ACCESS
ENVIRONMENTAL PLANNING

BIODIVERSITY DEVELOPMENT ASSESSMENT REPORT (BDAR)

PREPARED FOR

Proposed New Residential Dwelling
845 Ridge Road, Cooks Gap

Alain White

Access Environmental Planning

September 2022

ACCESS ENVIRONMENTAL PLANNING

Proponent	*Alain White*		
Client	*Alain White*		
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Executive Summary

Access Environmental Planning Pty Ltd (AEP) was commissioned by the proponent to prepare a Biodiversity Development Assessment Report (BDAR) for the proposed development of a new residential dwelling house at Cooks Gap near Gulgong. Inclusions for the assessment and reporting are as prescribed by the NSW Biodiversity Conservation (BC) Act 2016 and the corresponding Biodiversity Assessment Method (BAM) 2020.

The proposal

This proposal involves construction of a new residential dwelling made from recycled shipping containers, associated infrastructure, driveway and asset protection zone (APZ) for bushfire risk mitigation.

Proponent	*Alain White*
Proposal	*New residential dwelling*
Property Location	*845 Ridge Road, Cooks Gap, NSW 2850*
Cadastre	*Lot 80 / DP 251603*
Land use zoning	*R5 Large lot residential*
Latitude and longitude	*Lat -32.3215 Long 149.7118*
Accredited Assessor	*Christopher Botfield (BAAS No. 18023)*

Biodiversity Offset Scheme

The Biodiversity Offset Scheme (BOS) has an area threshold trigger providing an allowance for clearing native vegetation based on the minimum lot size of the property or its associated land zoning. It has an additional trigger which is based on whether the property for the proposed development is identified on the NSW State Biodiversity Values Map (BVM). If the proposed development requires more native vegetation clearance than the area threshold or the proposed development area is on the BVM then the development requires a Biodiversity Assessment resulting in a Biodiversity Development Assessment Report (BDAR). This will determine the Biodiversity Offset Credit (BOC) obligation. Large areas of the property have high biodiversity value and are included on the BVM, so the BOS is triggered and a BDAR is necessary. The BOS scheme allows compensatory measures to be assessed and calculated in an effort to mitigate the loss of ecological value caused by development.

The environment

Vegetation at the site is predominantly dry sclerophyll forest with modified woody areas and sections of derived grassland. The development site has undergone past management activities that have altered the structure of the existing native vegetation community and groundcover diversity in some places. The Plant Community Type (PCT) found at the proposed development site was Eastern NSW PCT 3753, *Dunedoo sandstone ironbark-pine forest* (comparable PCT 1610 a white box and black cypress pine community, used in the on-line BAM calculator). There are no threatened ecological communities (TEC) associated with this plant community.

Biodiversity Offsets Scheme summary

Site status, habitat suitability factors and efforts to minimise impacts from the development activities, mean threatened species are unlikely to be significantly impacted by site changes. The assessed condition means **three ecosystem credits** and **two species credits each for the regent honeyeater and the pine donkey orchid** are required to offset the biodiversity impacts of the proposal. Effects of indirect and prescribed impacts will be limited by the implementation of recommended safeguards. While the regent honeyeater is identified with potential serious and irreversible impacts (SAII) both the composition and integrity of the existing vegetation and scale of the proposal means that proposed development will not exacerbate factors that contribute to these effects.

Glossary of Terms and Abbreviations

Term	Meaning
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator (online)
BDAR	Biodiversity Development Assessment Report
BC Act	Biodiversity Conservation Act 2016
BOS	Biodiversity Offset Scheme
BVM	Biodiversity Values Map
DCCEEW	Department Climate Change, Energy, the Environment and Water
DPE	Department of Planning and Environment
DPIE	Department of Planning, Industry and Environment
EEC	Endangered Ecological Community
EMP	Environmental Management Plan
EP&A Act	Environmental Planning and Assessment Act 1979
EP&A Reg	Environmental Planning and Assessment Regulation 2021
EPA	Environment Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
EPI	Environmental Planning Instrument
FM Act	Fisheries Management Act 1994
GIS	Geographic Information System
IBRA	Interim Biogeographic Regionalisation of Australia
KTP	Key Threatening Processes
LEP	Local Environmental Plan
LGA	Local Government Area
MNES	Matters of National Environmental Significance
MWRC	Mid-Western Regional Council
NP&W Reg	National Parks and Wildlife Regulation 2009
NP&W Act	National Parks and Wildlife Act 1974
PCT	Plant Community Type
PMST	Protected Matters Search Tool
POEO	Protection of the Environment Operations Act 1997
REP	Regional Environmental Plan
RF Act	Rural Fires Act 1997
SAII	Serious and Irreversible Impacts
SCA	State Conservation Area
SEED	Sharing and Enabling Environmental Data
SEPP	State Environmental Planning Policy
TEC	Threatened Ecological Community
WARR Act	Waste Avoidance and Resource Recovery Act 2001
Note: DPE	Superseded DPIE, previously replacing Office of Environment and Heritage (OEH)

Any reference to OEH in the document relates to published documents or existing databases.

Contents

Figures

Tables

1. INTRODUCTION

Scope

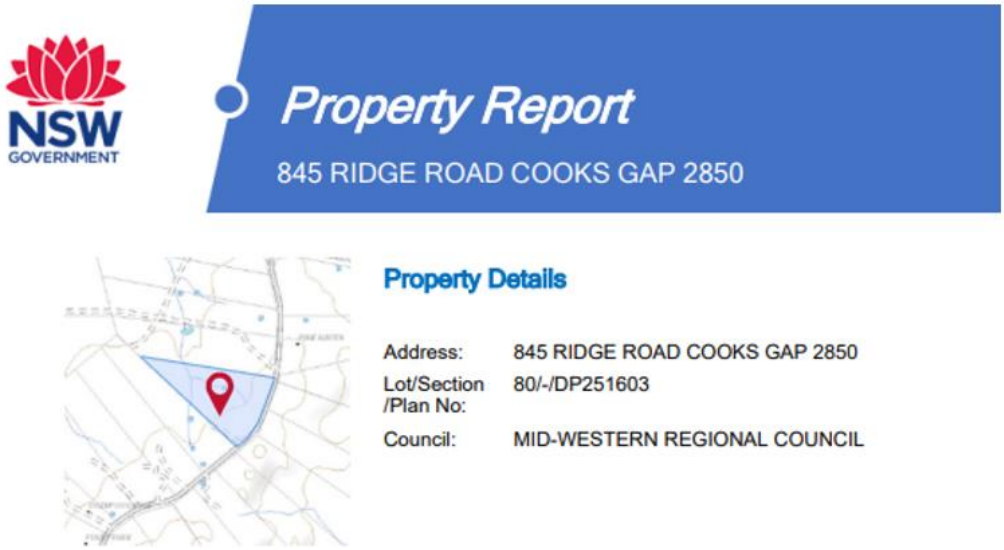
Access Environmental Planning (AEP) was engaged on behalf of the proponent to undertake a Biodiversity Development Assessment Report (BDAR) as specified under the NSW Biodiversity Conservation (BC) Act 2016 using the Biodiversity Assessment Method (BAM) (DPE 2020). This assessment has been undertaken to support a Development Application (DA) for a proposed new residential dwelling house (the Proposal) at 845 Ridge Road, Cooks Gap NSW, within Lot 80 DP 251603.

Where used throughout this report –

- 'Development Site' is the subject land and describes the area to be directly impacted by the proposed development on Lot 80/-/DP 251603 (**Figure 2, 12 and 15**),
- 'the Property' describes the entire land parcel at 845 Ridge Road (**Figures 1, 2**) and
- 'the Assessment Area' includes the Development Site and a 1500 metre (m) buffer from the outside edge of the Development Site's boundary (**Figure 7**).

Project Background

The Proposal is located over a small proportion of Lot 80 / DP 251603 at 845 Ridge Road, Cooks Gap. The land is owned by the proponent and in an area zoned as large lot residential (R5) in the Mid-Western Regional Council (MWRC) Local Environmental Plan (LEP) 2012.



There are no existing buildings on the property suitable for domestic accommodation and the proposal will make provision for a habitable residential structure, amenities and services.

The Property is 9.9 hectares (ha) (**Figure 2**) of which only a small fraction (approximately 3 %) is the Development Site, planned to include a shipping container house, shed/carport/storage, water tanks, access road, and bushfire Asset Protection Zones (APZs). Currently, the Property use is mainly recreational with areas that could be utilised for grazing sheep or cattle. Vegetation is a combination of grassland and dry sclerophyll forest and while the Property has differences in vegetation quality, the Development Site vegetation has been uniformly disturbed and has degraded ecological quality features compared to the remainder of the Lot. The nominal existing formed infrastructure consists only of a farm dam, power supply / power poles, access tracks and rural boundary fencing.

Local Context

The Development Site occurs within the MWRC Local Government Area (LGA) and is located approximately 5.2 kilometres (km) south west of Ulan village and 17.2 km north east of Gulgong. Surrounding landforms include ridges with predominantly woody vegetation further to the north and east, which incorporates the Munghorn Gap Nature Reserve (14 km distant) and Goulburn River National Park.

Proposed development

The proposed development consists of a new residential dwelling house with associated service components including water tanks, septic system, shed/storage, an access road and electrical connection infrastructure. There is existing site access in the southern area of the Property and a new access route is proposed from Ridge Road in the eastern zone of the Property, approximately 200 m in length. Water use for construction and operation will be supplied by a farm dam and water tanks. The site plans prepared by deWitt Consulting, dated September 2022, are shown in **Figures 4-5**.

The Biodiversity Offsets Scheme (BOS) applies to the development because areas of the Property are identified on the Biodiversity Values Map (BVM) (**Figure 3**) which automatically triggers assessment under the BOS. These same areas are listed as important areas for the regent honeyeater.

The Proposal has a capital investment value of approximately $250 000, with construction conducted off-site followed by planned house installation commencing late 2022, with development to be completed by late 2022 or early 2023.

Key construction activities for the Proposal include:

- Installation of driveway and site access,
- Installation of house components,
- Installation of water tanks and services,
- Electrical cabling, connection and provision of power,
- Provision of Asset Protection Zone (APZ) for bushfire risk mitigation.

Site details / selection

The Property contains existing lots within Mid-Western Regional Local Government Area (LGA) and is identified on the NSW Planning Portal as follows:

- Address: 845 RIDGE ROAD COOKS GAP NSW 2850
- Development Site –Lot/Section/Plan number: 80/-/251603
- Council: MID-WESTERN REGIONAL (MWRC)
- Land Zoning: R5 Large Lot Residential
- Bushfire Prone Land – Vegetation Category 1
- Minimum lot size: 12 hectares (ha)
- Actual lot size Lot 80/-/251603: 9.9 ha

The Development Site was selected as it best satisfies personal criteria for a pleasant outlook, with possible access to infrastructure necessities, whilst minimising the potential for environmental impacts.

In planning the Development Site, consideration was given to:

- Available house sites on the land with suitable topographic characteristics.
- Proximity to existing electrical infrastructure.

- Bushfire hazard characteristics.
- Other planned land management activities.
- The disturbance to site vegetation and the Avoid, Minimise, Offset hierarchy of the BOS.

Information sources

Documentation and information sources for this assessment include the following.

- Site plans by deWitt Consulting, dated September 2022 (**Figures 4 & 5**),
- Design plans by Container Homes (**Figure 6**),
- Mid-Western Regional Council Local Environmental Plan 2012 (pub. 10/08/2012),
- NSW Planning Portal (https://www.planningportal.nsw.gov.au/),
- NSW Government aerial imagery and other spatial data layers including contours, cadastre, etc. (www.maps.six.nsw.gov.au),
- BioNet databases (www.bionet.nsw.gov.au), including BioNet Atlas, threatened species profiles, species records, vegetation classification and the NSW DPE Threatened Biodiversity Data Collection (TBDC),
- The Department of Climate Change, Energy, the Environment and Water (DCCEEW) Protected Matters Search Tool (PMST) for Matters of National Environmental Significance (MNES),
- Flora NSW Online (www.plantnet.rbgsyd.nsw.gov.au) and *Flora of New South Wales* (Vol 1-4, Harden 1991-2002).

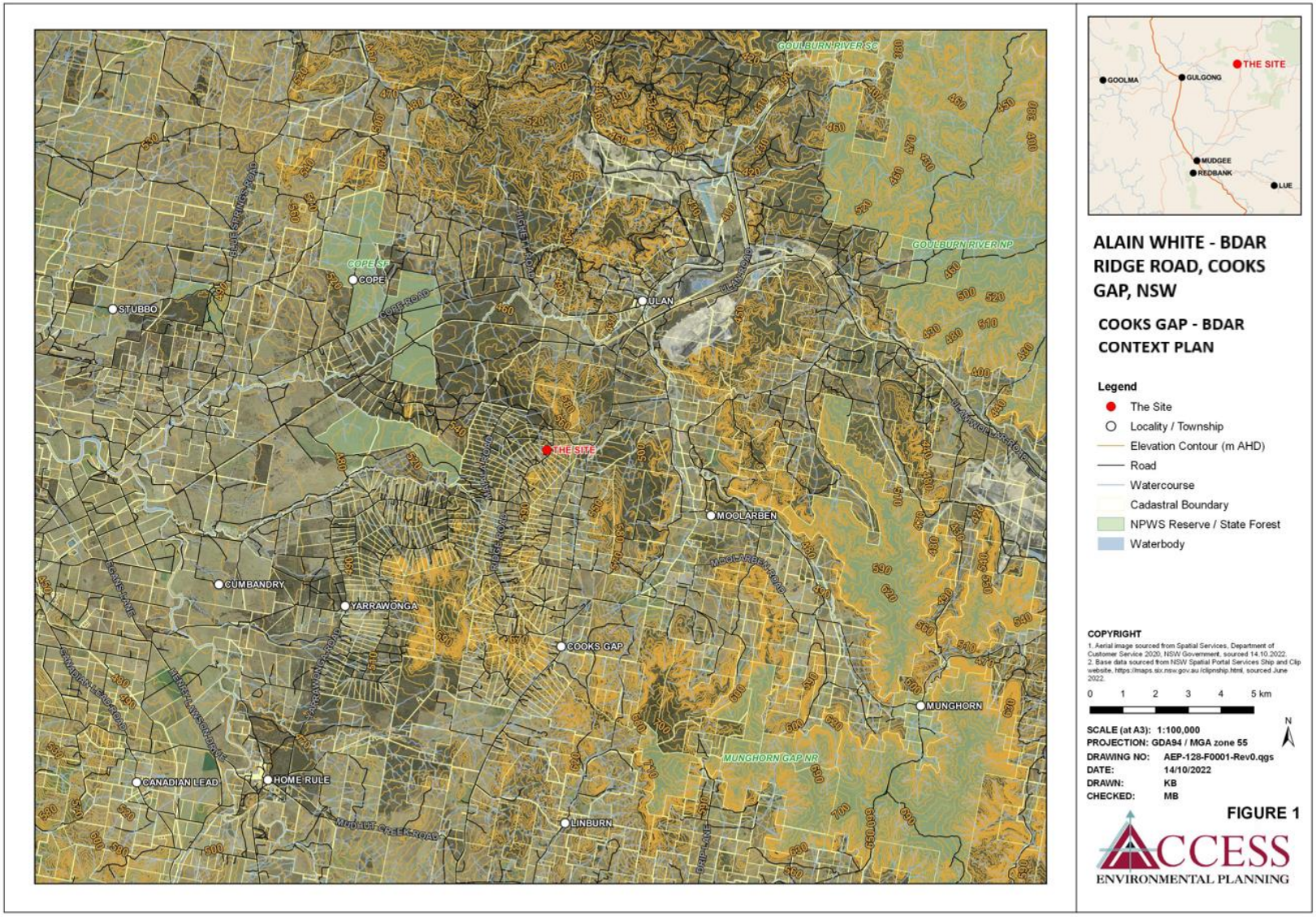


Figure 1: Site context, Ridge Road Cooks Gap, NSW.

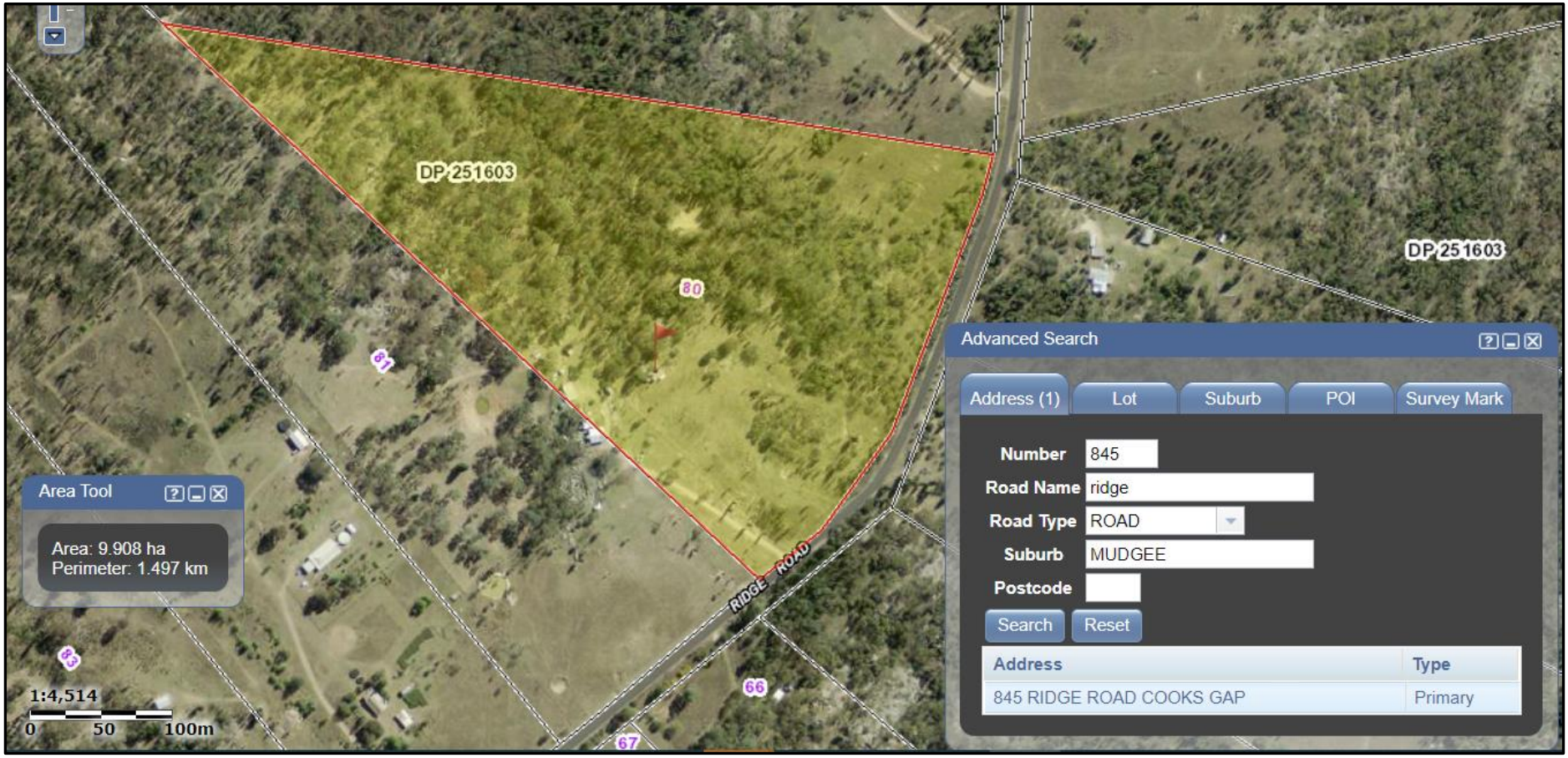


Figure 2: Cadastre and lot size SiX Maps (spatial imagery).

