Prepared for Eulonga Quarries Pty Ltd

BOS Evaluation

Eulonga Quarry - Biodiversity

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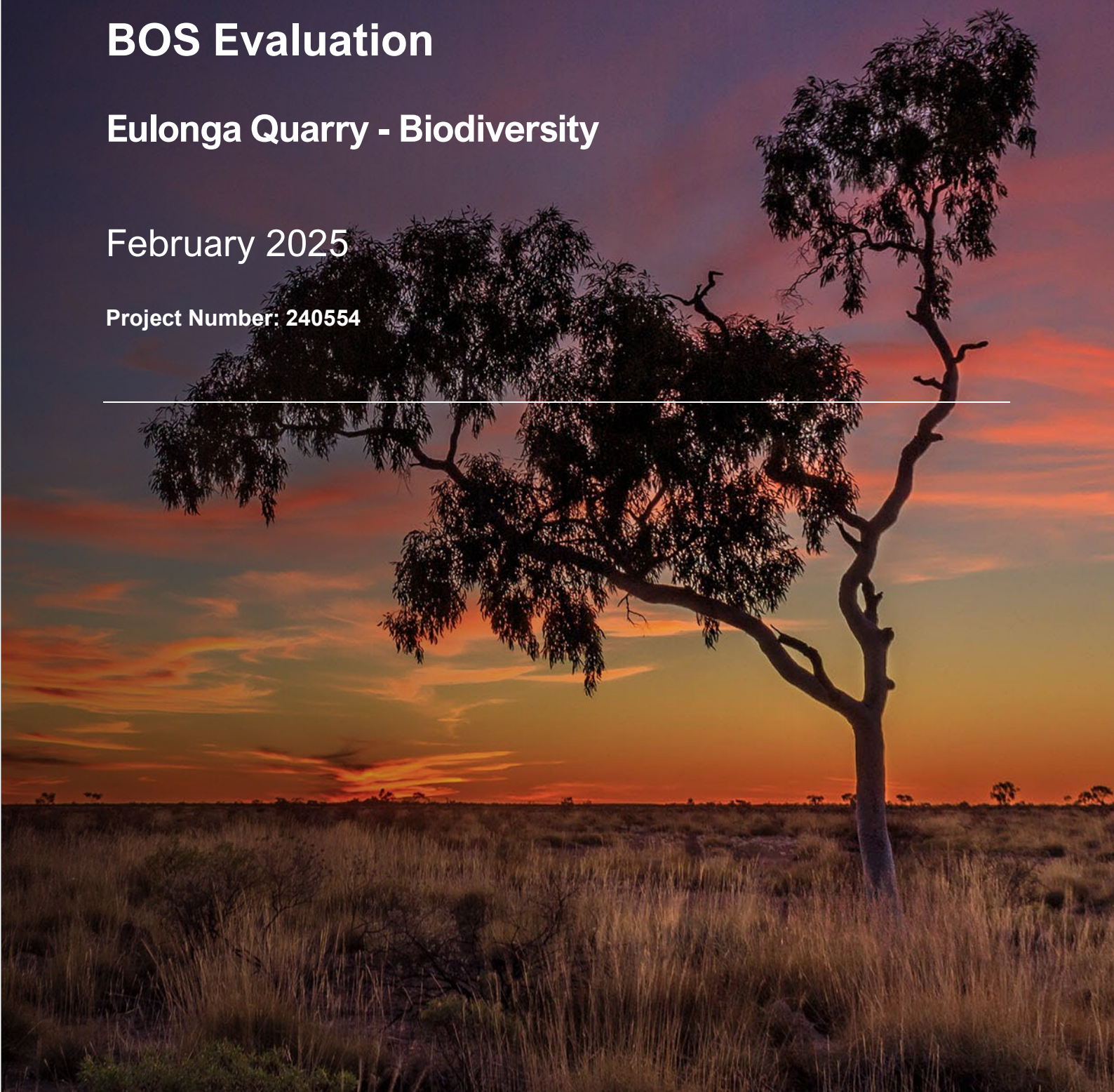

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We acknowledge the traditional owners of this land and pay our respect to Elders past, present and emerging. We recognise that the First Nations peoples of Australia have traditionally managed the resources of this land in a sustainable way, and that they are the original stewards of the Australian environment.

Table of contents

Figures

Tables

Appendices

Acronyms and abbreviations

BC Act	*Biodiversity Conservation Act 2016* (NSW)
Cth	Commonwealth
DBH	Diameter at breast height
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Cth) (formerly DAWE)
DCCEEW	Department of Climate Change, Energy, the Environment and Water (NSW) (formerly DPE)
DPE	(Former) Department of Planning and Environment (NSW) (now DCCEEW and DPHI)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
GIS	Geographic information system
ha	hectares
km	kilometres
LEP	Local Environment Plan
m	metres
MNES	Matters of national environmental significance
PMST	Protected matters search tool
REF	Review of Environmental Factors
TEC	Threatened ecological community

1. Introduction

NGH was commissioned by Eulonga Quarries Pty Ltd (the Proponent) to evaluate whether a proposal to expand a coarse-sand extraction quarry would need to be assessed under the NSW Biodiversity Offsets Scheme (BOS). A coarse sand quarry currently exists at the site along Gobarralong Rd, Gobarralong NSW (approximately 15 kilometres (km) south-east of Coolac). The Proponent wishes to expand the quarry by establishing a new extraction area south-west of the existing operation over an area of approximately 13.91 hectares (ha). The BOS evaluation is undertaken to evaluate whether the proposal triggers the need for a Biodiversity Development Assessment Report (BDAR) under the Biodiversity Conservation Act 2016.

