24 January 2025

Nicole Brewer
Director, Energy Assessments
Department of Planning, Housing and Infrastructure
4 Parramatta Square, 12 Darcy Street Parramatta NSW 2150

Dear Nicole,

Subject: Valley of the Winds (SSD-10461) – Amendment Letter – Local Road Upgrades - Black Stump Way and Moorefield Road (west)

1 Introduction

ACEN Australia (ACEN) seeks to amend the Valley of the Winds (VOW) Project, SSD-10461.

To date, ACEN have complemented an Environmental Impact Statement (EIS) and Amendment Report/Response to Submissions (RTS) for the Project.

ACEN propose to widen and/or upgrade the following existing local roads to facilitate the construction and operation of the Project:

- Black Stump Way;
- Moorefield Road (west); and
- Black Stump Way / Moorefield Road (west) intersection.

These local roads were identified for use in the EIS/RTS, however the extent of the physical upgrades and widening to the local roads has recently been agreed with the relevant road authorities and therefore included as an Amendment to the original application.

2 Description of the amendments

The proposed Project amendments include the widening and upgrade of the existing roads which are currently of variable running width to facilitate construction and operation of the Project.

2.1 Road upgrades

The proposed amendments are shown in **the Project Amendments figure provided in Attachment 1** and would generally comprise:

- **Black Stump Way (from the Golden Hwy to Mount Hope Cluster site access road intersection)** – approximately 28.4 kilometres (km) of upgrades to include reinstatement of unsealed road shoulders and bitumen seal to provide nominal 9m sealed formation width as far as is practicable and renewal or rehabilitation of the pavement for the width of both traffic lanes in accordance with Austroads Guide to Pavement Technology.

- **Black Stump Way / Moorefield Road (west) intersection** – upgrade of intersection to include sealed full Auxiliary Left and full Channelised Right treatments, unless to the extent that the Construction Traffic and Access Management Plan demonstrates that lesser upgrades are required.

- **Moorefield Road (west):**
  - Section A: from chainage 0 to 1.6 from Black Stump Way/ Moorefield Road (west) intersection provide 1.6 km of 7.2m bitumen seal.
  - Section B: from chainage 1.6 to 4.6 provide a 7.2m bitumen sealed width including shoulders, so far as is practicable without having to realign table drains, extend

culverts, or remove significant trees or sensitive vegetation or impact land that does not belong to Council.
- Section C: from chainage 4.6 to western cluster access gate, provide 7m unsealed width including shoulders, so far as is practicable.

The Revised Project Layout figure is provided in **Attachment 2**.

2.2 Amendment to Project Boundaries

ACEN seeks amendments to the Project boundaries (Project Site, Development Corridor and Indicative Construction Impact Footprint) due to the addition of road upgrades.

The total area of the Project Site, Development Corridor and Indicative Construction Impact Footprint are presented in **Table** 2-1.

Table 2-1: Confirmation of Project Areas

Project Area	Pre-amendment area (hectares)	Post-amendment area (hectares)
Project Site	24,082	24,120
Development Corridor	2760	2802
Indicative Construction Impact Footprint	688	735

3 Assessment of the amendment impacts

A Development Corridor has been developed which encompasses the proposed construction disturbance associated with the road upgrades. Biodiversity and Aboriginal heritage surveys have been completed within the Development Corridor. Black Stump Way and Moorefield Road Upgrades Addendum Biodiversity Assessment Report to support Valley of the Winds Wind Farm (Addendum Biodiversity Assessment Report) is included in **Attachment 3** and an Addendum Aboriginal Archaeology and Cultural Heritage Assessment Report is included in **Attachment 4**, a summary of the reports is provided in **Table** 3-1**.**

Traffic impacts associated with the use of Black Stump Way and Moorefield Road (west) were assessed within the EIS and subsequent Amendment Report and responses to RFIs. No changes to the traffic impacts previously presented result from this Project amendment which relates only to the extent of disturbance.

Traffic controls, noise and air impacts associated with the Project amendment would be consistent with any standard road upgrade and would be managed through the Project Construction Management Plans.

Table 3-1: Biodiversity and Aboriginal Cultural Heritage amendments

Aspect	Environmental Impact Assessment
Biodiversity	The Development Corridor area used in the Addendum Biodiversity Assessment Report is consistent with that described in Section 2.1. The section of Moorefield Road (west) from the Temporary Workforce Facility to the Girragulang Road cluster Project Area has been surveyed, however no biodiversity impacts are expected to occur. Therefore assessment of impacts are not required. Road upgrades for these sections will only occur where biodiversity values have been assigned as 'Cleared', comprising of gravel road edges with no trees or significant vegetation, or 'Exotic grassland' condition as per the definition of Exotic grassland within the Addendum report. The Development Corridor forms part of a habitat corridor comprising scattered remnant and regrowth vegetation within the road reserve of Black Stump Way and Moorefield Road (west). The Development Corridor has been located to avoid impacting as much vegetation as practicable with only trees located in proximity to the existing sealed road edge requiring removal. The removal of this vegetation (1.24 ha) over the entire length of the Development Corridor is not considered to significantly impact current habitat connectivity in the road reserve. Native vegetation in the majority of the Development Corridor comprises of managed roadside verges consisting of exotic grasslands with a significant component of exotic species and agricultural cropping species spread from adjacent farming lands, and scattered remnant and regrowth woodland with degraded native grasslands. Following the completion of targeted surveys at nine vegetation plots, no threatened flora species were identified. No targeted fauna surveys were undertaken due to time constraints, therefore assumed presence has been completed for all Candidate 'Species credit' species likely to occur with in the Development site. Additional biodiversity impact entities such as geological features, human-made structures and non-native vegetation, waterbodies, windfarm developments and vehicle strikes were considered in the Addendum report with no significant biodiversity impacts identified. Direct and indirect impacts along with mitigation and proposed adaptive management practices resulting from the upgrades of Moorefield Road (west) and Black Stump Way are outlined in Attachment 3.
Aboriginal Archaeology and Cultural Heritage Addendum	The Addendum study area consists of approximately 28 km of Black Stump Way, extending north from the intersection with the Golden Highway, and 4 km of Moorefield Road from the intersection of Black Stump Way extending east to the Girragulang Road cluster of the project. An Aboriginal Heritage Information Management System (AHIMS) database search returned 119 records of Aboriginal heritage sites within the search area, with one located within the addendum study area. A project update letter and methodology for the additional survey was provided to the Registered Aboriginal Parties (RAPs) for the project on 17 September 2024. A pedestrian survey was conducted for the addendum study area over the 3 and 4 October 2024, with attendance from two of the RAPs on both days.

Aspect	Environmental Impact Assessment
	The Aboriginal Heritage Site recorded within the addendum study area, a culturally modified tree (AHIMS ID# 28-6-0031), was confirmed through pedestrian survey, to be located 50 m outside of the road corridor. A second Aboriginal Heritage Site, a culturally modified tree (AHIMS ID# 36-3-0084) was plotted outside the road corridor and was confirmed to be located within the addendum study area. However, harm to the site can be avoided if the road corridor is built up over the existing ground surface and no ground disturbing works are conducted within the drip line of the tree. No additional Aboriginal sites were recorded during the additional survey. The assessment concludes that harm to 36-3-0084 can be avoided by the project, with the implementation of the identified management measures.

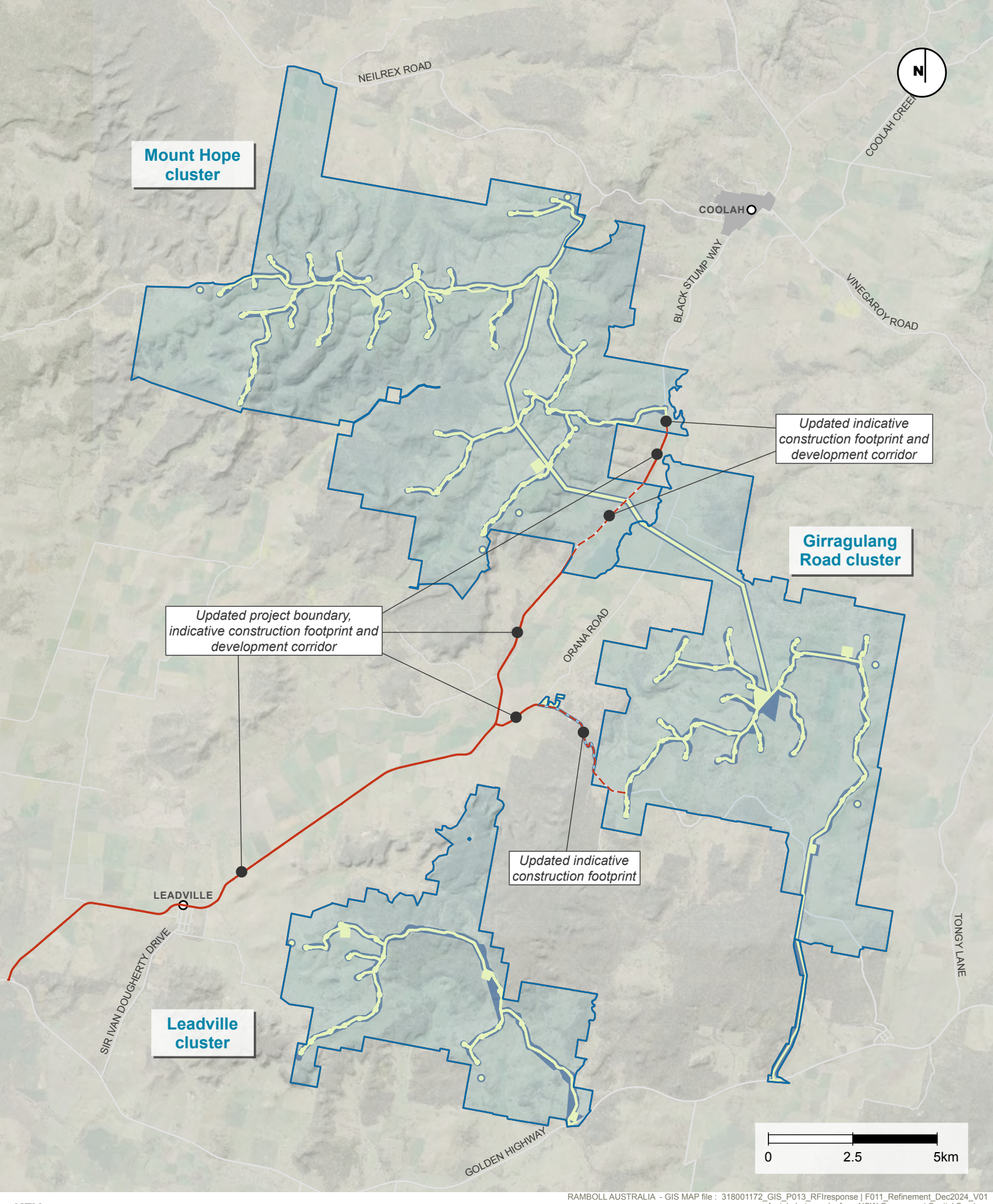
4 Justification of the amended project

The proposed amendments to the Project are required to facilitate the construction and operation of the Project. The amendments would not increase the impacts to Aboriginal Cultural Heritage. Minor additional biodiversity impacts of 1.24 ha would result from the proposed road upgrades.

Yours sincerely

Megan Richardson
NSW Wind Team Lead
ACEN Austra

Attachment 1: Project Amendments Figure



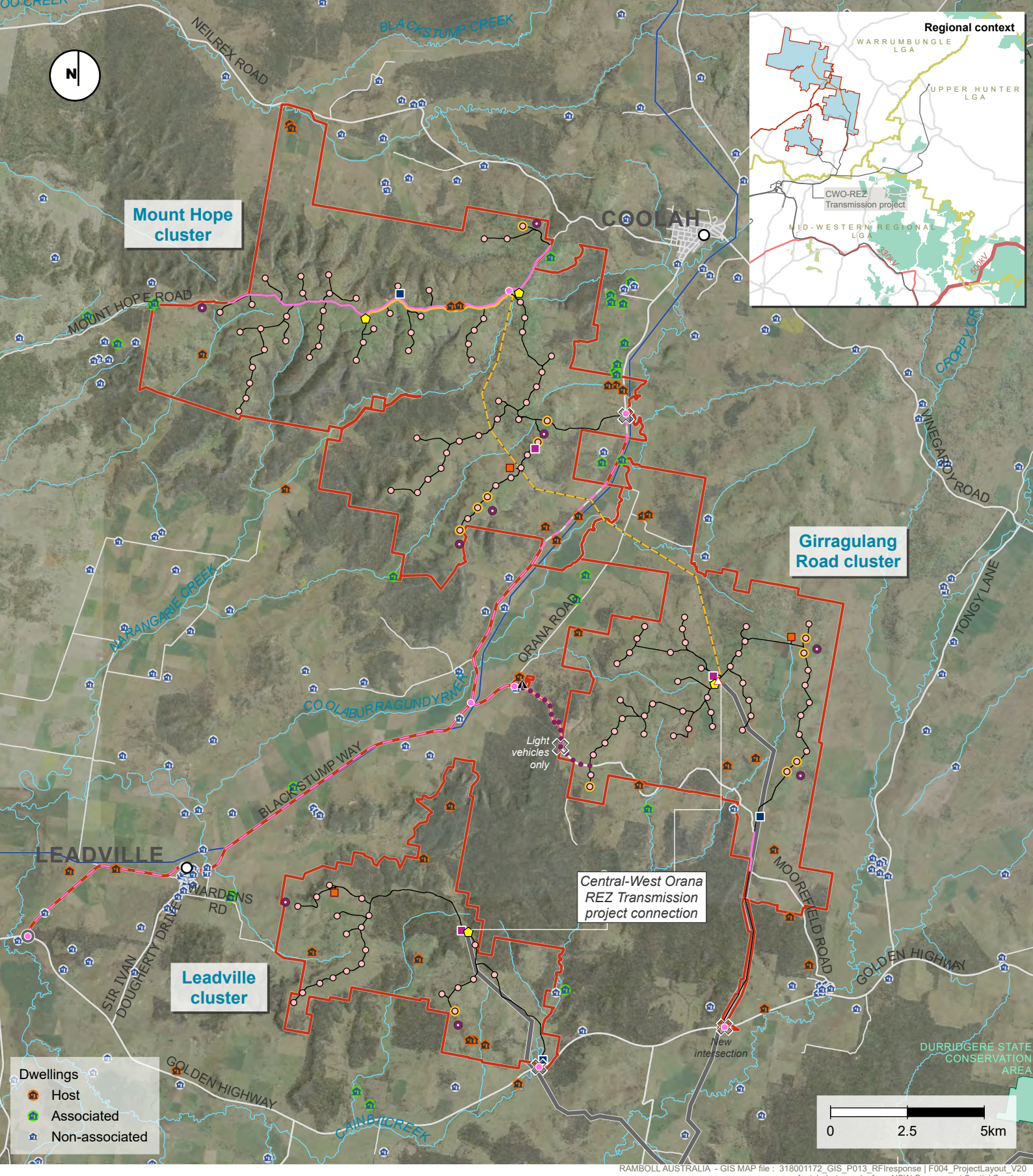
RAMBOLL AUSTRALIA - GIS MAP file : 318001172_GIS_P013_RFIresponse | F011_Refinement_Dec2024_V01
Aerial photography from NSW Government Spatial Services

KEY

- Previous wind farm site
- Previous indicative construction footprint
- Previous development corridor
- Addition to wind farm site, indicative construction footprint and development corridor
- Addition to indicative construction footprint/development corridor

Overview of project refinements

Attachment 2: Revised Project Layout figure



RAMBOLL AUSTRALIA - GIS MAP file : 318001172_GIS_P013_RFIresponse | F004_ProjectLayout_V20
Aerial photography from NSW Government Spatial Services

KEY

- Project site
- Turbine location
- Overhead transmission line (up to 330kV)
- Underground transmission line (up to 330kV)
- Access track and cabling
- Site access
- Construction workforce accommodation
- Intersection upgrade by ACEN
- Intersection upgrade by EnergyCo
- Proposed road upgrade
- Proposed road upgrade (limited)
- Road maintenance during construction
- BESS location**
- Substation and associated buildings
- Construction and permanent operation and maintenance compound
- Temporary facilities area*
- Quarry location**
- Permanent meteorological mast location
- Temporary meteorological mast location (co-located with turbine)
- National Parks and Reserves
- CWO-REZ Transmission project (SSI 48323210) (EnergyCo)
- Gas pipeline (Geoscience AU)

*May include site offices rock crushing facilities, concrete or asphalt batching plants, materials storage compounds, maintenance workshops, material stockpiles, laydown areas and parking spaces.
**Approximate only

Figure A3-1 | Project overview

Attachment 3: Black Stump Way and Moorefield Road Upgrades Addendum Biodiversity Assessment Report to support Valley of the Winds Wind Farm

Black Stump Way and Moorefield Road Upgrades

Addendum Biodiversity Assessment Report to support Valley of the Winds Project

ACEN Australia

ecological AUSTRALIA
A TETRA TECH COMPANY

Document Tracking

Project Name:	Black Stump Way and Moorefield Road Upgrades to support Valley of the Winds Project
Project Number:	24NEW9255
Project Manager:	Lily Gorrell

This report should be cited as 'Eco Logical Australia 2024, Black Stump Way and Moorefield Road Upgrades to support Valley of the Winds Project, Prepared for ACEN Australia.'

Acknowledgements

This document has been prepared by Eco Logical Australia Pty Ltd.

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1. Introduction

Eco Logical Australia (ELA) were engaged by ACEN Australia (ACEN) to undertake a biodiversity assessment and subsequent reporting, to assess the biodiversity impacts of the Valley of the Winds Project, herein referred to as 'the Project'.

ELA initially prepared a Biodiversity Development Assessment Report (BDAR) in April 2022, in accordance with the Biodiversity Assessment Method (BAM; DPIE, 2020). The BDAR was drafted to comply with the requirements of the Secretary's Environmental Assessment Requirements (SEARs) for the project, the general requirements of the NSW *Biodiversity Conservation Act 2016* (BC Act), and the requirements of the Referral Decision under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

As a result of submissions from the public as well as from the NSW Biodiversity Conservation Division (BCS), the BDAR was updated in October 2023 to accommodate a new development footprint, which sought to avoid and minimise impacts to biodiversity by nearly 50% of the initial proposal, whilst retaining a viable project. The revised BDAR was re-submitted to the Department of Planning, Housing, and Infrastructure (DPHI) in October 2023.

In addition to the above review process, it was identified by the Warrumbungle Shire Council (Council) that road upgrades would be required to accommodate the increased road usage along key roads within the vicinity of the Project, particularly increased use by heavy vehicles.

This Biodiversity Addendum Report has been prepared as an Addendum to the Project, to identify the biodiversity values within the road corridor and assess the impacts associated with these upgrades.

This Biodiversity Addendum Report has been prepared by Lily Gorrell, an Accredited Person (BAAS17101) to apply the Biodiversity Assessment Method (BAM) under the BC Act. All credit calculations have been undertaken using version 1.5 of the BAM Calculator (BAMC) in case number 00052248.

As this is an Addendum report to the Project, some sections will reference information contained within the latest Valley of the Winds 'Amended BDAR 2023'.

1.1. General description of the Development site

The Subject land includes portions of Black Stump Way (BSW), from the intersection off of the Golden Highway, ending approximately 10km south of Coolah, NSW. It also includes a small section of Moorefield Road that connects with the proposed temporary workforce accommodation camp for the Project. The Subject land is a 30 m buffer from the road centreline, and the area assessed for impacts asociated with road upgrades is referred to as the 'Development site' and are presented in Figure 1 (Location map). Due to the linear nature of the Development site, mapping has been provided as a 'map series' within Appendix D, E, F, G and H, with singular maps pulled from map series provided within this report for visual context.

The majority of the Development site comprises managed roadside verges comprising exotic grasslands with a significant component of exotic species and agricultural cropping species, spread from adjacent farming lands (Plate 1); and scattered remnant and regrowth woodland with degraded native grasslands (Plate 2).

A section of Moorefield Road (west), from the Temporary Workforce Accommodation Facility intersection to the Girragulang Road cluster project boundary has been addressed within this report however, no impacts to biodiversity are proposed within the road corridor, and therefore assessment

of impacts are not required. Scope of works required for this portion of Moorfield Road has been addressed in Section 1.3.

1.2. Development site footprint

The Development site footprint comprises a 7m disturbance footprint from the centreline on the majority of BSW, and a 10m disturbance footprint from the centreline on a 1km stretch of BSW between chaninage 19.6km to 20.6km. An example of a small section of the Development site is presented in Figure 2.

Plate 1: Degraded and managed roadside

Plate 2: Scattered roadside woodland with degraded native grasslands

1.3. Moorfield Road (West)

In consultation with Council, the section of Moorefield Road (west), from the Temporary Workforce Accommodation Facility intersection to the Girragulang Road cluster project boundary will require upgrading (Figure 3), however, some conditions apply to these upgrades as outlined below:

- Chainage 1.6-4.6: Provide a two-coat bitumen seal to meet 7.2m sealed width including shoulders, so far as is practicable without having to realign table drains, extend culverts, remove significant trees or sensitive vegetation or impact land that does not belong to Council.
- Chainage 4.6 - to western cluster access gate: Provide a 7m unsealed width including shoulders, so far as is practicable without having to realign table drains, extend culverts, remove significant trees or sensitive vegetation or impact land that does not belong to Council.

Based on the requirements specified, road upgrades for these sections will only occur where biodiversity values have been assigned as either 'Cleared', comprising of gravel road edges with no trees or significant vegetation or 'Exotic grassland' condition as per the definition of Exotic grassland within this report (Section 3.4).

Where vegetation in the form of PCT 479 or PCT 483 (as per Figure 3) has been identified i.e. significant vegetation, these areas will not be impacted by road upgrades.

1.4. Sources of information used

The following data sources were reviewed as part of this report:

- BioNet Vegetation Classification
- Bionet Atlas Database (accessed November 2024)
- BioNet Threatened Biodiversity Data Collection
- PlantNET (The NSW Plant Information Network System). Royal Botanic Gardens and Domain Trust, Sydney (PlantNET 2024).
- Amended BDAR 'Eco Logical Australia 2023. *Valley of the Winds Wind Farm'*. Prepared for ACEN Australia.

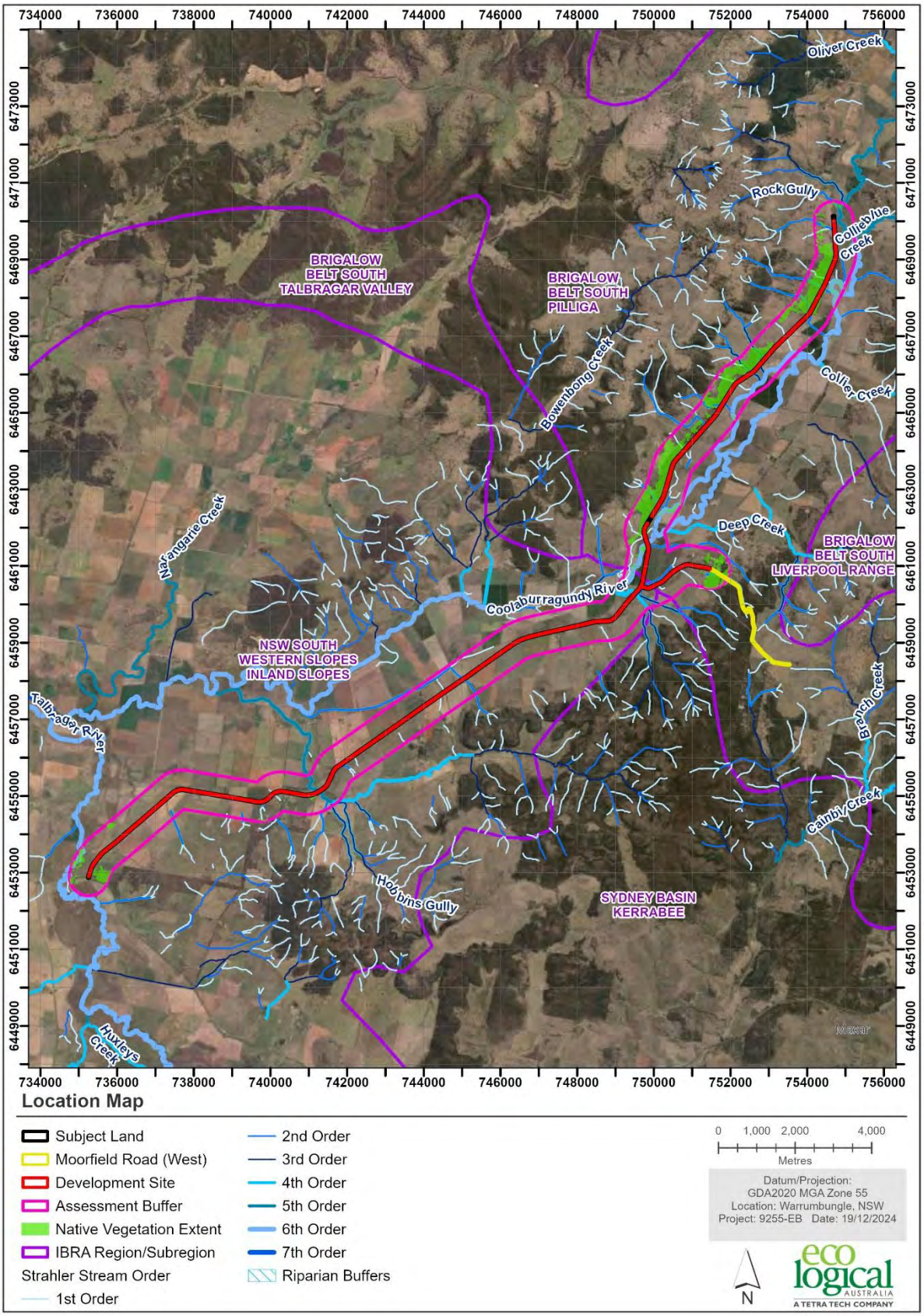

Figure 1: Location map

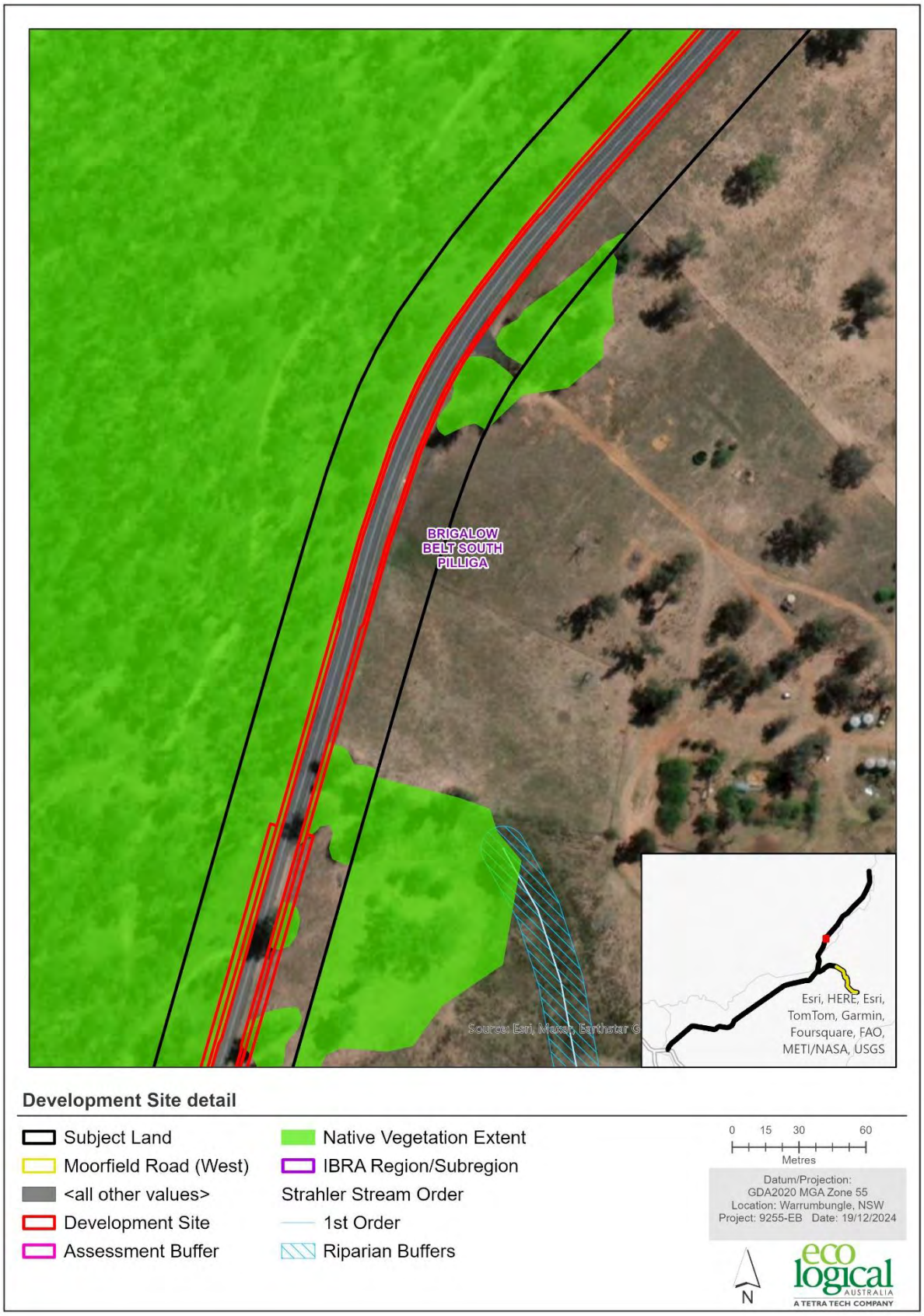

Figure 2: Subject land and Development site

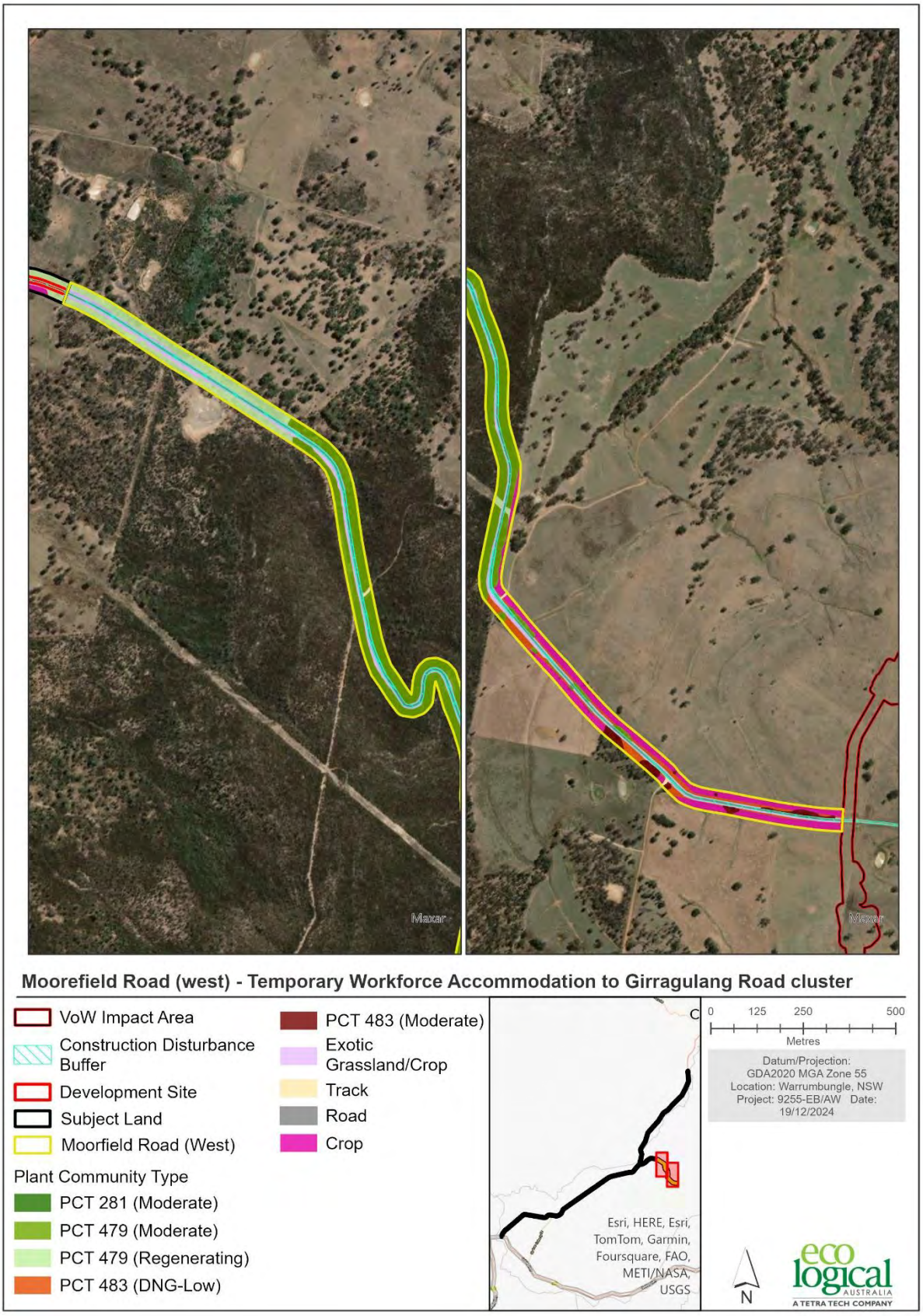

Figure 3: Moorefield Road (West)

1.5. Legislative context

Legislation relevant to the Development site is outlined in Table 1.

Table 1: Legislative context

Name	Relevance to the project	Report Section
Commonwealth		
Environment Protection and Biodiversity Conservation Act 1999	Matters of National Environmental Significance (MNES) have been identified on or near the development site. This report assesses impacts to MNES and concludes that the development is not likely to have a significant impact on MNES.	MNES are addressed in Section 8.3.
State		
Environmental Planning and Assessment Act 1979	The EP&A Act is the principal planning legislation for NSW. It provides a framework for the overall environmental planning and assessment of development proposals. The Valley of the Winds Project is State Significant Development (SSD) and has been assessed under Part 4.1 of the EP&A Act. Secretary's Environmental Assessment Requirements have been issued and required assessment of: • biodiversity values and the likely biodiversity impacts of the development including impacts associated with transport route road upgrades in accordance with the BC Act, including a detailed description of the proposed regime for minimising, managing and reporting on the biodiversity impacts of the development over time, and a strategy to offset any residual impacts of the development in accordance with the BC Act; • the likely impacts on koalas and their habitat in accordance with the requirements of State Environmental Planning Policy No. 44 – Koala Habitat Protection; • assess the impact of the project on birds and bats from blade strikes, low air pressure zones at the blade tips (barotrauma), and alteration to movement patterns resulting from the turbines and considering cumulative effects of other wind farms in the vicinity.	Biodiversity values are assessed in Section 1-4. Impacts area assessed in Sections 5-7. As biodiversity impacts are associated with road upgrades, no assessment of impacts associated with birds and bat blade strikes have been undertaken.
Biodiversity Conservation Act 2016	The proposed development requires submission of a Biodiversity Addendum Report to assess impacts to BC Act listed species and calculate the quantum of credits to be required as per the BAM.	This report has been prepared in accordance with the BAM (2020).
Local Land Services Amendment Act 2016	The LLS Act applies to this assessment, with respect to the development of the Native Vegetation Regulatory Map.	n/a
Planning Instruments		
Warrumbungle Local Environment Plan (LEP) 2013	The project is a SSD and will comply with EP&A Act and relevant State Environmental Planning Policies. The proposed development will aim to comply with LEP requirements and objectives in consultation with Warrumbungle Shire Council. Clause 6.3(2) of the LEP relates to mapped areas of Terrestrial Biodiversity. The development has been designed to avoid, minimise and mitigate impacts to mapped areas of biodiversity.	n/a

2. Landscape features

The site context for this assessment has been selected using the linear-based method and therefore the study area is a 500 m buffer around the impact centreline. Oh

The landscape features considered for this assessment are presented in Table 2 and across a map series within Appendix D:.

Table 2: Landscape features

Landscape feature	Subject Land/ Development site	Assessment Area	Data source
IBRA Region(s)	Brigalow Belt South NSW South Western Slopes	Brigalow Belt South NSW South Western Slopes	Interim Biogeographic Regionalisation for Australia, Version 7
IBRA subregion(s)	Pilliga Inland Slopes	Pilliga Inland Slopes	Interim Biogeographic Regionalisation for Australia, Version 7
Rivers and streams	There are numerous 1st-4th order streams across the Subject land/ Development site. Major waterways identified in the database review include Coolabaragundy River		NSW LPI Waterway mapping
Estuaries and wetlands	The assessment area does not contain any mapped wetlands.		NSW directory of important wetlands
Connectivity of different areas of habitat	Connectivity occurs along portions of the Subject land that comprise remnant woodland patches.		Aerial imagery and on-ground surveys.
Geological features of significance and soil hazard features	The assessment area does not contain any geological features of significance or soil hazard features.		Aerial imagery and on-ground surveys.
Areas of Outstanding Biodiversity Value	The assessment area does not contain any Areas of Outstanding Biodiversity Value.		Register of Declared Areas of Outstanding Biodiversity Value (DPIE 2020)
NSW (Mitchell) Landscapes	• Cape Hills Granite • Cassilis Slopes • Merrygoen Hills and Slopes • Talbragar – Upper Macquarie Terrace Sand and Gravels		NSW (Mitchell) Landscapes - version 3.1 (DPIE 2016)
Additional features required to be assessed	No additional landscape features identified		Project SEARs
Percent (%) native vegetation extent	There are no differences between the mapped vegetation extent and the aerial imagery. The assessment area is approximately 3,417 ha and contains approximately 539 ha of native vegetation (16%).		Calculated using aerial imagery and ArcGIS software

3. Native Vegetation

The majority of the Development site and wider Subject land comprises managed roadside verges comprising exotic grasslands with a significant component of exotic weed species and agricultural pasture/cropping species, likely from adjacent farming lands. Scattered remnant woodland occur along the length of BSW, with highly degraded native grasslands interspersed within these woodland patches.

3.1. Survey Effort

Vegetation surveys were undertaken within the Development site by Principal Ecologist and BAM Accredited Assessor Lily Gorrell and Ecologist Alex Yates on 11 – 12 November 2024 (Appendix E:; map series).

A total of 9 full-floristic vegetation plots were surveyed to identify Plant Community Types (PCTs) and Threatened Ecological Communities (TECs) on the Development site (Table 3). A total of 9 vegetation integrity survey plots were undertaken on the Development site to assess the composition, structure and function components of each vegetation zone in accordance with the BAM.

All field data collected at full-floristic and vegetation integrity plots is included in Appendix B: and Appendix C:.

Table 3: Full-floristic PCT identification plots

PCT ID	PCT Name	Number of plots surveyed
281	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats	4
Exotic Grassland	n/a	5

3.2. Native vegetation extent on the subject land

There are no differences between actual native vegetation extent and that shown in the imagery.