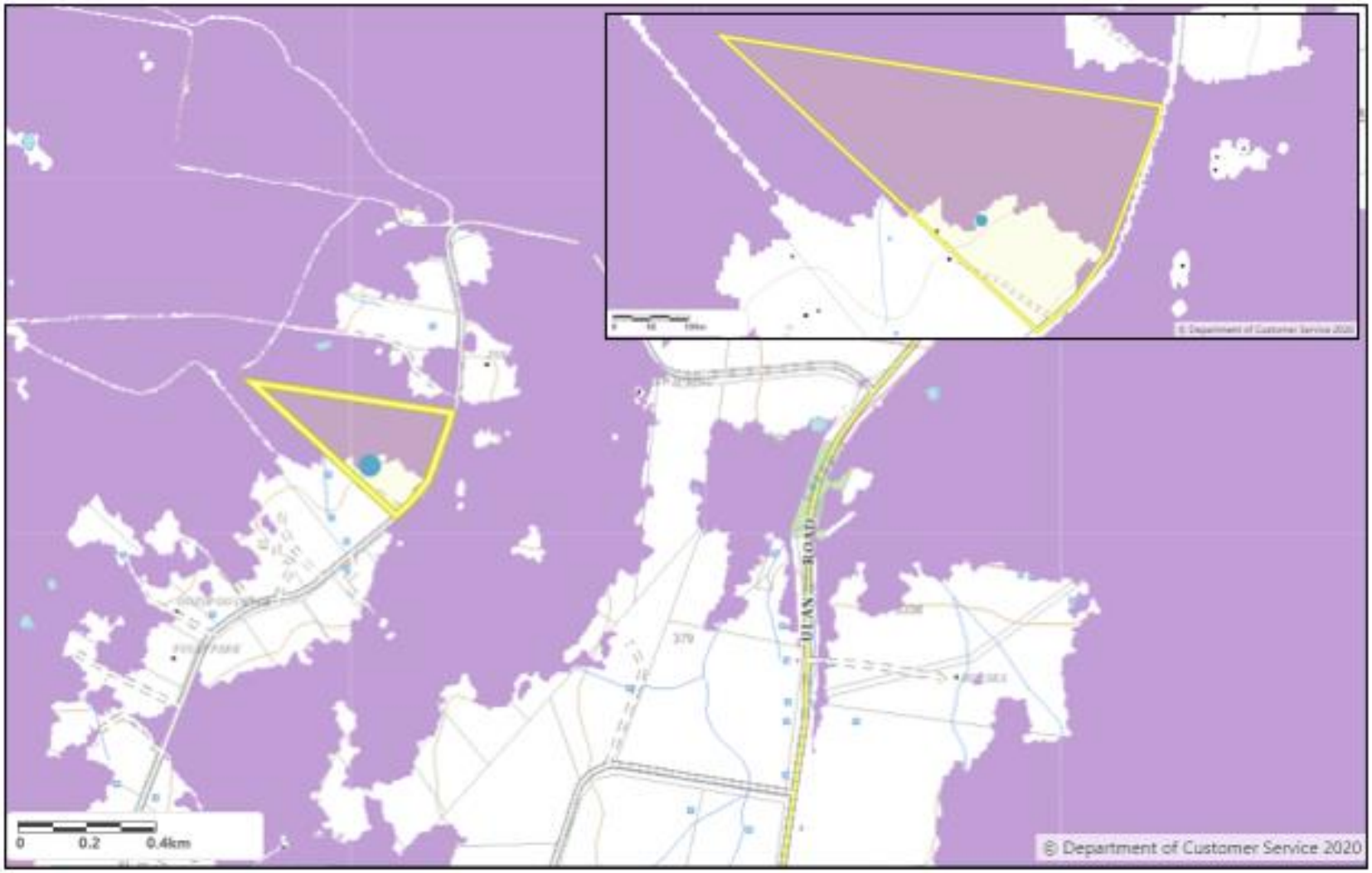


Figure 3: Biodiversity Values Map with relation to the Development Site.

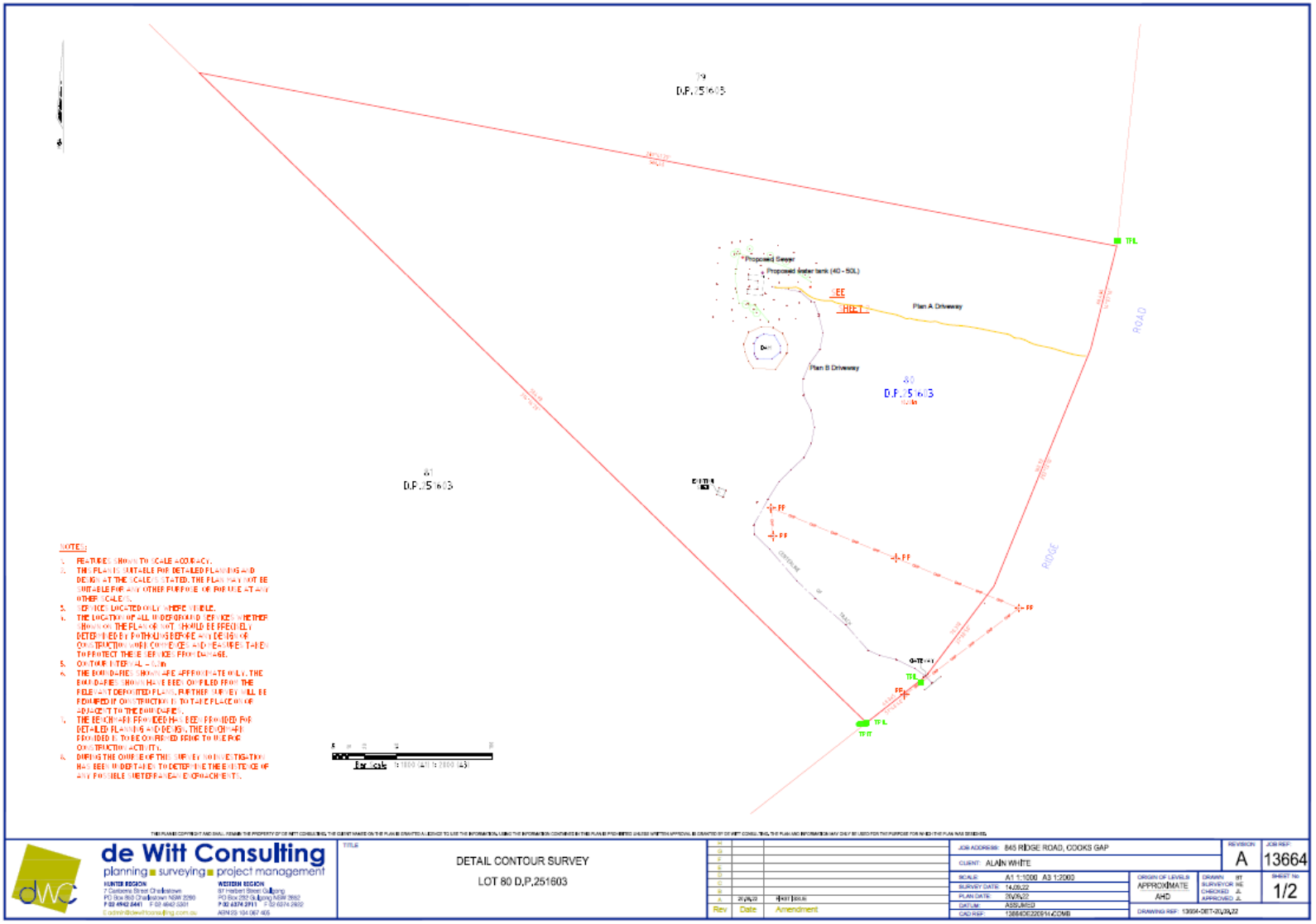


Figure 4: Site plan – house and driveway.

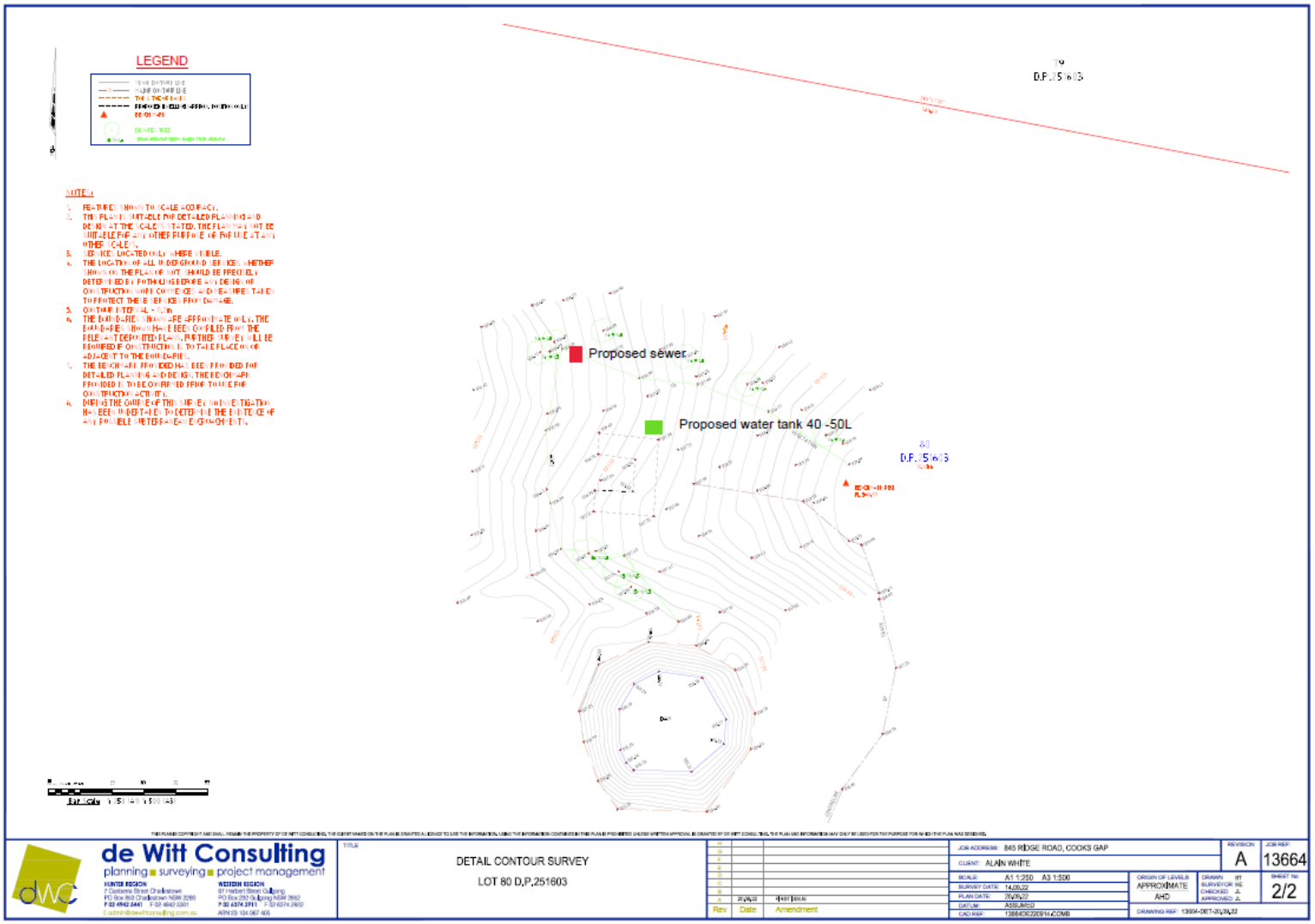


Figure 5: Site plan – dam and water services.

Consultation

The following consultation has been undertaken for this BDAR:

- Email correspondence, phone discussions and in person contact with the proponent, regarding project details.

Overview of methods

A desktop review of available information including vegetation maps and BioNet Atlas data was undertaken to identify possible native vegetation types and potential threatened species and ecological communities relevant to the site. Predicted species that could be present, including those with suitable habitat at the site, were further assessed under the BAM process.

Site inspections were undertaken on 30/06/2022, 01/09/2022, 28/09/2022, by Chris Botfield (Accredited BOS Assessor No. 18023), Renae Hill and Michaela Burns to assess the condition of native vegetation and habitat characteristics found at areas that will be impacted by the development. The following tasks were completed during the site assessment:

- Collation of a flora species list.
- Identification of vegetation communities present at the Development Site.
- Search for predicted threatened flora species and potential habitat for predicted threatened fauna, such as rock outcrops, caves and hollow bearing trees (HBT).

Author qualifications

In field assessments and report preparation have been conducted by Mr Christopher Botfield (BAAS No. 18023), an Accredited Biodiversity Assessment Method (BAM) Assessor and Ms Renae Hill, candidate BAM Assessor.

Mr Christopher Botfield - Principal Access Environment Planning

- Accredited Biodiversity Assessor for the Biodiversity Conservation Act 2016 - BAAS No 18023
- Certified Environmental Practitioner
- B. Environmental Management (B. App.Sc PRH) CSU

Experience in environmental resource and vegetation assessment, Indigenous land management, and landowner consultations. Over 30 years ecological practice and consulting experience in the Central Tablelands, Central West, Far West, North West Slopes and Sydney NSW regions.

Ms Renae Hill - Project Manager

- Accredited Biodiversity Assessor for the Biodiversity Conservation Act 2016 - candidate
- Graduate Diploma Environmental Management 2022 CSU
- Bachelor of Agriculture 2006 UNE,
- Bachelor of Science (Hons) 1994 UoN

Ecological practice and consulting experience in the Central Tablelands, Central West, Far West, North West Slopes and Sydney NSW regions, for the past 5 years. Previously 10 years of field agronomy experience, both in the Central West and Hunter regions.

Limitations and assumptions

The following limitations and assumptions of this study are acknowledged.

Not all flora species will have been detected at the site and additional species other than those listed in this report will be present. Some ephemeral or cryptic flora species may have been dormant and not detected at the time of the survey. Surveying over time, especially entering into the Spring season, helps to expand the potential for species to be observed and improve survey efficacy.

Legislative context

Assessment of the Proposal was undertaken in accordance with and in consideration of the following Acts and Policies:

- Commonwealth:
  - Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).
  - Biosecurity Act 2015;
- State:
  - Biodiversity Conservation Act 2016 (NSW) (BC Act);
  - Biodiversity Conservation Regulation 2017 (NSW) (BC Regulation);
  - Environmental Planning and Assessment Act 1979 (EP&A Act);
  - Local Land Services Act 2013 (LLS Act);
  - Biodiversity Assessment Method (BAM) (DPE, 2020).
- Local:
  - Mid-Western Regional Council Local Environmental Plan 2012 (MWRC LEP 2012),
  - Mid-Western Regional Council Development Control Plan 2013 (MWRC DCP 2013)

EPBC Act 1999

Under the EPBC Act assessment, approval is required for actions that are likely to have a significant impact on matters of national environmental significance (MNES). An action includes a project, development, undertaking, activity, or series of activities. The Act identifies nine MNES:

1. World Heritage properties,
2. National heritage places,
3. Wetlands of international importance (Ramsar Convention),
4. Listed threatened species and communities,
5. Migratory species listed under international agreements,
6. Great Barrier Reef Marine Park,
7. Commonwealth marine areas,
8. Nuclear actions and
9. Water resources in respect to Coal Seam Gas and large coal mines.

While this BDAR is not required to address MNES, the proponent is required to address the EPBC Act as part of their development application. Items 4 and 5 are potentially relevant to this proposal.

EP&A Act 1979

The Environmental Planning and Assessment Act 1979 (NSW) (EP&A Act), the Environmental Planning and Assessment Regulation 2021 (NSW) and associated environmental planning instruments (including State Environmental Planning Policies (SEPPs) and Local Environmental Plans (LEPs)) provide the framework for the assessment of the environmental impact of development proposals in NSW.

BC Act 2016

The BC Act sets out to conserve biodiversity at all levels consistent with the principles of ecologically sustainable development. It seeks to ensure a consistent, scientifically sound methodology for the assessment of biodiversity and to offset the impact of development through a Biodiversity Offset Scheme (BOS). The BC Act lists threatened species and communities, and determining authorities have a statutory obligation under the EP&A Act to consider whether a proposed activity is likely to

significantly affect threatened species, populations or ecological communities or their habitats. A BDAR is required for developments if biodiversity values may be impacted.

Biodiversity Assessment Method 2020

The Proposal has been assessed under the BAM (DPE 2020). The Biodiversity Accredited Assessor System (BAAS) Case number for the project is 00035874, with associated BAM Calculator number of 00035874/BAAS18023/22/00035875. The BAM online calculator (BAM-C) version number is 55, updated 14/10/2022.

LLS Act 2013

Legislation with provision for classification of rural land and subsequent treatment of native vegetation on such land. The Property is excluded from LLS provisions due to R5 land zoning.

Biosecurity Act 2015

Under the Biosecurity Act 2015 all plants are regulated with a general biosecurity duty "to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant and knows of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable."

2. LANDSCAPE CONTEXT

The Property is rural residential land located at Cooks Gap, with extensive areas of remnant bushland on and adjacent to it, to the north and east. It is accessed using Ulan Road then Ridge Road and is located approximately 17.2 km north east of the Gulgong township (**Figure 1**).

The Property has remnant native woodland and grassland areas derived from these woodlands with some exotic plant incursion (**Figures 10 and 13**). The Proposal is to be located on moderately sloping land that has been changed over time by previous land management activities. The fall of the land is generally to the north west towards Rouses Creek with the minor drainage lines and creeks of the area eventually draining to the Goulburn River.

The Development Site is within the Inland Slopes subregion of the NSW South-Western Slopes Interim Biogeographic Regionalisation of Australia (IBRA) bioregion. Subregion landscapes consist of undulating and hilly ranges and isolated peaks amongst wide valleys (DPIE 2020a). Broadly, the vegetation of the subregion consists of woodlands and open woodlands of white box (*Eucalyptus albens*), as well as vegetation communities dominated by grey box (*E. microcarpa*) and white cypress pine (*Callitris glaucophylla*). Other common tree species include red stringybark (*E. macrorhyncha*) on higher slopes, with black cypress pine (*Callitris endlicheri*), kurrajong (*Brachychiton populneus*), yellow box (E. *melliodora*) and Blakely's red gum (*E. blakelyi*) often occupying the lower slopes.

Landscape features

Table 1: Landscape features of the Development Site and Assessment Area

Landscape Features	Development Site
General description	Topography – undulating hills with granite outcropping, site slope to north west. Hydrology – the eastern portion (approximate 50% of the Property) is in a vulnerable groundwater zone (MWRC LEP 2012) (**Figure 9**). Geology – Siliceous granites forming quartz, feldspar, biotite and amphibole (Sharing and Enabling Environmental Data (SEED) portal (DPIE 2021b)). Soils tend to be Yellow Solodic (texture contrast between surface layers and clay sub soils) in the lower landscape positions with shallow Siliceous

	Sands in the upper portion of the landform (Dubbo Soil Landscapes sheet 1:250 000 (Data NSW 2020)).
Native vegetation cover	86% woody native vegetation cover in Assessment Area (**Figure 10**). Woody native vegetation exists in the majority of the Assessment Area as adjacent lands.
IBRA bioregion	NSW South-Western Slopes (Development Site) (**Figure 7**)
IBRA subregion	Inland Slopes (Development Site)
LGA	Mid-Western Regional
Rivers and streams	Only minor drainages line, Strahler stream order 1 or 2 – within the Development Site and Property (**Figure 8**). The more significant creeks – Ryans Creek and Rouses Creek (Strahler stream order 3) – have small sections towards the boundary of the 1500 m buffer assessment area.
Wetlands	No wetlands occur within the Development Site, Property, buffer zone or adjacent lands.
Habitat connectivity	The Development Site lies within modified woody areas connected and adjacent to large areas of continuous woody vegetation including Munghorn Gap Nature Reserve. The remnant woody vegetation serves as the main connectivity component in the landscape (**Figure 7**).
Significant geological features	There are small areas of rock outcrop near the Development Site and other areas of tors and rock outcrop in the Assessment Area. There are no other significant geological features like karst, caves, large crevices or cliffs in the Assessment Area.
Areas of outstanding biodiversity value	There are no areas of outstanding biodiversity value mapped within or adjacent to the Assessment Area.
NSW (Mitchell) landscapes	Cope Hills Granite (Development Site) For the Assessment Area – Mostly Cope Hills Granite but also includes a section of Talbragar – Upper Macquarie Terrace Sands and Gravels in the eastern portion.
Any additional features	No

Site Context

Details of the landscape assessment for the Development Site, according to the BAM (DPE 2020) using site-based assessment methodology and Geographic Information System (GIS) capabilities, are reported below.

Native vegetation cover

The Assessment Area (1500 m site buffer) has an area of approximately 944 ha which has native woody vegetation cover of 813 ha (86 %). While much of the surrounding land is modified farming land, native woody vegetation is well represented in areas to the north and east of the Property.

Geology and soils

The Study Area is mapped as occurring on Dexter and Rouse Soil Landscapes of the Dubbo 1:250 000 sheet (Data NSW, 2020). Siliceous Sands occupy upper and mid-slope areas and Yellow Solodic Soils are found in the lower slopes and drainage lines. Siliceous Sands are characterised as brown sandy loams to clayey sands with no structure, while Yellow Sodosols are yellowish coarse sandy loams with a distinct change to sandy clay loams in the subsoil. The landscape consists of low rolling hills with granite rock outcrops. These soils have low to very low natural fertility, acidic surface soil and seasonal waterlogging. The subject land would have moderate to high erosion hazard if extensively disturbed or cultivated.

