Biodiversity Development Assessment Report

Arcadia Estate Development, South Tamworth, New South Wales

Lot 1 & 2 on DP1213875 and Lot 1 on DP233288

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Executive Summary

This Biodiversity Development Assessment Report (BDAR) has been prepared by Green Tape Solutions on behalf of Moss Environmental and the proponent, CSO Engineers and Maximum Yield, who is seeking approval for the reconfiguration of the subject property, identified as lots 1 and 2 on DP1213875, and lot 1 on DP233288 into 921 low density residential allotments and medium density residential lots.

Pursuant to the BC Act, the aim of this BDAR is to:

- describe and assess the terrestrial flora, fauna and biodiversity values associated with the proposed development;
- identify and assess matters of local, state and national environmental significance, such as threatened species, populations and ecological communities listed as threatened under the *Biodiversity Conservation Act 2016* (BC Act) (NSW), the *Fisheries Management Act 1994* (FM Act) (NSW) and Matters of National Environmental Significance (MNES) listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Cwlth);
- identify and assess the significance of any likely impacts to matters of state and national environmental significance;
- document how the proposal meets the 'avoid, minimise and offset' framework including assessing all direct, indirect and prescribed impacts in accordance with the BAM;
- identify any other significant impacts associated with the proposed development and where required, provide mitigation measures to minimise these impacts; and
- Derive the credit number for the areas being impacted by the development footprint.

Key result of the assessment:

Two PCTs have been ground-truthed during site surveys including:

- White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion PCT 1383; and,
- Blakely's Red Gum - Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion PCT 599

Only PCTs 1383 will be fully cleared by the proposed development. Only PCTs 1383 will be fully cleared by the proposed development. Within the existing configuration, the developmental plan has deliberately steered clear of the clearance of PCT 599. No direct or indirect impacts will occur on PCT 599. To mitigate any potential indirect repercussions linked to the proposed development, bioretention basins will form a buffer between the new lots and PCT 599. This strategic measure aligns with best practices in environmental stewardship, ensuring the preservation of ecological integrity.

Targeted surveys were undertaken for candidate flora and fauna species where habitat elements were known to exist onsite. Of the flora species surveyed, none were found during targeted surveys. The majority of fauna candidate species identified in the BAM calculator were excluded from further assessment due to a lack of suitable habitat available onsite. The field investigation confirmed the presence of threatened fauna species listed under both the BC Act and the EPBC Act.

- *Saccolaimus flaviventris*
- *Myotis Macropus*

The site also confirmed the presence of a number of hollow-bearing trees and the use of the site by a large number of parrots (over 200 musk parrots roosting at night in the area during the time of the survey period). At the time of the investigation, a few hollows were also used by common species such as for red-rumped parrots. However, none of these species are listed threatened under the BC Act or EPBC Act.

The development will require the clearing of all vegetation on site and mitigation and management measures are proposed to address both direct and indirect impacts associated with the proposal. The proponent is voluntarily proposing a comprehensive mitigation strategy that encompasses the full rehabilitation of the waterway corridor. This initiative goes beyond regulatory requirements and underscores our dedication to minimizing the environmental impact of the development. Other mitigation measures include the implementation of a construction environmental management plan which will incorporate, but not limited to, dust, noise, light and erosion and sediment control. However, these measures are not sufficient to compensate the loss of TEC and loss of habitat to threatened fauna species. Credits are proposed to be carried out in accordance with the NSW Biodiversity Offsets Scheme as identified in Tables 1 and 2.and will be achieved by either:

- Retiring credits under the Biodiversity Offsets Scheme, or
- Making payments into the Biodiversity Conservation Fund using the offset payments calculator, or
- Funding a biodiversity action that benefits the threatened entity impacted by the development.

Table 1: Impacts that require an offset – ecosystem credits

Vegetation zone	PCT	TEC/EC	Impact area (ha)	Number of ecosystem credits required
1 - lot 1 and 2 DP1213875	Blakely's Red Gum - Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion PCT 599	White box - yellow box - Blakely's red gum grassy woodlands and derived native grasslands	0	1
2 - lot 1 DP233288	White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion – PCT 1383	White box - yellow box - Blakely's red gum grassy woodlands and derived native grasslands	0.6312	18

Table 2: Impacts that require an offset – species credits

Common name	Scientific name	Loss of habitat (ha) or individuals	Number of species credits required
Southern myotis	*Myotis macropus*	0.6312	15

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Abbreviations and Definitions

Terms	Definitions
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator
BC Act	Biodiversity Conservation Act 2016 (NSW)
BC Regulation	Biodiversity Conservation Regulation 2017 (NSW)
BDAR	Biodiversity Development Assessment Report
BOAMS	Biodiversity Offsets and Agreement Management System
BOS	Biodiversity Offsets Scheme
CEEC	Critically endangered ecological community
DBH	Diameter at breast height (over bark)
EC	Ecological community listed under the EPBC Act.
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW)
EEC	Endangered ecological community
HTW	High threat weed
IBRA	Interim Biogeographic Regionalisation for Australia
LLS Act	Local Land Services Act 2013 (NSW)
MNES	Matters of national environmental significance
NPW Act	National Parks and Wildlife Act 1974 (NSW)
NSW	New South Wales
PCT	Plant community type
SAII	Serious and irreversible impact
SEARs	Secretary's Environmental Assessment Requirements
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened ecological community
VEC	Vulnerable ecological community
Vegetation SEPP	State Environmental Planning Policy (Biodiversity and Conservation) 2021

Declarations

Certification under clause 6.15 Biodiversity Conservation Act 2016

I certify that this report has been prepared based on the requirements of, and information provided under, the Biodiversity Assessment Method and clause 6.15 of the *Biodiversity Conservation Act 2016* (BC Act).

Signature: 

Date: 16 May 2024

BAM Assessor Accreditation no: BAAS22019

This BDAR has been prepared to meet the requirements of BAM 2020. **Appendix A** provides an assessment of compliance with the minimum information requirements outlined in BAM **Appendix K.**

The assessor for the project certifies that the report has been prepared on the basis of the requirements of, and information provided under the BAM as at a specified date, and that date is within 14 days of the date the report is submitted to the decision-maker. The BAM Calculator (BAM-C) has been finalised and submitted within the Biodiversity Offsets and Agreement Management System (BOAMS). We acknowledge that to be considered valid, the BDAR must be submitted to the decision-maker within 14 days of the finalisation of the BAM-C.

Conflict of interest

I declare that I have considered the circumstances and there is no actual, perceived or potential conflict of interest.

This declaration has been made in the interests of full disclosure to the decision-maker. Full disclosure has also been provided to the client.

Signature: 

Date: 16 May 2024

BAM Assessor Accreditation no: BAAS22019

The authors and contributors curriculum vitae detailing the experiences, skills and knowledge to undertake this BAM assessment is detailed in this report.

1. Introduction

1.1 Proposed Development

1.1.1 Development Overview

Green Tape Solutions was commissioned by Moss Environmental Pty Ltd on behalf of CSO Engineers and Maximum Yield to prepare a Biodiversity Development Assessment Report (BDAR) to apply the Biodiversity Assessment Method (BAM) in accordance with the New South Wales (NSW) *Biodiversity Conservation Act 2016 (BC Act 2016)* for the residential development of Arcadia Estate, located on the southern side of Hillvue in Tamworth, NSW.

This BDAR has been prepared to assess the impacts of the proposed residential subdivision in accordance with the NSW Biodiversity Assessment Methodology (BAM), subject of lot 1 and 2 on Deposited Plans (DP) 1213875, and lot 1 DP233288 into 921 low density residential allotments and medium density residential lots.

The purpose of this report is:

- to describe and assess the terrestrial flora, fauna and biodiversity values associated with the proposed development;
- to identify and assess matters of local, state and national environmental significance, such as threatened species, populations and ecological communities listed as threatened under the *Biodiversity Conservation Act 2016* (BC Act) (NSW), the *Fisheries Management Act 1994* (FM Act) (NSW) and Matters of National Environmental Significance (MNES) listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Cwlth);
- to identify and assess the significance of any likely impacts to matters of state and national environmental significance;
- to document how the proposal meets the 'avoid, minimise and offset' framework including assessing all direct, indirect and prescribed impacts in accordance with the BAM;
- to identify any other significant impacts associated with the proposed development and where required, provide mitigation measures to minimise these impacts; and
- to detail the measures proposed to address the offset obligation (if any).

1.1.2 Development Location

The site is located at Bylong Road, Hillvue and is located within the Tamworth Regional Council (TRC) Local Government Area (LGA). The project site is situated within a large rural property that constitutes an area of approximately 1,206,000 m^2 (~ 120.6 hectares) within the suburb of Hillvue, located 2.7 km south of Tamworth town centre.

The site is bounded by low density residential dwellings to the north and north-east and by existing large lots utilised for primary production to the west and south, with Burgmanns Lane adjoining the southern boundary of the site. The project area is bounded by Burkes Gully to the west and a golf course to the east.

The site is primarily zoned as R1 – General Residential under the TRC Local Environmental Plan (LEP) 2010, with the exception of an approximate 150 metres wide strip along the southern boundary that is zoned under the LEP as R2 – Low Density Residential.

Refer to **Figure 1** for the Site Map and **Figure 2** for a Location Map.

1.1.3 Proposed Development and the Subject Land

The proposal seeks to subdivide the two (2) lots into 921 low and medium density residential allotments, in addition to 27 additional road corridors, a 30,139 m^2 district park located in the central proportion of the development and an environmental zone that is associated with Burkes Gully.

Figure 3 illustrates the proposed development layout.

1.2 Biodiversity Offsets Scheme Entry

The Biodiversity Values Map and Threshold Report is provided in Appendix 1. The site is not mapped under the Biodiversity Values Map.

The required clearing of mapped native vegetation is approximately 32ha. Using the LEP method, the minimum lot size is 450m^2 and the clearing threshold is 2,500m^2. As the clearing exceeds the clearing threshold under the BAM 2020, the development will be assessed under the Biodiversity Offset Scheme (BOS).

1.3 Excluded Impacts

Clause 6.8(3) of the BC Act specifies that the BAM is to exclude the assessment of the impacts of any clearing of native vegetation and loss of habitat on category 1 - exempt land (as defined in Part 5A of the LLS Act), other than prescribed impacts (as defined in clause 6.1 of the Biodiversity Conservation Regulation 2017 (BC Regulation)).

We note that a transitional period is currently in effect. Prior to undertaking vegetation management activities landholders should determine whether their land is regulated by the *Local Land Services Act 2013* (LLS Act) and, if it is, the category of their land under the LLS Act. The category of land will determine the activities that can be undertaken on the land without an authorisation and whether an authorisation is required. During the transitional period certain categories of land will be mapped on the transitional NVR map. Landholders can use this map to help determine the categorisation of their land. The transitional period will end when the final native vegetation regulatory map is made and published.

While the subject site is mapped as category 1 - exempt land under the Native Vegetation Regulatory Map, the proposed development is not a prescribed development and cannot be excluded from the BAM assessment.

1.4 Matters of National Environmental Significance

No EPBC referral was undertaken. Due to the impacts to listed fauna species and Threatened Ecological Communities (TEC) being White box - yellow box - Blakely's red gum grassy woodlands and derived native grasslands listed as Critically Endangered under the EPBC Act, an EPBC referral is warrant. Impacts to any MNES are considered throughout the BDAR.

2. Methodology

2.1 Information Sources

A desktop assessment was undertaken to review relevant environmental databases, technical reports, maps and legislation (Commonwealth, State and Local) to identify ecological values with the potential to occur within and surrounding the site. Recent and historical aerial imagery was also reviewed to assist with the verification of remnant vegetation. The results of the desktop assessment were used to inform the field survey design.

Searches undertaken as part of the desktop assessment were based on the site's central coordinates with a 10 km buffer or by lot and plan. The following key information sources used in the BDAR, including but not limited to:

- Atlas of Living Australia Database (ALA. 2016) [Online]. Available online at: http://spatial.ala.org.au/ [Accessed November 2023].
- BioNet Atlas Available online at: www.environment.nsw.gov.au [Accessed November 2023].
- BioNet NSW (Mitchell) Landscapes – Version 3.1
- BioNet Threatened Biodiversity Data Collection
- BioNet Vegetation Classification
- Birdlife Australia. 2019. Birdata [Online]. Birdlife Australia. Available online at: https://birdata.birdlife.org.au/ [Accessed November 2023].
- DCCEEW, 2023: EPBC Protected Matters Search Tool (PMST): Department of Climate Change, Energy, Environment and Water (DCCEEW). Canberra, Australia: Commonwealth of Australia.
- DECC (2008a). NSW (Mitchell) Landscapes Version 3. Department of Environment and Climate Change.
- DECC (2008b). Descriptions for NSW (Mitchell) Landscapes Version 2. Based on descriptions compiled by Dr. Peter Mitchell. DECC, NSW. Department of Environment and Climate Change.
- Department of the Environment (DoE) (2015). Arrive Clean, Leave Clean. Guidelines to help prevent the spread of invasive plant diseases and weeds threatening our native plants, animals and ecosystems. Commonwealth of Australia 2015.
- Directory of Important Wetlands in Australia
- DPIE (2020). Biodiversity Assessment Method Operational Manual – Stage 1. State of NSW and Department of Planning, Industry and Environment.
- DPIE (2020). Biodiversity Assessment Method. Published by the State of NSW and Department of Planning, Industry and Environment.
- DPIE (2021). Koala SEPP 2021 FAQs — development applications. Published by the State of NSW and Department of Planning, Industry and Environment. https://www.planning.nsw.gov.au/-/media/Files/DPE/Factsheets-and-faqs/Policy-and-

legislation/faqs-Koala-SEPP-2021-development-applications-process-2021-03.pdf?la=en [Accessed November 2023].

- Interim Biogeographic Regions of Australia (IBRA region and subregion) – Version 7.
- The Biodiversity Assessment Method 2020 (BAM, 2020) | NSW Environment and Heritage.
- Addendum Report for the Arcadia Development (The Envirofactor Pty Ltd, 2021);
- Arcadia Estate (East) Subdivision Master Plan, dated 06/07/2023 (CSO Engineers Pty Ltd., 2023);
- Flora and Fauna Assessment Report for the Arcadia Development (The Envirofactor Pty Ltd., 2015);
- TRC Flora and Fauna Assessment for Preposed Rezoning of Bylong Road, Tamworth NSW 2340 (Mitchel Hanlon Consulting Pty Ltd, 2014).

2.2 Accredited Assessors

Kelly Matthews (Principal Ecologist and Director of Green Tape Solutions) was the overseeing Accredited BAM Assessor for this BDAR. Her CV is provided in Appendix 2.

Kelly is a consultant with 20 years professional experience across a wide range of industries and locations, within both government and private sectors. Her core skills comprise the development of environmental strategy, ecological flora and fauna assessment, development and implementation of environmental management plans, provision of technical and specialist advice on ecological constraints and environmental legislation.

Kelly completed and reviewed over 2,000 technical reports, including Environmental Impact Statement (EIS) - Ecology chapters and appendices and Fauna and flora Management Plan. She has conducted a number of fauna and flora surveys and contributed to numerous ecological assessment reports across Australia and internationally including New Caledonia and Europe. Kelly has worked as an environmental advisor and undertook approvals and ecological activities to support infrastructure, development approvals and associated processes.

Along with her highly qualify technical skills, Kelly has sound knowledge of the environmental legislation and gained excellent understanding of Commonwealth, State and Local government requirements which make her the perfect candidate to achieve favourable outcomes for clients. She has vast experience in delivering practical outcomes and management plans that aim to deliver sustainable solutions for clients and the natural environment.

Kelly is also a Certified Environmental Practitioner under the Environmental Institute of Australia and New Zealand (EIANZ) and Chair of EIANZ Ecology Special Interest Section.

Accredited ecologists from the EnviroFactor and Ecological Australia undertook the 2015 and 2021 surveys and some of the information outlined in this report such as assessment of the vegetation community were originally covered by EnviroFactor in their Flora and Fauna Assessment. This information has been updated to reflect the current status and assessment of the vegetation on site.

All assessors involved with the project have extensive experience in assessing native vegetation and threatened species. All content and fieldwork are in accordance with the BAM 2020.

2.3 Mapping Native Vegetation Extent

Aerial image using NearMap and field assessment undertaken in November 2023 confirmed the native vegetation extent on site. All areas of native vegetation including native ground cover and tree canopy cover were assessed. The type and general extent of vegetation communities present were identified and assigned to vegetation zones.

Confirmation of the community types present was achieved by undertaking a flora survey, the identifying dominant and/or indicative species and by reviewing the vegetation community profiles within the Tamworth Regional Council Fine Scale Vegetation Mapping. Assessment of the potential for the derived vegetation communities to constitute TEC as listed under the BC Act and EPBC Act was made. The floristic composition, geomorphological characters, geographic distribution and condition of vegetation were considered when determining whether a TEC was present.

2.4 Native Vegetation, Threatened Ecological Communities and Vegetation Integrity Methods

2.4.1 Plot-based Vegetation Survey

All flora surveys were conducted in accordance with the BAM 2020 in order to assess the impact and associated offset.

As per the requirement of the BAM (Table 2.9) and based on the area of the site, BAM plots were undertaken to collect data. The plots were positioned to provide a wide spatial coverage of the project site and broader area. A plot-based full floristic survey and vegetation integrity assessment was carried out according to the BAM using a series of 20 x 20 metre plots (or equivalent 400 square metre area) nested inside a 20 x 50 metre plot (or equivalent 1,000 square metre area). Plots/mid-lines were established to provide a representative assessment of the vegetation integrity of the vegetation zone, accounting for the level of variation in the broad condition state of the vegetation zone.

A total of two (2) plots were undertaken on site and are illustrated in Appendix 3 - Figure 6 for the vegetation survey data for survey locations. The vegetation survey included the following aspects:

- Assessment of the biodiversity values;
- Identification of the landscape features;
- Assessment of the native vegetation cover (map native vegetation extent on the subject land, identify and map Plant Community Types (PCT) and TECs, map vegetation zones, determining vegetation integrity score);
- Assessing habitat suitability for threatened species (with respect to ecosystem credit and species credit species);
- Identification of suitable area to relocate the fallen timber; and
- Weed assessment and advice on their management.

2.4.2 Previous Surveys

In August 2015, Eco Logical Australia was engaged to validate field data collected in four (4) quadrats within the areas identified as TEC in the 2014 survey (Eco Logical Australia, 2015). Given the dynamic nature of the ground layer in these ecosystems and its susceptibility to change in grazing regime, rainfall, temperature and seasonality, it is difficult to understand how a survey conducted 2 years after the original survey in 2013, and conducted in a different season, would provide any validation of the original

survey data. This notwithstanding, the conclusion of this survey confirmed the presence of the TEC on site. This determination was again based on 0.04ha sampling sites rather than 0.1ha required by the Commonwealth guideline (DEH, 2006) and being undertaken in winter, outside the period of growth, flowering and seed set of most native ground layer species in northern NSW.

In May 2015, The EnviroFactor was engaged to provide additional data as to the likely occurrence of TEC on the project area. A field inspection of the area undertaken was also inconclusive due to seasonality (ie late autumn is outside the period of growth flowering and seed set of most native ground layer species).

Additional flora survey and fauna habitat assessment of the project area was carried out by EnviroFactor on the 21st October 2015 and Green Tape Solutions on the 30th October – 3rd November 2023. These surveys and assessment were consistent with the Commonwealth guideline for the identification of the TEC, as it uses a 0.1ha sampling site for data collection, plot assessment and were conducted in mid-spring within the growth, flowering and seed set of many ground layer species in Northern NSW.

2.5 Threatened Flora Survey Methods

2.5.1 Habitat Constraints Assessment

As part of the ecological assessment, important habitat features, which may support threatened flora within the site or otherwise indicate their presence, were determined in conjunction with the flora survey. The following were given particular consideration:

- The distribution and extent of habitat features within proximity of the area of disturbance or within areas subject to any residual/indirect impacts of the development activity;
- Continuity with similar habitat adjacent to the site, or connection with similar habitat off site by way of corridors.

2.5.2 Field Surveys Methodology

Seven surveys (20m x 50m quadrat) were undertaken across the site by the EnviroFactor and an additional four surveys were undertaken by Green Tape Solutions in November 2023 Refer to Appendix 3 - Figure 6 for the field survey locations undertaken By Green Tape Solutions and the EnviroFactor.

Continuity of vegetation within the site and the connectivity with similar vegetation off site. Surveys were undertaken over a total of five (5) days in November 2023. Previous surveys were also undertaken by the EnviroFactor in May 2015 and October 2015 to capture seasonal variations and detectability of both winter and spring/summer flowering species, in particular orchids and flowering grasses.

Within the quadrats the following data was recorded;

- all plant species present using modified Braun-Blanquet cover/abundance categories;
- percentage cover of dominant ground layer species
- percentage of non-vascular ground layer elements (litter/dead branches, bare soil/small rocks, cryptogams and large rock/boulder), and
- presence of fauna habitat features including; large and small tree hollows, standing dead trees, stumps, mistletoe, tree/shrub regeneration and fallen logs.

To establish the age structure of the vegetation community, number of trees per hectare and to quantify some the important fauna habitat features such as tree hollows a spot analysis technique was used.

This involved selecting a single tree ('central tree') within a representative area of the woodland patch adjacent to Burke's Gully and recording its diameter at breast height over bark (DBH) and the presence of fauna habitat features e.g. hollows, canopy health and mistletoe.

The same parameters were then recorded for next 15 nearest trees including the distance of these trees from the central tree. Seedling trees less than 1.5m tall were not counted, as they were too short to measure a diameter at breast height. Data from this technique gives a quantitative indication of the age structure of the woodland, as well as the density of habitat features e.g. standing dead trees, mistletoe and hollows.

General threatened flora surveys also involved informal techniques constituting the "Random Meander Method" as described by Cropper (1993). The survey methodologies focused on gaining an understanding of the following:

- Structural and floral diversity;
- The vegetation communities present and their extent;
- Determining the flora species present and the potential distribution of significant species in the site;
- The degree of disturbances or degradation and threats associated with the development; ·
- Continuity of vegetation within the site and the connectivity with similar vegetation off site.

2.6 Threatened Fauna Survey Methods

2.6.1 Habitat Constraints Assessment

A comprehensive habitat assessment of each of the vegetation communities within the site also determined habitat that may be of value or potentially support significant fauna species. The assessment involved searching, observing and recording habitat features such as:

The presence of mature trees with hollows, fissures and / or other suitable roosting / nesting places;

The presence of food trees and resources;

- Presence of hollow logs/debris and areas of dense leaf litter;
- Presence of fruiting and blossoming flora species;
- Complexity of vegetation structure;
- Vegetation connectivity and proximity to neighbouring areas of intact vegetation; and
- Presence of caves and man-made structures suitable as microchiropteran bat roost sites.

2.6.2 Field Surveys Methodology

The fauna survey and habitat assessment aimed to identify the presence of threatened fauna species and their habitats that would be potentially impacted by the proposal. This survey included consideration of the extent and quality of native vegetation, including the location of unique or significant habitat areas. A particular focus of the survey was to assess the potential significance of the proposal to fauna species listed on BC Act that are considered moderately or highly likely to occur.

The survey consisted of an area-based survey of the proposed construction footprint and surrounding vegetation. The following survey techniques were employed on site:

- Active searches: Active searches were undertaken to target potentially occurring threatened reptiles within the site. Searches were focused around preferential habitat for these species and key habitat features, such as dense leaf litter and fallen woody debris, rocky areas and crevices, hollow logs and burrows. These searches included identifying potential breeding and foraging habitat for these species. Active searches included:
    - Diurnal searches for sheltering or basking reptiles
    - Lifting rocks, log and debris rolling and raking per seasonal survey
    - Spotlight surveys for nocturnally active species.

  Active searches were undertaken by a team of two for a 30-minute period within each fauna habitat site.

- Diurnal bird surveys: Threatened and migratory bird species were targeted within each 2ha fauna search site by two observers for 20 minutes on four separate occasions for each seasonal survey. A bird survey was undertaken over four (4) mornings and evenings. The survey involved the observer slowly walking through the site, taking a different path on each occasion. Opportunistic records were taken during the wider fauna survey, with flora, fauna recording incidental sightings.
- Anabat Swift recordings: Two (2) anabat detectors were used to record the calls of microchiropteran bats. The recorders were left on site over four nights to suitable locations within the survey sites. Digitised bat calls have currently been analysed by Kelly Matthews, microbat specialist.
- Spotlighting: Spotlight searches for nocturnally active mammals, as well as birds and herpetofauna, was undertaken by two persons for a 30-minute period at each of the fauna habitat sites. Surveys commenced one hour after dusk and involved searching potential habitat on foot for approximately 1-2 hrs. Areas with hollow-bearing trees were targeted to detect arboreal mammals, forest owls and bats emerging from diurnal roosts to forage. Spotlighting was also undertaken along walking and vehicle tracks, as this is a species-specific technique for detecting threatened species.