Areas of non-native vegetation have been shown on mapping provided in (Appendix E:; map series) and justification provided below.

3.3. Plant Community Types present

PCTs identified within the Development site are presented in Table 4.

The Development site also comprised 12.65 ha of exotic vegetation and 0.62 ha of 'other' area which does not conform to a native PCT.

Table 4: Plant Community Types & Exotic Vegetation

PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Area	Percent cleared
281	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats	Western Slopes Grassy Woodlands	Grassy Woodlands	3.18	67%
Exotic Grasslands	n/a	n/a	n/a	12.65	n/a
Other	Residential, Road, Track, Waterway	n/a	n/a	0.62	n/a

3.3.1. Plant Community Type selection justification

In determining the best fit PCT for the Development site, the Amended 2023 BDAR was reviewed to identify any similar PCTs identified as part of the Project. The data collected in the BAM VI plots was also reviewed and compared against various attributes to assign vegetation to the best fit PCT. Attributes included dominant species in each stratum and relative abundance, community composition, soils and landscape position. PCT descriptions in the BioNet Vegetation Classification and the final scientific determinations for TECs has also been reviewed.

The selected PCT and other options considered are provided in Table 5.

Table 5: Potential PCTs

Selected PCT ID	PCT Name	Other PCT options
281	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats	483 - Grey Box x White Box grassy open woodland on basalt hills in the Merriwa region, upper Hunter Valley

Due to the floristics identified, landscape position and similarities with PCTs identified in the Amended BDAR 2023, only one alternate PCT option was considered likely for the vegetation within the Subject land and Development site, being PCT 483 'Grey Box x White Box grassy open woodland on basalt hills in the Merriwa region, upper Hunter Valley'. This PCT shares a similar suite of canopy species to that of PCT 281, including *Eucalyptus albens* (White Box) and *Eucalyptus melliodora* (Yellow Box) however, it does not comprise one of the dominant canopy species *Eucalyptus blakelyi* (Blakey's Red Gum).

PCT 483 occurs on brown to black earth, chocolate loam to clay soils derived from basalt mainly on hillslopes, hillcrests, footslopes and valley flats on rolling hills and low hills (DPE 2024). PCT 281 is a widespread community that occurs on black, brown and grey alluvial and colluvial clay loam, loam or sandy loam soils derived from a range of substrates on valley flats and footslopes in valleys in hill landform patterns (DPE 2024).

As the majority of the Development site occurs on the fertile low alluvial flats, used heavily for agriculture and cropping, with small portions occuring on low rises, it was considered PCT 281 is more suitable based on landscape position.

PCT 461 'Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion' has also been mapped within the Subject land, however, will not be impacted within the Development site. This small patch of vegetation at the southern end of the Subject land occurs at a slightly higher landscape position outside of any impact areas.

3.4. Plant Community Type descriptions

PCT 281 Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats

Within the Development site PCT 281 occurs on the valley flats and valley slopes throughout the Development site. This community predominantly occurs as an open grassy woodland comprising of small remnant clusters or isolated trees within the road corridor (Plate 3), with varying condition Derived Native Grasslands (DNG) occurring within and adjacent to these woodland patches (Plate 4).

This woodland comprises dominant canopy species including *Eucalyptus melliodora* (Yellow Box), *Eucalyptus blakelyi* (Blakely's Red Gum), *Eucalyptus albens* (White Box) and occasionally *Angophora floribunda* (Rough-barked Apple) and *Brachychiton populneus* subsp. *populneus* (Kurrajong).

Continual disturbance and management of the roadside has resulted in the DNG mostly dominated by exotic and pasture species such as *Avena* species (Oats), *Lolium perenne* (Perennial Ryegrass), *Bromus catharticus* (Prairie grass), *Foeniculum vulgare* (Wild Fennel), *Verbena bonariensis* (Purpletop Vervain), *Eragrostis curvula* (African Lovegrass), and *Plantago lanceolata* (Ribwort plantain). Minimal native groundlayer species remain in these areas and included species such as *Aristida ramosa* (Purple Wiregrass), *Wahlenbergia communis* (Tufted Bluebell), *Glycine tabacina* (Variable glycine), *Einadia nutans* subsp. *nutans* (Climbing Saltbush) and *Convolvulus erubescens* (Blushing Bindweed) (Plate 4).

Plate 3: PCT 281 'Moderate'

Plate 4: PCT 281 - DNG

This PCT conforms to *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions* listed as Critically Endangered under the BC Act and *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* listed as Critically Endangered under the EPBC Act and is collectively known as 'Box Gum Woodland'.

TEC status is discussed further in Section 3.5.

Exotic Grasslands

Exotic grasslands along the roadside comprise pasture species including *Avena* species (Oats), *Lolium perenne* (Perennial Ryegrass), *Bromus catharticus* (Prairie grass), *Bromus molliformis* (Soft Brome), *Phalaris aquatica* (Phalaris), *Medicago* species and *Trifolium* species. It is likely that most of these species have been aerially sown in the past across private properties and have seeded within the road reserve. Common exotic weed species include *Marrubium vulgare* (Horehound), *Foeniculum vulgare* (Wild Fennel), *Verbena bonariensis* (Purpletop Vervain), *Eragrostis curvula* (African Lovegrass), and *Plantago lanceolata* (Ribwort plantain) (Plate 5 and Plate 6).

Plate 5: Exotic grassland (dominated by pasture species)

Plate 6: Exotic Grassland (dominated by pasture and exotic weed species)

3.5. Threatened Ecological Communities

Assessment of PCT 281 was undertaken to determine if this vegetation community is consistent with TEC's listed under the BC Act and/or the EPBC Act.

Assessment of the assemblage of species in PCT 281 has been considered against potential TECs and their relevant Final Determination (BC Act) or Listing Advice (EPBC Act).

As per the Amended BDAR (2023) for the Project, PCT 281 is considered to conform to the BC Act listed *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions* (Box Gum Woodland) and also to the EPBC Act listed *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* both listed as Critically Endangered (Table 6).

Based on the highly degraded nature of PCT 281 'DNG' zone, and an assessment against the EPBC Act Box Gum Woodland decision criteria (Table 7), it is not considered to conform to the EPBC Act listing. Exotic Grassland and 'Other' identified within the Development site does not conform to any listed TEC's. Five (5) full-floristic vegetation plots were undertaken within these mapped areas with field data outlined in Appendix B: and Appendix C: collected to confirm the highly degraded condition state of these areas. These areas do not comprise any biodiversity values representative of any listed TEC's.

Table 6: Threatened Ecological Communities

PCT ID	BC Act			EPBC Act		
	Listing status	Name	Area (ha)	Listing status	Name	Area (ha)
281	Critically Endangered	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions	3.18	Critically Endangered	White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	1.24
Exotic Grassland	n/a	n/a	n/a	n/a	n/a	n/a
Other (Residential, Road, Track, Waterway)	n/a	n/a	n/a	n/a	n/a	n/a

Table 7: EPBC Act Box Gum Woodland assessment for DNG zone

Plot	PCT	Zone	Correct Overstorey	>50% perennial groundcover	Patch >0.1 ha	>12 non-grass native	Important species present	Patch >2 ha	20+ trees per ha OR natural regen	EPBC listed community
3	281	DNG	Yes	No - 5%	Yes	No -7	n/a	Yes	No large trees/regen	No

3.6. Vegetation integrity assessment

3.6.1. 3.5.1. Vegetation zones

A total of two (2) vegetation zones across two IBRA regions were identified on the Development site based on the broad condition state of PCT 281 present. A total of nine (9) vegetation integrity survey plots were collected on the Development site consistent with the BAM (Table 8).

Table 8: Vegetation zones and vegetation integrity survey plots collected on the Development site

Vegetation Zone	PCT ID	PCT Name	Condition	Area (ha)	Patch Size	Vegetation Integrity Survey Plots required	Vegetation Integrity Survey Plots collected
1	281	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats	DNG	1.93	101	1	1 (Plot 3)
2	281	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats	Moderate	1.24	101	1	3 (Plots 2, 4, 6)
-	-	Exotic Grassland	-	12.79	n/a	3*	5* (Plots 1, 5, 9, 10, 11)
-	-	Cleared, Residential, Road, Track, Waterway	-	0.62	n/a	0	0
			Total	16.58		5	9

*Not required, however, completed to confirm presence of exotic grassland not representative of any PCT

3.6.2. Patch size

Patch size was calculated using available vegetation mapping for all patches of intact native vegetation on and adjoining the Development site. Patch size was assigned to one of four classes (<5 ha, 5-24 ha, 25-100 ha or ≥100 ha). A patch size 101 ha was determined for the Development site.

3.6.3. Assessing vegetation integrity

A vegetation integrity assessment using the BAM Calculator (BAMC) was undertaken and the results are outlined in Table 9. As this is a linear development, the Development site crosses two IBRA regions, therefore two BAMC child cases have been run, being Brigalow Belt South (BBS), Pilliga Sub-region (Case: 00052249) and NSW South Western Slopes (SWS), Inland Slopes Sub-region (Case: 00053196).

Table 9: Vegetation integrity scores

IBRA	Veg Zone	PCT ID	Condition	Area (ha)	Composition Condition Score	Structure Condition Score	Function Condition Score	Presence of Hollow bearing trees	Current vegetation integrity score
BBS; Piliga	1	281	DNG	1.04	19.3	0.2	15	No	6.6
	2	281	Moderate	0.5	62.9	40.6	82.8	Yes	59.6
SWS; Inland Slopes	1	281	DNG	0.89	23.7	0.1	14.9	No	7.1
	2	281	Moderate	0.74	50.2	43.4	80.3	Yes	55.9

3.7. Use of local data

No local data has been used to modify benchmarks in this assessment.

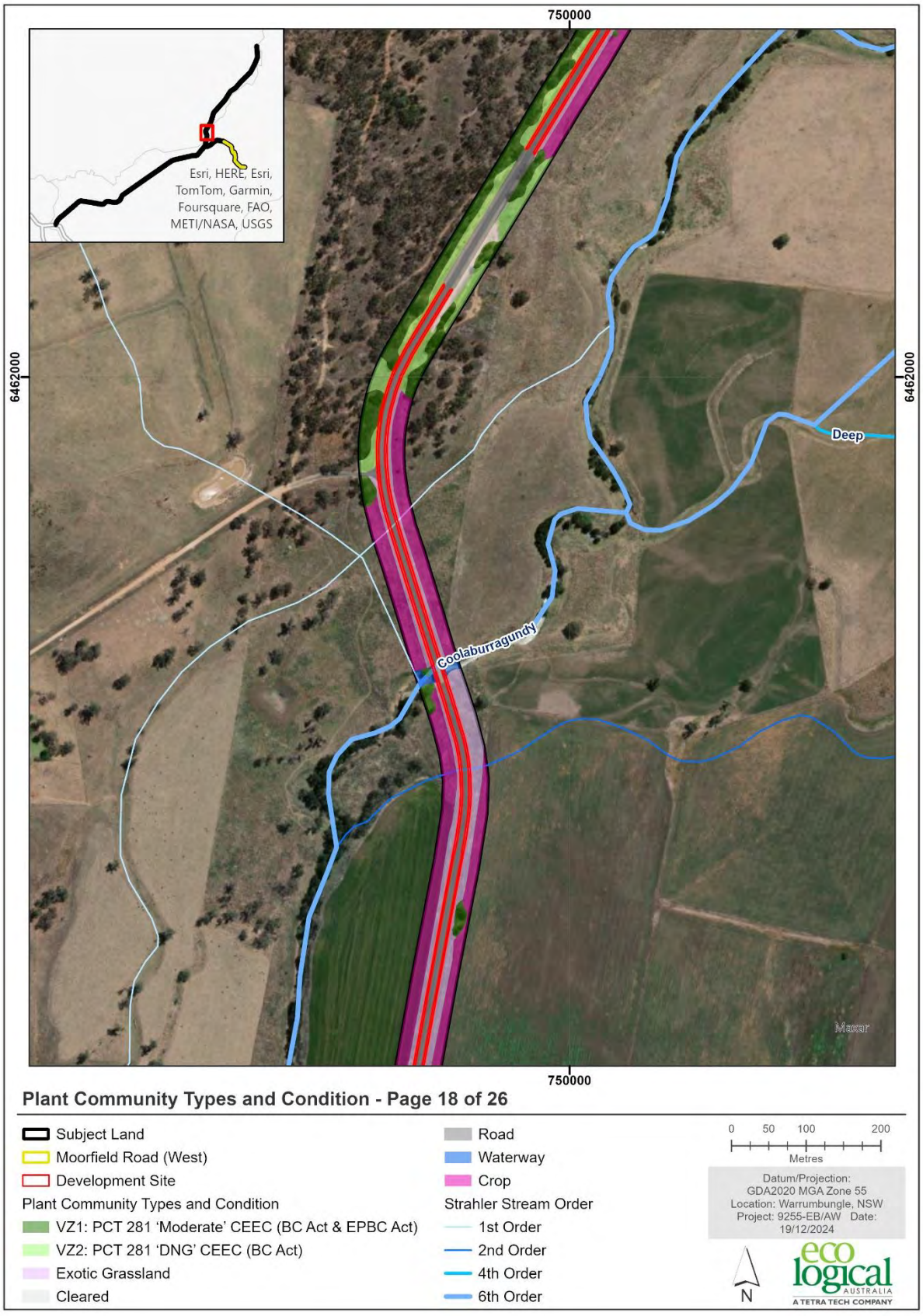

Figure 4: PCTs, Vegetation Zones and TEC (Box Gum Woodland)

4. Threatened species

4.1. Ecosystem credit species

Ecosystem credit species predicted to occur within the Development site are generated by the BAMC following the input of VI data and the PCTs identified within Chapter 3. Ecosystem credit species predicted to occur at the Development site, their associated habitat constraints, geographic limitations and sensitivity to gain class is included in Appendix J:.

No Ecosystem credit species have been excluded from the assessment.

4.2. Species credit species

4.2.1. Identification of species credit species

Species credit species that require further assessment on the Development site (i.e. candidate species), their associated habitat constraints, geographic limitations and sensitivity to gain class is included in Table 10.

Table 10: Candidate species credit species

Species	Common Name	Associated PCTs	IBRA Region	Habitat Constraints	Geographic limitations	Sensitivity to gain class	BC Act listing status	EPBC Act Listing status
Amphibians								
Litoria booroolongensis	Booroolong Frog	281	NSW South western Slopes	N/A	-	High	Endangered	Endangered
Birds								
Callocephalon fimbriatum	Gang-gang Cockatoo (breeding)	281	NSW South western Slopes	Hollow bearing trees - Eucalypt tree species with hollows at least 3 m above the ground and with hollow diameter of 7 cm or larger	-	High	Endangered	Endangered
Hieraaetus morphnoides	Little Eagle (breeding)	281	Brigalow Belt South NSW South western Slopes	Other - Nest trees - live (occasionally dead) large old trees within vegetation.	-	Moderate	Vulnerable	Not listed
Anthochaera phrygia	Regent Honeyeater	281	Brigalow Belt South NSW South western Slopes	Other - As per Important Habitat Map	-	High	Critically Endangered	Critically Endangered
Lophoictinia isura	Square-tailed Kite (breeding)	281	Brigalow Belt South NSW South western Slopes	Other - Nest trees	-	Moderate	Vulnerable	Not listed
Polytelis swainsonii	Superb Parrot	281	Brigalow Belt South NSW South western Slopes	Hollow bearing trees - Living or dead *E. blakelyi, E. melliodora, E. albens, E. camaldulensis, E. microcarpa, E. polyanthemos, E. mannifera, E. intertexta, E. bridgesiana* with hollows greater than 5cm diameter that are greater than 4m above ground or trees with a DBH of greater than 30cm.	-	High	Vulnerable	Vulnerable
Lathamus discolor	Swift Parrot	281	Brigalow Belt South NSW South western Slopes	Other - As per Important Habitat Map	-	Moderate	Endangered	Critically Endangered

Species	Common Name	Associated PCTs	IBRA Region	Habitat Constraints	Geographic limitations	Sensitivity to gain class	BC Act listing status	EPBC Act Listing status
Haliaeetus leucogaster	White-bellied Sea-Eagle (breeding)	281	Brigalow Belt South NSW South western Slopes	Other - Living or dead mature trees within suitable vegetation within 1km of a rivers, lakes, large dams or creeks, wetlands and coastlines	-	High	Vulnerable	Not listed
Burhinus grallarius	Bush Stone-curlew	281	Brigalow Belt South NSW South western Slopes	Fallen/standing dead timber including logs	-	High	Endangered	Not listed
Ninox connivens	Barking Owl (breeding)	281	Brigalow Belt South NSW South western Slopes	Hollow bearing trees - a living or dead tree with a hollow >20 cm diameter that occurs >4 metres above the ground	-	High	Vulnerable	Not listed
Tyto novaehollandiae	Masked Owl (breeding)	281	Brigalow Belt South NSW South western Slopes	Hollow bearing trees - a living or dead tree with a hollow >20 cm diameter that occurs >4 metres above the ground	-	High	Vulnerable	Not listed
Ninox strenua	Powerful Owl (breeding)	281	Brigalow Belt South NSW South western Slopes	Hollow bearing trees - a living or dead tree with a hollow >20 cm diameter that occurs >4 metres above the ground	-	High	Vulnerable	Not listed
Mammals		281						
Phascogale tapoatafa	Brush-tailed Phascogale	281	NSW South western Slopes	N/A	-	High	Vulnerable	Not listed
Petrogale penicillata	Brush-tailed Rock-wallaby	281	Brigalow Belt South NSW South western Slopes	Other - Land within 1 km of rocky escarpments, gorges, steep slopes, boulder piles, rock outcrops or clifflines	-	Very High	Endangered	Vulnerable
Pteropus poliocephalus	Grey-headed Flying-fox	281	Brigalow Belt South NSW South western Slopes	Other - Breeding camps	-	High	Vulnerable	Vulnerable
Phascolarctos cinereus	Koala	281	Brigalow Belt South	Other - Presence of koala use trees - refer to Survey Comments field in TBDC. Refer	-	High	Endangered	Endangered

Species	Common Name	Associated PCTs	IBRA Region	Habitat Constraints	Geographic limitations	Sensitivity to gain class	BC Act listing status	EPBC Act Listing status
			NSW South western Slopes	to the Koala (Phascolarctos cinereus): Biodiversity Assessment Method Survey Guide for information on targeted survey requirements and mapping species polygons.				
Petaurus norfolcensis	Squirrel Glider	281	Brigalow Belt South NSW South western Slopes	N/A	-	High	Vulnerable	Not listed
Miniopterus orianae oceanensis	Large Bent-winged Bat	281	Brigalow Belt South	Caves - Caves, tunnels, mines or other structures known or suspected to be used for breeding including species records with microhabitat code "IC - in cave;" observation type code "E nest-roost;" with numbers of individuals >500	-	Very High	Vulnerable	Not listed
Chalinolobus dwyeri	Large-eared Pied Bat	281	Brigalow Belt South NSW South western Slopes	Cliffs - Within two kilometres of rocky areas containing caves, overhangs, escarpments, outcrops, or crevices, or within two kilometres of old mines or tunnels.	-	Very High	Endangered	Endangered
Myotis macropus	Southern Myotis	281	NSW South western Slopes	Waterbodies - Waterbodies with permanent pools/stretches 3m or wider, including rivers, large creeks, billabongs, lagoons, estuaries, dams and other waterbodies, on or within 200m of the site.	-	High	Vulnerable	Not listed
Vespadelus troughtoni	Eastern Cave Bat	281	Brigalow Belt South	Within two kilometres of rocky areas containing caves, overhangs, escarpments, outcrops, crevices or boulder piles, or within two kilometres of old mines, tunnels, old buildings or sheds."	-	Very high	Vulnerable	Not listed
Reptiles		281						
Aprasia parapulchella	Pink-tailed Legless Lizard	281	Brigalow Belt South	N/A, however the department recommends that this species is assessed	-	High	Vulnerable	Vulnerable

Species	Common Name	Associated PCTs	IBRA Region	Habitat Constraints	Geographic limitations	Sensitivity to gain class	BC Act listing status	EPBC Act Listing status
			NSW South western Slopes	by expert report due to difficulty in detecting with confidence via survey.				
Flora								
Acacia ausfeldii	Ausfeld's Wattle	281	Brigalow Belt South NSW South western Slopes	N/A	-	High	Vulnerable	Not listed
Dichanthium setosum	Bluegrass	281	Brigalow Belt South NSW South western Slopes	N/A	-	High	Vulnerable	Vulnerable
Pomaderris cotoneaster	Cotoneaster Pomaderris	281	NSW South western Slopes	N/A	Inland slopes: In northern portion of Inland Slopes subregion the species may occur east of Castlereagh Hwy. In southern portion of Inland Slopes subregion the species may occur east of Snowy Mountains Hwy and Wee Jasper Rd.	High	Endangered	Endangered
Euphrasia arguta	Euphrasia arguta	281	NSW South western Slopes	N/A	-	High	Critically Endangered	Critically Endangered
Prasophyllum sp. *Wybong*	Prasophyllum sp. Wybong	281	Brigalow Belt South NSW South western Slopes	N/A	-	Moderate	Not listed	Critically Endangered
Swainsona sericea	Silky Swainson-pea	281	Brigalow Belt South	N/A	-	High	Vulnerable	Not listed
Prasophyllum petilum	Tarengo Leek Orchid	281	NSW South western Slopes	N/A. NSW scientific committee accepts P. sp. 'Wybong' as synonymous with P. petilum. However, the Commonwealth doesn't, pending agreement from the APC.	-	High	Endangered	Endangered

4.2.2. Assessment of habitat constraints and vagrant species

Details of species credits removed from the list in Table 10 based on absence of habitat constraints or vagrant species is provided in Table 11.

A habitat assessment including both on-ground surveys and desktop analyses was undertaken concurrently with vegetation survey across the Subject land to determine the types of threatened species habitats that may be present and require assessment. The habitat assessment included the following:

- Hollow bearing tree survey;
- Floristic data within each vegetation zone;
- Desktop cave and cliff line mapping; and
- Important area mapping.

The following sections describe the habitat features identified during the habitat assessment and outlines the methods and results for each information source.

4.2.2.1. Hollow bearing tree survey

Hollow-bearing tree (HBT) surveys were completed along the entirety of the Subject land to assess for the presence of hollow-bearing trees. At each HBT, the following information was collected:

- Tree species (or stag)
- Diameter at breast height (DBH)
- Number of hollows from 5 size classes (<50mm, 50-100mm, 100-200mm, 200-300mm, and >300mm)
- Height of hollows

Across the Subject land a total of 111 HBTs were identified, with 39 trees recording hollows of 20 cm or greater, within the Development site, only 5 trees recorded hollows above 20 cm. In most instances, HBTs will not require removal, as the majority sit outside the Development site, however, impacts have been considered for hollow dependent species as a number of trees comprising hollows are closer to the road edge and may require removal, or branches that may reach into or overhang the road corridor may require trimming. Hollow bearing trees recorded within the Subject land are presented in Appendix F:, map series.

4.2.2.2. Stick nests

During hollow-bearing tree surveys, 5 small stick nests were identified within the Subject land, however, none occurred within trees considered to fall within the Development site (Appendix F:, map series). All stick nests were less than 40 cm diameter. These small stick nests may provide habitat to Corvid species and small raptors such as Nankeen Kestrel (*Falco cenchroides*). A nest was observed occupied by Australian Raven (*Corvus coronoides*). None of these nests are considered to provide habitat to larger Species credit species such as Little Eagle or White-bellied Sea Eagle.

4.2.2.3. Aquatic habitat

Dams and waterbodies

No dams or waterbodies occurred directly within the Development site, however, there are several farm dams occurring within the Subject land, on private properties.

Streams and drainage

There are many 1st – 5th order streams mapped throughout the length of BSW and these mainly consist of weedy grassed drainage lines with little to no defined bed and banks that run through paddocks (Plate 7), however, the 6th order waterways include Coolabaragundy River comprises defined bed and banks and permanent water (Plate 8).

Plate 7: Undefined drainage line

Plate 8: Coolabaragundy River

4.2.2.4. Man-made structures

Man made structures within the Development site include residential housing and fencing, bridges and small culverts over drainage lines.

4.2.2.5. Cave and cliff line mapping

Cave and cliffline mapping was undertaken using LPI topographic data which identified cliff lines and cave features. This is the same layer utilised for the Project, with only a portion of these validated in the field as part of the original survey effort for Valley of the Winds.

4.2.2.6. Important area mapping

Important area mapping was reviewed for two candidate threatened species which require assessment using this method: Regent Honeyeater and Swift Parrot. Important area mapping was reviewed through the BAM Important Areas viewer on 19/11/2024 for each species. The important area mapping is not available for download, however it was determined that no areas of the Development site would impact on any important area mapping for either Regent Honeyeater or Swift Parrot (Plate 9).

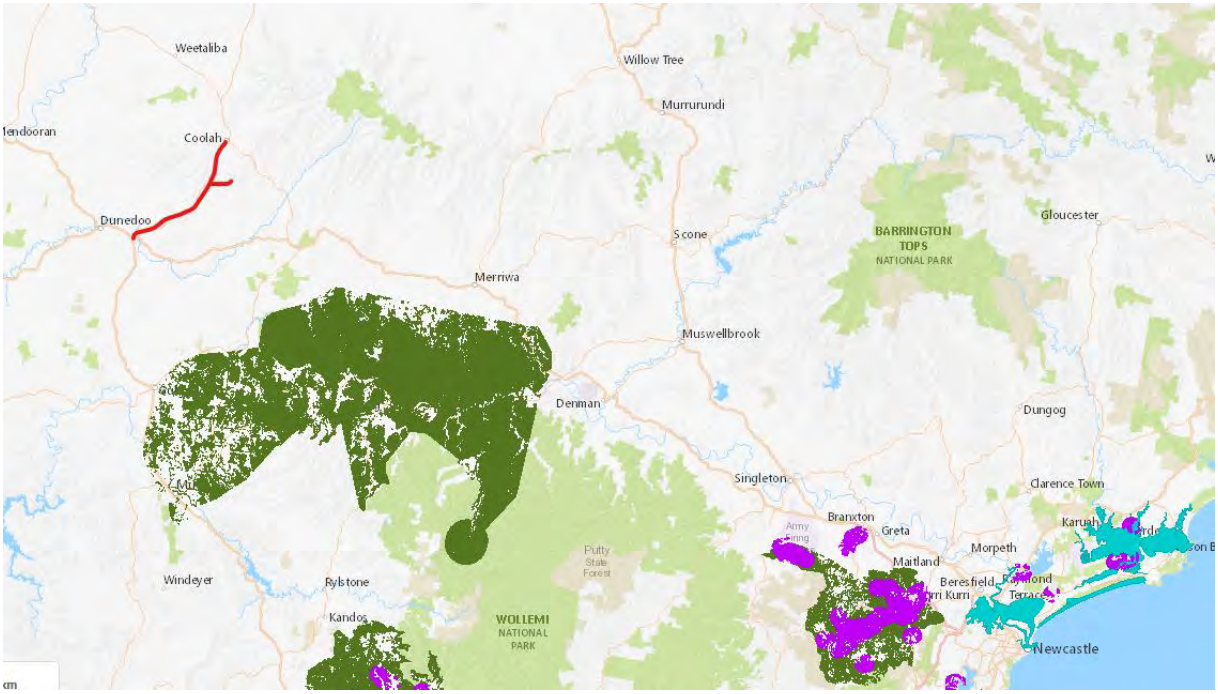

Plate 9: Important area mapping

Based on the fauna habitat assessment completed, habitat constraints listed in Threatened Biodiversity Data Collection (TBDC) and the condition/degradation of habitat features, the threatened species listed below in Table 11 were removed from further assessment.

Table 11: Justification for exclusion of candidate species from further assessment

Species name	Common name	Associated PCTs	Justification for exclusion of species from further assessment
Hieraaetus morphnoides	Little Eagle (breeding)	281	As per the TBDC, this species is excluded from further assessment as no suitable breeding habitat (nest trees) were identified within the Development site during the habitat assessment. Additionally, no suitable large stick nests were identified in the Broader Subject land.

Species name	Common name	Associated PCTs	Justification for exclusion of species from further assessment
Haliaeetus leucogaster	White-bellied Sea-Eagle (breeding)	281	As per the TBDC "Breeding habitat is live large old trees within 1km of a rivers, lakes, large dams or creeks, wetlands and coastlines **AND** the presence of a large stick nest within tree canopy". This species is excluded from further assessment as no breeding habitat (large stick nest within tree canopy) were identified within the Development site during the habitat assessment. Additionally, no suitable large stick nests were identified in the Broader Subject land.
Anthochaera phrygia	Regent Honeyeater	281, 479	The habitat constraints listed for Regent Honeyeater in the Threatened Biodiversity Data Collection (TBDC) refers to the Regent Honeyeater 'Important Area' mapping. The important area map identifies areas that are considered essential to support critical life stages such as breeding areas or locations important for foraging/over-wintering for migratory species. The Development site is not mapped as an 'Important Area' for this species (see Plate 9) therefore no further assessment as per BAM is required.
Lophoictinia isura	Square-tailed Kite (breeding)	281	As per the TBDC, this species is excluded from further assessment as no breeding habitat (nest trees) were identified within the Development site during the habitat assessment. Additionally, no suitable large stick nests were identified in the Broader Subject land.
Lathamus discolor	Swift Parrot	281, 479	The habitat constraints listed for Swift Parrot in the TBDC refers to the Swift Parrot 'Important Area' mapping. The important area map identifies areas that are considered essential to support critical life stages such as breeding areas or locations important for foraging/over-wintering for migratory species. The Development site is not mapped as an 'Important Area' for this species (see Plate 9), therefore no further assessment as per BAM is required.
Litoria booroolongensis	Booroolong Frog	281	As per the TBDC, which states 'refer to the NSW Survey Guide for Threatened Frogs' this species is excluded from further assessment as no suitable habitat will be impacted. The species requires permanent, or near permanent river environment with rocky structures (bedrock or cobble). Suitable breeding habitat consists of rocky structures in shallow water along the riparian zone, and non-breeding habitat is any habitat within the riparian zone (generally within 50 metres of the high water mark). Within the Development site, only habitat directly within the Coolabaragundy River is considered suitable habitat. Should this species occur within this habitat the species polygon boundary should align with aquatic habitats and a buffer, incorporating the PCTs with which the species is associated, of 50 metres radius from the top of bank. No suitable PCTs (habitat) occurs within 50 metres radius from the top of bank for the Coolabaragundy River, therefore no further assessment as per BAM is required.
Miniopterus orianae oceanensis	Large Bent-winged Bat	281	This species is a dual credit species, with breeding habitat being assessed as a species credit. Breeding habitat constraints for this species listed in the TBDC include: "Breeding habitat is defined as caves, tunnels, mines or other structures known or suspected to be used by this species including species records in BioNet with microhabitat code 'IC – in cave'; observation type code 'E nest-roost'; with numbers of individuals >500 ; or from the scientific literature (DPIE 2021).

Species name	Common name	Associated PCTs	Justification for exclusion of species from further assessment
			The best known breeding location for Large Bentwing-Bat is near Wee Jasper in southern NSW (385 km+ away), and the nearest known potential breeding population is at Wellington Caves, approximately 88.5 km from the Development site (Figure 66). This species has wide dispersal over the non-breeding period, and is widely known across NSW. The majority of activity for this species is east of the Great Dividing Range. The habitat assessment surveys conducted within the Development site determined that none of the habitats listed in the TBDC are suspected breeding habitat for this species. This species is excluded from further assessment.
Pteropus poliocephalus	Grey-headed Flying-fox	281	This species is excluded from further assessment as no breeding camps were identified within the Development site during the habitat assessment.
Petrogale penicillata	Brush-tailed Rock-wallaby	281	The habitat constraints listed in the TBDC for this species are "Land within1 km of rocky escarpments, gorges, steep slopes, boulder piles, rockoutcrops or clifflines". None of these habitat features are present in the Development site or within 1 km. Due to the lack of habitat features required by this species and the highly disturbed and fragmented nature of the road corridor, the Brush-tailed Rock-wallaby has been removed from further assessment. No Brush-tailed Rock-wallaby were observed during any of the field surveys completed to date.

4.2.3. Candidate species requiring further assessment

Based on the assessment of habitat constraints, threatened species survey were undertaken for all threatened flora species considered likely to occur. Candidate flora species requiring further assessment, and their survey timing are included below in Table 12.

No targeted fauna surveys have been undertaken due to the limited timframes for submission of this Addendum report, therefore, assumed presence has been completed for all Candidate 'Species credit' species considered likely to occur based on the habitat present within the Development site (Table 14).

Credits have been generated as per the BAM for all species included in Table 14.

4.2.4. Targeted surveys

Targeted surveys for species credit flora species were undertaken at the Development site on the dates outlined in Table 12 and have been completed in accordance with the survey period required for each species outlined in Table 10 as per the BAM. 10 m Parallel traverses were undertaken with a team of two surveyors traversing each side of the road corridor along the length of the Development site. Targeted field survey effort can be seen in Appendix F:, map series.

Table 12: Targeted surveys

Date	Surveyors	Effort	Target species
8 October 2024	Lily Gorrell, Janene Devereux, Sophie Montgomery, Alex Yates, Mel Thurtell, Emily Martin	48 hours	• *Acacia ausfeldii* • *Pomaderris cotoneaster* • *Prasophyllum petilum*
9 October 2024	Lily Gorrell, Janene Devereux, Sophie Montgomery, Alex Yates, Mel Thurtell, Emily Martin	48 hours	

Date	Surveyors	Effort	Target species
10 October 2024	Lily Gorrell, Janene Devereux, Sophie Montgomery, Alex Yates, Mel Thurtell, Emily Martin	12 hours	• *Prasophyllum sp. Wybong* • *Swainsona sericea*
	Total spring hours surveyed	108 hours	
11 November 2024	Janene Devereux, Liam Scanlan, Emily Martin, Finley Woodforth	40 hours	• *Dichanthium setosum* • *Euphrasia arguta*
12 November 2024	Janene Devereux, Liam Scanlan, Emily Martin, Finley Woodforth	40 hours	
	Total summer hours surveyed	80 hours	

Weather conditions during the targeted surveys are outlined in Table 13.

Table 13: Weather conditions

Date	Rainfall (mm)	Minimum temperature °C	Maximum temperature °C
8 October 2024	0	5.6	28.2
9 October 2024	0	10.7	18.7
10 October 2024	0	8.9	27.0
11 November 2024	0	16.1	20.7
12 November 2024	5.4	15.2	26.9

4.2.5. Results of targeted surveys

Following completion of targeted surveys, no threatened flora species were identified.

All species credit fauna species outlined in Table 10 have been assumed present on the Development site and are outlined in Table 14. There are no Geographic limitations for any species listed in Table 14.

4.2.6. Species polygons

Species polygons associated with assumed presence are presented within Appendix G:, map series. Where species polygons are the same for a number of species i.e. associated with PCT 281 'Moderate' woodland areas, they have been grouped. For certain species the species polygon relates to habitat buffers. This includes Large-eared Pied Bat and Eastern Cave Bat, in which the species polygon is only the PCT 281 'Moderate' woodland areas within 2km of caves and clifflines and in the respective IBRA region. The Pink-tailed Legless Lizard has also been assessed based on suitable habitat within 50 m of rocky habitat. This includes both PCT 281 'Moderate' and PCT 281 'DNG' zones within this buffer.

Table 14: Species credit species included in the assessment

Species	Common Name	Predicted IBRA	Species presence	Number of individuals / Habitat (ha)	Biodiversity Risk Weighting
Callocephalon fimbriatum	Gang-gang Cockatoo (breeding)	NSW South western Slopes	Yes (assumed present)	1.24	2
Polytelis swainsonii	Superb Parrot	Brigalow Belt South NSW South western Slopes	Yes (assumed present)	1.24	2
Burhinus grallarius	Bush Stone-curlew	Brigalow Belt South	Yes (assumed present)	1.24	2

Species	Common Name	Predicted IBRA	Species presence	Number of individuals / Habitat (ha)	Biodiversity Risk Weighting
		NSW South western Slopes			
Ninox connivens	Barking Owl (breeding)	Brigalow Belt South NSW South western Slopes	Yes (assumed present)	1.24	2
Tyto novaehollandiae	Masked Owl (breeding)	Brigalow Belt South NSW South western Slopes	Yes (assumed present)	1.24	2
Ninox strenua	Powerful Owl (breeding)	Brigalow Belt South NSW South western Slopes	Yes (assumed present)	1.24	2
Phascogale tapoatafa	Brush-tailed Phascogale	NSW South western Slopes	Yes (assumed present)	1.24	2
Phascolarctos cinereus	Koala	Brigalow Belt South NSW South western Slopes	Yes (assumed present)	1.24	2
Petaurus norfolcensis	Squirrel Glider	Brigalow Belt South NSW South western Slopes	Yes (assumed present)	1.24	2
Chalinolobus dwyeri	Large-eared Pied Bat	Brigalow Belt South NSW South western Slopes	Yes (assumed present) Foraging habitat only within 2km buffer from mapped caves and clifflines	0.39	3
Myotis macropus	Southern Myotis	NSW South western Slopes	Yes (assumed present)	1.24	
Vespadelus troughtoni	Eastern Cave Bat	Brigalow Belt South	Yes (assumed present) Foraging habitat only within 2km buffer from mapped caves and clifflines	0.39	3
Aprasia parapulchella	Pink-tailed Legless Lizard	Brigalow Belt South NSW South western Slopes	Yes (assumed present)	1.74	2

4.2.7. Expert reports

No Expert reports have been used in place of targeted survey for this assessment.

4.3. Identification of prescribed additional biodiversity impact entities

4.3.1. Karst, caves, crevices, cliffs, rocks and other geological features of significance

No karsts, caves, crevices, cliffs, rocks and other geological features of significance occur within the Development site.

4.3.2. Human-made structures and non-native vegetation

No human-made structures occur within the Development site. Non-native vegetation in the form of managed exotic grasslands occurs throughout the Development site, however, this is not considered to provide any significant foraging resources or habitat suitable for threatened species.

4.3.3. Habitat connectivity

The Development site forms part of a habitat corridor comprising scattered remnant and regrowth vegetation within the road reserve of Black Stump Way and Moorfield Road. The Development site has been located to avoid impacting as much vegetation as possible (PCT 281 'Moderate'), with only those trees located within close proximity to the existing sealed road edge requiring removal. The removal of this vegetation (1.24 ha) over the entire length of the Development site is not considered to significantly impact current habitat connectivity in the road reserve.

4.3.4. Water bodies, water quality and hydrological processes

No dams or waterbodies occur directly within the Development site, however, there are several farm dams occurring within the Subject land, on private properties. No impacts to water bodies, water quality or hydrological processes are considered likely. Erosion and sediment control measures will be implemented as part of a Construction Environmental Management Plan (CEMP) to mitigate any potential impacts to water quality in any nearby creeks or rivers.