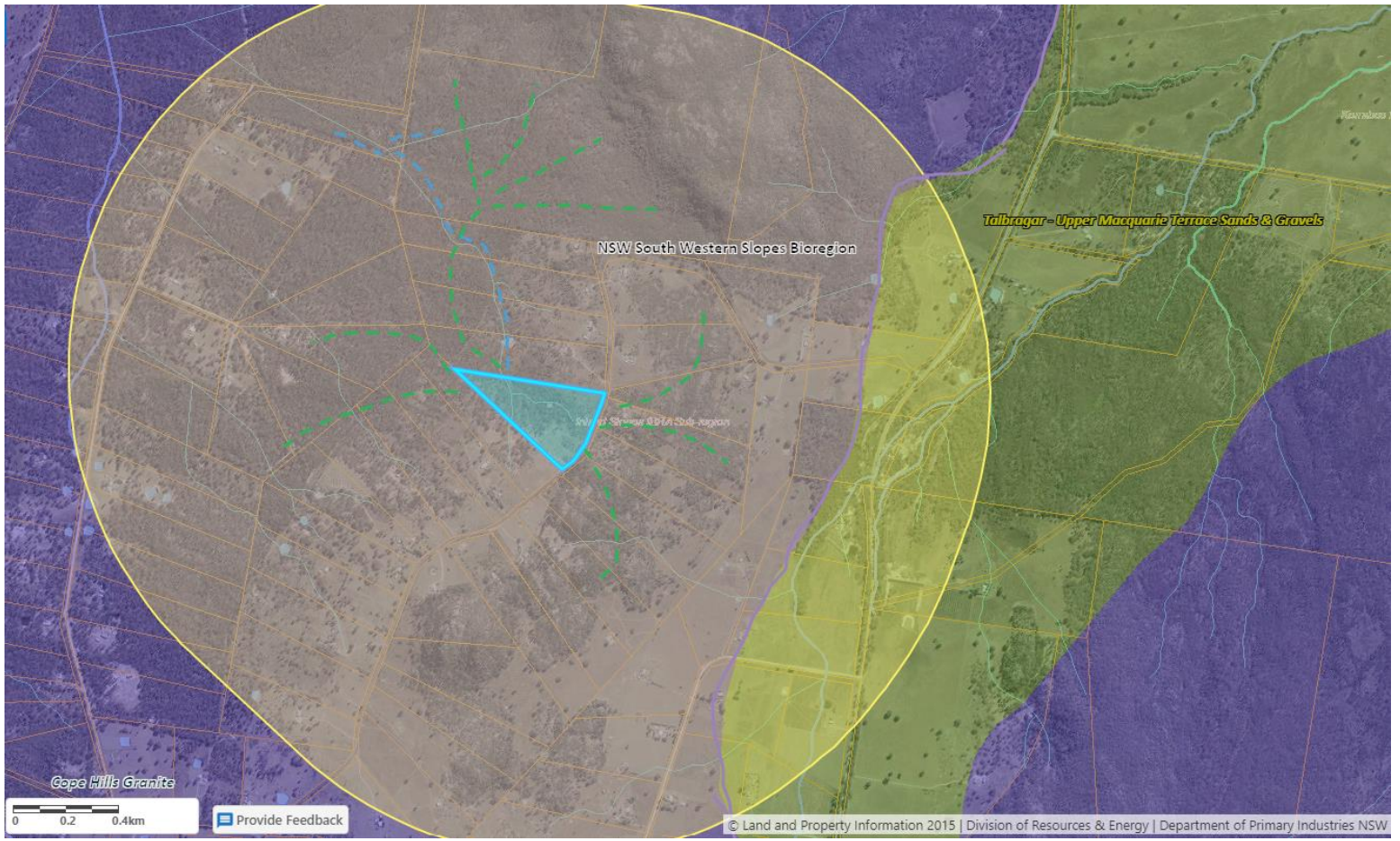


Figure 7: Overview of site landscape context.

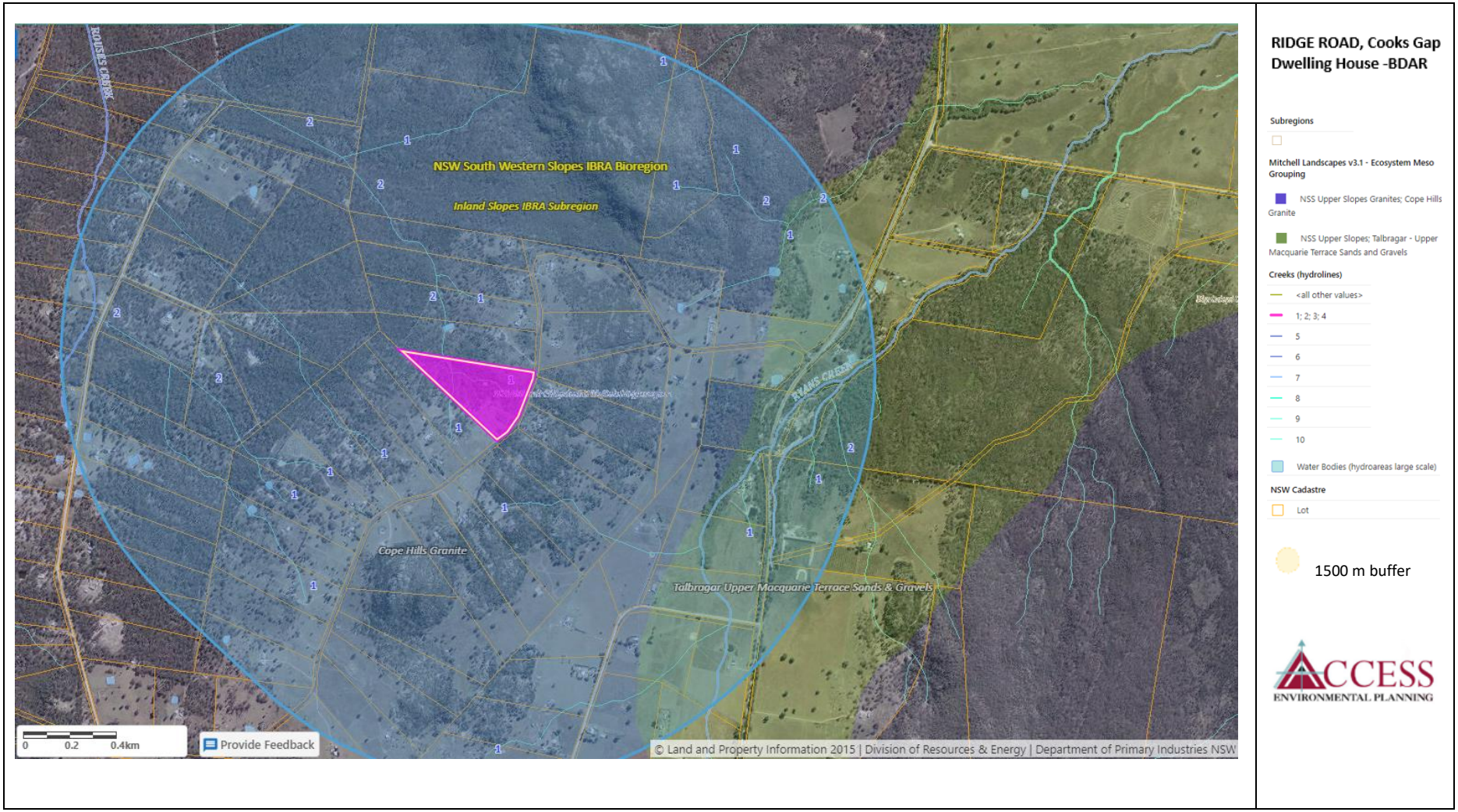


Figure 8: Strahler stream order watercourses.

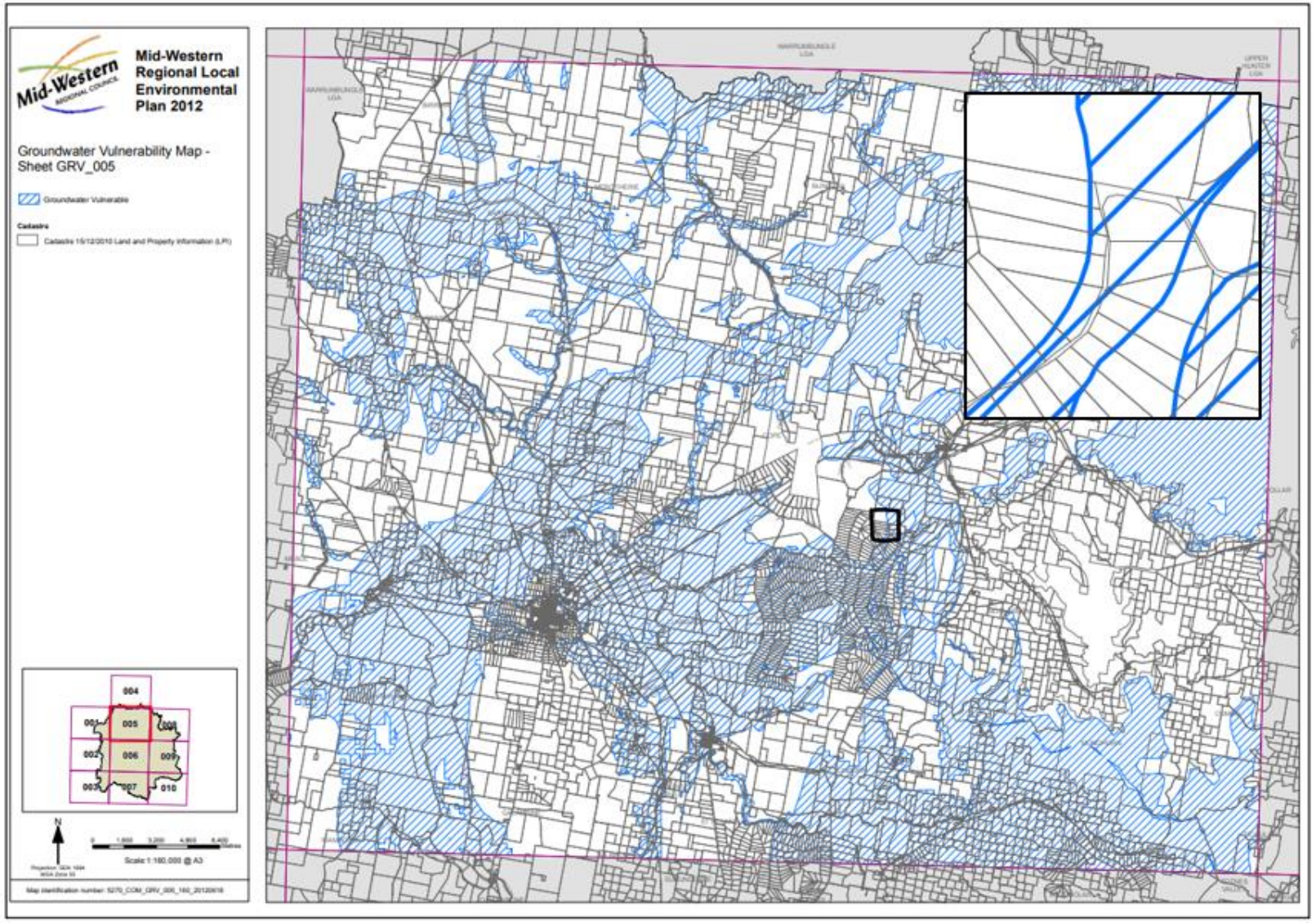


Figure 9: Groundwater vulnerability (MWRC–LEP)

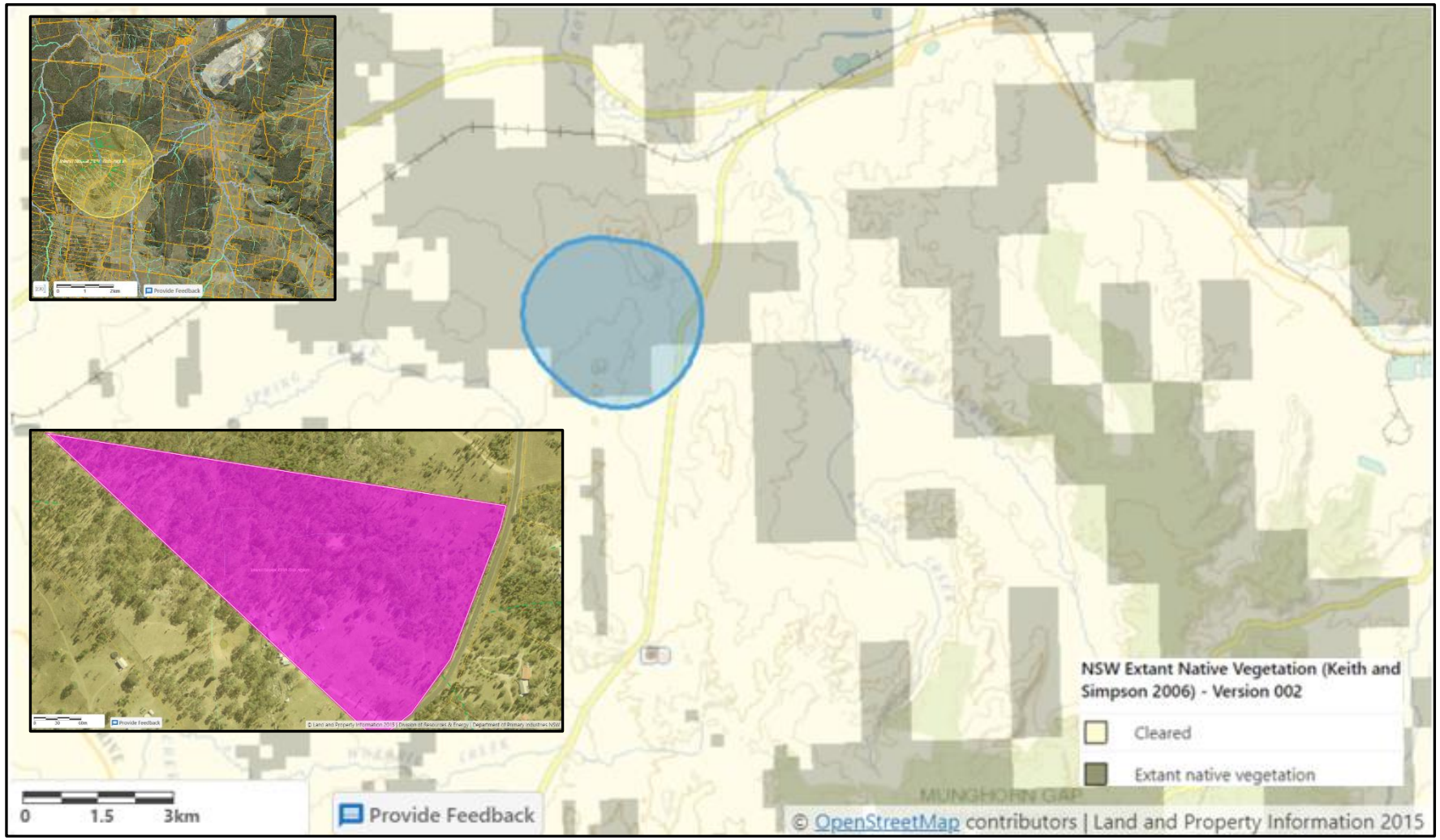


Figure 10: Native vegetation in Assessment Area.

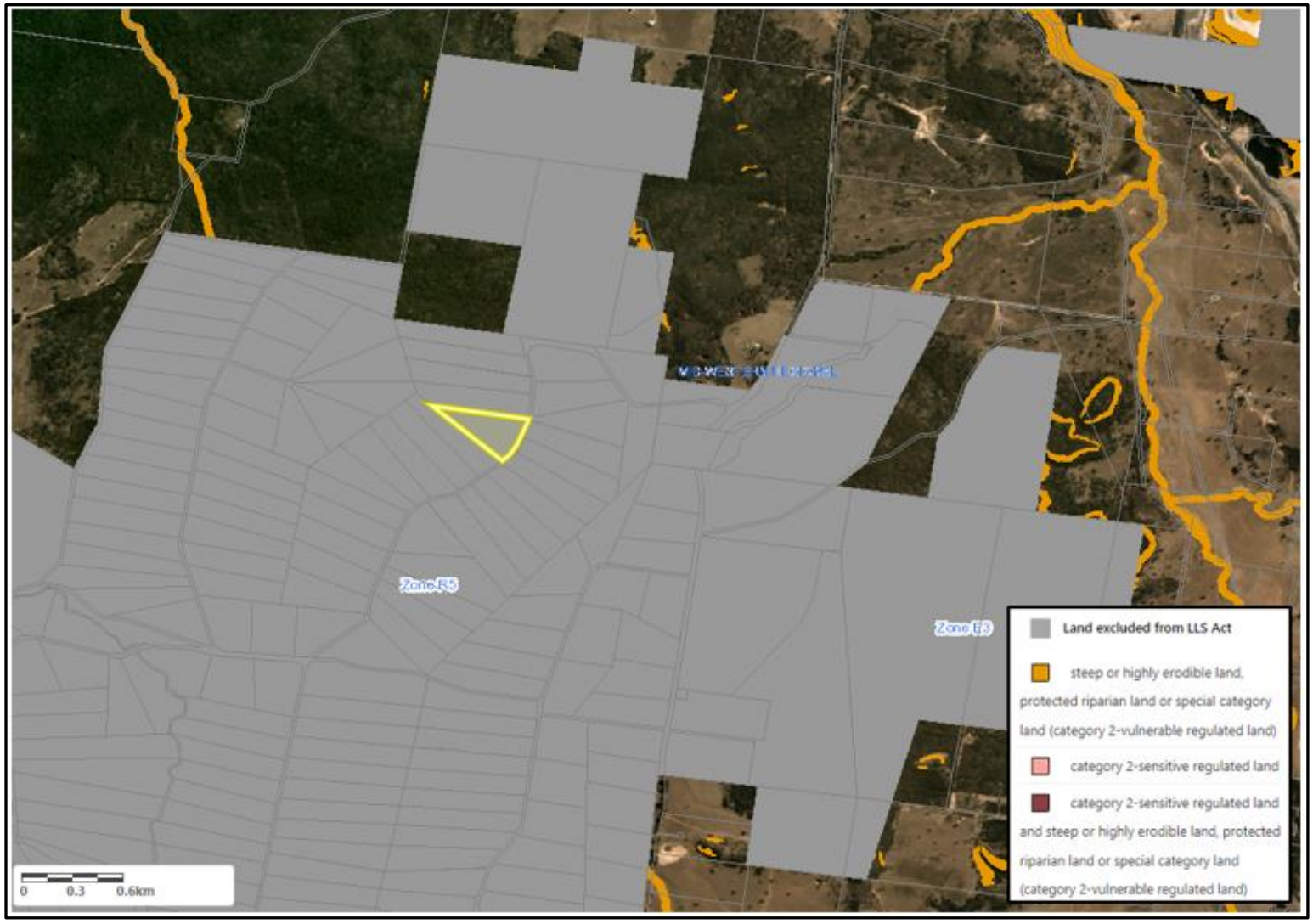


Figure 11: Native Vegetation Regulatory (NVR) Map.

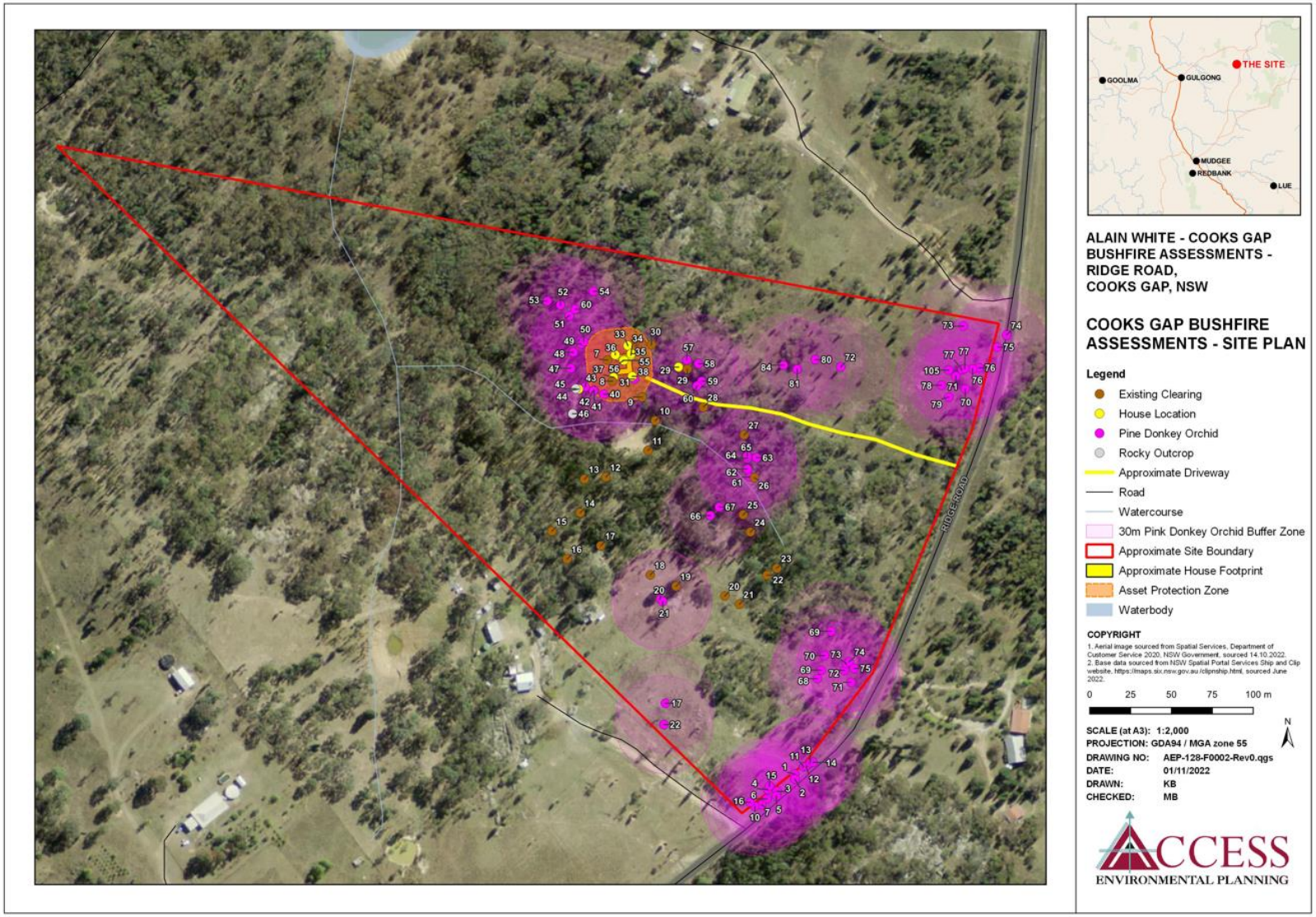


Figure 12: Site plan with proposed development location.

