. Associated with swamp margins, flooded agricultural land, tidal areas, saltmarshes. Regular but uncommon summer migrant. (Pizzey and Knight 2012). Distribution appears to favour coast, with scattered inland records where suitable habitat is present	Unlikely – No records nearby and suitable habitat is unconfirmed to exist within the study area. Lack of availability of permanent water is a limiting factor.

Name	Status NCA	Status EPBC	Source*	Preferred Habitat	Likelihood
Rainbow Bee-eater <i>(Merops ornatus)</i>	LC	Ma	PM/WO/ ALA	The rainbow bee-eater is abundant throughout most of Australia. It is a breeding migrant in the SE and SW of the country and a breeding resident in north. Throughout inland areas it is generally regarded as a passage migrant (Pizzey and Knight, 2012). It occurs in an extensive array of habitats across the continent.	Likely – Extensive records nearby and inhabits various habitats. Likely to exist within the site. Possibly a temporary passage migrant.
Rufous fantail <i>(Rhipidura rufifrons)</i>	SL	M, Ma	PM/ALA	This species prefers more complex undergrowth in rainforests, monsoon forests, wet eucalypt patches and gullies (Pizzey and Knight, 2012). Accordingly, it is much more common in the wetter coastal reaches of the state and less frequently encountered in drier areas inland.	Possible - Nearby records limited to a single report on ALA in the vicinity of Cobbold Gorge. Unlikely to exist within current ML, it could be considered slightly more probable in the moist gullies apparent in the proposed new ML to the west of the current site.
Sharp-tailed Sandpiper (<i>Calidris acuminata</i>)	SL	M, Ma	PM	Species typically inhabits tidal mudflats, saltmarshes, mangroves, wetlands, floodwater, irrigated agricultural land, ponds. Strong association with water. Widespread summer migrant to coastal and inland Australia (Pizzey and Knight, 2012).	Unlikely – No records nearby and suitable habitat is unconfirmed to exist within the study area. Lack of availability of permanent water is a limiting factor.

Name	Status NCA	Status EPBC	Source*	Preferred Habitat	Likelihood
Squatter Pigeon (southern) (<i>Geophaps scripta scripta</i>)	V	V	PM	The southern subspecies prefers remnant or regrowth open forest to sparse open woodland or scrub within 3 km of water sources (DAWE, 2022b). The habitat overstory is often dominated by Eucalyptus, Corymbia, Acacia, or Callitris species with a patchy, tussock-grassy understorey for foraging and breeding (DAWE, 2022b).	Unlikely – Nearest records are > 90km from the project and date to the mid 1990s. Suitable habitat is present and any presence of the squatter pigeon is likely to relate to the northern subspecies.
White-bellied Sea- Eagle (<i>Haliaeetus leucogaster</i>)	LC	M, Ma	PM/ALA	Inhabits a variety of habitats including coasts, islands, estuaries, inlets, large rivers, inland lakes, reservoirs. Widespread along all Australian coasts, travels inland along large rivers or to large water sources. (Pizzey and Knight 2012).	Possible - Some records nearby, probably limited by access to permanent water and suitable habitat.
Yellow Wagtail (<i>Motacilla flava</i>)	LC	M, Ma	PM	Distribution of records suggests this species favours coastal regions with higher rainfall. Little information available on preferred habitat in Australia.	Unlikely - No records nearby and suitable habitat is unconfirmed to exist within the study area. Overall rarity limits likelihood.
Mammals					

Name	Status NCA	Status EPBC	Source*	Preferred Habitat	Likelihood
Black-footed tree rat (<i>Mesembriomys gouldii rattoides</i>)	LC	V	PM	This species tends to favour open forests and tropical woodlands in areas with high annual rainfall (Menkhorst and Knight, 2011). Accordingly, almost all the Queensland records are in such areas, seldom reaching drier inland areas.	Unlikely - This species was identified through the PMST report which indicated a possibility of suitable habitats within the sample area. However, there are no records within 50km of the site and it appears suitable habitat is very unlikely to be present.
Greater glider (northern) (<i>Petauroides minor</i>)	V	V	PM	The species is locally common in wet and damp sclerophyll forest on the coast of eastern Australia. They are eucalypt specialists and although they can glide up to 100m, they seldom do (Menkhorst and Knight 2011).	Unlikely – There is a known population associated with the tall Eucalypt forests of Blackbraes National Park, approximately 60 km from the project location. Suitable habitat is not present within the project.
Short-beaked Echidna (<i>Tachyglossus aculeatus</i>)	SL	NL	WO/ALA	This species is Australia's most widely distributed mammal, inhabiting almost every terrestrial habitat on the continent (Menkhorst and Knight, 2011). Exists in lower densities in north.	Possible - The variability of habitats echidnas occupy leads all habitat within the site to be deemed suitable to this species. Unsurprisingly, there are multiple records within the 50km buffer. Though not recorded in recent surveys, the species likely inhabits the study area, though probably at low densities.
Reptiles					

Name	Status NCA	Status EPBC	Source*	Preferred Habitat	Likelihood
Common death adder <i>(Acanthophis antarcticus)</i>	V	NL	Surveys	This species occupies a wide range of habitats across QLD and Australia (Wilson and Swan, 2021). Death adders may be locally common, though usually exist at low to moderate abundance and have a very low detection rate of the species (Rowland and Ferguson, 2012). The death adder generally favours sites with complex ground cover, including leaf litter, rocks, and logs.	Known (SLR) - Apparently not known in the near vicinity until recorded on site in 2020. It is probably uncommon to rare throughout the study area, though may favour more suitable microhabitats along nearby sandstone escarpments, particularly along the weathered sandstone outcrops in the proposed new ML.
Mount Cooper striped lerista (<i>Lerista vittata</i>)	V	V	MPH	<i>Lerista vittata</i> is known only from low closed forest and woodlands with vine thickets in a small area around Mt Cooper Station near Charters Towers and one record near Gilberton, south of Rungulla NP (Department of the Environment, Water, Heritage and the Arts, 2008)	Unlikely – Suitable habitat is not present within the project area and the nearest records is more than 25 km south of the project.