1.1. Legal context

The proposed development would be assessed by the Cootamundra-Gundagai Regional Council under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The impacts of clearing native vegetation must be considered under the Biodiversity Offsetting Strategy and is subject to the thresholds of the Biodiversity Offset Scheme (BOS) as specified by the NSW *Biodiversity Conservation Act 2016* (BC Act) and the *Biodiversity Conservation Regulation 2017* (BC Reg).

Provided that the vegetation being cleared is native, then the BC Reg sets out threshold levels for when the BOS will be triggered. Triggering the BOS requires the preparation of a Biodiversity Development Assessment Report (BDAR). The threshold has two (2) criteria:

- Clearing native vegetation exceeds an area threshold. The area threshold varies depending on the minimum lot size (as determined by the relevant Local Environmental Plan (LEP)), or actual lot size (where there is no minimum lot size provided for the relevant land under the LEP).
- Whether the impacts occur within areas mapped on the Biodiversity Values Map (BVM) published by the Environment Agency Head.

If the area of native vegetation clearing does not meet the above thresholds:

- The impacts to threatened flora, fauna, populations and communities must be assessed against a Test of Significance (ToS) as per Section 7.3 of the BC Act. If a significant impact is considered likely, then the BOS applies to the proposed development.

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) protects nationally and internationally important flora, fauna, ecological communities and heritage places, which are defined in the EPBC Act as Matters of National Environmental Significance (MNES). The EPBC Act requires an evaluation of the potential for impact upon MNES due to the proposal. The significance of MNES impacts must then be assessed in accordance with the *Significance impact guidelines 1.1 – matters of national environmental significance* (DoE, 2013) via an Assessment of Significance (AoS). Where a proposal is likely to have a significant impact on a matter of national environmental significance, the proposal is referred to the Federal Environment Minister.

1.2. Scope of assessment

The primary aim of this report is to provide an evaluation of whether the proposal triggers the BOS and a BDAR is required. To this end, the objectives of this report are to:

- Identify the area of native vegetation in the subject land as defined in the Biodiversity Assessment Method (BAM) at the subject land.
- Assess the clearing of native vegetation against the BOS thresholds.
- Broadly characterise the type of native vegetation and the likely habitat value of the site to threatened flora and fauna.
- Characterise potential impacts according to the NSW Tests of Significance, if required.

2. Approach

2.1. Database searches

Database searches were completed for records of Commonwealth and NSW listed threatened species, populations and ecological communities. A full list of the database searches and the dates they were undertaken can be found below in Table 2-1.

Table 2-1 Database searches

Database search	Search date	Search area
BioNet threatened species and communities listed under the BC Act (DCCEEW NSW, 2024)	05/09/2024	Study Area
EPBC Protected Matters Search Tool (PMST) (DCCEEW (Cwth), 2024).	05/09/2024	Study Area
Biodiversity Values Map and Threshold Tool (NSW Gov., n.d.)	05/09/2024	Study Area
NSW Department of Primary Industries – WeedWise (DPI., 2024)		
State Vegetation mapping within the subject land (DCCEEW NSW, n.d.)	05/09/2024	subject land
Native Vegetation Regulatory Map (NSW Gov., n.d.)		

2.2. Field assessment

A site inspection was undertaken by NGH Ecologist Gillian Young on 24 September 2024. The aim of this site inspection was to inspect ground cover vegetation, identify tree species and any potential threatened flora or fauna habitat. The following was undertaken within the subject land:

- Two (2) step-point transects to determine native and exotic groundcover extent, and
- Hollow-bearing tree surveys (including species identification).

3. Results

The subject land occurs in the Inland Slopes subregion of the NSW south-western slopes IBRA region. The NSW Mitchell Landscape unit is Tarcutta Channels and Floodplains and its status is 'overcleared'.

3.1. Clearing thresholds

The subject land is Lot 158 DP750984 and Lot 4 DP1096529. The subject land is approximately 13.91ha and is zoned RU1 Primary Production under the *Gundagai Local Environmental Plan 2011*. A search of the NSW Planning Portal was conducted which determined the minimum lot size for both lots to be 40ha (NSW Government, 2024). As shown in Table 3-1, the native vegetation clearing threshold for the subject land is 1ha or more. That is, the clearing of 1ha or more of native vegetation will trigger the BOS.

Table 3-1 Native vegetation clearing threshold (bold indicates the threshold that applies to the subject land)

Minimum lot size associated with the property	Threshold for clearing, above which the BAM and offsets scheme apply
Less than 1 ha	0.25 ha or more
1 ha to less than 40 ha	0.5 ha or more
40 ha to less than 1000 ha	**1 ha or more**
1000 ha or more	2 ha or more

3.1.1. Field assessment

The vegetation within the subject land was a mixture of exotic and native groundcover. Trees visible on satellite imagery are remnant native trees. They mostly comprise *Eucalyptus camaldulensis* (River Red Gum) with occasional *Casuarina cunninghamiana* (River Sheoak). The site was split up into two zones:

- PCT 79 River Red Gum shrub/grass riparian tall woodland zone which contains all trees within the subject land. The woodland zone occurs as a single patch, which has been defined according to the BAM where trees are within 100m of each other.
- Highly degraded grassland

A buffer of 30m has been applied around trees for the tree protection zone (i.e. root and canopy zone areas). According to the BAM, patches of woody native vegetation that have a canopy gap of less than 100m from the next area of native vegetation are a single patch. Trees were measured from canopy edge at the desktop using GIS program and satellite imagery. Based on these measurements, there is a patch of PCT 79 woodland in the subject land. None of the trees in the subject land are likely to meet the BAM definition of 'scattered trees' as some occur in clusters.