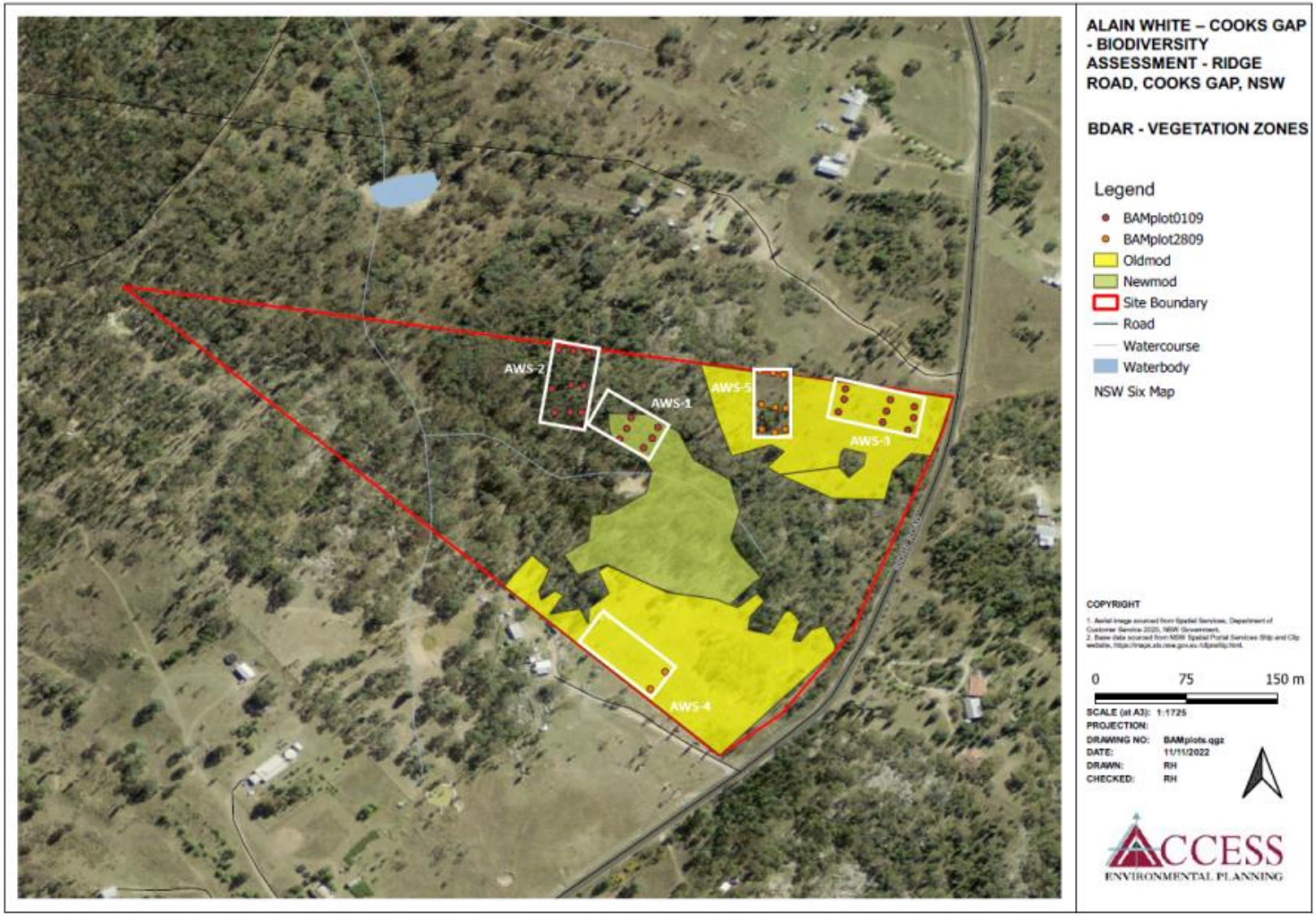


Figure 13: Vegetation management zones and BAM plot location.

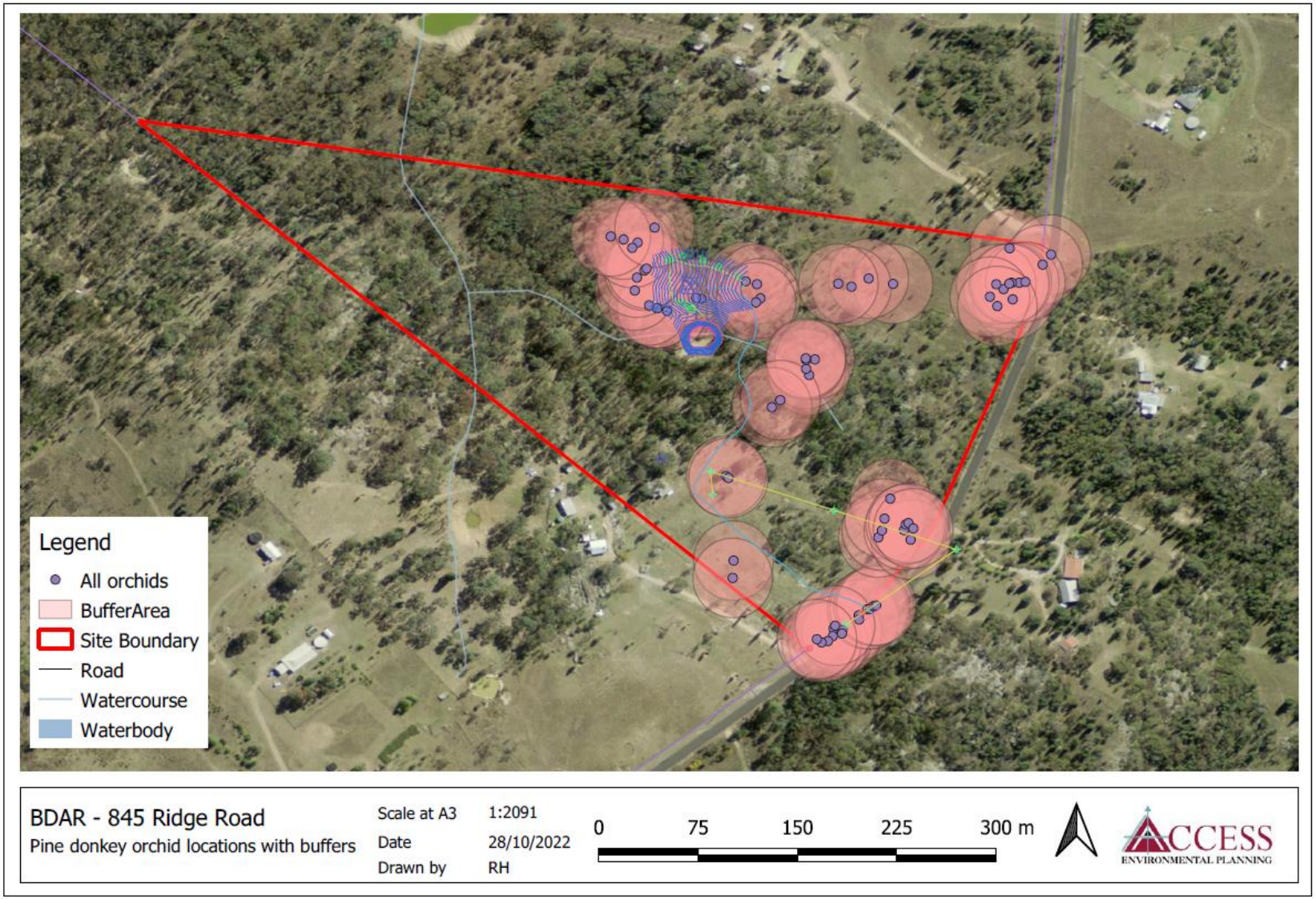


Figure 14: Pine donkey orchid locations.

Category 1 Land

The transitional Native Vegetation Regulatory (NVR) Map (**Figure 11**) displays some of the land categories established under the LLS Act that apply to land regulated by Part 5A of the LLS Act (excluded land, category 2 - vulnerable land and category 2 - sensitive land). The Property is excluded from the native vegetation provisions of the LLS Act and does not have a history of farming or cultivation.

3. NATIVE VEGETATION

Methodology

Native vegetation at the Development Site was assessed in accordance with Section 4 of the BAM (DPE 2020).

Data Review

Vegetation mapping completed as part of the State Vegetation mapping process, available online through the Sharing and Enabling Environmental Data (SEED) portal was reviewed to assist with the determination of Plant Community Types (PCTs) within the Property. Vegetation at the Development Site was listed having sections of:

PCT 1675 - Scribbly gum – narrow leaved ironbark – *Bossiaea rhombifolia* heathy open forest,

PCT 1610 – White box – black cypress pine shrubby woodland of the western slopes,

PCT 1871 – Western Hunter Dwyer's red gum – cypress woodland

Community 1871 has recently been decommissioned in the transitional processes relating to the development of Eastern NSW PCTs, to better represent PCTs in the eastern division of NSW.

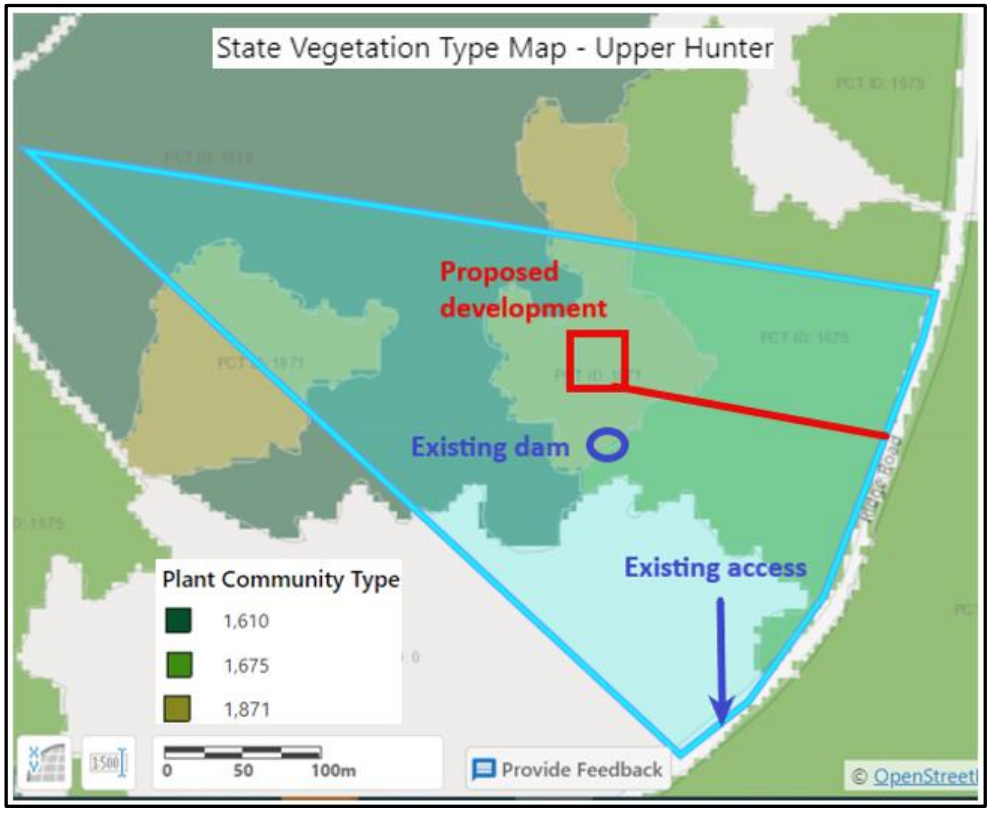


Figure 15: Existing vegetation map and site map.

Vegetation Mapping Surveys

Detailed vegetation surveys were conducted across the Development Site and Property in September 2022, with 20 m x 20 m BAM vegetation plots labelled as AWS-1, AWS-2, AWS-3, AWS-4 and AWS-5 as data was collected (**Figure 13**). Ecological function and structure characteristics were measured based on 20 m x 50 m field plots. The ambient weather conditions present on days of site investigations are outlined in **Table 2**.

Table 2: Weather observations at Mudgee Airport (station 062101) (BoM 2021)

Date	Rainfall (mm)	Temperature Min (°C)	Temperature Max (°C)	Relative Humidity 9am (%)	Relative Humidity 3pm (%)	Site conditions
30/06/22	0	5	15	98	56	Fine, Dry
01/09/22	0	4	20	96	42	Fine, Dry
28/09/22	9.6	6	17	69	56	Fine, Wet

Plant Community Type Determination

The vegetation community identified within the Development Site was assigned to the closest equivalent PCT from those listed in the BioNet Vegetation Classification database (DPIE 2020). It was determined through a comparison of the floristic descriptions of PCTs in the database with the plot data collected from the site. In addition to floristic and structural similarity, the location, landscape position, soil type and other diagnostic features of the vegetation communities on the site were compared to the descriptions in the database to determine the most suitable PCT. Threatened ecological communities (TECs) as defined in NSW and Commonwealth legislation were also identified if present.

A short list of the possible PCTs, collated from comparison with up to 27 criteria from site location and floral characteristics, was examined to determine the most representative PCT. For all plots, except AWS-3, the PCT 3753 was located first or second choice on the list (**Table 3**). The AWS-3 plot data had PCT 3753 placed slightly lower, at third in this list. Some plots still had the woody vegetation layer while other plots were in a derived grassland form but the original PCT was assigned to be the designated PCT.

Table 3: PCT options for AWS-1, the Development Site.

PCT	Form	Class	Common Name	Criteria matched	TEC Association	Comment
3534	DSF (Shrub/grass sub-form)	Upper Riverina DSF	Central West Stony Hills Stringybark-Box Forest	16	No	✗ Typical tree species not present
3753	DSF (Shrubby sub-form)	Western Slopes DSF	Dunedoo Sandstone Ironbark-Pine Forest	16	No	✓ Typical landform and acacias present – best match
3528	DSF (Shrub/grass sub-form)	NW Slopes Dry Sclerophyll Woodlands	Western Hunter Flats Apple-Gum Shrub Forest	15	No	✗ Site is not tall open forest on alluvial river flats

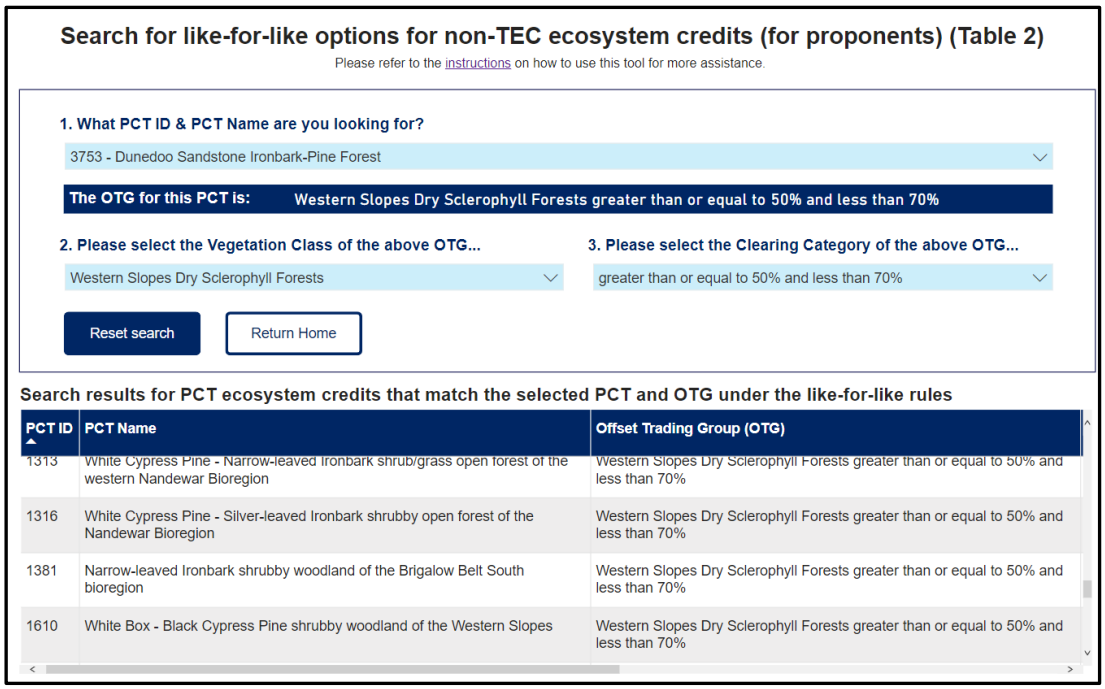
3376	Grassy Woodlands	Southern Tableland Grassy Woodlands	Southern Tableland Grassy Box Woodland	15	Yes	✗ Typical tree species are not present and shrub layer not sparse to absent
3388	Grassy Woodlands	Western Slopes Grassy Woodlands	Central West Valleys White Box Forest	15	Yes	✗ Site is not tall forest; typical gums are not present and not on alluvial flats
3396	Grassy Woodlands	Western Slopes Grassy Woodlands	Northwest Flats Box-Blakely's Red Gum Forest	15	Yes	✗ Site is not tall forest; mid layer is more abundant than sparse or absent
4150	DSF (Shrub/grass sub-form)	North-west Slopes Dry Sclerophyll Woodlands	Northwest White Box-White Pine Forest	15	Yes	✗ Distribution constraint as it is not known in bioregion
4152	DSF (Shrub/grass sub-form)	Upper Riverina DSF	Central West Tumbledown Gum Grassy Forest	15	No	✗ Frequent species *Eucalyptus dealbata* and *Hibbertia obtusifolia* not present
3540	DSF (Shrub/grass sub-form)	Upper Riverina DSF	Southwest Foothills Stringybark-Box Grassy Forest	14	No	✗ Typical tree species not present, grows in higher rainfall areas with sparse low shrub layer
3542	DSF (Shrub/grass sub-form)	Upper Riverina DSF	Southwest Ranges Stringybark-Box Sheltered Forest	14	No	✗ Typical tree species not present, grows in higher rainfall areas on moist deep soils
DSF - Dry sclerophyll Forest						
TEC - Threatened Ecological Community						

PCT 3753 – Dunedoo sandstone ironbark – pine forest, was chosen as the best fit PCT and was present in different condition states across the Property.

Transitional Arrangements

The BAM online calculator (BAM-C) has not yet been updated to include the recently introduced Eastern NSW PCTs and PCT 3753 had to be related to a similar old PCT. The PCT lookup tool, part of the transitional arrangements for migrating PCT system data, displays updated 'like for like' PCTs for Ecosystem credits generated from legacy PCTs or new Eastern NSW PCTs. Additionally, the Property is not in the area defined for the Eastern NSW PCTs and previous PCTs are still valid for zones west of

the Eastern NSW PCT boundary. These temporary arrangements also allow PCTs within the same Offset Trading Group (OTG) to be used. Incorporating these transitional arrangements allowed the use of *PCT 1610 – White box – black cypress pine shrubby woodland* (members of the same OTG) to be corelated to PCT 3753 and used in the BAM-C as the PCT.



Vegetation Zones

A vegetation zone is defined in the BAM (DPE 2020, Section 4) as a relatively homogenous area that is the same vegetation type and broad condition. Three vegetation zones were identified across the Property, with the Development Site impacting only two of these partitions. The different zones were designated as:

- Newmod – areas of more recent vegetation modification (1.3 ha – 1 BAM plot).
- Oldmod – typically grassland areas where there has been modification in the past (3.6 ha – 2 BAM plots).
- Unmod – woodland areas, largely undisturbed (4.9 ha – 2 BAM plots)

Assessing Vegetation Integrity (Site Condition)

Vegetation plots were undertaken at the Development Site to collect site condition data for the composition, structure and function attributes listed in **Table 4** in accordance with Section 4.3 of the BAM (DPE, 2020). Note however function attributes are not required where the vegetation form is a grassland. The locations of the plots were randomly selected to provide representative samples across the site with vegetation characteristics noted from 20 x 20 m plots and function aspects from 20 x 50 m plots.

Table 4: Composition, structure and function components of vegetation integrity.

Growth form groups used to assess composition (species richness) and structure (% foliage cover)	Function attributes
Tree (TG) Shrub (SG) Grass and grass-like (GG) Forb (FG) Fern (EG) Other (OG)	Number of large trees Tree regeneration (presence/absence) Tree stem size class (presence/absence) Total length of fallen logs Litter cover High threat exotic vegetation cover (HTE) Hollow-bearing trees (HBT)

The plot number undertaken at the site meets the minimum number required for each vegetation zone as detailed in Section 4.3.4, Table 3 of the BAM (DPE 2020). The locations of the BAM plots undertaken on the Property are shown in **Figure 13**.

Assessment Results

Vegetation within the development site

The Development Site showed signs of previous modification and disturbance with few standing trees, logs and woody residues moved, sapling regrowth and shrub species such as *Acacia* and *Cassinia*. The few native juvenile trees on the Development Site were *Eucalyptus albens* (white box), *E. dwyeri* (Dwyer's red gum) and *Angophora floribunda* (rough-barked apple). Much of the surrounding vegetation has standing black cypress pine trees that were defoliated. No exotic trees were noted across the Development Site. There is shrub growth across the Development Site and notably there were approximately 145 plants identified as *Diuris tricolor* (pine donkey orchid), listed as vulnerable under NSW BC Act 2016, at many locations around the Property. A small number of pine donkey orchids may be affected by construction works at the proposed Development Site.

The existing native species, structure of the vegetation, soil type and landscape position were used to identify the vegetation types according to the NSW standard Plan Community Type (PCT) classification. The 'best-fit' PCT identified at the Development Site was determined as:

- PCT 3753, *Dunedoo sandstone ironbark – pine forest*.

This vegetation type is a dry sclerophyll forest community with shrub, grasses and graminoids present in the understorey, occurring on loamy and clayey sands on low relief foot slopes and hillslopes.

Other aspects of the site are a rock outcrop to the south west of the Development Site (**Figure 12,** Way point (WP) 45, 46). The rock outcrop serves as potential habitat, particularly for reptiles, is not near proposed works and will be protected by a 30 m buffer zone. There is also a farm dam adjacent to the Development Site.

Figure 16: Typical vegetation at Development Site.

Figure 17: Rock outcrop south west of development site.