4.3.5. Wind farm developments

Although the Project is a wind farm development, this component of works relates to road widening, and therefore impacts for this assessment have been assessed based on the impacts proposed. Consideration of Prescribed impacts for a wind farm are addressed in the 'Amended BDAR 2023'.

4.3.6. Vehicle strikes

The Development site forms part of an existing road, and vehicle strikes are an existing threat, therefore it is not considered that any additional impacts above those already existing will significantly impact any threatened species likely to occur in the locality.

5. Avoiding and Minimising Impacts on Biodiversity Values

5.1. Locating and designing a project to avoid and minimise impacts on biodiversity values

5.1.1. Direct and indirect impacts

The requirement to upgrade Black Stump Way and portions of Moorefield Road as part of the Project have been requested by the Warrumbungle Shire Council. Where feasible within the limited road corridor, the Proponent has attempted to avoid and minimise impacts, including the following:

- Locating the road upgrades in areas where there are no biodiversity values, including the maintained roadside 'Exotic Grassland' and 'Cleared' land. This comprises 81% of the Development site.
- Locating the road upgrades in areas where the native vegetation or threatened species habitat is in the poorest condition, including the maintained roadsides DNG with a VI score of between 6.6 – 7.1. This comprises 12% of the Development site.
- The remaining area of road upgrades occur within degraded roadside remnant vegetation comprising a TEC, accounting for 7% of the total impacts. Where possible this will comprise of limb trimming and removal of trees only where they occur directly within the Development site and cannot be avoided.
- Any ancillary facilities required for project construction will be located in areas that have no biodiversity values i.e. Exotic vegetation, wide gravel shoulders, or existing rest stops.
- Avoids impact to habitat for species with land mapped on the important habitat map.
- The Proponent were restricted in the selection of the project location, as Warrumbungle Shire Council requested the road upgrades occur as part of the Project. Where possible the following has been considered:
    - No alternative modes or technologies that would avoid or minimise impacts on biodiversity values have been considered. Road upgrades are required and methods for construction are standard practise.
- Over the life of the Project development, various local roads have been excluded from use in an effort to ensure traffic does not travel through key towns – i.e. Coolah and Leadville, however, this has meant that the Mount hope cluster must be accessed from the south on Black Stump Way rather than from the north-east.

5.1.2. Prescribed biodiversity impacts

The requirement to upgrade Black Stump Way and portions of Moorefield Road as part of the Project have been requested by the Warrumbungle Shire Council. Where feasible within the limited road corridor, the Proponent has attempted to locate the works to avoid prescribed biodiversity impacts which has included the following:

- Locating the road upgrades to avoid, as far as practical, direct impacts on habitat features including Hollow Bearing Trees. In most instances, HBTs will not require removal, as the majority sit outside the Development site, however, impacts have been considered for hollow dependent species as some trees comprising hollows are quite close to the road edge and

some may require removal. Where practical, only overhanging branches that may reach into or overhang the road corridor will require removal, rather than the entire tree.

- Locating the road upgrades to avoid geological features of significance, groundwater-dependent plant communities and their supporting aquifers.
- Minimising the road upgrades to as far as practical, to avoid severing existing habitat corridors. It is not expected that any migratory flight paths to important habitat or preferred local movement pathways will be significantly impacted based on the minimal vegetation clearing required.
- In selecting the project location, the proponent has considered the following:
    - road upgrades are considered necessary, and whilst alternative modes or technologies that would avoid or minimise impacts on biodiversity values have been considered, the proposed works require construction methods that leave little room for alternatives.
    - alternative routes have been considered over the life of the Project development, including other options of various local roads, however, these have been excluded from use in an effort to ensure traffic does not travel through key towns – i.e. Coolah and Leadville. It is likely that use of other local roads would have also require some level of vegetation clearing for construction purposes.
    - Locating the road upgrades in areas where there are no biodiversity values, including the maintained roadside 'Exotic Grassland' and 'Cleared' land. This comprises 81% of the Development site.

6. Assessment of Impacts

6.1. Direct impacts

The direct impacts of the development on:

- native vegetation and threatened ecological communities are outlined in Table 15
- threatened species and threatened species habitat is outlined in Table 16
- prescribed biodiversity impacts is outlined in Section 6.4.

Direct impacts including the final project footprint (construction and operation) are shown in Appendix H:, map series.

Table 15: Direct impacts to native vegetation

PCT ID	PCT Name	IBRA/ Subregion	Condition Zone	BC Act listing	EPBC Act listing	Direct impact (ha)
281	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	Brigalow Belt South/Pilliga	Moderate	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions	White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0.50
		Brigalow Belt South/Pilliga	DNG			1.04
281	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	NSW South Western Slopes/Inland Slopes	Moderate	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions	White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	0.74
			DNG			0.89
					Total	3.18

Table 16: Direct impacts on threatened species and threatened species habitat

Species	Common Name	IBRA Region	Direct impact number of individuals / habitat (ha)	BC Act listing status	EPBC Act Listing status
Callocephalon fimbriatum	Gang-gang Cockatoo (breeding)	NSW South western Slopes	0.74 ha	Endangered	Endangered
Polytelis swainsonii	Superb Parrot	Brigalow Belt South NSW South western Slopes	1.24	Vulnerable	Vulnerable
Burhinus grallarius	Bush Stone-curlew	Brigalow Belt South NSW South western Slopes	1.24	Endangered	Not listed
Ninox connivens	Barking Owl (breeding)	Brigalow Belt South NSW South western Slopes	1.24	Vulnerable	Not listed
Tyto novaehollandiae	Masked Owl (breeding)	Brigalow Belt South NSW South western Slopes	1.24	Vulnerable	Not listed
Ninox strenua	Powerful Owl (breeding)	Brigalow Belt South NSW South western Slopes	1.24	Vulnerable	Not listed
Phascogale tapoatafa	Brush-tailed Phascogale	NSW South western Slopes	0.74	Vulnerable	Not listed
Phascolarctos cinereus	Koala	Brigalow Belt South NSW South western Slopes	1.24	Endangered	Endangered
Petaurus norfolcensis	Squirrel Glider	Brigalow Belt South NSW South western Slopes	1.24	Vulnerable	Not listed
Chalinolobus dwyeri	Large-eared Pied Bat (foraging)	Brigalow Belt South NSW South western Slopes	0.39	Endangered	Endangered
Myotis macropus	Southern Myotis	NSW South western Slopes	0.74	Vulnerable	Not listed
Vespadelus troughtoni	Eastern Cave Bat (foraging)	Brigalow Belt South	0.24	Vulnerable	Not listed
Aprasia parapulchella	Pink-tailed Legless Lizard	Brigalow Belt South NSW South western Slopes	1.47	Vulnerable	Vulnerable

6.2. Change in vegetation integrity

The change in vegetation integrity as a result of the development is outlined in Table 17.

Table 17: Change in vegetation integrity

Veg Zone	PCT ID	Condition	IBRA/ Subregion	Area (ha)	Current vegetation integrity score	Future vegetation integrity score	Change in vegetation integrity
1	281	Moderate	Brigalow Belt South/Pilliga	0.50	59.6	0	-59.6
2	281	DNG	Brigalow Belt South/Pilliga	1.04	6.6	0	-6.6
1	281	Moderate	NSW South Western Slopes/ Inland Slopes	0.74	55.9	0	-55.9
2	281	DNG	NSW South Western Slopes/ Inland Slopes	0.89	7.1	0	-7.1

6.3. Indirect impacts

The indirect impacts of the development are outlined in Table 18. For the purposes of this assessment, indirect impacts are considered to occur within a 10m buffer from the edge of the Development site boundary shown on Figure 2.

Table 18: Indirect impacts

Indirect impact	Description (nature, extent and frequency)	Biodiversity affected	Duration/ Timing	Consequence
inadvertent impacts on adjacent habitat or vegetation	Inadvertent impacts by site vehicles and construction machinery. Limited to within the Development site (construction footprint). Daily during construction phase.	Native groundcover species.	Daily during construction phase.	Minimal impact to native vegetation during construction phase. All impacts within the construction footprint have been included within vegetation integrity loss
Reduced viability of adjacent habitat due to edge effects	Minimal edge effect impacts likely as the development is situated in an existing highly disturbed landscape primarily managed for existing road reserve.	Native vegetation, threatened species habitats.	Daily, during the construction phase.	Minimal increase in edge effects along the road reserve in existing native vegetation.
Reduced viability of adjacent habitat due to noise, dust or light spill	Noise and dust created from machinery (no night works proposed therefore no light spill) Noise likely to carry further than 10 m from Development site boundary.	Fauna species and their habitats	Construction noise expected to only persist for the construction period.	Short term impacts. No measurable impact likely
transport of weeds and pathogens from the site to adjacent vegetation	Existing weeds are prevalent throughout the Development site. Risk of spread of weed seed or pathogens becoming established within Subject land and potential for	Native vegetation	Sporadic throughout construction period	Weed and pathogens to be managed under a CEMP during construction phase.

Indirect impact	Description (nature, extent and frequency)	Biodiversity affected	Duration/ Timing	Consequence
	spread into adjacent habitat nis considered low.			No impacts expected following completion of the road upgrades.
Increased risk of starvation or exposure and loss of shade or shelter	No increase of starvation or exposure or loss of shade and shelter expected.	n/a	n/a	n/a
loss of breeding habitat	No loss of breeding habitat expected due to indirect impacts.	n/a	n/a	n/a
trampling of threatened flora species	No threatened flora species identified. Vegetation within the subject land is highly degraded, subject to regular maintenance and unlikely to support habitat for threatened flora.	n/a	n/a	n/a
Inhibition of nitrogen fixation and increased soil salinity	No inhibition of nitrogen fixation and increased soil salinity expected.	n/a	n/a	n/a
Fertiliser drift	No fertiliser drift expected.	n/a	n/a	n/a
rubbish dumping	Minor littering. Inappropriate construction waste disposal. Potential for rubbish to spread via wind into adjacent vegetation	Adjacent native vegetation and habitats.	During working hours for construction	Minor, short term impacts.
wood collection	There is very little wood available for collection within the Development site or Subject land. Minor (but unlikely) collection possible by construction crew staff.	Adjacent native vegetation and habitats.	During working hours for construction	Minor, short term impacts. To be managed under a CEMP with information provided to staff regarding the impact this causes to native wildlife.
removal and disturbance of rocks including bush rock	There is very little bush rock available for removal or disturbance within the Development site or Subject land. Minor (but unlikely) collection possible by construction crew staff.	Adjacent native vegetation and habitats.	During working hours for construction	Minor, short term impacts. To be managed under a CEMP with information provided to staff regarding the impact this causes to native wildlife.
increase in predators	Predators already exist in the Subject land including foxes, dogs and cats. Unlikely to increase the risk of any predators.	n/a	n/a	n/a
increase in pest animal populations	Predators already exist in the Subject land including foxes, dogs and cats. Unlikely to increase the risk of any pest animal populations.	n/a	n/a	n/a
changed fire regimes	The project will not change the current fire regime in any way.	n/a	n/a	n/a
disturbance to specialist breeding	No disturbance to any specialist breeding habitats are likely.	n/a	n/a	n/a

Indirect impact	Description (nature, extent and frequency)	Biodiversity affected	Duration/ Timing	Consequence
and foraging habitat, e.g. beach nesting for shorebirds.				
sedimentation and contaminated and/or nutrient rich run-off	No increase in sediment or contaminated run off is expected. All construction works to be managed under a CEMP.	n/a	n/a	n/a

6.4. Prescribed biodiversity impacts

The Development site has the prescribed biodiversity impacts as outlined in Table 19.

Table 19: Direct impacts on prescribed biodiversity impacts

Prescribed biodiversity impact	Description (Nature, extent and frequency)	Consequences	Justification	Additional information
Karst, caves, crevices, cliffs, rocks and other geological features of significance	No impacts	n/a	n/a	n/a
Human made structures or non-native vegetation	No significant impacts	n/a	n/a	n/a
Habitat connectivity	The proposal will result in the loss of small areas of scattered patches of native vegetation that occur across the Development site providing habitat for highly mobile species.	Localised decrease in habitat connectivity.	Existing vegetation will be retained in the road reserve which will allow continued movement of threatened species utilising these habitat corridors.	The width of the upgrades has been minimised as far as practical, whilst allowing for an increased road width.
Water bodies, water quality and hydrological processes	No dams or waterbodies occur directly within the Development site, however, there are several farm dams occurring within the Subject land, on private properties. No impacts to water bodies, water quality or hydrological processes are considered likely.	n/a	n/a	n/a
Wind turbine strikes on protected animals	n/a	n/a	n/a	n/a
vehicle strikes	No additional significant impacts excepted above that already existing.	n/a	n/a	n/a

6.5. Mitigating and managing direct and indirect impacts

Measures proposed to mitigate and manage impacts at the development site before, during and after construction are outlined in Table 20.

Table 20: Measures proposed to mitigate and manage impacts

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
timing works to avoid critical life cycle events such as breeding or nursing	Major	Minor	Undertake reasonable steps to avoid, where possible, clearing during the seasonal breeding and torpor seasons for candidate fauna species considered to inhabit the locality. A pre-clearance survey plan should be developed to avoid impacts to threatened and non-threatened fauna. A qualified ecologist/licenced wildlife handler will supervise tree removal and an unexpected finds procedure will also be developed to address this risk of failure.	Protect fauna from risk of inadvertent injury during construction works.	During clearing work	Site manager
instigating clearing protocols including pre-clearing surveys, daily surveys and staged clearing, the presence of a trained ecological or licensed wildlife handler during clearing events	Major	Minor	A pre-clearance survey plan should be developed that outlines step by step guidance on best practise clearing protocols for the welfare of all species identified.	Any fauna utilising habitat within the Development site will be identified and managed to ensure clearing works minimise the likelihood of injuring resident fauna.	Prior to construction	Site manager/ Site ecologist
installing artificial habitats for fauna in adjacent retained vegetation and habitat or human made structures to replace the habitat resources lost and encourage animals to move from the impacted site, e.g. nest boxes	Moderate	Minor	Existing hollows within Hollow-bearing trees removed during construction will be relocated to outside the Development site and into areas of the subject land (within the road reserve).	Enhancement of retained habitats.	During construction	Site manager
clearing protocols that identify vegetation to be retained, prevent inadvertent damage and reduce soil disturbance; for example, removal of native vegetation by chain-saw, rather than heavy machinery, is preferable in situations where partial clearing is proposed	Moderate	Minor	Clearing protocols will be developed that identify vegetation to be retained, prevent inadvertent damage and reduce soil disturbance e.g. removal of native vegetation by chainsaw instead of heavy machinery where only partial clearing (limb trimming) is proposed. Fencing (or other barriers as required) and signage will be placed around those areas of vegetation to be maintained to prevent any	Vegetation to be retained outside of the Development site boundary will not be disturbed. No clearing works will occur outside of the Development site, including non-habitat vegetation.	During construction	Site manager

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
			accidental construction damage and provide a permanent barrier between the Development site and retained areas, particularly areas of PCT 281 'Moderate'. Use of appropriate machinery for vegetation removal adjacent to retained areas.			
sediment barriers or sedimentation ponds to control the quality of water released from the site into the receiving environment	Moderate	Minor	Appropriate controls will be implemented to manage exposed soil surfaces and stockpiles to prevent sediment discharge into waterways. All works within proximity to the drainage lines will have adequate sediment and erosion controls (e.g. sediment barriers, sedimentation ponds).	Erosion and sedimentation will be controlled	Construction and decommissioning	Site manager
noise barriers or daily/seasonal timing of construction and operational activities to reduce impacts of noise	Moderate	Minor	Construction works will predominately be undertaken during daylight hours. Noise impacts to be managed.	Noise impacts associated with the development will be managed.	During construction	Site manager
light shields or daily/seasonal timing of construction and operational activities to reduce impacts of light spill	Moderate	Minor	Construction works will generally be undertaken during daylight hours.	Light impacts of construction will be avoided	During construction	Site manager
adaptive dust monitoring programs to control air quality	Moderate	Minor	Dust suppression measures will be implemented to limit dust on site, particularly in the vicinity of Uarbry Village.	Mitigate dust created during construction activities	During construction	Site manager
programming construction activities to avoid impacts; for example, timing construction activities for when migratory species are absent from the site, or when particular species known to or likely to use the habitat on the site are not breeding or nesting	Moderate	Minor	Undertake reasonable steps to avoid, where possible, clearing during the seasonal breeding and torpor seasons for candidate fauna species considered to inhabit the locality. A pre-clearance survey plan should be developed to avoid impacts to threatened and non-threatened fauna. A qualified ecologist/licenced wildlife handler will supervise tree removal and an unexpected	Protect fauna from risk of inadvertent injury during construction works.	During clearing work	Site manager

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
			finds procedure will also be developed to address this risk of failure.			
temporary fencing to protect significant environmental features such as riparian zones	Moderate	Minor	Temporary fencing (or other barriers as required) and signage will be placed around those areas of vegetation to be maintained to prevent any accidental construction damage and provide a temporary barrier between the development site and retained areas, particularly areas of PCT 281 'Moderate' and significant riparian zones such as Coolabaragundy River.	Protection of sensitive environmental features.	During construction and clearing works.	Site manager
hygiene protocols to prevent the spread of weeds or pathogens between infected areas and uninfected areas	Moderate	Minor	Machinery associated with ground disturbance activities will be cleaned prior to entering and exiting the construction site to minimise the transport of weeds to vegetated areas to be retained. Hygiene protocols will be included as per the Department's *Hygiene guidelines – Protocols to protect priority biodiversity areas in NSW from Phytophthora cinnamomi, myrtle rust, amphibian chytrid fungus and invasive plants*.	Weed impacts managed	During construction and clearing works.	Site manager
staff training and site briefing to communicate environmental features to be protected and measures to be implemented	Moderate	Minor	All personnel working on the project will undertake an environmental induction as part of their site familiarisation. This will include: • site environmental procedures (vegetation management, sediment and erosion control, exclusion fencing and noxious weeds) • what to do in case of environmental emergency (e.g. chemical spills, fire, injured fauna) • key contacts in the case of an environmental emergency.	Staff trained and aware of environmental issues and responsibilities on site.	During construction and clearing works.	Site manager

6.6. Mitigating prescribed impacts

Measures proposed to mitigate and manage prescribed biodiversity impacts at the development site before, during and after construction are outlined in Table 21.

Table 21: Mitigation measures for prescribed biodiversity impacts

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Respon sibility
Scheduling timing of construction activities to avoid critical life cycle events	Major	Minor	Undertake reasonable steps to avoid, where possible, clearing during the seasonal breeding and torpor seasons for candidate fauna species considered to inhabit the locality. A pre-clearance survey plan should be developed to avoid impacts to threatened and non-threatened fauna. A qualified ecologist/licenced wildlife handler will supervise tree removal and an unexpected finds procedure will also be developed to address this risk of failure.	Protect fauna from risk of inadvertent injury during construction works.	During clearing work	Site manage r
Instigating clearing protocols including pre-clearing surveys, daily surveys and staged clearing, and using a trained ecological or licensed wildlife handler during clearing, construction and maintenance activities for human made structures and non-native vegetation	Major	Minor	A pre-clearance survey plan should be developed that outlines step by step guidance on best practise clearing protocols for the welfare of all species identified.	Any fauna utilising habitat within the Development site will be identified and managed to ensure clearing works minimise the likelihood of injuring resident fauna.	Prior to construction	Site manage r/ Site ecologis t
Retaining habitat features within the subject land or relocating them to adjacent retained remnant vegetation	Moderate	Minor	Existing hollows within Hollow-bearing trees removed during construction will be relocated to outside the Development site and into areas of the subject land (within the road reserve).	Enhancement of retained habitats.	During construction	Site manage r
Erecting temporary fencing to protect significant environmental features such as karst, caves, rock outcrops and water bodies	Moderate	Minor	Temporary fencing (or other barriers as required) and signage will be placed around those areas of vegetation to be maintained to prevent any accidental construction damage and provide a temporary barrier between the Development site and retained areas, particularly areas of PCT 281 ‘Moderate’ and significant riparian zones such as Coolabaragundy River.	Protection of sensitive environmental features.	During construction and clearing works.	Site manage r
Replacing habitat provided by human	n/a	n/a	n/a	n/a	n/a	n/a

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
made structures and non-native vegetation with alternative habitat						
Sediment barriers or sedimentation ponds to control the quality of water released from the site into the receiving environment	Moderate	Minor	Appropriate controls will be implemented to manage exposed soil surfaces and stockpiles to prevent sediment discharge into waterways. All works within proximity to the drainage lines will have adequate sediment and erosion controls (e.g. sediment barriers, sedimentation ponds).	Erosion and sedimentation will be controlled	Construction and decommissioning	Site manager
Staff training and site briefing to communicate environmental features to be protected and measures implemented to protect them	Moderate	Minor	All personnel working on the project will undertake an environmental induction as part of their site familiarisation. This will include: • site environmental procedures (vegetation management, sediment and erosion control, exclusion fencing and noxious weeds) • what to do in case of environmental emergency (e.g. chemical spills, fire, injured fauna) • key contacts in the case of an environmental emergency.	Staff trained and aware of environmental issues and responsibilities on site.	During construction and clearing works.	Site manager

6.7. Adaptive management strategy

An adaptive management strategy has not been proposed as it is not considered that any remaining impacts on biodiversity values are uncertain.

7. Impact summary

Following implementation of the BAM and the BAMC, the following impacts have been determined.

7.1. Serious and Irreversible Impacts (SAII)

The development has candidate Serious and Irreversible Impacts (SAII) values as outlined in Table 22. Detailed consideration of whether impacts on TECs that are serious and irreversible is included in Table 23.

Table 22: Serious and Irreversible Impacts Summary

Species / Community	Common Name	Principle	Direct impact individuals / area (ha)	Threshold
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions	Box Gum Woodland	1 and 2	1.24 ha of PCT 281 'Moderate' condition woodland 1.93 ha of PCT 281 'DNG'	No threshold identified.
Chalinolobus dwyeri	Large-eared Pied-bat	4	0 ha of breeding habitats 0.39 ha of foraging habitat associated with buffers	No threshold identified
Vespadelus troughtoni	Eastern Cave Bat	4	0 ha of breeding habitats 0.24 ha of foraging habitat associated with buffers	No threshold identified

From this point onwards, only Box Gum Woodland TEC has been considered further as an SAII entity. No SAII breeding habitat has been impacted for either Large-eared Pied-bat or Eastern Cave Bat, therefore impacts proposed to these two species is based on foraging habitat associated with 2km buffers of caves and clifflines as per the TBDC.

Detailed consideration of whether impacts on TECs that are serious and irreversible is included below (Table 23).

Table 23: Evaluation of an impact on a TEC consistent with 9.1.1 of the BAM

Impact Assessment Provisions	Assessment
1. the action and measures taken to avoid the direct and indirect impact on the potential entity for an SAII	Measures to avoid direct and indirect impacts are detailed in Section 5 of this report.
2a. evidence of reduction in geographic distribution (Principle 1, clause 6.7(2)(a) BC Regulation) as the current total geographic extent of the TEC in NSW AND the estimated reduction in geographic extent of the TEC since 1970 (not including impacts of the proposal)	The current total geographic extent of the TEC has been estimated by calculating the area of associated PCTs as mapped on the Brigalow Belt South – Nandewar, Central West – Lachlan, Upper Hunter, and Riverina PCT Maps (Figure 5). Based on this mapping, there is potentially 1,835,977 ha of the TEC currently in NSW. The reduction of the TEC since 1970 is not known, however Section 8 of the Final Determination identified that:

Impact Assessment Provisions	Assessment
	"White Box Yellow Box Blakely's Red Gum Woodland has been drastically reduced in area and highly fragmented because of clearance for cropping and pasture improvement. Austin et al. (2000) found the community had been reduced to less than 1% of its pre-European extent in the Central Lachlan region. Comparable degrees of reduction have been documented for NSW south western slopes and southern Tablelands (estimated <4% remaining, Thomas et. al. 2000), and for the Holbrook area (estimated <7% remaining, Gibbons and Boak (2000). Gibbons and Boak (2000) found remnants of woodlands dominated by Eucalyptus albens, E. melliodora and E. blakelyi were severely fragmented."
2b. extent of reduction in ecological function for the TEC using evidence that describes the degree of environmental degradation or disruption to biotic processes (Principle 2, clause 6.7(2)(b) BC Regulation) indicated by: i. change in community structure ii. change in species composition iii. disruption of ecological processes iv. invasion and establishment of exotic species v. degradation of habitat, and vi. fragmentation of habitat	Within the Development site, removal of canopy limbs where they overhang the road and where required, removal of some canopy trees to occur where they are situated in close proximity to the road edge. Within the groundlayer, complete removal within the Development site is expected. Species composition has been calculated at 0 (full impact), within all areas of the Development site, however, where possible, canopy trees will be retained. There is unlikely to be any invasion or establishment of exotic species, beyond those that already occur throughout the Subject land. Habitats within the Development site will be removed. Habitats that occur outside the Development site may be fragmented from each other, however the majority of the development site is located in an already fragmented landscape and is unlikely to further reduce connectivity of the TEC.
2c. evidence of restricted geographic distribution (Principle 3, clause 6.7 (2) (c) BC Regulation), based on the TECs geographic range in NSW according to the: i. extent of occurrence ii. area of occupancy, and iii. number of threat-defined locations.	This principle is not applicable to this TEC as it does not have a restricted geographic distribution. The TECs geographic range in NSW includes the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions. The Extent of Occurrence is 70.28 million hectares The Area of Occupancy is 15.1 million hectares Based on the State Vegetation Type Map (SVTM) (Figure 5) there is 1.8 million ha of the TEC currently in NSW. There are no threat-defined locations for this TEC.
2d. evidence that the TEC is unlikely to respond to management (Principle 4, clause 6.7 (2) (d) BC Regulation).	From section 1.2 and 3.1.4 of the Final Determination (DEH 2021) *"At any one time, above ground individuals of some species may be absent but the species may be represented below ground in the soil seed bank or as dormant structures such as bulbs, corms, rhizomes, rootstocks or lignotubers".* *"Areas of derived native grassland subject to grazing usually retain some native species and functioning ecological processes, and it is possible that the habitat value of these grasslands can be at least partially restored following a cessation of grazing and with the regeneration of tree species".* Based on the above statements, it is considered likely that this TEC would respond to management and soil seed bank to assist with regeneration.
3. Where the TBDC indicated that data is 'unknown' or 'data deficient' for a TEC for a criterion listed in subsection 9.1.1(2), the assessor must record this in the BDAR or BCAR.	n/a
4a. the impact on the geographic extent of the TEC (Principles 1 and 3) by estimating the total area of the TEC to be impacted by the proposal: i. in hectares, and	The total area of the TEC to be impacted by the proposal is 3.18 ha. Comprising of 1.24 ha of 'Moderate' condition woodland and 1.93 ha of DNG. The percentage of impact to the TEC across the current geographic extent is 0.00017%

Impact Assessment Provisions	Assessment
ii. as a percentage of the current geographic extent of the TEC in NSW.	
4b. the extent that the proposed impacts are likely to contribute to further environmental degradation or the disruption of biotic processes (Principle 2) of the TEC by: i. estimating the size of any remaining, but now isolated, areas of the TEC; including areas of the TEC within 500 m of the development footprint or equivalent area for other types of proposals ii. describing the impacts on connectivity and fragmentation of the remaining areas of TEC measured by: • distance between isolated areas of the TEC, presented as the average distance if the remnant is retained AND the average distance if the remnant is removed as proposed, and • estimated maximum dispersal distance for native flora species characteristic of the TEC, and • other information relevant to describing the impact on connectivity and fragmentation, such as the area to perimeter ratio for remaining areas of the TEC as a result of the development iii. describing the condition of the TEC according to the vegetation integrity score for the relevant vegetation zone(s) (Section 4.3). The assessor must also include the relevant composition, structure and function condition scores for each vegetation zone.	The extent of the TEC within 500m of the Development site is shown on Figure 6. Following development there will be approximately 5,522 ha of the TEC remaining within the assessment area. Across NSW there will remain over 1.8M ha of the TEC. The current connectivity and isolation of patches of the TEC was measured using Euclidean distance analysis between patches of the TEC (Figure 6). The change in the proportion of area between patches (i.e. future separation of the TEC) changed from an average separation of 207.37 m before development to 207.44 m after development. This is a small change for the majority of vegetation along Black Stump Way, as minimal clearing along roadside edges will not sever connectivity within the road corridor. One small area of change occurs along Moorfield Road, leading to the workers camp, where there is a minor change in canopy separation as shown in Figure 7. The project will not isolate any patches of the TEC, as the extent of the TEC is so prevalent locally. The maximum dispersal distance for native flora species before and after the development is unchanged. The area to perimeter ratio before the development is 32.43 m^2/m. The area to perimeter ratio after the development is 32.42 m^2/m. The condition of the TEC according to the vegetation integrity score is provided in Table 17.

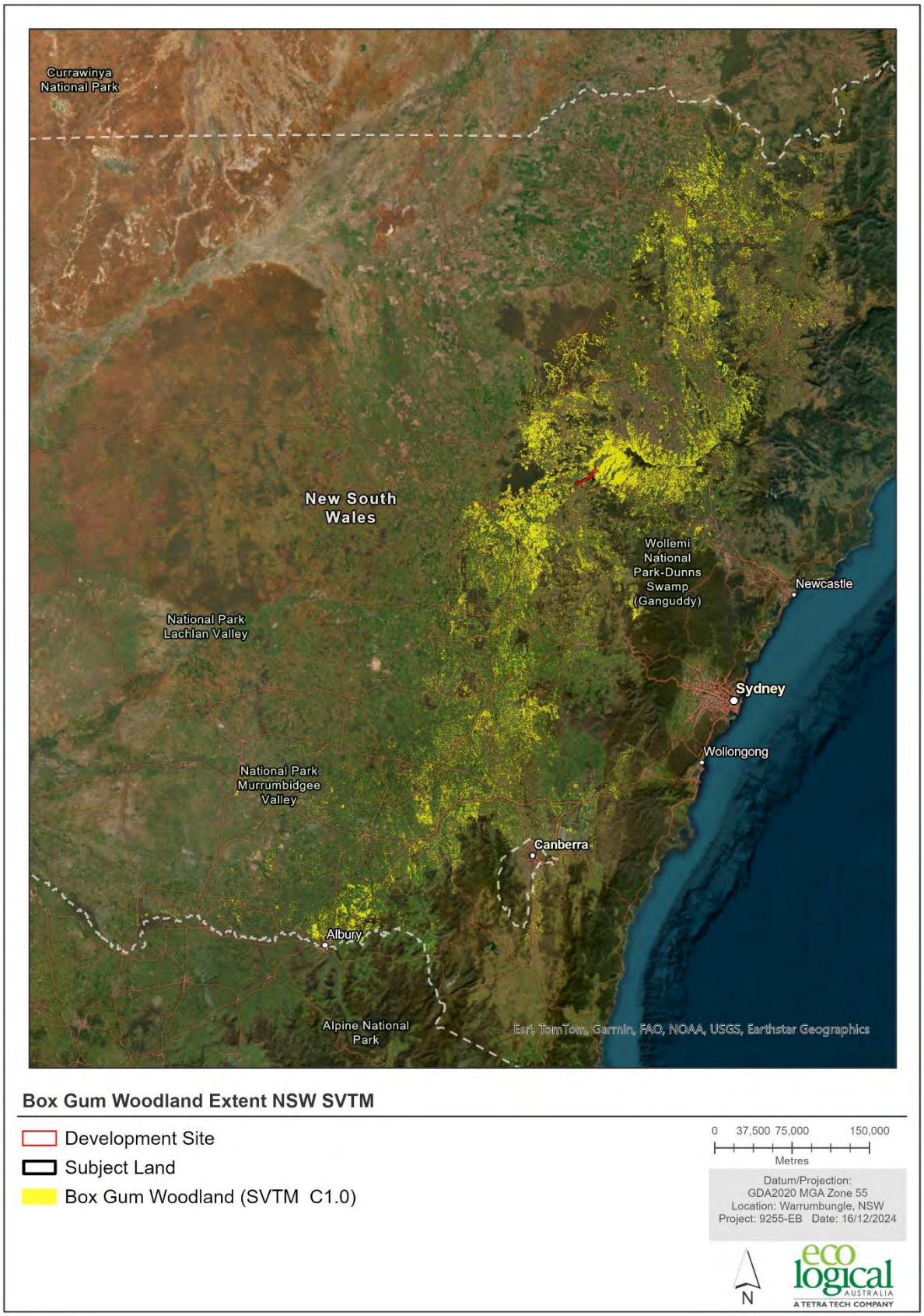

Figure 5: Extent of Box Gum Woodland TEC in NSW

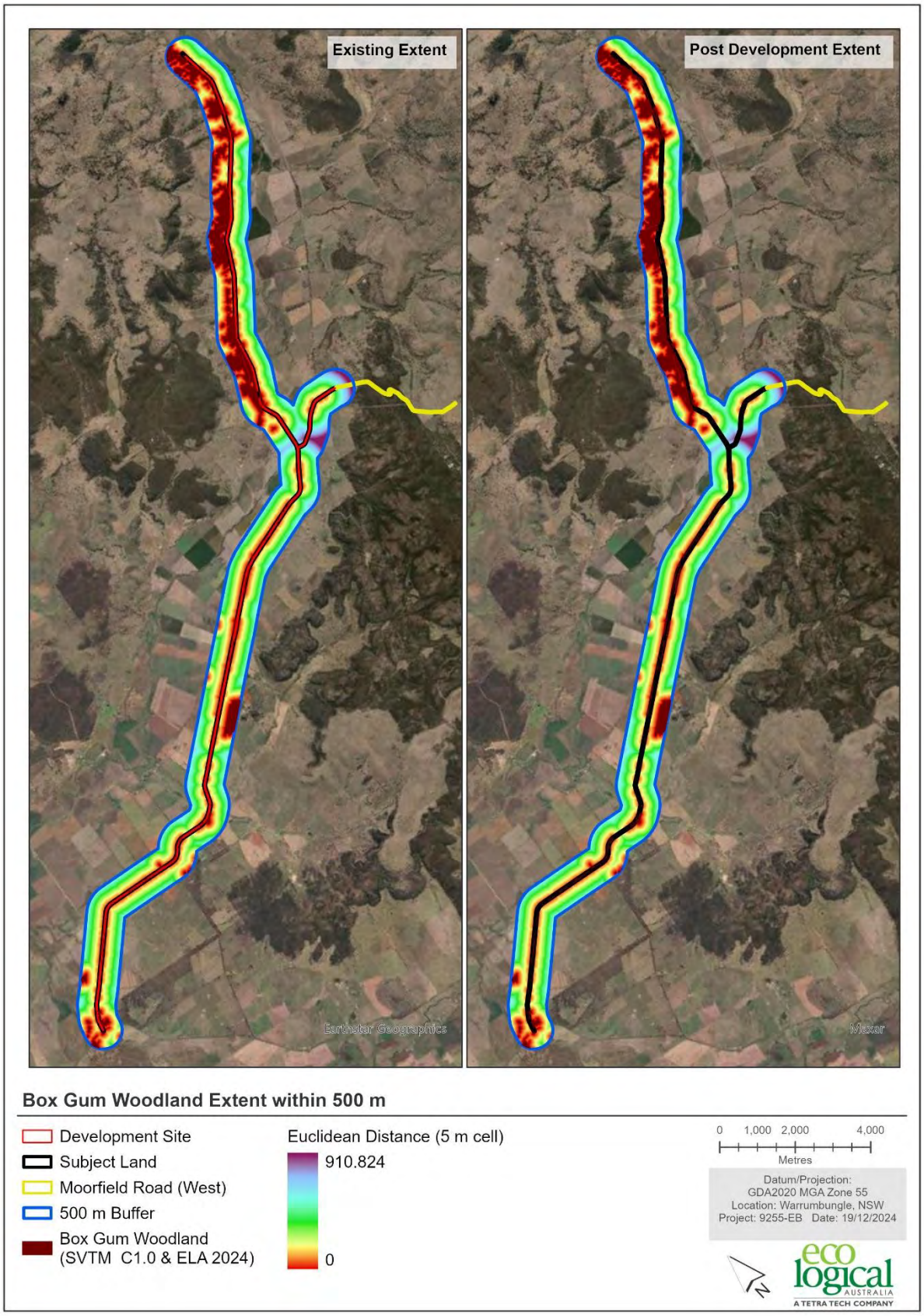

Figure 6: Extent of Box Gum Woodland TEC within 500m of the development and Patch connectivity of the TEC before and after proposed works

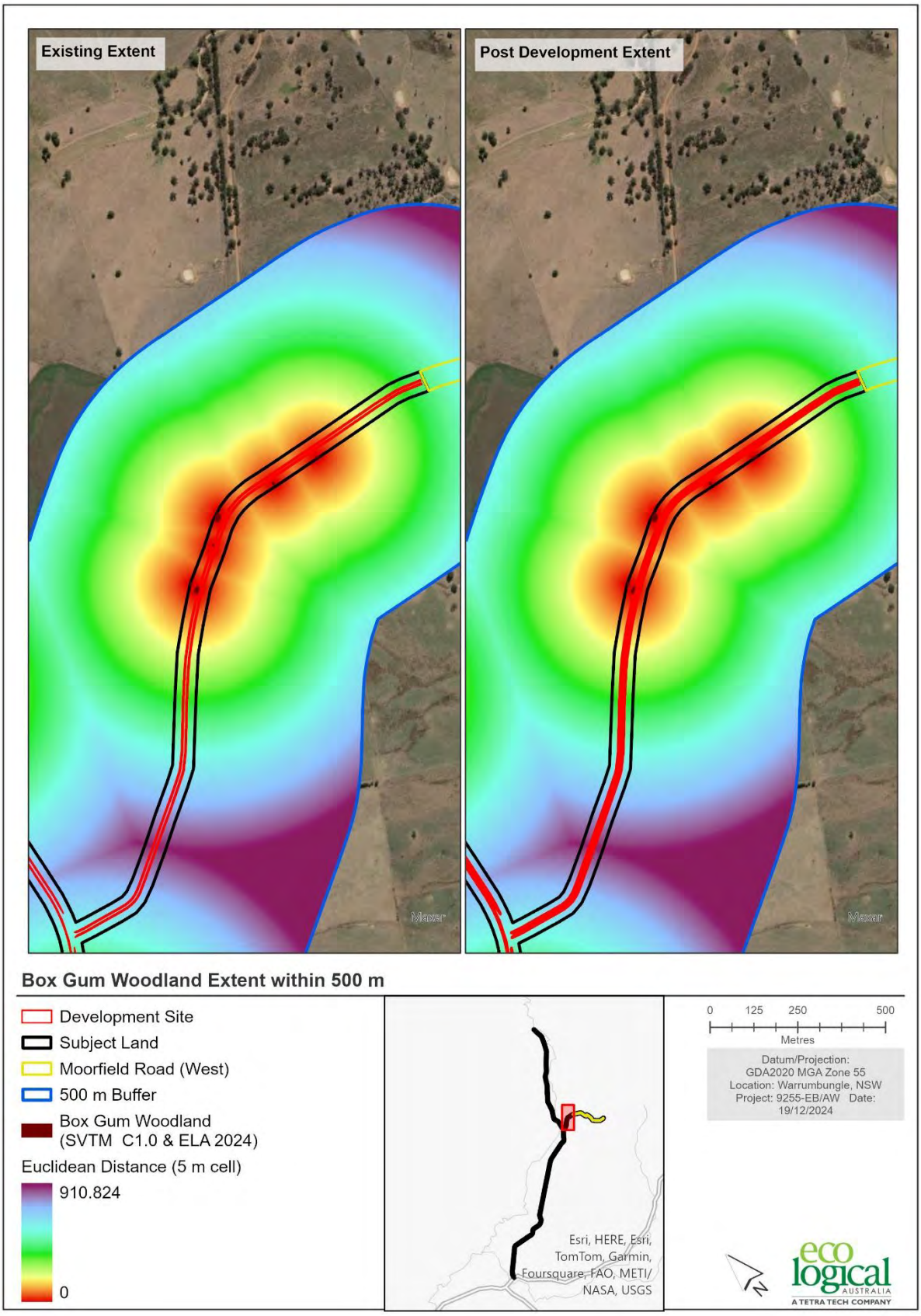

Figure 7: Area of change based on Euclidean Distance for patch connectivity of the TEC before and after proposed works

7.2. Impacts requiring offsets

The impacts of the development requiring offset for native vegetation are outlined in Table 24 and shown in Appendix H:, map series. The impacts of the development requiring offset for species credit species and their habitat are outlined in Table 25 and on Appendix H:, map series.