Areas that are less than 15% native cover are classified as exotic vegetation and are excluded from assessment (NSW DCCEEW, 2024). Two (2) step-point transects were undertaken to determine the exotic and native groundcover percentage in the grassland zone.

Both transects found a groundcover species mix including with exotic pasture species. The raw step-point data can be found in Appendix A. One transect has a total native cover of 63% and the other has a total

native cover of 18%, therefore all of the grassland area is technically considered native. The dominant 'native' species in the grassland is Couch Grass (*Cynodon dactylon)*, which under the BC Act is considered native vegetation. However, in an agricultural context, Couch Grass is a weed that is actively managed on this property and in the local area. As this report was written, annual weed management was undertaken on site and the grassland area has been sprayed to remove Couch Grass and replace with more palatable species for stock. This has been taken as part of allowable activities for rural landholders under the *Local Land Services Act 2013*.

Therefore, the 13.91ha subject land is considered to be vegetation comprised of approximately 1.37 ha of native woodland and 12.54ha of highly degraded grassland (i.e. land managed for pasture).

Areas of native vegetation used to evaluate the area clearing threshold can be seen in Figure 3-1, while Figure 3-5 shows areas of vegetation proposed to be removed for the proposal.

PCT justification

The following steps were undertaken to determine PCT:

Using the BioNet Plant Community Type excel dataset, the PCTs were filtered by IBRA subregion in the first instance and then by *Eucalyptus camaldulensis* upper stratum species. This resulted in a short list of 14 possible PCTs. Two of these PCTs also contain *C. cunninghamiana:*

- PCT 78 River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion
- PCT 79 River Red Gum shrub/grass riparian tall woodland or open forest wetland mainly in the upper slopes sub-region of the NSW South Western Slopes Bioregion and western South Eastern Highland Bioregion.

As these communities are very similar in description and there was little floristic data due to the disturbed nature of the site, this result was checked against the State Vegetation Type Mapping (SVTM). PCT 79 is mapped along the river adjacent to the proposal site. Therefore, the remnant patches of *E. camadulensis* and *C. cunninghamiana* trees on site have been classified as PCT 79.

Figure 3-1 Native vegetation present on site

Figure 3-2 PCTs present on site

Fauna habitat

The habitat within the subject land consists of canopy trees which provide shelter and a food source for local fauna and hollow bearing trees (HBTs) which may be utilised for shelter and breeding by animals. Table 3-2 shows number of hollows per tree. shows number of hollows observed in each size class.

Table 3-2 Hollows noted for site trees

Tree ID	DBH	No. hollows
1	110	2
2	110	3
3	105	0
4	200	5
5	200	4
6	200	5
7	250	1
8	Not noted	2

Table 3-3 Size classes of hollows observed

Size classes	No. hollows
6-10cm	
11-20cm	
20-40cm	
>40cm	

Figure 3-3 and Figure 3-4 provide examples of hollow-bearing trees that occur in the subject land. Additionally, the trees that occur within the subject land form part of the woodland connectivity along the Murrumbidgee River. There were no instances of rocky habitat recorded within the subject land.

Figure 3-3 Example of a large trunk hollow

Figure 3-4 Example of a small limb hollow

3.1.2. Evaluation

The proposal *will not trigger the BOS clearing thresholds* as it involves the removal of 0.17ha of native vegetation which is less than the clearing threshold of 1ha (Figure 3-2). The proposal will not require a BDAR to be prepared. This is discussed further in Section 4

Figure 3-5 Removed and retained vegetation on site

3.2. Biodiversity Values Mapping

The BVM identifies land with high biodiversity value that is particularly sensitive to impacts from development and clearing. The Murrumbidgee River has been mapped as Biodiverse Riparian Land and is within 50m of the western boundary of the subject land.

3.2.1. Evaluation

The proposal does not involve clearing within the BVM Biodiverse Riparian Land and therefore the proposal *does not trigger the BOS due to Biodiversity Values Mapping*. There is, however, potential for indirect impacts on the Biodiverse Riparian Land.

3.2.2. Test of significance

If the two BOS threshold criteria are not triggered, then a test of significance is required to test whether the proposal could have a significant impact upon threatened entities. Species returned from database searches were evaluated for potential to depend upon the habitat proposed to be impacted (directly and indirectly). This is reported on below.

3.2.3. Database searches and habitat evaluation

Nationally important wetlands

No nationally important wetlands occur within the subject land, nor within proximity of the subject land. Additionally, there are no RAMSAR wetlands within the subject land, nor proximity of the subject land.

Threatened ecological communities

PCT 79 is not associated with a Threatened Ecological Community (TECs).

