



Department of Planning and Environment

Biodiversity Development Assessment Report

Williams Park Estate, Thurgoona, NSW 2640

Prepared by Red-Gum Environmental Consulting Pty Ltd

(Project Lead: Stuart Mendham - BAM Accredited Assessor Number BAAS24052)



Final Report, 29 April 2025

Document control

Version	Date	Author	Details
1	27/02/2025	S. Mendham & D. Wall	Draft version issued for client comment
2	29/4/2025	S. Mendham & D. Wall	Final version for submission

Summary

This Biodiversity Development Assessment Report (BDAR) relates to the proposed subdivision of Lot 2 DP1189190, Lot 301 DP1124543, and Lot 302 DP1124543 at Williams Road, Thurgoona, NSW. There are also minor impacts occurring in the adjoining C3 land parcels of Lot 101 DP1128114 and Lot 303 DP1124543 (reserves on and adjoining Williams Road) and Lot 205 DP112899 (reserve around Eight Mile Creek). The BDAR has been undertaken to accompany a Development Application (DA) under Part 4 of the *Environmental Planning and Assessment Act 1979* (EPA Act), to be submitted to Albury City (Council).

This BDAR relates to the proposed subdivision of approximately 85 hectares of Subject Land over three lots at Williams Road, Thurgoona. The majority of the development site is vacant agricultural land that is used for cropping, set-stock grazing and fodder production, resulting in very little native vegetation remaining on the development site, aside from mostly scattered remnant trees. Works are also impacting small areas of the Environmental Management (C3) zoned road reserve associated with Williams Road, which bisects the estate, where remnant native vegetation including some native understorey species are persisting along the much of the roadside. There are also small impacts being incurred to a thin area of C3 land in the small development areas in the vicinity of Eight Mile Creek. The Subject Land includes an area dedicated to a future educational precinct, located between the main development area on the southern side of Williams Road, however no impacts in this area are included in the BDAR, and will be dealt with via a future assessment.

The development site is zoned General Residential (R1) for the majority of the development area, where all substantial impacts associated (roads and residential lots) with the development are to take place. As described above, there is also some C3 zoned land within the Subject Land, of which only several small areas are to be impacted by works associated with the development, mostly occurring along the road reserve of Williams Road, with works being of a linear 'roads and services connectivity' nature between the two main sections of the estate. The land is zoned under the Albury City *Local Environmental Plan 2010* (LEP), and with the Subject Land being excluded from the LLS Act, native vegetation is to be assessed through the *State Environmental Planning Policy (Biodiversity and Conservation) 2021*.

A Test of Significance (ToS) was produced by Hamilton Environmental Services (in 2023) for the subdivision development, however feedback from Council outlined several shortcomings in the scope of the ToS (the scope was restricted to C3 land impacts only), and broader assessment of the entire Subject Land was requested. In addition, Council also required a BDAR be produced, and an assessment be undertaken of all native vegetation on site and all BAM-C generated threatened species on the areas of C3 land, and a select number of threatened species on R1 land (the twelve species listed under the *Biodiversity Conservation Act 2016* (BC Act) since the R1 land was biocertified in 2011). Furthermore, Council required an assessment of listed Significant and Irreversible Impact (SII) candidates under the BC Act, including Box Gum Woodlands (based on conservation values), Sloane's Froglet, and the Regent Honeyeater (based on important habitat mapping). The BDAR has included the above requirements, and has been undertaken to accompany a DA under Part 4 of the EPA Act, to be submitted to Council.

The development footprint parts of the 85 hectare Subject Land area are proposed to be subdivided via an eight stage development called 'Williams Park Estate', and consist of four hundred and sixty two (462) residential lots, and one (1) englobo school lot (education precinct), with house lots ranging in size from 700 to 1561 square metres. The development footprint also includes several open spaces and natural reserves, the most significant of which will be the existing road reserve of Williams Road (approximately 7 hectares in size) which is being closed to vehicle traffic. The works will also include the development of an internal road network, construction of footpaths and bicycle paths, underground services, stormwater basins and Sloane's Froglet chain-of-ponds wetlands (habitat and

connectivity purposes), filling of a farm dam, fencing, revegetation areas and general rehabilitation works of the developed areas. The proposed works will require a small amount of native vegetation removal over parts of the site, significant earthworks to level the construction areas of the site and to create water basins and wetlands, and the installation of underground utilities required for the residential lots.