Table 24: Impacts to native vegetation that require offsets

IBRA	Vegetation Zone	PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Direct impact (ha)
Brigalow Belt South	1	281 'Moderate'	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	Western Slopes Grassy Woodlands	Grassy Woodlands	0.50
NSW South Western Slopes	1	281 'Moderate'	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	Western Slopes Grassy Woodlands	Grassy Woodlands	0.74
					Total	1.24

Table 25: Impacts on threatened species and threatened species habitat that require offsets

Species	Common Name	Direct impact number of individuals / habitat (ha)	BC Act listing status	EPBC Act Listing status
Callocephalon fimbriatum	Gang-gang Cockatoo (breeding)	0.74 ha	Endangered	Endangered
Polytelis swainsonii	Superb Parrot	1.24 ha	Vulnerable	Vulnerable
Burhinus grallarius	Bush Stone-curlew	1.24 ha	Endangered	Not listed
Ninox connivens	Barking Owl (breeding)	1.24 ha	Vulnerable	Not listed
Tyto novaehollandiae	Masked Owl (breeding)	1.24 ha	Vulnerable	Not listed
Ninox strenua	Powerful Owl (breeding)	1.24 ha	Vulnerable	Not listed
Phascogale tapoatafa	Brush-tailed Phascogale	0.74 ha	Vulnerable	Not listed
Phascolarctos cinereus	Koala	1.24 ha	Endangered	Endangered
Petaurus norfolcensis	Squirrel Glider	1.24 ha	Vulnerable	Not listed

Species	Common Name	Direct impact number of individuals / habitat (ha)	BC Act listing status	EPBC Act Listing status
Chalinolobus dwyeri	Large-eared Pied Bat (foraging)	0.39 ha	Endangered	Endangered
Myotis macropus	Southern Myotis	0.74 ha	Vulnerable	Not listed
Vespadelus troughtoni	Eastern Cave Bat (foraging)	0.24 ha	Vulnerable	Not listed
Aprasia parapulchella	Pink-tailed Legless Lizard	1.47	Vulnerable	Vulnerable

7.3. Impacts not requiring offsets

The impacts of the development not requiring offset for native vegetation are outlined in Table 26 and shown on Appendix H: (map series).

Table 26: Impacts to native vegetation that do not require offsets

Vegetation Zone	PCT ID	PCT Name	Direct impact (ha)	Rationale
2	281 'DNG'	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	1.93	Vegetation integrity score below offset threshold (VI Score 6.6 and 7.1) <15 for PCT representative of a CEEC

7.4. Areas not requiring assessment

Areas not requiring assessment include 'Exotic grasslands' and 'Other' comprising of Residential, Road, Track, Waterway. These areas are shown on Appendix H: (map series).

Note: As part of a comprehensive and risk averse assessment, these areas have been surveyed for threatened flora across both spring and summer periods.

7.5. Credit summary

The number of ecosystem credits required for the development are outlined in Table 27. The number of species credits required for the development are outlined in Table 28.

A biodiversity credit report is included in Appendix K:.

Table 27: Ecosystem credits required

Vegetation Zone	PCT ID & Condition	PCT Name	IBRA/ Subregion	Credit Class	Direct impact (ha)	Credits required
1	281 Moderate	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	Brigalow Belt South/Pilliga	Ecosystem	0.50 ha	19

Vegetation Zone	PCT ID & Condition	PCT Name	IBRA/ Subregion	Credit Class	Direct impact (ha)	Credits required
2	281 DNG	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	Brigalow Belt South/Pilliga	Ecosystem	1.04 ha	0
1	281 Moderate	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	NSW South Western Slopes/Inland Slopes	Ecosystem	0.74 ha	26
2	281 DNG	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	NSW South Western Slopes/Inland Slopes	Ecosystem	0.89 ha	0
					Total	45

Table 28: Species credit summary

Species	Common Name	IBRA Region	Direct impact number of individuals / habitat (ha)	Credits required
Callocephalon fimbriatum	Gang-gang Cockatoo (breeding)	NSW South western Slopes	0.74 ha	21
Polytelis swainsonii	Superb Parrot	Brigalow Belt South NSW South western Slopes	1.24	36
Burhinus grallarius	Bush Stone-curlew	Brigalow Belt South NSW South western Slopes	1.24	36
Ninox connivens	Barking Owl (breeding)	Brigalow Belt South NSW South western Slopes	1.24	36
Tyto novaehollandiae	Masked Owl (breeding)	Brigalow Belt South NSW South western Slopes	1.24	36
Ninox strenua	Powerful Owl (breeding)	Brigalow Belt South NSW South western Slopes	1.24	36
Phascogale tapoatafa	Brush-tailed Phascogale	NSW South western Slopes	0.74	21
Phascolarctos cinereus	Koala	Brigalow Belt South NSW South western Slopes	1.24	36
Petaurus norfolcensis	Squirrel Glider	Brigalow Belt South	1.24	36

Species	Common Name	IBRA Region	Direct impact number of individuals / habitat (ha)	Credits required
		NSW South western Slopes		
Chalinolobus dwyeri	Large-eared Pied Bat (foraging)	Brigalow Belt South NSW South western Slopes	0.39	17
Myotis macropus	Southern Myotis	NSW South western Slopes	0.74	21
Vespadelus troughtoni	Eastern Cave Bat (foraging)	Brigalow Belt South	0.24	11
Aprasia parapulchella	Pink-tailed Legless Lizard	Brigalow Belt South NSW South western Slopes	1.47	20
			Total	363

8. Consistency with legislation and policy

8.1. State Environmental Planning Policy SEPP (Biodiversity Conservation) 2021

Chapter 4 Koala habitat protection 2021

This Chapter aims to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current trend of koala population decline.

This Chapter applies to each local government area listed in Schedule 2, of which the Warrumbungle Shire Council is included. However, as per Subsection 4.4 (3) (d) this Chapter does not apply to land in the following land use zones, or an equivalent land use zone

(i) Zone RU1 Primary Production,

(ii) Zone RU2 Rural Landscape,

(iii) Zone RU3 Forestry.

The Development site and Subject land occurs within RU1 Primary Production, therefore Chapter 4 does not apply.

Based on the potential for Koala habitat, impacts within the Development site for Koala is detailed and assessed, in accordance with the requirements of the BAM and under Commonwealth requirements as per Section 8.3.

8.2. NSW Fisheries Management Act 1994

There are many 1st – 5th order streams mapped throughout the length of BSW and these mainly consist of weedy grassed drainage lines with little to no defined bed and banks that run through paddocks, however, the 6th order waterways include Coolabaragundy River comprises defined bed and banks and permanent water. This river is mapped as a Key Fish Habitat (KFH) for Eel-tailed Catfish and Purple Spotted Gudgeon.

Potential impacts are associated with indirect impacts during construction of the road upgrades. All disturbance will be avoided within the watercourse itself and no direct impacts are considered to occur to areas of KFH. The proponent will aim to avoid any obstruction of fish passage or dredging &/or reclamation. Otherwise the crossing will comply with the requirements of the FM Act (Part 7 Permit). Given the degraded nature of the majority of aquatic habitat present and mitigation measures proposed, the direct impacts to aquatic habitat are unlikely to be significant.

Potential indirect impacts on aquatic habitat include:

- impacts to water quality (if water is present) during construction of the creek crossing
- potential increase in run-off/sedimentation during construction

Given the degraded nature of the aquatic habitat present and mitigation measures proposed, the direct impacts to aquatic habitat are unlikely to be significant.

The proposed development is unlikely to impact aquatic threatened species.

8.3. Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

The Project was referred to the Commonwealth Minister for the Environment in 2020, and was declared a controlled action due to potential impacts primarily to Box Gum Woodland CEEC (Referral 2020/8668).

The referral identified potential impacts to two communities and 29 species listed under the EPBC Act. These species were derived from the project footprint identified in the referral, which has been significantly truncated and reduced through a number of design iterations. MNES relevant to (Referral 2020/8668) have been addressed as part of the Project.

A list of identified MNES and whether they may be impacted is described in Table 29. Those MNES with potential to be impacted by the proposed road upgrades within the Development site are further addressed in Section 8.3.1.

Table 29: Threatened species and communities considered as MNES under the EPBC Act

Species Name	Common Name	EPBC Act	Response	Nature	Quantum	Consequence
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland		Critically Endangered	Identified within the Subject land and Development site. **Further assessment required**	Removal of vegetation within development site.	1.24 ha of woodland removed	Removal of a minor amount of Box Gum Woodland. No significant residual impact
Anthochaera phrygia	Regent Honeyeater	Critically Endangered	Not identified on important area mapping. No impact to breeding habitat and minimal amount of potential foraging habitat impacted. **Further assessment required**	Removal of potential foraging habitat.	Removal of 1.24 ha of potential foraging habitat.	Removal of a minor amount of potential foraging habitat. No significant residual impact considered likely
Lathamus discolor	Swift Parrot	Critically Endangered	Not identified on important area mapping. No impact to breeding habitat and minimal amount of potential foraging habitat impacted. **Further assessment required**	Removal of potential foraging habitat.	Removal of 1.24 ha of potential foraging habitat.	Removal of a minor amount of potential foraging habitat. No significant residual impact considered likely
Callocephalon fimbriatum	Gang-gang Cockatoo	Endangered	Assumed present based on minimal amount of potential foraging habitat impacted. **Further assessment required**	Removal of native vegetation which acts as foraging habitat	Removal of 1.24 ha of foraging habitat.	Removal of a minor amount of potential foraging habitat. No significant residual impact considered likely
Polytelis swainsonii	Superb Parrot	Vulnerable	Assumed present based on minimal amount of potential foraging habitat impacted. **Further assessment required**	Removal of native vegetation which acts as foraging habitat	Removal of 1.24 ha of foraging habitat.	Removal of a minor amount of potential foraging habitat. No significant residual impact considered likely
Chalinolobus dwyeri	Large-eared Pied Bat	Vulnerable	Assumed present based on minimal amount of potential foraging habitat impacted. **Further assessment required**	Removal of native vegetation which acts as foraging habitat	Removal of 0.39 ha of foraging habitat. No impacts to breeding habitat.	Removal of a minor amount of potential foraging habitat. No significant residual impact considered likely
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Minimal amount of potential foraging habitat impacted. **Further assessment required**	Removal of native vegetation which acts as foraging habitat	Removal of 1.24 ha of foraging habitat.	Removal of a minor amount of potential foraging habitat.

Species Name	Common Name	EPBC Act	Response	Nature	Quantum	Consequence
					No impacts to breeding habitat.	No significant residual impact considered likely
Phascolarctos cinereus	Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)	Endangered	Assumed present based on minimal amount of potential habitat impacted. **Further assessment required**	Removal of native vegetation which acts as habitat	Removal of 1.24 ha of potential habitat. No impacts to breeding habitat.	Removal of a minor amount of potential habitat. No significant residual impact considered likely
Aprasia parapulchella	Pink-tailed Legless Lizard	Vulnerable	Assumed present based on minimal amount of potential habitat impacted. **Further assessment required**	Removal of native vegetation which acts as habitat	Removal of 1.74 ha of potential habitat. No impacts to breeding habitat.	Removal of a minor amount of potential habitat. No significant residual impact considered likely
Thesium australe	Austral Toadflax	Vulnerable	Not identified by field surveys. The species will therefore not be affected by the project, and no further assessment required.	N/A	N/A	N/A
Dichanthium setosum	Bluegrass	Vulnerable	Not identified by field surveys. The species will therefore not be affected by the project, and no further assessment required.	N/A	N/A	N/A
Pomaderris cotoneaster	Cotoneaster Pomaderris	Endangered	Not identified by field surveys. The species will therefore not be affected by the project, and no further assessment required.	N/A	N/A	N/A
Euphrasia arguta	Euphrasia arguta	Critically Endangered	Not identified by field surveys. The species will therefore not be affected by the project, and no further assessment required.	N/A	N/A	N/A
Prasophyllum sp. *Wybong*	Prasophyllum sp. Wybong	Critically Endangered	Not identified by field surveys. The species will therefore not be affected by the project, and no further assessment required.	N/A	N/A	N/A
Prasophyllum petilum	Tarengo Leek Orchid	Endangered	Not identified by field surveys. The species will therefore not be affected by the project, and no further assessment required.	N/A	N/A	N/A

8.3.1. Significant Impact Criteria

8.3.1.1. White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

This community was identified throughout the majority of the Development site. It occurs as patches of remnant vegetation. The proposed development seeks to clear 1.24 ha of the community. The listing advice for this community outlines the known extent of this community across different regions in NSW, totalling 250,729 ha (TSSC 2006). The proposed removal of 1.24 ha of this community constitutes a reduction of 0.00010% of the known extent of this community in NSW.

Table 30: Significant Impact Criteria for White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

Impact Criteria	Response
An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:	
Reduce the extent of an ecological community	The project will reduce the extent of the ecological community by 1.24 ha which is approximately 0.00010% of the known extent of this community in NSW.
Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines	The project involves upgrades to existing roads and may include limb trimming and potential removal of remnant vegetation. Any clearing of this community in that manner will likely increase fragmentation of the ecological community, however this increase is likely to be minimal given it will occur along an existing road and is unlikely to impede any genetic transfer between retained patches.
Adversely affect habitat critical to the survival of an ecological community	The Recovery Plan for this community identifies that moderate to highly fertile soils of the western slopes of NSW are habitat critical to the survival of the community (DECCW NSW 2010). Given the currently highly fragmented and degraded state of this ecological community, all areas of Box-Gum Grassy Woodland which meet the minimum condition criteria are considered critical. The project will adversely affect habitat considered to be critical to the survival of the community, however it is unlikely to result in any substantial change to the community locally.
Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns	There are no proposed modifications to groundwater, or substantial alterations of surface water drainage patterns. Minimal subsurface activities are proposed. The project is unlikely to affect any abiotic processes necessary for the community's survival.
Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting	The project will remove 1.24 ha of the community; however it is unlikely to result in any substantial change to the community locally.
Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: – assisting invasive species, that are harmful to the listed ecological community, to become established, or – causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or	The project will not assist any invasive species, nor cause any increased mobilisation of fertilisers which would kill or inhibit the growth of species in the ecological community.
Interfere with the recovery of an ecological community.	The Recovery Plan for this species identifies several recovery actions that have been undertaken to date

Impact Criteria	Response
	(DECCW NSW 2010). There are no known recovery actions currently implemented in the study area (e.g. community engagement or private land conservation actions). The project will remove 1.24 ha of the community. There will be no interference of the capacity for recovery of this community outside of the development site, which will be managed under the current land management regimes.
Conclusion	Significant efforts have been made to avoid impacts to this community throughout the project design process. The project will only require the removal of 1.24 ha of this community. This small area requiring removal along an existing road is unlikely to lead to a significant impact.

8.3.1.2. Woodland Birds Critically- Regent Honeyeater (Anthochaera Phrygia), Swift Parrot (Lathamus discolor) and Gang-gang Cockatoo (Callocephalon fimbriatum)

Regent Honeyeater

The Regent Honeyeater is listed as Critically Endangered under the EPBC Act. The Regent Honeyeater is endemic to mainland south-east Australia. It has a patchy distribution which extends from south-east Queensland, through New South Wales (NSW) and the Australian Capital Territory (ACT), to central Victoria. However, it is highly mobile, occurring only irregularly in most sites, and in variable numbers, often with long periods with few observation anywhere. It is most commonly associated with box-ironbark eucalypt woodland and dry sclerophyll forest, but also inhabits riparian vegetation and lowland coastal forest. In addition it can be found in a range of other habitats including remnant trees in farmland, roadside reserves and travelling stock routes, and in planted vegetation in parks and gardens (DotE, 2016). In NSW, Regent Honeyeater important habitat is included in the Biodiversity Assessment Method (BAM) Important Areas mapping. The BAM Important Areas mapping identifies areas that are considered important for the species. For example, sites where multiple records have been located over multiple years.

There is suitable foraging habitat present within the Development site for this species, as a result a significant impact criteria assessment has been undertaken in Table 31 below.

Swift Parrot

The Swift Parrot is listed as Critically Endangered and Marine under the EPBC Act. The Swift Parrot is a small, fast-flying, nectivorous parrot which occurs throughout *Eucalypt* forests in southeastern Australia. The Swift Parrot plumage is bright green with patches of red on the throat, chin and face. Swift Parrots breed in Tasmania in the summer and migrate to the Australian mainland in autumn where they disperse across the landscape as far north as Queensland and as far west as South Australia in search of nectar and lerps in *Eucalypts* (DCCEEW 2024). In NSW, Swift Parrots have been found to preferentially forage on large, mature trees that provide more reliable foraging resources (DCCEEW 2024e). Along the NSW coastline Swift Parrots will forage on the nectar of *Eucalyptus robusta, Eucalyptus tereticornis, Eucalyptus pilularis* and *Corymbia maculata.* Swift Parrots continue to forage across the mainland until they return back to Tasmania in October to begin their breeding season. In NSW, Swift Parrot important habitat is included in the BAM Important Areas mapping. The BAM Important Areas mapping identifies areas that are considered important for the species. For example, sites where multiple records have been located over multiple years.

There is suitable foraging habitat present within the Development site for this species, as a result a significant impact criteria assessment has been undertaken in Table 31 below.

Gang-gang Cockatoo

Gang-gang Cockatoos are found in a wide variety of forests and woodlands throughout NSW, Victoria and the ACT. The species favours old growth forest for nesting and roosting, with nests generally located in hollows that are at least 7 cm in diameter and greater than 3 m above the ground.

There are no existing records of this species within the Coolah locality, however there are numerous records of the species near Ulan which is approximately 40 km south of the Development site. There is suitable breeding habitat present within the Development site and no targeted survey was undertaken for this species, as a result presence for this species was assumed under the BAM and a significant impact criteria assessment has been undertaken in Table 31 below.

Table 31: Significant impact criteria assessment for Woodland Birds

Criterion	Assessment
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility of the following:	
Lead to a long-term decrease in the size of the population	There is no previous evidence of an existing population within the assessment area or within close proximity to the assessment area for these three birds. The project involves the proposed removal of 1.24 ha of potential foraging habitat for Regent Honeyeater and Swift Parrot and trees that contain hollows with suitable characteristics for potential breeding sites for Gang-gang Cockatoo. This potential habitat is near the north-western extent of the Gang-gang Cockatoo range and not within mapped important areas for Regent Honeyeater and Swift Parrot. The minimal amount of clearing required is unlikely to lead to a long-term decrease in the size of these species' populations.
Reduce the area of occupancy of the species	The project involves the proposed removal of 1.24 ha of potential foraging habitat for all three species and approximately 5 trees that comprise suitable characteristics for potential breeding sites. While this proposed clearing will reduce the area of occupancy of these species the project is near the north-western extent of the Gang-gang Cockatoo range and includes minimal foraging resources along a disturbed roadside. The minimal amount of clearing required is unlikely to significantly reduce the area of occupancy for these three species.
Fragment an existing population into two or more populations	All three species are highly mobile species that forages throughout a wide variety of forest and woodland habitats. The project involves the clearing of remnant vegetation along an existing road and is therefore unlikely to fragment an existing population of these species.
Adversely affect habitat critical to the survival of a species	The Recovery Plan for the Regent Honeyeater states that any breeding or foraging habitat in areas where the species is likely to occur and any newly discovered breeding or foraging locations (DotE 2016). No Regent Honeyeater were identified during any of the survey effort as part of the Project. No breeding habitat will be impacted. It is not considered that 1.24 ha of roadside remnant vegetation is habitat critical to the survival of a species. The Recovery Plan for the Swift Parrot states that habitat critical to the survival includes: - Breeding and foraging habitat in Tasmania - Foraging habitat on the Australian mainland, including White Box (*E. albens*); Yellow Box (*E. melliodora*) Whilst the Development site does provide habitat critical to the survival of the species based on foraging habitat, it is not considered that 1.24 ha of roadside remnant vegetation is likely to significantly impact habitat critical to the survival of this species. The Gang-gang Cockatoo Conservation Advice (DAWE 2022) identified habitat critical to the survival of the species as all foraging habitat and stands of suitable hollow-bearing trees. While the project will adversely affect habitat critical to the survival of the species through the removal of 1.24 ha of potential foraging habitat and suitable hollow-bearing trees these impacts are unlikely to have a significant impact on the species due to their small scale across a highly disturbed and fragmented landscape.
Disrupt the breeding cycle of a population	Both Regent Honeyeater and Swift Parrot do not breed within close proximity to the Subject land. Suitable hollow bearing trees required for breeding were identified within the Development site during surveys. Targeted surveys were not undertaken during the breeding season to determine whether these suitable hollows contained active nests of the Gang-gang Cockatoo,

Criterion	Assessment
	however, the lack of existing species records within the locality and the extremely disturbed roadside nature of the Development site indicate that the suitable hollows are unlikely to be used for breeding by the species.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The project involves the proposed removal of 1.24 ha of potential foraging habitat for the species and trees that contain hollows with suitable characteristics for potential breeding sites for the Gang-gang Cockatoo. While the project will modify and remove potential habitat availability and quality the small scale of the impacts are unlikely to cause these species to 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	The removal and modification of 1.24 ha of disturbed roadside vegetation is not considered likely to lead to invasive species that are harmful to these species becoming established.
Introduce disease that may cause the species to decline, or	The project is unlikely to introduce disease into the region and cause these species to decline. A CEMP will be developed that addresses hygiene protocols during construction.
Interfere with the recovery of the species.	The potential foraging (Regent Honeyeater and Swift Parrot) and breeding habitat is located within the road easement of an existing road that is frequently used by large trucks and traffic. The Development site is unlikely to contain high quality habitat as compared to more intact and less disturbed high-quality habitats in reserves and national parks within the region. The minimal area of potential habitat requiring removal is unlikely to interfere with the recovery of these species.
Conclusion	While the project is proposing the removal of 1.24 ha of potential foraging habitat comprising suitable hollow-bearing trees for the Gang-gang Cockatoo, there is unlikely to be a significant impact to these three species given the minimal amount of clearing required along an existing highly disturbed roadside.

8.3.1.3. Koala (Phascolarctos cinereus)

The Koala is listed as Endangered under the EPBC Act. The Koala is endemic to Australia and has a broad but patchy distribution across coast and inland areas of eastern and southern Australia (DAWE 2022). In NSW the Koala is predominantly found along the coast with major populations in the northern coastal regions bordering southern Queensland. Koalas are specialist folivores and predominantly feed on the leaves of *Eucalyptus, Corymbia* and *Lophostemon* species. Across their range Koalas are associated with over 600 species of food and shelter trees. Within a given area only a few of the available *Eucalyptus* spp. will be preferentially browsed, while other species may be incorporated into the diet as supplementary food species. Key factors that influence the quality of habitat for Koalas are the presence and density of preferred food tree species, the nutritional value of the foliage on the food trees, availability of shelter trees and vegetation structure (DAWE 2022a).

The Koala is a semi-arboreal species that spends the majority of its life within the canopy but occasionally comes to ground to travel between trees and habitat patches. Mature females generally produce one offspring per year between October and May. The ability to disperse between habitat patches is critical for Koalas to maintain metapopulations (DAWE 2022a). Koalas have a highly variable home range that appears to vary based on the availability of resources and increase as the spaces between trees increases. Males typically have a larger home range than females.

Table 32: Significant impact criteria assessment for Koala

Criterion	Assessment
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility of the following:	
Lead to a long-term decrease in the size of the population	The Development site may provide potential foraging resources for the Koala and may be used for dispersal throughout the local landscape, given minimal vegetation exists in the wider locality as it is primarily used for large scale cropping and grazing. The proposed works involves the removal of 1.24 ha of potential foraging habitat for the Koala. The minimal amount of clearing required is unlikely to lead to a long-term decrease in the size of a population of Koala in the locality.
Reduce the area of occupancy of the species	The proposed works involves the removal of 1.24 ha of potential foraging habitat. While this proposed clearing will reduce the area of occupancy for this species, the vegetation includes minimal foraging resources along a disturbed roadside. The minimal amount of clearing required is unlikely to significantly reduce the area of occupancy for this species.
Fragment an existing population into two or more populations	The proposed works involves the clearing of remnant vegetation along an existing road and is therefore unlikely to fragment an existing population of this species.
Adversely affect habitat critical to the survival of a species	The proposed works will remove 1.24 ha of potential foraging habitat for this species. It is not considered that the vegetation within the road reserve provides breeding habitat, therefore, it is not considered critical to the survival of the species.
Disrupt the breeding cycle of a population	The project is unlikely to disrupt any breeding. No signs of any breeding individuals were observed during any surveys and the minimal habitat and degraded nature of the vegetation within the Subject land is not likely to provide breeding habitat.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposed works will remove 1.24 ha of potential foraging habitat for the species. While the works will modify and remove potential habitat availability, the small scale of the impacts are unlikely to cause this species to decline.

Criterion	Assessment
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the critically endangered or endangered species' habitat	The removal and modification of 1.24 ha of disturbed roadside vegetation is not considered likely to lead to invasive species that are harmful to this species becoming established.
Introduce disease that may cause the species to decline, or	The project is unlikely to introduce disease into the region and cause this species to decline. A CEMP will be developed that addresses hygiene protocols during construction.
Interfere with the recovery of the species.	The potential foraging habitat is located within the road easement of an existing road that is frequently used by large trucks and traffic. The Development site is unlikely to contain high quality habitat as compared to more intact and less disturbed high-quality habitats in reserves and national parks within the region. The minimal area of potential habitat requiring removal is unlikely to interfere with the recovery of this species.
Conclusion	While the project is proposing the removal of 1.24 ha of potential foraging habitat, there is unlikely to be a significant impact to this species given the minimal amount of clearing required along an existing highly disturbed roadside.

8.3.1.4. *Superb Parrot (Polytelis swainsonii)*

The Superb Parrot is found throughout eastern inland NSW with the species core range being west of the Great Dividing Range in NSW from Canberra, Goulburn and as far west as Nyngan and Swan Hill. There are three main breeding areas within NSW: an area of the south-west slopes around Molong and Yass; along the Murrumbidgee River; and along the Murray and Edwards Rivers (Commonwealth of Australia 2021). This species requires hollows greater than 5 cm diameter that are more than 4 m above the ground in a tree with a DBH greater than 30 cm.

There is one existing record of Superb Parrot just north of the Coolah township that was recorded in 2015. There are numerous scattered records of the species west of the Development site near Mendooran and Dunedoo. There is suitable breeding habitat present within the Development site and no targeted survey was undertaken for this species, as a result presence for this species was assumed under the BAM and a significant impact criteria assessment has been undertaken in Table 33 below.

Table 33: Significant impact criteria assessment for Superb Parrot

Criterion	Assessment
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility of the following:	
Lead to a long-term decrease in the size of an important population of a species	The project involves the proposed removal of 1.24 ha of potential foraging habitat for the species and 5 trees that contain hollows with suitable characteristics for potential breeding sites. The proposed impacts are unlikely to lead to a long-term decrease in the size of an important population of the species given that the potential foraging and breeding habitat proposed for removal is minimal and is contained within disturbed roadside vegetation.
Reduce the area of occupancy of an important population	The project involves the proposed removal of 1.24 ha of potential foraging habitat for the species and 5 trees that contain hollows with suitable characteristics for potential breeding sites. While this proposed clearing will reduce the area of occupancy of the species the minimal amount of clearing required is unlikely to significantly reduce the area of occupancy of the Superb Parrot.
Fragment an existing important population into two or more populations	Superb Parrots are a highly mobile species that forages throughout a wide variety of woodland habitats as well as cropped and semi-urban areas. The project involves the clearing of remnant vegetation along an existing road and is therefore unlikely to fragment an existing population of the species.
Adversely affect habitat critical to the survival of a species	According to the species recovery plan all foraging and breeding habitat is critical to the survival of the Superb Parrot (Commonwealth of Australia 2021). While the project will adversely affect habitat critical to the survival of the species through the removal of 1.24 ha of potential foraging habitat and suitable hollow-bearing trees these impacts are unlikely to have a significant impact on the species due to the small scale.
Disrupt the breeding cycle of an important population	According to the species recovery plan there are three main breeding areas within NSW: an area of the south-west slopes around Molong and Yass; along the Murrumbidgee River; and along the Murray and Edwards Rivers (Commonwealth of Australia 2021). This species requires hollows greater than 5 cm diameter that are more than 4 m above the ground in a tree with a DBH greater than 30 cm. While there are trees containing hollows that meet the specifications described above, the Development site is

Criterion	Assessment
	well outside the known breeding areas and is located along a highly disturbed roadside. The Development site is unlikely to act as a core breeding location to the species. Therefore, the project is unlikely to disrupt the breeding cycle of the Superb Parrot.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The project involves the proposed removal of 1.24 ha of potential foraging habitat for the species and trees that contain hollows with suitable characteristics for potential breeding sites. While the project will modify and remove potential habitat availability and quality the small scale of the impacts are unlikely to cause the species to decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The species conservation advice lists nest competition with invasive species (such as European Honeybees and Common Starling) and native species (such as Sulphur-crested Cockatoos and Eastern Rosellas) as a key threat to the species. Numerous competitor species have frequently been observed utilising hollows within the locality and further removal of suitable hollows has potential to increase competition with these species.
Introduce disease that may cause the species to decline, or	Superb Parrots are susceptible to psittacine beak and feather disease (PBFD) which is transmitted through feather dander, faeces and saliva. The project is unlikely to introduce PBFD into the region and cause the species to decline.
Interfere substantially with the recovery of the species.	The project contains habitat that is considered to be habitat critical to the survival of the Superb Parrot and involves the proposed removal of 1.24 ha of potential foraging habitat for the species and trees that contain hollows with suitable characteristics for potential breeding sites. However, the project is not located within a known area containing a breeding colony of the species and is located along a disturbed road easement frequently used by large trucks and traffic. The Development site is unlikely to contain high quality habitat as compared to more intact and less disturbed high-quality habitats in reserves and national parks within the region. The minimal area of potential habitat requiring removal is unlikely to interfere with the recovery of the species.
Conclusion	While the project is proposing the removal of 1.24 ha of potential foraging habitat and suitable hollow-bearing trees there is unlikely to be a significant impact to this species given the minimal amount of clearing required along an existing highly disturbed roadside.

8.3.1.5. Large-eared Pied Bat (Chalinolobus dwyeri)

This species was assumed present based on the 2km buffer from caves and clifflines as per the BAM. Should this species be present within the Development site is not considered to be an important population as described in *Matters of National Environmental Significance Significant impact guidelines 1.1* (Commonwealth of Australia, 2013) as:

- Individuals, if present would not be considered part of a key source population either for breeding or dispersal as no breeding habitat was identified within 100m of the Development site.
- The population is not near the limit of the species range.

However, there is suitable potential foraging habitat present within the Development site and no targeted survey was undertaken for this species, as a result presence for this species was assumed under the BAM and a significant impact criteria assessment has been undertaken in Table 34 below.

Table 34: Significant impact criteria assessment for Large-eared Pied Bat

Criterion	Assessment
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility of the following:	
Lead to a long-term decrease in the size of an important population of a species	The proposed road upgrades require the removal of 1.24 ha of potential foraging habitat for the species. The proposed impacts are unlikely to lead to a long-term decrease in the size of an important population of the species given that it is unlikely that an important population occurs, and the potential foraging habitat proposed for removal is minimal and is contained within disturbed roadside vegetation.
Reduce the area of occupancy of an important population	The proposed works involves the proposed removal of 1.24 ha of potential foraging habitat. While this proposed clearing will reduce the area of occupancy of the species the minimal amount of clearing required is unlikely to significantly reduce the area of occupancy for this highly mobile species or impact an important population.
Fragment an existing important population into two or more populations	Large-eared Pied Bat are a highly mobile species that forages throughout a wide variety of woodland habitats. The project involves the clearing of remnant vegetation along an existing road and is therefore unlikely to fragment an existing population of the species.
Adversely affect habitat critical to the survival of a species	According to the species recovery plan habitat is critical to the survival of the species includes diurnal roosts for shelter. Roosts are utilised during the day and also at night when not feeding and sandstone cliffs and fertile wooded valley habitat within close proximity of each other (DERM 2011). The minimal potential foraging habitat present within the Development site is not considered habitat critical to the survival of this species.
Disrupt the breeding cycle of an important population	The proposed works are unlikely to disrupt any breeding, as no breeding sites were identified.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The project involves the proposed removal of 1.24 ha of potential foraging habitat for the species. While the proposed works will modify and remove potential habitat availability and quality the small scale of the impacts are unlikely to cause the species to decline.

Criterion	Assessment
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The removal and modification of 1.24 ha of disturbed roadside vegetation is not considered likely to lead to invasive species that are harmful to these species becoming established.
Introduce disease that may cause the species to decline, or	The project is unlikely to introduce disease into the region and cause these species to decline. A CEMP will be developed that addresses hygiene protocols during construction.
Interfere substantially with the recovery of the species.	The potential foraging habitat is located within the road easement of an existing road that is frequently used by large trucks and traffic. The Development site is unlikely to contain high quality habitat as compared to more intact and less disturbed high-quality habitats in reserves and national parks within the region. The minimal area of potential habitat requiring removal is unlikely to interfere with the recovery of this species.
Conclusion	While the proposed works require the removal of 1.24 ha of potential foraging habitat, there is unlikely to be a significant impact to this species given the no impacts to breeding habitat will occur and a minimal amount of clearing is required along an existing highly disturbed roadside.

8.3.1.6. Grey-headed Flying-fox (Pteropus poliocephalus)

The Grey-headed Flying-fox is listed as Vulnerable under the EPBC Act and Vulnerable under the BC Act. Grey-headed Flying Fox are typically medium to dark grey with many light-tipped hairs with fur extending to the feet. Its defining feature is an orange or russet-coloured collar which encircles the neck. This species occupies the coastal lowlands and slopes of south-eastern Australia from Bundaberg to Geelong and inland NSW to the tablelands and western slopes. The Grey-headed Flying-fox is a highly mobile, partially migratory species with a distribution that is highly varied between seasons and years. The Grey-headed Flying-fox forms part of one single, interbreeding population. The species breeds once a year between October and December (DAWE 2021).

Grey-headed Flying-foxes typically roost in camps which are used as a daytime refuge. Camps are generally stable sites, however numbers and occupation can vary over time, depending on the availability of foraging resources within the locality (DAWE 2021).

This species primarily feeds on blossom and fruit in the canopy and will occasionally supplement this with leaves. This species tends to favour *Eucalyptus* sp., *Corymbia* sp., *Angophora* sp., *Melaleuca* sp., *Banksia* sp. and *Ficus* sp. and will migrate in response to flowering events and the availability of food. This species will forage between 20 km and 40 km in a feeding foray from a camp site, with most distances <20 km. Up to 20 km is considered the average foraging distance and has been used in this assessment (DAWE 2021).

Threats to the Grey-headed Flying-fox include loss of foraging and roosting habitat, competition with Black Flying-foxes, negative public attitude and conflict with humans, electrocution, entanglement in netting and on barbed-wire, climate change and disease (DAWE 2021).

There is suitable foraging habitat present within the Development site and no targeted survey was undertaken for this species, therefore a significant impact criteria assessment has been undertaken in Table 35 below.

Table 35: Significant impact criteria assessment for Grey-headed Flying-fox

Criterion	Assessment
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility of the following:	
Lead to a long-term decrease in the size of an important population of a species	The project involves the proposed removal of 1.24 ha of potential foraging habitat for the species. The proposed impacts are unlikely to lead to a long-term decrease in the size of an important population of the species given that the potential foraging habitat proposed for removal is minimal and is contained within disturbed roadside vegetation and no breeding camps will be impacted.
Reduce the area of occupancy of an important population	The project involves the proposed removal of 1.24 ha of potential foraging habitat for the species. While this proposed clearing will reduce the area of occupancy of the species the minimal amount of clearing required is unlikely to significantly reduce the area of occupancy for this highly mobile species.
Fragment an existing important population into two or more populations	Grey-headed Flying Foxes are a highly mobile species that forages throughout a wide variety of woodland habitats as well as cropped and semi-urban areas where feed resources are present. The proposed works involves the clearing of remnant vegetation along an existing road and is therefore unlikely to fragment an existing population of the species.

Criterion	Assessment
Adversely affect habitat critical to the survival of a species	The Development site contains 1.24 ha of potential foraging habitat. Actions that would adversely affect habitat critical to the survival of the species includes loss of foraging habitat, disturbance to camps and impacts of climate change. Loss of foraging habitat is relevant to this proposal. The Grey-headed Flying-fox is highly mobile and utilises a range of foraging resources within 20 km of camps. The foraging habitat in the Development site forms part of a wider network of resources that extend beyond the Subject land into the locality. While the project will adversely affect habitat critical to the survival of the species through the removal of 1.24 ha of potential foraging habitat, these impacts are unlikely to have a significant impact on the species due to the small scale of clearing proposed.
Disrupt the breeding cycle of an important population	No roosting habitat in the form of camps would be removed or disturbed for the Grey-headed Flying-fox.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The project involves the proposed removal of 1.24 ha of potential foraging habitat. While the project will modify and remove potential habitat availability and quality the small scale of the impacts are unlikely to cause the species to decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The major threats to the Grey-headed Flying-fox are related to vegetation clearance, camp disturbance, mortality in commercial fruit crops, heat stress, entanglement, climate change, bushfire, conflict with humans and electrocution. These threats are not associated with the increased presence of an invasive species. The proposed development is unlikely to result in invasive species becoming established in the Grey-headed Flying-fox habitat.
Introduce disease that may cause the species to decline, or	The Grey-headed Flying-fox is susceptible to Lyssavirus. Increases of the Lyssavirus typically occurs when a population is undergoing stress. The Development site would provide limited foraging habitat that would make up a mosaic of resources that would be utilised in the region. The habitat within the Development site would not provide the primary foraging resource, nor does the Subject land contain known camps for this species. The removal of 1.24 ha of foraging habitat is unlikely to cause a level of distress such that the Grey-headed Flying-fox is likely to decline.
Interfere substantially with the recovery of the species.	The proposed works are not located within a known area containing a breeding camp of the species and is located along a disturbed road easement frequently used by large trucks and traffic. The Development site is unlikely to contain high quality habitat as compared to more intact and less disturbed high-quality habitats in reserves and national parks within the region. The minimal area of potential habitat requiring removal is unlikely to interfere with the recovery of the species.
Conclusion	While the project is proposing the removal of 1.24 ha of potential foraging habitat there is unlikely to be a significant impact to this species given the minimal amount of clearing required along an existing highly disturbed roadside.