Threatened species

Habitat evaluation (presented in Appendix B) identified the following species have a high potential to occur or occupy the proposal area due to nearby records or suitable habitat:

- Dusky Woodswallow (*Artamus cyanopterus cyanopterus*)
- Brown Treecreeper (eastern subspecies) (*Climacteris picumnus victoriae*)
- Grey Falcon *(Falco hypoleucos*)
- Swift Parrot *(Lathamus discolor*)
- Booroolong Frog *(Litoria booroolongensis)*
- Southern Bell Frog (*Litoria raniformis)*
- Major Mitchell's Cockatoo (eastern) (*Lophochroa leadbeateri leadbeateri)*
- Blue-winged Parrot (*Neophema chrysostoma)*

- Corben's Long-eared Bat (*Nyctophilus corbeni)*
- Greater Glider (southern and central) (*Petauroides Volans)*
- Superb Parrot (*Polytelis swainsonii)*
- Diamond Firetail (*Stagonopleura guttata)*

However, none of the above species are likely to be impacted by the proposal Due to the majority of HBTs being retained or the species mainly using habitat features that exist outside of the Development Footprint.

4. Recommendations

To move forward with the proposal, we make the following recommendations:

- Retention of woodland areas and hollow-bearing trees.
- Focus a majority of clearing and development in grassland area.

We also recommend tree planting to be undertaken along the eastern creek line of the proposal site. This will provide additional habitat and connectivity to the site.

5. Conclusion

NGH visited the subject land at Lot 158 DP750984 and Lot 4 DP1096529 in Gobarralong near Coolac, NSW and found remnant native hollow-bearing trees along with native-dominated grassland. All of the subject land qualifies as 'native vegetation'. The proposal would disturb ~0.17ha of native vegetation in a zone with an area clearing threshold of one hectare, therefore the proposal does not trigger the BOS and a BDAR is not required to be submitted with the development application to Cootamundra-Gundagai Regional Council under Part 4 of the EP&A Act.

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Appendix A Raw field data

A.1 Step-point transects

Transect Step Number	Native (N), Exotic (E), Bare/Rock (B)	Native (N), Exotic (E), Bare/Rock (B)
1	e	n
2	e	n
3	e	n
4	e	e
5	e	n
6	e	e
7	n	n
8	e	e
9	n	n
10	n	e
11	e	n
12	n	n
13	n	n
14	n	n
15	n	n
16	n	n
17	n	e
18	e	e
19	e	n
20	n	n
21	e	n
22	n	n
23	n	n
24	e	n

Transect Step Number	Native (N), Exotic (E), Bare/Rock (B)	Native (N), Exotic (E), Bare/Rock (B)
25	e	n
26	e	n
27	e	n
28	e	n
29	e	n
30	e	e
31	e	e
32	e	e
33	e	n
34	e	n
35	e	n
36	e	n
37	e	e
38	e	n
39	e	n
40	e	n
41	e	e
42	e	n
43	e	n
44	e	e
45	e	e
46	n	n
47	e	n
48	n	n
49	e	b
50	n	e
51	e	e
52	e	n

Transect Step Number	Native (N), Exotic (E), Bare/Rock (B)	Native (N), Exotic (E), Bare/Rock (B)
53	e	n
54	e	e
55	e	n
56	e	n
57	e	n
58	e	n
59	e	n
60	e	n
61	e	n
62	e	e
63	e	e
64	e	n
65	e	e
66	e	e
67	e	n
68	e	n
69	e	n
70	e	n
71	e	n
72	e	e
73	e	n
74	e	e
75	e	e
76	e	e
77	e	e
78	e	n
79	e	e
80	e	n

Transect Step Number	Native (N), Exotic (E), Bare/Rock (B)	Native (N), Exotic (E), Bare/Rock (B)
81	b	n
82	e	e
83	n	e
84	n	e
85	e	e
86	e	n
87	e	n
88	e	e
89	e	e
90	e	n
91	e	n
92	e	n
93	e	n
94	e	e
95	e	n
96	e	n
97	e	e
98	e	e
99	n	n
100	e	e
% exotic (Cat 1 if>50)	**81**	**36**
% native (Not Cat 1 if>50)	**18**	**63**
% bare (Cat 1 if>90)	**1**	**1**
TOTAL %	**100**	**100**

A.2 Hollow-bearing tree register

Tree ID	Tree H	DBH	Comments	H_1_T	H_1_S	H_1_H	H_2_T	H_2_S	H_2_H	H_3_T	H_3_S	H_3_H	H_4_T	H_4_S	H_4_H	H_5_T	H_5_S	H_5_H
1	15	110	large fissure inside trunk	Fissure	20-40cm	4	Limb	20-40cm	8									
2	15	110	on a 45 degree angle	Limb	11-20cm	6	Limb	11-20cm	8	Fissure	20-40cm							
3	20	105	45 degree angle, no visible hollows															
4	25	2	lots of hollow spouts, trunk hollows	Trunk	20-40cm	3	Limb	11-20cm	8	Limb	11-20cm	10	Trunk	6-10cm	5	Limb	11-20cm	15
5	30	2	cockatoos? ten or so large limb hollows, too many to mark!	Limb	>40cm	20	Limb	20-40cm	22	Limb	20-40cm	20	Limb	20-40cm	20			
6	23	2	Tree that is desired to be removed, 2nd priority.	Trunk	6-10cm	8	Limb	>40cm	10	Limb	11-20cm	12	Trunk	6-10cm	5	Limb	11-20cm	6

Appendix B Habitat evaluation

The tables in this appendix present the habitat evaluation for threatened species, ecological communities and endangered populations listed for the locality in the NSW BioNet Database[1] and those identified as potentially occurring in the area according to the Commonwealth EPBC Protected Matters Search Tool[2].