  Spotlighting was undertaken with a minimum survey effort of 1.5 person hours per hectare of average complexity. Additional survey effort occurred within other habitat types.

- Remote Senor Camera: Five (5) motion cameras were placed across the site over the 5 days survey period.
- Elliott trapping: 20 ‘Type A’ (330 x 100 x 90 mm) Elliott traps were placed per survey site. Baited Elliott traps were placed ten metres apart in two roughly parallel lines 25 m either side of the centre transect of the generic survey site, starting from five metres. Open for a minimum of four consecutive nights during a survey period. Traps were baited with a mix of rolled oats with peanut butter and honey. Elliott traps were checked each morning within 2 hours of sunrise. Elliott traps had adequate shelter but were closed during the day to prevent animals entering as the risk of heat exposure is particularly high.
- Call Playback: Call playback sessions were undertaken on 5 occasions. Approximately half of the call playback sessions were conducted for 30 minutes at twilight, while the remaining sessions were conducted for 30 minutes at least one hour after twilight. Each session began with a five minutes listening period, followed by the broadcasting of pre-recorded calls of each threatened species with potential to occur within the particular habitat type. Each call was played

for three minutes, followed by a two minutes listening period. Following each call-playback session, the area was spotlighted for five minutes.

- Koala Spot Assessment Technique (SAT) (Phillips and Callaghan, 2011) provides an indication of how frequently an area of habitat is utilised by koalas, giving a measure of koala activity and habitat importance. This technique was utilised to assess potential presence of koalas within the site. The technique involves identifying a centre tree as per the following criteria (in decreasing priority):
    - A tree of any species where one or more koala faecal pellets have been observed; and/or
    - A tree in which a koala has been observed; and/or,
    - Any other tree known or considered to be potentially important for koalas.
    - Two observers walked along transects located within suitable Koala habitat looking out for koalas or evidence of koalas (centre tree). When a centre tree was identified, 30 surrounding trees were sampled (trees = 100 mm DBH) by undertaking a systematic search for faecal pellets. A SAT score was assigned based on the percentage of trees identified as having evidence of Koalas (e.g. number of trees containing evidence = 15 / 30 =50%).

Refer to Appendix 3 - Figure 6 for field survey locations.

2.7 Weather Conditions

The Tamworth region has a warm and dry climate with warm humid summers and mild winters and is subject to influence from monsoonal climate systems and easterly troughs. Seasonality is not pronounced; however, the 'wet' season generally occurs during the December – April period. The dry season usually occurs from spring to mid-summer (August/September to December) when deep, low-pressure systems near Tasmania bring strong, hot and dry westerly winds to the region (Bureau of Meteorology, 2021).

Tamworth is located approximately 384 m above sea level and is heavily influenced by the topography and climate systems. Prior to the site investigation, the 2023 El Niño event has been tracking around moderate strength within the region. El Niño events are associated with a weakening, or even reversal, of the prevailing trade winds. The long-range forecast for the region indicates December to February rainfall is likely to be below average across much of Australia as a result of the 2023 El Niño event (Bureau of Meteorology, 2023).

Table 1: Environmental conditions during threatened species surveys

Survey undertaken (e.g. method / targeted species)	**Date**	**Time**	**Temperature** (min. & max.)	**Wind (light, mod…)**	**Rainfall** (mm)
Fauna and flora surveys	30/10/2023	0600 – 2200	7.4 - 31.1	41 NNW	0 mm
Fauna and flora surveys	31/10/2023	0600 – 2200	10.6 - 32.3	44 WSW	0 mm

Survey undertaken (e.g. method / targeted species)	**Date**	**Time**	**Temperature** (min. & max.)	**Wind (light, mod…)**	**Rainfall** (mm)
Fauna and flora surveys	01/11/2023	0600 – 2200	11.1 - 29.0	50 SE	0 mm
Fauna and flora surveys	02/11/2023	0600 – 2200	10.4 - 28.5	41 ESE	0 mm
Fauna and flora surveys	03/11/2023	0600 – 2200	12.6 - 26.6	52 ESE	0 mm

2.8 Limitations

The ability to detect plants and accurately identify them to species level can vary greatly with season, prevailing climatic conditions and the presence of reproductive material (e.g. flowers, fruit and seed capsules). The survey undertaken as part of this assessment only represents a 'snapshot' in time and therefore may not provide a true indication of the presence of any given species within the project site. For example, some cryptic flora species may only be detected during flowering periods that may not coincide during the survey period. Similarly, plants may become senescent or enter dormancy during the winter months or prolonged dry conditions. Hence, this survey should not be regarded as conclusive evidence that certain protected plants do not occur at the site, however every effort has been made to detect these species wherever possible.

3. Site Context and Field Survey Results

3.1 Assessment Area

The site is located at Bylong Road, Hillvue on Lot 1 and 2 on Deposited Plans (DP) DP1213875, and lot 1 DP233288, within the TRC LG. The project site is situated within a large rural property that constitutes an area of approximately 1,206,000 m2 (~ 120.6 hectares) within the suburb of Hillvue, located 2.7 km south of Tamworth town centre.

The site is bounded by low density residential dwellings to the north and north east and existing large lots utilised for primary production to the west and south, with Burgmanns Lane intersecting the southern boundary of the site. The projects area is bounded by Burkes Gully on the eastern boundary.

As per the BAM, the assessment area includes the subject land (development lot) and a 1,500 m buffer surrounding the outside edge of the boundary of the subject land. The 1,500m buffer is provided using QGIS Version 3.22.16.

3.2 Landscape Features

Landscape features identified within the subject land and assessment area are shown on Figure 2 Site Map and Figure 3 Location Map, respectively.

3.2.1 IBRA Bioregions and IBRA Subregions

The site occurs within the Peel subregion of the Nandewar bioregion as per the *Interim Biogeographic Regionalisation for Australia (IBRA) Version 7*. At a local level, the site forms part of the '*Tamworth - Keepit Slopes and Plains'* Mitchell Landscape (DECC 2008a) and is described as:

3.2.2 Rivers, Streams, Estuaries and Wetlands

There are no declared RAMSAR Wetlands located within the area. No action resulting from the proposed activity will impact on RAMSAR Wetlands.

The site contains a tributary of Timbumburi Creek, known locally as Burkes Gully that runs approximately 2.15 km through Arcadia Estate. These catchments are associated with the Peel River systems located approximately 5.5 km downstream of the site.

This tributary provides high quality habitat for many aquatics and avarian species for breeding, foraging and dispersal resources including several species listed under the *BC Act 2016* and the *EPBC Act 1999*.

3.2.3 Habitat Connectivity

Habitat linkages are limited to a tributary of Timbumburi Creek which runs to the west of the site. Vegetation to the north on adjacent property also provide some stepping stones connectivity to the creek but the vegetation would not be considered a significant biodiversity corridor. Ecological connectivity is poor to the north, west, east and south as the site is adjacent to the cleared rural estate and bound by residential development to the north and east.

3.2.4 Areas of Outstanding Biodiversity Value

The site is not mapped as having or being close to Areas of Outstanding Biodiversity Values.

3.2.5 Karst, Caves, Crevices, Cliffs, Rocks or Other Geological Features of Significance

No karst, caves, crevices, cliffs, rocks or other geological features of significance was identified within the subject land and assessment area. The site has been subjected to intensive and historic practices for agricultural and horticultural land usage.

3.2.6 NSW (Mitchell) Landscape

The site forms part of the '*Tamworth - Keepit Slopes and Plains'* Mitchell Landscape (DECC 2008a) and is described as:

- *Extensive area of undulating to rolling slopes and plains with low hills and low ranges forming the western fall of the New England plateau. Complex geology of folded and faulted sedimentary and metamorphic rocks with minor interbedded volcanics. Rock types include; Silurian-Devonian chert, slate, phyllite, tuff, schist and Carboniferous conglomerate, sandstone, mudstone, andesite and small areas of limestone. General elevation 500 to 800m, local relief 250m, with some peaks reaching 1100m. Shallow stony soils on ridges. Texture contrast soils on almost all slopes shifting in colour from red-brown on upper slopes to yellow with harsh subsoils prone to gully development on lower slopes.*
- *White box (Eucalyptus albens) grassy woodlands, with yellow box (Eucalyptus melliodora), Blakely's red gum (Eucalyptus blakelyii), cooba (Acacia salicina) and lightwood (Acacia implexa) on lower slopes. Rough barked apple (Angophora floribunda) and yellow box (Eucalyptus melliodora) on flats. River oak (Casuarina cunninghamiana) along major streams with river red gum (Eucalyptus camaldulensis) increasing to the west. Patches of red stringybark (Eucalyptus macrorhyncha) and red ironbark (Eucalyptus sideroxylon) on steeper slopes in the east. (DECC 2008a).*

3.2.7 Soil Hazard Features

The soil landscape of Arcadia Estate comprises principally residual soils (Duri) with a small outcrop of erosional soils (Fullwoods Hill) located in its south-west corner (refer Figure 3.2). The qualities and limitations of the Duri soil landscape are defined in the publication "Soil Landscapes of the Tamworth" (DLWC, 2001) as follows:

- *Complex soils; localised dieback; localised poor drainage; localised engineering hazard; gully erosion risk; inherent erosion risk; localised permanent high-water tables; localised known discharge and recharge areas; localised high run -on; localised dry land salinity; localised seasonal waterlogging; localised shallow soils; sheet erosion risk; localised wind erosion risk (under traditional cultivation).*

The presence of dry land salinity will need to be considered in the design of water sensitive urban design features to minimise the risk of groundwater mounding leading to saline groundwater flowing into waterways.

4. Native Vegetation, Threatened Ecological Communities and Vegetation Integrity

4.1 Native Vegetation Extent

4.1.1 Changes to the Mapped Native Vegetation Extent

The extent of native vegetation in the project site was ground-truthed and mapped using up to date aerial imagery. Polygons were digitised in a GIS at a scale of between 1:1,000 and 1:5,000. The vegetation extent within the project site has been mapped as accurately as possible and is illustrated in Appendix 3 - Figure 7.

Based on the above method, the native vegetation covers an area of 105.9ha within the assessment area (1,500m buffer around the development).

4.1.2 Areas that are not Native Vegetation

Area that are not native in the assessment area include paddocks, cleared area, dwellings, other infrastructure, tracks, roads and areas with exotic species. This area covers a large portion of the assessment area since the site is surrounded by residential and agriculture lands. These areas have been heavily degraded.

4.2 Plant Community Types

4.2.1 Overview

Three (3) vegetation communities, including two native vegetation zones and one non-native zone. (Appendix 3 – Figure 7) have been ground-truthed during site surveys, these include;

- Blakely's Red Gum – Yellow Box grassy tall woodland
- White Box grassy woodland
- Exotic rural land

Vegetation within the subject land has been assessed as aligning with the BioNet Vegetation Classification PCTs and their extent is shown in Appendix 3 – Figure 8. Detailed descriptions of each PCT are provided in the following subsections and summarised in Table 2.

Table 2 PCTs identified within the subject land

PCT ID	PCT name	Subject area (ha)
599	Blakely's Red Gum – Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion	1.6587 ha
1383	White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion	3.5894ha including • 0.6312ha (on site) • 2.9582ha (on adjacent site to the west)
Total area		5,2481ha

4.2.2 PCT 599 – Blakely's Red Gum – Yellow Box grassy tall woodland

A small area of this community occurs towards the northern end of Burke's Gully. This area is currently used by cattle for grazing; however, the canopy layer is dominated by Blakely's red gum and yellow box with occasional white box and/or grey box (*E. moluccana*).

The shrub layer is sparse and mostly dominated by African boxthorn (*Lycium ferocissimum*) vegetation. This community comprises a mature age/old growth stand (e.g. mature trees/old growth with only one or two cohorts) with little regeneration present.

At the time of the inspection, the understorey is dominated by native species diverse areas with high level of exotic species (35%) and over 50% of native species. Dominant species include rye grass (*Lolium sp*)*, bromes (*Bromus spp*)*, rat tail grass (*Vulpia muralis*), burr medic (*Medicago polymorpha*)*, couch (*Cynodon dactylon*), climbing saltbush (*Einadia nutans*) and brassicas (*Sisymbrium spp*)*. Other species present include rough speargrass (*Austrostipa scabra*), red grass (*Bothriochloa spp*), clovers (*Trifolium spp*)*, wallaby grasses (*Rytidosperma spp*), kidneyweed (*Dichondra species A*), and fuzzweed (*Vittadinia sp*). The condition of this woodland vegetation is considered to be poor.

Table 3: 599 – Blakely's Red Gum – Yellow Box grassy tall woodland.

PCT ID	599
PCT name	Blakely's Red Gum – Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion
Vegetation formation	Grassy Woodlands
Vegetation class	Western Slopes Grassy Woodlands
Extent within subject land	1.6587 ha

Alignment with TECs

Under the BioNet Vegetation Classification, this PCT is associated with the White-Box – Yellow – Box Blakely's Red Gum Grassy TEC under the *BC Act*. This community is described as tall woodland dominated by Blakely Red Gum (*Eucalyptus blakelyi*) and Yellow Box (*Eucalyptus melliodora*) often with *Angophora floribubnda* on flats or White Box (*Eucalyptus albens*) on hills.

The shrub layer is absent to sparse and includes species such as *Acacia implexa, Olearia elliptica subsp. Elliptica, Geijera parviflora, Myoporum montanum,* or *Pimelea neo-anglica.* The ground cover is usually mid-dense to dense dominated by grasses and forbs. Grass species include *Aristida personata, Austrostipa verticillata, Themeda australis, Bothriochloa macra* or *Dichanthium sericeum*. Forb species include *Dichondra repens, Geranium solanderi, Hydrocotyle laxiflora, Rumex brownii, Scutellaria humilis, Hypericum gramineum, Senecio quadridentatus, Haloragis heterophylla, Dianella longifolia var. longifolia* and *Chrysocephalum apiculatum*. The sedges *Cyperus gracilis* or *Carex inversa* may be present along with the climbers *Glycine tabacina* or *Glycine 14ucullate1414*. Juncus and other wetland species occur in drainage depressions.

This TEC Occurs on brown, red to black sandy loam to clay loam soils that may be either alluvial / colluvial or derived from fine-grained sedimentary or metamorphic substrates and sometimes volcanic rocks on valley flats, hillslopes in hills and low hills landform patterns. Widespread in the Nandewar Bioregion and on the eastern edge of the Brigalow Belt South Bioregion.

The determination of the TEC is made from the field assessment of plot number 2 which confirmed the dominance of native species within the canopy layer and over 50% of the native vegetation within the ground layer. This result was also confirmed by the EnviroFactor in their 2015 report which identified the presence of 21 native species at the time of their assessment within their quadrat. The plot also recorded exotic understorey dominated by ryegrass*, bromes*, and burr medic* but the presence of exotics is not sufficient to exclude it from being a TEC.

The patch is 1.6587 ha in size and support more than 20 trees per ha (Appendix 6 for field data). This community meets the minimum condition criteria for the TEC.

Alignment with EPBC Act listed TECs

The EPBC Act protects nine (9) listed MNES. Under the EPBC Act, if a development proposal involves an action that will or is likely to result in a significant impact on a MNES, the proposal must be referred to the DCCEEW (an EPBC Referral).

A protected matters search tool (PMST) was conducted under the EPBC Act on the 17th October 2023, with a 10km buffered footprint around the site. The PMST search identified the following MNES:

- Wetlands of International Importance (we note that these wetlands are located in South Australia but they appear in the EPBC tool search result because the subject site is located up-stream)
  - Banrock station wetland complex;
  - Riverland; and
  - The Coorong, and lakes Alexandrina and Albert wetland.
- Four (4) Threatened Ecological Communities (TECs):
  - Natural grassland on basalt and fine textured alluvial plains of northern New South Wales and southern Queensland (Critically Endangered);
  - New England Peppermint *(Eucalyptus nova-anglica)* Grassy Woodland (Critically Endangered);
  - Weeping Myall Woodlands (Endangered);
  - White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Critically Endangered).
- 42 Threatened species and 10 Migratory species.

The presence of a threatened ecological community, White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Critically Endangered) was identified during the site investigations. The site also contains moderate degrees of habitat in the form of foraging resources, shelter, and potential breeding resources for species listed under the EPBC Act. Justification of the TEC is provided below.

Over time many areas that were formally part of this community have been excluded from the EPBC list as they are now heavily degraded and no longer retain sufficient values to merit protection under the EPBC Act. Under the EPBC Act, areas that are part of the listed TEC must have either:

- an intact tree layer and a predominantly native ground layer; or
- an intact native ground layer with a high density of native plant species but no remaining tree layer.

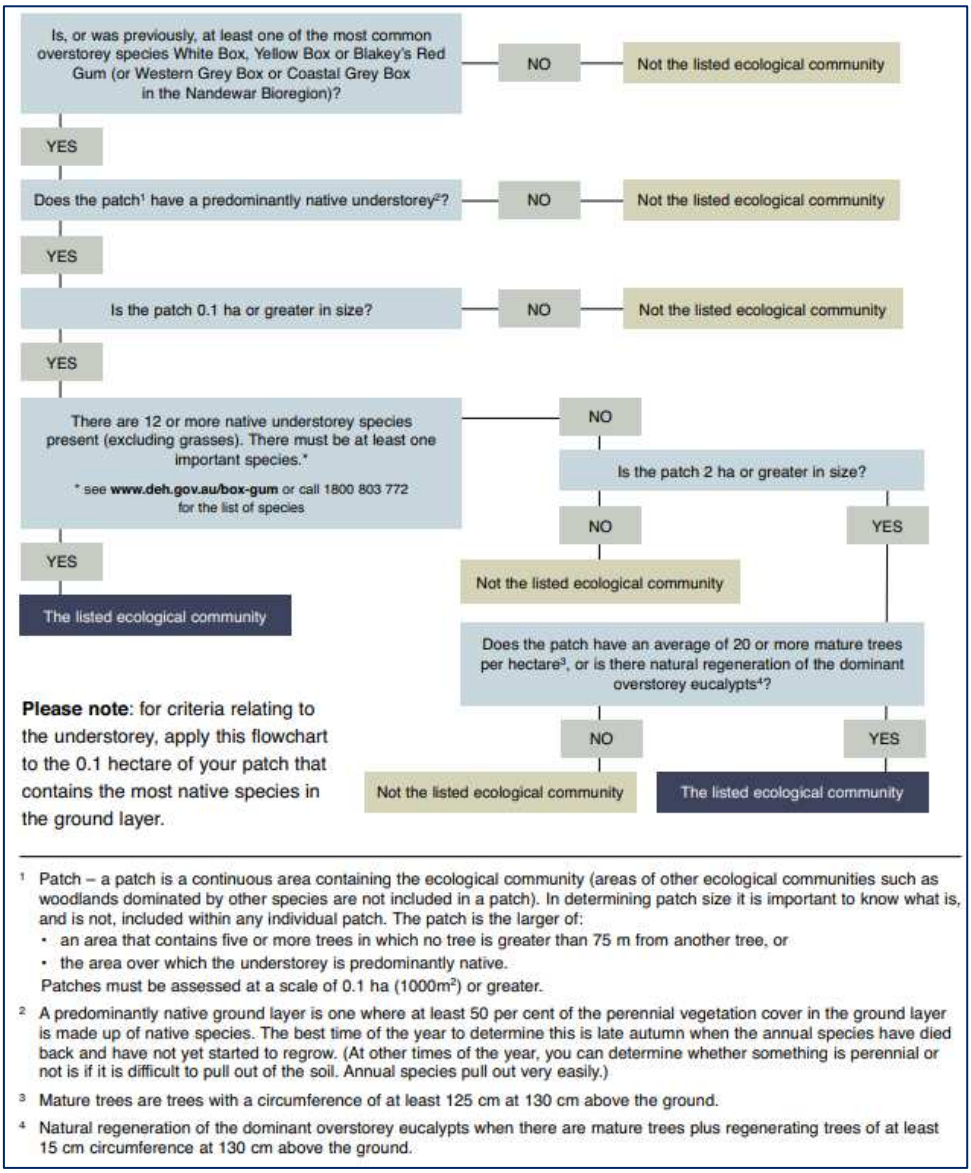
Shrubs can occur naturally in grassy woodland and form an important part of this ecological community, providing habitat for many birds and insects. However, a patch that has a continuous shrub layer of

more than 30% is no longer considered to be a grassy woodland and is excluded from the listed ecological community. The community on the subject site contains an intact tree layer, low shrub layer and predominantly native species covering the ground layer. To confirm if this community meets the TEC under the EPBC Act, we followed the flowchart provided in the White box – Yellow box – Blakely's red gum grassy woodlands and derived native grasslands profile (DCCEEW, 2006) (Figure 1).

The patch is confirmed to be a TEC as it contains the following:

- Contain at the most comment overstorey species including White Box, Yellow Bow and Blakely's Red Gum;
- Contains five or more trees in which no tree is located greater than 75m from another tree;
- Is predominantly dominated by native species (more than 50% cover);
- Is 1.6587 ha therefore more than 0.1ha in size; and,
- Contains more than 12 native understorey species (Refer to Appendix 7) and one important species (*Chrysocephalum apiculatum*).

Figure 1: Step to Determine the presence of White box – Yellow box – Blakely's red gum grassy woodlands TEC



4.2.3 PCT 1383 – White Box Grassy Woodland

This community occurs on the proposed development access corridor between Bylong Road and the main project area. The canopy layer is dominated by white box (*Eucalyptus albens*), yellow box (*E. melliodora*) with a few Blakely's red gum (*E. blakelyi*). A small amount of Eucalyptus spp is regenerating in the understorey. This community comprises an uneven age stand, including old growth trees with more than one age class of regeneration present.

At the time of the inspection, ground layer vegetation included less than 20% weed species. Common weed species include; bromes (*Bromus spp*)*, ryegrass (*Lolium sp*)* and Paterson's curse (*Echium plantagineum*)*. However, the ground layout was dominated by native grasses and forbs including rough speargrass (*Austrostipa scabra*), pitted bluegrass (*Bothriochloa decipiens*), hare's foot clover (*Trifolium arvense*)*, snow grass (*Poa sieberiana*), purple wiregrass (*Aristida 17ucull*), tall windmill grass (*Chloris 17ucullate17*), wallaby grasses (*Rytidosperma spp*). Sparely present were also species likeknob sedge (Carex inversa), common woodruff (*Asperula conferta*), bottle washers (*Enneapogon nigricans*), yellow burr daisy (*Calotis lappulacea*), fuzzweed (*Vittadinia sp*), many-flowered mattrush (*Lomandra multiflora*) and pink tongues (*Rostellularia adscendens*).

The vegetation community extent to the adjacent sites to the west of the subject lot and form a larger patch of vegetation. The condition of this woodland vegetation is considered to be moderate.

Table 4: 1383 – White Box grassy woodland

PCT ID	1383
PCT name	White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion
Vegetation formation	Grassy Woodlands
Vegetation class	Western Slopes Grassy Woodlands
Extent within the assessment area	3.5894ha
Extent within subject land	0.6312ha

Alignment with TECs

The PCT is associated with the White-Box – Yellow – Box Blakely's Red Gum Grassy and Derived Native Grassland TEC within the BioNet Vegetation Classification. Appendix E and F of Updating BioNet Plant Community Types: Eastern NSW PCT Classification Version 1.1 (2022) was used to identify PCT-TEC relationships. Qualifying statements stored in the 'TEC Comments' field in the BioNet Vegetation Classification application were important to consider when using this PCT-TEC association data.

The determination of the EEC is made from the field assessment of plot 1 which confirmed the presence of mostly native species in the canopy and ground layers (22 species). This PCT extends further to the west on the adjacent properties. *Eucalyptus albens* dominates the plot but *Eucalyptus melliodora* and *Eucalyptus blakelyi* are also present. Grass and herbaceous species generally characterise the ground layer. The survey also recorded exotic understorey dominated by ryegrass*, bromes*, and burr medic* but the presence of exotics is not sufficient to exclude it from being a TEC.

The PCT was compared to the Final Determination.

Alignment with EPBC Act listed Ecs

Using the information outlined in Section 0 and following the step outlined in Figure 1, the patch is confirmed to be a TEC under the EPBC Act as it contains the following:

- Contain at the most comment overstorey species including White Box, Yellow Bow and Blakely's Red Gum;
- Contains five or more trees in which no tree is located greater than 75m from another tree;
- Is predominantly dominated by native species (more than 50% cover);
- Is 3.5894 ha (0.6312ha + 2.9582 ha) therefore more than 0.1ha in size; and,
- Contains more than 12 native understorey species (Refer to Appendix 6) and one important species (*Dichopogon fimbriatus, Bulbine bulbosa*).

4.3 Threatened Ecological Communities

TECs identified within the subject land are listed in Table 5 and their extent is shown on Appendix 3-Figure 9.