8.3.1.7. Pink-tailed Legless Lizard (Aprasia parapulchella)

The Pink-tailed Legless Lizard is primarily known from the Central and Southern Tablelands and the South Western Slopes, with a confirmed outlier record on the Hay Plains north of Hay. There is a concentration of populations in the Canberra/Queanbeyan Region. Other populations have been recorded near Cooma, Yass, Bathurst, Albury and West Wyalong (OEH 2023).

The Pink-tailed Legless Lizard's habitat includes primary and secondary grassland, grassy woodland and woodland communities, and the species usually inhabits sloping sites that contain rocky outcrops or scattered, partially buried rocks (Robertson and Heard 2008; Wong et al. 2011). These rocky habitats tend to be well-drained mid-slope or ridge-top sites with loosely embedded rocks on soil substrate with ant galleries present (TSCC 2015).

The habitat present within the Development site is considered marginal, and is not considered to provide the habitat requirements discussed above, however, as no targeted survey was undertaken for this species, presence for this species was assumed under the BAM and a significant impact criteria assessment has been undertaken in Table 36 below as a precautionary measure. Native vegetation within 50m of rocky areas within the Development site totals 1.74 ha.

Table 36: Significant impact criteria assessment for Pink-tailed Legless Lizard

Criterion	Assessment
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility of the following:	
Lead to a long-term decrease in the size of an important population of a species	The project involves the proposed removal of 1.74 ha of potential habitat, comprising both woodland and DNG zones considered likely to comprise small areas of rocky habitat. The proposed impacts are unlikely to lead to a long-term decrease in the size of an important population of the species given that the potential habitat proposed for removal is minimal and is contained within disturbed roadside vegetation.
Reduce the area of occupancy of an important population	It is not considered that the marginal habitat present within the Development site supports an important population of this species. A maximum of 1.74 ha of habitat, will require removal. While this proposed clearing will reduce the area of occupancy of potential marginal habitat, the minimal amount of clearing required is unlikely to significantly reduce the area of occupancy for this species.
Fragment an existing important population into two or more populations	The project involves the clearing of DNG and remnant vegetation along an existing road and is therefore unlikely to fragment an existing population of the species.
Adversely affect habitat critical to the survival of a species	There is no recovery plan for this species, however the Conservation advice states, "species usually inhabits sloping sites that contain rocky outcrops or scattered, partially buried rocks" (TSCC 2015). The habitat within the road reserve is highly degraded and unlikely to form habitat critical to the survival of the species.
Disrupt the breeding cycle of an important population	It is not considered that the vegetation within the Development site comprises habitat suitable for breeding, therefore, removal of 1.74 ha of degraded roadside habitat is not likely to disrupt the breeding cycle of an important population.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The project involves the proposed removal of 1.74 ha of potential habitat for the species. While the proposed works will modify and remove potential habitat availability and

Criterion	Assessment
	quality the small scale of the impacts are unlikely to cause the species to decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The removal and modification of 1.74 ha of disturbed roadside vegetation is not considered likely to lead to invasive species that are harmful to this species becoming established.
Introduce disease that may cause the species to decline, or	The project is unlikely to introduce disease into the region and cause these species to decline. A CEMP will be developed that addresses hygiene protocols during construction.
Interfere substantially with the recovery of the species.	The potential habitat is located within the road easement of an existing road that is frequently used by large trucks and traffic. The Development site is unlikely to contain high quality habitat as compared to more intact and less disturbed high-quality habitats in reserves and national parks within the region. The minimal area of potential habitat requiring removal is unlikely to interfere with the recovery of this species.
Conclusion	While the proposed works require the removal of 1.74 ha of potential habitat, there is unlikely to be a significant impact to this species and a minimal amount of clearing is required along an existing highly disturbed roadside.

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Appendix A: Definitions

The following terminology has been used throughout this report for the purposes of describing the impacts of the proposal in the context of a biodiversity assessment in accordance with the NSW Biodiversity Assessment Method 2020. This terminology may or may not align with other technical documents associated with the proposed development.

Terminology	Definition
Biodiversity credit report	The report produced by the Credit Calculator that sets out the number and class of biodiversity credits required to offset the remaining adverse impacts on biodiversity values at a development site, or on land to be biodiversity certified, or that sets out the number and class of biodiversity credits that are created at a biodiversity stewardship site.
BioNet Atlas	The BioNet Atlas (formerly known as the NSW Wildlife Atlas) is the OEH database of flora and fauna records. The Atlas contains records of plants, mammals, birds, reptiles, amphibians, some fungi, some invertebrates (such as insects and snails) and some fish
Broad condition state:	Areas of the same PCT that are in relatively homogenous condition. Broad condition is used for stratifying areas of the same PCT into a vegetation zone for the purpose of determining the vegetation integrity score.
Connectivity	The measure of the degree to which an area(s) of native vegetation is linked with other areas of vegetation.
Credit Calculator	The computer program that provides decision support to assessors and proponents by applying the BAM, and which calculates the number and class of biodiversity credits required to offset the impacts of a development or created at a biodiversity stewardship site.
Development	Has the same meaning as development at section 4 of the EP&A Act, or an activity in Part 5 of the EP&A Act. It also includes development as defined in section 115T of the EP&A Act.
Development footprint	The area of land that is directly impacted on by a proposed development, including access roads, and areas used to store construction materials.
Development site	An area of land that is subject to a proposed development that is under the EP&A Act.
Ecosystem credits	A measurement of the value of EECs, CEECs and threatened species habitat for species that can be reliably predicted to occur with a PCT. Ecosystem credits measure the loss in biodiversity values at a development site and the gain in biodiversity values at a biodiversity stewardship site.
Extent of occurrence (EOO)	Measures the spatial spread of a taxon to determine the degree to which risks from threatening factors could impact an entire population, and is not intended to be an estimate of the amount of occupied or potential habitat.
High threat exotic plant cover	Plant cover composed of vascular plants not native to Australia that if not controlled will invade and outcompete native plant species.
Hollow bearing tree	A living or dead tree that has at least one hollow. A tree is considered to contain a hollow if: (a) the entrance can be seen; (b) the minimum entrance width is at least 5 cm; (c) the hollow appears to have depth (i.e. you cannot see solid wood beyond the entrance); (d) the hollow is at least 1 m above the ground. Trees must be examined from all angles.
Important wetland	A wetland that is listed in the Directory of Important Wetlands of Australia (DIWA) and SEPP 14 Coastal Wetlands
Linear shaped development	Development that is generally narrow in width and extends across the landscape for a distance greater than 3.5 kilometres in length
Local population	The population that occurs in the study area. In cases where multiple populations occur in the study area or a population occupies part of the study area, impacts on each subpopulation must be assessed separately.
Local wetland	Any wetland that is not identified as an important wetland (refer to definition of Important wetland).
NSW (Mitchell) landscape	Landscapes with relatively homogeneous geomorphology, soils and broad vegetation types, mapped at a scale of 1:250,000.

Terminology	Definition
Multiple fragmentation impact development	Developments such as wind farms and coal seam gas extraction that require multiple extraction points (wells) or turbines and a network of associated development including roads, tracks, gathering systems/flow lines, transmission lines
Operational Manual	The Operational Manual published from time to time by DPIE, which is a guide to assist assessors when using the BAM
Patch size	An area of intact native vegetation that: a) occurs on the development site or biodiversity stewardship site, and b) includes native vegetation that has a gap of less than 100 m from the next area of native vegetation (or ≤30 m for non-woody ecosystems). Patch size may extend onto adjoining land that is not part of the development site or stewardship site..
Proponent	A person who intends to apply for consent to carry out development or for approval for an activity.
Reference sites	The relatively unmodified sites that are assessed to obtain local benchmark information when benchmarks in the Vegetation Benchmarks Database are too broad or otherwise incorrect for the PCT and/or local situation. Benchmarks can also be obtained from published sources.
Regeneration	The proportion of over-storey species characteristic of the PCT that are naturally regenerating and have a diameter at breast height <5 cm within a vegetation zone.
Residual impact	An impact on biodiversity values after all reasonable measures have been taken to avoid, minimise or mitigate the impacts of development. Under the BAM, an offset requirement is determined for the remaining impacts on biodiversity values.
Retirement of credits	The purchase and retirement of biodiversity credits from an already-established biobank site or a biodiversity stewardship site secured by a biodiversity stewardship agreement.
Riparian buffer	Riparian buffers applied to water bodies in accordance with the BAM
Sensitive biodiversity values land map	Development within an area identified on the map requires assessment using the BAM.
Site attributes	The matters assessed to determine vegetation integrity. They include: native plant species richness, native over-storey cover, native mid-storey cover, native ground cover (grasses), native ground cover (shrubs), native ground cover (other), exotic plant cover (as a percentage of total ground and mid-storey cover), number of trees with hollows, proportion of over-storey species occurring as regeneration, and total length of fallen logs.
Site-based development	a development other than a linear shaped development, or a multiple fragmentation impact development
Species credits	The class of biodiversity credits created or required for the impact on threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. Species that require species credits are listed in the Threatened Biodiversity Data Collection.
Subject land	Is land to which the BAM is applied in Stage 1 to assess the biodiversity values of the land. It includes land that may be a development site, clearing site, proposed for biodiversity certification or land that is proposed for a biodiversity stewardship agreement.
Threatened Biodiversity Data Collection	Part of the BioNet database, published by DPIE and accessible from the BioNet website.
Threatened species	Critically Endangered, Endangered or Vulnerable threatened species as defined by Schedule 1 of the BC Act, or any additional threatened species listed under Part 13 of the EPBC Act as Critically Endangered, Endangered or Vulnerable.
Vegetation Benchmarks Database	A database of benchmarks for vegetation classes and some PCTs. The Vegetation Benchmarks Database is published by OEH and is part of the BioNet Vegetation Classification.
Vegetation zone	A relatively homogenous area of native vegetation on a development site, land to be biodiversity certified or a biodiversity stewardship site that is the same PCT and broad condition state.
Wetland	An area of land that is wet by surface water or ground water, or both, for long enough periods that the plants and animals in it are adapted to, and depend on, moist conditions

Terminology	Definition
	for at least part of their life cycle. Wetlands may exhibit wet and dry phases and may be wet permanently, cyclically or intermittently with fresh, brackish or saline water
Woody native vegetation	Native vegetation that contains an over-storey and/or mid-storey that predominantly consists of trees and/or shrubs

Appendix B: Vegetation Floristic Plot Data

Vegetation Zone 1: PCT 281 DNG – Plot 3

Scientific name	Common name	Exotic	HTW	Cover	Abundance
Aristida ramosa	Purple Wiregrass			0.5	100
Asperula conferta	Common Woodruff			0.1	50
Avena spp.	Oats	*		20	2000
Brassica rapa subsp. *campestris*	Turnip	*		1	50
Bromus catharticus	Praire Grass	*		5	1000
Bromus molliformis	Soft Brome	*		2	500
Catharanthus spp.	Catharanthus spp.	*		0.1	5
Convolvulus erubescens	Pink Bindweed			0.1	5
Echium plantagineum	Patterson's Curse	*		0.1	10
Einadia hastata	Berry Saltbush			0.1	100
Einadia nutans subsp. *nutans*	Climbing Saltbush			0.1	100
Eragrostis curvula	African Lovegrass	*	1	10	500
Foeniculum vulgare	Fennel	*		5	100
Glycine tabacina	Variable Glycine			0.1	5
Hypochaeris radicata	Catsear	*		0.1	5
Lolium rigidum	Wimmera Ryegrass	*		2	500
Lomandra filiformis subsp. *filiformis*	Lomandra filiformis subsp. filiformis			0.1	1
Marrubium vulgare	White Horehound	*		5	500
Medicago sativa	Lucerne	*		3	500
Modiola caroliniana	Red-flowered Mallow	*		0.1	10
Paspalum mandiocanum	Broadleaf Paspalum	*	1	5	500
Petrorhagia dubia	Petrorhagia dubia	*		0.1	20
Plantago lanceolata	Lamb's Tongues	*		1	100
Silybum marianum	Variegated Thistle	*		0.5	20
Trifolium angustifolium	Narrow-leaved Clover	*		5	500
Trifolium campestre	Hop Clover	*		1	500
Verbena bonariensis	Purpletop	*		0.1	5
Wahlenbergia communis	Tufted Bluebell			0.1	5

Vegetation Zone 2: PCT 281 Moderate – Plot 2

Scientific name	Common name	Exotic	HTW	Cover	Abundance
Arthropodium milleflorum	Pale Vanilla-lily			0.1	5
Austrostipa scabra subsp. *scabra*	Rough Speargrass			2	500
Austrostipa verticillata	Slender Bamboo Grass			1	100
Avena spp.	Oats	*		15	2000
Bromus catharticus	Praire Grass	*		5	500
Bromus molliformis	Soft Brome	*		1	100
Calotis lappulacea	Yellow Burr-daisy			0.1	50

Scientific name	Common name	Exotic	HTW	Cover	Abundance
Echium plantagineum	Patterson's Curse	*		0.1	10
Einadia hastata	Berry Saltbush			2	500
Einadia nutans subsp. *nutans*	Climbing Saltbush			1	500
Eragrostis curvula	African Lovegrass	*	1	10	1000
Eremophila debilis	Amulla			0.5	100
Eucalyptus blakelyi	Blakely's Red Gum			5	1
Eucalyptus crebra	Narrow-leaved Ironbark			0.1	2
Eucalyptus melliodora	Yellow Box			20	3
Glycine tabacina	Variable Glycine			0.1	100
Lepidium africanum	Common Peppercress	*		0.1	20
Lolium rigidum	Wimmera Ryegrass	*		2	500
Lomandra multiflora subsp. *multiflora*	Many-flowered Mat-rush			0.1	20
Marrubium vulgare	White Horehound	*		20	500
Medicago sativa	Lucerne	*		0.1	50
Plantago lanceolata	Lamb's Tongues	*		0.1	100
Sida corrugata	Corrugated Sida			0.1	100
Solanum nigrum	Black-berry Nightshade	*		0.1	5
Trifolium arvense	Haresfoot Clover	*		1	500
Verbena bonariensis	Purpletop	*		0.1	5
Wahlenbergia communis	Tufted Bluebell			0.1	10

Vegetation Zone 2: PCT 281 Moderate – Plot 4

Scientific name	Common name	Exotic	HTW	Cover	Abundance
Aristida ramosa	Purple Wiregrass			0.5	100
Austrostipa verticillata	Slender Bamboo Grass			1	50
Avena spp.	Oats	*		15	1000
Brachychiton populneus subsp. *populneus*	Brachychiton populneus subsp. populneus			0.5	1
Bromus catharticus	Praire Grass	*		15	1000
Calotis lappulacea	Yellow Burr-daisy			0.1	100
Cenchrus pennisetiformis	Buffel Grass	*	1	20	1000
Dianella longifolia var. longifolia	Dianella longifolia var. longifolia			0.1	1
Echium plantagineum	Patterson's Curse	*		0.1	20
Einadia nutans subsp. nutans	Climbing Saltbush			0.1	50
Eragrostis curvula	African Lovegrass	*	1	10	500
Eucalyptus blakelyi	Blakely's Red Gum			25	5
Festuca spp.	Festuca spp.			10	500
Foeniculum vulgare	Fennel	*		1	20
Grevillea spp.	Grevillea spp.			1	10
Lolium rigidum	Wimmera Ryegrass	*		5	1000
Medicago sativa	Lucerne	*		1	500
Melia azedarach	White Cedar			1	2

Scientific name	Common name	Exotic	HTW	Cover	Abundance
Petrorhagia dubia	Petrorhagia dubia	*		0.1	10
Plantago lanceolata	Lamb's Tongues	*		0.5	500
Trifolium arvense	Haresfoot Clover	*		1	500
Verbena bonariensis	Purpletop	*		0.1	10
Wahlenbergia communis	Tufted Bluebell			0.1	5

Vegetation Zone 2: PCT 281 Moderate – Plot 6

Scientific name	Common name	Exotic	HTW	Cover	Abundance
Acacia implexa	Hickory Wattle			3	50
Aristida ramosa	Purple Wiregrass			2	500
Austrostipa aristiglumis	Plains Grass			5	100
Brachychiton populneus subsp. *populneus*	Kurrajong			0.1	1
Calotis lappulacea	Yellow Burr-daisy			0.2	100
Cassinia sifton	Cassinia sifton			0.1	1
Convolvulus erubescens	Pink Bindweed			0.1	5
Desmodium brachypodum	Large Tick-trefoil			0.1	1
Dianella longifolia var. *longifolia*	Dianella longifolia var. longifolia			0.1	20
Dichondra repens	Kidney Weed			0.2	500
Einadia nutans subsp. *nutans*	Climbing Saltbush			0.2	100
Eragrostis curvula	African Lovegrass	*	1	20	2000
Erodium cicutarium	Common Crowfoot	*		0.1	50
Eucalyptus albens	White Box			35	15
Euchiton sphaericus	Star Cudweed			0.1	20
Geranium solanderi var. *solanderi*	Geranium solanderi var. solanderi			0.1	500
Glycine tabacina	Variable Glycine			0.1	50
Hydrocotyle laxiflora	Stinking Pennywort			0.1	100
Hypericum perforatum	St. Johns Wort	*	1	0.1	50
Lolium rigidum	Wimmera Ryegrass	*		20	2000
Lomandra multiflora subsp. *multiflora*	Many-flowered Mat-rush			0.1	5
Medicago sativa	Lucerne	*		1	100
Petrorhagia dubia	Petrorhagia dubia	*		0.1	20
Tricoryne elatior	Yellow Autumn-lily			0.1	1
Trifolium angustifolium	Narrow-leaved Clover	*		1	500
Plantago lanceolata	Lamb's Tongues	*		0.5	500
Trifolium campestre	Hop Clover	*		0.1	50
Trifolium arvense	Haresfoot Clover	*		1	500
Vicia sativa subsp. *sativa*	Vicia sativa subsp. sativa	*		0.1	50
Verbena bonariensis	Purpletop	*		0.1	20
Wahlenbergia communis	Tufted Bluebell			0.1	10

Exotic grassland – Plot 1

Scientific name	Common name	Exotic	HTW	Cover	Abundance
Avena spp.	Oats	*		20	2000
Brassica rapa subsp. campestris	Turnip	*		0.1	5
Briza minor	Shivery Grass	*		0.2	100
Bromus catharticus	Praire Grass	*		5	500
Bromus molliformis	Soft Brome	*		5	500
Cenchrus pennisetiformis	Buffel Grass	*	1	10	1000
Cyperus aggregatus	Cyperus aggregatus	*		0.1	100
Daucus carota	Wild Carrot	*		0.1	5
Echium plantagineum	Patterson's Curse	*		0.5	50
Eragrostis curvula	African Lovegrass	*	1	0.5	100
Foeniculum vulgare	Fennel	*		1	50
Galenia pubescens	Galenia	*	1	0.1	5
Lolium rigidum	Wimmera Ryegrass	*		1	1000
Lysimachia arvensis	Scarlet Pimpernel	*		2	500
Marrubium vulgare	White Horehound	*		0.1	2
Medicago sativa	Lucerne	*		0.2	100
Paspalum mandiocanum	Broadleaf Paspalum	*	1	5	500
Phalaris aquatica	Phalaris	*		0.1	20
Plantago lanceolata	Lamb's Tongues	*		0.5	500
Silybum marianum	Variegated Thistle	*		0.1	10
Solanum nigrum	Black-berry Nightshade	*		0.2	100
Trifolium arvense	Haresfoot Clover	*		5	1000
Trifolium repens	White Clover	*		0.1	50
Verbena bonariensis	Purpletop	*		0.2	50

Exotic grassland – Plot 5

Scientific name	Common name	Exotic	HTW	Cover	Abundance
Avena spp.	Oats	*		25	2000
Brassica rapa subsp. *campestris*	Turnip	*		0.5	50
Bromus catharticus	Praire Grass	*		10	1000
Bromus molliformis	Soft Brome	*		1	100
Daucus carota	Wild Carrot	*		1	500
Echium plantagineum	Patterson's Curse	*		0.1	10
Hirschfeldia incana	Buchan Weed	*		0.5	50
Hypochaeris radicata	Catsear	*		0.1	10
Lactuca serriola f. serriola	Prickly Lettuce	*		0.5	500
Lolium rigidum	Wimmera Ryegrass	*		5	500
Medicago sativa	Lucerne	*		10	1000
Modiola caroliniana	Red-flowered Mallow	*		1	100
Paspalum mandiocanum	Broadleaf Paspalum	*	1	1	100
Plantago lanceolata	Lamb's Tongues	*		0.1	20

Scientific name	Common name	Exotic	HTW	Cover	Abundance
Rumex crispus	Curled Dock	*		0.5	50
Silybum marianum	Variegated Thistle	*		10	100
Trifolium campestre	Hop Clover	*		1	500
Verbena bonariensis	Purpletop	*		0.1	10
Vicia sativa subsp. *sativa*	Vicia sativa subsp. sativa	*		5	100

Exotic grassland – Plot 9

Scientific name	Common name	Exotic	HTW	Cover	Abundance
Avena spp.	Oats	*		30	2000
Bromus catharticus	Praire Grass	*		10	1000
Bromus molliformis	Soft Brome	*		1	100
Eragrostis curvula	African Lovegrass	*	1	5	100
Foeniculum vulgare	Fennel	*		0.1	2
Hordeum spp.	Hordeum spp.	*		1	100
Hypochaeris radicata	Catsear	*		0.1	50
Lactuca serriola f. serriola	Prickly Lettuce	*		0.1	20
Lolium rigidum	Wimmera Ryegrass	*		20	2000
Paronychia brasiliana	Chilean Whitlow Wort	*		1	500
Paspalum mandiocanum	Broadleaf Paspalum	*	1	1	100
Petrorhagia dubia	Petrorhagia dubia	*		0.5	500
Plantago lanceolata	Lamb's Tongues	*		5	100
Rumex crispus	Curled Dock	*		0.1	5
Sonchus oleraceus	Common Sowthistle	*		0.1	10
Trifolium arvense	Haresfoot Clover	*		1	100
Trifolium campestre	Hop Clover	*		1	100
Trifolium repens	White Clover	*		0.1	10
Verbena bonariensis	Purpletop	*		0.1	5

Exotic grassland – Plot 10

Scientific name	Common name	Exotic	HTW	Cover	Abundance
Avena spp.	Oats	*		40	2000
Bromus catharticus	Praire Grass	*		40	2000
Bromus molliformis	Soft Brome	*		5	1000
Centaurea solstitialis	St Barnabys Thistle	*		0.1	
Daucus carota	Wild Carrot	*		0.1	20
Foeniculum vulgare	Fennel	*		10	100
Marrubium vulgare	White Horehound	*		0.1	5
Medicago sativa	Lucerne	*		2	500
Paspalum mandiocanum	Broadleaf Paspalum	*	1	1	50
Tragopogon porrifolius subsp. *porrifolius*	Salsify	*		0.1	1
Trifolium arvense	Haresfoot Clover	*		1	100

Scientific name	Common name	Exotic	HTW	Cover	Abundance
Verbena bonariensis	Purpletop	*		0.1	10
Vicia sativa subsp. *sativa*	Vicia sativa subsp. sativa	*		1	100

Exotic grassland – Plot 11

Scientific name	Common name	Exotic	HTW	Cover	Abundance
Avena spp.	Oats	*		30	2000
Bromus catharticus	Praire Grass	*		20	2000
Bromus molliformis	Soft Brome	*		5	1000
Eragrostis curvula	African Lovegrass	*	1	1	100
Festuca spp.	Festuca spp.			2	100
Foeniculum vulgare	Fennel	*		1	100
Lolium rigidum	Wimmera Ryegrass	*		5	1000
Medicago sativa	Lucerne	*		5	500
Paspalum mandiocanum	Broadleaf Paspalum	*	1	30	500
Plantago lanceolata	Lamb's Tongues	*		1	100
Tragopogon porrifolius subsp. *porrifolius*	Salsify	*		0.1	10
Trifolium angustifolium	Narrow-leaved Clover	*		1	500
Trifolium arvense	Haresfoot Clover	*		1	500
Trifolium campestre	Hop Clover	*		1	500
Trifolium repens	White Clover	*		2	500
Verbena bonariensis	Purpletop	*		0.1	50
Vicia sativa subsp. *sativa*	Vicia sativa subsp. sativa	*		2	100

Appendix C: Vegetation Integrity Plot Data

Veg Zone	Plot	PCT	Area	Condition	Zone	Longitude	Latitude	Bearing
1	3	281	1.93	DNG	55	149.5115803	-32.01753471	213
2	2	281	1.24	Moderate	55	149.5087687	-32.01970757	212
2	4	281	1.24	Moderate	55	149.5440101	-32.01445798	254
2	6	281	1.24	Moderate	55	149.6867785	-31.89830884	12
-	1	Exotic	12.79	Exotic grassland	55	149.4977216	-32.02791353	196
-	5	Exotic	12.79	Exotic grassland	55	149.6426639	-31.96112386	175
-	9	Exotic	12.79	Exotic grassland	55	149.5888147	-31.99004982	20
-	10	Exotic	12.79	Exotic grassland	55	149.6001652	-31.98275944	20
-	11	Exotic	12.79	Exotic grassland	55	149.6925984	-31.87945597	4

Veg zone	Plot	Composition						Structure					
		Tree	Shrub	Grass	Forbs	Ferns	Other	Tree	Shrub	Grass	Forbs	Ferns	Other
1	3	0	0	2	4	0	2	0.0	0.0	0.6	0.4	0.0	0.2
2	2	3	1	3	6	0	1	25.1	0.5	3.1	3.4	0.0	0.1
2	4	3	1	3	4	0	0	26.5	1.0	11.5	0.4	0.0	0.0
2	6	2	1	4	9	0	3	35.1	3.0	12.1	1.2	0.0	0.3
-	1	0	0	1	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
-	5	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
-	9	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
-	10	0	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0
-	11	0	0	2	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0

Veg zone	Plot	Functional										
		Large Trees	HBTs	Litter	Fallen Logs	Stem 5 to 9	Stem 10 to 19	Stem 20 to 29	Stem 30 to 49	Stem 50 to 79	Regen	High Threat Weed
1	3	0	0	52	0	0	0	0	0	0	0	15.0
2	2	7	7	50	8	1	1	1	1	1	1	10.0
2	4	3	0	69	0	1	1	1	1	1	1	30.0
2	6	3	2	65	10	1	1	1	1	1	1	20.1
-	1	0	0	42	0	0	0	0	0	0	0	15.6
-	5	0	0	38	0	0	0	0	0	0	0	1.0
-	9	0	0	22	0	0	0	0	0	0	0	6.0
-	10	0	0	16	0	0	0	0	0	0	0	1.0
-	11	0	0	18	0	0	0	0	0	0	0	31.0

Appendix D: Site Map Series

Appendix E: PCT & Vegetation Zone Map Series

Appendix F: Targeted Flora Survey Effort Map Series

Appendix G: Ecosystem and Species polygons Map Series

Appendix H: Impacts requiring offset, impacts not requiring offset, and impacts not assessed Map Series

Appendix I: Candidate Threatened Fauna Species

Appendix J: Predicted Ecosystem Credit Species

Appendix K: Biodiversity credit report

Attachment 4: Addendum Aboriginal Archaeology and Cultural Heritage Assessment Report

View southwest of Moorefield Road and the surrounding landscape.

ADDENDUM ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT

VALLEY OF THE WINDS WIND FARM – UPGRADES TO MOOREFIELD ROAD AND BLACK STUMP WAY

COOLAH NSW

NOVEMBER 2024

Report prepared by

OzArk Environment & Heritage for ACEN Australia

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ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT COVER SHEET

Report Title	Addendum Aboriginal Cultural Heritage Assessment Report: Valley of the Winds Wind Farm – Upgrades to Moorefield Road and Black Stump Way, Coolah NSW.
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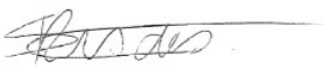

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Acknowledgement

OzArk acknowledge the traditional custodians of the area on which this assessment took place and pay respect to their beliefs, cultural heritage, and continuing connection with the land. We also acknowledge and pay respect to the post-contact experiences of Aboriginal people with attachment to the area and to the Elders, past and present, as the next generation of role models and vessels for memories, traditions, culture and hopes of local Aboriginal people.

ABBREVIATIONS AND GLOSSARY

ACHMP	Aboriginal Cultural Heritage Management Plan. An ACHMP is a statutory document that details the management of Aboriginal cultural values associated with the project.
ACHAR	Aboriginal Cultural Heritage Assessment Report. As set out in the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*, all developments where harm to Aboriginal objects is likely must be assessed in an ACHAR.
ACHCRs	*Aboriginal Cultural Heritage Consultation Requirements for Proponents.* Guidelines for conducting Aboriginal community consultation for developments where harm to Aboriginal objects is likely.
AHIMS	Aboriginal Heritage Information Management System. AHIMS is the central register of all Aboriginal sites within NSW.
Code of Practice	*Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* under Part 6 NPW Act. Issued by DECCW in 2010, the Code of Practice is a set of guidelines that allows limited test excavation without the need to apply for an AHIP.
DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water. DCCEEW contains the Environment and Heritage Group including Heritage NSW.
DPHI	NSW Department of Planning, Housing and Infrastructure. DPHI contains the Planning agency.
EIS	Environmental Impact Statement. A required document for major projects documenting all potential impacts to the environment, including heritage, that may arise due to the development.
GSE	Ground surface exposure. A measure of factors that may reveal surface artefacts such as erosion scalds.
GSV	Ground surface visibility. A measure of factors that may obscure the detection of surface artefacts such as leaf litter.
Heritage NSW	Government department tasked with ensuring compliance with the NPW Act. Heritage NSW is advised by the Aboriginal Cultural Heritage Advisory Committee (ACHAC).
LALC	Local Aboriginal Land Council

NPW Act	*National Parks and Wildlife Act 1974*. Primary legislation governing Aboriginal cultural heritage within NSW.
OzArk	OzArk Environment & Heritage Pty Ltd.
PAD	Potential archaeological deposit. Indicates that a particular location has potential to contain subsurface archaeological deposits, although no Aboriginal objects may be visible.
RAP	Registered Aboriginal Party. An individual or group who have indicated through the ACHCR process that they wish to be consulted regarding the project.
The Guide	*The Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW*.
TU	Test unit. Usually measuring 50 x 50 cm, TUs are a standard excavation square size used in the test excavation phase of an investigation.

EXECUTIVE SUMMARY

OzArk Environment & Heritage (OzArk) has been engaged Ramboll Australia Pty Ltd on behalf of ACEN Australia (the proponent) to complete an addendum Aboriginal Cultural Heritage Assessment Report (ACHAR) for the Valley of the Winds Wind Farm project (the project). The addendum ACHAR relates to upgrade works to Moorefield Road and Black Stump Way which will provide access to the project. This addendum ACHAR should be read in conjunction with the ACHAR (*Aboriginal Cultural Heritage Assessment Report: Valley of the Winds Wind Farm*. OzArk 2023). The project is located south of Coolah, NSW, in the Warrumbungle Shire Council Local Government Area.

The addendum study area consists of approximately 28 kilometres (km) of Black Stump Way, extending north from the intersection with the Golden Highway. Additionally, 4 km of Moorefield Road requires assessment from the intersection of Black Stump Way extending east towards the Girragulang Road cluster of the project.

Most of the addendum study area is comprised of low gradient slopes, however, a small section of floodplain is also present. The study area along Black Stump Way is intersected by the Coolaburragundy River and several additional ephemeral drainage lines.

A search of the Aboriginal Heritage Information Management System (AHIMS) database returned 118 records for Aboriginal heritage sites within the designated search area and one within the addendum study area.

The pedestrian survey was able to confirm that the culturally modified tree, DTG/ST27 - Naturi (AHIMS ID# 28-6-0031) which currently plots within the road corridor at the intersection of Moorfield Road and Black Stump Way on the AHIMS database is actually located 50 metres to the north and outside of the road corridor.

Another culturally modified tree, Leadville; (AHIMS ID# 36-3-0084) also plots incorrectly on the AHIMS database; however, the site card notes that the site should be within the road corridor of Black Stump Way. During the pedestrian survey it was confirmed that the site is in fact located within the road corridor.

36-3-0084 (Leadville;) is located within the Black Stump Way road corridor where road upgrades are currently proposed. No ground disturbing works should be conducted within the dripline of the tree as this may cause inadvertent harm to the site. However, proposed works which will not disturb the existing ground surface such as building up the road surface can be conducted within the dripline of the tree as no damage to the ground surface should occur.

The location of the tree should be provided to contractors prior to the commencement of works.

No test excavation is required at the site as no PAD has been identified in association with the landforms which surround the site.

Under Section 89A of the *National Parks and Wildlife Act 1974* (NPW Act) it is mandatory that all newly recorded Aboriginal sites be registered with AHIMS. As a professional in the field of cultural heritage management it is the responsibility of OzArk to ensure this process is undertaken.

The following recommendations are made in addition to those contained in the ACHAR (*Aboriginal Cultural Heritage Assessment Report: Valley of the Winds Wind Farm*. OzArk 2023) and are based on the potential harm caused by the project to Aboriginal cultural values and with regard to:

- Legal requirements under the terms of the NPW Act whereby it is illegal to damage, deface or destroy an Aboriginal place or object without the prior written consent of Heritage NSW
- The findings of the current investigations undertaken within the addendum study area
- The interests of the Aboriginal community.

Recommendations concerning Aboriginal cultural values within the addendum study area are as follows:

1. Following granting of development consent for the project, the proponent will be required to develop an Aboriginal Cultural Heritage Management Plan (ACHMP) as per the Conditions of Approval. The ACHMP must be developed in consultation with the Registered Aboriginal Parties and the NSW Department of Planning, Housing and Infrastructure (DPHI) (with input from Heritage NSW). The ACHMP will include an unanticipated finds protocol, unanticipated skeletal remains protocol, requirements for inductions, and long-term management of the Aboriginal sites for the entire project, including the addendum study area. The ACHMP must be approved by the DPHI prior to construction activities occurring within the project area that will include the addendum study area.
2. Harm to Aboriginal site 36-3-0084 (Leadville;), located within the addendum study area of the project, should be avoided in accordance with the management measures set out in **Section 6**.
3. The location of site 36-3-0084 (Leadville;), will be shown on all appropriate plans to ensure that it is not inadvertently harmed during the construction phase of the project.
4. All land-disturbing activities must be confined to within the project's development footprint and access road upgrades. Should the parameters of the proposed work extend beyond this, then further archaeological assessment will be required.

CONTENTS

FIGURES

TABLES

1 INTRODUCTION

1.1 FOREWORD

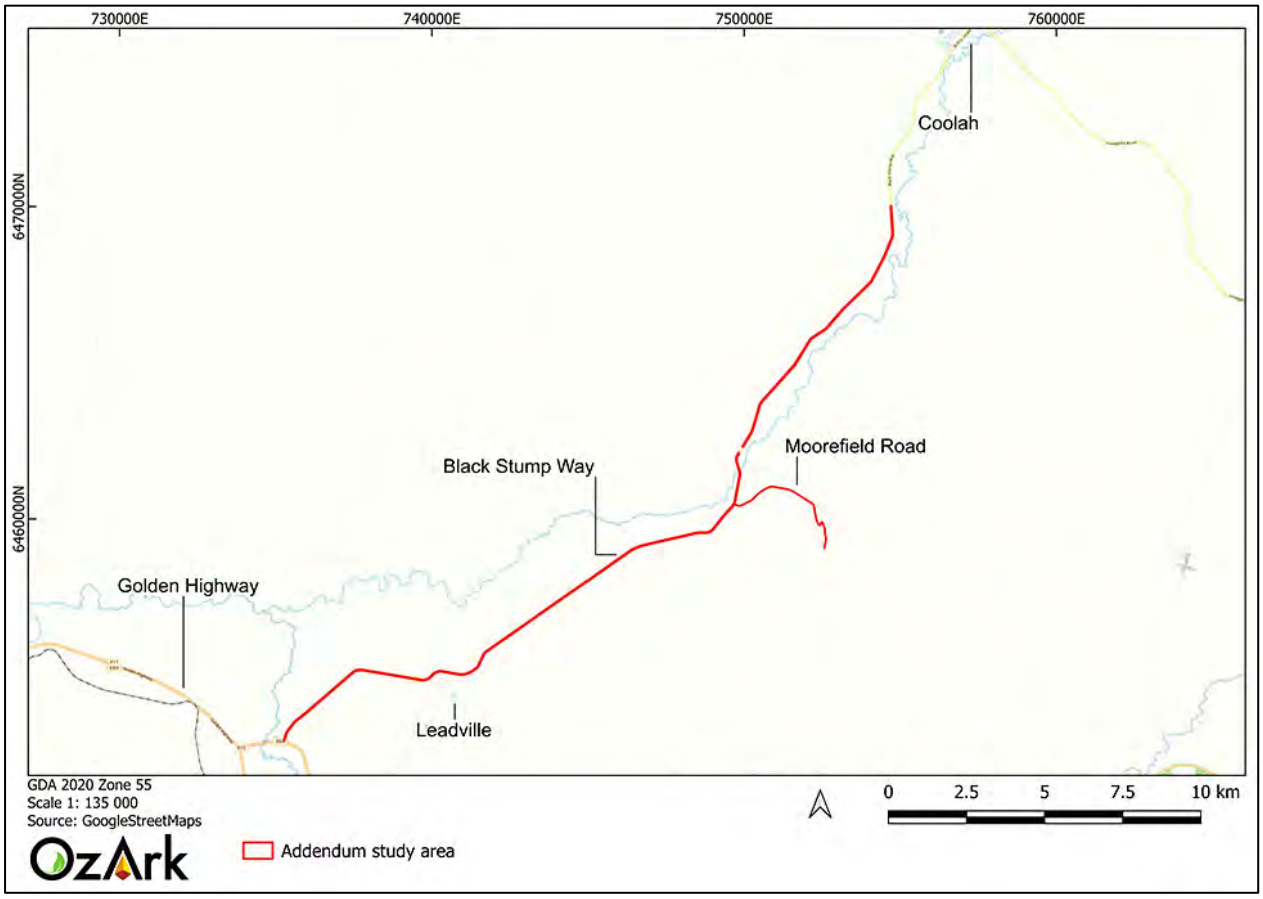
This document is an addendum Aboriginal Cultural Heritage Assessment Report (ACHAR) for the Valley of the Winds wind farm (the project) and should be read in conjunction with the primary ACHAR developed for the project (*Aboriginal Cultural Heritage Assessment Report: Valley of the Winds Wind Farm*. OzArk 2023).