V = Vulnerable; E = Endangered; CE = Critically Endangered;

The likelihood of occurrence is based on presence of habitat, proximity of nearest records and mobility of the species (where relevant). The assessment of potential impact is based on the nature of the proposal, the ecology of the species and its likelihood of occurrence. The following classifications are used:

Likelihood of occurrence:

- Known: Species was recorded during the project-related field investigations (>75%)
- Likely: Species have a high probability of occurring within the study area (>50% but <75%)
- Potential: Species have a moderate probability of occurring in the study area (>25% but <50%)
- Unlikely: Species have a low probability of occurring in the study area, though may be known or predicted within the broader locality (<25%).

Potential for impact:

- No: The proposal would not impact this species or its habitats. No Assessment of Significance (AoS) is necessary.
- Unlikely: Although habitat may be impacted, the entity is unlikely to be impacted. A justification is provided for each relevant species. No Assessment of Significance (AoS) is necessary.
- Possible: Habitat to be impacted and the entity may be impacted. An AoS has been applied to these entities.
- Yes: The proposal may impact this species or its habitats. An AoS has been applied to these entities.

Note: Migratory marine species have been excluded from this habitat as it is not considered to be oceanic

[1] BioNet is administered by the NSW Office of Environment & Heritage (OEH) and is an online database of fauna and flora records that contains over four million recorded sightings.

[2] This online tool is designed for the public to search for matters protected under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). It is managed by the Commonwealth Department of the Environment and Energy.

Scientific Name	Common Name	NSW Listing	EPBC Listing	BioNet records	Habitat description	Likelihood of occurrence	Potential for impact
Ammobium craspedioides	Yass Daisy	V	V	NA	Open Eucalypt forests/woodlands; River Red Gum, Mallee, Buloke, Cypress Pine (Pizzey & Knight, 2012)	Low –potential habitat on subject land, no records.	Low – not likely to occur on site.
Amphibromus fluitans	River Swamp Wallaby-grass, Floating Swamp Wallaby-grass	V	V	NA	*Amphibromus fluitans* grows mostly in permanent swamps. The species needs wetlands which are at least moderately fertile and which have some bare ground, conditions which are produced by seasonally-fluctuating water levels (BioNet, n.d.)	Low –potential habitat on subject land, no records.	Low – not likely to occur on site
Anthochaera phrygia	Regent Honeyeater	CE	CE	NA	Dry open forest, woodlands, or Red Ironbark, Yellow Box, white and Yellow Gum, Mistletoe on River She-oaks, trees in farmlands, streets, gardens (Pizzey & Knight, 2012)	Low - potential habitat in subject land, no records.	Low – not likely to occur on site.
Aphelocephala leucopsis	Southern Whiteface	V	V	NA	Southern Whitefaces live in a wide range of open woodlands and shrublands where there is an understorey of grasses or shrubs, or both. These areas are usually in habitats dominated by acacias or eucalypts on ranges, foothills and lowlands, and plains (Higgins & Peter, 2002)	Low – no records in proximity to subject land.	Low – Species may use trees that occur on the outskirts of the Development footprint.

Scientific Name	Common Name	NSW Listing	EPBC Listing	BioNet records	Habitat description	Likelihood of occurrence	Potential for impact
Aprasia parapulchella	Pink-tailed Worm-lizard, Pink-tailed Legless Lizard	V	V	NA	Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (*Themeda australis*) (BioNet, n.d.)	Low - no habitat in subject land.	Low – not likely to occur on site.
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V,P	Not listed	15	Open forests/woodlands; timbered paddocks; coastal/sub-inland scrubs; golf courses, orchards, roadside timber, street trees. Breeds Aug-Jan. Nests 20m high on horizontal branch, against trunk on lifting bark, stump, end of broken branch, and fallen limbs (Pizzey & Knight, 2012).	Moderate – Potential habitat in proximity to subject land.	Low – unlikely to depend on resource in development footprint.
Bidyanus bidyanus	Silver Perch, Bidyan	Not listed	E	NA	Rivers, lakes and reservoirs, preferring areas of rapid flow. Swims near surface (Allen, Midgley, & Allen, 2002).	Low - no habitat in subject land.	Low – not likely to occur on site.
Botaurus poiciloptilus	Australasian Bittern	E	E	NA	Narrow habitat preferences, preferring shallow, vegetated freshwater or brackish swamps (Pizzey & Knight, 2012).	Low - no habitat in subject land.	Low – not likely to occur on site.
Caladenia arenaria	Sand-hill Spider-orchid	E	E	NA	Occurs in woodland with sandy soil, especially that dominated by White Cypress Pine	Low – no ideal habitat on subject	Low – not likely to occur on site.