Table 5 TECs within the subject land

TEC name	Profile ID (from TBDC)	BC Act status	EPBC Act status	Associated vegetation zones within the subject land	Area within subject land (ha)
White box – yellow box – Blakely's red gum grassy woodlands and derived native grasslands	599 1383	Critically Endangered	Critically Endangered	1 and 2	2.2899 (0.6312ha PCT1383 +1.6587ha PCT 599)

4.4 Vegetation Zones

Two (2) vegetation zones were identified matching each PCTs patch. Each zone is described in Table 6 and mapped in Appendix 3 – Figure 10:

- Zone 1 – PCT 599: one vegetation zone has been identified on site. This zone has similar condition and structure across the site.
- Zone 2 – PCT 1383: one vegetation zone has been identified on site. This zone has similar condition and structure across the site.

Table 6: Vegetation zones and patch sizes

Vegetation zone ID	PCT ID number and name	Condition / other defining feature	Area (ha)	Patch size class	No. vegetation integrity plots required	No. vegetation integrity plots completed	No19ucullat integrity plots used in assessment	Plot IDs of vegetation integrity plots used in assessment
1	599 Blakely's Red Gum – Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion	Good condition canopy vegetation, dominated by native species in the understorey, presence of hollows	1.6587	☒ 5 ha ☐ 5–24 ha ☐ 25–100 ha ☐ 100 ha	1	1	1	1
2	1383 White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion	Good condition canopy vegetation, dominated by native species in the understorey, presence of hollows	3.5894	☒ 5 ha ☐ 5–24 ha ☐ 25–100 ha ☐ 100 ha	1	1	1	2

4.5 Vegetation Integrity (Vegetation Condition)

4.5.1 Vegetation Integrity Survey Plots

In accordance with BAM Table 3, a total number of two (2) plots were undertaken across the identified PCTs.

Quaternary surveys were undertaken to confirm the presence of threatened flora species and ensure the area did not meet any of the TECs listed under the BC Act or EPBC Act. The assessment revealed that the paddock is composed mostly of exotic species of grasses and forbs which would not be considered as native vegetation. Consequently, this area did not require any plots.

Table 7 illustrates the number of plot per zone to meet the BAM methodology.

Table 7 Minimum number of plots required per zone area

Vegetation zone ID	Vegetation zone area (ha)	Minimum number of plots required under BAM	Number of plot performed on site	Compliance with BAM
1 (PCT 599)	2 (1.6587ha)	1	1	Yes
2 (PCT 1383)	2 (0.6312ha)	1	1	Yes

4.5.2 Scores

Raw data for each plot are provided in Appendix 6 illustrates the vegetation integrity scores for the two zones.

Table 8 Vegetation integrity scores

Vegetation zone ID	Composition condition score	Structure condition score	Function condition score (where relevant)	Vegetation integrity score	Hollow bearing trees present?
1 (PCT 599)	39.4	31.7	78.9	46.2	Yes
2 (PCT 1383)	50.5	29.3	63.8	45.5	Yes

4.5.3 Use of Benchmark Data

Green Tape Solutions used the relevant guidance published by the department on the benchmark data.

5. Habitat Suitability for Threatened Species

Following input of all plot data into the BAM Calculator, a list of threatened species with potential to occur at the site ('candidate threatened species') was generated. The BAM Calculator sorts threatened species into two biodiversity credit classes as follows:

1. **Predicted threatened species (ecosystem credit species):** Threatened species where the likelihood of occurrence of a species or elements of the species' habitat can be predicted by vegetation surrogates and landscape features, or for which targeted survey has a low probability

of detection, are identified in the Threatened Biodiversity Data Collection as ecosystem credit species. Targeted survey is not required for these species.

2. **Candidate threatened species (species credit species):** Threatened species for which vegetation surrogates and/or landscape features cannot reliably predict the likelihood of their occurrence or components of their habitat. These species are identified in the Threatened Biodiversity Data Collection (TBDC). A targeted survey or an expert report is required to confirm the presence of these species on the subject land.

5.1 Identification of Threatened Species for Assessment

5.1.1 Ecosystem Credit Species

An assessment of habitat suitability was undertaken for the list of predicted threatened species (ecosystem credit species) generated by the BAM-C (refer to Appendix C). In accordance with the BAM only those species lacking listed habitat constraints in the BAM-C were omitted from the final list of predicted species which is shown below. Ecosystem credit species likely to occur on or use the site is recorded in Table 9.

Table 9 Predicted ecosystem credit species

Name	Listing status		Sources	Retained for further assessment?	Vegetation zone ID	Sensitivity to gain class
	BC Act	EPBC Act				
White box – yellow box – Blakely's red gum grassy woodlands and derived native grasslands	Critically Endangered	Critically Endangered	☒ BAM-C ☐ TBDC ☒ Previous survey ☒ Current survey	Yes	599 1383	High

5.1.2 Species Credit Species

For streamlined assessments the only species credit species that require targeted survey are those listed at risk of a serious and irreversible impact (SAII). However, if in the process of surveying for SAII species other species credit species are identified on site, assessors are required to generate credits for those species.

An assessment of habitat suitability for SAII listed candidate threatened species (species credit species) was undertaken for the list of species credit species generated by the BAM-C. The predicted species are outlined in Table 11.

Table 10 Predicted fauna species credit species

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act					
Anthochaera phrygia	Regent Honeyeater (Breeding)	CE	CE	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	No	No habitat for this species is present on on site – the site is heavily degraded and has been used for rural activities.	Zone 1 – PCT 599 Zone 2 – PCT 1383	High
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Yes		Zone 1 – PCT 599 Zone 2 – PCT 1383	Moderate
Calyptorhynchus lathami	Glossy Black-Cockatoo (Breeding)	V	V	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	No	The site doesn't have any Allocasuarina and casuarina species.	Zone 1 – PCT 599 Zone 2 – PCT 1383	High

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act					
Chalinolobus picatus	Little Pied Bat	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Yes		Zone 1 – PCT 599 Zone 2 – PCT 1383	High
Chthonicola 23ucullate	Speckled Warbler	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	No	There are no large, undisturbed remnants on site which is required for the species to persist in an area. No habitat for this species is present on site – the site is heavily degraded and has been used for rural activities.	Zone 1 – PCT 599 Zone 2 – PCT 1383	High
Circus assimilis	Spotted Harrier	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Yes		Zone 1 – PCT 599 Zone 2 – PCT 1383	Moderate
Climacteris picumnus	Brown Treecreeper	V	-	☒ BAM-C ☐ TBDC	Yes		Zone 1 – PCT 599 Zone 2 – PCT 1383	High

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act					
victoriae	(eastern subspecies)			☐ Previous survey ☒ Current survey				
Daphoenositta chrysoptera	Varied sittella	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	No	This species Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and *Acacia* woodland. the habitat was not found on site.	Zone 1 – PCT 599 Zone 2 – PCT 1383	Moderate
Dasyurus maculatus	Spotted-tailed Quoll	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Spotted-tailed quolls live in various environments, including forests, woodlands, coastal heathlands and rainforests. They are sometimes seen in open country or on grazed areas and rocky outcrops. They are mainly solitary animals and will make their dens in rock shelters, small caves, hollow logs and tree hollows. Habitat is not present on site	Zone 1 – PCT 599 Zone 2 – PCT 1383	Moderate

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act					
Falco subniger	Black Falcon	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Yes		Zone 1 – PCT 599 Zone 2 – PCT 1383	Moderate
Glossopsitta pusilla	Little Lorikeet	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Yes		Zone 1 – PCT 599 Zone 2 – PCT 1383	High
Grantiella picta	Painted Honeyeater	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	No	The Site does not contain habitat constraint features/ Mistletoes present at a density of greater than five mistletoes per hectare	Zone 1 – PCT 599 Zone 2 – PCT 1383	Moderate
Haliaeetus leucogaster	White-bellied Sea-Eagle (Breeding)	V	-	☒ BAM-C ☐ TBDC	Yes		Zone 1 – PCT 599 Zone 2 – PCT 1383	High

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act					
				☐ Previous survey ☒ Current survey				
Hieraaetus morphnoides	Little Eagle (Foraging)	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Yes		Zone 1 – PCT 599 Zone 2 – PCT 1383	Moderate
Hirundapus caudacutus	White-throated Needletail	-	V	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	No	Vagrant species	Zone 1 – PCT 599 Zone 2 – PCT 1383	High
Lophoictinia isura	Square-tailed Kite (Foraging)	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey	Yes		Zone 1 – PCT 599 Zone 2 – PCT 1383	Moderate

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act					
				☒ Current survey				
Lathamus discolor	Swift Parrot (Foraging)	E	CE	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Yes		Zone 1 – PCT 599 Zone 2 – PCT 1383	Moderate
Macropus dorsalis	Black-striped Wallaby	E	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	No	Preferred habitat is characterised by dense woody or shrubby vegetation within three metres of the ground. This dense vegetation must occur near a more open, grassy area to provide suitable feeding habitat. This habitat was not found present on site.	Zone 1 – PCT 599 Zone 2 – PCT 1383	High
Melanodryas 27ucullate 27ucullate	Hooded Robin (south-eastern form)			☒ BAM-C ☐ TBDC ☐ Previous survey	Yes		Zone 1 – PCT 599 Zone 2 – PCT 1383	High

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act					
				☒ Current survey				
Miniopterus orianae oceanensis	Large Bent-winged bat (foraging)	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Yes		Zone 1 – PCT 599 Zone 2 – PCT 1383	High
Neophema pulchella	Turquoise Parrot	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Yes		Zone 1 – PCT 599 Zone 2 – PCT 1383	High
Myotis macropus	Southern Myotis			☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Yes		Zone 1 – PCT 599 Zone 2 – PCT 1383	High

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act					
Ninox strenua	Powerful owl	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Yes		Zone 1 – PCT 599 Zone 2 – PCT 1383	High
Ninox connivens	Barking Owl (Foraging)	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Yes		Zone 1 – PCT 599 Zone 2 – PCT 1383	High
Petroica boodang	Scarlet Robin	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Yes		Zone 1 – PCT 599 Zone 2 – PCT 1383	Moderate
Petroica phoenicea	Flame Robin	V	-	☒ BAM-C ☐ TBDC	Yes		Zone 1 – PCT 599 Zone 2 – PCT 1383	Moderate

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act					
				☐ Previous survey ☒ Current survey				
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Yes		Zone 1 – PCT 599 Zone 2 – PCT 1383	Moderate
Pteropus poliocephalus	Grey-headed flying fox	V	V	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Yes		Zone 1 – PCT 599 Zone 2 – PCT 1383	High
Stagonopleura guttata	Diamond Firetail	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey	Yes		Zone 1 – PCT 599 Zone 2 – PCT 1383	Moderate

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act					
				☒ Current survey				
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	Yes		Zone 1 – PCT 599 Zone 2 – PCT 1383	High
Tyto novaehollandiae	Masked Owl (Foraging)	V	-	☒ BAM-C ☐ TBDC ☐ Previous survey ☒ Current survey	No	Lives in dry eucalypt forests and woodlands from sea level to 1100 m. This is a forest owl, but often hunts along the edges of forests, including roadsides. There are no forest within 5-10km of the site.	Zone 1 – PCT 599 Zone 2 – PCT 1383	High

5.2 Presence of Candidate Species Credit Species

In accordance with BAM Subsection 5.2.4 and from the remaining list of candidate species credit species, Table 11 (flora) identifies species determined to be present within the subject land based on:

- assumed presence within the subject land, and
- targeted threatened species surveys.

29 bird species, 13 mammals (mostly microbat species recorded), five (5) amphibians and 45 flora species have been recorded on site. Within these sightings, two (2) threatened fauna species *Myotis sp* (possible flyover) and *Saccolaimus flaviventris* (Definitely confirmed) were confirmed on site as part of the anabat data analysis (Expert report is provided separately).

No other threatened fauna or flora species were recorded on site.

A number of trees occurring within the development site were considered to be potentially hollow-bearing. An assessment was undertaken of all accessible trees within the development site to record the species, presence of hollows, tree height, diameter and the number, size and location of hollows.

The Regent Honeyeater was not detected during surveys. White Box is a key foraging species for the Regent Honeyeater (OEH, 2016), however the White Box was not in flower during the time of the surveys. The regent Honeyeater is nomadic over large distances and unlikely to be detected if food sources are scarce in the area at the time of surveys.

The Booroolong Frog inhabits rocky permanent streams with some fringing vegetation cover and requires exposed rocks and rock crevices for breeding near and within shallow pools. No rocky permanent streams occurred within the development site and there is little to no fringing vegetation. The creek which runs through the development site is degraded from grazing and has no rocks or crevices present within the stream that would provide breeding habitat for this species. As no suitable habitat is present within the proposal area, it is not considered to occur within the development site.

The Tusked frog require habitats with high humidity and moisture, making rainforests and wet sclerophyll forests ideal. This frog is highly dependent on specific ecological conditions for its survival. Sites lacking the necessary moisture, suitable water bodies, vegetation cover, or experiencing habitat degradation are unlikely to support this unique frog species.

Pink-tailed Legless Lizards thrive in areas with soft, loose soil or sand, facilitating burrowing. They prefer habitats with sufficient ground cover, including grasses and low vegetation, for concealment and protection. Human activities leading to habitat disturbance, such as urbanization or agricultural practices, can disrupt the lizard's burrows and reduce the availability of suitable habitats. The site does provide good soil condition to facilitate borrows but this species was not found utilising the site during the field investigation.

The Pale-headed Snake requires diverse environments for foraging and shelter, and habitat loss can be detrimental. Pale-headed snakes are often found in woodland and forested areas with a mix of trees and understory vegetation. They utilise the vegetation for cover and hunting. Changes in land use can result in alterations to vegetation structure, impacting the availability of suitable hiding places and basking sites for the snake.

The site does not provide suitable habitat with Barking owl and powerful owl or masked owl. These species prefer old-growth forests with large, mature trees for nesting and roosting. The presence of such trees is crucial for their breeding success. They thrive in ecosystems with high biodiversity. A variety of

prey species, including possums, gliders, and other nocturnal mammals, contribute to the owl's suitability in a given habitat. The site does not provide suitable habitat for this species due to the lack of vegetation, lack of large hollows, and dysconnectivity to any large patch of forest.

The site exhibits the presence of small to medium-sized hollows, a characteristic suitable for hollow-specialized species like the sugar glider. However, despite this favourable attribute, the sugar glider was not observed during the conducted spotlighting activities. Furthermore, the identified tree species align with the habitat preferences for the koala; however, no evidence of koala presence was detected on site. The limited connectivity and sparse vegetation coverage across the site suggest that it may not be conducive to serving as habitat for koalas. The absence of observed koala activity, coupled with the identified factors, diminishes the likelihood of the site being utilised by this species.

Finally, the site offers potential foraging habitat suitable for species such as the Little Eagle, Grey-headed Flying Fox, and Square-tailed Kite. However, despite this apparent habitat suitability, comprehensive searches targeting threatened species and field surveys did not substantiate the presence of these species within the surveyed area.

5.2.1 Myotis macropus

Myotis sp. are a group of bats that feed on aquatic prey by trawling their feet or tail over the water surface. In NSW, the southern myotis (*Myotis macropus*) is the only species of this group and is listed as Vulnerable under the BC Act. The southern myotis is adapted to riparian habitats, where it roosts in caves, tunnels, bridges, or hollow trees near permanent water bodies. It forages along streams, rivers, lakes, and wetlands, mainly preying on fish, crustaceans, and aquatic insects.

The southern myotis is ecologically specialised and sensitive to habitat loss, fragmentation, and degradation caused by human activities such as development, agriculture, logging, mining, and pollution. These threats may reduce the availability and quality of roosting and foraging sites, as well as the abundance and diversity of prey species. The conservation of the southern myotis requires the protection and restoration of riparian habitats, the retention of hollow-bearing trees and artificial structures that provide roosts, and the minimisation of disturbance and pollution at roosting and foraging sites.

This species was recorded along the waterway.

5.2.2 Saccolaimus flaviventris

Saccolaimus flaviventris, also known as the yellow-bellied sheathtail-bat, is a large, insectivorous bat that occurs in a variety of habitats across Australia, including NSW. It roosts in tree hollows, under bark, or in artificial structures such as buildings, bridges, or bat boxes. It forages over open areas, such as woodlands, grasslands, farmlands, and urban areas, mainly feeding on beetles, moths, and other flying insects. It is a highly mobile and migratory species, with seasonal movements between northern and southern regions.

Calls of this species were recorded across the site on all 3 anabats.

The yellow-bellied sheathtail-bat is listed as vulnerable under the BC Act, due to habitat loss, fragmentation, and degradation caused by development, agriculture, logging, mining, and other human activities. These threats may reduce the availability and quality of roosting and foraging sites, as well as the abundance and diversity of prey species.

The conservation of the yellow-bellied sheathtail-bat requires the protection and restoration of habitat, the retention of hollow-bearing trees and artificial structures that provide roosts, and the minimisation of disturbance and pollution at roosting and foraging sites.

Table 11: Determining the presence of candidate flora and fauna species credit species on the subject land

Scientific name	Common name	Method used to determine presence	Present	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
Acacia atrox	Myall Creek Wattle	Targeted threatened species survey	No	No
Adelotus brevis - endangered population	Tusked Frog population in the Nandewar and New England Tableland Bioregions	Targeted threatened species survey	No	No
Anthochaera phrygia	Regent Honeyeater	Targeted threatened species survey	No	No
Aprasia parapulchella	Pink-tailed Legless Lizard	Targeted threatened species survey	No	No
Burhinus grallarius	Bush Stone-curlew	Targeted threatened species survey	No	No
Callistemon pungens	Callistemon pungens	Targeted threatened species survey	No	No
Calyptorhynchus lathami	Glossy Black-Cockatoo	Targeted threatened species survey	No	No
Cercartetus nanus	Eastern Pygmy-possum	Targeted threatened species survey	No	No
Chalinolobus dwyeri	Large-eared Pied Bat	Targeted threatened species survey	No	No
Commersonia procumbens	Commersonia procumbens	Targeted threatened species survey	No	No

Scientific name	Common name	Method used to determine presence	Present	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
Dichanthium setosum	Bluegrass	Targeted threatened species survey	No	No
Digitaria porrecta	Finger Panic Grass	Targeted threatened species survey	No	No
Euphrasia arguta	Euphrasia arguta	Targeted threatened species survey	No	No
Hieraaetus morphnoides	Little Eagle	Targeted threatened species survey	No	No
Homopholis belsonii	Belson's Panic	Targeted threatened species survey	No	No
Hoplocephalus bitorquatus	Pale-headed Snake	Targeted threatened species survey	No	No
Lathamus discolor	Swift Parrot	Targeted threatened species survey	No	No
Litoria booroolongensis	Booroolong Frog	Targeted threatened species survey	No	No
Lophoictinia isura	Square-tailed Kite	Targeted threatened species survey	No	No
Miniopterus orianae oceanensis	Large Bent-winged Bat	Targeted threatened species survey	No	No
Ninox connivens	Barking Owl	Targeted threatened species survey	No	No
Ninox strenua	Powerful Owl	Targeted threatened species survey	No	No

Scientific name	Common name	Method used to determine presence	Present	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
Petaurus norfolcensis	Squirrel Glider	Targeted threatened species survey	No	No
Phascolarctos cinereus	Koala	Targeted threatened species survey	No	No
Picris evae	Hawkweed	Targeted threatened species survey	No	No
Polygala linariifolia	Native Milkwort	Targeted threatened species survey	No	No
Prasophyllum sp. Wybong	Prasophyllum sp. Wybong	Targeted threatened species survey	No	No
Pteropus poliocephalus	Grey-headed Flying-fox	Targeted threatened species survey	No	No
Swainsona sericea	Silky Swainson-pea	Targeted threatened species survey	No	No
Thesium australe	Austral Toadflax	Targeted threatened species survey	No	No
Tylophora linearis	Tylophora linearis	Targeted threatened species survey	No	No
Tyto novaehollandiae	Masked Owl	Targeted threatened species survey	No	No
Uvidicolus sphyrurus	Border Thick-tailed Gecko	Targeted threatened species survey	No	No

5.3 Threatened Species Surveys

Targeted threatened species surveys requiring survey as per the BAM calculators are identified in

Table 12. The other species found on site are included in the ecosystem credit.

Table 12: Threatened species surveys for candidate flora and fauna species credit species on the subject land

Scientific name	Common name	Threatened flora species surveys				Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (transects or grids)	Timing of survey – within recommended period? (BAM-C / TBDC)		Effort (hours & no. people)		
Haliaeetus leucogaster	White-bellied Sea-Eagle	Bird survey, morning, day and evening surveys	☒ Yes Oct 2015 and November 2023	☐ No	70 hours, 2 Green Tape Solutions Staff, over 5 days Additional 45 hours done by other.	No	No
Myotis macropus	Southern Myotis	Anabats, Echometer	☒ Yes Oct 2015 and November 2023	☐ No	60 hours, over 5 days/ 4 nights	Assumed present	No

A list of specific survey requirements for the species in accordance with the BAM-C / TBDC, and guidelines published by the department is outline in section 2.6, and how they have been addressed.

5.4 Expert Reports

One bat expert report is provided with this BDAR to assess the presence of microbat species on site.

The assessment of the presence of all other threatened species was undertaken as part of field survey undertaken as per the relevant guidelines.

5.5 Area or Count, and Location of Suitable Habitat for a Species Credit Species

BAM Subsection 5.2.5 outlines the requirements for preparing a species polygon. A species polygon must be prepared for each species credit species:

- determined to be present or likely to use suitable habitat on the subject land by a species survey, expert report or important habitat map or
- assumed to be present (not applicable to proposed biodiversity stewardship sites).

Species are assessed using one of 2 units of measure: ‘count of individuals’ or ‘area of suitable habitat’, the outcomes of which are used in credit calculations. The unit of measure appropriate for the species

is automatically populated in the BAM-C from the TBDC. All fauna species are assessed by area whereas some flora species are assessed by area and others by count.

The approach and information used to prepare the polygon must be described in the BDAR. The species polygon was finalised after completion of the species survey or expert report (where relevant). In accordance with Box 2 in the BAM, the species polygon must:

- use the unit of measurement identified for that species in the TBDC to show the locations of individual flora species (see BAM Subsection 5.2.5(3.)), or the area of suitable fauna/flora species habitat**.**
- contain the habitat constraints or other suitable microhabitats associated with that species on the subject land
- take into consideration information within the TBDC for the species regarding the species polygon (usually located in the 'general notes' field)
- be established by adding a 30 m buffer around the individuals or groups of individuals for flora species assessed by count on the subject land
- use GPS to confirm the location of the species polygon on the best available orthorectified aerial image of the subject land.

A description of the species including any habitat constraints present on the subject land; the area of suitable habitat or number of individuals recorded; any buffers applied to define the polygon must be included in the BDAR. The polygon also include accurate GPS point locations centred on the live specimens or shells found.

Figure 11outlines the suitable habitat for the target species present within the subject land, detailing the species suitability extents.

Table 13 Results for present species (recorded within the subject land)

Scientific name	Common name	Biodiversity risk weighting (BAM-C & TBDC*)	SAII entity** (BAM-C & TBDC)	Habitat constraints / microhabitats present on the subject land	Abundance – No. individual present on subject land	Extent (ha) of suitable habitat present on site	TBDC species specific recommendations e.g., buffers, general comments (where relevant)
Myotis macropus	Southern Myotis	High (2)	False	☒Hollow bearing trees ☒ Within 200 m of riparian zone ☒ Bridges, caves or artificial structures within 200 m of riparian zone and waterbodies This includes rivers, creeks, billabongs, lagoons, dams and other waterbodies on or within 200m of the site	Anabat call analysis	8.68ha	

* There may be occasions when the TBDC has been updated with new listings or new information for a listed species that is not yet reflected in BAM-C. At all times, the data in the BAM-C is to be used in an assessment and is considered correct; however, the TBDC could provide more up to date data/information that should be considered as part of the assessment.

** A list of SAII entities is also available on the department's website.

6. Identifying Prescribed Impacts

Prescribed additional biodiversity impacts (prescribed impacts) are the impacts identified in clause 6.1 of the BC Regulation. These can be direct or indirect impacts and are additional to the impacts of native vegetation clearing (BAM Chapter 6). In general, prescribed impacts are habitats or features of the environment that are irreplaceable. Avoiding and minimising these impacts will likely be a consideration for the decision-maker in determining conditions of consent/approval for development proposals.

Stage 1 of the BAM seeks to identify if the proposal is likely to result in any prescribed impacts that must be included in the BDAR. Identification of potential prescribed impacts under BAM Chapter 6 is primarily aimed at development, activity, clearing and biodiversity certification proposals.

Prescribed impacts are identified in Table 14.