As the addendum study area is in the same region as the project, OzArk 2023 provides general landscape and archaeological context that is also applicable to the addendum study area. This information is not reproduced in this report and the primary ACHAR should be consulted for this environmental and archaeological context.

1.2 DESCRIPTION OF THE PROPOSAL

OzArk Environment & Heritage (OzArk) has been engaged Ramboll Australia Pty Ltd on behalf of ACEN Australia (the proponent) to complete an addendum ACHAR for upgrade works to Moorefield Road and Black Stump Way that will provide access to the project. The project is located south of Coolah, NSW, in the Warrumbungle Shire Council Local Government Area (LGA) (**Figure 1-1**).

Figure 1-1: Map showing the location of the addendum study area.



1.3 BACKGROUND

OzArk produced an ACHAR for the project in 2023 which included pedestrian survey across 2,738 hectares (ha) of land. Although a portion of the addendum study area is located within the wind farm site boundary, it was not included within the project survey boundary and therefore has not been subject to previous survey. The addendum study area, project survey boundary, and wind farm site boundary are shown on **Figure 1-2**.

The survey for the project resulted in five Aboriginal sites being recorded including one isolated find, one artefact scatter, two artefact scatters with potential archaeological deposits (PAD) and one stone quarry in association with an artefact scatter and PAD.

The assessment concluded that the survey results were consistent with the predictive model that suggested stone artefact sites have a strong tendency to be recorded in topography with slopes less than 10 degrees with one exception (Old Farm OS-1) which was recorded in a crest/ridgeline landform.

The ACHAR for the project was included as part of the project's Environmental Impact Statement (EIS). The EIS was placed on public exhibition from 23 May to 20 June 2022. Since public exhibition of the EIS, it has been identified that Black Stump Way and Moorefield Road require upgrades to provide access to the project.

This addendum ACHAR has been prepared to assess potential impacts to Aboriginal cultural heritage relating to the proposed road upgrades.

1.4 PROPOSED WORK

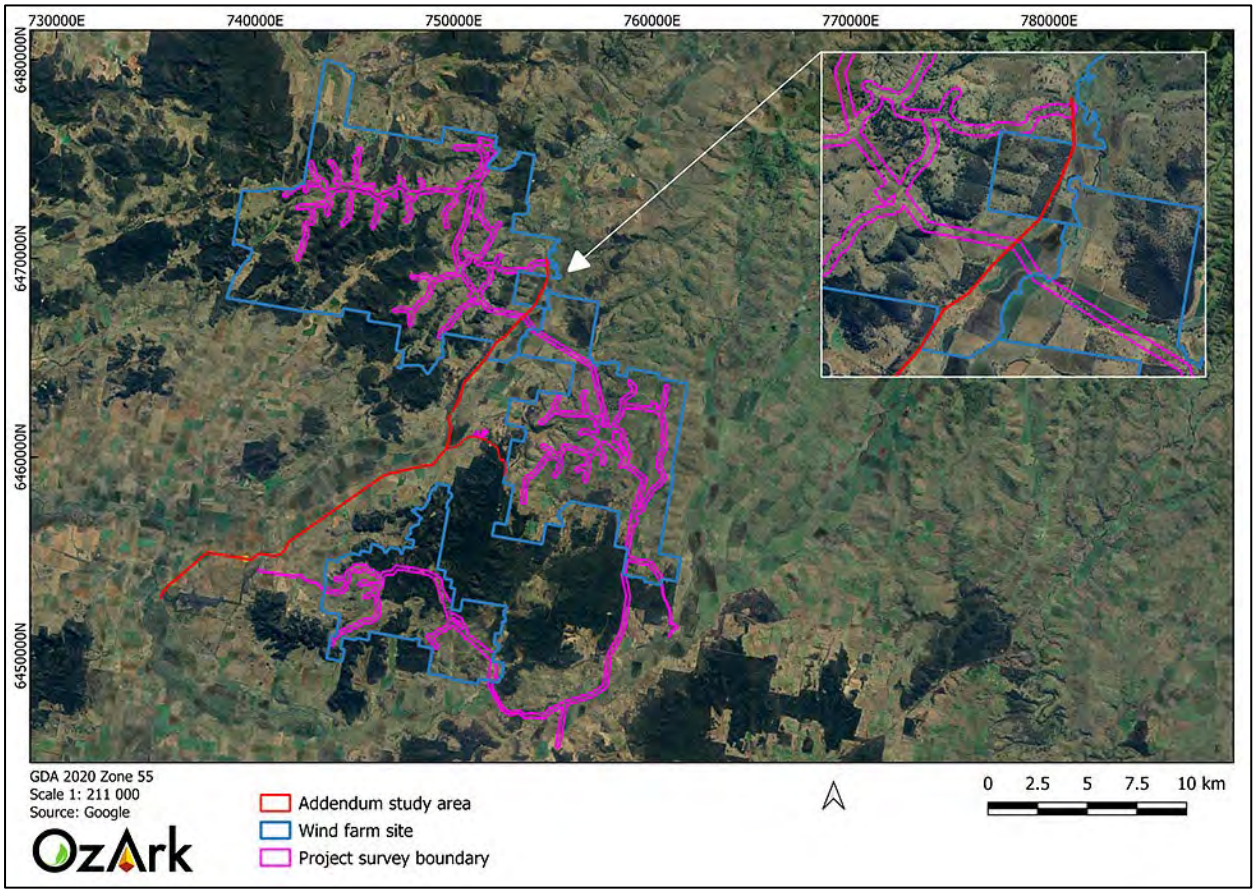
The proposed works associated with this addendum include the upgrading of Moorfield Road and Black Stump Way to allow access to the project. Works will be restricted to the existing road corridors.

1.5 ADDENDUM STUDY AREA

The addendum study area consists of approximately 28 kilometres (km) of Black Stump Way, extending north from the intersection with the Golden Highway. Additionally, 4 km of Moorefield Road requires assessment from the intersection of Black Stump Way extending east towards the Girragulang Road cluster of the project.

Most of the addendum study area is comprised of low gradient slopes, however, a small section of floodplain is also present. The addendum study area along Black Stump Way is intersected by the Coolaburragundy River and several additional ephemeral drainage lines.

Figure 1-2: Aerial showing the addendum study area, wind farm site, and project survey boundary.



1.6 RELEVANT LEGISLATION

OzArk 2023 contains all relevant details regarding the legislative requirements pertaining to Aboriginal cultural heritage.

1.7 DATE OF ARCHAEOLOGICAL ASSESSMENT

The field survey of the addendum study area was undertaken by OzArk on 3 and 4 October 2024.

1.8 OZARK INVOLVEMENT

1.8.1 Field survey

The fieldwork survey was undertaken by:

- Fieldwork Director: Tenae Robertson (OzArk Project Archaeologist, B Archaeological Practices, Australian National University).
- Archaeologist: Jordan Henshaw (OzArk Archaeologist, B Ancient History, Macquarie University).

1.8.2 Reporting

The reporting component of the heritage assessment was undertaken by:

- Report author: Jordan Henshaw
- Ben Churcher: (OzArk Principal Archaeologist. BA (hons), Dip Ed.).

2 ABORIGINAL CULTURAL HERITAGE ASSESSMENT

2.1 ASSESSMENT APPROACH

The archaeological assessment followed the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (Code of Practice; DECCW 2010).

The Aboriginal cultural heritage assessment followed the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (the Guide; OEH 2011) and the *Aboriginal cultural heritage consultation requirements for proponents* (ACHCRs) (DECCW 2010b).

2.2 PURPOSE AND OBJECTIVES

The purpose of this study is to identify and assess heritage constraints relevant to the proposed works.

The study will apply the Code of Practice, the Guide, and the ACHCRs in the completion of the Aboriginal cultural heritage assessment to meet the following objectives:

Objective One: Undertake background research on the addendum study area to formulate a predicative model for site location

Objective Two: Identify and record Aboriginal cultural heritage values within the addendum study area. This includes intangible cultural values, Aboriginal objects, and any landforms likely to contain further archaeological deposits

Objective Three: To assess the significance of any recorded Aboriginal cultural values, Aboriginal objects, or sites in consultation with Registered Aboriginal Parties (RAPs)

Objective Four: Assess the likely impacts of the proposed work to Aboriginal cultural heritage values and provide management recommendations.

2.3 REPORT COMPLIANCE WITH THE CODE OF PRACTICE

The Code of Practice establishes requirements that should be followed by all archaeological investigations where harm to Aboriginal objects may be possible. **Table 2-1** tabulates the compliance of this report with the requirements established by the Code of Practice.

Table 2-1: Report compliance with the Code of Practice.

Code of Practice Requirement	Context of the Requirement	Concordance in this report
Requirement 1a	Review previous archaeological work	**Section 2.6**
Requirement 1b	Review AHIMS searches	**Section 2.6.1**
Requirement 2	Review the landscape context	**Section 2.5**
Requirement 3	Summarise and discuss the local and regional character of Aboriginal land use and its material traces	**Section 2.6**
Requirement 4a	Develop predictive model	**Section 2.7**
Requirement 4b	Present predictive model results	**Section 2.7.3**
Requirement 5a	Archaeological survey sampling strategy	**Section 3.1**
Requirement 5b	Archaeological survey requirements	This Requirement was fulfilled during the undertaking of the survey
Requirement 5c	Archaeological survey units	**Section 2.7.3**
Requirement 6	Site definition	**Section 2.7.3**
Requirement 7a	Site recording information to be recorded	All sites were recorded in accordance with this requirement
Requirement 7b	Site recording: scales for photography	All artefact photographs employed a centimetre scale bar.
Requirement 8a	Geospatial information	All site locations were logged using a non-differential handheld GPS.
Requirement 8b	Datum and grid coordinates	All coordinates are provided in GDA Zone 55.
Requirement 9	Record survey coverage data	**Section 3.1**
Requirement 10	Analyse survey coverage	**Section 3.3**
Requirement 11	Archaeological Report content and format	This report adheres to this Requirement.
Requirement 12	Records	OzArk understands to maintain all survey records for at least five years.
Requirement 13a	Notifying Heritage NSW of breaches	Not applicable
Requirement 13b	Providing Heritage NSW with information	Not applicable
Requirement 14	Test excavation which is not excluded from the definition of harm	Not applicable as test excavation did not take place in the addendum study area.
Requirement 15a	Consultation regarding test excavation	Not applicable
Requirement 15b	Developing a test excavation sampling strategy	Not applicable
Requirement 15c	Providing Heritage NSW with notification of the test excavation	Not applicable
Requirement 16a	Test excavation that can be carried out in accordance with the Code of Practice	Not applicable
Requirement 16b	Objects recovered during test excavations	Not applicable
Requirement 17	When to stop test excavations	Not applicable
Requirement 18–20	Artefact recording	The procedures for artefact recording were adhered to during the investigation.

2.4 ABORIGINAL COMMUNITY CONSULTATION

The Aboriginal cultural heritage assessment of the proposal has followed the ACHCRs (DECCW 2010b). The ACHCRs were initiated for the project and have been followed for the addendum

ACHAR (**Appendix 1 Table 1**). Further details on Aboriginal community consultation are found in OzArk 2023.

The following groups or individuals comprise the RAPs for the project:

- Gomeroi People NC2011/006
- Gilgandra LALC
- Dubbo LALC
- Murong Gialinga Aboriginal & Torres Strait Islander Corporation
- Paul Brydon
- AT Gomilaroi Cultural Consultancy
- Michael Long
- Kevin Sampson
- Brian Draper
- Talcon Pty Ltd
- Steve Talbott
- Cacatua General Services
- AGA Services
- Bawurra
- Stakeholder 1
- Stakeholder 2

A log and copies of all correspondence with Aboriginal community stakeholders regarding the project is presented in **Appendix 1**. Consultation pre-September 2024 is detailed in the ACHAR (OzArk 2023).

To inform RAPs of the required additional survey, a project update letter and methodology was sent to all RAPs on 17 September 2024 (**Appendix 1 Figure 1**). The methodology outlined the proposed sampling strategy for the addendum study area.

Kevin Sampson representing Cacatua General Services and Cullen Long representing Michael Long attended both days of the additional survey (3–4 October 2024).

On 14 November 2024 this addendum ACHAR was sent to all RAPs with a 14-day comment period closing on 28 November due to project time constraints. RAPs were notified that additional time could be provided, if required (**Appendix 1 Figure 2** and **Appendix 1 Figure 3**). No submissions or feedback was received from any RAPs.

2.4.1 Cultural values identified throughout the ACHCR process

The addendum study area is within a broader cultural landscape that has value to the local community, however, no specific comments regarding Aboriginal cultural values within the addendum study area were received during the ACHCR process.

2.5 LANDSCAPE CONTEXT

An understanding of the environmental context of a study area is requisite in any Aboriginal archaeological investigation (DECCW 2010). It is a particularly important consideration in the development and implementation of survey strategies for the detection of archaeological sites. In addition, natural geomorphic processes of erosion and/or deposition, as well as human-activated landscape processes, influence the degree to which the remains of material culture are retained in the landscape as archaeological sites; and the degree to which they are preserved, revealed and/or conserved in present environmental settings.

2.5.1 Topography and hydrology

The addendum study area is primarily situated on flat landforms and gentle slopes within the road corridors of Black Stump Way and Moorefield Road.

The section of the addendum study area which follows Black Stump Way, also follows the Coolaburragundy River in a general north–south direction. The river intersects the addendum study area approximately 1 km north of the intersection between Moorfield Road and Black Stump Way. Several minor ephemeral drainage lines also intersect the addendum study area along both road corridors.

The Black Stump Way portion of the addendum study area increases in elevation from 400 metres (m) above sea level at the intersection with the Golden Highway to 470 m above sea level at its northern extent. The road corridor follows a natural valley between elevated foothills and plateaus which define the surrounding Liverpool Ranges.

The section of Moorefield Road is subject to a more considerable elevation change from 620 m above sea level at its eastern extent and decreases to approximately 440 m above sea level at its intersection with Black Stump Way.

2.5.2 Geology and soils

Soil analysis has important ramifications for archaeological research through the potential impact of different soils on human activity (such as agricultural exploitation) and the impact of the soils on archaeological evidence (such as post-depositional movement).

The geology of the addendum study area is predominately sandy Quaternary alluvial sediments associated with the Coolaburragundy River.

Detailed soil profiles covering the addendum study area are largely unavailable, however, the southern portion of the addendum study area extending from the Golden Highway until Leadville can be classified as a Home Rule soil type. The Home Rule soil type is characterised by low fertility and water holding capacity. Surface soils tend to be acidic, and prone to seasonal waterlogging. The Siliceous Sands Home Rule topsoil ranges between 10–35 centimetres (cm) in depth and tends to be loose brown to dark brown loamy sandy with small quartz and felspar gravels present. The subsoil tends to be a bright brown to red-brown loose clayey-sand, with small quartz and felspar gravels. These types of soil are prone to erosion, especially if no surface cover is present. Furthermore, drainage depressions are highly susceptible to gully erosion due to water runoff (Murphy and Lawrie 1998).

The soils across the remainder of the addendum study area include Chromosols and Dermosols which are mostly associated within the valleys or low-lying plains and consist of aggrading environments. Dermosols lack a strong texture contrast between the B1 and B2 horizon and have high agricultural potential because of its good structure, moderate to high chemical fertility, and water-holding capacity.

In contrast, Chromosols have strong texture contrast between A horizons and B horizons, however, they are also suitable for agricultural purposes. Both soil types preserve archaeological deposits and are in areas that are generally more favourable to past Aboriginal occupation.

2.5.3 Vegetation

Most of the addendum study area has been cleared of vegetation for the initial construction and ongoing maintenance of the Black Stump Way and Moorfield Road corridors. The area surrounding the addendum study area has also undergone extensive vegetation clearance for agricultural purposes, greatly reducing the amount of mature vegetation present throughout the region. Despite this, mature nature vegetation remains present at several locations along both the Black Stump Way and Moorefield Road corridors. According to Mitchell (2002), these species are likely to include yellow box, rough-barked apple, and river red gums near waterways. However, broad-leaved and narrow-leaved iron bark, grey box, and wattle can also exist along with an extensive range of additional Eucalyptus and Acacia species.

2.5.4 Land use history and existing levels of disturbance

The addendum study area has undergone considerable disturbances since British settlement, which have impacted its ability to preserve Aboriginal objects. The region has been used for agricultural purposes, including cropping and grazing which has involved the widespread clearing of native vegetation and the introduction of heavy, hard hoofed animals. Cropping has been undertaken along the flats and floodplains of the Coolaburragundy River.

The road corridors within the addendum study area have been subject to considerable ground disturbing earthworks required for their initial construction and ongoing maintenance. Associated infrastructure along the road corridors includes subsurface drainage culverts, large areas of hard fill which have been used to build up the ground surface, as well as Hannahs Bridge over the Coolaburragundy River and various guardrails, property fences, and abandoned rail infrastructure. The addendum study area also extends through the town of Leadville where overhead electrical infrastructure, subsurface telecommunication infrastructure, and residential buildings are situated adjacent to Black Stump Way.

2.5.5 Conclusion

The low gradient slopes of the addendum study area would have been hospitable for Aboriginal people in the past. The Coolaburragundy and Talbragar Rivers (located at the south of the addendum study area) would have been major sources of food in the region and would have heavily contributed to a sustained Aboriginal population through food and fibre resources. Vegetation clearance and agricultural development since British settlement has changed the landscape considerably and negatively impacted the potential for Aboriginal artefacts to be preserved.

2.6 ARCHAEOLOGICAL CONTEXT

2.6.1 Ethno-historic sources of regional Aboriginal culture

A detailed outline of the Aboriginal cultures of the study area, including the addendum study area, is detailed in OzArk 2023, Section 5.1.

2.6.2 Desktop database searches conducted

A desktop search was conducted on the following databases to identify any previously recorded heritage within the addendum study area. The results of this search are summarised in **Table 2-2** and the AHIMS data is presented in **Appendix 2**.

Table 2-2: Aboriginal cultural heritage: desktop-database search results.

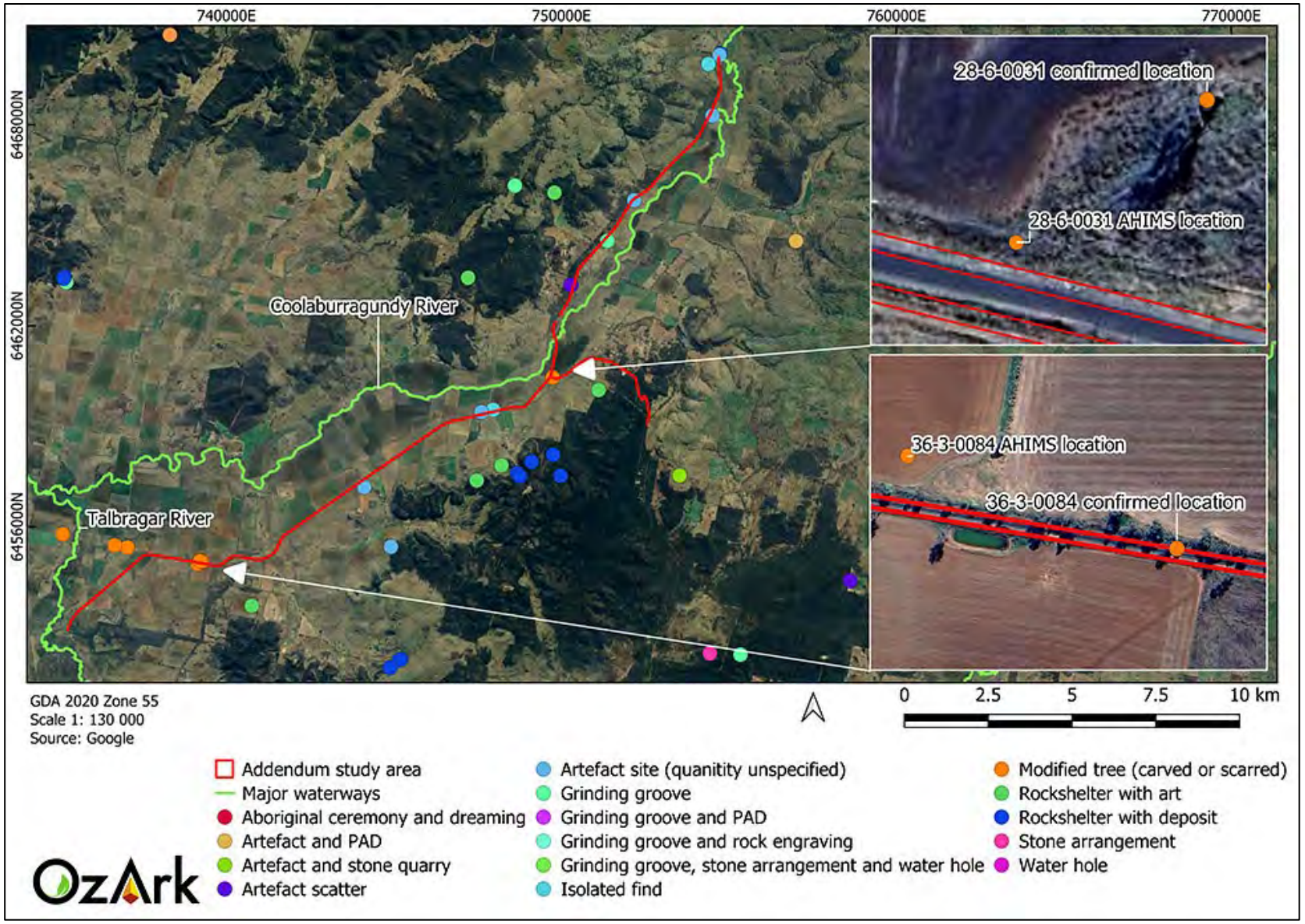
Name of Database Searched	Date of Search	Type of Search	Comment
National and Commonwealth Heritage Listings	1/10/24	Warrumbungle LGA	No places listed on either the National or Commonwealth heritage lists are located within the addendum study area.
National Native Title Claims Search	1/10/24	NSW	One Native Title claim covers the addendum study area: Gomeroi People NC2011/006, Federal Court No. NSD2308/2011
AHIMS	15/9/24	45 x 30 km centred on the addendum study area	118 sites were located within the search area, one site (DTG/ST27 – Naturi) plots within the addendum study area.
Local Environmental Plan (LEP)	1/10/24	Warrumbungle LEP of 2013	None of the Aboriginal places noted occur near the addendum study area.

A search of the AHIMS database returned 118 records for Aboriginal heritage sites within the designated search area (**Table 2-3**). **Figure 2-1** shows the location of the AHIMS sites that have been recorded near the addendum study area.

Table 2-3: Site types and frequencies of AHIMS sites near the addendum study area.

Site Type	Number	% Frequency
Artefact site (quantity unspecified)	23	19.6
Modified tree (carved or scarred)	18	15.3
Isolated find	14	11.9
Rockshelter with deposit	14	11.9
Rockshelter with art	12	10.3
Grinding groove	10	8.5
Stone arrangement	7	5.9
Artefact and PAD	5	4.2
Artefact scatter	4	3.4
PAD	4	3.4
Artefact and stone quarry	1	0.8
Grinding groove and PAD	1	0.8
Grinding groove and rock engraving	1	0.8
Grinding groove, stone arrangement and water hole	1	0.8
Modified tree (carved or scarred) and artefact	1	0.8
Aboriginal ceremony and dreaming	1	0.8
Water hole	1	0.8
Total	**118**	**100**

Figure 2-1: Previously recorded sites in relation to the addendum study area.



2.6.3 Regional and local archaeological context

OzArk 2023, Sections 5.2 and 5.3, provide an archaeological context for the project and presents further summaries of archaeological investigations in the area.

2.6.3.1 Previous studies near the addendum study area

Several recent investigations in the region allow the archaeological context of the addendum study area to be understood.

Umwelt 2023

Umwelt were engaged by Tilt Renewables to complete an additional addendum ACHAR for Modification 1 of the Liverpool Range Wind Farm project located approximately 10 km northeast from the addendum study area.

The modification required amendments to infrastructure, transport routes and an increase in native vegetation clearing limits and therefore required additional assessment. The additional survey was unable to locate any previously unrecorded Aboriginal sites or areas of archaeological potential. This was due to the small size of the addendum study area which comprised or sloping landforms that did not provide direct access to water sources and had been substantially disturbed.

EMM 2023

EMM were engaged by the Energy Corporation of NSW (EnergyCo) to complete an ACHAR for the Central-West Orana Renewable Energy Zone transmission project (REZ). This major project extends south from Coolah to Wollar and east from Cassilis to Goolma and included 798 km of pedestrian survey over a 90 day period. A total of 183 Aboriginal sites were documented including artefact scatters (n=78), isolated finds (n=65), grinding grooves (n=15) and culturally modified trees (n=14). Clusters of sites were primarily located within 250 m of named creeks throughout the region.

A six-week test excavation program was also completed which consisted of 128 test units (TUs) excavated by hand, yielding a total of 84 artefacts. All cultural materials were recovered from the upper 40 cm of the soil profile within TUs, and the majority of the assemblage was recovered from the upper 20 cm. Most of the artefacts were made white, milky quartz (n=44), with lesser occurrences of tuff (n=26), chalcedony (n=2), and chert (n=2). The quality of the milky quartz artefacts was extremely high and results in a more predictable flake manufacture.

The findings of the field investigation align closely with the previous investigations completed throughout the region. These all demonstrate that the most significant cultural deposits appear to primarily be found along major watercourses and/or strongly influenced by other environmental factors such as the presence of sandstone outcrops and rock overhangs.

2.6.3.2 *Conclusion*

Utilising data that has been collected both regionally and locally, broad statements about archaeological sites that have the potential to occur within the addendum study area can be made. These predictions include:

- Cultural deposits appear to primarily be recorded along major watercourses and/or strongly influenced by other environmental factors such as the presence of sandstone outcrops and rock overhangs.
- Sloping landforms which do not provide access to water are less likely to contain intact Aboriginal sites
- Disturbances to landforms can also decrease the ability of the landscape to preserve Aboriginal objects.

2.7 PREDICTIVE MODEL FOR SITE LOCATION

Across Australia, numerous archaeological studies in widely varying environmental zones and contexts have demonstrated a high correlation between the permanence of a water source and the permanence and/or complexity of Aboriginal occupation. Site location is also affected by the availability of and/or accessibility to a range of other natural resources including plant and animal foods, stone and ochre resources and rock shelters, as well as by their general proximity to other sites/places of cultural/mythological significance. Consequently, sites tend to be found along permanent and ephemeral water sources, along access or trade routes, or in areas that have good flora/fauna resources and appropriate shelter.

In formulating a predictive model for Aboriginal archaeological site location within any landscape it is also necessary to consider post-depositional influences on Aboriginal material culture. In all but the best preservation conditions very little of the organic material culture remains of ancestral Aboriginal communities survives to the present. Generally, it is the more durable materials such as stone artefacts, stone hearths, shells, and some bones that remain preserved in the current landscape. Even these, however, may not be found in their original depositional context since these may be subject to either (a) the effects of wind and water erosion/transport, both over short- and long-time scales, or (b) the historical impacts associated with the introduction of European farming practices including grazing and cropping, land degradation, and farm related infrastructure. Scarred trees, due to their nature, may survive for up to several hundred years but rarely beyond.

2.7.1 Site types in the region of the addendum study area

There is a range of site types in the region of the addendum study area as is illustrated in the AHIMS search undertaken. This search returned sites ranging from rockshelters and grinding grooves to modified trees and open artefact sites (i.e. isolated finds and artefact scatters). Given the landscape of the addendum study area, many of these site types will not be present.

For example, the lack of rock outcropping decreases the potential for rockshelter sites, and the disturbances involved in construction road corridors largely reduces the density and frequency of artefact scatters.

Table 2-4 provides a definition of site types recorded in the region and **Table 2-6** assesses their likelihood of being present in the addendum study area.

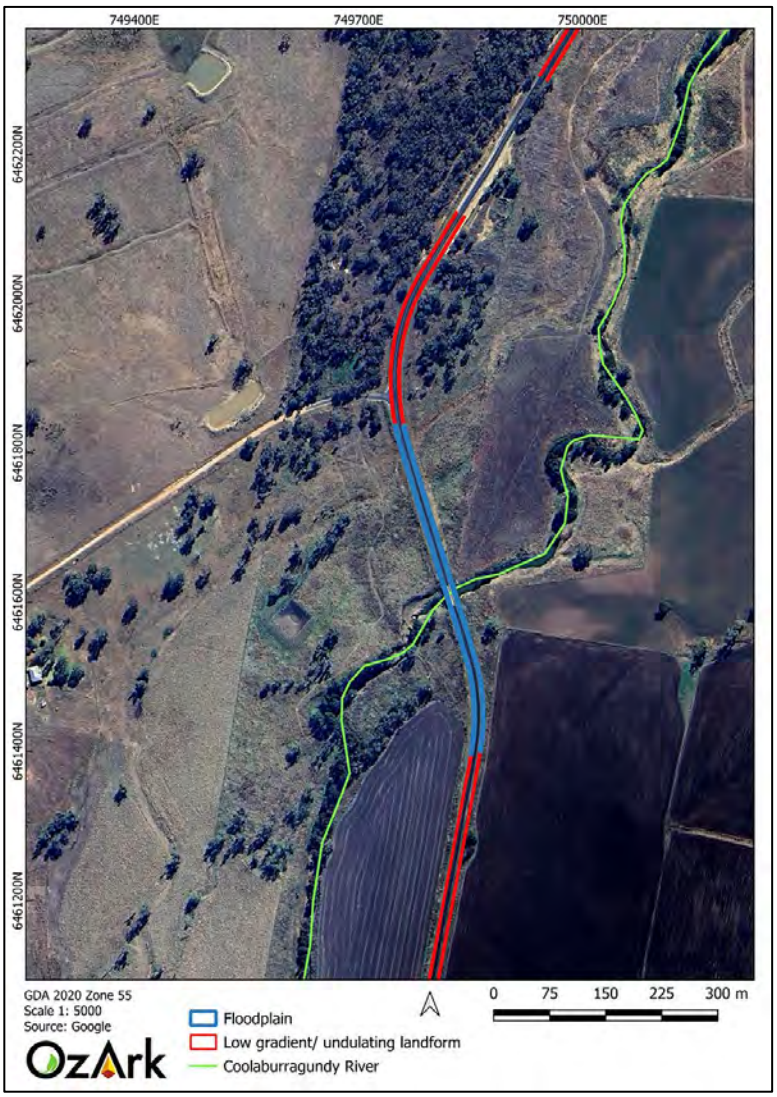
Table 2-4: Site types recorded in the region of the addendum study area.

Site type	Site description
Isolated finds	May be indicative of random loss or deliberate discard of a single artefact, the remnant of a now dispersed and disturbed artefact scatter, or an otherwise obscured or subsurface artefact scatter. They may occur anywhere within the landscape but are more likely to occur in topographies where open artefact scatters typically occur.
Open artefact scatters	Artefact scatters are defined as two or more artefacts, not located within a rock shelter, and located no more than 50 m away from any other constituent artefact. This site type may occur almost anywhere that Aboriginal people have travelled and may be associated with hunting and gathering activities, short- or long-term camps, and the manufacture and maintenance of stone tools. Artefact scatters typically consist of surface scatters or sub-surface distributions of flaked stone discarded during the manufacture of tools but may also include other artefactual rock types such as hearth and anvil stones. Less commonly, artefact scatters may include archaeological stratigraphic features such as hearths and artefact concentrations which relate to activity areas. Artefact density can vary considerably between and across individual sites. Small ground exposures revealing low density scatters may be indicative of a background scatter rather than a spatially or temporally distinct artefact assemblage. These sites are classed as 'open', that is, occurring on the land surface unprotected by rock overhangs, and are sometimes referred to as 'open camp sites'. Artefact scatters are most likely to occur on level or low gradient contexts, along the crests of ridgelines and spurs, and elevated areas fringing watercourses or wetlands. Larger sites may be expected in association with permanent water sources. Topographies which afford effective through-access across, and relative to, the surrounding landscape, such as the open basal valley slopes and the valleys of creeks, will tend to contain more and larger sites, mostly camp sites evidenced by open artefact scatters.
Culturally modified trees	Aboriginal scarred trees contain evidence of the removal of bark (and sometimes wood) in the past by Aboriginal people, in the form of a scar. Bark was removed from trees for a wide range of reasons. It was a raw material used in the manufacture of various tools, vessels, and commodities such as string, water containers, roofing for shelters, shields and canoes. Bark was also removed because of gathering food, such as collecting wood boring grubs or creating footholds to climb a tree for possum hunting. Due to the multiplicity of uses and the continuous process of occlusion (or healing) following removal, it is difficult to accurately determine the intended purpose for any example of bark removal. Scarred trees may occur anywhere old growth trees survive. The identification of scars as Aboriginal cultural heritage items can be problematical because some forms of natural trauma and European bark extraction create similar scars. Many remaining scarred trees probably date to the historic period when bark was removed by Aboriginal people for both their own purposes and for roofing on early European houses. Consequently, the distinction between European and Aboriginal scarred trees may not be clear.
Grinding grooves	Grinding grooves are the remnants of ground edge hatchet manufacture and sometimes from food preparation. The site is most likely to occur on flat outcrops of coarse-grained sandstone in the vicinity of water sources, however, grinding grooves have also been recorded on fine-grained granite and quartzite outcrops.
Rockshelters and art sites	Utilised in the past for both habitation and ceremonial purposes. The term ‘rock shelter site’ refers to rock shelters/rock overhangs that contain evidence such as stone artefacts and/or bones and/or plant remains (from meals eaten at the site) and/or hearths (fireplaces). Most rock shelter sites are secular in nature, however, those that also contain rock art or engravings are often believed to be non-secular in nature. The term ‘rock art site’ generally refers to Aboriginal ochre paintings or ochre or charcoal drawings located on a rock slab (generally in a sheltered place like the floor of a cave or rock shelter), boulder, cliff-face, cave or rock shelter wall or roof, or wall of a rock overhang. Most rock art sites are found in locations that are sheltered from the elements. This observation, however, is probably biased to some extent, as rock art would not preserve well in open positions. Rock art sites are generally believed to be non-secular in nature.

2.7.2 Landform modelling

A consideration of the landforms within the addendum study area enables a prediction regarding the type and distribution of sites to be made. A large portion of the addendum study area is comprised of gently undulating landforms, however, a small portion intersecting the Coolaburragundy River is defined as floodplain. **Figure 2-2** shows the floodplain landform within the addendum study area. The survey units used to describe the addendum study area use the same terminology as that developed for OzArk 2023. Two survey units are present in the addendum study area, Survey Unit 3, Low gradient/ undulating landforms, and Survey Unit 4, Floodplains.

Figure 2-2: Landforms within the addendum study area.



Previous studies in the region (EMM 2023, Umwelt 2023, OzArk 2023) indicate that low gradient/ undulating landforms are more likely to contain intact artefact sites as they are likely to have avoided more severe erosional processes common in steep/moderate slopes. While gentle sloping landforms are present, they are distant to water and have been disturbed from agricultural land use and the construction and maintenance of Black Stump Way and Moorfield Road.

Previous archaeological investigations in the region also indicate that isolated artefacts or low-density artefact scatters would be the most common site type to be present. However, if these site types are present, they would most likely be in a secondary context, as the artefacts are likely to have been displaced by historic agricultural/transport disturbances. Despite large scale vegetation clearance, culturally modified trees may also be present within the addendum study area as road corridors often preserve mature vegetation.

2.7.3 Conclusion

Based on knowledge of the environmental context of the addendum study area and a desktop review of the known local and regional archaeological record, the following predictions are made concerning the probability of landforms within the addendum study area to contain Aboriginal objects (**Table 2-5**) and site types which may be present (**Table 2-6**).

Table 2-5: Likelihood of landforms within the addendum study area to contain Aboriginal objects.

Survey unit[1]	Landform type	Likelihood to contain Aboriginal objects
3	Low gradient/ undulating landforms	Undulating landforms are a degrading landform, especially in the addendum study area where vegetation removal has accelerated soil loss. Given these landforms consist of low gradients they are still suitable for occupation and often favoured for Aboriginal occupation, however, when distant from waters they are less likely to have been occupied.
4	Floodplains	Floodplains are an aggrading environment that are impacted by flooding and channel migration. While floodplains would have provided resources to encourage occupation and use in the past, their geomorphic nature makes them poor preservers of archaeological deposits and any objects in such landforms are likely to be in a secondary context.

Table 2-6: Likelihood of certain site types being present in the addendum study area.

Site type	Likelihood of being present in the addendum study area
Isolated finds	As isolated finds can occur anywhere, particularly within disturbed contexts, it is predicted that this site type could be recorded within the addendum study area.
Open artefact scatters	Stone artefact distributions of variable artefact densities are some of the most common Aboriginal object found within the region. A general correlation between landform and the nature of the evidence of past Aboriginal occupation is evident. Higher artefact density sites are located on elevated landforms adjacent to waterways. As the addendum study area intersects the Coolaburragundy River, as well as several ephemeral drainage lines, regional studies show that low-density artefact scatters could be recorded.
Culturally modified trees	Due to potentially mature trees within the addendum study area, this site type may be recorded. It is also noted that this site type has been recorded inside the addendum study area near the intersection of Black Stump Way and Moorfield Road.
Grinding grooves	Grinding grooves can be recorded anywhere appropriate rock outcroppings are available and more often in proximity to waterways. Two grinding grooves sites have been recorded in proximity to the addendum study area, but it is unlikely that this site type will be recorded in the addendum study area given the linear nature of the study area and the small areas of waterways that are included.
Rockshelters and art sites	Due to the lack of suitable topography within the addendum study area, this site is not predicted to be recorded.

[1] Refer to OzArk (2023) Table 4-2 for survey unit definitions.