Scientific Name	Common Name	NSW Listing	EPBC Listing	BioNet records	Habitat description	Likelihood of occurrence	Potential for impact
					(*Callitris glaucophylla*) (BioNet, n.d.).	land.	
Caladenia concolor	Crimson Spider-orchid, Maroon Spider-orchid	E	V	NA	Habitat is regrowth woodland on granite ridge country that has retained a high diversity of plant species, including other orchids (BioNet, n.d.).	Low- no ideal habitat on subject land.	Low – not likely to occur on site.
Calidris acuminata	Sharp-tailed Sandpiper	Not listed	V	NA	Tidal mudflats, saltmarshes, mangroves; shallow fresh, brackish or saline inland wetlands; floodwaters, irrigated pasture and crops; sewage ponds and saltfields (Pizzey & Knight, 2012).	Low - no habitat in subject land.	Low – not likely to occur on site.
Calidris ferruginea	Curlew Sandpiper	CE	CE	NA	Tidal mudlfats; saltmarsh, saltfields; fresh, brackish or saline wetlands; sewage ponds (Pizzey & Knight, 2012).	Low - no habitat in subject land.	Low – not likely to occur on site.
Callocephalon fimbriatum	Gang-gang Cockatoo	E	E	NA	Favours old growth forest and woodland attributes for nesting and roosting. Nests are located in hollows that are 7 cm in diameter or larger in eucalypts and 3 metres or more above the ground. (BioNet, n.d.).	Low - no ideal habitat in subject land.	Low – not likely to occur on site.

Scientific Name	Common Name	NSW Listing	EPBC Listing	BioNet records	Habitat description	Likelihood of occurrence	Potential for impact
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	V	V	NA	Temperate rainforests, *Eucalypt* forests, woodlands from sea-level to above snowline, heathlands, *Banksia*, *Hakea*, *Acacia* woodlands and scrubs; shelter belts, plantations of eucalypts and exotic conifers (Pizzey & Knight, 2012).	Low - no ideal habitat in subject land.	Low – not likely to occur on site.
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V,P	V	41	Drier forests, woodlands, scrubs, river red gums on water courses and around lakeshores, paddocks with standing dead timber, stumps, margins of denser wooded areas (Pizzey & Knight, 2012).	High - high number of recent records in the area.	Low – may utilise trees bordering subject land but unlikely to depend on development footprint.
Crinia sloanei	Sloane's Froglet	E	E	NA	It is typically associated with periodically inundated areas in grassland, woodland and disturbed habitats. (BioNet, n.d.).	Low - no habitat in subject land.	Low – not likely to occur on site.
Dasyurus maculatus maculatus (SE mainland population)	Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population)	V	E	NA	Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline (BioNet, n.d.).	Low - no ideal habitat in subject land.	Low – not likely to occur on site.

Scientific Name	Common Name	NSW Listing	EPBC Listing	BioNet records	Habitat description	Likelihood of occurrence	Potential for impact
Delma impar	Striped Legless Lizard, Striped Snake-lizard	V	V	NA	Found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component. (BioNet, n.d.).	Low - no habitat in subject land.	Low – not likely to occur on site.
Falco hypoleucos	Grey Falcon	V	V	NA	Lightly treed inland plains, gibber deserts, sand ridges, pastoral lands, timber watercourses; seldom in driest deserts (Pizzey & Knight, 2012).	Moderate - potential habitat in subject land.	Low - May use subject land for hunting.
Gallinago hardwickii	Latham's Snipe, Japanese Snipe	V	V	NA	Freshwater or brackish wetlands, preferring to be close to protective vegetation cover (Pizzey & Knight, 2012).	Low - no ideal habitat in subject land.	Low – not likely to occur on site.
Glossopsitta pusilla	Little Lorikeet	V,P	Not listed	0	Forages primarily in the canopy of open *Eucalyptus* forest and woodland, yet also finds food in *Angophora, Melaleuca* and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. (BioNet, n.d.).	Low - no records within proximity to the project area.	Low – not likely to occur on site.
Grantiella picta	Painted Honeyeater	V	V	NA	Mistletoes in eucalypt forests/woodlands; black box on watercourses; box-ironbark-yellow gum woodlands; paperbarks,	Low - no ideal habitat in subject land.	Low – not likely to occur on site.

Scientific Name	Common Name	NSW Listing	EPBC Listing	BioNet records	Habitat description	Likelihood of occurrence	Potential for impact
					Casuarinas; mulga, other *acacias*; trees on farmland; gardens (Pizzey & Knight, 2012).		
Grevillea wilkinsonii	Tumut Grevillea	CE	CE	NA	At the Goobarragandra River sites the species generally grows in close proximity to the water, at altitudes between 310 and 340 m. Most healthy adult plants occur in open sunny areas, and those plants found under the canopy of dense vegetation tend to be spindly and are sometimes subject to sooty mould infestations (BioNet, n.d.).	Low - doesn't normally occur at elevation of site.	Low – not likely to occur on site.
Hieraaetus morphnoides	Little Eagle	V,P	Not listed	2	Plains, foothills, open forests, woodlands and scrublands; river red gums on watercourses and lakes (Pizzey & Knight, 2012).	Low - low records and no recent records in proximity to the project area.	Low – not likely to occur on site.
Hirundapus caudacutus	White-throated Needletail	V	V	NA	Airspace over forests, woodlands, farmlands, plains, lakes, coasts, towns, feeding companies frequency patrol back and forward along favoured hilltops and timbered ranges (Pizzey & Knight, 2012).	Low - no typical habitat in subject land.	Low – may fly over but impact unlikely.
Keyacris scurra	Key's Matchstick	E	E	NA	Typically found in native grasslands and	Low - not ideal	Low – not likely to