Name	Status NCA	Status EPBC	Source*	Preferred Habitat	Likelihood
Freshwater crocodile (<i>Crocodylus johnstoni</i>)	LC	Ma	PM/ALA	A listed marine species, the freshwater crocodile inhabits many water sources with good connectivity to the Gulf of Carpentaria. Generally, this species requires permanent water (Wilson & Swan, 2021).	Unlikely - The freshwater crocodile has been recorded nearby in the vicinity of Cobbold Gorge. Individuals are known to travel large distances inland and may venture upstream and into the mining lease through Agate creek, particularly in the wet season. However, given the lack of permanent water in the vicinity of the site, it is unlikely for resident animals to persist year-round.
Merten's Water Monitor (<i>Varanus mertensi</i>)	E	E	PM	Mertens' water monitor is semi-aquatic. It is a capable climber that readily takes to the water when disturbed (Shine 1986; Wilson & Knowles 1988; Leseberg & Campbell 2015). Long term activity areas were found to be consistently smaller around waterbodies associated with natural gorges (average = 0.07 ha) than open irrigation channels (average = 0.65 ha) (Mayes 2006). Mertens' water monitor is a highly aquatic lizard that seldom ventures more than 5–10 m from the edge of the water (Wilson & Knowles 1988; Mayes 2006; Smith & Griffiths 2009) except when transitting among core aquatic activity areas (Mayes 2006).	Unlikely – The ephemeral creek (Agate Creek) is not likely to provide sufficient habitat throughout the year and there are no permanent waterbodies within the Project area that would encourage transit.

Name	Status NCA	Status EPBC	Source*	Preferred Habitat	Likelihood
Yakka skink (<i>Egernia rugosa</i>)	V	V	MPH	Associated habit includes rocky outcrops, sand plain areas and dense ground vegetation, in association with open dry sclerophyll forest (ironbark) or woodland, brigalow forest and open shrub land. The yakka skink has also been recorded in lancewood forest on coarse gritty soils in the vicinity of low ranges, foothills and undulating terrain with good drainage (Department of Environment and Science, 2022).	Unlikely - There are no nearby records of this species, with the closest available report on ALA in the vicinity of Blackbraes National Park, approximately 83km to the southeast.
Shark					
Freshwater Sawfish (<i>Pristis pristis</i>)	E	E	PM	It is a marine/estuarine species that spends its first three–four years in freshwater growing to about half its adult size (4 m+) (Allen 2000 pers. comm.). Juveniles and sub-adult Freshwater Sawfish predominantly occur in rivers and estuaries, while large mature animals tend to occur more often in coastal and offshore waters up to 25 m depth (Giles et al. 2006; Stevens et al. 2005). A study on the movement patterns of other sawfish species , <i>P. clavata</i> and <i>P. zijsron</i> , showed that the species had a high fidelity to an area, with movements restricted to only a few square kilometres within the coastal fringe, and influenced by tides (Stevens et al. 2008).	Unlikely – Project location is not within tidal influence

PM – Protected matters search; WO – Wildlife Online search; ALA – Atlas of living Australia; MPH – Modelled potential habitat

SIGNIFICANT RESIDUAL IMPACT ASSESSMENT
SAVANNAH GOLDFIELDS LIMITED

Appendix 3 Habitat for Conservation Significant Fauna Significant Residual Impact Assessment

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1 Introduction

This assessment has been completed as a revision of the Wulguru Technical Services (2023) report by supplementing the assessment with the inclusion of species listed between the completion of that report and the preparation of this report.

It was noted that additional threatened species were listed: the squatter pigeon (southern) (*Geophaps scripta scripta*), the greater glider (northern) (*Petauroides minor*); Mertens' Water Monitor (*Varanus mertensi**); Freshwater Sawfish (*Pristis pristis**) and *Macroptherathes montana** and one migratory species, the White-bellied Sea Eagle (*Haliaeetus leucogaster*).

2 Flora

2.1 *Cycas cairnsiana* (EPBC – V, NCA – V)

Cycas cairnsiana is known from gritty, skeletal soils on siliceous granite. It occurs in exposed areas, among large boulders, shrubs, or open Eucalypt woodland (Hill, 1996; DEWHA, 2008c). Nearby records (~20 km) are part of a significant population unit.

While nearby records exist nearby, and suitable habitat may be present within the project area, *C. cairnsiana* has not been recorded within the project area despite extensive survey effort and the large and conspicuous nature of the species.

Table 1 Significant Impact Criteria for Vulnerable Wildlife or Habitat for *Cycas cairnsiana* (NCA, EPBC).

Is there a chance or possibility that an action will?	Response
Lead to a long-term decrease in the size of a local population or of an important population of the species	There are no known populations within project area.
Reduce the extent of occurrence of the species or area of occupancy of an important population	Species not currently known from project area, not within area of occupancy.
Fragment an existing population into two or more populations	There are no known populations within project area.
Result in genetically distinct populations forming as a result of habitat isolation	There are no known populations within project area.
Adversely affect habitat critical to the survival of a species	There is no critical habitat within the project area
Disrupt the breeding cycle of an important population	There are no populations important or known populations within project area.
Modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that the species is likely to decline	Habitat may be present within the project area though no individuals or populations have been located, therefore any impacts to habitat are unlikely.

Is there a chance or possibility that an action will?	Response
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	While suitable habitat may exist within the ML no records have been found. Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Introduce disease that may cause the species or population to decline	There are no known populations within project area. Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Interfere substantially with the recovery of the species	No known populations within project area
Cause disruption to ecologically significant locations (breeding, feeding, nesting, migration, or resting sites) of a species	No ecologically significant locations for the species within the project area
An action is likely to have a significant impact on a critically endangered or vulnerable species if there is a real chance or possibility that any of the above-mentioned criteria are true - No significant residual impact	

2.2 *Dichanthium setosum* (EPBC – V)

Dichanthium setosum or Bluegrass is a species of perennial grass that usually grows to approximately 70cm in height. It has an erect stem and leaves which are generally hairless (DEWHA, 2008d). This species is primarily known from NSW, with isolated records north into QLD. It has a known association with heavy basaltic black soils as well as stonier red-brown loams (DEWHA, 2008d).

D. setosum is not recorded near the project area and the nearest known records of this species over 100 kilometres to the east. The sandstone dominated habitats of the project area not consistent with suitable habitat for this species, which is usually associated with the heavy soils and clays. *D. setosum* is not considered a likely inhabitant of the Agate Creek area. As such, this species and its ecology is not likely to suffer any effects from upcoming expansion of the Agate Creek project. No significant residual impact criteria for this species are triggered.

Table 2 Significant impact criteria for vulnerable species *Dichanthium setosum* (EPBC)

Is there a chance or possibility that an action will?	Response
Lead to a long-term decrease in the size of an important population of a species	Not known from the project area.
Reduce the area of occupancy of an important population	The project area is not within the known area of occupancy for this species.