Throughout the main development footprint, there are eighty nine (89) native trees which are within the R1 zones part of the development area, including forty-five (45) trees in a patch of Blakely's Red-gum near the proposed estate entry road (all of which is being retained in a reserve), and thirty-four (34) scattered trees located throughout the paddocks, eleven (11) of which are being removed, and seventeen (17) are being deemed lost due to unpredictable tree protection zone (TPZ) impacts, but are to be retained for aesthetics and habitat purposes. There is also one R1 patch tree being deemed lost. Impacts in these R1 areas will range from moderate to significant, with varying levels of excavation required, including shaping and reforming the land surface, some trenching and under boring for services, as well as the ongoing impacts of the development as the estate is built and starts to function, including from physical construction of houses and gardens to the ongoing use of the residential lots and roadways, for day-to-day living for its residents.

In total 0.26 hectares of native vegetation on C3 land will be removed/impacted from the proposed development, and a total of fifty-nine (59) trees are deemed lost (36 to be removed and 23 deemed lost but are to be retained).

The selection of the Subject Land was made based on its general absence of high-quality habitats, with the majority of the property being dominated by exotic vegetation, except for some remnant scattered trees and a small patch of trees. Other efforts were taken to avoid and minimise impacts to environmental values on and surrounding the Subject Land, the most significant of which include:

- The initial design earmarked the patch of 45 Blakey's Red-gum on the R1 land to be cleared, however it was decided to retain this area after discussions between engineers and project ecologists, based on the value of this area as part of the NSW Grassy Woodland Threatened Ecological Community (TEC). This area is now to be reserved and managed as a conservation area, with habitat augmentation to occur including revegetation and nestbox installations.
- The realignment of a connecting path between the northern estate section and the road reserve of Williams Road was incorporated, to capitalise on the position of an existing gate and disturbed area along a fence line. The new impact area is clear of any significant trees and quality native grass cover, helping to reduce impacts from construction to trees and helps protect a moderate quality derived native grassland just east of the new alignment (now being protected).
- Numerous design changes and specific requirements have been incorporated for Sloane's Froglet, including the creation of a chain-of-ponds style wetlands drainage system (connectivity corridor) which is being constructed to Sloane's Froglet design standards, and is aiming to replace some of the connectivity being lost as a result of developing through current movement corridors for the species. All stormwater basins are also being designed to Sloane's Froglet habitat requirements, effectively contributing to increasing the suitable breeding habitat that is available for the species across the Subject Land.
- Efforts are being made to retain trees wherever possible, providing they do not pose an asset or health and safety risk to future residents or users of the local area. There are numerous trees that have been deemed lost due to TPZ impacts or unpredictable future impacts from ongoing use of the estate by residents. However, where possible and safe, many of these trees are still being retained for aesthetic and habitat purposes. For instance, of the fifty-nine (59) trees being removed or deemed lost, twenty-three (23) trees are being retained on site.

There are three Plant Community Types (PCTs) present in the Subject Land, those being, in order of dominance:

- PCT 266 'White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion' (3.98 hectares);
- PCT 277 'Blakeley's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion' (3.12 hectares); and
- PCT 278 'Riparian Blakeley's Red Gum – box – shrub – sedge – grass tall open forest of the central NSW South Western Slopes Bioregion' (0.17 hectares).

Combined, there is 7.28 hectares of native patch vegetation present, which equates to 9% of the Subject Land. Almost all of the patch vegetation occurs on C3 land. Where remnant patch vegetation persists, these areas are considered BC Act listed Grassy Woodlands TEC, based on the presence of mature canopy trees and their ability to be rehabilitated. However, assessment revealed there are no areas that qualify for the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed Grassy Woodlands TEC, based upon these woodland areas being lower quality and small in size, therefore not meeting the stricter EPBC Act listing criteria.