Table 14: Prescribed impacts identified

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature.
Karst, caves, crevices, cliffs, rocks or logs	☐Yes / ☒No	There were occurrences of karst, caves, cliffs or rocks recorded within the development site.	All listed threatened species on site
Vehicle strikes	☒Yes / ☐No	Currently not present as the site is used for rural purposes. Development will result in vehicles on site during and post construction.	All listed threatened species on site
Human-made structures	☒Yes / ☐No	A shed is present. Development will result in residential development and the removal of all infrastructures on site.	All listed threatened species on site
Non-native vegetation	☒Yes / ☐No	Under current management there is significant threat for invasive environmental weed intrusion into otherwise intact vegetation and negative impact on local biodiversity. Weeds of most threat to these areas have the potential to colonise the ground layer of adjacent vegetation, reduce habitat availability and the ability for native species succession.	All listed threatened species on site
Habitat connectivity	☒Yes / ☐No	Habitat linkages are mostly across the site. Ecological connectivity is poor but remain long the waterway corridor. The corridor is proposed to be significantly revegetated which will enhance and improve the ecological values of the site.	All listed threatened species on site
Waterbodies, water quality	☒Yes / ☐No	There are permanent water bodies at the site within the waterway corridor. The creek was not	All listed threatened species on site

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature.
and hydrological processes		running at the time of the inspection however ephemeral drainage lines, puddles and areas of surface water within low-lying areas provide breeding habitat for some water dependant frog and bird species at certain times of the year.	

7. Impact Assessment (Biodiversity Values and Prescribed Impacts)

Under the BAM, the proponent must apply the key principle of avoiding or minimising the direct, indirect and prescribed impacts on biodiversity values in accordance with section 6.12 of the BC Act. As per the BAM Operational Manual Stage 2 (DPE, 2023)), the avoid and minimise principle have been applied to direct impacts, indirect impacts and prescribed impacts (as per cl. 6.1 of the BC Regulation) and is detailed in the following sections.

7.1 Avoiding Impacts

Following the field inspection and mapping of the TEC, the development layout has been updated so the bioretention basins sit outside the TEC. The development fully avoids any clearing the vegetation in the Burkes Gully TEC zone (PCT599) and the bioretention basins will provide a buffer between the new lot and the PCT ensuring no direct or indirect impacts to PCT 599.

7.2 Minimise Direct and Indirect Impacts

The construction and occupancy phases of the proposal have the potential to cause unavoidable impacts on biodiversity values. These direct impacts would occur as a result of habitat clearance, construction of buildings, roads and infrastructure, and the long-term occupancy of land. Within the existing configuration, the developmental plan has deliberately steered clear of the clearance of PCT 599. To mitigate any potential indirect repercussions linked to the proposed development, a vegetated buffer will be instituted around this particular vegetative patch. This strategic measure aligns with best practices in environmental stewardship, ensuring the preservation of ecological integrity.

Furthermore, the restoration of the adjacent waterway is an integral component of the comprehensive environmental management strategy. This rehabilitation initiative is meticulously designed to incorporate indigenous plant species, contributing substantially to the enhancement of the PCT within the designated area. By fortifying the PCT, the proposed development aims to orchestrate the restoration of the entire ecosystem, fostering sustainability and resilience over the long term. This conscientious approach underscores our commitment to ecological preservation and the cultivation of a harmonious coexistence between development and environmental conservation.

7.2.1 Impact to Vegetation

Some clearing will be required for site access in Lot 1 DP233288. In consultation with Council's Traffic and development engineers, the intersection alignment at Bylong Road was the preferred option, i.e. centrally located between Gabrialla Way and Darien Avenue to the north and moving the access was not feasible. However, the road alignment has been moved slightly to the east within Lot 1 DP233288 keep a larger portion of the remnant PCT 1383 area intact with the neighbouring Lot 19 DP 1252892 to the west.

From the model, the vegetation clearing for the development will result in a reduction in the extent of the PCT 1383 to the north. The total clearing impact area is 0.6312ha of PCT 1383.

The mitigation of environmental impact through the rehabilitation of a waterway corridor, specifically through the revegetation of a creek with native vegetation, is a proactive and sustainable approach that can yield multifaceted benefits.

First and foremost, the introduction of native vegetation helps restore and enhance the ecological integrity of the creek ecosystem which is currently heavily degraded. Native species play a crucial role in stabilising soil, preventing erosion, and maintaining water quality by acting as natural filters.

Moreover, the reestablishment of native vegetation fosters biodiversity by providing habitat and food sources for local fauna, contributing to the overall health and resilience of the ecosystem.

In addition to ecological benefits, the rehabilitation effort will also address aesthetic and recreational aspects. The inclusion of native species will create a more visually appealing and natural landscape, enhancing the overall aesthetic value of the waterway corridor. This not only contributes to the well-being of local communities but also encourages responsible recreation.

Moreover, the reintroduction of native vegetation matching the PCT will also mitigate the impacts across the landscape, reduce invasive species, as these plants are better adapted to the local climate and ecosystem, thereby outcompeting invasive species.

Ongoing monitoring and maintenance are also critical to track the progress of the revegetation effort and address any challenges that may arise. Ultimately, the rehabilitation of a waterway corridor through native vegetation revegetation not only mitigates environmental impact but also demonstrates a commitment to sustainable development and the preservation of natural ecosystems.

Table 15 Vegetation Clearing Impacts

Impact	Impacted entities	Extent	Frequency	Duration	Project phase/ timing of impact	Likelihood and consequences
Clearing habitat and resources for threatened species and local fauna	*Myotis macropus, Saccolaimus flaviventris,* all fauna on site during time of clearing.	0.6312ha of vegetation clearing	Ongoing	Long term	Construction	Certain - Loss of habitat and resources for species survival
Risk for injury and mortality of fauna due to vegetation clearing	Birds nesting in trees (over 200 musk lorikeets were recorded on site every roosting in trees every evening), reptiles and amphibians in grasses and soils, mammals including *Myotis macropus, Saccolaimus flaviventris,* and arboreal mammals in trees.	0.6312ha of vegetation clearing	1 week	Short term	Construction	Medium – death of fauna.
Transport of weeds and pathogens from the site to adjacent vegetation	PCTs/ TEC	0.6312ha of vegetation clearing	1-2 days	Medium-long term	Operation	Medium -
Temporary machinery disturbance (noise, light, etc.) to local fauna species.	All fauna on site during time of clearing.	0.6312ha of vegetation clearing	1-2 days	Short term	Construction	High – fauna disorientation, stress, lead to death.
Permanent disturbance and edge effect to retained vegetation (noise, light, etc.) to local fauna species.	All fauna on site during time of clearing.	0.6312ha of vegetation clearing	Ongoing	Long term	Operation	High – fauna disorientation, stress, lead to death.

7.2.2 Impact to Threatened Flora Species

No threatened flora species were confirmed present within or in proximity of the development footprint. There are no direct or indirect impacts to threatened flora species.

7.2.3 Impact to Fauna Species and Habitat

Apart for the vegetation clearing which is outlined in Section 7.2.1, increase in edge effects and associated possible degradation of retained vegetation on the adjacent site can occur as a result of the development. The PCTs are already subject to edge effects to some extent along the existing residential area and rural clearing. In particular, effects such as weed invasion, light and noise could result from the future dwelling.

Although the current PCT are already facing some high level of edge effect, expected edge effect impacts from the proposed development include:

- New weed species introduction and an increase in weed infestations within the currently intact native community.
- Increase in predation of resident fauna by introduced species. Predators such as cats, and dogs exploit patch edges and small native mammals susceptible to feral species predation were recorded on site. Unrestricted cats and dogs can contribute significantly to disturbance and/or mortality of native fauna, greatly reducing the ability of remnant habitats to support native species (McKinney, 2002). Direct impacts (predation) increase threat to many birds as well as herpetofauna and small mammals. Indirect impacts involving distress to animals and disturbance to breeding sites can permanently discourage native fauna from utilising otherwise available habitat.
- Loss of suitable habitat for fauna due to environmental changes and potential unsuitability of retained vegetation due to disturbance associated with future land use; for example, detrimental impacts to breeding behaviour or deterrence of breeding due to noise and light pollution from street and new dwelling. Light pollution impacts fauna in several ways including reduction in sleep quality, reduced ability to forage and behavioural changes such as avoidance of lit areas. Overall, light pollution will reduce the amount and quality of habitat available for fauna in the retained vegetation. Other edge effects that will also impact fauna include changes in moisture and an increase in noise and disturbance.
- Light pollution can be partially mitigated with narrow spectrum amber lighting solutions for street and dwellings. The habitat patch is currently adjoined by residential development and a small road. The noise level is expected to increase with the increase in dwelling within the area.
- Habitats within the proposed ecological corridor will also be subject to indirect impacts associated with altered drainage and reduction in patch size (width). The altering of hydrology at the site as well as restoration and management techniques proposed within the waterway corridor is expected to mitigate some of the above impacts.
- The loss of habitat, shelter, refuge, food and other resources for a range of fauna species, including common/unlisted (Least concern) fauna species that reside on site and other species likely to utilise the site from the local and broader region, including the listed species.

Trees with hollows and mature trees reasonably expected to contain hollows are well represented at the site. The development will result in the removal of over 15 trees containing medium to large hollows.

Hollows are available within contiguous vegetated remnants and resident species will be forced to disperse and find opportunities and suitable components of biodiversity within adjoining areas. The local survival of hollow dependant species such as Musk parrot and Red-rumped parrots that have been seen using the hollows at the time of the inspection will require both an abundance of this resource within unoccupied or non-conflicting territories, of adequate patch size and within accessible reach of affected species

7.2.4 Impacts on Water Quality, Water Bodies and Hydrological Processes

Although the development footprint was designed to avoid development within the waterway zones and this area will be fully revegetated, the final site layout may have some indirect impacts such as:

- Pollution, erosion and/or sedimentation during construction phase;
- Erosion and/or sedimentation during construction phase; and,
- Rubbish during construction and operational phase.

There is no anticipated impact to water quality or hydrological processes as the development will implement stormwater management plan and construct appropriate stormwater basins on site.

7.2.5 Impact to Ecological Connectivity

Habitat linkages are generally absent on site. Ecological connectivity is poor on site and near the site as the land is surrounding by rural and residential lots.

Increase in noise, light and human disturbance may cause more reclusive species to move away from areas of retained vegetation in the study area, in effect increasing the penetration of edge-effects on habitat.

Reducing edge effects is a critical aspect of ecological corridor rehabilitation, and it plays a pivotal role in maximising the effectiveness of habitat connectivity. Significant rehabilitation of the ecological corridor will have a profound impact on increasing habitat connectivity, fostering resilience in ecosystems, and supporting biodiversity. Habitat connectivity refers to the degree to which landscapes facilitate the movement of species and the flow of ecological processes across various habitats. Rehabilitation initiatives will involve the creation or restoration of wildlife corridors which are currently absent. These linear pathways will aim to connect habitats along the creek, enabling the movement of species between isolated areas.

The waterway restoration will also incorporate buffer zones and transitional habitats along the edges of rehabilitated areas which will help minimise abrupt transitions between different ecosystems. These transitional zones serve as gradual interfaces, reducing the intensity of edge effects and providing species with more favourable conditions as they move between habitats.

A restoration plan will be prepared which will diversify the structure and composition of vegetation along corridor edges, creating a varied and dense vegetative buffer which will help mitigate edge effects by providing continuous cover for wildlife. Native plant species are particularly beneficial in this context as they are well-adapted to the local conditions.

The width and design of the ecological corridor itself can influence edge effects. A wider corridor will accommodate more gradual transitions and reduce the impact of edge-related disturbances. The corridor will also include stormwater basins to manage water quality across the site.

7.3 Avoiding and Minimise Prescribed Impacts

The sections below described each impact and as per BAM (2020). Table 15 illustrates the prescribed impacts to the species.

Table 16: Avoidance and minimisation measures for direct, indirect and prescribed impacts

Impacted entities (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	Extent (ha or zone reference)	Frequency	Duration (long-term/ short-term/ medium-term)	Mitigation measures	Likelihood and consequences
Direct Impacts					
Loss of ecological values including foraging and habitat resources and loss of landscape amenity values	All vegetation on site	Permanent impact	Operational phase: Long term.	• Rehabilitation of the waterway will be provided to reinstate the ecosystem and provide a net gain benefit overall in vegetation. • Rehabilitation can be performed prior to clearing being undertaken. A staged rehabilitation program is to be undertaken. • Native tree planting will be incorporated in the landscape plan.	• Loss of foraging habitat for common and threatened species in short term. • Residual impact to TEC.
Injury or death of fauna	All species	Temporary impact	Construction phase: Short term.	• An appropriately experienced and suitably qualified fauna spotter catcher is to be engaged to conduct a pre-clearing fauna survey to identify fauna habitat and breeding places and remove fauna from vegetation to be cleared. Only a designated and trained person (fauna spotter catcher) can handle and remove fauna. • Injury or mortality of fauna species will be minimised by managing habitat clearing and by having a qualified fauna spotter supervising all clearing activities.	• If protocols are followed, minimal impacts will result. If protocols fail consequences could be moderate due to the presence of threatened species.

Impacted entities (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	Extent (ha or zone reference)	Frequency	Duration (long-term/ short-term/ medium-term)	Mitigation measures	Likelihood and consequences
Loss of Threatened Ecological Community – White Box Grassy Woodland – planted, remnant and derived grassland	All vegetation on site	Permanent impact	Operational phase: Long term.	• Rehabilitation of the waterway will not be able to recreate the PCT due to the extensive stormwater mitigations requirement. • Loss of TEC will be offset through the BDAR.	• Direct loss of TEC • Residual impact to TEC.
Displacement of resident fauna	All species	Temporary impact	Construction phase: Short term.	• Nest box installation to compensate the loss of any hollow-bearing trees. • The construction contractor shall take all reasonable and practicable management measures to avoid environmental harm and environmental nuisance to native fauna and known fauna habitat and breeding places. • Contractors will be supplied with a construction protocol regarding clearing requirements through a work site start-up and induction program.	• If protocols are followed, minimal impacts will result. If protocols fail consequences could be possible loss of wildlife.
Removal of habitat suitable for threatened fauna species.	Threatened species in particular the listed microbat	Permanent impact	Operational phase: Long term.	• Rehabilitation of the waterway will compensate the habitat lost.	• Direct loss of wildlife habitat in the short term. • Increase of habitat in the long-term through net

Impacted entities (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	Extent (ha or zone reference)	Frequency	Duration (long-term/ short-term/ medium-term)	Mitigation measures	Likelihood and consequences
	present on site			• Rehabilitation could be performed prior to clearing being undertaken. A staged rehabilitation program is to be undertaken. • Erosion and sediment control measures are to be implemented in line with the Erosion and Sediment control plan.	gain vegetation across the site.
Disruption to connectivity	Limited – connectivity is poor on the site	Temporary impact	Construction phase: Short term.	• Qualified fauna spotter supervising all clearing activities. • Rehabilitation could be performed prior to clearing being undertaken. A staged rehabilitation program is to be undertaken.	• Direct loss of wildlife habitat in the short term. • Increase of ecological connectivity in the long-term through net gain vegetation across the site.
Removal of habitat features e.g. HBTs	All hollow-dependant species	Permanent impact	Construction phase: Long term.	• Salvage of the hollows during the vegetation clearing. • Nest box installation to compensate the loss of any hollow-bearing trees.	• Direct loss of wildlife habitat in the short term. • Increase of habitat in the long-term through net gain vegetation across the site.
Indirect Impacts					

Impacted entities (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	Extent (ha or zone reference)	Frequency	Duration (long-term/ short-term/ medium-term)	Mitigation measures	Likelihood and consequences
Reduced viability of adjacent habitat due to edge effects (noise, dust or light spill)	Unknown	Permanent impact	Operational phase: Long term.	• Directional lighting guards should be installed to minimise light spill. Any lights will comply with the dark surrounds lighting levels in AS4282-1997 - Control of the obtrusive effects of outdoor lighting. • Noise control management plan to be implemented during construction. • Revegetation of the waterway to create a buffer and mitigate the noise to the creek • Dust management plan will be implemented during the construction phase.	• If protocols are followed failure is still possible. If failure does occur consequences could be some disruption to wildlife habitat in the long- term. • Increase of habitat in the long-term through net gain vegetation across the site.
Transport of weeds and pathogens from the site to adjacent vegetation	Unknown	Permanent/ ongoing impact	Construction and operational phases: Long term.	• The construction contractor shall take all reasonable and practicable management measures to avoid environmental harm and environmental nuisance to native fauna and known fauna habitat and breeding places. • Contractors will be supplied with a construction protocol regarding clearing requirements through a work site start-up and induction program. • Weed management will be provided in the long-term within the rehabilitation / creek area.	• If protocols are followed, minimal impacts will result. If failure does occur consequences could be moderate due to the adjacent farming lands and waterway that has the potential to transport weed seed.

Impacted entities (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	Extent (ha or zone reference)	Frequency	Duration (long-term/ short-term/ medium-term)	Mitigation measures	Likelihood and consequences
The increase of resident in the area may result in an increase in dog attack and on wildlife.	Unknown	Permanent/ ongoing impact	Operational phases: Long term.	• Pet dogs will be excluded from the waterway corridor / rehabilitation area. • To improve resident awareness and reduce wildlife kill from dogs' attacks, signs will be installed across the development.	• If protocols are followed, minimal impacts will result. If failure does occur consequences could be possible wildlife death as a result of predation. • Increase of habitat used by wildlife in the long-term through reduce access to pet.
Increased risk of starvation, exposure and loss of shade or shelter	Unknown	One off	Construction and operational phases: Long term.	• Rehabilitation of the waterway will compensate the habitat lost. • Rehabilitation could be performed prior to clearing being undertaken. A staged rehabilitation program is to be undertaken. • Erosion and sediment control measures are to be implemented in line with the Erosion and Sediment control plan.	• If protocols are followed, minimal impacts will result. Unlikely increase to starvation, exposure and loss of shade or shelter in the long term. • Increase of habitat in the long-term through net gain vegetation across the site.

Impacted entities (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	Extent (ha or zone reference)	Frequency	Duration (long-term/ short-term/ medium-term)	Mitigation measures	Likelihood and consequences
Rubbish dumping	Unknown	Permanent/ ongoing impact	Construction and operational phases: Long term.	• Monitor the effectiveness of controls and establish triggers for corrective action where potential impacts are observed.	• If protocols are followed, minimal impacts will result. If failure does occur consequences could be possible rubbish in the waterway corridor in the long term.
Increase of road kills	Across whole site	Rare	Operational phase: Long term.	• To improve driver awareness and reduce wildlife road strikes vehicle activated signs and static wildlife signs will be installed across the development. • Provision of fauna friendly fences along the waterway and speed bumps on the raod to ensure that wildlife can move safely around the landscape.	• If protocols are followed, minimal impacts will result. If failure does occur consequences could be possible death to wildlife.
Wildlife downing in pool	Across whole site	Rare	Operational phase: Long term.	• Any pools must have water-exit devices (platform, skamperramp, froglog, rope, etc) or must be built so one side is shallow and enable wildlife to escape.	• If protocols are followed, minimal impacts will result. If failure does occur consequences could be possible death to wildlife.
Invasion of fire ants	Across whole site	Rare	Construction phase: short term.	• Fire ant movement controls shall be implemented to restrict and monitor the movement of materials that may carry fire ants. These controls may	• If protocols are followed, minimal impacts will result. If failure does occur

Impacted entities (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	Extent (ha or zone reference)	Frequency	Duration (long-term/ short-term/ medium-term)	Mitigation measures	Likelihood and consequences
				include obtaining a Biosecurity Permit to move soil and other landscaping materials where required. The site foreman/supervisor shall be responsible for ensuring all fire ant compliance requirements are met at all times. Further advice regarding fire ant compliance can be obtained on the DPIE website at Red imported fire ants (nsw.gov.a)	consequences could be possible impact to human and pet.
Sediment run-off in the creek	In the waterway corridor	Possible	Construction phase: short term.	• Erosion and sediment control measures are to be implemented in line with the Erosion and Sediment control plan. • Avoid high risk construction activities such as earthworks during severe wet weather.	• If protocols are followed, minimal impacts will result. If failure does occur consequences could be possible erosion and pollution of the waterway.

7.4 Residual Direct and Indirect Impacts

Table 17 documents impact likely to occur on the subject land after steps taken to avoid and minimise impacts.

Table 17 Summary of residual direct impacts

Direct impact (Describe the impact on PCT/TEC/EC or threatened species and their habitat)	BC Act status	EPBC Act status	SAII entity	Project phase/timing of impact (e.g. construction, operation, rehabilitation)	Extent (ha, number of individuals)
Clearing of TEC	Critically Endangered	Critically Endangered	Yes	Construction and operational phase	0.6312ha
Myotis macropus	Vulnerable	Not listed	No	Clearing of foraging vegetation during construction phase.	Unknown, foraging.

Table 18 documents the change in vegetation integrity for residual direct impacts on native vegetation, TECs, threatened species and their habitat that were identified on the subject land. As all vegetation will be cleared on site and the mitigation measures will include the rehabilitation of the creek and the sue of the creek for stormwater basins and stormwater quality management plan, it is not possible to create a like for like offset on site. Therefore, integrity scores above zero after development is zero.

Table 18 Impacts to vegetation integrity

Vegetation zone	PCT ID	Management zone	Area (ha)	Before development				After development				Change in VI score
				Composition	Structure	Function	VI score	Composition	Structure	Function	VI score	
1	599	1	1.6587	39.4	31.7	78.9	46.2	39.4	31.7	78.9	46.2	0

Vegetation zone	PCT ID	Management zone	Area (ha)	Before development				After development				Change in VI score
				Composition	Structure	Function	VI score	Composition	Structure	Function	VI score	
2	1383	2	0.6312	50.5	29.3	63.8	45.5	0	0	0	- 45.5	- 45.5

7.5 Mitigating residual impacts – management measures and implementation

Table 19 provides details of the proposed mitigation and management measures.

Table 19 Summary of proposed mitigation and management measures for residual impacts (direct, indirect and prescribed)

Mitigation measure (specify if none proposed and ensure an adaptive management strategy is developed and addressed in Section 0)	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	MNES (when relevant)
Preparation and implementation of the vegetation management plan to include clearing protocol and presence of fauna spotter during the clearing.	Hollow-bearing trees within the development site would not be cleared between June and February. Weed, hygiene and pest management protocols will be prepared and implemented as part of the Biodiversity Management Plan for the development.	Pre-construction and construction phases	Regular	Client/ Clearing contractor	Low risk of failure - If protocols are followed failure is still possible. If failure does occur consequences could be moderate due to the adjacent farming lands and waterway that has the potential to transport weed seed	TEC
Timing works to avoid critical life cycle events such as breeding or nursing	Hollow-bearing trees within the development site would not be cleared between June and February, to avoid the breeding season of *myotis macropus* and *saccolaimus flaviventris*.	Tree clearing to be undertaken in February and June	Once off	Client/ Clearing contractor	Low risk of failure	TEC

Mitigation measure (specify if none proposed and ensure an adaptive management strategy is developed and addressed in Section 0)	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	MNES (when relevant)
	If clearing outside of this period cannot be achieved, pre-clearing surveys would be undertaken to ensure these species do not occur	outside breeding season.				
Preparation and implementation of the nest box management plan and relocation of habitat features (fallen timber, hollow logs) from within the development site	Hollow logs and significant surface rock will be relocated from the development footprint into areas that are not being impacted upon. Works will be supervised by an ecologist.	Pre construction and operational phase	Regular	Client/ Clearing contractor	Low risk of failure - This is a low risk activity, it will not make up for the loss of habitat but it will enable the retention of more habitat onsite than if no relocation and retention occurred.	TEC
Making provision for the ecological restoration, rehabilitation and/or ongoing maintenance of retained native vegetation habitat on or adjacent to the development site.	Details of site rehabilitation will be provided in the vegetation management plan. This includes replanting of indigenous species, ongoing maintenance of plantings and measures of success	All stages	Regular	Client.	If the protocols are followed there will some residual impacts to TEC as the rehabilitation will not fully offset the loss of TEC.	TEC

Mitigation measure (specify if none proposed and ensure an adaptive management strategy is developed and addressed in Section 0)	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	MNES (when relevant)
Preparation and implementation of the erosion and sediment control management plan	Details of erosion and sediment management will be in the Construction Environmental Management Plan	Construction and construction phases	Regular	Client.	If the protocols are followed there will be no residual impacts only benefits to the surrounding environment. If protocols fail then there will be no improvement to biodiversity following construction.	
Preparation and implementation of the light impact and management plan.	Details of dust management will be in the Construction Environmental Management Plan • Avoid night works ie works after sunset or before sunrise. • Direct operation lights away from vegetated areas particularly woodlands	Construction and operational phases	Regular	Client.	If the protocols are followed there will be no residual impacts only benefits to the surrounding environment. If protocols fail then there will be no improvement to biodiversity following construction.	Threatened species

Mitigation measure (specify if none proposed and ensure an adaptive management strategy is developed and addressed in Section 0)	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	MNES (when relevant)
Preparation and implementation of the dust management plan	Details of dust management will be in the Construction Environmental Management Plan	Construction phase	Regular	Client.	If the protocols are followed there will be no residual impacts only benefits to the surrounding environment. If protocols fail then there will be no improvement to biodiversity following construction.	Threatened species
Staff training and site briefing to communicate environmental features to be protected and measures to be implemented	Details of staff briefing, toolbox talks and post incident protocols will be inthe CEMP to ensure that all staff onsite are aware of the biodiversity constraints throughout the Pre-Construction, Construction and Operation phases	All stages	Regular	Client.	If protocols are followed residual impacts are minimal.	
Programming construction activities to avoid critical life cycle events; for example, timing construction activities for	Hollow-bearing trees within the development site would not be cleared between June and February, to avoid the breeding	Pre-construction phase	One-off	Client.	There is still a chance these species will be impacted upon due to out of season	

Mitigation measure (specify if none proposed and ensure an adaptive management strategy is developed and addressed in Section 0)	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	MNES (when relevant)
when migratory species are absent from the site, or when particular species known to or likely to use the habitat on	season of Superb Parrot and Corben's Long-eared Bat and the core hibernation period for Corben's Long-eared Bat. • If clearing outside of this period cannot be achieved, pre-clearing surveys would be undertaken to ensure these species do not occur.				breeding, however the risk is low and if the species is detected they will be relocated or referred to a wildlife rescue group if dependent young are detected.	