Is there a chance or possibility that an action will?	Response
Fragment an existing population into two or more populations	No populations are known within or nearby to the project area.
Adversely affect habitat critical to the survival of a species	Habitat within project area is likely unfavourable for this species.
Disrupt the breeding cycle of an important population	Species is not known to the project area
Modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that the species is likely to decline	Habitat within the project area is likely unfavourable for this species.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	While suitable habitat may exist within the ML no records have been found. Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Introduce disease that may cause the species to decline	Species is not known to the project area. Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Interfere substantially with the recovery of the species	Species is not known to the project area
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that any of the above-mentioned criteria are true - No significant residual impact	

2.3 *Drummondita calida* (NCA – V)

Drummondita calida is a bushy shrub with narrow leaves to 1 mm with obvious oil dots and fissured bark. This species exists in isolated populations, with specimens known nearby to the project area, including within Rungulla NP. These specimens are known to grow on exposed, bare sandstone, as well as in open woodland among large boulders (Ford, 2010). It may be locally common in certain areas, with Ford (2010) recording several specimens during surveys in Rungulla NP, in REs including 2.10.9 (previously 2.10.2x1), 2.10.2, 2.10.5a (previously 2.10.5x2) and 2.7.2.

With multiple records nearby, and suitable habitat present within the project area, *D. calida* is considered a likely inhabitant of the project area, however ground-truthing surveys within the project area did not encounter the species.

D. calida continue to be considered in any further surveys within the project area due to the presence of suitable habitat. Any specimens identified during surveys within the project area should be reported and relevant consideration given to management of identified populations.

Table 3 Significant impact criteria for vulnerable species *Drummondita calida* (NCA)

Is there a chance or possibility that an action will?	Response
Lead to a long-term decrease in the size of a local population	There are no known populations within project area.
Reduce the extent of occurrence of the species	Habitat modification in the project area is unlikely to reduce useable habitat or area of occupancy as the species was not recorded within the ML and impacts to sandstone habitats avoid plateaus and have been minimised to an area less than 6 ha.
Fragment an existing population	There are no known populations within project area.
Result in genetically distinct populations forming as a result of habitat isolation	The area surrounding the disturbance area is well connected and separations of populations is unlikely.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	While suitable habitat may exist within the ML no records have been found. Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Introduce disease that may cause the population to decline	Potential habitat areas such as sandstone jump ups have been avoided. Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Interfere substantially with the recovery of the species	The project activities are not likely to interfere with the recovery of the species.
Cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species	There are no ecologically significant areas for the species located within the project area.
An action is likely to have a significant impact on a near threatened species if there is a real chance or possibility that any of the above-mentioned criteria are true - No significant residual impact	

2.4 *Labichea brassii* (NCA – NT)

Labichea brassii is a little-known species which has been recorded infrequently in areas nearby to the project area. The nearby records form part of a population around the southern limit of the range for this species. Nearby specimens have been collected on sandstone plateaus of Gregory range, consistent with RE 2.10.2x1 (Ford, 2010) and was noted recently by WTS staff in small creek line associated with metamorphics.

Nearby records and suitable habitat within the project area suggest that this species is a possible inhabitant of the project area. While it has not been recorded within the project area or the surrounding sandstone plateaus and outcrops, areas of preferred habitat for the species exist within the project area. RE 2.10.2x1 in which it has been collected is now mapped as RE 2.10.9: Rock pavements and outcrops with patches of *Acacia* spp., *Corymbia* spp. and *Eucalyptus* spp. in dissected Mesozoic sandstone ranges but is not currently mapped within the project area and has not been encountered during ground-truthing vegetation surveys.

As *L. brassii* is currently not known from within the project area, however this species should be considered in any further surveys within the project area due to the presence of suitable habitat. Any specimens identified during surveys within the project area should be reported and relevant consideration given to management of identified populations.

Table 4 Significant impact criteria for near threatened species* *Labichea brassii* (NCA)

Is there a chance or possibility that an action will?	Response
Lead to a long-term decrease in the size of a local population	There are no known populations within project area. Sandstone plateaus are not impacted by disturbance and areas associated with creek lines are largely avoided or linear in nature, therefore impacts are unlikely to decrease local populations if present.
Reduce the extent of occurrence of the species	Habitat modification in the project area is unlikely to reduce useable habitat or area of occupancy as the species was not recorded within the ML and impacts to sandstone habitats have been minimised to an area less than 6 ha and do not impact plateaus.
Fragment an existing population	There are no known populations within project area.
Result in genetically distinct populations forming as a result of habitat isolation	The area surrounding the disturbance area is well connected and separations of populations is unlikely.

Is there a chance or possibility that an action will?	Response
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	While suitable habitat may exist within the ML no records have been found. Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Introduce disease that may cause the population to decline	Potential habitat areas such as sandstone jump ups have been avoided. Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Interfere substantially with the recovery of the species	The project activities are not likely to interfere with the recovery of the species.
Cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species	There are no ecologically significant areas for the species located within the project area.
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that any of the above-mentioned criteria are true - No significant residual impact	

*Specific significant residual impact guidelines are not available for near threatened species. These species are precautionarily investigated here under generalised guidelines for vulnerable species.

2.5 *Leptospermum pallidum* (NCA – NT)

Leptospermum pallidum is a tea-tree to 3 m with fissured bark. It is known to grows on lateritic ridges, edges of cliffs with skeletal soil, and on the margins of vine thickets. Nearby specimens are part of one of the few disjunct populations of this species. These specimens appear to favour sandstone outcrops of the Gregory range, having been recorded in Rungulla NP among boulders on a low sandstone hill (Ford, 2010).

The closest records for this species occur in Rungulla NP to the south, and on sandstone plateaus near Cobbold Gorge. While this species has not been recorded within the project area, described suitable habitat is present.

L. pallidum is not currently known from within the project area however this species should be considered in any further surveys within the project area due to the presence of suitable habitat. Any specimens identified during surveys within the project area should be reported and relevant consideration given to management of identified populations.