Figure 18: Existing farm dam.

Figure 19: Defoliated black cypress pine trees.

Figure 20: Pine donkey orchid.

Native vegetation types

Site species lists are provided in **Appendix 1**.

Weeds

No significant woody weeds were observed and only minor isolated occurrence of the high threat exotic weed, *Opuntia spp*. (prickly pears), were observed at the Property.

Threatened ecological communities

The vegetation community identified at the Development Site PCT 3753, *Dunedoo sandstone ironbark – pine forest*, is not associated with any threatened ecological communities (TEC) listed under the *Biodiversity Conservation Act 2016*.

Aquatic habitat

Threatened aquatic species and ecological communities are listed under the *Fisheries Management Act 1995* if they face a very high risk of extinction in the near future as determined by the Fisheries Scientific Committee. The nearest named watercourse is Ryans Creek, approximately 1.1 km to the east of the Development Site. The site inspection confirmed two minor drainage lines and the absence of any significant watercourses or riparian habitat. No key fish habitat is mapped near the Development Site and there are no expected impacts to aquatic habitat or threatened aquatic species or ecosystems. There is a far dam near the Development Site that will not be impacted by proposed activities.

4. THREATENED SPECIES

Assessing Habitat Suitability

An assessment of suitable habitat for threatened species and populations within the Development Site was conducted to help assess the significance of proposed works. Preliminary information came from database searches of the NSW Department of Planning and Environment (DPE) BioNet Atlas and the Department of Climate Change, Energy, the Environment and Water (DCCEEW) Protected Matters Search Tool (PMST). Results are summarised in **Appendix 2** with the actual search results presented in **Appendix 3 and 4**.

Threatened flora

The BioNet Wildlife Atlas database contains records for four threatened plant species, *Leucochrysum albicans var. tricolor* (hoary sunray), *Acacia ausfeldii* (Ausfeld's wattle), *Diuris tricolor* (pine donkey orchid) and *Prasophyllum petilum* (Tarengo leek orchid) previously observed within a 10 km^2 range, centred around the Development Site (**Appendix 3**). As previously acknowledged, specimens of *Diuris tricolor* were located on the Property but there was no incidence of the remaining species found at the Property. A short discussion for each species is provided below.

Leucochrysum albicans var. tricolor **(hoary sunray):** a perennial everlasting daisy that can occur in grassland, woodland, forest and sometimes along roadsides. More commonly found on the Southern Tablelands adjacent areas like Albury, Bega and Goulburn, it is known to require bare ground for germination.

Acacia ausfeldii **(Ausfeld's wattle)**: grows in the Mudgee, Ulan, Tallawang area in eucalypt woodland with sandy soil. Typically associated species include *Eucalyptus albens* (white box), *E. blakelyi* (Blakely's red gum) and *Callitris spp*.

***Diuris tricolor* (pine donkey orchid):** a terrestrial orchid, flowering September to October, which grows in sandy soils amongst the grassy understorey of sclerophyll forest often associated with Cypress pine (*Callitris spp*.).

***Prasophyllum petilum* (Tarengo leek orchid):** grows within natural temperate grassland and grassy woodland associated with river tussock (*Poa labillardieri*), black gum (*Eucalyptus aggregata*) and tea trees (*Leptospermum spp*.) and is highly susceptible to grazing. Plants flower spring to early summer, existing as underground tubers after fruiting and so are not visible outside of growing periods.

Vegetation assessments and survey found 145 pine donkey orchid individuals. No other threatened flora was identified.

Threatened fauna

The proposed Development Site contains areas of degraded fauna habitat with no hollow-bearing trees. It does not contain many habitat features required for native fauna species to breed, such as abundant and varied food resources, a diverse shrub/ground cover layer and leaf litter. Infrequent sapling trees present within the Development Site are *Acacia doratoxylon* (Currawang), seedling *Eucalyptus dwyeri* (Dwyer's red gum), *Angophora floribunda* (rough-barked apple) *and Eucalyptus albens* (white box) with limited potential to provide foraging habitat due to their immature state.

A BioNet Atlas search has identified 17 threatened fauna species that have previously been recorded within 10 km^2 of the site (**Appendix 3**). Threatened species previously seen in the area are *Hieraaetus morphnoides* (little eagle), *Callocephalon fimbriatum* (gang-gang cockatoo), *Calyptorhynchus lathami* (glossy black cockatoo), *Glossopsitta pusilla* (little lorikeet), *Climacteris picumnus victoriae* (brown treecreeper (eastern subspecies)), *Chthonicola sagittata* (speckled warbler), *Anthochaera phrygia* (regent honeyeater), *Grantiella picta* (painted honeyeater), *Daphoensitta chrysoptera* (varied sittella), *Artamus cyanopterus cyanopterus* (dusky woodswallow), *Melanodryas cucullata cucullata* (hooded robin (south eastern form)), *Petroica phoenicea* (flame robin), *Stagonopleura guttata* (diamond firetail), *Phascolarctos cinereus* (koala), *Saccolaimus flaviventris* (yellow-bellied sheathtail-bat), *Chalinolobus dwyeri* (large-eared pied bat) and *Miniopterus orianae oceanensis* (large bent-winged bat).

The likely presence of these species was considered in relation to whether suitable habitat is present, in the modified woodland (**Appendix 2**). Species that depend on swamps, large water bodies, riparian vegetation or caves do not have suitable habitat at the Development Site. Hollow-bearing trees provide shelter or nesting sites for hollow-dependant threatened fauna but no hollow-bearing trees were identified. There is an area of rock outcrop to the south west of the proposed Development Site which is important habitat for the spotted tailed quoll and reptiles. Species that use rock outcrops for habitat may utilise the site but the Development Site does not encroach on the rock outcrop and will not have impact on this area.

***Hieraaetus morphnoides* (little eagle):** Open eucalypt forest, woodland, Sheoak or Acacia woodlands and riparian woodlands; builds large stick nests in tall living trees and preys on birds, reptiles and mammals.

***Callocephalon fimbriatum* (gang-gang cockatoo):** Exist in tall mountain forests and woodlands in spring and summer and moves to the drier more open forests and woodlands, of the inland areas, in autumn and winter. The species favours old growth forests and woodlands for nesting, using hollows in larger eucalypts at least 3 m above the ground.

***Calyptorhynchus lathami* (glossy black cockatoo):** This species feeds almost exclusively on the seeds of forest oak and she-oak (*Casuarina* and *Allocasuarina* species). No *Casuarina or Allocasuarina* feed

trees are present at the site, and none will need to be cleared for the development. Habitat for this species will not be impacted.

***Glossopsitta pusilla* (little lorikeet):** Could occasionally be present in the area, utilising the forest habitat flowering eucalypt trees when in season. Favoured feed trees are heavy-flowering eucalyptus.

***Climacteris picumnus victoriae* (brown treecreeper (eastern subspecies)):** Inhabits eucalypt woodlands and dry open forests of the inland slopes and plains; preferring stringybarks or other rough barked eucalypts, typically with grassy understorey rather than a dense shrub layer. They are sedentary and territorial but do require tree hollows for nesting.

***Chthonicola sagittata* (speckled warbler):** Lives in *Eucalyptus* dominated communities with a grassy understorey, often on rocky ridges or gullies. Foraging takes place on the ground around tussocks and under bushes consuming seeds and insects. Typically breeding pairs have small territories.

***Anthochaera phrygia* (regent honeyeater)**: Inhabit woodlands an abundance of mistletoes where it feeds mainly on nectars from the few eucalypts that produce high volumes (Mugga ironbark, yellow box, white box and swamp mahogany) and mistletoes.

***Grantiella picta* (painted honeyeater):** Known habitats include boree/weeping myall (*Acacia pendula*), brigalow (*A. harpophylla*), box-gum woodland and box-ironbark forests, feeding on the fruits of mistletoes, insects and nectar.

***Daphoensitta chrysoptera* (varied sittella):** A relatively sedentary bird with a wide distribution, inhabiting eucalypt forests and woodlands, especially those containing rough-barked species, mature smooth-barked gums with dead branches, mallee and acacia woodland. The proposal will only affect a very small area of open forest habitat for this species and is unlikely to have an adverse effect on any local occurrence of the species.

***Artamus cyanopterus cyanopterus* (dusky woodswallow):** Characteristically found in eucalypt forests and woodlands, including mallee communities, with an open understorey but can also inhabit shrubland, heathland and farmland near wooded areas.

***Melanodryas cucullata cucullata* (hooded robin (south eastern form)):** Widespread but uncommon. Found in lightly timbered woodland, mainly dominated by acacia and/or eucalypts. The proposal will affect a very small area of forest habitat for this species and is unlikely to have an adverse effect on any local occurrence of the species.

***Petroica phoenicea* (flame robin):** Breeds in tall, moist eucalypt forest and woodlands and in winter moves to drier more open habitats like the western slopes and plains, where it can also live in pastures and native grasslands, with or without scattered trees.

***Stagonopleura guttata* (diamond firetail):** Found in diverse habitats including open forest, mallee and natural temperate grasslands, feeding exclusively on the ground on grasses, herbs and insects. Vegetation impacts at the site are limited and if these species have used the site they would continue to be able to do so.

***Phascolarctos cinereus* (koala):** Koalas have been recorded in the Mudgee area, with and the forest trees on the site include koala use species, listed for the North West Slopes Management Area, in a very young state. Due to lack of canopy development the growth form of these trees was assigned as zero. Impacts to Koala habitat are expected to be minimal due to the small size of the development and negligible extent of existing trees. The species will not be adversely impacted as the development will not encroach on other areas of forest.

***Saccolaimus flaviventris* (yellow-bellied sheathtail-bat):** Roosts in tree hollows and buildings but can use mammal burrows if other resources are limited.

***Chalinolobus dwyeri* (large-eared pied bat):** Roosts in caves, cliff crevices, old mine workings and disused mud nests of the *Petrochelidon ariel* (fairy martin), generally in well timbered areas containing gullies.

***Miniopterus orianae oceanensis* (large bent-winged bat):** A number of threatened hollow/cave-dependant bats may be present in the area and could be present at the site from time to time. There are no suitable hollow-bearing trees in the building footprint or rock overhangs or caves nearby that would provide potential breeding and roosting habitat. The proposal is unlikely to affect potential breeding or roosting habitat for these species.

Ecosystem credit species

Assessment of habitat suitability for ecosystem credit species has been conducted in accordance with Section 5.2 of the BAM. Ecosystem credits help represent threatened species that can be predicted to be present by the type and condition of vegetation at the Development Site and a habitat assessment has been completed to assess potentially significant impacts.

A list of predicted ecosystem credit species for the Development Site was reviewed in the BAM calculator (BAM-C). The potential for the identified ecosystem credit species to occur on the Development Site was assessed according to species specific habitat requirements, as detailed in **Table 5**. Where habitat features were not present due to the altered condition of the site vegetation, ecosystem credit species were excluded from further consideration.

Table 5: Assessment of ecosystem credit species within the Development Site.

Scientific name	Common name	Confirmed predicted species	Justification
Ninnox connivens	Barking owl	No	The Development Site does not have open forest / woodland structure; adjacent timbered areas have only sparse foliage, no old trees or large hollows and therefore is not suitable habitat.
Climacteris picumnus victoriae	Brown treecreeper	Yes	Woodland and dry open forest, mainly with rough barked tree species, often with a grassy understorey is present at the Property.
Melanodryas cucullata cucullata	Hooded robin	Yes	Lightly wooded country, with structural diversity including saplings, shrubs and grasses is present at the Property.
Glossopsitta pusilla	Little lorikeet	Yes	Eucalyptus woodland and areas near intermittent drainage lines exist at the Property, mistletoe and small hollows are not. Species may forage or transit through the Property.
Anthochaera phrygia	Regent honeyeater	Yes	Woodlands containing some ironbark and white box exist on

			the Property. Parts of the Property, including the Development Site, are on Important areas map for this species.
Chthonicola sagittata	Speckled warbler	Yes	Eucalyptus dominated, open canopy communities with a grassy understorey – exist in some areas of undisturbed remnants at the Property.
Dasyurus maculatus	Spotted-tailed quoll	Yes	Prefers mature wet forests and requires den sites such as hollows, rock outcrops or caves.
Lophoictinia isura	Square tailed kite	Yes	Open woodlands exist at the Property adjacent to the Development Site.
Neophema pulchella	Turquoise parrot	Yes	Edges of woodland, timbered ridges and creeks in farmland exist at the Property.
Daphoenositta chrysoptera	Varied sitella	Yes	Woodlands with Eucalypt species and rough barked trees, exist at the Property.
Hirundapus caudacutus	White-throated needletail	Yes	Largely aerial and more often seen near the coast, they are more likely to be seen above wooded areas, including open forest and rainforest
Grantiella picta	Painted honeyeater	No	No mistletoes on Development Site or adjacent areas of the Property.

Barking owl - inhabit open forests and woodlands, requiring dense foliage for cover and old trees with large hollows for nesting.

Brown treecreeper - Inhabits eucalypt woodland and dry open forest, mainly with rough barked tree species like stringybarks or ironbarks, often with an grassy open understorey.

Hooded robin - Open eucalypt woodland, acacia scrub and mallee, requires structural diversity including mature gum trees, saplings, shrubs and grasses

Little lorikeet - Forages in the canopy of open eucalyptus forest and woodland, often in riparian areas. Feeds mainly on nectar and pollen, sometimes native fruits and mistletoe. Nests are typically hollows in limbs or trunk of smooth barked eucalypts with a small entry hole (3 cm), high above the ground (2 - 15 m).

Regent honeyeater - Temperate woodlands, open forests feeds on eucalypt nectar (Mugga ironbark, yellow box, white box) and mistletoes.

Speckled warbler - Eucalyptus dominated communities with a grassy understorey - scattered native tussock grasses, sparse shrub layer, some eucalypt regrowth and an open canopy, typically in undisturbed remnant vegetation.

Spotted tailed quoll - Prefers mature wet forests and needs den sites such as hollows, rock outcrops or caves.

Square tailed kite – Woodlands and open forest, with a preference for timbered watercourses with large hunting ranges.

Turquoise parrot – Eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland.
Varied sitella - Eucalypt woodlands & forests, rough barked trees, feeds on insects.
White-throated needletail - Largely aerial and more often seen near the coast, they are more likely to be seen above wooded areas, including open forest and rainforest.
Painted honeyeater - Inhabits Boree/Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*), Box-Gum woodland and Box-Ironbark forests. Feeds on fruits of mistletoes, eucalypts and acacias.

All credit determinations are derived from complex algorithms supporting the function of the online BAM calculator (BAM-C). Change in vegetation integrity, area of impact, connectivity in the landscape and adjacent vegetation features are all components of the calculation. A summary of ecosystem credits, from the BAM-C online tool is shown below:

Case
00035874/BAAS18023/22/00035875

App last updated: 09/12/2021 11:00 (Version: 1.4.0.00)
BAM data last updated *: 14/10/2022 (Version: 55) * Disclaimer

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	Vegetation integrity loss	Area	Sensitvity to loss	Sensitivity to loss(Justification)	Species sensitivity to gain class	Biodiversity risk weighting	Potential SAII	Ecosystem credits
White Box - Black Cypress Pine shrubby woodland of the Western Slopes									
1	1610_Newmod	2.3	1.3 hectares	Moderate Sensitivity to Loss	PCT Cleared - 67%	High Sensitivity to Gain	1.75		1
2	1610_Oldmod	0.3	3.6 hectares	Moderate Sensitivity to Loss	PCT Cleared - 67%	High Sensitivity to Gain	1.75		1
3	1610_Unmod	0	4.9 hectares	Moderate Sensitivity to Loss	PCT Cleared - 67%	High Sensitivity to Gain	1.75		1
								Subtotal: 3	
								Total: 3	

Species credit species

Identify threatened species for assessment

A list of predicted species credit species for the Development Site was reviewed in the BAM-C. Species credits pertain to threatened species that cannot be predicted by the vegetation present and relates primarily to species for which breeding habitat is available.

Habitat constraints and vagrant species

The potential for identified species credit species to occur on the Development Site was assessed according to species particular habitat requirements, as detailed in **Table 6**. Where habitat features were not present due to the condition of the site vegetation, species credit species were found not to be candidate species and no further assessment was required.

Table 6: Assessment of species credit species within the Development Site.

Scientific Name	Common Name	Confirmed candidate species (Yes/No?)	Justification
Acacia ausfeldii	Ausfeld's Wattle	Yes	Footslopes and low rises on sandstone – targeted survey failed to identify species.
Anthochaera phrygia	Regent honeyeater	Yes	Assumed present as the Development Site is in the

			Important Areas Map for this species.
Diuris tricolor	Pine donkey orchid	Yes	Individuals noted at the site inspections.
Eucalyptus cannonii	Capertee Stringybark	Yes	Not identified at the site inspection - targeted survey.
Ninox connivens	Barking Owl	No	No living or dead trees with hollows greater than 20 cm in diameter and greater than 4 m from the ground.
Phascolarctos cinereus	Koala	No	Koala use tree species were at Development site but only as saplings, with no canopy cover.
Lophoictinia isura	Square tailed kite	No	No suitable old trees, no nest sites and no male and female birds. Not found in targeted survey.

Due to the site vegetation being unsuitable because of a deficit of mature eucalypt trees and being altered by previous recreation activities there were only four candidate species that required further assessment.

Threatened Species Surveys

Candidate Threatened Flora

The minimum suggested survey effort for targeted flora survey is two 20 m x 20 m quadrats for every 2 – 50 ha stratification unit (DEC 2004, p. 5-69). Five 20 x 20 m plots were used in a targeted survey for *Acacia ausfeldii* and *Eucalyptus cannonii*. No incidence of these species was observed.

The pine donkey orchid was observed at many locations both inside vegetation plots and from random meander of Property areas.

Candidate Threatened Fauna

Rock outcrop was found to the south west of the Development Site. A 30 m buffer will protect this rock outcrop from any potential disturbance.

For diurnal birds multiple timed area searches were conducted, 2 x 30 minute search in the Development Site or the same habitat type and 1 x 30 minute search in the wooded area to the west. This was in conjunction with opportunistic observations, including birds that were flying over the site and in or over adjacent areas. Birds were identified by sight and bird call vocalisations. Observations and surveys were conducted mid-morning and afternoon, the weather on observation days was mild and sunny with moderate ambient wind conditions.

Square tailed kite: mainly inhabits open eucalypt forests and woodlands but also utilises nearby open habitats. Typical tree species of habitat areas include stringybarks, peppermints, river red gums, angophoras, cypress pines, casuarinas and box-ironbark communities.

Regent honeyeater: is listed as a candidate species credit species in the BAM-C and most vegetation at the Property is listed as important habitat for regent honeyeaters. Mapped important areas are recognised as critical for the survival of the species and typically provide food resources and breeding habitat for the regent honey eater. Areas that coincide with the Important Area Maps do not require survey to determine species presence.

Capertee stringybark: typically 10 – 15 m, with persistent stringybark and predominantly restricted to the central tablelands and slopes. Within the altitudinal range 450 m to 1050 m this species seems to tolerate most situations except valley floors.

Koala: Inhabit eucalypt woodlands and forests where they are inactive for most of the day, feeding mainly at night. Most time is spent in the tree canopy but they will traverse open ground to move between trees. Their home range varies in size due to habitat quality ranging from less than two hectares to hundreds.

The PCT at the Development Site is known to have an association with threatened species including koalas. There are isolated individual sapling koala use trees for the North West Slopes koala modelling region like white box, rough-barked apple and Dwyer's red gum however their resulting canopy cover is nearly zero (0.3 %) making the tree growth form absent with respect to koala use. Therefore the Development Site was assessed as unsuitable koala habitat with no further survey required (Koala BAM Survey Guide, DPE 2022).

Identified Threatened Species

The presence of the regent honeyeater is assumed however, no other threatened fauna species or their habitat requirements were identified on site.

5. AVOID AND MINIMISE IMPACTS ON BIODIVERSITY VALUES

Avoiding and minimising impacts during project planning

Project location

The residence is planned to be situated on land, which already has reduced biodiversity values due to previous land management practices. The residential building will be situated on a previously disturbed area meaning any impacts will be small in extent and localised. Better quality vegetation will remain undisturbed in other areas of the Property.

Locations where pine donkey orchids have been identified will be avoided.

The construction materials and technique for the residential building will use shipping containers delivered to site and placed onto piers, minimising the degree of ground disturbance due to extended site construction activities and numerous personnel trafficking the area.

The building will be powered by a solar panel system with battery back-up, effectively 'off grid', avoiding any ground intrusion for trenched power cables or canopy disturbance for overhead powerline provision.

Water tanks, bottled gas services, part of the access driveway and required turning area for fire fighting vehicles will be in the Asset Protection Zone (APZ) allowance for the residence, minimising the need for additional clearing or disruption to the existing environment.

The existing farm dam will be retained, which would continue to provide habitat for species utilising the current water resources.

Avoid and Minimise Impacts on prescribed biodiversity impacts

The following are prescribed impacts which need to be considered as per section 6 of the BAM and constitute impacts which potentially effect habitat, connectivity in the landscape, water quality or hydrological processes, machinery or vehicle impact of threatened species.

Impact of the development on the habitat of threatened species or ecological communities associated with significant geological features, human made structure or non-native vegetation:

No significant geological features, human made structures or abandoned buildings occur within the Property. There was a rocky outcrop identified slightly south west of the Development Site which is outside the scope of works and will be excluded by 30 m from proposed activities (**Figures 12 and 17**). Within the Development Site no significant trees need removal. Activities that may cause noise, dust, vibration and potentially sediment runoff effects would be small in extent and short term in nature.