Details of the adaptive management strategy proposed to monitor and respond to impacts on biodiversity values will be provided in the future management plan.

8. Serious and Irreversible Impacts

8.1 Assessment for Serious and Irreversible Impacts on Biodiversity Values

The principles used to determine if a development will have serious and irreversible impacts, include impacts that:

- Will cause a further decline of the species or ecological community that is currently observed, estimated, inferred, or reasonably suspected to be in a rapid rate of decline, or
- 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, or
- Impact on the habitat of a species or ecological community that is currently observed, estimated, inferred, or reasonably suspected to have a very limited geographic distribution, or
- Impact on a species or ecological community that is unlikely to respond to measures to improve habitat and vegetation integrity and is therefore irreplaceable.

While mitigation measures will be put in place to avoid and minimise the impact on flora and fauna, the reduction of the vegetation clearing cannot be fully mitigated and the development will result in loss of TEC, habitat and feeding site for threatened species recorded on site in the short term.

Table 20 outlines the entities at risk of Serious and Irreversible Impacts (SII) caused by the development which will require an offset.

Table 20 Entities at risk of an SAII

Entities	Reason for inclusion in assessment
White Box Yellow Box Blakely's Red Gum Woodland	Included in current list of entities at risk of an SAII and is likely to be impacted by the proposal
Southern Myotis *(Myotis macropus)*	Included in current list of entities at risk of an SAII and is likely to be impacted by the proposal

8.2 Impact Summary

8.2.1 Impacts on native vegetation and TECs or ECs (ecosystem credits)

Table 21 identifies impacts on native vegetation and TECs that require an offset as per BAM Subsection 9.2.1.

Table 21 Impacts to Ecosystems – Ecosystem credits

Vegetation zone	PCT name	TEC	Impact area (ha)	TEC association	Entity at risk of an SAII?	Current VI score	Biodiversity Risk Weighting	Ecosystem Credit (as per calculator)
PCT 599	Blakely's Red Gum - Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion	White Box Yellow Box Blakely's Red Gum Woodland	0 ha	White Box Yellow Box Blakely's Red Gum Woodland	Yes	0	2.5	1
PCT 1383	White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion	White Box Yellow Box Blakely's Red Gum Woodland	0.6312 ha	White Box Yellow Box Blakely's Red Gum Woodland	Yes	45.5	2.5	18

8.2.2 Impacts on threatened species and their habitat (species credits)

Table 22 identifies impacts on threatened species (species credits) that require an offset as per BAM Subsection 9.2.2.

Table 22 Impacts that require an offset – species credits

Common name	Scientific name	BC Act status	EPBC Act status	Loss of habitat (ha) or individuals	Biodiversity risk weighting
Southern Myotis	*Myotis macropus*	V	-	0.6312ha	High (2)

8.2.3 Indirect and Prescribed Impacts

Indirect and prescribed impacts that remain after measures to avoid, minimise and mitigate have been applied. They do not require offset and/or other conservation measures. Specify the proposed offset for each of these impacts are outlined in Table 23.

Table 23 Summary of proposed offsets for residual indirect and prescribed impacts

Residual indirect or prescribed impact (identified in Table 16 after mitigation)	Proposed offset (additional biodiversity credit requirement and/or other conservation measures)
Nil	Nil

The site is currently cleared of vegetation. The mitigation provided in the Table 16 are sufficient to mitigate any prescribed impact.

8.3 Impacts that do not need further assessment

Table 24 to identify impacts that do not need further assessment for ecosystem credits (as per BAM Section 9.3(1–2.).

Table 24 Impacts that do not need further assessment for ecosystem credits

Impact	Location within subject land	Justification why no further assessment is required
Karst, caves, crevices, cliffs, rocks or logs	Nil	Not on site
Vehicle strikes	Nil	Vehicle strike will not impact on threatened species identified on site
Human-made structures	Nil	No impact identified
Non-native vegetation	Acros the site	No impact identified
Habitat connectivity	Along the waterway	Waterway corridor is identified, retained, and will be fully rehabilitated
Waterbodies, water quality and hydrological processes	Along the waterway	Waterway corridor is identified , retained, and will be fully rehabilitated

9. Biodiversity credit report

An offset is required for all impacts of development on PCTs that are associated with:

- a vegetation zone that has a VIS ≥15 where the PCT represents an endangered or critically endangered ecological community, or
- a vegetation zone that has a VIS of ≥17 where the PCT is associated with threatened species habitat (as represented by ecosystem credits), or a vulnerable ecological community, or
- a vegetation zone that has a VIS ≥20 where the PCT does not represent a threatened ecological community and is not associated with threatened species habitat.

An offset is not needed for impacts on native vegetation if the vegetation integrity score is below those listed above. None of the VIS for our site meet these criteria and therefore identified impacts are to be offset.

9.1 Ecosystem Credits

Table 25 Ecosystem credit class and matching credit profile

Ecosystem credits	Attributes shared with matching credits					
	PCT name	PCT vegetation class	Associated TEC or EC	Offset trading group (BAM Section 10.2, Tables 4 & 5)	Hollow bearing trees present?	IBRA subregion (in which proposal is located)
1	Blakely's Red Gum - Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion	599	Yes TEC	Endangered ecological community	Yes	Peel subregion of the Nandewar bioregion as per the *Interim Biogeographic Regionalisation for Australia (IBRA) Version 7*.

Ecosystem credits	Attributes shared with matching credits					
	PCT name	PCT vegetation class	Associated TEC or EC	Offset trading group (BAM Section 10.2, Tables 4 & 5)	Hollow bearing trees present?	IBRA subregion (in which proposal is located)
18	White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion	1383	Yes TEC	Endangered ecological community	Yes	Peel subregion of the Nandewar bioregion as per the *Interim Biogeographic Regionalisation for Australia (IBRA) Version 7*.

9.2 Species credits

Table 26 Species credit class and matching credit profile

Species credits	Attributes shared with matching credits				
	Name of threatened species	Kingdom	BC Act status	EPBC Act status	IBRA region
15	Southern Myotis	Animalia	Vulnerable	Not listed	Peel subregion of the Nandewar bioregion as per the *Interim Biogeographic Regionalisation for Australia (IBRA) Version 7*.

10. Conclusion

This BDAR has been prepared to assess the impacts of the proposed reconfiguration in accordance to the NSW BAM, subject of lot 1 and 2 DP1213875, and lot 1 DP233288 into 921 low density residential allotments and medium density residential lots.

Two PCTs have been ground-truthed during site surveys including:

- White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion PCT 1383; and,
- Blakely's Red Gum - Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion PCT 599

Only PCTs 1383 will be fully cleared by the proposed development. Only PCTs 1383 will be fully cleared by the proposed development. Within the existing configuration, the developmental plan has deliberately steered clear of the clearance of PCT 599. To mitigate any potential indirect repercussions linked to the proposed development, a vegetated buffer will be instituted around this particular vegetative patch. This strategic measure aligns with best practices in environmental stewardship, ensuring the preservation of ecological integrity.

The desktop and field investigation confirmed the presence of threatened fauna species listed under both the BC Act and EPBC Act. These species will be impacted by the development and offset credits are required. As per 4 December 2023, the following species credits and ecosystem credits will be required:

- 0.6312ha clearing of PCT 1383 – 18 Credits;
- Potential indirect impact to PCT 599 as per the BAM Calculator – 1 Credit;
- 0.6312ha clearing of Southern Myotis habitat *(Myotis macropus)* habitat, listed as Vulnerable under BC Act – 15 Credits. Both PCTs are considered habitat for this species.

Mitigation and management measures are proposed to adequately address impacts associated with the proposal, both directly and indirectly. The retirement of the updated credit requirement is proposed to be carried out in accordance with the NSW Biodiversity Offsets Scheme and will be achieved by either:

- Retiring credits under the Biodiversity Offsets Scheme, or
- Making payments into the Biodiversity Conservation Fund using the offset payments calculator, or
- Funding a biodiversity action that benefits the threatened entity impacted by the development.

11. References

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BioNet Vegetation Classification

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NSW Interim Biogeographic Regions of Australia (IBRA region and subregion) – Version 7.

Appendix 1

Biodiversity Values Map and Threshold Report

Department of Planning and Environment

Biodiversity Values Map and Threshold Report

This report is generated using the Biodiversity Values Map and Threshold (BMAT) tool. The BMAT tool is used by proponents to supply evidence to a consent authority to determine whether or not a Biodiversity Development Assessment Report (BDAR) is required under the Biodiversity Conservation Regulation 2017 (Cl. 7.2 & 7.3).

The report provides results for the proposed development footprint area identified by the user and displayed within the blue boundary on the map.

There are two pathways for determining whether or not a BDAR is required for the proposed development:

1. Is there Biodiversity Values Mapping?
2. Is the 'clearing of native vegetation area threshold' exceeded?

Biodiversity Values Map and Threshold Report

Date of Report Generation		30/10/2023 4:19 PM
Biodiversity Values (BV) Map Threshold - Results Summary		
1	**Does the development Footprint intersect with BV mapping?**	no
2	**Was ALL of the BV Mapping within the development footprinted added in the last 90 days?** (dark purple mapping only, no light purple mapping present)	no
3	**Date of expiry of dark purple 90 day mapping***	N/A
4	**Is the Biodiversity Values Map threshold exceeded?**	no
Area Clearing Threshold - Results Summary		
5	**Size of the development or clearing footprint**	1,228,731.9 sqm
6	**Native Vegetation Area Clearing Estimate (NVACE)**	322,861.9 sqm
7	**Method for determining Minimum Lot Size**	LEP
8	**Minimum Lot Size** (10,000sqm = 1ha)	450 sqm
9	**Area Clearing Threshold** (10,000sqm = 1ha)	2,500 sqm
10	**Is the Area Clearing Threshold exceeded?**	yes

Is the proposed development assessed above the Biodiversity Offsets Schema (BOS) threshold? Exceeding the BOS threshold will require completion of a Biodiversity Development Assessment Report (BDAR). More details provided on page 2.	**yes**

What do I do with this report?

• If the result above indicates a BDAR is required, a Biodiversity Development Assessment Report **may be required** with your development application. Go to https://customer.lmbc.nsw.gov.au/assessment/AccreditedAssessor to access a list of accredited assessors. An accredited assessor can apply the Biodiversity Assessment Method and prepare a **BDAR**.

• If the result above indicates a BDAR is not required, you have not exceeded the BOS threshold. This report can be provided to Council to support your development application. You may still require a permit from your local council. Review the development control plan and consult with council. You may still be required to assess whether the development is '"likely to significantly affect threatened species" as determined under the test in Section 7.3 of the Biodiversity Conservation Act 2016. You may also be required to review the area where no vegetation mapping is available.

• If all Biodiversity Values mapping within your development footprint are less than 90 days old, i.e. mapping is displayed as dark purple on the map, a BDAR may not be required if your Development Application is submitted within that 90 day period. *Any BV mapping less than 90 days old on this report will expire on the date provided in Line item 3 above.

For more detailed advice about actions required, refer to the **Interpreting the evaluation report** section of the Biodiversity Values Map Threshold Tool User Guide.

Review Options:

• If you believe the Biodiversity Values mapping is incorrect please refer to our BV Map Review webpage for further information.

• If you disagree with the NVACE result for Line Item 6 above (i.e. area of Native Vegetation within the Development footprint proposed to be cleared) you can undertake a self-assessment. For more information about this refer to the **Guide for reviewing BMAT Tool area clearing threshold results**.

Acknowledgement

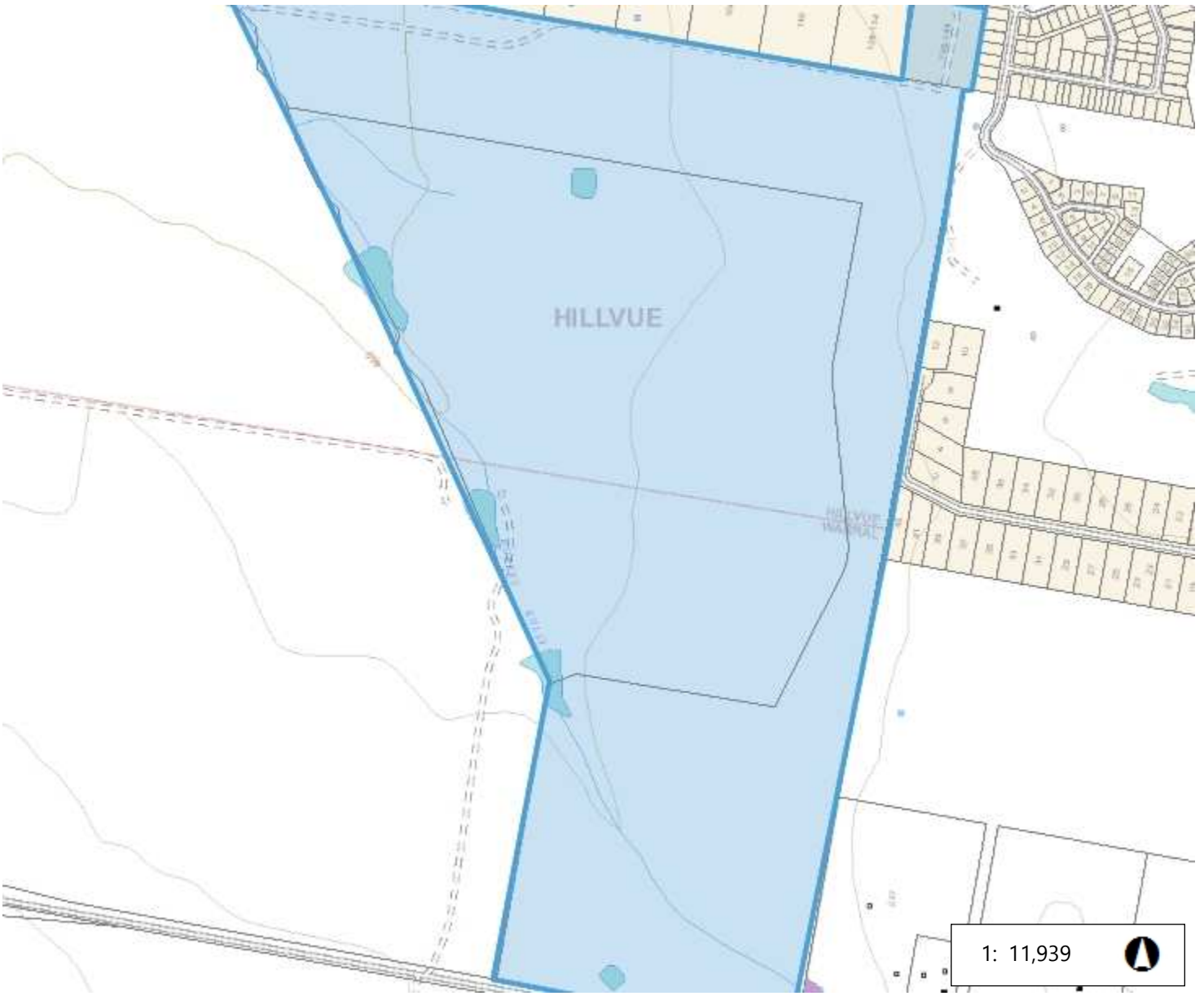
I, as the applicant for this development, submit that I have correctly depicted the area that will be impacted or likely to be impacted as a result of the proposed development.

Signature: _____ Date:_____

(Typing your name in the signature field will be considered as your signature for the purposes of this form)

30/10/2023 04:19 PM

Biodiversity Values Map



606.5 0 303.24 606.5 Metres

WGS_1984_Web_Mercator_Auxiliary_Sphere

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Legend

- Biodiversity Values that have been mapped for more than 90 days
- Biodiversity Values added within last 90 days
- Native Vegetation Area Clearing Estimate (NVACE)
- Development area selected by proponent

30/10/2023 04:19 PM

The results provided in this tool are generated using the best available mapping and knowledge of species habitat requirements.

This map is valid as at the date the report was generated. Checking the Biodiversity Values Map viewer for mapping updates is recommended.

Appendix 2

Assessor Resume

Green Tape SOLUTIONS
ENVIRONMENTAL CONSULTING

KELLY MATTHEWS

Founding Director / Principal Ecologist
Masters in Environmental Management, Griffith University, Queensland
Masters in Ecology and Biology of Populations and Ecosystems, Lille University, France
Certified Environmental Practitioner (EIANZ)
Certified Lead Auditor for ISO 14009, ISO 9001 and ISO 4801
Accredited Infrastructure Sustainability Accredited Professional
BAM Accredited BAAS22019

AREAS OF EXPERTISE

Kelly is a consultant with 20 years professional experience across a wide range of industries and locations, within both government and private sectors. Her core skills comprise the development of environmental strategy, ecological flora and fauna assessment, development and implementation of environmental management plans, provision of technical and specialist advice on ecological constraints and environmental legislation.

Kelly completed and reviewed over 2,000 technical reports, including Environmental Impact Statement (EIS) - Ecology chapters and appendices and Fauna and flora Management Plan. She has conducted a number of fauna surveys and monitoring programs and contributed to numerous ecological assessment reports across Australia and internationally including New Caledonia and Europe. Kelly has worked as an environmental advisor and undertook approvals and ecological activities to support infrastructure, development approvals and associated processes. Along with her highly qualify technical skills, Kelly has sound knowledge of the environmental legislation and gained excellent understanding of Commonwealth, State and Local government requirements which make her the perfect candidate to achieve favourable outcomes for clients. She has vast experience in delivering practical outcomes and management plans that aim to deliver sustainable solutions for clients and the natural environment.

- Environmental planning, survey and assessment
- Ecological (flora/fauna) Survey and Biodiversity Assessment and Monitoring
- Environmental Impact Statement (EIS)
- Environmental Management Plan
- EPBC referrals and field reports
- Bird and Bat Management Plan
- Offset Strategy and Management Plan
- Fauna Management Plan
- Environmental Risk Assessments
- Vegetation Management Plan and Monitoring
- Rehabilitation Management Plan and Monitoring
- Significant Species Management Plan
- Pre-clearance Surveys, including Threatened Species, Weed Identification and Inspection of Animal Breeding Places
- Bushfire Assessment/Management Plan
- Qualified Fauna Spotter Catcher
- Wildlife Carer (specialised in microbats)
- Koala Spotter and Other Threatened Fauna Species Survey and Monitoring
- Environmental services - water quality, soil assessment and noise assessment
- EPBC Independent Audits
- Quality, Safety and Environmental Systems Audits and Reporting.

PREVIOUS EXPERIENCE

- **Director / Principal Ecologist**
  Green Tape Solutions Consulting, Australia 2014-Present
- **Ecologist**
  Development Assessment, Brisbane City Council, Australia 4-month 2014
- **Senior Ecologist**
  RPS, Australia 2012-2014
- **Ecologist/Bushfire Officer**
  Development Assessment, Brisbane City Council, Australia 2009-2012
- **Invasive Species Officer**
  Brisbane City Council, Australia 2006-2009
- **Environmental Scientist**
  New Caledonia Government and World Wildlife Fund, New Caledonia 2005-2006
- **Technical Environmental Officer**
  Natural Park of the Plains of L'Escaut, Belgium 2004-2005
- **Conservation Officer**
  Blongios – Non-Governmental Organisation, France 1999-2004

CERTIFICATIONS & ACCREDITATIONS

- Accredited Prince2 Project Management
- Certified Environmental Practitioner (EIANZ)
- Certified Lead Auditor for ISO 14009, ISO 9001 and ISO 4801
- Accredited Infrastructure Sustainability Accredited Professional
- Queensland Herbarium's Regional Ecosystem Classification and Biocondition Training
- CASA Remote Pilot Licence
- Nationally accredited construction white card
- Venomous snake handling certification plus advanced handling
- Origin HSE Leadership: Module 0 and 1 Training Card
- Operate Vehicles in the Field (PMASUP236B) / Operate a Light Vehicle (RIIVEH201B)
- Skillpass
- RRTO Mine Induction – Standard 11 Surface Operations and Coal Board Medical clearance
- Coal Board Medical
- Queensland driver's licence - Class C Open (Qld)
- Weed and seed certificate (AHCBIO201)
- First aid and remote first aid certificate
- Wildcare, wildlife and rehabilitation training
- Class A License Bird Bander
- Australian Lyssa virus vaccinations

Curriculum Vitae - CONTINUED -

MEMBERSHIPS

- **Active Member,** Communication Committee of the Queensland Environment Institute of Australia and New Zealand (EIANZ), Certified CEnvp
- **Active Member,** Animal Ethics Committee Qld
- **Active Member**, Queensland Environmental Law Association (QELA) / Planning and Environment Committee
- **Active Member**, Australasian Bat Society
- **Member**, Urban Development Institute of Australia (UDIA)
- **Member**, Planning Institute of Queensland (PIA)
- **Member,** Women's Network Australia
- **Member**, Birds Queensland, Birds Australia and Queensland Wader Studies Group
- **Member**, Ecological Society of Australia
- **Member**, Wildlife Preservation Society of Queensland
- **Active Member**, Australasian Bat Society

Appendix 3

Figures

Figure 2: Site Map

Project: PR23273_BDAR_939 Torrens Tile Subdivision

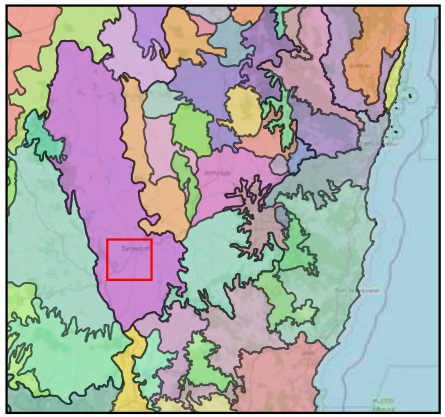
- Subject Site
- 1500 m Assessment Area
- Cadastral Boundaries
- Mapped Watercourses

The subject lot is located within the following:

IBRA7 - Bioregions
- Nandewar

IBRA7 - Subregions
- Peel

NSW Mitchell Landscapes
- Tamworth - Keepit Slopes and Plains



Notes:
- Survey Data by Green Tape Solutions
- Site Infrastructure and Impact Areas from Client
- Base map Copyright (c) Esri and its data suppliers.