Table 5 Significant impact criteria for near threatened species* *Leptospermum pallidum* (NCA)

Is there a chance or possibility that an action will?	Response
Lead to a long-term decrease in the size of a local population	There are no known populations within project area.
Reduce the extent of occurrence of the species	Habitat modification in the project area is unlikely to reduce useable habitat or area of occupancy as the species was not recorded within the ML and impacts to sandstone habitats have been minimised to an area less than 7 ha.
Fragment an existing population	There are no known populations within project area.
Result in genetically distinct populations forming as a result of habitat isolation	The area surrounding the disturbance area is well connected and separations of populations is unlikely.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	While suitable habitat may exist within the ML no records have been found. Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Introduce disease that may cause the population to decline	Potential habitat areas such as sandstone jump ups have been avoided. Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases. Myrtle rust is a disease of species in family Myrtaceae however the fungus is shown to be more prevalent in the wet tropics and therefore unlikely to affect Myrtaceae species in the area.
Interfere substantially with the recovery of the species	The project activities are not likely to interfere with the recovery of the species.
Cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species	There are no ecologically significant areas for the species located within the project area.
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that any of the above-mentioned criteria are true - No significant residual impact	

*Specific significant residual impact guidelines are not available for near threatened species. These species are precautionarily investigated here under generalised guidelines for vulnerable species.

2.6 *Pluchea punctata* (NCA – E)

Pluchea punctata is a woody perennial shrub growing to approximately 80 cm in the family Asteraceae. It is listed as endangered under the NC Act, primarily due to its lack of known locations and overall rarity. This species is primarily known in Queensland from a single locality near the project area. At this site, it has been recorded growing at the base of a steep hill on reddish-brown soil. It has been associated with *Triodia* sp, *Eucalyptus microneura* and *Grevillea striata* (Bean, 2011).

While *P. punctata* is not known from within the project area, collection records for this species exist just 5 km from the current ML. It is also predicted that suitable habitat is likely within the project area. While this species has not yet

been recorded within the ML, it should be considered during any surveys within the project area. The species is considered a possible inhabitant of the project area.

Any specimens identified during surveys within the project area should be reported and relevant consideration given to the management of identified populations.

Table 6 Significant impact criteria for vulnerable wildlife habitat of *Pluchea punctata* (NCA)

Is there a chance or possibility that an action will?	Response
Lead to a long-term decrease in the size of a local population	No individuals or known populations within project area. Habitat may be present in reddish-brown soils associated with erosive areas of metamorphics at the base of hills and in valleys. Disturbance areas in these soils are largely linear and unlikely to disturb populations if present.
Reduce the extent of occurrence of the species	Area of occupancy for the species is not well known, and the species itself is not known to inhabit the project area.
Fragment an existing population	No current known populations within project area.
Result in genetically distinct populations forming as a result of habitat isolation	No populations or habitat known within the project area.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	While suitable habitat may exist within the ML no records have been found. Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.

Is there a chance or possibility that an action will?	Response
Introduce disease that may cause the population to decline	Potential habitat areas such as sandstone jump ups have been avoided. Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Interfere substantially with the recovery of the species	The project activities are not likely to interfere with the recovery of the species.
Cause disruption to ecologically significant locations (breeding, feeding, nesting, migration, or resting sites) of a species	There are no ecologically significant areas for the species located within the project area.
An action is likely to have a significant impact on a critically endangered or vulnerable species if there is a real chance or possibility that any of the above-mentioned criteria are true - No significant residual impact	

2.7 *Solanum carduiforme* (NCA – V)

Solanum carduiforme is a spiny, weed-like sprawling shrub, known from multiple disjunct locations in Western Australia, the Northern Territory and Queensland, including in the vicinity of Cobbold Gorge and elsewhere nearby (Ford, 2010). Locally, *S. carduiforme* has been recorded growing adjacent to or on sandstone outcrops and among spinifex on sandy soils in Rungulla NP (TSSC, 2013., Ford, 2010),.

There are multiple nearby records of *Solanum carduiforme* in the nearby Rungulla NP, and near Cobbold Gorge to the north. Habitat for this species is described as shallow soils on sandstone pavements and on deeper sandy soils with spinifex.

While *S. carduiforme* has not yet been recorded within the project area, habitat is present. This species should be considered in any further surveys within the project area due to the presence of suitable habitat. Any specimens identified during surveys within the project area should be reported and relevant consideration given to management of identified populations.

Table 7 Significant impact criteria for vulnerable species *Solanum carduiforme* (NCA)

Is there a chance or possibility that an action will?	Response
Lead to a long-term decrease in the size of a local population	There are no known populations within project area.
Reduce the extent of occurrence of the species	Habitat modification in the project area is unlikely to reduce useable habitat or area of occupancy as the species was not recorded within the ML and impacts to sandstone habitats avoid plateaus and have been minimised to an area less than 6 ha.

Is there a chance or possibility that an action will?	Response
Fragment an existing population	There are no known populations within project area.
Result in genetically distinct populations forming as a result of habitat isolation	The area surrounding the disturbance area is well connected and separations of populations is unlikely.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	While suitable habitat may exist within the ML no records have been found. Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Introduce disease that may cause the population to decline	Potential habitat areas such as sandstone jump ups have been avoided. Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Interfere substantially with the recovery of the species	The project activities are not likely to interfere with the recovery of the species.
Cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species	There are no ecologically significant areas for the species located within the project area.
An action is likely to have a significant impact on a near threatened species if there is a real chance or possibility that any of the above-mentioned criteria are true - No significant residual impact	

3 Fauna

3.1 Common death adder (*Acanthophis antarcticus*) (NCA – V)

The following significant residual impact test was used to assess potential impacts of the upcoming project expansion for the common death adder:

According to the Significant Residual Impacts Guidelines, activities within the current ML and proposed development area are overall unlikely to affect the common death adder. Further surveys may be undertaken to confirm the predicted low abundance of the death adder within the project area. It is recommended that habitat modification within the site be accompanied by pre-clear surveys and actual clearing be assisted by spotter catchers.

Table 8 Significant impact criteria for vulnerable wildlife habitat for *Acanthophis antarcticus* (NCA)

Is there a chance or possibility that an action will?	Response
Lead to a long-term decrease in the size of a local population	Local population is likely to be sparse and not critical to the overall survival of the species.
Reduce the extent of occurrence of the species	Predicted to inhabit most of QLD. Habitat modification within project area will not reduce potential extent of the species.
Fragment an existing population	Population of the species is largely continuous across its range and disruption to connectivity of habit is not likely as a result of project activities.
Result in genetically distinct populations forming as a result of habitat isolation	Population of the species is largely continuous across its range and disruption to connectivity of habit is not likely as a result of project activities.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Invasive species known to be harmful to the death adder (cane toad, feral cat) are already well established throughout Queensland. Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Introduce disease that may cause the population to decline	There are no known diseases that could likely to be introduced. Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Interfere substantially with the recovery of the species	The area is not critical habitat and project activities are unlikely to interfere with the recovery of the species.
Cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species	Ecologically significant locations are not present within the study area and breeding, feeding activity is unlikely to be affected by habitat modification within project area.
An action is likely to have a significant impact on a critically endangered or vulnerable species if there is a real chance or possibility that any of the above-mentioned criteria are true - No significant residual impact	

3.2 Ghost bat (*Macroderma gigas*) (EPBC – V, NCA – E)

The ghost bat is a very large and distinct species of microbat. It is distributed patchily across the country, with the smaller units making up three larger populations in Western Australia, the Northern Territory and Queensland. (Menkhorst & Knight, 2011; ALA 2021). Roosting habitats include mine shafts and cave systems (Menkhorst & Knight, 2011) though it is likely that the species uses a variety of other habitats for foraging. As cave systems are very limited across the country this is a significant constraint for populations of the species.