Distance from site activities provides an adequate buffer to protect the rock outcrop from disturbance and the lack of other structures or significant non-native vegetation limits any possible impacts of the Proposal on existing habitat features.

Impacts of the development on the connectivity of different habitat which facilitates movement of threatened species:

The Development Site is part of a mostly continuous and large area of woody native vegetation and is located at the edge of this connected vegetation. The Proposal, therefore, is likely to have only marginal effects on habitat connectivity because of the change in vegetation and increasing proportion of grassland to the east and south of the Development Site. There are only minor drainage lines in the vicinity of the Proposal, with no nearby larger rivers and it is not anticipated there will be any change in access to water for fauna at the site. Much of the existing ground cover will continue to exist due to the small size of the Proposal and only partially modified vegetation in the designated APZ.

Due to the small extent of the development and its position in a previously modified area on the edge of remnant vegetation it is not expected the Proposal will further exacerbate fragmentation of habitat for threatened fauna species potentially occurring in surrounding vegetation.

Impacts of the development on water bodies, quality and hydrological processes that sustain threatened species or ecological communities:

There are no threatened ecological communities associated with the vegetation type at the site. There is an unnamed first order (Strahler stream order) drainage line running east to west which has proximity to proposed works. Ideally first order water courses should have a 10 m buffer either side of the middle of the watercourse to prevent erosion and other adverse effects. The farm dam will also remain as a potential habitat resource. Possible impacts of construction activities include leaks and spills from vehicles, plant and equipment, particulates from internal combustion engines, and dust from plant and vehicle movements. Standard management measures to help mitigate risks associated with routine construction activities include:

- Spill prevention measures
- Maintaining equipment
- Dust suppression if required
- Erosion control

After construction – groundcover will be maintained through normal grounds maintenance activities and hydrological processes are unlikely to be affected by use of the site for residential purposes.

Impact of wind turbine strikes on protected animals:

Not applicable to this development application.

Impacts of vehicle strikes on threatened species or on animals that are part of a TEC:

During construction and operation, traffic at the Development Site will be increased because currently there is infrequent vehicle movement. Vehicle access will be via gateways located at Ridge Road property entrances and vehicle movement will be generally low speed, due to the terrain and short traversing distances. Vegetation that exists on travel routes from these access gateways is mainly grassland, with only isolated trees, reducing the likelihood that occupants of vehicles would encounter any threatened terrestrial animals. Once construction is completed traffic will again be minimal. In the long term there will be minor increases to existing traffic movement patterns and frequency but no significant additional impacts on threatened species or animals.

Assessment of Impacts

Impacts on native vegetation and Habitat

Direct Impacts

The area which requires total clearing is comprised of the residential building and associated service infrastructure (which covers 0.05 ha) and the access road (disturbing 0.07 ha). The driveway will be nominally 4.0 m wide to allow for Rural Fire Service (RFS) vehicles to utilise the Property access in case of bushfire. An additional 0.13 ha of modified vegetation will form a bushfire Asset Protection Zone (APZ) which will not be totally removed. This APZ can retain up to 15 % tree canopy cover, some isolated shrubs, with most of the grass composition remaining unchanged but decreasing in proportional coverage. This means the total area of vegetation directly impacted will be 0.25 ha.

No mature trees require removal and no trees with hollows were observed during site surveys.

No TECs will be impacted and all the condition states of *PCT 3753* will still be present on the Property.

Threatened pine donkey orchids were identified within the Development Site. Six pine donkey orchids have species polygons (30 m radius) intersecting with the house footprint but only two are very close (approximately 3 m from the southern wall of the proposed building, south east corner) and could be disturbed by works. These species can be protected from disturbance during construction by physical exclusion barriers. If protection by exclusion is not possible an attempt could be made to translocate the two closest pine donkey orchids by removing a dug soil core, containing the underground dormant subterranean tuber, to an alternate prepared site nearby on the Property, (Bell 2019, https://www.anpc.asn.au/wp-content/uploads/2019/09/APC_28-1_Jun-Aug19_Bell.pdf). The likely impact to approximately 1 % (2 out of 145 individual plants) of the collection of pine donkey orchids at the Property in considered to be very small and will not endanger the population.

Management of APZ will be ongoing, ensuring tree canopy cover is less than 15 %, preferably with smooth barked trees, shrubs are separated by large gaps, groundcover is kept short and litter not allowed to accumulate.

The regent honeyeater is identified as at risk of serious and irreversible impacts (SAII).

Principles for determining serious and irreversible impacts

An impact is to be regarded as serious and irreversible if it is likely to contribute significantly to the risk of a threatened species (including endangered populations) or ecological community becoming extinct based on the following 4 principles (as set out in clause 6.7 of the Biodiversity Conservation Regulation 2017):

- **Principle 1:** The impact will cause a further decline of a species or ecological community that is currently observed, estimated, inferred or reasonably suspected to be in a rapid rate of decline
- **Principle 2:** The impact will further reduce the population size of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very small population size
- **Principle 3:** The impact is made on the habitat of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very limited geographic distribution
- **Principle 4:** The impacted species or ecological community is unlikely to respond to measures to improve its habitat and vegetation integrity, and therefore its members are not replaceable.

Details of the life cycle requirements and threats impacting the regent honeyeater (shown below, from http://www.environment.gov.au/biodiversity/threatened/species/pubs/82338-conservation-advice.pdf) in comparison to the characteristics of the Development Site (**Table 7**), shows SAII are unlikely.

Resources that the regent honeyeater uses:

- nectar from eucalypts including Mugga ironbark, yellow box, white box, swamp mahogany
- flowering of stringybark species can also contribute to nectar resources
- nectar and fruit from mistletoes
- invertebrates / insects and their exudates (lerps and honeydew)

Breeding habitat for the regent honeyeater - nest are made in:

- Horizontal branches or forks in tall mature eucalypts and sheoaks
- Mistletoe haustoria

Threats:

- Clearing, fragmentation and degradation of habitat
- Removal of large trees
- Competition from other more aggressive honeyeaters, noisy miner (*Manorina melanocephala*) and noisy friar bird (*Philemon corniculatus*)
- Predation by nest predators such as pied currawongs (*Strepera graculina*)

Table 7: Consideration of the site with regard to principles indicating SAII.

Principle	Development Site	SAII
1 Further decline	Consists of juvenile shrubs, seedlings and groundcover species. There is no nectar producing eucalypts that will be impacted Works will not significantly affect insects available (potential secondary food source). There is no breeding resource available	Unlikely, due to site conditions
2 Reduce population	No individuals will be harmed. Breeding habitat is not present and will not be impacted – no mature eucalypts, sheoaks or mistletoe exist at the site.	No

3 Impact on habitat	Further clearing and degradation of habitat is minor. Fragmentation will not be exacerbated as impact is to fringing vegetation. Use of the site for residential dwelling will not enhance natural advantage to aggressive honeyeaters, noisy miners or pied currawongs in the surrounding environment.	Unlikely
4 Limited species response to habitat improvements, members not replaceable	No individuals will be harmed. Breeding habitat is not present and will not be impacted – no mature eucalypts, sheoaks or mistletoes exist at the site.	No

Indirect Impacts

The Proposal has the potential for edge effects on vegetation located near the Development Site. Adjacent woodland vegetation could be impacted resulting in changes to ecological composition, structure and function, potentially reducing habitat resources for insects and birds. Potential indirect impacts include:

- Increased weed invasion due to disturbed ground surfaces and potential spread or introduction of pathogens from the site to adjacent vegetation. These processes could occur anytime during construction but would not be an ongoing issue in the operational phase, where ground surfaces and vegetation would have stabilised and vehicular traffic will be reduced. Erosion, sedimentation and contaminated run-off risks, would be small in magnitude due to the building pier foundation system, small extent of disturbed areas and industry standard construction erosion and sediment control measures. The hazard is highest in the early stages of construction whenever there are storms and bare, disturbed ground surfaces. The threat of these processes will not continue into the occupation phase unless there is ground disturbance for unforeseen maintenance or future domestic needs.
- Accidental incursions into adjacent vegetation during site deliveries and ground works, due to personnel error or loss of vehicle control. The extent, frequency and duration of any such incidents would be small and only during construction.
- Reduced viability of adjacent habitat due to edge effects, where disturbing impacts creep further into undisturbed pockets of vegetation. These influences would exist long term through building construction and site residence but the greatest impact could be expected initially during construction and preparation of the APZ, where effects of vegetation modification could continue a few metres further past the actual clearing boundary. The level of existing disturbance at the site minimises the magnitude of the future condition change.
- Reduced viability of adjoining habitats due to increased noise, dust or light spill. Increased noise and dust impacts would occur potentially daily during construction activities and effects would be magnified during windy conditions. The consequences of additional noise and dust would not be ongoing through the Development's operational phase but light spill could be an issue during ongoing operation. Due to the size of the residence and typical residential lighting needs lighting impacts are unlikely to significantly affect surrounding woody habitat.
- Increased risk of starvation or exposure and loss of shade and shelter is potentially an ongoing effect through construction and operation of the Proposal. Increased movement and activity at the site as work commences will naturally tend to discourage animals from using the area. These effects will continue over the long term.

- Loss of breeding habitat would happen from start of construction and continue through the ongoing occupation of the residential building. This is expected to be a small impact because of the limited size of the Proposal and the degraded condition of the existing site vegetation.
- Trampling of threatened flora species would specifically affect the pine donkey orchid observed at the site. Effects would be greatest during construction.
- Inhibition of nitrogen fixation and increased soil salinity through changed land management (removal of deep rooted trees, irrigation producing water imbalances) affecting soil nutrient and water cycling. Salinity processes could start during construction and continue through occupation but risks are considered low.
- Fertiliser drift would only be a potential impact during occupation of the residential building and could result in the gradual decline of native vegetation. The effects are likely to be minimal as the planned future use of the site is residential, with passive recreation not intensive agriculture.
- Wood collection could occur over the long term during residence for wood fire heating, cooking and recreational purposes. Where wood is collected and used only by the occupants of the Property and not for commercial purposes this impact is likely to be minimal.
- Removal and disturbance of rocks is possible during construction and operation of the Development for future landscaping. The effects could be significant if a large amount of rock is disturbed.
- Increase in predators and pest animal populations could be facilitated by poor land management practices or if rubbish were to accumulate primarily in the house occupation phase. Routine domestic care and maintenance would make an increase in predators unlikely and the risk of this happening is minimal.
- Disturbance to specialist breeding and foraging habitat for the regent honeyeater could occur throughout construction and future use of the site. As nectar producing eucalypts and mistletoes do not occur at the site the potential loss is small.
- There is increased risk of fire during construction work from welding, machinery sparks, vehicle ignition or electrical fault. Fire risk potential would be reduced from that present during construction but this risk would be ongoing through the operational phase. The operational stage would have fire risk similar to the existing residential / recreational land use which can have fires start through lightning strike, loss of control of planned fires and vehicle ignition (driving through or slashing paddocks with long grass or shrubs) and could affect all site vegetation.
- Increase in rubbish dumping in adjoining habitats may occur from illegal and irresponsible treatment of construction waste or domestic rubbish. It could occur throughout both construction and operation, potentially daily or as personnel attend site.

There is better quality woody vegetation down slope and to the west of the Development Site providing some site resilience and ongoing habitat resources, which will reduce any negative influence of site activities. The listed potential indirect impacts are unlikely to significantly affect the viability of these higher biodiversity value woody areas and there will be negligible long term change in the fire regimes or fire threat to this zone.

There will be no disturbance or removal of rocks or bush rock as the rock outcrop slightly south west of the house site will have a 30 m protection buffer.

Provided appropriate mitigation measures are implemented (**Table 8**), the Proposal is unlikely to have a significant long-term effect on threatened species, ecological communities and their habitats.

Prescribed impacts

There will be no change to factors that may influence prescribed impacts.

Mitigating and Managing impacts on Biodiversity values

Construction works will be managed, implementing measures outlined in **Table 8**.

Table 8: Summary of direct, indirect and prescribed impacts of the Proposal

Impact	Action and Outcome	Responsibility	Timing
Direct			
Clearing of native vegetation / habitat	Mark out boundary of Development Site to prevent unnecessary ground disturbance	Site Manager	Prior to ground disturbance
	Ensure vehicle and equipment parking areas and unloading zones are designated and positioned to limit any new disturbance	Site Manager	Prior to construction
	Identify and communicate the location of environmentally sensitive areas and exclusion zones at the initial site visit for site personnel and contractors, to protect important habitat features		
	If it is necessary to move any fallen limbs or timber, relocate it to another area of the Property, to reduce the impact from removing dead wood, which can be a fauna resource	Site Manager	Prior to and during construction
	Avoid and minimise clearing impacts to ground cover where possible to reduce overall vegetation impacts. Retain all eucalypt trees adjacent to driveway access.		
Removal of hollow-bearing trees, habitat trees	No hollow bearing habitat trees require removal.	N/A	N/A
Pine donkey orchid	Install physical barricade around pine donkey orchid locations nearest the Development Site, exclude traffic from these areas	Site Manager	Prior to ground disturbance
Indirect			
Transfer of weeds and pathogens to and from the site	Inspect vehicles to be used on site for soil and plant material residue as a biosecurity measure	Site Manager	Prior to first use on site
	Clean vehicles by brushing or blowing off any plant material prior to site entry to avoid transferring weed propagules or pathogens	Site Contractors	During construction
	Inspect the site and control any new infestations of recognised priority weeds to remediate impact of weed incursion	Site Manager	After construction
Erosion, sedimentation and contaminated runoff	Erosion and sedimentation controls as per Landcom/Department of Housing Managing Urban Stormwater, Soils and Construction Guidelines (the Blue Book).	Site Manager	Prior to and during construction

Impact	Action and Outcome	Responsibility	Timing
	https://www.environment.nsw.gov.au/research-and-publications/publications-search/managing-urban-stormwater-soils-and-construction-volume-1-4th-editon Maintain vegetation especially downslope of disturbed areas to control water release from the site, improve water quality and reduce pollution risks Spill kit kept on site to control accidental fuel spills		
Accidental incursions	Ensure deliveries to site are unloaded in already disturbed areas Create a buffer zone protecting vegetation Ensure all work is done by licenced and experienced professionals	Site Manager	Prior to and during construction
Edge effects	Create a buffer and install exclusion fencing / signage, protecting vegetation	Site Manager	Prior to and during construction
Noise, vibration, lighting, waste and air pollution impacts to adjacent habitat	Restrict human traffic to the Development Site, to avoid disturbance in adjacent habitat areas Noise and vibration impacts minimised by using appropriate and well maintained equipment and coordinating disruptive activities where possible No night works requiring lighting and any permanent lighting restricted to the immediate development zone to minimise light spill and possible changes to animal behaviour Any waste materials produced from on-site activities to be recycled or removed to appropriately licenced waste facility To reduce dust generation any loads of bulk material will be covered in transit and work will cease in high wind conditions if required	Site Manager	During construction and operation
Increased risk of starvation or exposure and loss of shade and shelter	Gradually progress to peak site activity to allow animals the opportunity to move away. Minimise disturbance to the other areas of the property.	Site Manger	Prior to and during construction

Impact	Action and Outcome	Responsibility	Timing
Loss of breeding habitat	Avoid any impact to trees when constructing driveway access	Site Owner	Prior to and during construction
Trampling of threatened flora species	Induction of site workers to inform about threatened plants Physical barriers to protect threatened plants Minimal vegetation disturbance outside of building APZ	Site Manager Residents	Prior to and during construction During construction and occupation
Inhibition of nitrogen fixation and increased soil salinity	Minimise removal of trees Minimise irrigation Maintain natural water movement across the landscape	Site Manager Residents	Prior to construction During occupation of house
Fertiliser drift	Minimise fertiliser use Apply fertiliser if required only to managed landscape areas Minimise off target exposure to bushland Use fertiliser suitable for native plants	Residents	During occupation
Wood collection	Commercial wood collection not permitted Leave substantial logs (greater than 10 cm diameter) in bushland areas for habitat where possible	Residents	During occupation
Removal and disturbance of rocks	Avoid disturbance of bush rock which will continue to provide habitat resources.	Residents	During occupation
Increase in predators and pest populations	Routine domestic care and maintenance will help prevent pests encroaching near the residence Removal of rubbish before it accumulates will avoid predators and pests gaining competitive advantage by utilising foreign materials.	Residents	During occupation
Disturbance to specialist breeding and foraging habitat	Avoid any disturbance of hollow bearing trees.	Residents	During occupation
Increased fire risk	Provision of APZ for a defendable space around the building.	Site Owner	During construction

Impact	Action and Outcome	Responsibility	Timing
	Provision of access for fire fighting vehicles. Provision of water reserves for fire- fighting.		and occupation
Increased rubbish	Remove rubbish before it accumulates to reduce fire hazard and avoid scavenging animal behaviour.	Site Manager, all site visitors and residents	During construction and occupation
Prescribed			
Geological features, fabricated structures and non-native vegetation	Avoid disturbance to areas of rock outcrop.	Residents	During occupation
Connectivity through the landscape	Avoid modification to woodland areas over the long term.	Residents	During occupation
Impacts to surface and groundwater quality	Standard erosion control measures like sediment fences, maintaining vegetation and mulching, where appropriate. A spill management procedure to be developed in case of accidental spill or fuel leak	Site Manager	During construction Prior to construction
Vehicle collision with fauna	Low on site vehicle speed to accommodate uneven ground and to reduce accident potential	Site Owner	During construction

6. IMPACT SUMMARY

The following is an assessment of the impacts requiring offsetting in accordance with Section 9 of the BAM (DPE 2020) and includes impacts:

- on biodiversity values at risk of serious and irreversible impact
- for which offset requirements need to be determined
- for which offset requirements do not need to be determined
- that do not require further assessment

Serious and irreversible impacts

While the regent honeyeater needs consideration regarding Serious and Irreversible Impacts (SAII) these are not expected to occur at the Development Site due to lack of existing foraging and breeding resources. Tree and mistletoe species used by the regent honeyeater are not present at the Development Site.

Identification of impacts requiring offsets

Impacts on Native vegetation

The PCT identified at the development site is not representative of any endangered or critically endangered ecological community but is potentially associated with threatened species, notably the regent honeyeater and the pine donkey orchid, which was identified at the site. Such vegetation communities with a vegetation integrity score of greater than 17 require offsets to be determined.

The assessed vegetation integrity score was above this threshold requiring biodiversity offset credits to be determined.

A summary of the impacts on native vegetation and the required ecosystem credits is provided in **Table 9**. For *PCT 3753 – Dunedoo sandstone ironbark – pine forest* the closest fit vegetation type in the BAM-C is PCT 1610 – White box – black cypress pine shrubby woodland of the western slopes.

Table 9: Summary of required ecosystem credits.

Vegetation Zone	Vegetation Zone Name	Area (ha)	Current Vegetation Integrity Score	Future Vegetation Integrity Score	Change in VI Score	Credits Required	BAM Case No.
1	1610-Newmod HouseDrive 1610-Newmod APZ	0.05 0.13	28.1 28.1	0 15.6	-28.1 -12.5	1	00035875
2	1610-Oldmod OldAPZ	0.07	25.8	9.1	-16.7	1	00035875
3	1610-Unmod	4.9	45.3	45.3	0	1	00035875
	Total Credit Required for PCT 1610					**3**	

The 'like – for like' Credit Report is provided in Appendix 5.

Impacts on Species credit species

Species credits were identified for both the regent honeyeater and pine donkey orchid.

Table 10: Summary of required species credits.

Species	Vegetation Zone Name	Area (ha)	Credits Required	BAM Case No.
Regent honeyeater	1610-Newmod 1610-Oldmod	0.05 0.07	1 1	00035875
	Sub-total		**2**	
Pine donkey orchid	1610-Newmod 1610-Oldmod	0.05 0.03	1 1	00035875
	Sub-total	0	**2**	

Species credits for the regent honeyeater and the pine donkey orchid require offsetting (**Appendix 5**).

Impacts not requiring offsets

Impacts on species identified outside the Development Site do not require offsets to be determined. No impacts on threatened species outside the Development Site were identified.

Impacts that do not need further assessment

There was minimal established non-native vegetation that could be potentially used as habitat for threatened species. It is only when threatened species may be using non-native vegetation that further assessment may be warranted, therefore no further impacts need appraisal.

7. ASSESSMENT OF OTHER BIODIVERSITY LEGISLATION

EPBC Act

Proposal was not considered likely to have significant impact on MNES:

Table 11: Matters of national environmental significance checklist.

Factor		Impact
a.	*Any impact on a World Heritage property?*	*Nil*
b.	*Any impact on a National Heritage place?*	*Nil*
c.	*Any impact on a wetland of international importance?*	*Nil*

Factor	Impact
d. Any impact on a listed threatened species or communities?	*Unlikely*
e. Any impacts on listed migratory species?	*Nil*
f. Any impact on a Commonwealth marine area?	*Nil*
g. Does the proposal involve a nuclear action (including uranium mining)?	*Nil*
Additionally, any impact (direct or indirect) on Commonwealth land?	*Nil*

Biosecurity Act

Isolated occurrences of prickly pear were identified at the Property and should be controlled over time.

8. CONCLUSION AND RECOMMENDATIONS

A total of 40 native plant species were recorded during the site assessment, with some exotic (weed) species (**Appendix A**).

BAM assessment has confirmed there are no threatened ecological communities (TECs) at the Development Site. The threatened pine donkey orchid is present at the Development Site and efforts have been made to minimise impacts through positioning, materials and construction technique of the planned house, least disturbance driveway route, using solar technology to minimise ground disturbance and the future management strategies of the APZ. Three ecosystem credits and two species credits each for the regent honeyeater and the pine donkey orchid will be procured and retired as part of the Development Application process.