Created By: JG
Date: 04/12/2023
Version: 1

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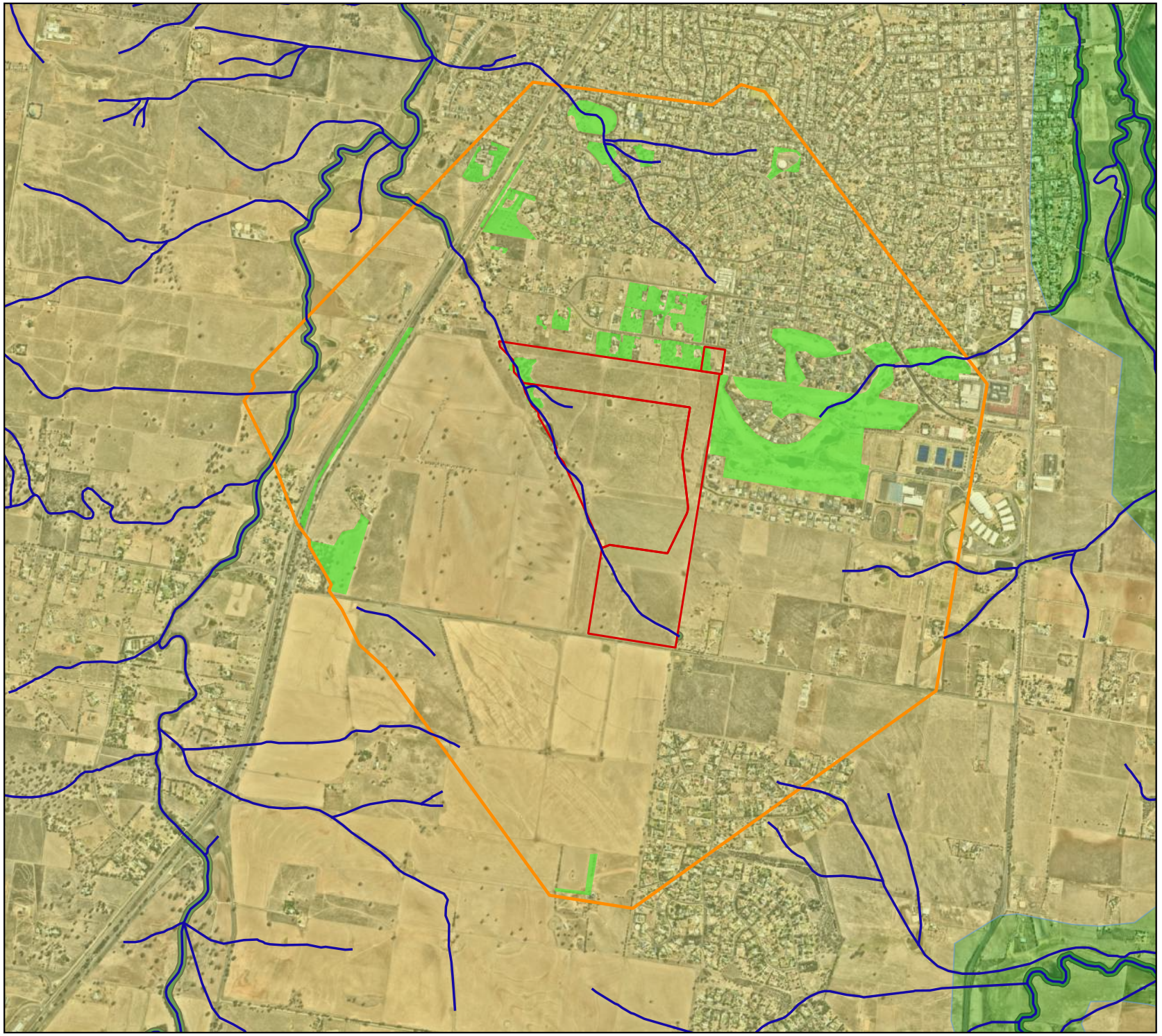


Figure 3: Location Map

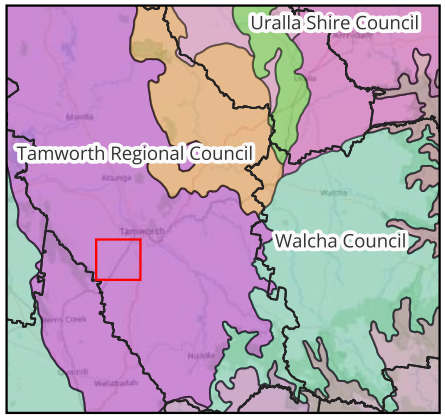
Project: PR23273_BDAR_939 Torrens Tile Subdivision

- Subject Site
- 1500 m Assessment Area
- Mapped Watercourses
- Biodiversity Values
- Native Vegetation Extent

NSW Mitchell Landscapes
- Peel Channels and Floodplain
- Tamworth - Keepit Slopes and Plains

IBRA7 Bioregions
- Nandewar

IBRA7 Subregions
- Peel



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Version: 1

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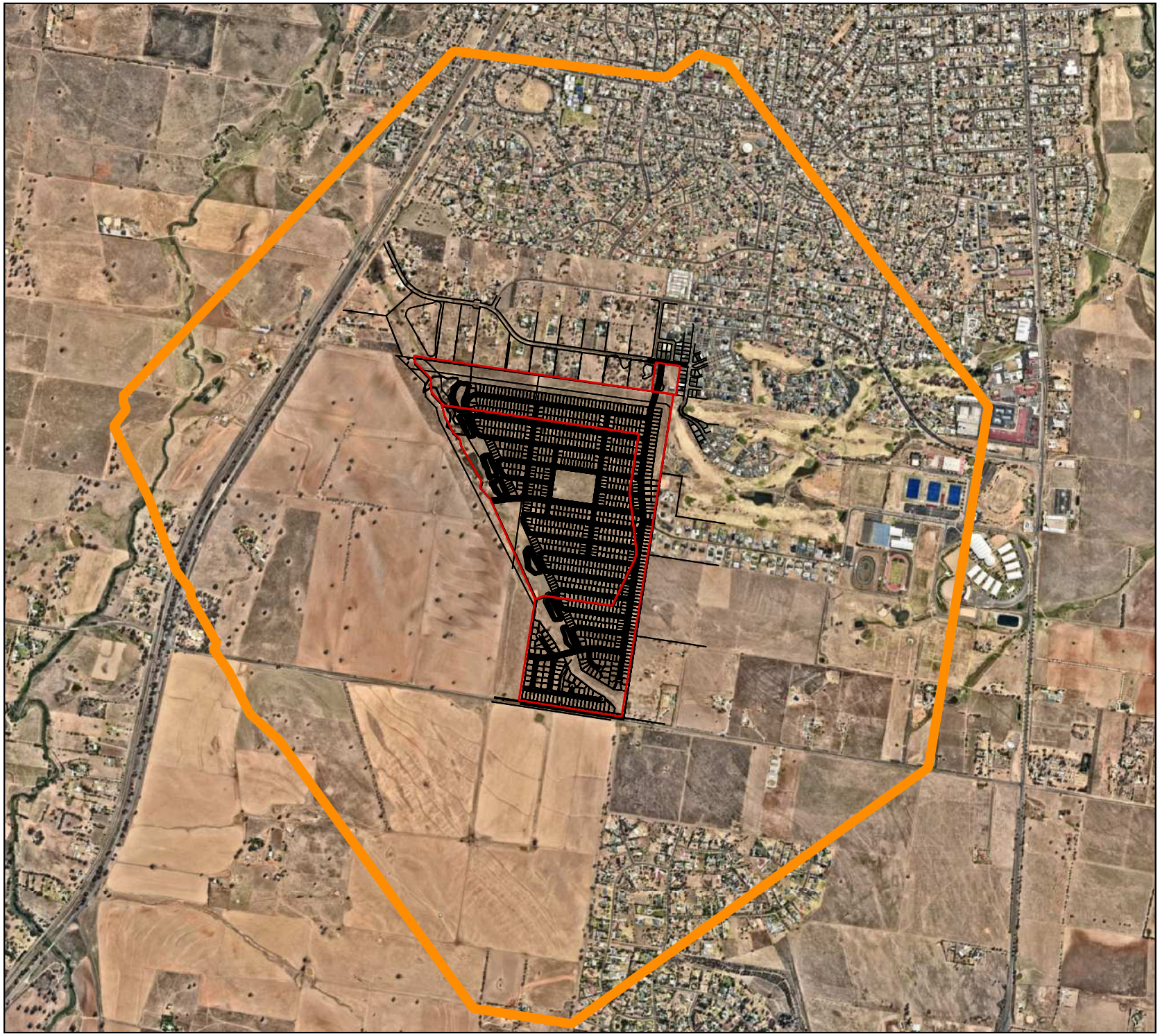
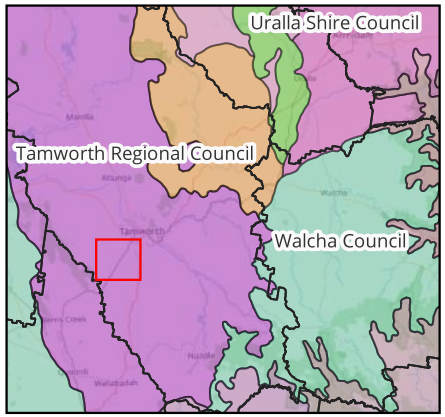


Figure 4: Development layout

Project: PR23273_BDAR_939 Torrens Tile Subdivision

Ecological Layers
- Subject land
- 1500 m Assessment Area



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Version: 3

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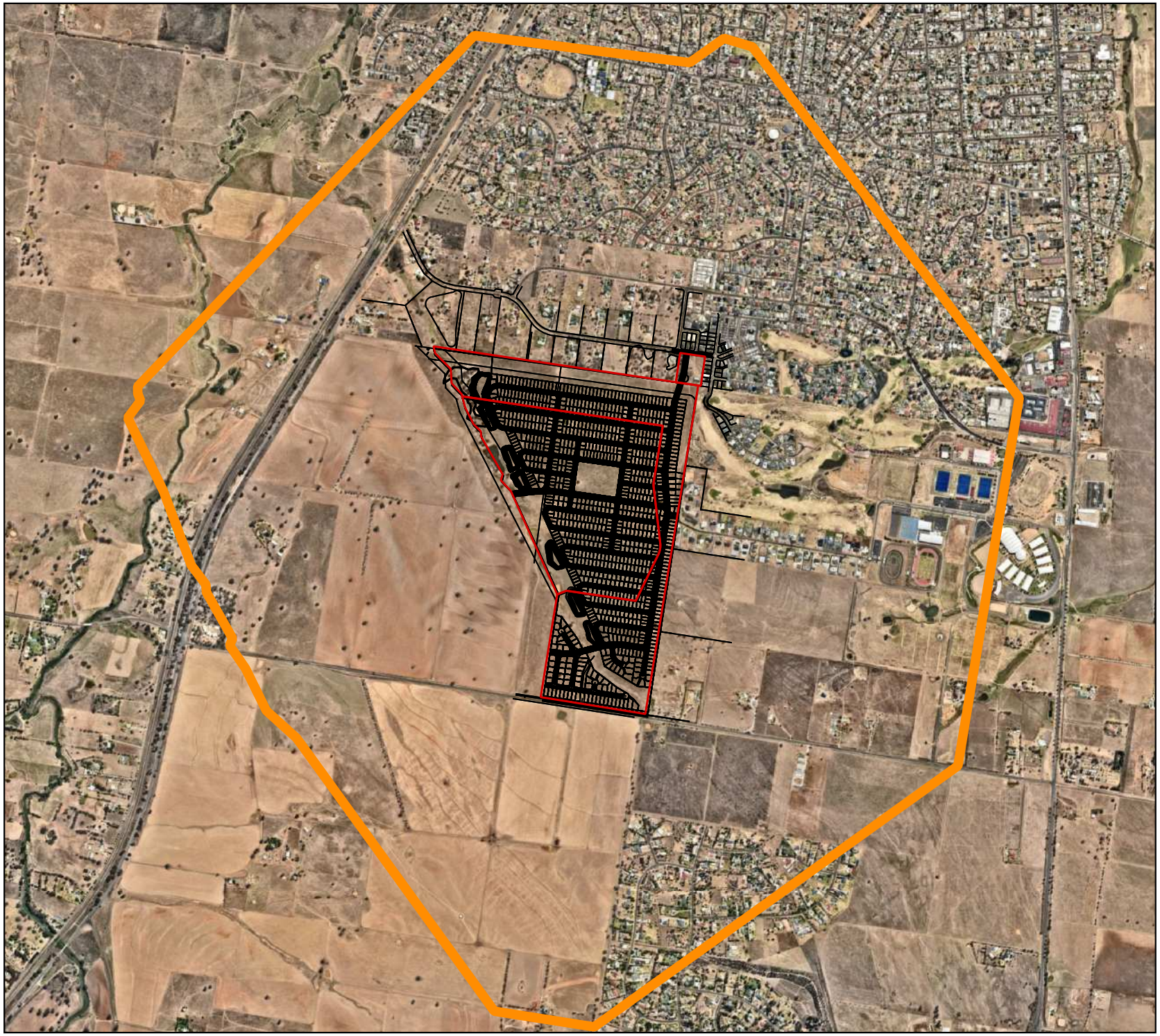


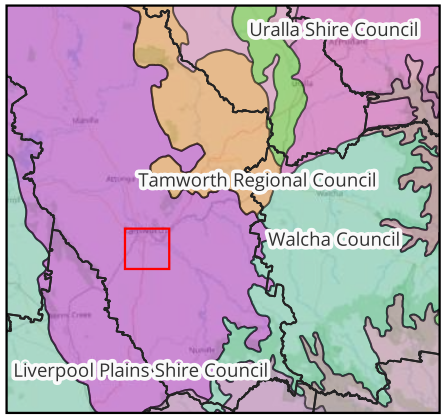
Figure 5: Biodiversity Values Map

Project: PR23273_BDAR_939 Torrens Tile Subdivision

Subject land

1500 m Assessment Area

Biodiversity Values



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Date: 16/05/2024
Version: 3

0 250 500 m

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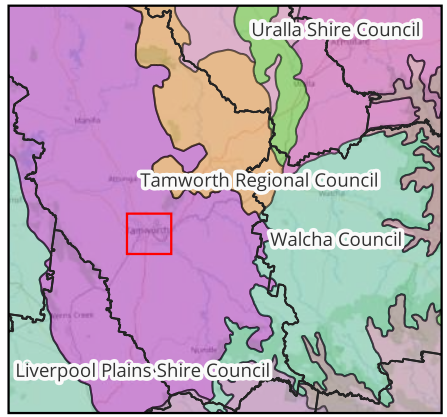
Figure 6: Field survey locations

Project: PR23273_BDAR_939 Torrens Tile Subdivision

- Subject land
- Cadastral Boundaries
- BAM Transects [2]
- Mapped Watercourses
- Camera Trap [4]
- Quaternary Survey [8]
- Anabats Device [3]
- Koala Survey [2]
- Bird Surveys [7]

Vegetation Community
- PCT ID 599
- PCT ID 1383



Notes:
- Survey Data by Green Tape Solutions
- Site Infrastructure and Impact

Created By: JG
Date:

0 100 200 m

Green Tape SOLUTIONS

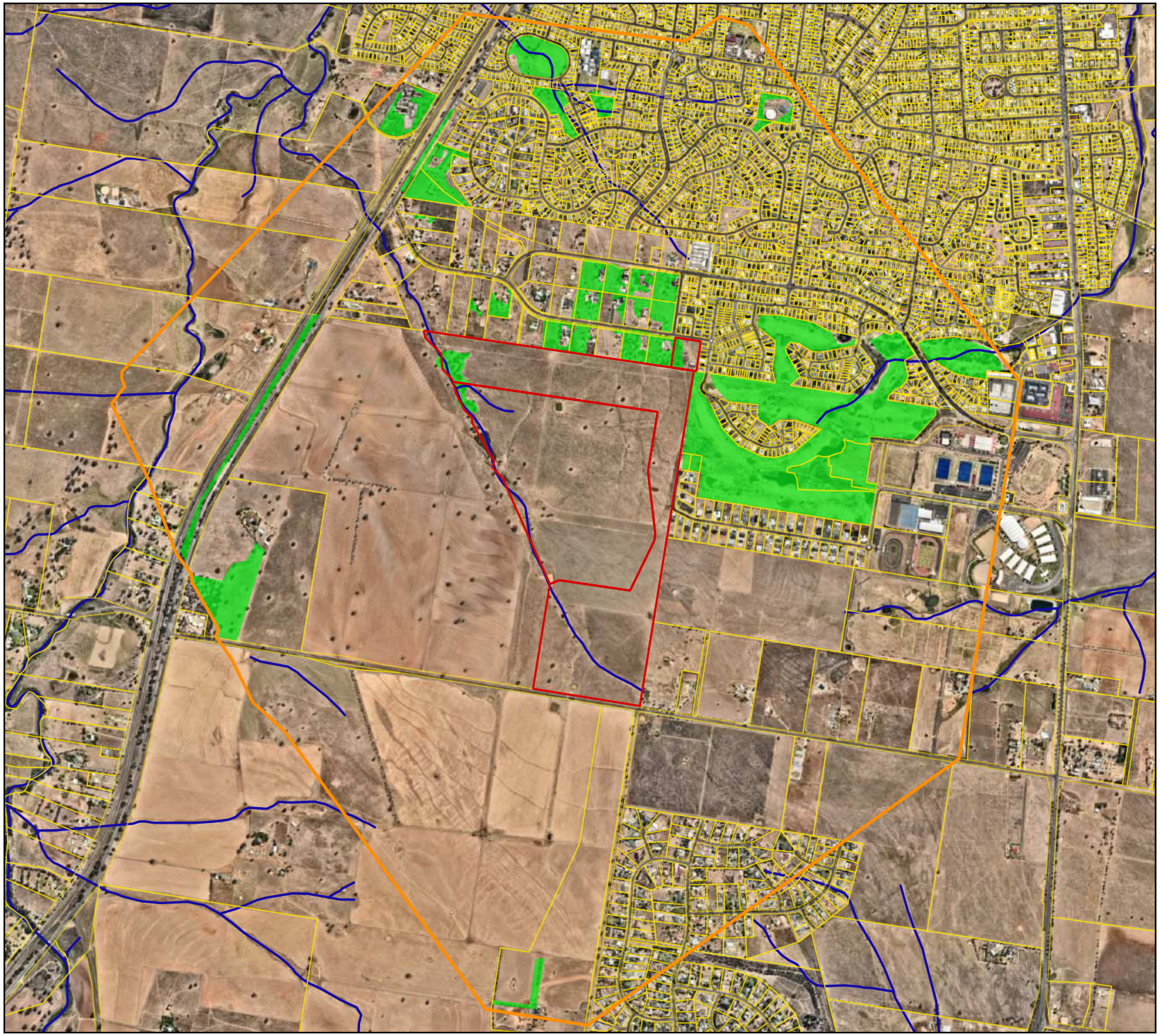
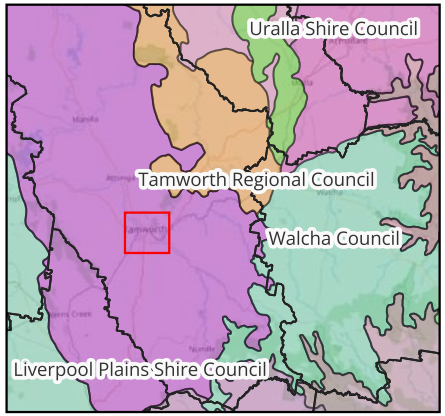


Figure 7: Native vegetation extent

Project: PR23273_BDAR_939 Torrens Tile Subdivision

- Subject land
- 1500 m Assessment Area
- Cadastral Boundaries
- Native Vegetation Extent
- Mapped Watercourses



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Date: 04/12/2023
Version: 1

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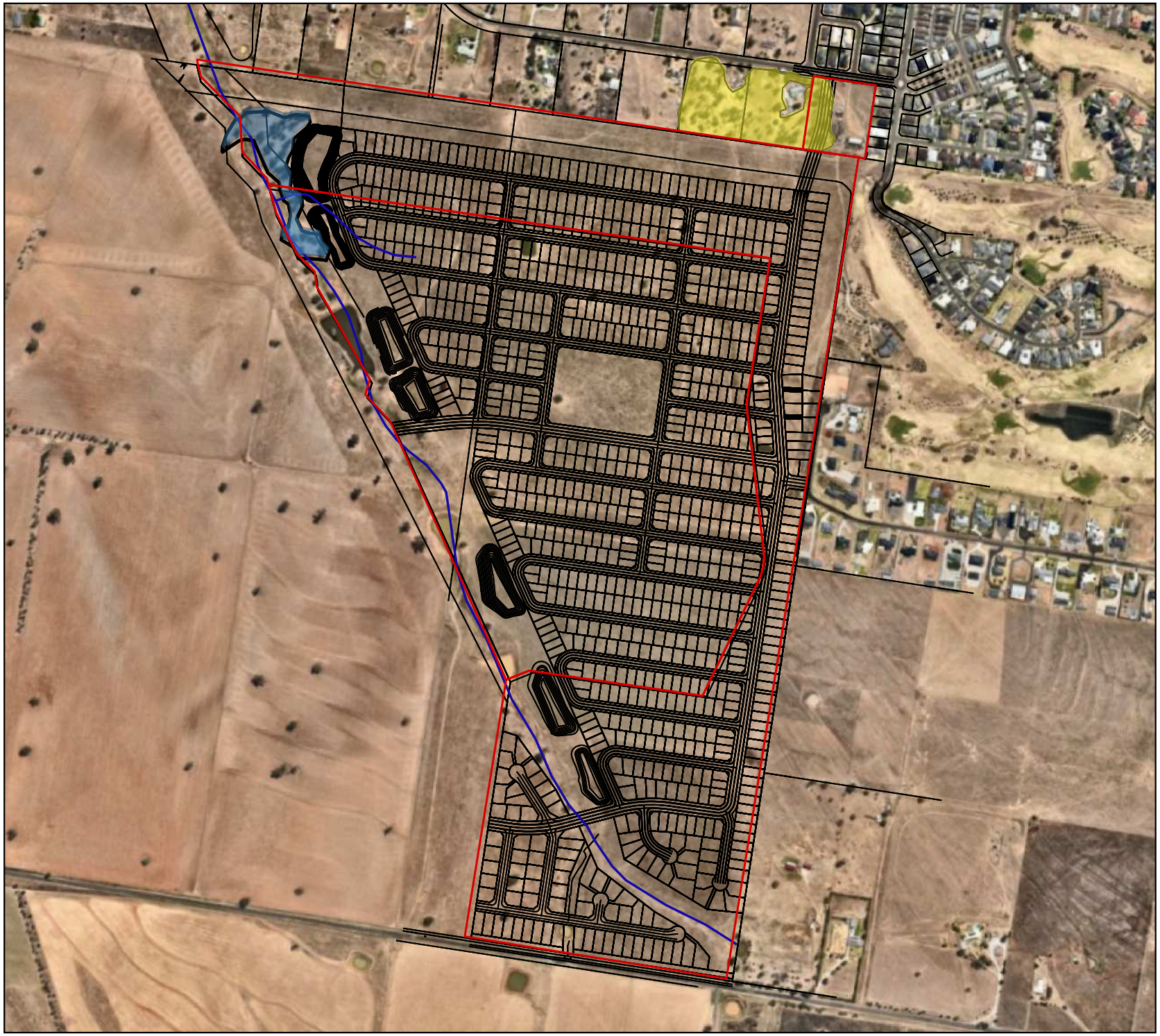
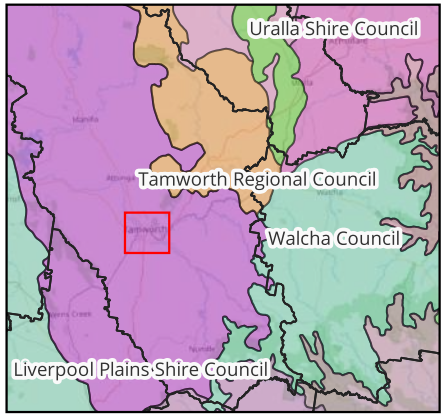


Figure 8: Plant Community Types

Project: PR23273_BDAR_939 Torrens Tile Subdivision

Subject land
1500 m Assessment Area
Mapped Watercourses
Vegetation Community Types (PCTs)
PCT id 599
PCT ID 1383
ArcadiaBaseLine



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Version: 2

0 100 200 m

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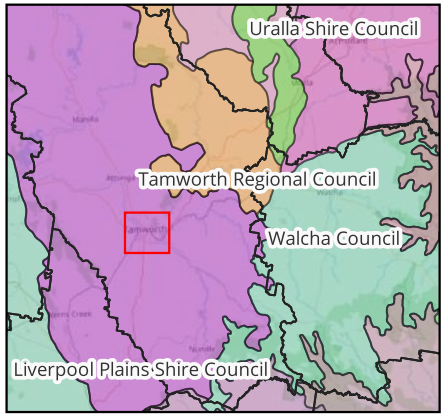
Figure 9: Threatened ecological communities and ecological communities

Project: PR23273_BDAR_939 Torrens Tile Subdivision

- Subject land
- Cadastral Boundaries
- Mapped Watercourses
- White box - Yellow box - Blakely's red gum grassy woodlands and derived native grasslands