Records of the ghost bat in Queensland are largely confined to areas which include these roosting habitats and known to rock outcrops and cave systems of the Undara, Chillagoe, and sandstone caves in the vicinity of Blackbraes NP (ALA, 2021). The ghost bat is considered a possible inhabitant of the project area due to the complex sandstone ranges adjacent to the project disturbance areas, however, it has not been recorded in recent surveys. Suitable habitat is limited to a few areas comprised of larger sandstone outcrops of the Gregory range. There are no known cave systems or similar, likely to be directly affected by upcoming development within the project area.

Table 9 Significant impact criteria for vulnerable (NCA, EPBC) wildlife or habitat for *Macroderma gigas*.

Is there a chance or possibility that an action will?	Response
Lead to a long-term decrease in the size of a local population or of an important population of the species	There are currently no known populations within the project area.
Reduce the extent of occurrence of the species or area of occupancy of an important population	The project area is not located within any known areas of occurrence and therefore not expected to reduce the extent of the nearest known population at Blackbraes NP.
Fragment an existing population into two or more populations	There are no known populations within or near to the project area that would be fragmented due to the project.
Result in genetically distinct populations forming as a result of habitat isolation	There are no known populations within or near to the project area that would be fragmented due to the project, resulting in habitat isolation.
Adversely affect habitat critical to the survival of a species	There is no habitat critical to the survival of the species present within the project area therefore this is unlikely to be affected by development within the project area.
Disrupt the breeding cycle of an important population	There are no known populations within the project area.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Any potential suitable habitat within the project area is not likely to be disturbed or modified and there are no known populations within the project area.

Is there a chance or possibility that an action will?	Response
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Introduce disease that may cause the species or population to decline	There are no known diseases that could likely to be introduced. Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Interfere substantially with the recovery of the species	The area is not critical habitat and project activities are unlikely to interfere with the recovery of the species.
Cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species	Ecologically significant locations are not present within the study area and breeding, feeding activity is unlikely to be affected by habitat modification within project area.
An action is likely to have a significant impact on a critically endangered or vulnerable species if there is a real chance or possibility that any of the above-mentioned criteria are true - No significant residual impact	

3.3 Grey falcon (*Falco hypoleucos*) (EPBC – V, NCA – V)

The grey falcon is a small pale grey falcon, 44 cm head to tail with a yellow eye ring, cere, legs and feet (Pizzey & Knight, 2012). The falcon is said to inhabit a diverse range of inland habitats in lightly treed plains, deserts, sand- ridges, and pastoral areas as well as tree lined watercourses (Pizzey & Knight, 2012) and typically associated with areas where annual rainfall is less than 500 mm (Schoenjahn, 2018). Threats listed as very high and high priority for action include predation by invasive species, habitat loss due to climate change, fragmentation and grazing/ land clearing, and stochastic events on a small population.

The project area has a mean annual rainfall of 800+ mm and is therefore outside of the grey falcon's typical preferred range. There are however, records in the Rungulla NP and Forsyth regions, though these are infrequent and likely to be transitory rather than residential records. The project area is unlikely to consist of ecologically significant habitat for the falcon. As the relevant listed threats to the species, such as predation by cats and habitat fragmentation due to land clearing, relate more closely to existing grazing in the area, the project activities are not likely to be the source of threatening processes.

Table 10 Significant impact criteria for endangered or vulnerable (NCA) and vulnerable (EPBC) wildlife or habitat for *Falco hypoleucos*

Is there a chance or possibility that an action will?	Response
Lead to a long-term decrease in the size of a local population or of an important population of the species	Should populations be present in the region these are likely small and very unlikely to be affected by project activities.
Reduce the extent of occurrence of the species or area of occupancy of an important population	Records in the region are presently outside of the typical extent for the species and the population generally
Fragment an existing population into two or more populations	While the greater population of this species has a broad and continuous distribution there are no local population and the project is not likely to cause fragmentation.
Result in genetically distinct populations forming as a result of habitat isolation	While the greater population of this species has a broad and continuous distribution there are no local population and the project is not likely to cause fragmentation.
Adversely affect habitat critical to the survival of a species	Critical habitat for this species is not known or likely to occur within the project area
Disrupt the breeding cycle of an important population	Critical habitat for this species is not known or likely to occur within the project area therefore breeding is unlikely to be affected
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Disturbance associated with the project is not associated with any preferred habitat and therefore very unlikely to cause a decline in the species generally.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Introduce disease that may cause the species or population to decline	There are no known diseases that could likely to be introduced. Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Interfere substantially with the recovery of the species	Habitat in the project area is not considered critical to the recovery of the species.

Is there a chance or possibility that an action will?	Response
Cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species	Habitat in the project area is not considered ecologically significant to the survival of the species.
An action is likely to have a significant impact on a critically endangered or vulnerable species if there is a real chance or possibility that any of the above-mentioned criteria are true - No significant residual impact	

3.4 Koala (*Phascolarctos cinereus*) (EPBC – E, NCA – V)

The iconic koala is an arboreal marsupial with a thick woolly fur coat that relies on particular eucalypt trees for food, shelter, and connectivity of populations to maintain genetic integrity. Habitat trees include the locally present *Eucalyptus tereticornis*, *E. camaldulensis*, *E. crebra* along with other *Corymbia*, *Angophora* and *Lophostemon* spp..

The koala was recently upgraded to endangered under the EPBC Act due to increased loss of habitat in southeast Queensland due to development and the effects of extreme bushfires.

The lack of recent records in the area and the current contraction of populations of the koala towards the edges of their range makes the species difficult to assess. The species is probably not likely to occur within the project area, though they will be considered as a possible inhabitant precautionarily for the purposes of this report. Diligence should be applied when operating in any areas where Koala habitat trees are present.