3 RESULTS OF ABORIGINAL ARCHAEOLOGICAL ASSESSMENT

3.1 SAMPLING STRATEGY AND FIELD METHODS

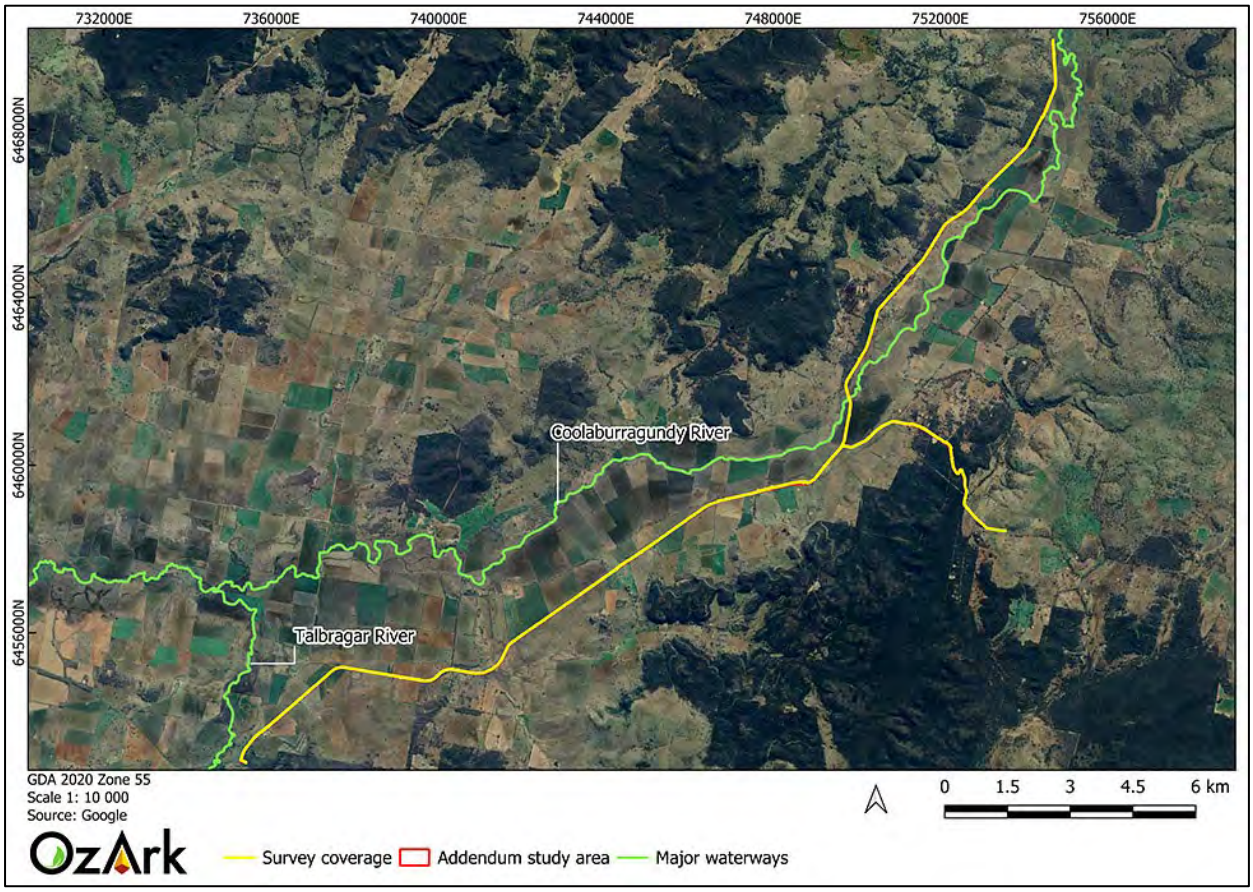
Standard archaeological field survey and recording methods were employed in this study (Burke & Smith 2004).

It should be noted that the aim of any archaeological survey is not to locate each artefact in a landscape but to undertake investigations so that the archaeological potential and archaeological characteristics of all landforms within the addendum study area are known. Therefore, the aims of the survey were to:

- Conduct pedestrian transects to sample across all landforms in the addendum study area so that their archaeological potential could be determined
- Evaluate whether the predictive model set out in **Section 2.7** is valid
- Determine if any portions of the addendum study area require test excavation to understand the archaeological potential at a particular location.

Figure 3-1 shows the survey tracks of the OzArk archaeologists during the survey. The OzArk archaeologists were accompanied by two Aboriginal site officers.

Figure 3-1: Survey coverage within the addendum study area.



3.2 PROJECT CONSTRAINTS

The main constraint during the survey was poor ground surface visibility (GSV) across most of the addendum study area. **Figure 3-2** shows examples of GSV within the addendum study area. The lack of access to private property also made verifying the location of some previously recorded sites difficult.

Figure 3-2: View of GSV within the addendum study area.

1. View west along Moorfield Road showing thick ground cover.

2. View north along Black Stump Way showing partially maintained ground cover within the road corridor.

3.3 EFFECTIVE SURVEY COVERAGE

Two of the key factors influencing the effectiveness of archaeological survey are GSV and ground surface exposure (GSE). These factors are quantified to ensure that the survey data provides adequate evidence for the evaluation of the archaeological materials across the landscape. For the purposes of the current assessment, these terms are used in accordance with the definitions provided in the Code of Practice.

GSV is defined as:

> *… the amount of bare ground (or visibility) on the exposures which might reveal artefacts or other archaeological materials. It is important to note that visibility, on its own, is not a reliable indicator of the detectability of buried archaeological material. Things like vegetation, plant or leaf litter, loose sand, stone ground or introduced materials will affect the visibility. Put another way, visibility refers to 'what conceals'* (DECCW 2010: 39).

GSE is defined as:

> *… different to visibility because it estimates the area with a likelihood of revealing buried artefacts or deposits rather than just being an observation of the amount of bare ground. It is the percentage of land for which erosion and exposure was sufficient to reveal*

archaeological evidence on the surface of the ground. Put another way, exposure refers to 'what reveals' (DECCW 2010: 37).

Table 3-1 calculates the effective survey coverage within the addendum study area. Note that these calculations are for the addendum study area not the wider project area.

In general, **Table 3-1** presents an approximation of the amount of ground surface able to be seen at any location within specific landform units. For example, at any one location within Survey Unit 4 (Floodplain) within the addendum study area, approximately 9% of the ground surface could be seen due to small but relatively frequent exposures. Within Survey Unit 3 (Low gradient/ undulating landforms) the effective survey coverage drops to 2.5% due to thick ground covers.

Table 3-1: Effective survey coverage within the addendum study area.

Landform	Survey Unit Area (sq m)	Visibility %	Exposure %	Effective Coverage Area (sq m)	Effective Coverage %
Floodplain	13368	60	15	1203	9
Low gradient/ undulating landforms	1026315	50	5	25,657	2.5

Table 3-2 demonstrates that the survey efficacy in Survey Unit 4 (Floodplains) may have contributed to the lack of site recordings, however, it is assessed that the landforms have a very low archaeological potential due to the observed disturbances within the limited, linear corridor of the road reserve. Although Survey Unit 3 (Low gradient/ undulating landforms) has a low survey efficacy, the lack of recorded sites is more likely due to the nature of the landforms being distant to water.

Table 3-2: Incidence of site recordings within the addendum study area.

Landform	Landform area (sq m)	Area Effectively Surveyed (sq m)	% of Landform Effectively Surveyed	Number of Sites	Number of Artefacts or Features
Floodplain	13368	1203	9	0	0
Low gradient/ undulating landforms	1026315	25,657	2.5	0	0

3.4 ABORIGINAL COMMUNITY COMMENTS ON THE SURVEY

No comments were received in the field that altered the survey methodology or provided further information on the cultural values of the addendum study area.

3.5 TEST EXCAVATION

No test excavation was undertaken for this assessment. The absence of surface artefacts, high level of observed ground disturbance, and landforms with low archaeological potential indicated that subsurface archaeological deposits within the addendum study area would be extremely unlikely.

3.6 SUMMARY OF SURVEY RESULTS

The pedestrian survey resulted in the recording of no additional Aboriginal sites. However, the location of several previously recorded sites was confirmed.

Several previously recorded sites are located within privately owned land adjacent to the addendum study area. Despite not having access to private property all adjacent landforms in the addendum study area were inspected and it was confirmed that none of these nearby sites extend into the addendum study area.

The pedestrian survey was able to confirm that a culturally modified tree, DTG/ST27 - Naturi (AHIMS ID# 28-6-0031) which currently plots within the road corridor at the intersection of Moorfield Road and Black Stump Way on the AHIMS database is actually located 50 m to the north, outside of the road corridor (**Figure 2-1**).

Another culturally modified tree, Leadville; (AHIMS ID# 36-3-0084) also plots incorrectly on the AHIMS database; however, the site card notes that the site should be within the road corridor of Black Stump Way. During the pedestrian survey it was confirmed that the site is in fact located within the road corridor (**Figure 2-1**). The mature white box tree located approximately 6 m north of the Black Stump Way road surface has been scarred once on its north-western side. The elongated scar measures approximately 94 cm high and 23 cm in width. Considerable regrowth has concealed part of the scar, especially at the upper portion. Otherwise, the scar is in a similar condition to when it was originally recorded in 1987.

All attempts were made to locate, Leadville; (AHIMS ID# 36-3-0085) which also plots outside of the addendum study area but is noted as being within the road corridor according to the available site card. However, the location of the scarred tree was unable to be confirmed, and it is believed that the tree has died or has been removed.

Figure 3-3 shows the addendum study area as well as the confirmed locations of both 28-6-0031 previously thought to be within the addendum study area and 36-3-0084 which is located within the addendum study area.

Figure 3-3: Addendum study area and locations of 28-6-0031 and 36-3-0084.

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>1. View west along Moorefield Road.</td><td>2. View north along Black Stump Way.</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>3. View north of 28-6-0031 located outside the addendum study area.</td><td>4. View north of 36-3-0084 located within the addendum study area.</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>5. View east along Black Stump Way to Leadville township.</td><td>6. View north of the Black Stump Way crossing the Coolaburragundy River.</td></tr>
</table>

3.6.1 Discussion

The regional studies, predictive model, and assessment of the wider project area (OzArk 2023) suggested that artefact scatters and isolated finds would be the most common site type recorded. However, no sites were identified during the survey of the addendum study area. Most of the addendum study area has been previously cleared of vegetation, and the remaining stands of vegetation consist mostly of regrowth with few mature native trees. As mentioned above the location of one previously recorded scarred tree was confirmed within the addendum study area.

The absence of stone quarries and grinding grooves is attributable to the absence of suitable rock outcropping within the addendum study area.

It was noted that low GSV was the main constraint to the survey. However, while the low GSV may have obscured surface artefacts, it is considered that a representative sample of the addendum study area was achieved through pedestrian survey. As such, rather than low GSV hampering the detection of sites, it is considered more likely that the disturbed nature of landforms within the addendum study area would have only supported sporadic or short-term visitation due to the lack of available water and the undifferentiated nature of the landforms. The previous disturbance through the addendum study area relates predominately to farming practices, with fences, vehicle tracks, vegetation clearance, and road construction all causing localised areas of higher disturbance. Such disturbances are likely to have already impacted any Aboriginal sites, if they had been present, in the addendum study area.

4 SIGNIFICANCE ASSESSMENT

4.1 INTRODUCTION TO SIGNIFICANCE ASSESSMENT

The concept of cultural significance is used in Australian heritage practice and legislation to encompass all the cultural values and meanings that might be recognised in a place. The *Burra Charter*'s definition of cultural significance is broad and encompasses places that are significant to Indigenous cultures (Burra Charter 2013).

A more detailed discussion of cultural heritage significance is provided in OzArk 2023.

4.2 ASSESSED SIGNIFICANCE OF THE RECORDED SITES

Table 4-1 presents a summary of the significance assessment of 36-3-0084 (Leadville;) a culturally modified tree that is located within the addendum study area.

Social or Cultural Value

The social and cultural value of Aboriginal sites is generally determined through consultation with Aboriginal people. Generally, the Aboriginal community regard all sites as having high cultural significance. This is due to all sites being able to provide a connection to their ancestors, as well as being a tangible part of the history of Aboriginal settlement in the area.

Archaeological/Scientific Value

36-3-0084 (Leadville;) is assessed as having low archaeological significance. Past land use, principally agricultural grazing and vegetation clearance, has disturbed the integrity and context of the site, lowering the potential to add to our knowledge of the area.

Aesthetic Value

6-3-0084 (Leadville;) presents some potential for the layperson to appreciate the site type, albeit in a modified landscape. 6-3-0084 (Leadville;) is assessed to have a low-moderate aesthetic value.

Historic Value

6-3-0084 (Leadville;) does not have any association with important persons, places, or events. Therefore, the site has no known historic values.

Table 4-1: Aboriginal cultural heritage significance assessment.

Site Name	AHIMS ID#	Social or Cultural Value	Archaeological / Scientific Value	Aesthetic Value	Historic Value
Leadville;	36-3-0084	High	Low-moderate	Low	None

4.2.1 Statement of significance

The intangible Aboriginal cultural values across the wider district relate to a number of important places and themes associated with non-archaeological cultural values. These places mainly relate to spiritual and ceremonial connections across the broader landscape that may encompass areas of culturally significant geographical features.

There may be places with intangible cultural significance within the addendum study area, although no specific locations have so far been identified by the Aboriginal community. The scientific value of the culturally modified tree, 6-3-0084 (Leadville;), within the addendum study area is considered to have a low potential to provide further information on the traditional Aboriginal use of the region.

The landforms within the addendum study area have been heavily disturbed by agricultural and transport activities and this lowers the scientific value of the area. Apart from the general understanding of the aesthetic qualities of the addendum study area, there are no known places with identified aesthetic values.

There are no known historical heritage values associated with the addendum study area.

5 ASSESSING HARM

5.1 AVOIDING AND MINIMISING HARM

5.1.1 Conserving significant Aboriginal cultural heritage

An object of the NPW Act is the '*conservation of objects places and features… of cultural value within the landscape, including… places, objects and features of significance to Aboriginal people*' (s.2A(1(b)(i)).

5.1.2 Opportunities to conserve Aboriginal cultural heritage values

As heritage professionals, OzArk, strives for good conservation outcomes. In particular, OzArk is primarily concerned with the conservation and protection of Aboriginal cultural heritage that is of significance to Aboriginal people.

Two primary objectives when managing harm to an Aboriginal object are:

- Impacts to significant Aboriginal objects and places should always be avoided wherever possible
- Where impacts to Aboriginal objects and places cannot be avoided, proposals should be amended to reduce the extent and severity of impacts to significant Aboriginal objects and places using reasonable and feasible measures.

Based on the outcomes of the field survey, one previously recorded Aboriginal object, 6-3-0084 (Leadville;), will require specific management measures in order to conserve Aboriginal cultural heritage values.

No areas of PAD were identified across the addendum study area, or at the previously recorded site. The significant levels of surface and subsurface disturbance from agriculture and road construction have resulted in erosion and soil loss in adjacent landforms.

5.2 LIKELY IMPACTS TO ABORIGINAL HERITAGE FROM THE PROJECT

Table 5-1 presents a summary of potential impacts to Aboriginal cultural heritage associated with the addendum study area.

Harm to 6-3-0084 (Leadville;) can be avoided by the project, however, management measures outlined in **Section 6** are required to ensure harm does not occur.

Table 5-1: Aboriginal cultural heritage impact assessment.

Site Name	AHIMS ID#	Type of Harm (Direct/Indirect / None)	Degree of Harm (Total/Partial / None)	Consequence of Harm (Total/Partial/No Loss of Value)
Leadville;	36-3-0084	None	None	No loss of value

5.3 ECOLOGICALLY SUSTAINABLE DEVELOPMENT PRINCIPLES

OzArk (2023) introduces and defines the Ecologically Sustainable Development (ESD) principles.

5.3.1 Applicability to the proposal

The loss of any Aboriginal cultural values, be they physical sites or intangible values, is to be avoided as much as is possible to ensure that the environmental impacts of the proposal are as sustainable as is possible. The addendum to the project achieves this as no sites are expected to be harmed if recommended management measures are followed.

The project will adhere to the ESD principles of ensuring that impacts are minimised and that the Aboriginal cultural heritage values within the addendum study area and its immediate surrounds are maintained.

Table 5-2 examines the application of ESD principles to the project.

Table 5-2: Application of ESD principles to the project.

ESD principle	Response
Avoiding and minimising harm	The project will avoid one identified Aboriginal site within the addendum study area, meaning no Aboriginal sites will be harmed by the project.
The integration principle	The project has sought to minimise impacts to Aboriginal cultural heritage wherever possible.
The precautionary principle	The archaeological assessment has followed the precautionary principle through undertaking a robust impact assessment to ensure that harm to Aboriginal objects is minimised.
The intergenerational equity principle	The archaeological measures and management proposed in this report to ensure that 6-3-0084 (Leadville;) is not unintentionally harmed are designed to ensure that there is no change to the current inter-generational equity that exists at the addendum study area.

6 MANAGEMENT OF ABORIGINAL CULTURAL HERITAGE SITES

6.1 MANAGEMENT AND MITIGATION OF RECORDED ABORIGINAL SITES

Appropriate management of cultural heritage items is primarily determined based on their assessed significance as well as the likely impacts of the proposed development. The following management options are general principles, in terms of best practice and desired outcomes, rather than mitigation measures against individual site disturbance.

1. Avoid impact by altering the development proposal or in this case by avoiding impact to a recorded Aboriginal site. If this can be done, then a suitable curtilage around the site must be provided to ensure its protection both during the short-term construction phase of development and in the long-term use of the area. If plans are altered, care must be taken to ensure that impacts do not occur to areas not previously assessed.

2. If impact is unavoidable then approval to disturb sites under the authority of an Aboriginal Cultural Heritage Management Plan (ACHMP) will be sought from the NSW Department of Planning, Housing and Infrastructure (DPHI). The project ACHMP will include the addendum study area and management for site 36-3-0084 (Leadville;).

6.2 MANAGEMENT AND MITIGATION OF RECORDED ABORIGINAL SITES

36-3-0084 (Leadville;) is within the addendum study area and will be avoided by the proposal. Site specific management and mitigation measures are detailed below.

6.2.1 36-3-0084 (Leadville;)

36-3-0084 (Leadville;) is located within the Black Stump Way road corridor where road upgrades are currently proposed. No ground disturbing works should be conducted within the dripline of the tree as this may cause inadvertent harm to the site. However, proposed works which will not disturb the existing ground surface such as building up the road surface can be conducted within the dripline of the tree as no damage to the ground surface should occur.

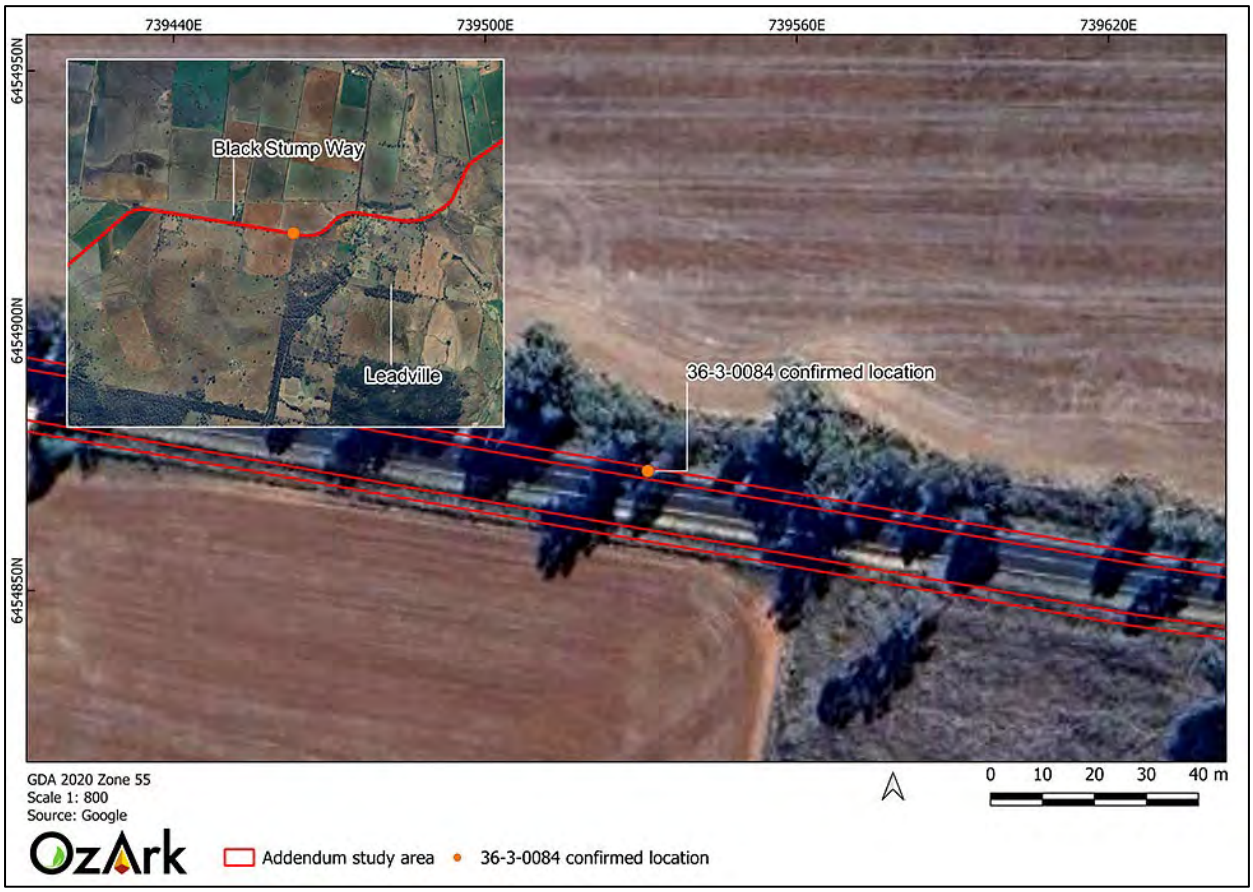
The location of the tree should be provided to contractors prior to the commencement of works.

No test excavation is required at the site as no PAD has been identified in association with the landforms which surround the site.

These recommendations are made due to:

- The cultural value of this site and its importance to the Aboriginal community
- The nature of the site (scarred tree)
- Being in landforms with high previous disturbance from a range of factors including land use practices.

Figure 6-1: Confirmed location of 36-3-0084 (Leadville;).



6.3 UNANTICIPATED FINDS PROTOCOL

Should development consent for the project be gained, an ACHMP would be developed in consultation with RAPs and DPHI. The ACHMP will contain procedures should a new discovery of Aboriginal artefacts be made during construction and/or operation of the project. The procedure in **Section 6.3.1** is an example of an unanticipated finds protocol that could be incorporated into the ACHMP.

6.3.1 Unanticipated finds protocol example

An Aboriginal artefact is anything which is the result of past Aboriginal activity. This includes stone (artefacts, rock engravings etc.), plant (culturally scarred trees) and animal (if showing signs of modification; i.e. smoothing, use). Human bone (skeletal) remains may also be uncovered while onsite.

Cultural heritage significance is assessed by the Aboriginal community and is typically based on traditional and contemporary lore, spiritual values, and oral history, and may also consider scientific and educational value.

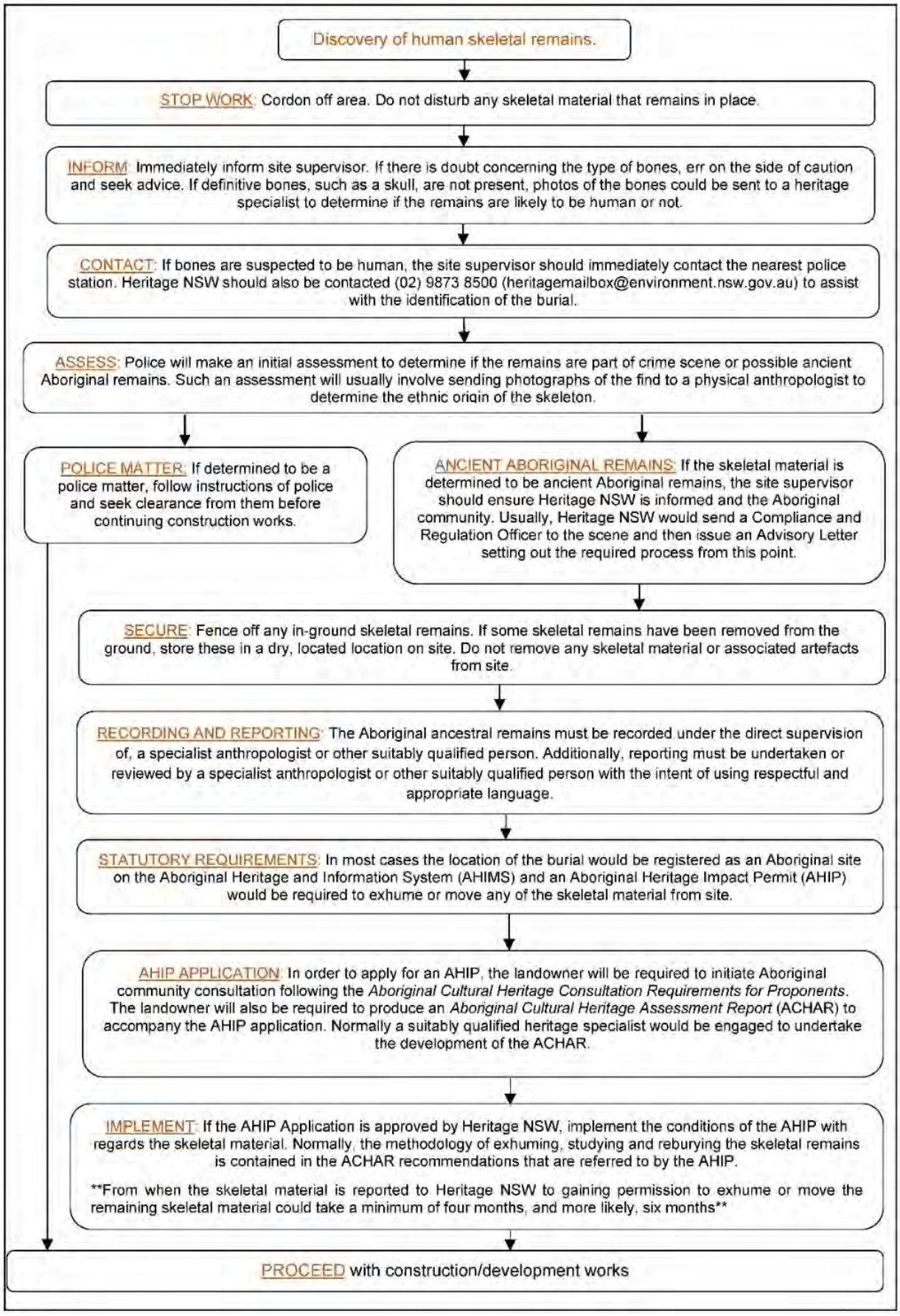
Protocol to be followed if previously unrecorded or unanticipated Aboriginal object(s) are encountered:

1. If any Aboriginal object is discovered and/or harmed in, or under the land, while undertaking the proposed development activities, the proponent must:
    a. Not further harm the object
    b. Immediately cease all work at the particular location
    c. Secure the area to avoid further harm to the Aboriginal object
    d. Notify Heritage NSW as soon as practical on (02) 9873 8500 (heritagemailbox@environment.nsw.gov.au), providing any details of the Aboriginal object and its location; and
    e. Not recommence any work at the particular location unless authorised in writing by Heritage NSW.
2. If Aboriginal burials are unexpectedly encountered during the activity, work must stop immediately, the area secured to prevent unauthorised access and NSW Police and Heritage NSW contacted.
3. Cooperate with the appropriate authorities and relevant Aboriginal community representatives to facilitate:
    a. The recording and assessment of the find(s)
    b. The fulfilment of any legal constraints arising from the find(s), including complying with Heritage NSW directions
    c. The development and implementation of appropriate management strategies, including consultation with stakeholders and the assessment of the significance of the find(s).
4. Where the find(s) are determined to be Aboriginal object(s), recommencement of work in the area of the find(s) can only occur in accordance with any consequential legal requirements and after gaining written approval from Heritage NSW (normally an AHIP or through the procedures of an approved ACHMP).

6.4 UNANTICIPATED SKELETAL REMAINS PROTOCOL

Should development consent for the project be gained, an ACHMP would be developed in consultation with RAPs and DPHI. The ACHMP would contain procedures should a new discovery of human skeletal remains be made during construction or operation of the project. A potential flow-chart relating to the discovery of human skeletal remains is shown on **Figure 6-2**.

Figure 6-2: Unanticipated skeletal remains protocol example.



7 RECOMMENDATIONS

The following recommendations are made in addition to those contained in the ACHAR (OzArk 2023) and are based on the potential harm caused by the project to Aboriginal cultural values and with regard to:

- Legal requirements under the terms of the NPW Act whereby it is illegal to damage, deface or destroy an Aboriginal place or object without the prior written consent of Heritage NSW
- The findings of the current investigations undertaken within the addendum study area
- The interests of the Aboriginal community.

Recommendations concerning Aboriginal cultural values within the survey boundary are as follows:

1. Following granting of development consent for the project, the proponent will be required to develop an ACHMP as per the Conditions of Approval. The ACHMP must be developed in consultation with the RAPs and the DPHI (with input from Heritage NSW). The ACHMP would include an unanticipated finds protocol, unanticipated skeletal remains protocol, requirements for inductions, and long-term management of the Aboriginal sites for the entire project, including the addendum study area. The ACHMP must be approved by the DPHI prior to construction activities occurring within the project area that will include the addendum study area.

2. Harm to Aboriginal site 36-3-0084 (Leadville;), located within the addendum study area of the project, should be avoided in accordance with the management measures set out in **Section 6**.

3. The location of site 36-3-0084 (Leadville;), will be shown on all appropriate plans to ensure that it is not inadvertently harmed during the construction phase of the project.

4. All land-disturbing activities must be confined to within the project's development footprint and access road upgrades. Should the parameters of the proposed work extend beyond this, then further archaeological assessment will be required.

REFERENCES

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Umwelt 2023	Umwelt (Australia) Pty Limited. 2023. *Liverpool Range Wind Farm – Addendum Report: Aboriginal Cultural Heritage Assessment*. Report to Tilt Renewables Australia Pty Ltd as trustee for Liverpool Range Wind Farm Project.

APPENDIX 1: ABORIGINAL COMMUNITY CONSULTATION

Appendix 1 Table 1: Aboriginal community consultation log.

Continued from OzArk 2023

Aboriginal Consultation Log			
17.9.2024	AT Gomilaroi Cultural Consultancy	CB emailed Project update letter **closing date 1.10.24**	Email
17.9.2024	Michael Long	CB emailed Project update letter **closing date 1.10.24**	Email
17.9.2024	Brian Draper	CB emailed Project update letter **closing date 1.10.24**	Email
17.9.2024	Talcon Pty Ltd	CB emailed Project update letter **closing date 1.10.24**	Email
17.9.2024	Steve Talbot	CB emailed Project update letter **closing date 1.10.24**	Email
17.9.2024	Gomeroi People NC2011/006	CB emailed Project update letter **closing date 1.10.24**	Email
17.9.2024	Cacatua General Services	CB emailed Project update letter **closing date 1.10.24**	Email
17.9.2024	AGA Services	CB emailed Project update letter **closing date 1.10.24**	Email
17.9.2024	Bawurra	CB emailed Project update letter **closing date 1.10.24**	Email
17.9.2024	Dubbo Local Aboriginal Land Council	CB emailed Project update letter **closing date 1.10.24**	Email
17.9.2024	Gilgandra Local Aboriginal Land Council	CB emailed Project update letter **closing date 1.10.24**	Email
17.9.2024	Paul Brydon	CB emailed Project update letter **closing date 1.10.24**	Email
17.9.2024	Murong Gialinga Aboriginal & Torres Strait Islander Corporation	CB emailed Project update letter **closing date 1.10.24**	Email
17.9.2024	Kevin Sampson	CB emailed Project update letter **closing date 1.10.24**	Email
17.9.2024	Corroboree Aboriginal Corporation	CB emailed Project update letter **closing date 1.10.24**	Email
17.9.2024	Gunjeewong	CB emailed Project update letter **closing date 1.10.24**	Email
14.11.24	AT Gomilaroi Cultural Consultancy	JH email Addendum ACHAR **closing date 28.11.24**	Email
14.11.24	Michael Long	JH email Addendum ACHAR **closing date 28.11.24**	Email
14.11.24	Brian Draper	JH email Addendum ACHAR **closing date 28.11.24**	Email
14.11.24	Talcon Pty Ltd	JH mailed Addendum ACHAR **closing date 28.11.24**	Postal
14.11.24	Steve Talbot	JH email Addendum ACHAR **closing date 28.11.24**	Email
14.11.24	Gomeroi People NC2011/006	JH email Addendum ACHAR **closing date 28.11.24**	Email
14.11.24	Cacatua General Services	JH email Addendum ACHAR **closing date 28.11.24**	Email
14.11.24	AGA Services	JH email Addendum ACHAR **closing date 28.11.24**	Email
14.11.24	Bawurra	JH email Addendum ACHAR **closing date 28.11.24**	Email

Aboriginal Consultation Log			
14.11.24	Dubbo Local Aboriginal Land Council	JH email Addendum ACHAR **closing date 28.11.24**	Email
14.11.24	Gilgandra Local Aboriginal Land Council	JH email Addendum ACHAR **closing date 28.11.24**	Email
14.11.24	Paul Brydon	JH email Addendum ACHAR **closing date 28.11.24**	Email
14.11.24	Murong Gialinga Aboriginal & Torres Strait Islander Corporation	JH email Addendum ACHAR **closing date 28.11.24**	Email
14.11.24	Kevin Sampson	JH email Addendum ACHAR **closing date 28.11.24**	Email
14.11.24	Corroboree Aboriginal Corporation	JH email Addendum ACHAR **closing date 28.11.24**	Email
14.11.24	Gunjeewong	JH email Addendum ACHAR **closing date 28.11.24**	Email

Appendix 1 Figure 1: Project Update Letter

OzArk Environment & Heritage ABN 29 675 720 564

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17 September 2024

ABORIGINAL CULTURAL HERITAGE ASSESSMENT UPDATE
VALLEY OF THE WINDS WIND FARM – ADDITIONAL SURVEY AREAS.

Dear Members,

We wish to apologise for the delay in correspondence and thank you for your continued interest and participation as a Registered Aboriginal party (RAP) for the Valley of the Winds Wind Farm (the Project).

The purpose of this letter is to update you in relation to the progress of this Project. Since finalisation of the *Aboriginal Cultural Heritage Assessment Report* (ACHAR) for the Project, it has been identified that ACEN Australia (the proponent) requires assessment of Black Stump Way and Moorefield Road to provide access to the Project.

OzArk has now been engaged to assess the additional components required for the Project (**Figure 1-1**). The additional components include:

- Approximately 28 kilometres (km) of Black Stump Way, extending from the intersection with the Golden Highway in the south to the Mount Hope cluster in the north
- Approximately 5.8 km of Moorefield Road, from the intersection of Black Stump Way extending towards the Girragulang Road cluster.

A search of the Aboriginal Heritage Information Management System (AHIMS) database conducted on 15 September 2024 returned 118 Aboriginal sites within a 10 kilometre (km) by 10 km search area centred on the additional survey areas (Lat, Long From: -32.1041, 149.3948 - Lat, Long To : -31.8128, 149.8891) (**Figure 1-2**). Several previously recorded Aboriginal sites are located near the additional survey areas which will require ground truthing. These sites include artefact scatters and scarred trees, mostly recorded as part of 1998 assessment for a gas pipeline extending from Dubbo to Tamworth via Gunnedah.

The additional survey will be completed in accordance with the assessment methodology prepared for the Project in May 2021 and the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (the Code of Practice; DECCW 2010). The survey will be undertaken by two OzArk archaeologists and two RAPs.

Landform modelling shows the two sections of road predominately comprise Survey Unit 3 (low gradient/undulating landforms), while a small section of Black Stump Way comprises Survey Unit 4 (floodplain landforms), where it intersects Coolaburragundy River. Black Stump Way also intersects Hobbins Gully, a non-perennial watercourse. The section of Moorefield Road does not intersect any named watercourses. Vegetation along the road corridors is variable across both sections, with some stretches cleared of all trees, while other areas are densely treed.

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Based on the landform modelling, the survey will involve 'targeted pedestrian survey' across Survey Unit 3 landforms (low gradient/undulating landforms). This will involve sampling sections along the road corridors in accordance with the Code of Practice, with a focus on understanding the archaeological potential of representative landforms within these areas. Full pedestrian survey will be completed along the section of Black Stump Way which contains Survey Unit 4 (floodplain landforms).

The results of the survey will be presented in an addendum to the ACHAR for the Project which will be distributed to all RAPs once complete for review. This will detail whether any Aboriginal sites will be harmed by the proposed works along the roads.

In addition to any comments of the above sampling strategy for the survey, we welcome any Aboriginal cultural heritage knowledge relevant to the additional survey areas that you care to share. This input will help to improve our assessment outcomes and ensure Aboriginal cultural values are considered during the survey.

OzArk is asking that any comments on this document be received in 14 days by Tuesday 1 October 2024. Please let OzArk know as soon as possible if this 14-day review period causes you any issues and we'll try to arrive at a mutually agreeable time.

Should you have any queries in relation to the enclosed information please do not hesitate to contact our office on (02) 6882 0118 or stephanie@ozarkehm.com.au.

Kind regards,

Stephanie Rusden
Senior Archaeologist
stephanie@ozarkehm.com.au

OzArk Environment & Heritage

Figure 1-1: Map of the additonal Project components.