The assessment finds that, of the threatened fauna species that have been recorded locally, some have suitable foraging habitat at the Property and may occur there from time to time. Potential breeding resources are very limited at the Development Site due to existing vegetation condition. Overall there are expected to be minimal significant impacts to habitat features that may be used by any of these threatened fauna species. There are no specialised habitat features such as rock outcrops, cliffs or caves in the Development Site.

Declaration

I declare that this BDAR has been prepared in accordance with the requirements of the BAM and relevant legislation. It contains all available information that is relevant to the environmental assessment of the development to which the statement relates. The site of the proposal has been inspected by Access EP staff to gather the site-specific physical data presented in this report.

To the best of my knowledge, the information contained in this BDAR is neither false nor misleading.

Christopher Botfield

9. References

Agriculture Victoria, Soil Resources Glossary
http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/gloss_HR Data NSW, (2020), Soil

Bell, S. (2019), Threatened Plant Translocation Case Study: Translocation 'success' is all about detection: experiences with two threatened orchids from the Hunter Valley of NSW. AustralianPlant Conservation, Vol (*28*) No. 1. https://www.anpc.asn.au/wp-content/uploads/2019/09/APC_28-1_Jun-Aug19_Bell.pdf

Bureau of Meteorology (BoM) (2021), Daily Climate Statistcis Mudgee NSW, http://www.bom.gov.au/climate/dwo/202107/html/IDCJDW2088.202107.shtml

Landscape Map of the Dubbo region https://data.nsw.gov.au/data/dataset/soil-landscapes-of-the-dubbo-1-250000-sheet6bb19/resource/bc83c865-49ef-422b-835b-abd278b2116a?inner_span=True https://datasets.seed.nsw.gov.au/dataset/b6f6ab04-9f4d-4505-aa3a-99653d30072f/resource/bb6992f0-6a22-4d16-921a-d5f8bdb6d628/download/dubbosi554ed1slmapl

Department of Climate Change Energy, the Environment and Water (DCCEEW), (2022), Protected Matters Search Tool http://www.environment.gov.au/epbc/pmst/index.html

Department of Environment and Conservation (DEC) NSW, (2004), Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities, https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Threatened-species/draft-threatened-biodiversity-survey-guide.pdf

NSW Department of Planning and Environment (DPE) (2020), Biodiversity Assessment Method (BAM) https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity-offsets-scheme/accredited-assessors/biodiversity-assessment-method-2020

NSW Department of Planning and Environment (DPE) (2022), Koala (*Phascolarctos cinereus*) Biodiversity Assessment Method Survey Guide https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Threatened-species/koala-phascolarctos-cinereus-biodiversity-assessment-method-survey-guide-220249.pdf

NSW Department of Planning, Industry and Environment, (2021a) BioNet: The website for the Atlas of NSW Wildlife: A whole-of-government system for flora and fauna sightings information. http://www.environment.nsw.gov.au/atlaspublicapp/UI_Modules/ATLAS_/AtlasSearch.aspx

NSW Department of Planning, Industry and Environment (DPIE), (2016) Bioregions https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Bioregions/bioregions-south-western-slopes.pdf

NSW Department of Planning, Industry and Environment (DPIE), (2020a), Land and Soil Information https://www.environment.nsw.gov.au/topics/land-and-soil/information/espade

NSW Department of Planning, Industry and Environment (2020b), Threatened Species found in Inland Slopes IBRA sub-region, Threatened species search tool. https://www.environment.nsw.gov.au/threatenedspeciesapp/AreaHabitatSearch.aspx

https://www.environment.nsw.gov.au/threatenedspeciesapp/cmaSearchResults.aspx?SubCmaId=344 Accessed: 05/11/2021

NSW Department of Planning, Industry and Environment (DPIE), (2021b), The Central Resource for Sharing and Enabling Environmental Data (SEED) in NSW, https://www.seed.nsw.gov.au/

NSW Department of Primary Industries - NSW Weedwise, Priority Weeds for the Central West, https://weeds.dpi.nsw.gov.au/WeedBiosecurities?AreaId=59

Spatial Information Exchange, Cadastral and Imagery Data, NSW Government Department of Finance and Services, https://maps.six.nsw.gov.au/

Appendix 1: Flora and Fauna Species Lists

Flora species list for the BAM field plots:

01/09/2022 Scientific name	Field plot AWS - 1 Common name	BAM Growth form	Cover (%)	Type
Acacia doratoxylon	Currawang	TG	10	N
Cassinia arcuata	Sifton bush	SG	1.5	N
Aristida vagans	Three awn spear grass	GG	5	N
Eucalyptus dwyeri	Dwyer's red gum (s)	TG	0.1	N
Xerochrysum bracteatum	Golden everlasting	FG	4	N
Xerochrysum viscosum	Sticky everlasting	FG	4	N
Angophora floribunda	Rough barked apple (s)	TG	0.1	N
Melichrus urceolatus	Melichrus	SG	0.1	N
Aira elegantissima	Delicate hairgrass			E
Austrostipa scabra	Rough spear grass	GG	2	N
Cheilanthes sieberi	Rock fern	EG	0.2	N
Cirsium vulgare	Spear thistle			E
Hardenbergia violacea	False sarsaparilla	OG	0.1	N
Aristida caput-medusae	Many headed wiregrass	GG	2	N
Verbascum thapsus	Great mullien		0.5	E
Diuris tricolor	Pine donkey orchid	FG	0.1	N
Eucalyptus albens	White box (s)	TG	0.1	N
Caladenia caerula	Blue finger orchid	FG	0.1	N
Acacia stenophylla	River cooba	TG	0.2	N
Drosera hookeri		OG	0.1	N
Galium murale	Small bedstraw		0.1	E
Conyza spp.	Fleabane		0.5	E

AWS-1 – midline view

AWS-1 – midline ground

01/09/2022 Scientific name	Field plot AWS - 2 Common name	BAM Growth form	Cover (%)	Type
Acacia doratoxylon	Currawang	TG	2	N
Callitris endlicheri	Black cypress pine	TG	1	N
Poa sieberiana	Snow grass	GG	4	N
Caladenia catenata	White finger orchid	FG	0.1	N
Acacia dawsonii		SG	0.5	N
Cassinia arcuata	Sifton bush	SG	5	N
Aristida vagans	Three awn spear grass	GG	5	N
Eucalyptus dwyeri	Dwyer's red gum (s)	TG	0.1	N
Xerochrysum bracteatum	Golden everlasting	FG	10	N
Dianella longifolia	Blue flax lily	FG	0.1	N
Angophora floribunda	Rough barked apple (s)	TG	1	N
Wurmbea diocea	Early Nancy	FG	0.1	N
Gahnia aspera	Rough sword sedge	GG	0.1	N
Melichrus urceolatus	Melichrus	SG	2	N
Microtis parviflora	Leek orchid	FG	0.1	
Aira elegantissima	Delicate hairgrass		5	E
Austrostipa scabra	Rough spear grass	GG	2	N
Wahlenbergia stricta	Tall bluebell	FG	0.1	N
Cheilanthes sieberi	Rock fern	EG	0.1	N
Austrodanthonia racemosa	Wallaby grass	GG	0.1	N
Verbascum thapsus	Great mullien		0.1	E
Opuntia spp.	Prickly pear		0.1	E
Diuris tricolor	Pine donkey orchid	FG	0.1	N
Eucalyptus albens	White box (s)	TG	1	N
Hypochoeris radicata	Flat weed		10	E
Leucopogon muticus	Blunt beard heath	SG	0.2	N
Calytrix tetragona	Common fringe myrtle	SG	0.4	N
Carex inversa	Sedge	GG	0.1	N
Harmogia densifolia		SG	0.1	N
Oenothera stricta	Common evening primrose		0.1	E
Conyza spp.	Fleabane		0.5	E

AWS-2 midline view

AWS-2 midline ground

01/09/2022 Scientific name	Field plot AWS - 3 Common name	BAM Growth form	Cover (%)	Type
Acacia doratoxylon	Currawang	TG	0.1	N
Acacia stenophylla	River cooba	TG	0.1	N
Callitris endlicheri	Black cypress pine	TG	1	N
Cassinia arcuata	Sifton bush	SG	2	N
Sporobolus creber	Rat's tail fescue	GG	10	N
Cheilanthes sieberi	Rock fern	EG	10	N
Cymbopogon refractus	Barbed wire grass	GG	1	N
Aristida vagans	Three awn spear grass	GG	10	N
Cynodon dactylon	Couch	GG	20	N
Wurmbea diocea	Early Nancy	FG	0.1	N
Aira elegantissima	Delicate hairgrass		3	E
Diuris tricolor	Pine donkey orchid	FG	0.1	N
Hypochoeris radicata	Flat weed		30	E
Astroloma humifusum	Cranberry heath	SG	0.1	N
Carex inversa	Sedge	GG	0.1	N
Rumex domosus	Wiry dock	FG	0.1	N
Senecio macranthus		FG	0.1	N
Oenothera stricta	Common evening primrose		0.1	E

AWS-3 midline view

AWS-3 midline ground

28/09/2022 Scientific name	Field plot AWS - 4 Common name	BAM Growth form	Cover (%)	Type
Acacia doratoxylon	Currawang	TG	0.2	N
Acacia stenophylla	River cooba	TG	0.2	N
Cassinia arcuata	Sifton bush	SG	0.5	N
Sporobolus creber	Rat's tail fescue	GG	5	N
Cheilanthes sieberi	Rock fern	EG	2	N
Aristida vagans	Three awn spear grass	GG	3	N
Wurmbea diocea	Early Nancy	FG	0.1	N
Hypochoeris radicata	Flat weed		25	E
Calytrix tetragona	Common fringe myrtle	SG	0.2	N
Opuntia spp.	Prickly pear		0.1	HTE-M
Microtis parviflora	Slender onion orchid	FG	0.1	
Aira caryophyllea	Silvery hairgrass		0.2	E
Conyza bonariensis	Fleabane		3	E
Rumex acetosella	Sorrel		0.1	E
Triptilodiscus pygmaeus	Common sunray	FG	0.1	N
Xerochrysum bracteatum	Golden everlasting	FG	0.5	N
Entolasia stricta	Wiry panic	GG	0.2	N
Austrostipa scabra	Speargrass	GG	0.5	N
Perotis rara	Comet grass	GG	0.2	N

AWS-4 midline view

AWS-4 midline ground

28/09/2022	Field plot AWS - 5			
Scientific name	Common name	BAM Growth form	Cover (%)	Type
Acacia doratoxylon	Currawang	TG	5	N
Eucalyptus behriana	Bull mallee (s)	TG	0.5	N
Eucalyptus dawsonii	Slaty gum (s)	TG	0.5	N
Eucalyptus albens	White box (s)	TG	0.5	N
Eucalyptus fibrosa	Red ironbark (s)	TG	0.2	N
Diuris tricolor	Pine donkey orchid	FG	0.2	
Acacia implexa	Hickory	SG	20	N
Cassinia arcuata	Sifton bush	SG	40	N
Sporobolus creber	Rat's tail fescue	GG	5	N
Cheilanthes sieberi	Rock fern	EG	2	N
Aristida vagans	Three awn spear grass	GG	5	N
Wurmbea diocea	Early Nancy	FG	0.2	N
Caladenia cutenata	White lady fingers	FG	0.1	N
Callitris glaucophylla	White cypress pine	TG	1	N
Angophora floribunda	Rough barked apple	TG	0.2	N
Melichrus urceolatus	Urn heath	SG	1	N
Harmogia densifolia		SG	1	N
Poa sieberiana	Snow grass	GG	10	N
Acacia dawsonii	Dawson's wattle	SG	3	N

AWS-5 midline view

AWS-5 midline ground

Fauna Species List:

Scientific Name	Common Name	Location
Coturnix coturnix	Quail	On site
Pardalotus punctatus	Pardalote	On site
Taeniopygia bichenovii	Double barred finch	On site
Acanthiza chrysorrhoa	Yellow rumped thornbill	On site
Licentious chrysops	Yellow faced honeyeater	On site
Malurus cyaneus	Superb fairy-wren	On site
Cacatua galerita	Sulphur crested cockatoo	On site

Appendix 2: Threatened Species Database Search

A list of threatened species, populations and ecological communities that have been reported or modelled to occur from within a specific radius of the Study Area was obtained from the following databases:

NSW Department of Planning and Environment (DPE) Bionet Atlas (10 km^2 search area); and

Department Climate Change, Energy, the Environment and Water (DCCEEW) Protected Matters search tool (PMST) (1 km buffer).

Assessments were then made of the likelihood of the threatened species, populations and ecological communities reported or modelled to have occurred in the locality or using habitat within the Study Area as an essential part of a foraging range.

The following table summarises the likelihood of these threatened species and EPBC Act listed migratory species occurring within the Study Area based on the habitat requirements of each species. The likelihood of occurrence was designated according to specified criteria:

Known – species identified within the site during surveys

High – species previously recorded in the area or suitable habitat (such as roosting or foraging resources) present at the site

Moderate – species may be known from the area, potential habitat resources are available within the site

Low – species not known from the area and / or only marginal habitat is available at the site

Nil – habitat requirements not met within the site

P – Protected, V – Vulnerable, E – Endangered, CE – Critically Endangered

No.	Species		BC Act	EPBC Act	No. of records	Source	Habitat requirements	Likelihood of occurrence	Assessment required (EPBC)?
	Flora								
1	*Dichanthium setosum*	Bluegrass	-	V	-	PMST	Associated with heavy basaltic soils and red-brown loams. Soil conditions not suitable and **field survey did not detect the species.**	Nil	No
2	*Diuris tricolor*	Pine Donkey Orchid	V, P	-	6	Bionet	Grows in sclerophyll forest among grass often with native Cypress pine (*Callitris* spp.) - **Species found on site**	Known	-
3	*Euphrasia arguta*		-	CE	-	PMST	Only known in the Nundle area and likely to decline in routinely disturbed environments.	Nil	No
4	*Leucochrysum albicans var. tricolor*	Hoary sunray	-	E	8	BioNet	Can occur in grassland, woodland and forest on generally heavy soils. Highly dependent on bare ground for germination and disturbance may be required for successful establishment. **Not recorded at site inspection.**	Moderate	No
5	*Lepidium aschersonii*	Spiny Pepper-cress		V	-	PMST	Indicative distribution does not occur within the site. Found on ridges of gilgai clays dominated by Brigalow, Belah, Buloke and Grey Box. **Not recorded at site inspection.**	Low	No
6	*Prasophyllum petilum*	Tarengo leek orchid	E, P	E	2	PMST, Bionet	Known from selected sites growing in open areas, grassland or woodland, with river tussock poa, black gum, tea-tress or box-gum with kangaroo grass, unlikely to persist with routine grazing/disturbance. **Not recorded at site inspection.**	Low	No
7	*Prasophyllum sp Wybong*	A leek orchid	-	CE	-	PMST	Considered a synonym to Prasophyllum petilum.	Low	No
8	*Swainsona recta*	Small purple-pea	-	E	-	PMST	Often in association with box-gum woodland, with understorey dominants including kangaroo grass (*Themeda australis*), poa tussocks (*Poa* spp.) and spear-grasses (*Austrostipa* spp.). **Targeted field survey did not detect the species**.	Low	No

No.	Species		BC Act	EPBC Act	No. of records	Source	Habitat requirements	Likelihood of occurrence	Assessment required (EPBC)?
9	*Thesium australe*	Austral toadflax	-	V	-	PMST	Indicative distribution does not occur within the site. Occurs in grassland often in association with kangaroo grass. **Not recorded at site inspection.**	Low	No
10	*Tylophora linearis*		-	E	-	PMST	Grows in dry scrub and open forest, generally altitudes are within 300 - 400 m above sea level. **Not recorded at site inspection.**	Low	No
11	*Acacia ausfeldii*	Ausfeld's Wattle	V	-	65	BioNet	It is found in the Mudgee-Ulan-Gulgong area. T**argeted survey did not find any in the proposed disturbance area.**	High	-
	Endangered Ecological Communities								
12	*Grey box (Eucalyptus microcarpa) grassy woodlands and derived native grasslands*			E	-	PMST	Tree canopy is dominated by grey box (*Eucalyptus microcarpa*), with other associated species including *Allocasuarina luehmannii, Brachychiton populneus, Callitris glaucophylla, Eucalyptus albens, E. camaldulensis, E. conica, E. largiflorens, E. melliodora and E. populnea*. **Tree canopy not dominated by grey box.**	Nil	No
13	*Central Hunter Valley eucalypt forest and woodland*			CE	-	PMST	It occurs in the Hunter Valley region, Sydney Basin and NSW North Coast IBRA bioregions, on medium fertility soils of valley floors and lower slopes. Canopy is dominated by *Eucalyptus crebra, Corymbia maculata, E. dawsonii and E. moluccana*. **Required tree species dominance not satisfied, EEC not represented.**	Nil	No
14	*White box-yellow box-Blakely's red gum grassy woodland and derived native grassland*			CE	-	PMST	Characterised by the presence or prior occurrence of white box, yellow box or Blakely's red gum on moderately to highly fertile soils. Community is mainly grassy with sparse shrubs. **Only white box present, soils not fertile, EEC not represented.**	Low	No
	Birds								

No.	Species		BC Act	EPBC Act	No. of records	Source	Habitat requirements	Likelihood of occurrence	Assessment required (EPBC)?
15	*Anthochaera phrygia*	Regent honeyeater	CE	CE	1	PMST, BioNet	Temperate woodlands, open forests feeds on eucalypt nectar (Mugga ironbark, yellow box, white box). **Potential habitat degraded.**	Low	No
16	*Artamus cyanopterus cyanopterus*	Dusky woodswallow	V, P		1	BioNet	Found in dry, open eucalypt forests and woodlands, with an open or sparse understorey of shrubs, groundcover and woody debris. **Not recorded at site inspection.**	High	-
17	*Calidris ferruginea*	Curlew sandpiper	-	CE	-	PMST	Occupies littoral and estuarine habitats, foraging in shallow water and roosting on shingle, shell or sand beaches. **Site does not have adequate habitat features.**	Nil	No
18	*Callocephalon fimbriatum*	Gang-gang Cockatoo	V, P	E	1	PMST, Bionet	Can utilise drier open eucalypt forests and woodlands in autumn and winter especially box-gum and box-ironbark but favours old growth requiring 7 cm or larger hollows. **Dominated by cypress pine with no hollows.**	Low	No
19	*^Calyptorhynchus lathami*	SE Glossy Black-Cockatoo	V, P	V	2	PMST, BioNet	Open inland woodlands where Casuarinas and Allocasuarinas are common. **No preferred tree species present at the site.**	Low	No
20	*Chthonicola sagittata*	Speckled warbler	V, P	-	17	BioNet	Eucalyptus dominated communities with a grassy understorey - scattered native tussock grasses, sparse shrub layer, some eucalypt regrowth and an open canopy, typically in undisturbed remnant vegetation. **Not recorded at site inspection.**	High	-
21	*Climacteris picumnus victoriae*	Brown treecreeper (eastern subspecies)	V, P	-	4	BioNet	Inhabits eucalypt woodland and dry open forest, mainly with rough barked tree species like stringybarks or ironbarks, often with an grassy open understorey. **Not recorded at site inspection.**	Moderate	-
22	*Daphoenositta chrysoptera*	Varied Sittella	V, P	-	3	BioNet	Eucalypt woodlands & forests, rough barked trees, feeds on insects. **Not recorded at site inspection.**	Moderate	-

No.	Species		BC Act	EPBC Act	No. of records	Source	Habitat requirements	Likelihood of occurrence	Assessment required (EPBC)?
23	*Erythrotriorchis radiatus*	Red Goshawk	CE	V		PMST	Distribution not known to extend to the central west of NSW, often found in riparian habitats, rainforest or swamp forest. **Habitat features not on site.**	Nil	No
24	*Falco hypoleucos*	Grey falcon	-	V	-	PMST	Shrubland, grassland and wooded watercourses in arid and semi-arid regions and wetlands. Feeds on birds, reptiles and mammals. **Typical habitat features not present on site.**	Low	No
25	*Glossopsitta pusilla*	Little lorikeet	V, P	-	3	BioNet	Forages in the canopy of open eucalyptus forest and woodland, often in riparian areas. Feeds mainly on nectar and pollen, sometimes native fruits and mistletoe. Nests are typically hollows in limbs or trunk of smooth barked eucalypts with a small entry hole (3 cm), high above the ground (2 - 15 m). **Site does not contain nectar and mistletoe food resources and lacks hollows.**	Low	-
26	*Grantiella picta*	Painted Honeyeater	V, P	V	1	PMST, BioNet	Inhabits Boree/Weeping Myall (Acacia pendula), Brigalow (A. harpophylla), Box-Gum woodland and Box-Ironbark forests. Feeds on fruits of mistletoes, eucalypts and acacias. **Unsuitable habitat features on site.**	Low	No
27	*Hieraaetus morphnoides*	Little eagle	V, P	-	1	BioNet	Eucalypt forest, woodland or open woodland. Nests in tall living trees, where pairs build large stick nests in winter. Preys on birds, reptiles, mammals and sometimes insects. **Potential foraging habitat.**	Moderate	-
28	*Lathamus discolor*	Swift Parrot	E	CE	-	PMST	Dry sclerophyll forest & woodland, flowering Eucalypts or lerp infested trees. Favoured feed trees are not present or only at sapling stage. **Unsuitable habitat features on site.**	Low	No
29	*Leipoa ocellata*	Malleefowl	-	V	-	PMST	Predominantly in mallee communities with spinifex understorey; prefers light sandy soils and diverse shrub/herb vegetation	Nil	No