An assessment of impact to the koala was included in the SLR report and the findings as follows:

The study area is mapped to occur on the western boundary of the modelled distribution of the Koala and is within an “inland” habitat context for the Koala within the EPBC Act Referral Guidelines for the vulnerable Koala. Koala habitat can be broadly defined as any forest or woodland containing species that are known foodtrees. The diet of the Koala is mainly restricted to foliage of certain *Eucalyptus* spp.; however, it may also consume foliage of related genera, including *Corymbia* spp., *Angophora* spp. and *Lophostemon* spp. As most of the study area is dominated by potential food trees for the Koala, it is broadly considered that most of the study area is habitat for this species. However, reliable soil moisture and fertility are also important factors in determining Koala habitat (DoE, 2014). Most of the study area is dominated by plains and slopes that do not retain soil moisture for extended periods throughout the year. Additionally, sandstone formations within the study area typically comprise nutrient poor soils and are therefore not overly fertile. Vegetation communities along Agate Creek within the study area represents the most suitable habitat for the Koala. However, this riparian vegetation is marginal, and Agate Creek itself is a highly ephemeral watercourse. The broader area supports larger watercourses with denser riparian vegetation, which likely provide more suitable habitat for local Koala populations. Local records of this species are all located from 16 to 20kms to the east and northeast of the study area in open woodland communities similar to those ground-truthed within the study area.

As this species was considered as having a moderate likelihood of occurring within the study area a habitat assessment was conducted in accordance with the EPBC Act Referral Guidelines for the

vulnerable Koala (2014). The outcome of this assessment was that, while there are no local records of this species that are of significant relevance to the study area, the site contains habitat that may be suitable to the Koala (Table 14). Key outcomes from the habitat assessment tool were:

- o There is no evidence of any Koalas within 2km of the edge of the impact area within the last 10 years.
- o Emergent trees of at least two species that are known as Koala food trees are present.
- o The study area is part of a contiguous landscape.
- o The study area has some degree of dog or vehicle threat present.
- o Habitat within the study area is unlikely to be important for achieving the interim recovery objective.

While the study area supports potentially suitable habitat for the Koala, given the absence of any evidence of this species occurring within the study area, it is important to consider the following characteristics for the assessment of significance of the study area to this species:

- o A habitat score of five represents a moderate habitat value and, in this case, the score is based entirely on habitat suitability as local records of this species are within 16 to 20km of the study area and are all >20 years old.
- o The scale of disturbance within the study area is low compared to the size of the surrounding area of remnant vegetation. Any clearing within the study area is not likely to impact broader connectivity values for this species.

On this basis, it is unlikely that development the study area will result in a significant impact to any local individuals or populations of Koala that may occur in the area.

Due to the lack of any evidence of this species occurring within the study area during field assessments, no recent local records, and a relatively minor loss of potentially suitable habitat for this species within the study area, it is unlikely that development of the study area will:

- o Lead to a long-term decrease in the size of any local populations of Koala;
- o Reduce the area of occupancy of any local populations;
- o Fragment any population into multiple populations;
- o Adversely affect habitat critical to the survival of the Koala;
- o Disrupt the breeding cycle of an important population;
- o Modify, destroy, remove or isolate, or decrease the availability or quality of habitat to the extent that the Koala is likely to decline;
- o Result in invasive species that are harmful to Koalas becoming established in Koala habitat;
- o Introduce disease that may cause the species to decline; or
- o Interfere substantially with the recovery of the species.

Overall, it is considered unlikely that there will be any significant impacts to local populations of Koala within the study area.

Table 11 Significant impact criteria for endangered or vulnerable (NCA) and endangered (EPBC) wildlife or habitat for *Phascolarctos cinereus*

Is there a chance or possibility that an action will?	Response
Lead to a long-term decrease in the size of a local population or of an important population of the species	There is no known population within the project area and nearby records are >25 years old
Reduce the extent of occurrence of the species or area of occupancy of an important population	The disturbance areas associated with the project are unlikely to impact the occupancy or the extent of the koala.
Fragment an existing population into two or more populations	There are no current known populations nearby, therefore fragmentation of populations is unlikely to occur. Connectivity of surrounding habitat will additionally remain intact with avoidance and minimisation of impacts to riparian vegetation.
Result in genetically distinct populations forming as a result of habitat isolation	There are no current known populations nearby, therefore fragmentation of populations is unlikely to occur. Connectivity of surrounding habitat will additionally remain intact with avoidance and minimisation of impacts to riparian vegetation.
Adversely affect habitat critical to the survival of a species	Habitat within the project area has the potential to be listed as critical based the koala habitat assessment tool. However, this habitat is unlikely to be significantly affected.
Disrupt the breeding cycle of a population	No known populations or breeding in the vicinity of the project area.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Disturbance of potential habitat is minimised and unlikely to be contribute to species decline.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the critically endangered or endangered species' habitat.	Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Introduce disease that may cause the species or population to decline	Known diseases in koalas (Chlamydia, KoRV) exist in most populations though are not likely to be further spread or introduced via development within the project area.

Is there a chance or possibility that an action will?	Response
Interfere with the recovery of the species	The project and associated project activities are very unlikely to be significant to the recovery of the koala.
Cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species	There are no ecologically significant locations within the project area and disturbance of potential habitat is minimised.
An action is likely to have a significant impact on a critically endangered or vulnerable species if there is a real chance or possibility that any of the above-mentioned criteria are true - No significant residual impact	

3.5 Large-eared horseshoe bat (greater/large form) (*Rhinolophus robertsi*) (EPBC – V, NCA – E)

The large-eared horseshoe bat is a species of insectivorous bat in the family Rhinolophidae. The taxonomy of this species group is not fully resolved, with some sources listing the species as *R. philippinensis*, however, the name

R. robertsi is currently more widely accepted by experts in this field. It is also important to consider here that there are two forms of the large-eared horseshoe bat (greater and lesser). *R. robertsi* refers to the large form or greater large-eared horseshoe bat (Threatened Species Scientific Committee, 2016). This species is known from habitats from rainforests to open Eucalypt forests and woodlands. Roosting habitats for this species are variable, and include overhanging vegetation, hollows in trees, caves and mine shafts, tunnels, culverts and drains under roads and other similar man-made habitats (Threatened Species Scientific Committee, 2016).

The large-eared horseshoe bat is generally uncommon and seldom seen. As such, the distribution for this species is not well known. It appears to favour coastal areas, from the tip of Cape York to around Townsville (Australasian Bat Society, 2022; Threatened Species Scientific Committee, 2016). This species also extends further inland where suitable habitat is available and has been recorded in inland cave systems such as Chillagoe and Undara. The project area is well outside the known and possible distributions for this species and the species has not been recorded within the project area, however it is possible that nearby complex sandstone habitats of the Gregory range provide suitable habitat for this species. The most significant threatening processes for this species include disturbance or destruction of roost sites and habitat loss (Threatened Species Scientific Committee, 2016).