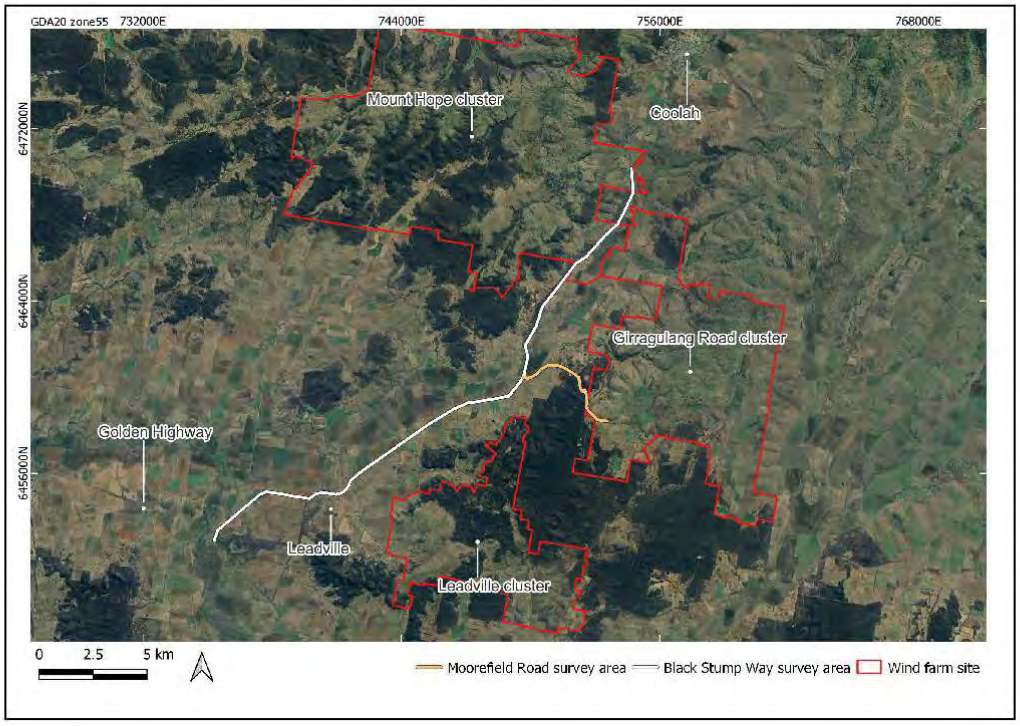

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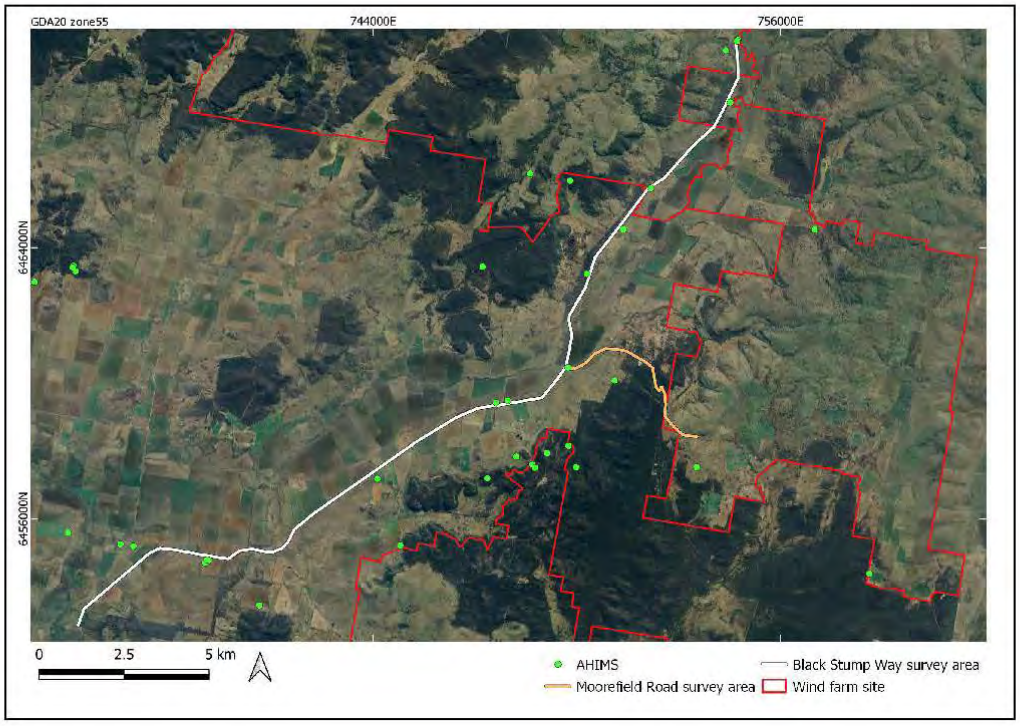
Figure 1-2: AHIMS sites located near the additional Project components.



Appendix 1 Figure 2: Addendum ACHAR Email

Hello Members,

Following on from our project update letter provided on 17 September 2024, the survey for the addendum assessment areas (Black Stump Way and Moorefield Road) has been completed and the draft Aboriginal Cultural heritage assessment Report (ACHAR) prepared detailing the results of the assessment.

Please find attached a copy of the draft ACHAR for your review. As this is an addendum ACHAR, OzArk is asking that any comments on this document be received in 14 days by Thursday 28 November 2024.

Please let OzArk know as soon as possible if this 14-day review period causes you any issues and we'll try to arrive at a mutually agreeable time; although the project is now on a very tight timeframe and the proponent has asked that any comments be received as soon as is possible.
OzArk thanks you for your understanding in this matter.

Thanks,
Jordan

Jordan Henshaw
Archaeologist

ISO 9001 Quality Management | ISO 14001 Environmental Management | ISO 45001 Health & Safety Management

OzArk Environment & Heritage
PO Box 2069 DUBBO 2830
02 6882 0118
jordan@ozarkehm.com.au, www.ozarkehm.com.au

OzArk and staff respectfully acknowledge the Traditional Owners and Custodians of the Country on which we work.

Appendix 1 Figure 3: Addendum ACHAR Letter

OzArk Environment & Heritage
Dubbo | Queanbeyan
Wollongong | Newcastle
Katoomba
T: 02 6882 0118
enquiry@ozarkehm.com.au
www.ozarkehm.com.au
ABN 29 675 720 564
145 Wingewarra St
PO Box 2069
DUBBO NSW 2830

14 November 2024

LETTER REPORT

VALLEY OF THE WINDS DRAFT ADDENDUM ACHAR

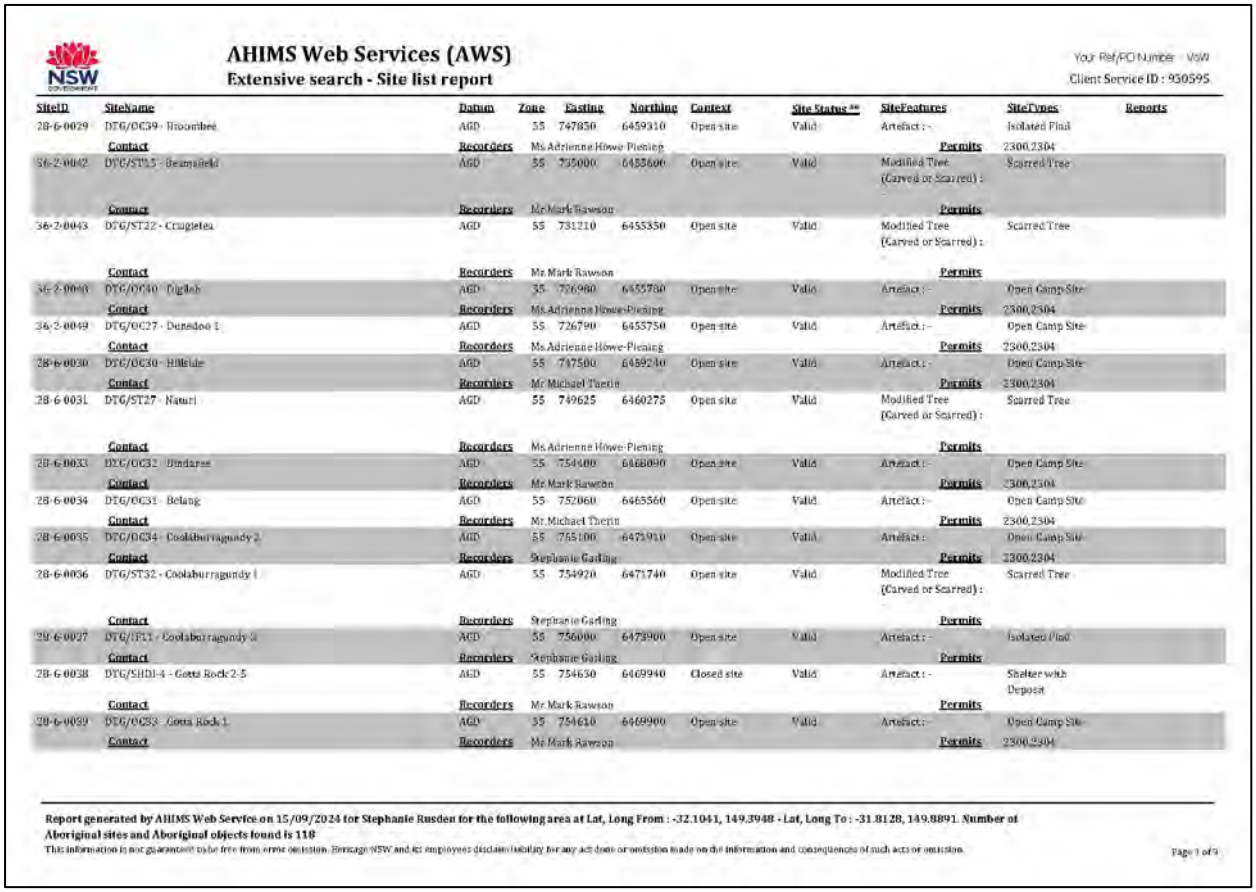
Hello Members,

Following on from our project update letter provided on 17 September 2024, the survey for the addendum assessment areas (Black Stump Way and Moorefield Road) has been completed and the draft Aboriginal Cultural heritage assessment Report (ACHAR) prepared detailing the results of the assessment.

Please find attached a copy of the draft ACHAR for your review. As this is an addendum ACHAR, OzArk is asking that any comments on this document be received in 14 days by Thursday 28 November 2024.

Please let OzArk know as soon as possible if this 14-day review period causes you any issues and we'll try to arrive at a mutually agreeable time; although the project is now on a very tight timeframe and the proponent has asked that any comments be received as soon as is possible. OzArk thanks you for your understanding in this matter.

APPENDIX 2: AHIMS SEARCH RESULTS



AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : VoW
Client Service ID : 930595

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
28-6-0029	DTG/OC39 - Broombee	AGD	55	747850	6459310	Open site	Valid	Artefact : -	Isolated Find	
	Contact	Recorders	Ms Adrienne Howe-Piening					Permits	2300,2304	
36-2-0042	DTG/ST35 - Beamsfield	AGD	55	735000	6455600	Open site	Valid	Modified Tree (Carved or Scarred) :	Scarred Tree	
	Contact	Recorders	Mr Mark Rawson					Permits		
36-2-0043	DTG/ST22 - Craigielea	AGD	55	731210	6455350	Open site	Valid	Modified Tree (Carved or Scarred) :	Scarred Tree	
	Contact	Recorders	Mr Mark Rawson					Permits		
36-2-0048	DTG/OC40 - Digilah	AGD	55	726980	6455780	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Ms Adrienne Howe-Piening					Permits	2300,2304	
36-2-0049	DTG/OC27 - Dunedoo 1	AGD	55	726790	6455750	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Ms Adrienne Howe-Piening					Permits	2300,2304	
28-6-0030	DTG/OC30 - Hillside	AGD	55	747500	6459240	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Mr Michael Therin					Permits	2300,2304	
28-6-0031	DTG/ST27 - Naturi	AGD	55	749625	6460275	Open site	Valid	Modified Tree (Carved or Scarred) :	Scarred Tree	
	Contact	Recorders	Ms Adrienne Howe-Piening					Permits		
28-6-0033	DTG/OC32 - Bindaree	AGD	55	754400	6468090	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Mr Mark Rawson					Permits	2300,2304	
28-6-0034	DTG/OC31 - Belang	AGD	55	752060	6465560	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Mr Michael Therin					Permits	2300,2304	
28-6-0035	DTG/OC34 - Coolaburragundy 2	AGD	55	755100	6472910	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Stephanie Garling					Permits	2300,2304	
28-6-0036	DTG/ST32 - Coolaburragundy 1	AGD	55	754920	6471740	Open site	Valid	Modified Tree (Carved or Scarred) :	Scarred Tree	
	Contact	Recorders	Stephanie Garling					Permits		
28-6-0037	DTG/IF13 - Coolaburragundy 3	AGD	55	756000	6473900	Open site	Valid	Artefact : -	Isolated Find	
	Contact	Recorders	Stephanie Garling					Permits		
28-6-0038	DTG/SHD1-4 - Gotta Rock 2-5	AGD	55	754630	6469940	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	Recorders	Mr Mark Rawson					Permits		
28-6-0039	DTG/OC33 - Gotta Rock 1	AGD	55	754610	6469900	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Mr Mark Rawson					Permits	2300,2304	

Report generated by AHIMS Web Service on 15/09/2024 for Stephanie Rusden for the following area at Lat, Long From : -32.1041, 149.3948 - Lat, Long To : -31.8128, 149.8891. Number of Aboriginal sites and Aboriginal objects found is 118

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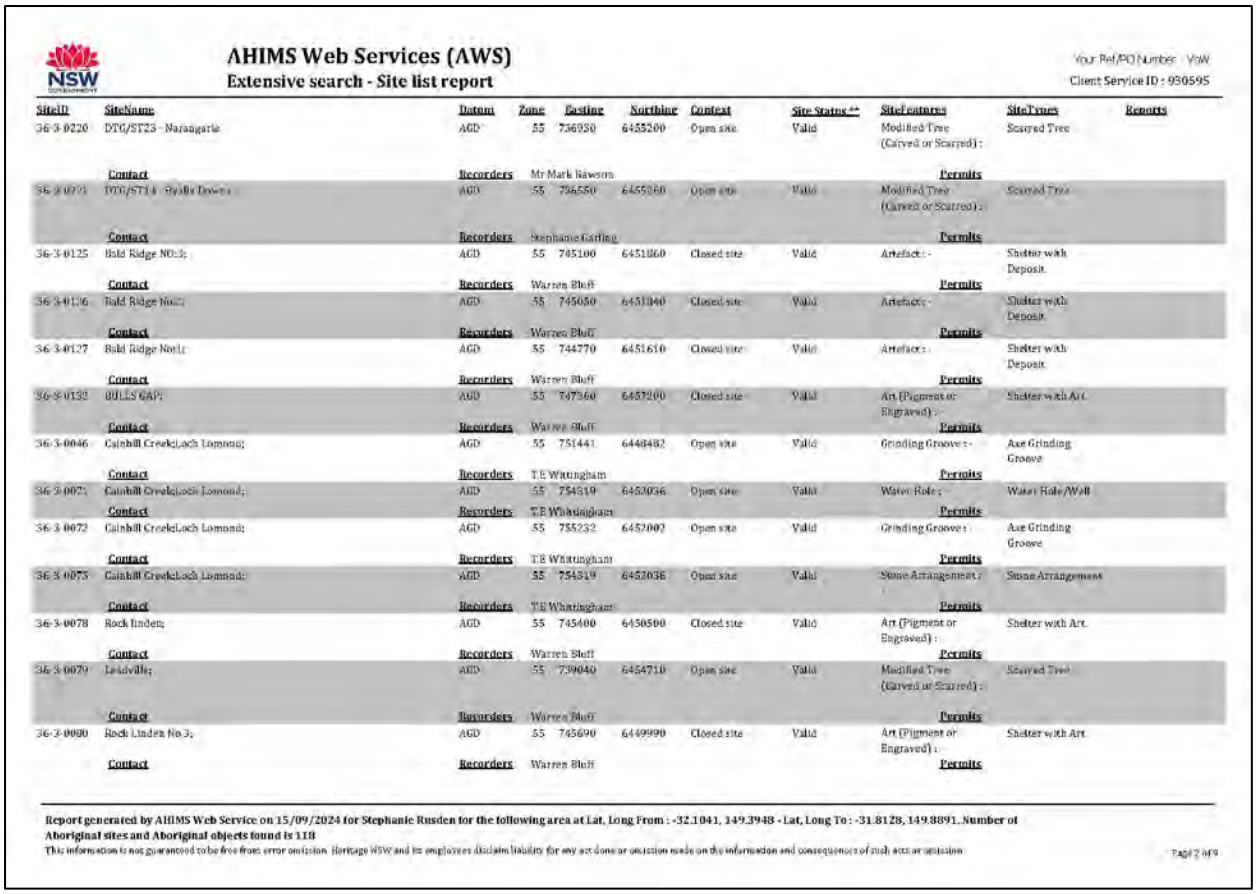
Page 1 of 9



AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : VoW
Client Service ID : 930595

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
36-3-0020	DTG/ST23 - Narangarie	AGD	55	736930	6455200	Open site	Valid	Modified Tree (Carved or Scarred) :	Scarred Tree	
	Contact	Recorders	Mr Mark Rawson					Permits		
36-3-0070	DTG/ST14 - Hyllix Downs	AGD	55	736550	6455060	Open site	Valid	Modified Tree (Carved or Scarred) :	Scarred Tree	
	Contact	Recorders	Stephanie Garling					Permits		
36-3-0125	Bald Ridge NO:3;	AGD	55	745100	6451860	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	Recorders	Warren Bluff					Permits		
36-3-0126	Bald Ridge No:2;	AGD	55	745050	6451840	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	Recorders	Warren Bluff					Permits		
36-3-0127	Bald Ridge No:1;	AGD	55	744770	6451610	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	Recorders	Warren Bluff					Permits		
36-3-0132	BULLS GAP;	AGD	55	747360	6452200	Closed site	Valid	Art (Pigment or Engraved) :	Shelter with Art	
	Contact	Recorders	Warren Bluff					Permits		
36-3-0046	Cainhill Creek/Loch Lomond;	AGD	55	751441	6448482	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	
	Contact	Recorders	T.E Whittingham					Permits		
36-3-0071	Cainhill Creek/Loch Lomond;	AGD	55	754819	6452036	Open site	Valid	Water Hole :	Water Hole/Well	
	Contact	Recorders	T.E Whittingham					Permits		
36-3-0072	Cainhill Creek/Loch Lomond;	AGD	55	755232	6452002	Open site	Valid	Grinding Groove :	Axe Grinding Groove	
	Contact	Recorders	T.E Whittingham					Permits		
36-3-0073	Cainhill Creek/Loch Lomond;	AGD	55	754819	6452036	Open site	Valid	Stone Arrangement :	Stone Arrangement	
	Contact	Recorders	T.E Whittingham					Permits		
36-3-0078	Rock linden;	AGD	55	745400	6450500	Closed site	Valid	Art (Pigment or Engraved) :	Shelter with Art	
	Contact	Recorders	Warren Bluff					Permits		
36-3-0079	Leadville;	AGD	55	739040	6454710	Open site	Valid	Modified Tree (Carved or Scarred) :	Scarred Tree	
	Contact	Recorders	Warren Bluff					Permits		
36-3-0080	Rock Linden No.3;	AGD	55	745690	6449990	Closed site	Valid	Art (Pigment or Engraved) :	Shelter with Art	
	Contact	Recorders	Warren Bluff					Permits		

Report generated by AHIMS Web Service on 15/09/2024 for Stephanie Rusden for the following area at Lat, Long From : -32.1041, 149.3948 - Lat, Long To : -31.8128, 149.8891. Number of Aboriginal sites and Aboriginal objects found is 118

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Page 2 of 9

AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : VoW
Client Service ID : 930595

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
36-2-0018	Crabtree;	AGD	55	731947	6453923	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	Recorders	Mukurrwa Austin					Permits		
36-3-0014	Leadville;	AGD	55	740644	6453458	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	Recorders	Phil Hughes					Permits		
36-3-0082	Old Castle;	AGD	55	744800	6455220	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Warren Bluff					Permits		
36-3-0082	Rock Linden No.1;	AGD	55	745010	6449790	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	1333
	Contact	Recorders	Warren Bluff					Permits		
36-3-0083	Rock Linden No.4;	AGD	55	745820	6450800	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	Recorders	Warren Bluff					Permits		
36-3-0084	Leadville;	AGD	55	739150	6454780	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
	Contact	Recorders	Warren Bluff					Permits		
36-3-0085	Leadville;	AGD	55	739100	6454790	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
	Contact	Recorders	Warren Bluff					Permits		
36-3-0088	Gundooee No2;	AGD	55	740307	6450337	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	Recorders	Warren Bluff					Permits		
36-3-0089	GUNDOOEE NO 1;	AGD	55	747024	6450293	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	Recorders	Warren Bluff					Permits		
36-3-0108	Argyll No.4;	AGD	55	753760	6448200	Open site	Valid	Stone Arrangement : -	Stone Arrangement	
	Contact	Recorders	Warren Bluff					Permits		
36-3-0109	Argyll No.5;	AGD	55	754100	6448050	Open site	Valid	Stone Arrangement : -	Stone Arrangement	
	Contact	Recorders	Warren Bluff					Permits		
36-3-0111	Argyll No.3	GDA	55	753448	6446943	Open site	Valid	Grinding Groove : -, Stone Arrangement : -, Water Hole : -	Axe Grinding Groove,Stone Arrangement,Water Hole/Well	
	Contact	Recorders	Warren Bluff(OzArk Environmental and Heritage Management - Dubbo,Miss Steph					Permits		
36-3-0112	Argyll No.2;	AGD	55	754050	6447030	Open site	Valid	Stone Arrangement : -	Stone Arrangement	
	Contact	Recorders	Warren Bluff					Permits		

Report generated by AHIMS Web Service on 15/09/2024 for Stephanie Rusden for the following area at Lat, Long From : -32.1041, 149.3948 - Lat, Long To : -31.8128, 149.8891. Number of Aboriginal sites and Aboriginal objects found is 118

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AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : VoW
Client Service ID : 930595

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
36-3-0113	Argyll No.1;	AGD	55	754700	6447120	Open site	Valid	Grinding Groove :	Axe Grinding Groove	
	Contact	Recorders	Warren Bluff					Permits		
36-3-0114	Waringle;	AGD	55	740700	6447900	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Warren Bluff					Permits		
28-5-0005	Box Valley Station;	AGD	55	735110	6463120	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	
	Contact	Recorders	Warren Bluff					Permits		
28-5-0018	Box Vally No2;	AGD	55	735050	6463260	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	Recorders	Warren Bluff					Permits		
28-5-0019	Box Vally No3;	AGD	55	735030	6463230	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	Recorders	Warren Bluff					Permits		
28-5-0020	Box Vally No4;	AGD	55	735900	6462000	Open site	Valid	Stone Arrangement : -	Stone Arrangement	
	Contact	Recorders	Warren Bluff					Permits		
28-6-0001	Salisbury;Coolah;	AGD	55	738200	6470500	Open site	Valid	Artefact : -, Modified Tree (Carved or Scarred) : -	Open Camp Site,Scarred Tree	
	Contact	Recorders	Glen Morris					Permits		
28-6-0003	Pound Gully Estate Area1;Pilga Burra;	AGD	55	747300	6463350	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	2074
	Contact	Recorders	Warren Bluff					Permits		
28-6-0004	Pound Gully Estate Pilga Burra 2	AGD	55	749680	6465790	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	2074
	Contact	Recorders	R.B Easton					Permits		
28-6-0006	Hannin's Bridge;	AGD	55	751000	6459000	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	Recorders	Isabel McHrydn					Permits		
28-6-0007	Weeraman;	AGD	55	744000	6457000	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	R Hawkins					Permits		
28-6-0009	Galandene;Coolah;	AGD	55	755950	6478200	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	1333
	Contact	Recorders	L Ahearn					Permits		
28-6-0010	Coolah;	AGD	55	755000	6476000	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	
	Contact	Recorders	Sabu Dunn					Permits		
28-6-0011	Bong Bong Coolah;	AGD	55	748500	6466000	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	
	Contact	Recorders	ASRSYS					Permits		

Report generated by AHIMS Web Service on 15/09/2024 for Stephanie Rusden for the following area at Lat, Long From : -32.1041, 149.3948 - Lat, Long To : -31.8128, 149.8891. Number of Aboriginal sites and Aboriginal objects found is 118

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AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : VoW
Client Service ID : 930595

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
28-6-0013	Pilca Buna No 2;	AGD	55	751260	6464350	Open site	Valid	Grinding Groove :	Axe Grinding Groove	
	Contact	Recorders	Warren Bluff					Permits		
28-6-0014	Sierra Downs No5;	AGD	55	749000	6457760	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	Recorders	Warren Bluff					Permits		
36-3-0153	Springdale;	AGD	55	753100	6446370	Open site	Valid	Stone Arrangement : ;	Stone Arrangement	1333
	Contact	Recorders	Warren Bluff					Permits		
36-3-0154	Springdale;	AGD	55	752000	6445450	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	1333
	Contact	Recorders	Warren Bluff					Permits		
36-3-0180	Open campsite;	AGD	55	768500	6447000	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Sheree-Lee Evans					Permits		
28-6-0015	Sierra Downs No2;	AGD	55	748570	6457410	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	Recorders	Warren Bluff					Permits		
28-6-0016	Sierra Downs No1;	AGD	55	748570	6457620	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	Recorders	Warren Bluff					Permits		
28-6-0017	Sierra Downs No3;	AGD	55	748650	6457330	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	Recorders	Warren Bluff					Permits		
28-6-0018	Sierra Downs No4;	AGD	55	749640	6457970	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	Recorders	Warren Bluff					Permits		
28-6-0020	Quindalup;	AGD	55	770440	6462980	Open site	Valid	Modified Tree (Carved or Scarred) :	Scarred Tree	
	Contact	Recorders	Warren Bluff					Permits		
28-6-0021	Quindalup 2;	AGD	55	769600	6463420	Open site	Valid	Modified Tree (Carved or Scarred) :	Scarred Tree	
	Contact	Recorders	Warren Bluff					Permits		
28-6-0022	Gallidibus;	AGD	55	764040	6470250	Open site	Valid	Modified Tree (Carved or Scarred) :	Scarred Tree	
	Contact	Recorders	Warren Bluff					Permits		
28-6-0024	Serria Downs;	AGD	55	748100	6457650	Closed site	Valid	Art (Pigment or Engraved) :	Shelter with Art	
	Contact	Recorders	Warren Bluff					Permits		

Report generated by AHIMS Web Service on 15/09/2024 for Stephanie Rusden for the following area at Lat, Long From : -32.1041, 149.3948 - Lat, Long To : -31.8128, 149.8891. Number of Aboriginal sites and Aboriginal objects found is 118

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AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : VoW
Client Service ID : 930595

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
28-6-0025	Serria Downs;	AGD	55	749860	6457940	Closed site	Valid	Artefact: -	Shelter with Deposit	1333
	Contact	Recorders	Warren Bluff					Permits		
36-2-0078	Talbragar River 7	GDA	55	771725	6462254	Open site	Valid	Potential Archaeological Deposit (PAD) : , Grinding Groove : 1		
	Contact	Recorders	Umwelt (Australia) Pty Limited - Individual users, Miss Rebecca Ogden-Brunell, Mis					Permits		
36-2-0089	Dunedoo ST	AGD	55	726301	6450980	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders	April Blair					Permits		
36-3-0003	The Springs Harbry The Pinnacle	AGD	55	754149	6447466	Open site	Valid	Art (Pigment or Engraved) : -, Grinding Groove : -	Axe Grinding Groove,Rock Engraving	
	Contact	Recorders	Isabel McBryde					Permits		
28-6-0040	BBS; Gilgandra LALC; Crowe Reserve	AGD	55	750172	6463037	Open site	Valid	Artefact: 30		90850
	Contact	Recorders	Val Purcell,Gilgandra LALC - BBS Survey team					Permits		
36-2-0429	Beryl-Dunedoo OS2 with PAD	GDA	55	727582	6449194	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact	Recorders	Doctor Jodie Benton					Permits		
36-2-0430	Beryl Dunedoo OS1 with PAD	GDA	55	727522	6449591	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1		
	Contact	Recorders	Doctor Jodie Benton					Permits		
28-6-0055	Liverpool Range LU6-L1	GDA	55	766467	6476439	Open site	Valid	Artefact : -		
	Contact	Recorders	Doctor Julie Dibden,NSW Archaeology Pty Ltd					Permits		
36-3-0500	Cuboon-1	GDA	55	733226	6449921	Open site	Valid	Artefact : -		
	Contact	Recorders	RPS AAP Consulting Pty Ltd - Hamilton,Madlen Slack					Permits		
36-2-0513	Dunedoo Solar APT24	GDA	55	726660	6455894	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr Matthew Barber,NGH Heritage - Fyshwick					Permits		
28-5-0078	Dunedoo Solar APT23	GDA	55	726915	6457804	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr Matthew Barber,NGH Heritage - Fyshwick					Permits		
28-5-0079	Dunedoo Solar APT22	GDA	55	726895	6458113	Open site	Valid	Artefact :		
	Contact	Recorders	Mr Matthew Barber,NGH Heritage - Fyshwick					Permits		
28-5-0080	Dunedoo Solar APT21	GDA	55	726770	6458184	Open site	Valid	Artefact :		
	Contact	Recorders	Mr Matthew Barber,NGH Heritage - Fyshwick					Permits		
28-5-0095	Dunedoo Solar APT15	GDA	55	726289	6457461	Open site	Valid	Artefact :		
	Contact	Recorders	Mr Matthew Barber,NGH Heritage - Fyshwick					Permits		

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AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : VoW
Client Service ID : 930595

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
28-5-0096	Dunedoo Solar AFT16	GDA	55	726621	6457994	Open site	Valid	Artefact :		
	Contact	Recorders	Mr Matthew Barber,NGH Heritage - Fyshwick						Permits	
28-5-0097	Dunedoo Solar AFT17	GDA	55	726784	6457934	Open site	Valid	Artefact :		
	Contact	Recorders	Mr Matthew Barber,NGH Heritage - Fyshwick						Permits	
28-5-0098	Dunedoo Solar AFT18	GDA	55	727005	6458011	Open site	Valid	Artefact :		
	Contact	Recorders	Mr Matthew Barber,NGH Heritage - Fyshwick						Permits	
28-5-0099	Dunedoo Solar AFT19	GDA	55	727090	6458143	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr Matthew Barber,NGH Heritage - Fyshwick						Permits	
28-5-0100	Dunedoo Solar AFT20	GDA	55	726845	6458206	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr Matthew Barber,NGH Heritage - Fyshwick						Permits	
28-6-0063	The Rock IF-1	GDA	55	754390	6469014	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr Brendan Fisher						Permits	
36-3-3805	Kensington OS-1	GDA	55	758621	6454390	Open site	Valid	Artefact :		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr Brendan Fisher						Permits	
28-6-0060	Orana OS-1	GDA	55	757004	6466532	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr Brendan Fisher						Permits	
28-6-0061	Old Farm OS-1	GDA	55	755551	6467532	Open site	Valid	Artefact : -, Stone Quarry : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr Brendan Fisher						Permits	
36-3-3806	Cainbd Creek OS-2	GDA	55	752081	6449278	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr Brendan Fisher						Permits	
36-3-4083	SNI-CMT08	GDA	55	765993	6444590	Open site	Not a Site	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	AHIMS APP Users,AHIMS APP Users,AHIMS APP Users,Miss Rohani (emm consulti						Permits	
36-3-4062	SNI-AS74	GDA	55	769840	6444938	Open site	Valid	Artefact : -		
	Contact	Recorders	AHIMS APP Users,Miss Rohani (emm consulting) Dutch						Permits	
36-3-4077	SNI-CMT07	GDA	55	765940	6444553	Open site	Not a Site	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	AHIMS APP Users,AHIMS APP Users,Miss Rohani (emm consulting) Dutch,Miss Roh						Permits	
36-3-4077	SNI-AS39	GDA	55	753412	6447014	Open site	Valid	Artefact :		
	Contact	Recorders	AHIMS APP Users,Miss Rohani (emm consulting) Dutch						Permits	
36-3-4082	SNI-IF45	GDA	55	753364	6447091	Open site	Valid	Artefact :		
	Contact	Recorders	AHIMS APP Users,Miss Rohani (emm consulting) Dutch						Permits	

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AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : VoW
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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
36-3-4083	SNI-IF44	GDA	55	751688	6448368	Open site	Valid	Artefact :		
	Contact	Recorders	AHIMS APP Users,Miss Rohani (emm consulting) Dutch						Permits	
36-3-4103	SNI-0505	GDA	55	766074	6444800	Closed site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	AHIMS APP Users,Miss Rohani (emm consulting) Dutch						Permits	
36-3-4110	SNI-GG17	GDA	55	767566	6445765	Open site	Valid	Grinding Groove : -		
	Contact	Recorders	AHIMS APP Users,Miss Rohani (emm consulting) Dutch						Permits	
36-3-4051	Gilgamaay (Brothers)	GDA	55	745707	6446680	Open site	Valid	Aboriginal Cemetery and Dreaming : -		
	Contact	Recorders	Dariinjung LALC - Wong,Ms Sharon Hodgetts						Permits	
36-3-4117	SNI-GG14	GDA	55	753433	6446957	Open site	Valid	Grinding Groove : -		
	Contact	Recorders	AHIMS APP Users,Miss Rohani (emm consulting) Dutch						Permits	
36-3-4113	SNI-AS87	GDA	55	772212	6446674	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	AHIMS APP Users,Miss Rohani (emm consulting) Dutch						Permits	
36-3-4094	SNI-SA01	GDA	55	753470	6446950	Open site	Valid	Stone Arrangement : -		
	Contact	Recorders	AHIMS APP Users,Miss Rohani (emm consulting) Dutch						Permits	
36-3-4101	SNI-IF77	GDA	55	748141	6445152	Open site	Valid	Artefact : -		
	Contact	Recorders	AHIMS APP Users,Miss Rohani (emm consulting) Dutch						Permits	
28-6-0066	Junction Creek	GDA	55	769750	6472027	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Umwelt (Australia) Pty Limited - Individual users,Miss Alison Fenwick						Permits	
28-6-0067	Turee Creek 2	GDA	55	764718	6468055	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Umwelt (Australia) Pty Limited - Individual users,Miss Alison Fenwick						Permits	
28-6-0068	Turee Creek 1	GDA	55	764068	6467940	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	Umwelt (Australia) Pty Limited - Individual users,Miss Alison Fenwick						Permits	
28-6-0080	LAWF ST 2	GDA	55	771455	6466740	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Umwelt (Australia) Pty Limited - Individual users,Miss Alison Fenwick						Permits	
36-2-0778	Wattle Grove IF1	GDA	55	728463	6450405	Open site	Valid	Artefact : -		
	Contact	Recorders	Ms Sophia Grubnic						Permits	

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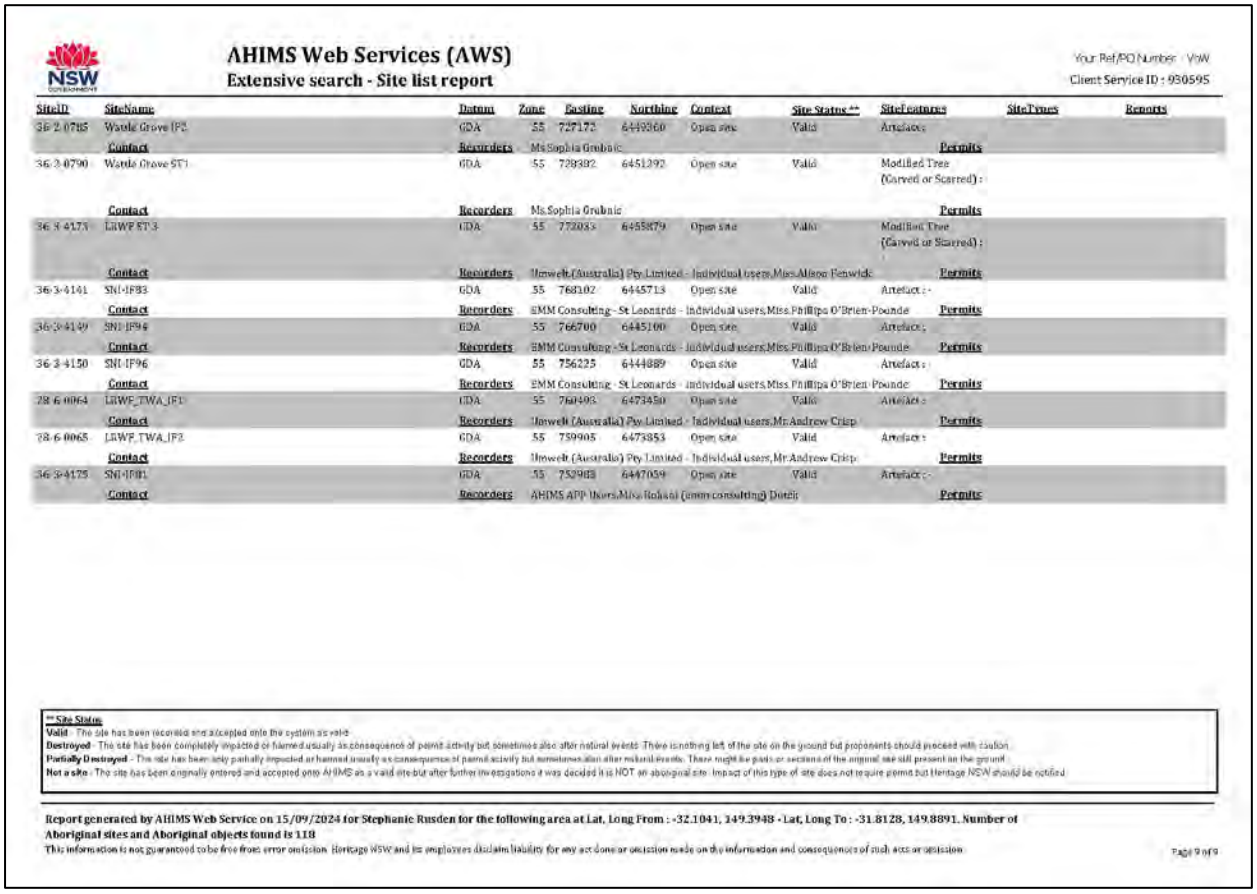

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : VoW
Client Service ID : 930595

SiteID	SiteName	Datum	Zone	Eastine	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
36-2-0785	Wattle Grove IF2	GDA	55	727172	6449360	Open site	Valid	Artefact :		
	Contact	Recorders	Ms.Sophia Grubnic						Permits	
36-3-0790	Wattle Grove ST1	GDA	55	728382	6451292	Open site	Valid	Modified Tree (Carved or Scarred) :		
	Contact	Recorders	Ms.Sophia Grubnic						Permits	
36-3-4173	LRWF ST3	GDA	55	772083	6455879	Open site	Valid	Modified Tree (Carved or Scarred) :		
	Contact	Recorders	Umwelt (Australia) Pty Limited - Individual users,Miss.Alison Fenwick						Permits	
36-3-4141	SNI-IF83	GDA	55	768102	6445713	Open site	Valid	Artefact : -		
	Contact	Recorders	EMM Consulting - St Leonards - Individual users,Miss.Phillipa O'Brien-Pounde						Permits	
36-3-4149	SNI-IF96	GDA	55	766700	6445100	Open site	Valid	Artefact :		
	Contact	Recorders	EMM Consulting - St Leonards - Individual users,Miss.Phillipa O'Brien-Pounde						Permits	
36-3-4150	SNI-IF96	GDA	55	756225	6444889	Open site	Valid	Artefact :		
	Contact	Recorders	EMM Consulting - St Leonards - Individual users,Miss.Phillipa O'Brien-Pounde						Permits	
28-6-0064	LRWF_TWA_IF1	GDA	55	760405	6473450	Open site	Valid	Artefact :		
	Contact	Recorders	Umwelt (Australia) Pty Limited - Individual users,Mr.Andrew Crisp						Permits	
28-6-0065	LRWF_TWA_IF2	GDA	55	759905	6473853	Open site	Valid	Artefact :		
	Contact	Recorders	Umwelt (Australia) Pty Limited - Individual users,Mr.Andrew Crisp						Permits	
36-3-4175	SNI-IF81	GDA	55	752988	6447059	Open site	Valid	Artefact : -		
	Contact	Recorders	AHIMS APP Users,Miss.Rohani (emm consulting) Dutzir						Permits	

**Site Status
Valid - The site has been recorded and accepted onto the system as valid
Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution
Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground
Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

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