Scientific Name	Common Name	NSW Listing	EPBC Listing	BioNet records	Habitat description	Likelihood of occurrence	Potential for impact
	Grasshopper				grassy woodlands but it has also been recorded in other vegetation associations usually containing a native grass understory (especially kangaroo grass *Themeda triandra*) and known food plants (particularly Asteraceae) (BioNet, n.d.).	habitat in subject land.	occur on site.
Lathamus discolor	Swift Parrot	E	CE	NA	Open grassy woodland, with dead trees, near permanent water and forested hills, coastal heaths, pastures with exotic grasses, weeds, roadsides, orchards (Pizzey & Knight, 2012).	Moderate - utilise Eucalypt species, though not usually the species present on site.	Low – not likely to occur on site.
Leipoa ocellata	Malleefowl	E	V	NA	*Mallee*, *Acacia*, paperback, she oak, and other scrubs; *Eucalypt* woodland; coastal heaths; mostly on sandy or gravel soils (Pizzey & Knight, 2012).	Low - no habitat in subject land.	Low – not likely to occur on site.
Lepidium aschersonii	Spiny Peppercress	V	V	NA	Found on ridges of gilgai clays dominated by Brigalow (*Acacia harpophylla*), Belah (*Casuarina cristata*), Buloke (*Allocasuarina luehmanii*) and Grey Box (*Eucalyptus microcarpa*). In the south has been recorded growing in Bull Mallee (*Eucalyptus behriana*).	Low - does not usually in this landscape type.	Low – not likely to occur on site

Scientific Name	Common Name	NSW Listing	EPBC Listing	BioNet records	Habitat description	Likelihood of occurrence	Potential for impact
					Often the understorey is dominated by introduced plants. The species grows as a a component of the ground flora, in grey loamy clays. Vegetation structure varies from open to dense, with sparse grassy understorey and occasional heavy litter (BioNet, n.d.).		
Litoria booroolongensis	Booroolong Frog	E	E	NA	Live along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses (BioNet, n.d.).	Moderate - possible habitat adjacent to the subject site.	Low – More likely to use areas outside of development footprint.
Litoria raniformis	Southern Bell Frog,	E	V	NA	Usually found in or around permanent or ephemeral Black Box/*Lignum*/Nitre Goosefoot swamps, *Lignum*/*Typha* swamps and River Red Gum swamps or billabongs along floodplains and river valleys. They are also found in irrigated rice crops, particularly where there is no available natural habitat (BioNet, n.d.).	Moderate - possible habitat adjacent to the subject site.	Low – More likely to use areas outside of development footprint.
Lophochroa leadbeateri leadbeateri	Major Mitchell's Cockatoo (eastern), Eastern Major Mitchell's	Not listed	E	NA	Near water on timbered water courses, surrounding grasslands, gibber, saltbush, mulga and other acacias, stands of native	Moderate - possible habitat on subject	Low – Habitat that could potentially be used as habitat is

Scientific Name	Common Name	NSW Listing	EPBC Listing	BioNet records	Habitat description	Likelihood of occurrence	Potential for impact
	Cockatoo, Pink Cockatoo (eastern)				*Cypress*, *Casuarinas*, larger *Mallee Eucalypts* with suitable nest hollows and mallee associated with riverine woodlands (Pizzey & Knight, 2012).	site.	outside development footprint.
Maccullochella macquariensis	Trout Cod	Not listed	E	NA	Rapidly flowing streams, around the cover of logs and debris, over rocky or gravel bottoms. Larger fish occur in deeper sections (Allen, 2002).	Low - no habitat in subject land.	Low – not likely to occur on site.
Maccullochella peelii	Murray Cod	Not listed	V	NA	Slow flowing turbid water of rivers and streams at low elevations. Also fast-moving clear, rocky upland streams. Favours deeper water around boulders, longs, undercut banks and overhanging vegetation (Allen, Midgley, & Allen, 2002).	Low - no habitat in subject land.	Low – not likely to occur on site.
Macquaria australasica	Macquarie Perch	Not listed	E	NA	It occurs in both the inland drainage of the Murray–Darling Basin (MDB) and the coastal drainages of the Shoalhaven and Hawkesbury Nepean Catchments in New South Wales (Lindermans, 2007)	Low - no habitat in subject land.	Low – not likely to occur on site.
Melanodryas	South-eastern	E1,P	E	1	Drier *Eucalypt* forests, woodlands, scrubs with	Low - low	Low – not likely to