Table 12 Significant impact criteria for endangered (NCA and EPBC) wildlife or habitat for *Rhinolophus robertsi*

Is there a chance or possibility that an action will?	Response
Lead to a long-term decrease in the size of a local population or of an important population of the species	There are no known populations within or near the project area.

Is there a chance or possibility that an action will?	Response
Reduce the extent of occurrence of the species or area of occupancy of an important population	The project area is outside the area of occupancy for this species and unlikely to cause a reduction in the extent or range of the species
Fragment an existing population into two or more populations	There are no known populations within or near the project area and disturbance area of the project do not impact habitat connectivity in the surrounding area.
Result in genetically distinct populations forming as a result of habitat isolation	There are no known populations within or near the project area and disturbance area of the project do not impact habitat connectivity in the surrounding area.
Adversely affect habitat critical to the survival of a species	There are no areas of habitat critical to the survival of the species within the project area.
Disrupt the breeding cycle of a population	There are no known breeding populations nearby
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Habitat within the project area not known or likely to be used by this species.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the critically endangered or endangered species' habitat.	Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Introduce disease that may cause the species or population to decline	There are no known disease likely to be introduced. The harmful white-nose syndrome not currently known in Australia. Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases
Interfere with the recovery of the species	There is no habitat critical to the recovery of the species within the project area.
Cause disruption to ecologically significant locations (breeding, feeding, nesting, migration, or resting sites) of a species	There are no ecologically significant locations within the project area and disturbance of potential habitat is minimised.
An action is likely to have a significant impact on a critically endangered or vulnerable species if there is a real chance or possibility that any of the above-mentioned criteria are true - No significant residual impact	

3.6 Short-beaked Echidna (*Tachyglossus aculeatus*) (NCA – SL)

The short-beaked echidna is a short, stocky, terrestrial monotreme capable of digging and burrowing using its powerful spade like claws to obtain food and create shelter. Its back and exposed body parts are covered in thick sharp spines which provide protection from predators. The echidna is a specialised ant and termite feeder, using its long snout and tongue to extract them from nests and mounds, but will also eat any terrestrial invertebrate or larvae. The short-beaked echidna is highly continuous in its distribution across the country, and are relatively successful in most terrestrial habitats sheltering in cracks, crevices and burrows (Menkhorst & Knight, 2011)

The echidna was not recorded during the baseline surveys, however echidna scats were found on subsequent surveys within the MDL confirming their presence within the project area. Density of individuals or populations at the local scale is difficult to determine though it is very unlikely that the disturbance associated with the project would have a significant residual impact on any populations present. Preclearance of any disturbance areas is advised, and a fauna spotter catcher should be present during any clearing or excavation operations.

Table 13 Significant impact criteria for special least concern (NCA) species *Tachyglossus aculeatus*

Is there a chance or possibility that an action will?	Response
Lead to a long-term decrease in the size of a local population	This species is well distributed and continuous across its range. Populations are very unlikely to be negatively impacted. Connectivity in the surrounding area remains intact
Reduce the extent of occurrence of the species	The echidna is widely distributed and the area of occupancy very unlikely to be impacted as a result of the project
Fragment an existing population	Continuous distribution of this species is not vulnerable to fragmentation. Habitat connectivity will not be effected by the project
Result in genetically distinct populations forming as a result of habitat isolation	Continuous distribution of this species is not vulnerable to fragmentation. Habitat connectivity will not be effected by the project
Cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species	The current project area does not contain ecologically significant locations for the species or population.
An action is likely to have a significant impact on a special least concern species if there is a real chance or possibility that any of the above-mentioned criteria are true - No significant residual impact	

3.7 Caspian tern (*Hydroprogne caspia*) (EPBC – M, Ma, NCA – SL)

The caspian tern is a large tern which is general found along the coast, less frequently occurring around inland lakes, reservoirs, and other water bodies. It favours islands and sandspits for breeding which

typically occurs September to December. It is said to be nomadic and partly migratory (Pizzey and Knight, 2012).

Occasional records in the area are likely to be transitional rather than migratory. The project is unlikely to have an impact on migratory or breeding habits of the tern.

Table 14 Significant impact criteria for migratory species *Hydroprogne caspia*

Is there a chance or possibility that an action will?	Response
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles, or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species	The project area does not represent important habitat for this species. As such, no foreseeable impact from proposed habitat modification exists.
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species	Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species	There are no ecologically significant populations or proportion of the species likely to exist within the project area or to be affected by the project activities.
An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that any of the above-mentioned criteria are true - No significant residual impact	

3.8 Common Greenshank (*Tringa nebularia*) (EPBC – M, Ma, NCA – SL)

The common greenshank is a wading shorebird which is readily identified by a white triangle on the back when in flight. The greenshank breeds in the Palaearctic region of the northern hemisphere, migrating to Australia for the summer (Birdlife Australia, 2022).

As with other shorebirds, the common greenshank's presence within the site is likely to be infrequent, transitory, and not significant in terms of the overall population of the species. Accordingly, proposed habitat modification within the site does not represent a significant threat to the species.

Table 15 Significant impact criteria for migratory species *Tringa nebularia*

Is there a chance or possibility that an action will?	Response
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles, or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species	The project area does not represent important habitat for this species. As such, no foreseeable impact from proposed habitat modification exists.

Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species	Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species	There are no ecologically significant populations or proportion of the species likely to exist within the project area or to be affected by the project activities.
An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that any of the above-mentioned criteria are true - No significant residual impact	

3.9 Little curlew (*Numenius minutus*) (EPBC – M, Ma, NCA – SL)

The little curlew is a wading bird of coastal and inland wetlands and grasslands. As the name suggests the little curlew is the smallest of the curlews with a long thin, streaked neck and a short, slender bill. It has a mottled brown body with a white belly, and a dark crown with a pale eyebrow over a large eye. The little curlew breeds in Siberia and is widespread across northern Australia in the summer months.

The reliance of the little curlew on water and wading habitats suggests its presence within the project area is limited to temporary visits. As habitat within the project area is, in general, unfavourable to the little curlew, any modification to site habitat is unlikely to negatively affect this species.