No.	Species		BC Act	EPBC Act	No. of records	Source	Habitat requirements	Likelihood of occurrence	Assessment required (EPBC)?
							with a with a dense but discontinuous canopy. **Inadequate site features.**		
30	*Melanodryas cucullata cucullata*	Hooded robin	V, P	-	1	BioNet	Open eucalypt woodland, acacia scrub and mallee, requires structural diversity including mature gum trees, saplings, shrubs and grasses. **Site features limited structural diversity.**	Low	-
31	*Numenius madagascariensis*	Eastern curlew	-	CE	-	PMST	Coastal distribution. **The site is not near the coast.**	Nil	No
32	*Petroica phoenicea*	Flame robin	V, P	-	2	BioNet	Dry eucalypt forests and woodlands with an open grassy understorey, usually with abundant logs and fallen timber. In autumn and winter they may live in open grassy woodlands and grasslands or grazed paddocks with scattered trees. **Not recorded at site inspection.**	High	-
33	*Polytellis swainsonii*	Superb parrot	V, P	V	-	PMST	Found in box-gum, box-cypress pine, boree woodlands and river red gum forest; nest in hollows of large trees mainly in tall riparian forest or woodland; feeds on grass seeds, herbaceous plants, fruits, nectar, insects and grain. May forage up to 10 km from nesting sites primarily in grassy box woodland. **Breeding habitat features are not present.**	Low	No
34	*Pycnoptilus floccosus*	Pilotbird	-	V	-	PMST	Lowland pilotbirds occur in forests from the Blue Mountains, in the wetter forests of eastern Australia, south to Dandenong. They live in dense forests with heavy undergrowth and forage on damp ground or among leaf litter. **Site resources are unlikely to support this species - the forest is not dense with heavy wet undergrowth.**	Low	No
35	*Rostratula australis*	Australian painted snipe	-	E	-	PMST	Prefers swamp edge, dams, marshes where there is grass cover and low scrub or open timber; forages in shallow water. **No wetlands or swamps nearby.**	Nil	No

No.	Species		BC Act	EPBC Act	No. of records	Source	Habitat requirements	Likelihood of occurrence	Assessment required (EPBC)?
36	*Stagonopleura guttata*	Diamond firetail	V, P		3	BioNet	Uses grassy eucalypt woodlands, open forest, mallee, natural temperate grassland, riparian areas and sometimes lightly wooded farmland. Feeds on the ground, consuming grass and herb seeds and leaves. **Potential foraging habitat.**	High	-
	Fish								
37	*Galaxis rostratus*	Flathead galaxias	-	CE	-	PMST	Found in still or slow moving water bodies like wetlands and lowland streams	Nil	No
38	*Macquaria australasica*	Macquarie perch	-	E	-	PMST	Found in waters with lots of cover from aquatic vegetation, snags and overhanging branches	Nil	No
	Mammals								
39	*Chalinolobus dwyeri*	Large-eared pied bat	V, P	V	10	PMST	Roosts in caves and cliff crevices, frequenting dry open forest and woodland near these features. **Unsuitable habitat features on site.**	Low	No
40	*Dasyurus maculatus maculatus*	Spot-tailed quoll	-	E	-	PMST	Prefers mature wet forests and need den sites such as hollows, rock outcrops or caves. **Potential habitat from rock outcrop.**	Low	No
41	*Miniopterus orianae oceanensis*	Large bent-winged bat	V, P	-	26	BioNet	Primarily use caves but can also use old mines, tunnels, buildings and other fabricated structures. **Unsuitable habitat features on site.**	Low	-
42	*Nyctophilus corbeni*	Corben's long-eared bat	-	V	-	PMST	Box/ironbark/cypress pine vegetation, roosts in tree hollows, crevices & under loose bark, hunts in understorey & on ground. **No hollows, potential foraging or other habitat.**	Low	No
43	*Phascolarctos cinereus*	Koala	V, P	E	1	PMST BioNet	Koala use trees may be present but they are juvenile stems and species sighting records are old. **Inadequate occurrence of koala use trees recorded at site inspection.**	Moderate	No
44	*Pseudomys novaehollandiae*	New Holland mouse		V		PMST	Found in heathlands, woodlands and forests with a heathland understorey and	Low	No

No.	Species		BC Act	EPBC Act	No. of records	Source	Habitat requirements	Likelihood of occurrence	Assessment required (EPBC)?
							vegetated sand dunes; lives socially in burrows. **Site does not have heathland understorey.**		
45	*Pteropus poliocephalus*	Grey-headed flying-fox	V, P	V	-	PMST	Mostly within 200 km of the east coast; in rainforests, tall sclerophyll forests and woodlands with roosting camps located near gullies, close to water in vegetation with a dense canopy. **No suitable habitat available.**	Low	No
46	*Saccolaimus*	Yellow-bellied sheathtail-bat	V, P		1	BioNet	Roosts in tree hollows and buildings, sometimes in mammal burrows. It flies high and fast over forest canopies for insects when foraging. **Potential foraging habitat.**	Low	-
	Reptiles								
47	*Aprasia parapulchella*	Pink-tailed worm-lizard	-	V	-	PMST	Sloping open woodland with native grassy ground layers, particularly kangaroo grass and rocky outcrops or partially buried rocks. **Development Site soils are loamy sands, with sparse grass.**	Low	No
48	*Delma impar*	Striped legless lizard	-	V	-	PMST	Potential habitat includes areas which have native grasslands or grassy woodlands with tussock structure; mostly on cracking clay soils with some surface rock. **Non-clay surface soils.**	Low	No
	Migratory species								
49	*Apus pacificus*	Fork-tailed swift				PMST	Occur over inland plains, foothills or in coastal areas, usually from October-March. They eat insects and can fly as low as 1 m above open areas or water.	Low	No
50	*Hirundapus caudacutus*	White-throated needletail		V		PMST	Largely aerial and more often seen near the coast, they are more likely to be seen above wooded areas, including open forest and rainforest	Low	No
51	*Motacilla flava*	Yellow wagtail				PMST	Mainly coastal distribution	Nil	No
52	*Myiagra cyanoleuca*	Satin flycatcher				PMST	Tall forests, wetter habitats, coastal distribution	Nil	No

No.	Species		BC Act	EPBC Act	No. of records	Source	Habitat requirements	Likelihood of occurrence	Assessment required (EPBC)?
53	*Rhipidura rufifrons*	Rufous fantail				PMST	Wet sclerophyll forests, coastal distribution	Nil	No
54	*Actitis hypoleucos*	Common sandpiper	-		-	PMST	Utilise inland floodplain areas in wet years and the grassy edges of wetlands, foraging in shallow water	Nil	No
55	*Calidris acuminata*	Sharp-tailed sandpiper	-		-	PMST	Occupies littoral and estuarine habitats, foraging in shallow water and roosting on shingle, shell or sand beaches.	Nil	No
56	*Calidris ferruginea*	Curlew sandpiper	-	CE	-	PMST	Inhabits muddy marshes and wet grassy zones	Nil	No
57	*Calidris melanotos*	Pectoral sandpiper	-		-	PMST	Can be in freshwater wetlands on or near the coast, generally among dense vegetation cover including sedges, grasses, lignum, reeds and rushes	Nil	No
58	*Gallinago hardwickii*	Latham's snipe	-		-	PMST	Coastal distribution	Nil	No
59	*Numenius madagascariensis*	Eastern curlew	-	CE		PMST	Coastal distribution	Nil	No

Appendix 3: BioNet Atlas of NSW Wildlife search results

Threatened species sightings:

Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria : Public Report of all Valid Records of Threatened (listed on BC Act 2016) ,Commonwealth listed ,CAMBA listed ,JAMBA listed or ROKAMBA listed Entities in selected area [North: -32.27 West: 149.66 East: 149.76 South: -32.37] returned a total of 159 records of 21 species.

Report generated on 1/09/2022 7:35 AM

Class	Family	Scientific Name	Common Name	NSW status	Comm. status	Records
Aves	Accipitridae	*Hieraaetus morphnoides*	Little Eagle	V,P		1
Aves	Cacatuidae	*^^Callocephalon fimbriatum*	Gang-gang Cockatoo	V,P,3	E	1
Aves	Cacatuidae	*^Calyptorhynchus lathami*	Glossy Black-Cockatoo	V,P,2		2
Aves	Psittacidae	*Glossopsitta pusilla*	Little Lorikeet	V,P		3
Aves	Climacteridae	*Climacteris picumnus victoriae*	Brown Treecreeper (eastern subspecies)	V,P		4
Aves	Acanthizidae	*Chthonicola sagittata*	Speckled Warbler	V,P		17
Aves	Meliphagidae	*Anthochaera phrygia*	Regent Honeyeater	E4A,P	CE	1
Aves	Meliphagidae	*Grantiella picta*	Painted Honeyeater	V,P	V	1
Aves	Neosittidae	*Daphoenositta chrysoptera*	Varied Sittella	V,P		3
Aves	Artamidae	*Artamus cyanopterus cyanopterus*	Dusky Woodswallow	V,P		1
Aves	Petroicidae	*Melanodryas cucullata cucullata*	Hooded Robin (south-eastern form)	V,P		1
Aves	Petroicidae	*Petroica phoenicea*	Flame Robin	V,P		2
Aves	Estrildidae	*Stagonopleura guttata*	Diamond Firetail	V,P		3
Mammalia	Phascolarctidae	*Phascolarctos cinereus*	Koala	E1,P	E	1
Mammalia	Emballonuridae	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	V,P		1
Mammalia	Vespertilionidae	*Chalinolobus dwyeri*	Large-eared Pied Bat	V,P	V	10

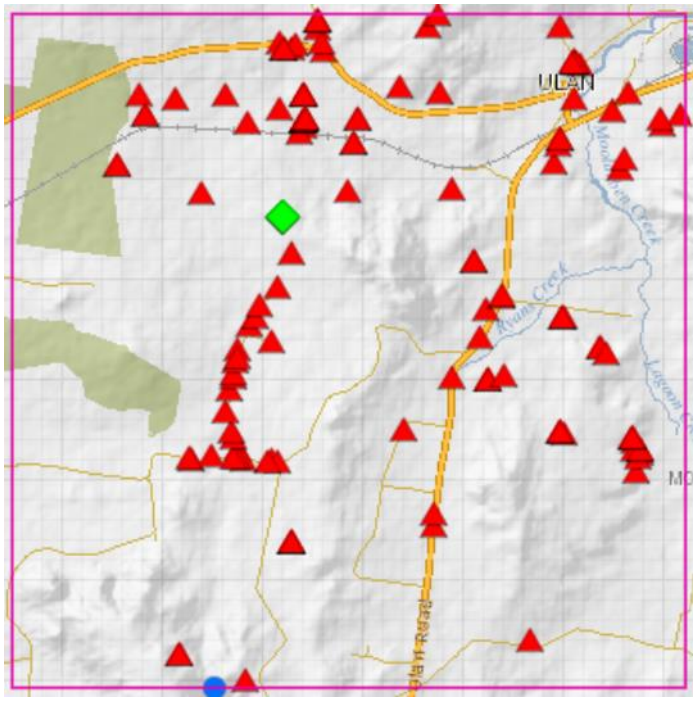
Mammalia	Miniopteridae	*Miniopterus orianae oceanensis*	Large Bent-winged Bat	V,P		26
Flora	Asteraceae	*Leucochrysum albicans var. tricolor*	Hoary Sunray		E	8
Flora	Fabaceae (Mimosoideae)	*Acacia ausfeldii*	Ausfeld's Wattle	V		65
Flora	Orchidaceae	*^Diuris tricolor*	Pine Donkey Orchid	V,P,2		6
Flora	Orchidaceae	*^Prasophyllum petilum*	Tarengo Leek Orchid	E1,P,2	E	2

NSW status

1	Sensitivity Class 1 (Sensitive Species Data Policy)
2	Sensitivity Class 2 (Sensitive Species Data Policy)
3	Sensitivity Class 3 (Sensitive Species Data Policy)
CH	Critical Habitat (Threatened Species Conservation Act 1995)
E1	Endangered (Threatened Species Conservation Act 1995)
E2	Endangered Population (Threatened Species Conservation Act 1995)
E3	Endangered Ecological Community (Threatened Species Conservation Act 1995)
E4	Presumed Extinct (Threatened Species Conservation Act 1995)
E4A	Critically Endangered (Threatened Species Conservation Act 1995)
E4B	Critically Endangered Ecological Community (Threatened Species Conservation Act 1995)
FCE	Critically Endangered Fish (Fisheries Management Act 1994)
FE	Endangered Fish (Fisheries Management Act 1994)
FEC	Endangered Ecological Community of Fish (Fisheries Management Act 1994)
FEP	Endangered Population of Fish (Fisheries Management Act 1994)
FKTP	Key Threatening Process of Fish (Fisheries Management Act 1994)
FP	Protected Fish (Fisheries Management Act 1994)
FV	Vulnerable Fish (Fisheries Management Act 1994)
FX	Extinct Fish (Fisheries Management Act 1994)
KTP	Key Threatening Process (Threatened Species Conservation Act 1995)
P	Protected (National Parks & Wildlife Act 1974)
V	Vulnerable (Threatened Species Conservation Act 1995)
V2	Vulnerable Ecological Community (Threatened Species Conservation Act 1995)

Commonwealth status

C	Listed on China Australia Migratory Bird Agreement
CD	Conservation Dependent (Commonwealth EPBC Act 1999)
CE	Critically Endangered (Commonwealth EPBC Act 1999)
E	Endangered (Commonwealth EPBC Act 1999)
J	Listed on Japan Australia Migratory Bird Agreement
K	Listed on Republic of Korea Australia Migratory Bird Agreement
KTP	Key Threatening Process (Commonwealth EPBC Act 1999)
V	Vulnerable (Commonwealth EPBC Act 1999)
X	Extinct (Commonwealth EPBC Act 1999)
XW	Extinct in the Wild (Commonwealth EPBC Act 1999)



☑ Species records mapped as held

☑ Category 3 sensitive spp. 0.01°(~1km) rounded

☑ Category 2 sensitive spp.0.1°(~10km) rounded

Appendix 4: Protected Matters Report Summary

Australian Government
Department of Agriculture, Water and the Environment

EPBC Act Protected Matters Report

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

Report created: 01-Sep-2022

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	5
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	32
Listed Migratory Species:	11

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	18
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands)		[Resource Information]
Ramsar Site Name	Proximity	Buffer Status
Banrock station wetland complex	800 - 900km upstream from Ramsar site	In buffer area only
Hunter estuary wetlands	150 - 200km upstream from Ramsar site	In feature area
Riverland	800 - 900km upstream from Ramsar site	In buffer area only
The coorong, and lakes alexandrina and albert wetland	1000 - 1100km upstream from Ramsar site	In buffer area only
The macquarie marshes	200 - 300km upstream from Ramsar site	In buffer area only

Listed Threatened Ecological Communities [Resource Information]

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

Community Name	Threatened Category	Presence Text	Buffer Status
Central Hunter Valley eucalypt forest and woodland	Critically Endangered	Community may occur within area	In feature area
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community likely to occur within area	In feature area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area	In feature area

Listed Threatened Species [Resource Information]

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Scientific Name	Threatened Category	Presence Text	Buffer Status
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat likely to occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area	In feature area

Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Polytelis swainsonii Superb Parrot [738]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat may occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
FISH			
Galaxias rostratus Flathead Galaxias, Beaked Minnow, Flat-headed Galaxias, Flat-headed Jollytail, Flat-headed Minnow [84745]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area	In buffer area only
MAMMAL			
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area	In feature area
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In feature area
PLANT			
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Euphrasia arguta [4325]	Critically Endangered	Species or species habitat may occur within area	In feature area
Lepidium aschersonii Spiny Pepper-cress [10976]	Vulnerable	Species or species habitat may occur within area	In feature area
Prasophyllum petilum Tarengo Leek Orchid [55144]	Endangered	Species or species habitat may occur within area	In feature area
Prasophyllum sp. Wybong (C.Phelps ORG 5269) a leek-orchid [81964]	Critically Endangered	Species or species habitat may occur within area	In feature area
Swainsona recta Small Purple-pea, Mountain Swainson-pea, Small Purple Pea [7580]	Endangered	Species or species habitat may occur within area	In feature area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area	In feature area
Vincetoxicum forsteri listed as Tylophora linearis [92384]	Endangered	Species or species habitat may occur within area	In feature area
REPTILE			
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area	In feature area
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely to occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area

Appendix 5: Biodiversity Credit Reports

NSW GOVERNMENT

BAM Credit Summary Report

Proposal Details

Assessment Id 00035874/BAAS18023/22/00035875	Proposal Name Ridge Rd	BAM data last updated * 14/10/2022
Assessor Name Christopher J Botfield	Report Created 14/11/2022	BAM Data version * 55
Assessor Number BAAS18023	BAM Case Status Open	Date Finalised To be finalised
Assessment Revision 0	Assessment Type Part 4 Developments (General)	BOS entry trigger BOS Threshold: Biodiversity Values Map

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAII	Ecosystem credits
White Box - Black Cypress Pine shrubby woodland of the Western Slopes												
1	1610_New mod	Not a TEC	28.1	2.3	1.3	PCT Cleared - 67%	High Sensitivity to Gain			1.75		1

2	1610_Oldmod	Not a TEC	25.8	0.3	3.6	PCT Cleared - 67%	High Sensitivity to Gain			1.75		1
3	1610_Unmod	Not a TEC	45.3	0.0	4.9	PCT Cleared - 67%	High Sensitivity to Gain			1.75		1
											Subtotal	**3**
											Total	**3**

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAII	Species credits
Anthochaera phrygia / Regent Honeyeater (Fauna)									
1610_Newmod	2.3	2.3	0.05	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Critically Endangered	Critically Endangered	True	1
1610_Oldmod	0.3	0.3	0.07	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Critically Endangered	Critically Endangered	True	1
								Subtotal	**2**

Diuris tricolor / Pine Donkey Orchid (Flora)									
1610_Newmod	2.3	2.3	0.05	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	1
1610_Oldmod	0.3	0.3	0.03	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	1
								Subtotal	**2**

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00035874/BAAS18023/22/00035875

Assessor Name
Christopher J Botfield

Proponent Names

Assessment Revision
0

BOS entry trigger
BOS Threshold: Biodiversity Values Map

Proposal Name
Ridge Rd

Assessor Number
BAAS18023

Report Created
13/11/2022

Assessment Type
Part 4 Developments (General)

BAM data last updated *
14/10/2022

BAM Data version *
55

BAM Case Status
Open

Date Finalised
To be finalised

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		

Species
Anthochaera phrygia / Regent Honeyeater

Additional Information for Approval

BAM Biodiversity Credit Report (Like for like)

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
Grantiella picta / Painted Honeyeater

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
1610-White Box - Black Cypress Pine shrubby woodland of the Western Slopes	Not a TEC	9.8	0	3	3

1610-White Box - Black Cypress Pine shrubby woodland of the Western Slopes	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region

	Western Slopes Dry Sclerophyll Forests This includes PCT's: 54, 110, 217, 255, 273, 287, 330, 333, 341, 343, 346, 348, 358, 403, 455, 456, 472, 577, 581, 592, 617, 673, 676, 713, 940, 956, 1277, 1279, 1313, 1316, 1381, 1610, 1661, 1668, 1709	Western Slopes Dry Sclerophyll Forests >=50% and <70%	1610_Newmod	No	1	Inland Slopes, Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Western Slopes Dry Sclerophyll Forests This includes PCT's: 54, 110, 217, 255, 273, 287, 330, 333, 341, 343, 346, 348, 358, 403, 455, 456, 472, 577, 581, 592, 617, 673, 676, 713, 940, 956, 1277, 1279, 1313, 1316, 1381, 1610, 1661, 1668, 1709	Western Slopes Dry Sclerophyll Forests >=50% and <70%	1610_Oldmod	No	1	Inland Slopes, Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Western Slopes Dry Sclerophyll Forests This includes PCT's: 54, 110, 217, 255, 273, 287, 330, 333, 341, 343, 346, 348, 358, 403, 455, 456, 472, 577, 581, 592, 617, 673, 676, 713, 940, 956, 1277, 1279, 1313, 1316, 1381, 1610, 1661, 1668, 1709	Western Slopes Dry Sclerophyll Forests >=50% and <70%	1610_Unmod	No	1	Inland Slopes, Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Anthochaera phrygia / Regent Honeyeater	**1610_Newmod, 1610_Oldmod**	0.1	2.00
Diuris tricolor / Pine Donkey Orchid	**1610_Newmod, 1610_Oldmod**	0.1	2.00

Credit Retirement Options

Like-for-like credit retirement options

Anthochaera phrygia / Regent Honeyeater	Spp	IBRA subregion
	Anthochaera phrygia / Regent Honeyeater	Any in NSW
Diuris tricolor / Pine Donkey Orchid	Spp	IBRA subregion
	Diuris tricolor / Pine Donkey Orchid	Any in NSW

Appendix 6: Staff Contributions

The following staff were involved in the compilation of this report:

Name	Qualifications	Title/Experience	Contribution
Christopher Botfield	*B Env Management CSU 1999*	Principal Ecologist	Flora surveys Fauna surveys BAM Calculator Report review
Renae Hill	*Grad. Dip. Env Management CSU 2022* *BAgr UNE 2006* *BSc(Hons) UoN 1994*	Project Manager	Flora surveys PCT allocation Report writing
Michaela Burns	*BAgr Bus Management CSU 2019*	Project Officer	BAM plots
Kim Bennett	*B Env Sc (Hons)* *B A Computer Sc Legal Studies*	GIS Specialist	GIS data management
Tony Moody	*B App Sci, CSU, 1996*	Project Officer	Report review
Liz Mansfield			Report review