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Version: 1

0 100 200 m

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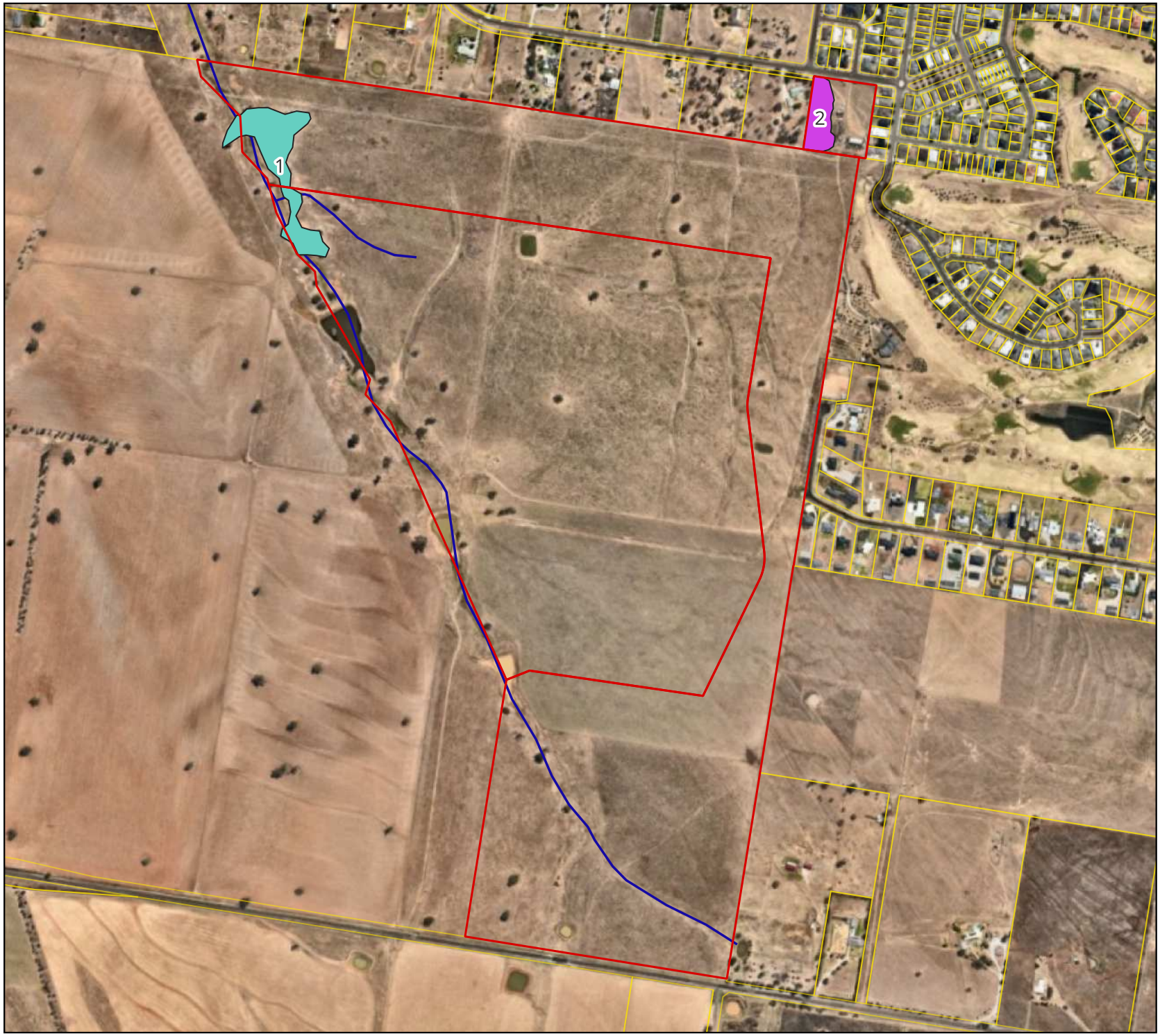
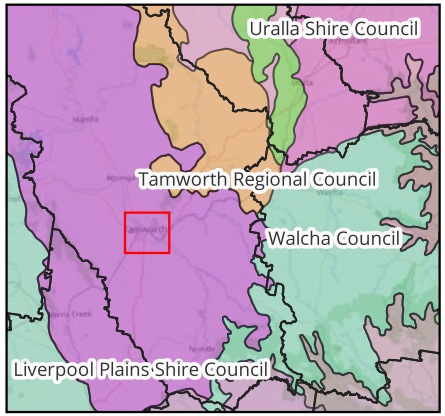


Figure 10: Vegetation zones

Project: PR23273_BDAR_939 Torrens Tile Subdivision

Subject land
Cadastral Boundaries
Mapped Watercourses

Vegetation Zones / PCT ID
Zone 1 - PCT ID 599
Zone 2 - PCT ID 1383



Notes:
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- Site Infrastructure and Impact Areas from Client
- Base map Copyright (c) Esri and its data suppliers.

Created By: JG
Date: 04/12/2023
Version: 1

0 100 200 m

Green Tape SOLUTIONS

Appendix 4

Species List

*Scientific name**	Common name	Count
Acridotheres tristis	Common myna	1
Alisterus scapularis	Australian king-parrot	2
Anas gracilis	Grey teal	2
Anas superciliosa	Pacific black duck	8
Bos taurus	European cattle	50
Cacatua galerita	Sulphur-crested cockatoo	2
Chalinolobus gouldii	Gould's wattled bat	2
Chelodina longicollis	Eastern snake-necked turtle	1
Chenonetta jubata	Australian wood duck	5
Chenonetta jubata	Australian wood duck	5
Corvus orru	Torresian crow	1
Egretta novaehollandiae	White-faced heron	2
Eolophus roseicapilla	Galah	10
Equus caballus	Horse	2
Geopelia placida	Peaceful dove	5
Glossopsitta concinna	Musk lorikeet	250
Grallina cyanoleuca	Magpie-lark	3
Gymnorhina tibicen	Australian magpie	3
Hirundo neoxena	Welcome swallow	15
Lepus europaeus	European brown hare	6
Limnodynastes fletcheri	Barking frog	20

Limnodynastes peronii	Striped marshfrog	20
Limnodynastes tasmaniensis	Spotted grassfrog	20
Litoria latopalmata	Broad palmed rocketfrog	20
Litoria peronii	Emerald spotted treefrog	20
Macropus giganteus	Eastern grey kangaroo	5
Malurus cyaneus	Superb fairy-wren	5
Manorina melanocephala	Noisy miner	4
Melloria quoyi	Black butcherbird	1
Microcarbo melanoleucos	Little pied cormorant	1
Ocyphaps lophotes	Crested pigeon	4
Petrochelidon nigricans	Tree martin	20
Phalacrocorax sulcirostris	Little black cormorant	5
Platalea regia	Royal spoonbill	1
Platycercus eximius	Eastern rosella	15
Platyplectrum ornatum	Ornate burrowing frog	20
Psephotus haematonotus	Red-rumped parrot	5
Pteropus alecto	Black flying-fox	7
Rhipidura leucophrys	Willie wagtail	1
Sturnus vulgaris	Common starling	25
Tachybaptus novaehollandiae	Australasian grebe	2
Threskiornis spinicollis	Straw-necked ibis	10
Trichoglossus moluccanus	Rainbow lorikeet	14

Appendix 5

Matters of National Environmental Significance

If a project is deemed a controlled action, summarise details provided in the BDAR including:

- MNES relevant to the project
- Measures to avoid and minimise impacts on MNES
- Impacts to MNES
- Mitigation measures relevant to MNES
- Final offset requirements for MNES.

Reference relevant sections of the BDAR.

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: 17-Nov-2023

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	3
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	42
Listed Migratory Species:	10

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	45
Commonwealth Heritage Places:	1
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

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	12
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands)		[Resource Information]
Ramsar Site Name	Proximity	Buffer Status
Banrock station wetland complex	1000 - 1100km upstream from Ramsar site	In feature area
Riverland	900 - 1000km upstream from Ramsar site	In feature area
The coorong, and lakes alexandrina and albert wetland	1100 - 1200km upstream from Ramsar site	In feature area

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
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	Critically Endangered	Community likely to occur within area	In feature area
New England Peppermint (Eucalyptus nova-anglica) Grassy Woodlands	Critically Endangered	Community may occur within area	In feature area
Weeping Myall Woodlands	Endangered	Community may occur within area	In feature area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to 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			
Anthochaera phrygia			
Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	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
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat likely to 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 known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat likely to occur within area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Polytelis swainsonii](#) Superb Parrot [738]	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
[Stagonopleura guttata](#) Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area	In feature area
FISH			
[Maccullochella peelii](#) Murray Cod [66633]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
FROG			
[Litoria booroolongensis](#) Booroolong Frog [1844]	Endangered	Species or species habitat known to occur within area	In feature area
MAMMAL			
[Chalinolobus dwyeri](#) Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat known 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 known 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
[Petaurus australis australis](#) Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat may occur within area	In feature area
[Petrogale penicillata](#) Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
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 may occur within area	In buffer area only
Pteropus poliocephalus			
Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area	In feature area
PLANT			
Cadellia pentastylis			
Ooline [9828]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Callistemon pungens			
[55581]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Dichanthium setosum			
bluegrass [14159]	Vulnerable	Species or species habitat known to occur within area	In feature area
Eucalyptus nicholii			
Narrow-leaved Peppermint, Narrow-leaved Black Peppermint [20992]	Vulnerable	Species or species habitat known to occur within area	In feature area
Euphrasia arguta			
[4325]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Homoranthus prolixus			
[55198]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Lepidium aschersonii			
Spiny Peppercress [10976]	Vulnerable	Species or species habitat may occur within area	In feature area
Lepidium monoplocoides			
Winged Pepper-cress [9190]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
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 murrayana			
Slender Darling-pea, Slender Swainson, Murray Swainson-pea [6765]	Vulnerable	Species or species habitat may occur within area	In feature area
Thesium australe			
Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to 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			
Anomalopus mackayi			
Five-clawed Worm-skink, Long-legged Worm-skink [25934]	Vulnerable	Species or species habitat may occur within area	In feature area
Aprasia parapulchella			
Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat known to occur within area	In feature area
Hemiaspis damelii			
Grey Snake [1179]	Endangered	Species or species habitat may occur within area	In feature area
Myuchelys belli			
Western Sawshelled Turtle [86075]	Endangered	Species or species habitat may occur within area	In buffer area only
Uvidicolus sphyrurus			
Border Thick-tailed Gecko, Granite Belt Thick-tailed Gecko [84578]	Vulnerable	Species or species habitat known 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			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hirundapus caudacutus			
White-throated Needletail [682]	Vulnerable	Species or species habitat known 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 likely to 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

Other Matters Protected by the EPBC Act

Commonwealth Lands	[Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Commonwealth Bank of Australia		

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Commonwealth Bank of Australia [12980]	NSW	In buffer area only
Commonwealth Trading Bank of Australia		
Commonwealth Land - Commonwealth Trading Bank of Australia [16080]	NSW	In feature area
Commonwealth Land - Commonwealth Trading Bank of Australia [12972]	NSW	In buffer area only
Commonwealth Land - Commonwealth Trading Bank of Australia [12958]	NSW	In buffer area only
Communications, Information Technology and the Arts - Australian Postal Corporation		
Commonwealth Land - Australian Postal Commission [12964]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [12993]	NSW	In buffer area only
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian & Overseas Telecommunications Corporation [12962]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [12965]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [12963]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [12950]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [12953]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [12955]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [12954]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [12956]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [12973]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [12957]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [15957]	NSW	In buffer area only
Defence		
Commonwealth Land - Defence Service Homes Corporation [12968]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [12969]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [12967]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Defence Service Homes Corporation [12966]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [12970]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [12971]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [12979]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [12975]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [12951]	NSW	In buffer area only
Commonwealth Land - Director of Defence Service Homes [12978]	NSW	In buffer area only
Defence - TAMWORTH GRES DEPOT ; BEERSHEBA BARRACKS-TAMWORTH [11202]	NSW	In buffer area only

Defence - Defence Housing Authority		
Commonwealth Land - Defence Housing Authority [12960]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16070]	NSW	In feature area
Commonwealth Land - Defence Housing Authority [15429]	NSW	In feature area
Commonwealth Land - Defence Housing Authority [16158]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [12977]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [12976]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15427]	NSW	In feature area
Commonwealth Land - Defence Housing Authority [15428]	NSW	In feature area
Commonwealth Land - Defence Housing Authority [16101]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16100]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16069]	NSW	In feature area
Commonwealth Land - Defence Housing Authority [16102]	NSW	In feature area
Commonwealth Land - Defence Housing Authority [16103]	NSW	In feature area
Commonwealth Land - Defence Housing Authority [12981]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [12959]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [12961]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [12974]	NSW	In buffer area only

Commonwealth Heritage Places [Resource Information]

Name	State	Status	Buffer Status
Historic			
Tamworth Post Office	NSW	Listed place	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely to occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area

Extra Information

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Chaffey Dam Pipeline Project	2022/09314		Completed	In buffer area only
Controlled action				
Hills Plain subdivision	2005/2432	Controlled Action	Completed	In buffer area only
One Tree Hill Estate - Stage 13	2003/1142	Controlled Action	Post-Approval	In feature area
Operation of Peel River Drought Protection Works	2019/8590	Controlled Action	Post-Approval	In buffer area only
Vegetation clearing for a residential subdivision	2013/6812	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
Dubbo - Tamworth Natural Gas Pipeline	2000/32	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Replacement Pipeline between Dungowan Village and Calala	2021/9091	Not Controlled Action	Completed	In buffer area only
Residential Development & Assoc Infrastructure 31 & 41 Panorama Road	2005/2115	Not Controlled Action	Completed	In feature area
Residential Subdivision, Warramunga Avenue	2005/2201	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
Aerial baiting for wild dog control	2006/2713	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Rural residential subdivision, Lots 172 and 180 DP753851 Barakula Drive, Moore Creek, NSW	2016/7736	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

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

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

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

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

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

Please feel free to provide feedback via the Contact us page.

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Appendix 6

Vegetation Survey Data / Plots

NSW BAM Assessment

$JOBNAME$
Plot $JOBNUMBER$,

Project Information

Form	753012	Date:	31/10/2023
Form Name	NSW BAM Assessment	Project Reference	Torrens
Plot Number	BC1	Observers	Kelly Matthews

Site Information

IBRA Region	4. Mitchell Grass Downs (MGD)
Vegetation Zone ID	2
Datum	WGS84
Coordinate System	Geographic
MGA Zone	56
Plot Location Description	Woodland white box and red gum

Physiography and Site Features

Lithology	Sedimentary rocks	Soil depth (cm)	1
Landform Element	Plain	Distance to nearest water and type	500
Slope	0-5 Degree	Comments	0
Aspect	South		
Soil surface texture	Silty loam		

Height of Form Group

Emergent Height (m)	0	Middle Stratum Height (m) - Bottom	2
Emergent Height (m) - Bottom	0	Middle Stratum Height (m) - Top	9
Emergent Height (m) - Top	0	Lower Stratum Height (m) - Bottom	0
Upper Stratum Height (m) - Bottom	10	Lower Stratum Height (m) - Top	2

Upper Stratum Height (m) - Top	16		

Disturbance

Type of Disturbance	Clearing
Severity of Disturbance	3
Age of Disturbance	3
Type of Disturbance	Logging
Severity of Disturbance	2
Age of Disturbance	3
Type of Disturbance	Grazing
Severity of Disturbance	1
Age of Disturbance	3

Vegetation Class

PCT	
Large Tree Benchmark Size (DBH)	
Confidence in Tree Benchmark Size	
Presence of EEC	Yes
Confidence in EEC	

Plot Information (20m x 50m)

Orientation of midline from 0 m point (Degree)	210

Plot Photos

Start Location / GPS		End Location / GPS	

Photo from start point	Photo from end point
 North	 North
 East	 East
 South	 South
 West	 West

Function (1,000m2 plot)

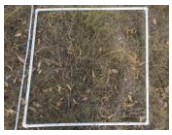
> 80 +cm (Count)	2	10 - 19cm (Count or tick)	10
50 - 79cm (Count or tick, if large tree benchmark size is >50cm)	0	5 - 9cm (Count or tick)	0
30 - 49cm (Count or tick, if large tree benchmark size is >30cm)	4	Presence of Tree Regeneration <5cm	Yes

20 - 29cm (Count or tick, if large tree benchmark size is >20cm)	2	Presence of Hollow-bearing Tree	Yes

Length of fallen logs

Total Length of log	45
Log Per ha Total	450

Quadrat (1m x 1m)

Quadrats	5m	15m	25m	35m	45m	Mean
Litter Cover (%)	100.00	100.00	100.00	80.00	80.00	92.00
Bare Ground Cover (%)	0.00	0.00	0.00	5.00	5.00	2.00
Cryptogram Cover (%)	0.00	0.00	0.00	0.00	0.00	0.00
Rock Cover (%)	0.00	0.00	0.00	0.00	0.00	0.00
Photo						
Total Cover (Must be 100%)	100%	100%	100%	85%	85%	

Species Richness (400m2)

Group Form Code	*Species list*	High Threat Weed	Foliage Cover (0.1, 0.2, 0.3, …, 1, 2, 3, 4, 5, 10, 15, ... 100%)	Abundance (Count 1, 2, etc when ≤10, estimate when >10, integer values)	Voucher taken

Grass & Grasslike (GG)	*Aristida ramosa*		3.00	560	No
Grass & Grasslike (GG)	*Asperula conferta*		1.20	140	No
Grass & Grasslike (GG)	*Austrostipa scabra*		15.00	130	No
Grass & Grasslike (GG)	*Bothriochloa decipiens*		1.00	25	No
Grass & Grasslike (GG)	*Bothriochloa decipiens*		15.00	1300	No
Grass & Grasslike (GG)	*Bromus diandrus**		0.60	20	No
Grass & Grasslike (GG)	*Bromus hordeaceus**		0.60	30	No
Forb (FG)	*Bulbine bulbosa*		2.00	50	No
Grass & Grasslike (GG)	*Carex inversa*		4.00	650	No
Forb (FG)	*Cheilanthes sieberi*		5.00	110	No
Forb (FG)	*Chrysocephalum apiculatum*		3.00	40	No
Forb (FG)	*Dichondra spp.*		1.00	300	No
Forb (FG)	*Dichopogon fimbriatus*		4.00	240	No
Forb (FG)	*Dichopogon strictus*		5.00	260	No
Grass & Grasslike (GG)	*Dryopoa dives*		3.00	120	No
Grass & Grasslike (GG)	*Enneapogon nigricans*		30.00	230	No
Tree (TG)	*Eucalyptus albens*		25.00	4	No

Tree (TG)	*Eucalyptus blakelyi*		38.00	14	No
Tree (TG)	*Eucalyptus melliodora*		0.50	1	No
Forb (FG)	*Galium gaudichaudii*		0.30	50	No
Forb (FG)	*Glycine tabacina*		3.00	30	No
Grass & Grasslike (GG)	*Lolium sp**		2.40	80	
Grass & Grasslike (GG)	*Lomandra multiflora*		15.00	120	No
Grass & Grasslike (GG)	*Poa sieberiana*		4.00	680	No
Grass & Grasslike (GG)	*Rostellularia adscendens*		4.00	230	No
Grass & Grasslike (GG)	*Rytidosperma setaceum*		0.50	20	No
Grass & Grasslike (GG)	*Sporobolus fertilis*		82.00	650	No
Grass & Grasslike (GG)	*Tragus australianus*		2.00	300	No
Forb (FG)	*Vittadinia cuneata*		2.00	50	No
Forb (FG)	*Wahlenbergia spp.*		0.20	30	No

NSW BAM Assessment
BC2

Project Information

Form	753012	Date:	01/11/2023
Form Name	NSW BAM Assessment	Project Reference	PR23273
Plot Number	BC2	Observers	Kelly Matthews

Site Information

IBRA Region	11. Brigalow Belt (BRB)
Vegetation Zone ID	2
Datum	WGS84
Coordinate System	Geographic
MGA Zone	56
Plot Location Description	Paddock, white and yellow box woodland

Physiography and Site Features

Morphological type		Soil colour	Yellow to yellow-brown
Lithology	Sedimentary rocks	Soil depth (cm)	0
Landform Element	Plain	Distance to nearest water and type	50
Slope	Flat	Microrelief	
Aspect	West	Comments	Adjacent to creek
Soil surface texture	Silty loam		

Height of Form Group

Emergent Height (m)		Middle Stratum Height (m) - Bottom	0
Emergent Height (m) - Bottom	0	Middle Stratum Height (m) - Top	0
Emergent Height (m) - Top	0	Lower Stratum Height (m) - Bottom	0

Upper Stratum Height (m) - Bottom	14	Lower Stratum Height (m) - Top	2
Upper Stratum Height (m) - Top	18		

Disturbance

Type of Disturbance	Grazing
Severity of Disturbance	3
Age of Disturbance	3
Type of Disturbance	Logging
Severity of Disturbance	3
Age of Disturbance	3
Type of Disturbance	Clearing
Severity of Disturbance	3
Age of Disturbance	3

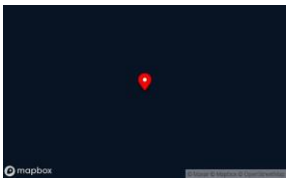
Vegetation Class

PCT	599
Large Tree Benchmark Size (DBH)	50
Confidence in Tree Benchmark Size	Composition: High | Structure: Moderate | Function: Logs-High; Litter-Very High; Large Trees-Moderate
Presence of EEC	Yes
Confidence in EEC	100%

Plot Information (20m x 50m)

Orientation of midline from 0 m point (Degree)	258

Plot Photos

Start Location / GPS		End Location / GPS	
Photo from start point		Photo from end point	
 North		 North	
 East		 East	
 South		 South	
 West		 West	
Landscape photo(s)	 		

	
Spot photo(s)	

Function (1,000m2 plot)

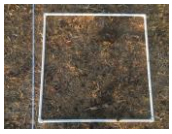
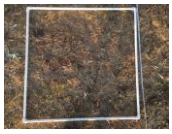
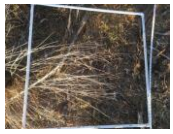
> 80 +cm (Count)	5	10 - 19cm (Count or tick)	0
50 - 79cm (Count or tick, if large tree benchmark size is >50cm)	4	5 - 9cm (Count or tick)	0
30 - 49cm (Count or tick, if large tree benchmark size is >30cm)	4	Presence of Tree Regeneration <5cm	No
20 - 29cm (Count or tick, if large tree benchmark size is >20cm)	3	Presence of Hollow-bearing Tree	Yes

Length of fallen logs

Total Length of log	126
Log Per ha Total	1260

Quadrat (1m x 1m)

Quadrats	5m	15m	25m	35m	45m	Mean
Litter Cover (%)	98.00	95.00	95.00	91.00	98.00	95.40
Bare Ground Cover (%)	2.00	5.00	5.00	8.00	2.00	4.40
Cryptogram Cover (%)	0.00	0.00	0.00	0.00	0.00	0.00

Rock Cover (%)	0.00	0.00	0.00	0.00	0.00	0.00
Photo						
Total Cover (Must be 100%)	100%	100%	100%	99%	100%	

Species Richness (400m2)

Group Form Code	*Species list*	High Threat Weed	Foliage Cover (0.1, 0.2, 0.3, …, 1, 2, 3, 4, 5, 10, 15, ... 100%)	Abundance (Count 1, 2, etc when ≤10, estimate when >10, integer values)	Voucher taken
Grass & Grasslike (GG)	*Aristida ramosa*		4.00	60	No
Grass & Grasslike (GG)	*Austrostipa scabra*		3.00	50	No
Grass & Grasslike (GG)	*Austrostipa verticillata*		8.00	80	No
Forb (FG)	*Boerhavia dominii*		12.00	130	No
Forb (FG)	*Bromus hordeaceus**		9.00	80	No
Forb (FG)	*Calotis lappulacea*		3.00	140	No
Forb (FG)	*Carthamus lanatus**		20.00	80	No
Forb (FG)	*Chamaesyce drummondii*		4.00	30	No
Forb (FG)	*Chrysocephalum apiculatum*		0.30	15	No
Forb (FG)	*Convolvulus graminetinus*		20.00	80	**No**

Grass & Grasslike (GG)	*Cynodon dactylon*		44.00	250	No
Forb (FG)	*Dichondra sp A*		6.00	90	**No**
Forb (FG)	*Echium plantagineum* *		0.70	20	No
Forb (FG)	*Einadia nutans*		1.20	30	No
Grass & Grasslike (GG)	*Elymus scaber*		0.10	10	No
Grass & Grasslike (GG)	*Enneapogon nigricans*		2.00	10	No
Tree (TG)	*Eucalyptus albens*		16.00	2	No
Tree (TG)	*Eucalyptus blakelyi*		0.50	1	No
Tree (TG)	*Eucalyptus melliodora*		22.00	3	No
Forb (FG)	*Glycine tabacina*		3.00	30	**No**
Forb (FG)	*Hedypnois rhagadioloides**		6.00	90	No
Shrub (SG)	*Lycium ferocissimum*		6.00	2	No
Forb (FG)	*Plantago debilis*		0.70	20	**No**
Forb (FG)	*Plantago lanceolata**		6.00	80	**No**
Grass & Grasslike (GG)	*Rytidosperma richardsonii*		5.00	40	No
Forb (FG)	*Salvia reflexa**		2.00	40	**No**
Forb (FG)	*Sisymbrium officinale**		3.00	30	No
Forb (FG)	*Sonchus oleraceus**		2.00	40	No
Forb (FG)	*Trifolium campestre**		6.00	80	No
Forb (FG)	*Vulpia muralis**		3.00	140	**No**
Forb (FG)	*Wahlenbergia luteola*		0.10	10	No

Appendix 7

Credit reports

Append a copy (PDF format) of the following BAM-C credit reports with finalised status:

- Credits summary report
- Biodiversity credit report (Like-for-like)
- Candidate threatened species report
- Predicted species report.