Table 16 Significant impact criteria for migratory species *Numenius minutus*

Is there a chance or possibility that an action will?	Response
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles, or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species	The project area does not represent important habitat for this species. As such, no foreseeable impact from proposed habitat modification exists.
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species	Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species	There are no ecologically significant populations or proportion of the species likely to exist within the project area or to be affected by the project activities.
An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that any of the above-mentioned criteria are true - No significant residual impact	

3.10 Rufous fantail (*Rhipidura rufifrons*) (EPBC – M, Ma, NCA – SL)

The rufous fantail is a small darting fantail with an obvious rufous rump and brow. It is typically found in the understory of thicker vegetation such as coastal scrubs and along waterways (Pizzey & Knight, 2012). Migratory patterns are unclear, though there is a notable absence from more elevated areas and those of lower latitude during the cooler months (Birdlife Australia, 2022).

While there is a possibility that the rufous fantail exists in the vicinity of the site, their affinity for shady, moist areas suggests that preferred habitat is limited to waterway vegetation. Records of the fantail are largely coastal and it is likely that the few records in the area are likely to be transitory occurrences.

Table 17 Significant impact criteria for migratory species *Rhipidura rufifrons*

Is there a chance or possibility that an action will?	Response
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles, or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species	The project area does not represent important habitat for this species. As such, no foreseeable impact from proposed habitat modification exists.
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species	Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species	There are no ecologically significant populations or proportion of the species likely to exist within the project area or to be affected by the project activities.
An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that any of the above-mentioned criteria are true - No significant residual impact	

3.11 White-bellied Sea-Eagle (*Haliaeetus leucogaster*) (EPBC – M, Ma, NCA – SL)

The white-bellied Sea Eagle is the second largest raptor found in Australia and are found in and near coastal areas of Australia, including inland river systems. The White-bellied Sea-Eagle feeds mainly off aquatic animals, such as fish, turtles and sea snakes, but it also takes birds and mammals. It is a skilled hunter and will attack prey up to the size of a swan. Sea-Eagles feed on carrion (dead prey) such as sheep and fish along the waterline. They harass smaller birds, forcing them to drop any food they carry. Sea-Eagles feed alone, in pairs or in family groups. Scattered sightings include areas south and west of Forsayth (ALA, 2025). The habitats occupied by the sea-eagle are characterised by the presence of large areas of open water (larger rivers, swamps, lakes, the sea). Birds have been recorded in (or flying over) a variety of terrestrial habitats (Marchant & Higgins 1993) In the absence of permanent water and the significant distance from such, this species is not considered to be susceptible to any modification to habitat or other effects from the upcoming expansion of the Agate

Creek project. It is considered that there would be No significant residual impact as a result of the project.

Table 18 Significant impact criteria for marine species *Haliaeetus leucogaster*

Is there a chance or possibility that an action will?	Response
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles, or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species	The project area does not represent important habitat for this species. As such, no foreseeable impact from proposed habitat modification exists.
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species	Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species	There are no ecologically significant populations or proportion of the species likely to exist within the project area or to be affected by the project activities.
An action is likely to have a significant impact on a marine species if there is a real chance or possibility that any of the above-mentioned criteria are true - No significant residual impact	

3.12 Cattle Egret (*Ardea ibis*) (EPBC – Ma)

The cattle egret is a small common egret, named so due to its habitual feeding around horses and cattle. It is typically white with a yellow bill and greyish legs. Head and chest plumage flush to a buff orange colour during the breeding season. The cattle egret is well distributed along the east, south east and northern coasts of Australia and rarely found in dry inland areas (Pizzey & Knight, 2012). It is infrequently recorded in the Forsyth area and individuals and populations area unlikely to be impacted by disturbance associated with project. It is considered that there would be No significant residual impact as a result of the project.

Table 19 Significant impact criteria for migratory species *Ardea ibis*

Is there a chance or possibility that an action will?	Response
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles, or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species	The project area does not represent important habitat for this species. As such, no foreseeable impact from proposed habitat modification exists.

Is there a chance or possibility that an action will?	Response
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species	Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species	There are no ecologically significant populations or proportion of the species likely to exist within the project area or to be affected by the project activities.
An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that any of the above-mentioned criteria are true - No significant residual impact	

3.13 Rainbow Bee-eater (*Merops ornatus*) (EPBC – Ma)

The rainbow bee-eater is a small to medium bird that boast colourful feathers and two streamer tail feathers (Pizzey & Knight, 2012). It is a flitting, insect eating bird well known for its aerial acrobatics and keen ability to snatch insects from the air before precisely returning to its roost. The bee-eater is extremely abundant across most of Australia and occurs in an extensive array of habitats surrounds. It nests in sandbanks and soil ridges by burrowing into the vertical face (Birdlife Australia, 2022). The broad extent of this species suggests that its population, even at a local scale is very unlikely to suffer detrimental effects as a result of habitat modification within the project area. Areas suitable for nesting should be thoroughly observed and precleared under a species management program prior to disturbance. It is considered that there would be No significant residual impact as a result of the project.

Table 20 Significant impact criteria for migratory species *Merops ornatus*

Is there a chance or possibility that an action will?	Response
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles, or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species	The project area does not represent important habitat for this species. As such, no foreseeable impact from proposed habitat modification exists.
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species	Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases. Identification of cane toad and fox populations will be advised to Etheridge Shire Council.
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an	There are no ecologically significant populations or proportion of the species likely to exist within

Is there a chance or possibility that an action will?	Response
ecologically significant proportion of the population of a migratory species	the project area or to be affected by the project activities.
An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that any of the above-mentioned criteria are true - No significant residual impact	

3.14 Magpie goose (*Anseranas semipalmata*) (EPBC – Ma)

The magpie goose is a large pied goose that inhabits a wide range of wetlands and flooded plains. It is widely distributed across northern and eastern Australia, with populations following natural and artificial wetlands throughout its range. Within the project area, the magpie goose is probably seasonal and uncommon. As habitat within the project area is largely unfavourable, this species is not considered to be susceptible to any modification to habitat or other effects from the upcoming expansion of the Agate Creek project. It is considered that there would be No significant residual impact as a result of the project.

Table 21 Significant impact criteria for marine species *Anseranas semipalmata*

Is there a chance or possibility that an action will?	Response
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles, or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species	The project area does not represent important habitat for this species. As such, no foreseeable impact from proposed habitat modification exists.
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species	Activities on site adhere to the Etheridge Shire Pest Management Plan and ensure weed and hygiene protocols and reduce the likelihood of introduction of invasive species and diseases.
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species	There are no ecologically significant populations or proportion of the species likely to exist within the project area or to be affected by the project activities.
An action is likely to have a significant impact on a marine species if there is a real chance or possibility that any of the above-mentioned criteria are true - No significant residual impact	