Scientific Name	Common Name	NSW Listing	EPBC Listing	BioNet records	Habitat description	Likelihood of occurrence	Potential for impact
cucullata cucullata	Hooded Robin				fallen logs, debris, mallee, *Casuarina*, cypress pine, mulga, cleared paddocks, *Banksia* dominated coastal scrubs (Pizzey & Knight, 2012).	records.and no recent records in proximity to the project area.	occur on site.
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	V,P	Not listed	1	occupies mostly upper levels of drier open forests or woodlands dominated by Box and Ironbark Eucalypts, especially Mugga Ironbark (*Eucalyptus sideroxylon*), White Box (*E. albens*), Inland Grey Box (*E. microcarpa*), Yellow Box (*E. melliodora*), Blakely's Red Gum (*E. blakelyi*) and Forest Red Gum *(E. tereticornis).* (BioNet, n.d.)	Low - low records and no recent records in proximity to the project area.	Low – not likely to occur on site.
Neophema chrysostoma	Blue-winged Parrot	V	V	NA	Blue-winged Parrots inhabit a range of habitats from coastal, sub-coastal and inland areas, through to semi-arid zones. They tend to favour grasslands and grassy woodlands and are often found near wetlands both near the coast and in semi-arid zones (Higgins, 1999).	Moderate - possible habitat on subject land.	Low – Most likely to using trees outside development footprint.
Nyctophilus corbeni	Corben's Long-eared Bat, South-eastern Long-eared Bat	V	V	NA	Inhabits a variety of vegetation types, including mallee, Bulloke *Allocasuarina leuhmanni* and Box Eucalypt dominated communities, but it is	Moderate - possible habitat on subject	Low – may utilise trees bordering subject land but

Scientific Name	Common Name	NSW Listing	EPBC Listing	BioNet records	Habitat description	Likelihood of occurrence	Potential for impact
					distinctly more common in Box/Ironbark/Cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland (BioNet, n.d.).	land.	unlikely to depend on development footprint.
Petauroides volans	Greater Glider (southern and central)	E	E	NA	Feeds exclusively on eucalypt leaves, buds, flowers and mistletoe. Shelter during the day in tree hollows and will use up to 18 hollows in their home range. Recorded using hollows with a minimum diameter of 8 cm (BioNet, n.d.).	Moderate - possible habitat on subject land.	Low – may utilise trees bordering subject land but unlikely to depend on development footprint.
Petroica phoenicea	Flame Robin	V,P	Not listed	0	Breeds in upland tall moist Eucalypt forests and woodlands, often on ridges and slopes. (BioNet, n.d.).	Low - no records within proximity to the project area.	Low – not likely to occur on site.
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)	Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)	E	E	NA	Inhabit Eucalypt woodlands and forests. Feed on the foliage of more than 70 Eucalypt species and 30 non-Eucalypt species, but in any one area will select preferred browse species (BioNet, n.d.).	Low - Moderate possible habitat on subject land.	Low – not likely to occur on site.
Polytelis	Superb Parrot	V,P,3	V	11	River Red Gums, Black Box, Yellow Box, River	Moderate – Some	Low – known to

Scientific Name	Common Name	NSW Listing	EPBC Listing	BioNet records	Habitat description	Likelihood of occurrence	Potential for impact
swainsonii					Oak, mostly near rivers; mallee, stubbles, pastures, gardens (Pizzey & Knight, 2012).	potential habitat on subject land.	utilise paddock trees but outside of important breeding area.
Pomaderris cotoneaster	Cotoneaster Pomaderris	E	E	NA	Cotoneaster Pomaderris has been recorded in a range of habitats in predominantly forested country. The habitats include forest with deep, friable soil, amongst rock beside a creek, on rocky forested slopes and in steep gullies between sandstone cliffs (BioNet, n.d.).	Low - Doesn't usually occur in the subject land.	Low – not likely to occur on site.
Prasophyllum petilum	Tarengo Leek Orchid	E	E	NA	Grows in open sites within Natural Temperate Grassland at the Boorowa and Delegate sites (BioNet, n.d.)	Low -no associated habitat on subject land.	Low – not likely to occur on site.
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	NA	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops (BioNet, n.d.).	Low -no associated habitat on subject land.	Low – not likely to occur on site.
Rostratula australis	Australian Painted Snipe	E	E	NA	Well-vegetated shallows and margins of wetlands, dams, sewage ponds; wet pastures,	Low -no associated habitat on subject	Low – not likely to

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					marshy areas, irrigation systems, lignum, tea-tree scrub, open timber (Pizzey & Knight, 2012).	land.	occur on site.
Stagonopleura guttata	Diamond Firetail	V,P	V	20	River Red Gums, Black Box, Yellow Box, River Oak, mostly near rivers; mallee, stubbles, pastures, gardens (Pizzey & Knight, 2012).	Moderate – may utilise habitat along river and bordering subject land.	Low – unlikely to depend on resources in development footprint.
Swainsona recta	Small Purple-pea, Mountain Swainson-pea, Small Purple Pea	E	E	NA	Before European settlement Small Purple-pea occurred in the grassy understorey of woodlands and open-forests dominated by Blakely's Red Gum (*Eucalyptus blakelyi)*, Yellow Box (*E. melliodora)*, Candlebark Gum (*E. rubida)* and Long-leaf Box (*E. goniocalyx)* (BioNet, n.d.).	Low - no associated species or habitat on subject land.	Low – not likely to occur on site.
Synemon plana	Golden Sun Moth	V	V	NA	Grasslands dominated by wallaby grasses are typically low and open - the bare ground between the tussocks is thought to be an important microhabitat feature for the Golden Sun Moth, as it is typically these areas on which the females are observed displaying to	Low - no associated species or habitat on subject land.	Low – not likely to occur on site.

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					attract males (BioNet, n.d.).		
Thesium australe	Austral Toadflax, Toadflax	V	V	NA	Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast (BioNet, n.d.).	Low - no associated species or habitat on subject land.	Low – not likely to occur on site.

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