Appendix 8

BDAR Compliance Requirements

Table 27 to specify where each component of the BDAR minimum information requirements has been addressed in accordance with BAM Appendix K.

Table 27 Assessment of compliance with BDAR minimum information requirements

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
Introduction	Chapters 2 and 3	Information	
		Introduction to the biodiversity assessment including:	–
		☒ brief description of the proposal	1.1.1
		☒ identification of subject land boundary, including: ☒ operational footprint ☒ construction footprint indicating clearing associated with temporary/ancillary construction facilities and infrastructure	1.1.3
		☒ general description of the subject land	1.1.3
		☒ sources of information used in the assessment, including reports and spatial data	2.1
		☒ identification and justification for entering the BOS	1.2
		Maps and tables	
		☒ Map of the subject land boundary showing the final proposal footprint, including the construction footprint for any clearing associated with temporary/ancillary construction facilities and infrastructure	Appendix 3

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
Landscape	Sections 3.1 and 3.2, Appendix E	Information	
		Identification of site context components and landscape features, including:	–
		☒ general description of subject land topographic and hydrological setting, geology and soils	3.2.1
		☒ per cent native vegetation cover in the assessment area (as described in BAM Section 3.2)	2.3
		☒ IBRA bioregions and subregions (as described in BAM Subsection 3.1.3(2.))	3.2.1
		☒ rivers and streams classified according to stream order (as described in BAM Subsection 3.1.3(3.) and Appendix E)	3.2.2
		☒ wetlands within, adjacent to and downstream of the site (as described in BAM Subsection 3.1.3(3.))	3.2.2
		☒ connectivity of different areas of habitat (as described in BAM Subsection 3.1.3(5–6.))	3.2.3
		☒ karst, caves, crevices, cliffs, rocks and other geological features of significance and for vegetation clearing proposals, soil hazard features (as described in BAM Subsections 3.1.3(7.) and 3.1.3(12.))	3.2.5
		☒ areas of outstanding biodiversity value occurring on the subject land and assessment area (as described in BAM Subsection 3.1.3(8–9.))	3.2.4
		☒ any additional landscape features identified in any SEARs for the proposal	3.2.5
		☒ NSW (Mitchell) landscape on which the subject land occurs	3.2.6
		☒ details of field reconnaissance undertaken to confirm the extent and condition of landscape features and native vegetation cover (as described in Operational Manual Stage 1 Section 2.4)	4.1

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		Maps and tables	
		☒ Site Map ☒ Property boundary ☒ Boundary of subject land ☒ Cadastre of subject land (including labelling of Lot and DP or section plan if relevant) ☒ Landscape features identified in BAM Subsection 3.1.3	Figure 2
		☒ Location Map ☒ Digital aerial photography at 1:1,000 scale or finer ☒ Boundary of subject land ☒ Assessment area (i.e. the subject land and either 1500 m buffer area or 500 m buffer for linear development) ☒ Landscape features identified in BAM Subsection 3.1.3 ☒ Additional detail (e.g. local government area boundaries) relevant at this scale	Figure 3
		Landscape features identified in BAM Subsection 3.1.3 and to be shown on the Site Map and/or Location Map include:	–
		☒ IBRA bioregions and subregions ☒ rivers, streams and estuaries ☒ wetlands and important wetlands ☒ connectivity of different areas of habitat ☒ karst, caves, crevices, cliffs, rocks and other geological features of significance and if required, soil hazard features	Figure 1, Figure 2 and Figure 3

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ areas of outstanding biodiversity value occurring on the subject land and assessment area ☒ any additional landscape features identified in any SEARs for the proposal ☒ NSW (Mitchell) landscape on which the subject land occurs	
		Data	
		☐ All report maps as separate jpeg files	no PDF and shapefiles
		Individual digital shape files of:	–
		☒ subject land boundary	–
		☒ assessment area (i.e. subject land and 1500 m buffer area) boundary	–
		☒ cadastral boundary of subject land	–
		☒ areas of native vegetation cover	–
		☒ landscape features	–
Native vegetation	Chapter 4, Appendix A and Appendix H	Information	
		☒ Identify native vegetation extent within the subject land, including cleared areas and evidence to support differences between mapped vegetation extent and aerial imagery (as described in BAM Section 4.1(1–3.) and Subsection 4.1.1)	4.1 & Figure 7
		☒ Provide justification for all parts of the subject land that do not contain native vegetation (as described in BAM Subsection 4.1.2)	4.1.2

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ Review of existing information on native vegetation including references to previous vegetation maps of the subject land and assessment area (described in BAM Section 4.1(3.) and Subsection 4.1.1)	4.1.1
		☒ Describe the systematic field-based floristic vegetation survey undertaken in accordance with BAM Section 4.2	2.4
		☐ Where relevant, describe the use of more appropriate local data, provide reasons that support the use of more appropriate local data and include the written confirmation from the decision-maker that they support the use of more appropriate local data (as described in BAM Subsection 1.4.2 and Appendix A)	
		For each PCT within the subject land, describe:	–
		☒ PCT name and ID	4.2 and Figure 8
		☒ vegetation class	4.4
		☒ extent (ha) within subject land	4.2
		☒ evidence used to identify a PCT including any analyses undertaken, references/sources, existing vegetation maps (BAM Section 4.2(1–3.))	4.2
		☒ plant species relied upon for identification of the PCT and relative abundance of each species	Insert relevant reference and Appendix 6
		☒ if relevant, TEC status including evidence used to determine vegetation is the TEC (BAM Subsection 4.2.2(1–2.))	4.2 & Figure 8
		☒ estimate of per cent cleared value of PCT (BAM Subsection 4.2.1(5.))	4.2
		Describe the vegetation integrity assessment of the subject land, including:	–
		☐ identification and mapping of vegetation zones (as described in BAM Subsection 4.3.1)	4.4 and Figure 10

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ description of vegetation zones within the subject land (as described in Operational Manual Stage 1 Table 2 and Subsection 3.3.2)	4.4 and Figure 10
		☒ area (ha) of each vegetation zone	4.4
		☒ assessment of patch size (as described in BAM Subsection 4.3.2)	4.4
		☒ survey effort (i.e. number of vegetation integrity survey plots) as described in BAM Subsection 4.3.4(1–2.)	4.5.1
		☒ use of relevant benchmark data from BioNet Vegetation Classification (as described in BAM Subsection 4.3.3(5.))	4.5.3
		Where use of more appropriate local benchmark data is proposed (as described in BAM Subsection 1.4.2, BAM Subsection 4.3.3(5.) and BAM Appendix A):	–
		☒ identify the PCT or vegetation class for which local benchmark data will be applied ☒ identify published sources of local benchmark data (if benchmarks obtained from published sources) ☒ describe methods of local benchmark data collection (if reference plots used to determine local benchmark data)	4.5.3
		☒ provide justification for use of local data rather than BioNet Vegetation Classification benchmark values	4.5.3
		☐ provide written confirmation from the decision-maker that they support the use of local benchmark data	Not applicable
		Maps and tables	
		☐ Map of native vegetation extent within the subject land at scale not greater than 1:10,000 including identification of all areas of native vegetation including areas that are ground cover only, cleared areas (as described in BAM Section 4.1(1–3.)) and all parts of the subject land that do not contain native vegetation (BAM Subsection 4.1.2)	Figure 8

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ Map of PCTs within the subject land (as described in BAM Section 4.2(1.))	Figure 8
		☒ Map of vegetation zones within the subject land (as described in BAM Subsection 4.3.1)	Figure 10
		☒ Map the location of floristic vegetation survey plots and vegetation integrity survey plots relative to PCT boundaries	Figure 6
		☒ Map of TEC distribution on the subject land and table of TEC listing, status and area (ha)	Figure 9 & Table 5
		☒ Map of patch size locations for each native vegetation zone and table of patch size areas (as described in BAM Subsection 4.3.2)	Figure 10 & Table 6
		Table of current vegetation integrity scores for each vegetation zone within the site and including:	–
		☒ composition condition score ☒ structure condition score ☒ function condition score ☒ presence of hollow bearing trees	Table 7
		Data	
		☐ All report maps as separate jpeg files	PDF ONLY provided – jpeg can be screen shot or snip from PDF
		☐ Plot field data (MS Excel format)	PDF ONLY provided – jpeg can be screen shot or snip from PDF
		☒ Plot field datasheets	Appendix 6
		Digital shape files of:	–

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ PCT boundaries within subject land	–
		☒ TEC boundaries within subject land	–
		☒ vegetation zone boundaries within subject land	–
		☒ floristic vegetation survey and vegetation integrity plot locations	–
Threatened species	Chapter 5	Information	
		Identify ecosystem credit species likely to occur on the subject land, including:	–
		☒ list of ecosystem credit species derived from the BAM-C (as described in BAM Subsection 5.1.1 and Section 5.2(1.))	Tabe 9
		☒ justification and supporting evidence for exclusion of any ecosystem credit species based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2)	5.1.1
		☒ justification for addition of any ecosystem credit species to the list	5.1.1
		Identify species credit species likely to occur on the subject land, including:	–
		☒ list of species credit species derived from the BAM-C (as described in BAM Subsection 5.1.1)	Table 10
		☒ justification and supporting evidence for exclusions based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2)	5.1.2
		☒ justification and supporting evidence for exclusions based on degraded habitat constraints and/or microhabitats on which the species depends (as described in BAM Subsection 5.2.2)	5.1.2
		☒ justification for addition of any species credit species to the list	5.1.2

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		From the list of candidate species credit species, identify:	–
		☒ species assumed present within the subject land (if relevant) (as described in BAM Subsection 5.2.4(2.a.)) ☒ species present within the subject land on the basis of being identified on an important habitat map for a species (as described in BAM Subsection 5.2.4(2.d.)) ☒ species for which targeted surveys are to be completed to determine species presence (BAM Subsection 5.2.4(2.b.)) ☒ species for which an expert report is to be used to determine species presence (BAM Subsection 5.2.4(2.c.))	Table 11 and Table 12
		Present the outcomes of species credit species assessments from:	–
		☒ threatened species survey (as described in BAM Section 5.2.4)	Table 12 and Table 13
		☐ expert reports (if relevant) including justification for presence of the species and information used to make this determination (as described in BAM Subsection 5.2.4, Section 5.3, Box 3)	Not applicable
		Where survey has been undertaken include detailed information on:	–
		☒ survey method and effort (as described in BAM Section 5.3)	2.6
		☒ justification of survey method and effort (e.g. citation of peer-reviewed literature) if approach differs from the department's taxa-specific survey guides or where no relevant guideline has been published	5.3 and Table 14
		☒ timing of survey in relation to requirements in the TBDC or the department's taxa-specific survey guides. Where survey was undertaken outside these guides include justification for the timing of surveys	5.3 and Table 14
		☒ survey personnel and relevant experience	Declaration ii and Appendix 2
		☒ describe any limitations to surveys and how these were addressed/overcome	5.3

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		Where an expert report has been used in place of survey (as described in BAM Section 5.3, Box 3), include:	–
		☐ justification of the use of an expert report ☐ identify the expert, provide evidence of their expert credentials and departmental approval of expert status ☐ all requirements of Box 3 have been addressed in the expert report	Not applicable
		Where use of local data is proposed (BAM Subsection 1.4.2):	–
		☒ identify relevant species ☒ identify data to be amended ☒ identify source of information for local data, e.g. published literature, additional survey data, etc. ☒ justify use of local data in preference to VIS Classification or TBDC data	5.5
		☐ provide written confirmation from the decision-maker that they support the use of local data	Not applicable
		Species polygon completed for species credit species present within the subject land (assumed present or determined on the basis of survey, expert report or important habitat map) ensuring that:	–
		☒ the unit of measure for each species is documented	Table 17
		for species assessed by area:	–
		☒ the polygon includes the extent of suitable habitat for the target species within the subject land (as described in BAM Subsection 5.2.5)	Figure 11
		☒ a description of, and evidence-based justification for, the habitat constraints, features or microhabitats used to map the species polygon including reference to information in the TBDC for that species and any buffers applied	5.5

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		for species assessed by counts of individuals:	–
		☐ the number of individual plants present on the subject land (as described in BAM Subsection 5.2.5(3.))	Not applicable
		☐ the method used to derive this number (i.e. threatened species survey or expert report) and evidence-based justification for the approach taken	Not applicable
		☐ the polygon includes all individuals located on the subject land with a buffer of 30 m around the individuals or groups of individuals on the subject land	Not applicable
		☒ Identify the biodiversity risk weighting for each species credit species identified as present within the subject land (as described in BAM Section 5.4)	Table 13 and Table 21
		Maps and tables	
		☒ Table showing ecosystem credit species in accordance with BAM Subsection 5.1.1, and identifying:	
		☒ the ecosystem credit species removed from the list	Table 9
		☒ the sensitivity to gain class of each species	Table 9
		☒ Table detailing species credit species in accordance with BAM Section 5.2 and identifying:	Table 10
		☒ the species credit species removed from the list of species because the species is considered vagrant, out of geographic range or the habitat or microhabitat features are not present	Table 10
		☒ the candidate species credit species not recorded on the subject land as determined by targeted survey, expert report or important habitat map	Table 11 and Table 12
		☒ Table detailing species credit species recorded or assumed as present within the subject land, habitat constraints or microhabitats associated with the species, counts of individuals (flora)/extent of suitable habitat (flora and fauna) (as described in BAM Subsection 5.2.6) and biodiversity risk weighting (BAM Section 5.4)	5.2, Table 11 and Table 12

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ Map indicating the GPS coordinates of all individuals of each species recorded within the subject land and the species polygon for each species (as described in BAM Subsection 5.2.5)	Figure 11
		Data	
		☒ Digital shape files of suitable habitat identified for survey for each candidate species credit species	_
		☒ Survey locations including GPS coordinates of any plots, transects, grids	Appendix 6
		☒ Digital shape files of each species polygon including GPS coordinates of located individuals	_
		☒ Species polygon map in jpeg format	_
		☒ Expert reports and any supporting data used to support conclusions of the expert report	not applicable
		☒ Field datasheets detailing survey information including prevailing conditions, date, time, equipment used, etc.	Appendix 6
Prescribed impacts	Chapter 6	Information	
		Identify potential prescribed biodiversity impacts on threatened entities, including:	–
		☒ karst, caves, crevices, cliffs, rocks and other geological features of significance (as described in BAM Subsection 6.1.1) ☒ occurrences of human-made structures and non-native vegetation (as described in BAM Subsection 6.1.2) ☒ corridors or other areas of connectivity linking habitat for threatened entities (as described in BAM Subsection 6.1.3) ☒ waterbodies or any hydrological processes that sustain threatened entities (as described in BAM Subsection 6.1.4)	Table 14

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☐ protected animals that may use the proposed wind farm development site as a flyway or migration route (as described in BAM Subsection 6.1.5)	Not applicable
		☒ where the proposed development may result in vehicle strike on threatened fauna or on animals that are part of a threatened ecological community (as described in BAM Subsection 6.1.6)	Table 14
		☒ Identify a list of threatened entities that may be dependent upon or may use habitat features associated with any of the prescribed impacts	6.0
		☒ Describe the importance of habitat features to the species including, where relevant, impacts on life cycle or movement patterns (e.g. Subsection 6.1.3)	6.0
		Where the proposed development is for a wind farm:	–
		☐ identify a candidate list of protected animals that may use the development site as a flyway or migration route, including: resident threatened aerial species, resident raptor species and nomadic and migratory species that are likely to fly over the proposal area (as described in BAM Subsection 6.1.5)	Not applicable
		☐ provide details of targeted survey for candidate species of wind farm developments undertaken in accordance with BAM Subsection 6.1.5(2–3.)	Not applicable
		☐ predict the habitual flight paths for nomadic and migratory species likely to fly over the subject land and map the likely habitat for resident threatened aerial and raptor species (BAM Subsection 6.1.5(4.))	Not applicable
		Where the proposal may result in vehicle strike:	Not applicable
		☐ identify a list of threatened fauna or protected fauna species that are part of a TEC and at risk of vehicle strike due to the proposal	Not applicable
		Maps and tables	

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ Map showing location of any prescribed impact features (i.e. karst, caves, crevices, cliffs, rocks, human-made structures, etc.)	Figure 1, Figure 2 and Figure 3
		☐ Map showing location of potential vehicle strike locations	not applicable
		☐ Maps of habitual flight paths for nomadic and migratory species likely to fly over the site and maps of likely habitat for threatened aerial species resident on the site (for wind farm developments only)	not applicable
		Data	
		☒ Digital shape files of prescribed impact feature locations	_
		☒ Prescribed impact features map in jpeg format	PDF ONLY provided – jpeg can be screen shot or snip from PDF
Avoid and minimise impacts	Chapter 7	Information	
		Demonstration of efforts to avoid and minimise impacts on biodiversity values (including prescribed impacts) associated with the proposal location in accordance with Chapter 7, including an analysis of alternative:	–
		☒ modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology	7.1 and 7.2
		☒ routes that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed route	7.1 and 7.2
		☒ alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location	7.1 and 7.2

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ alternative sites within a property on which the proposal is located that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed site	7.1 and 7.2
		☒ Describe efforts to avoid and minimise impacts (including prescribed impacts) to biodiversity values through proposal design (as described in BAM Sections 7.1 and 7.2)	7.1 and 7.2
		☒ Identification of any other site constraints that the proponent has considered in determining the location and design of the proposal (as described in BAM Subsection 7.2.1(3.))	7.3
		☒ Detail measures or options considered but not implemented because they are not feasible and/or practical (e.g. due to site constraints)	7.3
		Maps and tables	
		☒ Table of measures to be implemented to avoid and minimise the impacts of the proposal, including action, outcome, timing and responsibility	Table 17 and Table 19
		☒ Map of alternative footprints considered to avoid or minimise impacts on biodiversity values; and of the final proposal footprint, including construction and operation	Figure 3
		☒ Maps demonstrating indirect impact zones where applicable	Figure 12
		Data	
		Digital shape files of:	–
		☐ alternative and final proposal footprint	–
		☒ direct and indirect impact zones	–
		☐ Maps in jpeg format	PDF ONLY provided – jpeg can be screen shot or snip from PDF

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
Assessment of impacts	Chapter 8, Sections 8.1 and 8.2	Information	
		☒ Determine the impacts on native vegetation and threatened species habitat, including a description of direct impacts of clearing of native vegetation, threatened ecological communities and threatened species habitat (as described in BAM Section 8.1)	Table 21 and Table 22
		Assessment of indirect impacts on vegetation and threatened species and their habitat including (as described in BAM Section 8.2):	–
		☒ description of the nature, extent, frequency, duration and timing of indirect impacts of the proposal	Table 21 and Table 22
		☒ documenting the consequences to vegetation and threatened species and their habitat including evidence-based justifications	8.2
		☒ reporting any limitations or assumptions, etc. made during the assessment	8.2
		☒ identification of the threatened entities and their habitat likely to be affected	Table 20
		Assessment of prescribed biodiversity impacts (as described in BAM Section 8.3) including:	–
		assessment of the nature, extent frequency, duration and timing of impacts on the habitat of threatened species or ecological communities associated with:	–
		☒ karst, caves, crevices, cliffs, rocks and other features of geological significance	8.2.3
		☒ human-made structures	8.2.3
		☒ non-native vegetation	8.2.3
		☒ connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range	8.2.3
		☒ movement of threatened species that maintains their life cycle	8.2.3

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ water quality, waterbodies and hydrological processes that sustain threatened species and threatened ecological communities	8.2.3
		☐ assessment of the impacts of wind turbine strikes on protected animals	not applicable
		☒ assessment of the impacts of vehicle strikes on threatened species of animals or on animals that are part of a TEC	8.2.2
		☒ evaluate the consequences of prescribed impacts	8.2.3
		☒ describe impacts that are uncertain	8.2.3
		☒ document limitations to data, assumptions and predictions	8.2 and 1.1
		Maps and tables	
		☒ Table showing change in vegetation integrity score for each vegetation zone as a result of identified impacts	Table 18
		Data	
		N/A	–
Mitigation and management of impacts	Chapter 8, Sections 8.4 and 8.5	Information	
		Identification of measures to mitigate or manage impacts in accordance with the recommendations in BAM Sections 8.4 and 8.5 including:	–
		☒ techniques, timing, frequency and responsibility ☒ identify measures for which there is risk of failure	Table 20

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ evaluate the risk and consequence of any residual impacts	
		☐ document any adaptive management strategy proposed	Not provided
		Identification of measures for mitigating impacts related to:	–
		☒ displacement of resident fauna (as described in BAM Subsection 8.4.1(2.))	8.2
		☒ indirect impacts on native vegetation and habitat (as described in BAM Subsection 8.4.1(3.))	
		☒ mitigating prescribed biodiversity impacts (as described in BAM Subsection 8.4.2)	
		☐ Details of the adaptive management strategy proposed to monitor and respond to impacts on biodiversity values that are uncertain (BAM Section 8.5)	Not provided – wll be prepared as part of approval conditions
		Maps and tables	
		☒ Table of measures to be implemented before, during and after construction to mitigate and manage impacts of the proposal, including action, outcome, timing and responsibility	Table 20
		Data	
		N/A	–
Impact summary	Chapter 9	Information	
		Identification and assessment of impacts on TECs and threatened species that are at risk of a serious and irreversible impacts (SAII, in accordance with BAM Section 9.1) including:	–
		☒ addressing all criteria in Subsection 9.1.1 for each TEC listed as at risk of an SAII present on the subject land	Table 20, Table 21 and Table 22
		☒ for each TEC, report the extent of the TEC in NSW	Table 21

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ addressing all criteria in Subsection 9.1.2 for each threatened species at risk of an SAII present on the subject land	Table 20, Table 21 and Table 22
		☒ for each threatened species, report the population size in NSW	Table 22
		☒ documenting assumptions made and/or limitations to information ☒ documenting all sources of data, information, references used or consulted ☒ clearly justifying why any criteria could not be addressed	Table 20, Table 21 and Table 22
		☒ Identification of impacts requiring offset in accordance with BAM Section 9.2	Table 23 and Table 24
		☒ Identification of impacts not requiring offset in accordance with BAM Subsection 9.2.1(3.)	not applicable
		☒ Identification of areas not requiring assessment in accordance with BAM Section 9.3	8.3
		Maps and tables	
		☒ Map showing the extent of TECs at risk of an SAII within the subject land	Figure 12
		☒ Map showing location of threatened species at risk of an SAII within the subject land	Figure 12
		Map showing location of:	–
		☒ impacts requiring offset	Figure 12
		☒ impacts not requiring offset	Figure 12
		☒ areas not requiring assessment	Figure 12
		Data	
		Digital shape files of:	–
		☒ extent of TECs at risk of an SAII within the subject land	–

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ location of threatened species at risk of an SAII within the subject land	_
		☒ boundary of impacts requiring offset	_
		☒ boundary of impacts not requiring offset	_
		☒ boundary of areas not requiring assessment	_
		☐ Maps in jpeg format	PDF ONLY provided – jpeg can be screen shot or snip from PDF
Impact summary	Chapter 10	Information	
		Ecosystem credits and species credits that measure the impact of the development on biodiversity values, including:	–
		☒ future vegetation integrity score for each vegetation zone within the subject land (Equation 25 and Equation 26 in BAM Appendix H) ☒ change in vegetation integrity score (BAM Subsection 8.1.1) ☒ number of required ecosystem credits for the direct impacts of the proposal on each vegetation zone within the subject land (BAM Subsection 10.1.2)	Table 23 and Table 24
		☒ biodiversity risk weighting for each	Table 23 and Table 24
		☒ number of required species credits for each candidate threatened species that is directly impacted on by the proposal (BAM Subsection 10.1.3)	Table 23 and Table 24
		Maps and tables	
		☒ Table of PCTs requiring offset and the number of ecosystem credits required	Table 23
		☒ Table of threatened species requiring offset and the number of species credits required	Table 24

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		Data	
		☒ Submitted proposal in the BAM Calculator	_
Biodiversity credit report	Chapter 10	Information	
		☒ Description of credit classes for ecosystem credits and species credits at the development or clearing site or land to be biodiversity certified (BAM Section 10.2)	Table 23 and Table 24
		☒ BAM credit report in pdf format	Appendix 7
		Maps and tables	
		☒ Table of credit class and matching credit profile	Table 25
		Data	
		☒ BAM credit report in pdf format	Appendix 7