Targeted surveys were conducted to search for candidate threatened species, as determined by the BAM-C (via three child cases under parent case: 00054054) and by database searches for the area within 10 kilometres (km) of the Subject Land. Surveys revealed that there were threatened species present, including Squirrel Glider (spotlighted and detected on numerous remote cameras), Sloane's Froglet (present in all waterways and drainage lines across much of the Subject Land), as well as Scarlet Robin and Flame Robin, which were in the interface between R1 and C3 land. In addition to these, Regent Honeyeater was presumed present, based on the presence of vegetation mapped on the species' important habitat map (IHM), and Southern Myotis was also presumed present, due to the difficulty in excluding the species based on expert assessment of bat call data. No threatened flora was present on site.

Direct impacts from the development upon threatened entities include the loss of one farm dam and minor impacts to two other dams, all of which are breeding habitat for Sloane's Froglet and feeding habitat for Southern Myotis, as well as some Sloane's Froglet migrational habitat areas (drainage lines between dams on Thurgoona Training Academy and those in the southern part of the development), which are being lost to development. There are small impacts occurring to low quality areas of mapped NSW Grassy Woodland along Williams Road, where connectivity works are being undertaken. However, only two large trees are considered lost (but are being retained) in these areas, therefore there are no anticipated significant impacts occurring in the C3 land to threatened species or communities in this area.

In terms of indirect impacts expected from the development, these may include impacts such as noise and/or erosion and sedimentation associated with the construction phase of the project, light pollution from estate lights, ongoing noise pollution, changed surface drainage with the installation of stormwater drains and redirections into detention basins, and the potential for ongoing degradation issues such as weed incursions into bushland from garden escapes or dumping of garden waste, and predation from mismanaged domestic cats and unrestrained dogs. With the closure of Williams Road to vehicle traffic and the designation of the road as a conservation reserve, the development is considered unlikely to have significant negative impacts on adjacent areas of native vegetation and fauna habitat if all construction mitigation measures (pre, during and post construction) are implemented.

Given the already heavily modified nature of the Subject Land and broader locality, and its proximity to urban areas, the project is considered unlikely to reduce the viability of any adjacent native vegetation or habitat due to edge effects, noise or dust, or cause significant disturbance to breeding habitats. There is likely to be contribution of moderate to significant changes in the light environment,

with the addition of streetlights throughout the estate, and light spill of residential buildings and exterior lights. There is a potential for some impact to nocturnal species and invertebrate species from light pollution, which may impact on the suitability or preference of certain species to continue utilising the area for their nocturnal activities. Monitoring of Squirrel Glider presence post-construction is recommended, with any drop in numbers to trigger a review and actions to control light pollution along the Williams Road interface.

Prescribed impacts include the loss of one farm dam and the small impact being made to two other dams, and changes to the drainage and hydrology of the Subject Land, which may have some impact on species currently using these areas, especially Sloane's Froglet during their migrational movements (connectivity impacts). However, the provision of new stormwater detention basins and wetland connectivity features, all of which are being designed with Sloane's Froglet construction principles in mind, means the long-term impacts from the initial loss of a dam and drainage lines may be minimal. However, monitoring is recommended, to ensure existing and new movement corridors and detention basins are being utilised, and any absence or drop in Sloane's Froglet usage will trigger a review of habitat designs. Vehicle strikes are also a potential prescribed impact. However, actions are being put in place via design considerations and Construction Environmental Management Plan (CEMP) actions to help minimise the potential for vehicle strikes.

According to the NSW BioNet Threatened Biodiversity Profile Data Collection (TBCD), Sloane's Froglet has been declared as a SAI entity according to it meeting SAI Principle 3, in that it is known from three or less locations and/or has an area of occupancy (AOO) of less than 10 square kilometres, or an extent of occurrence (EOO) of less than 100 square kilometres. The species polygon which represents suitable habitat for this SAI on the Subject Land covers large areas of the proposed development area. Based on the Significant Impact Criteria (SIC) assessment indicating that a significant impact to this species is possible from the development, Sloane's Froglet clearly is an SAI entity that is at risk of significant impact, and requires further consideration in terms of the risks posed by this proposal, and the adequacy of the suggested avoidance and mitigation measures. A referral to the Commonwealth Environment Minister is therefore recommended.

There are a number of risk mitigation measures being incorporated into the designs, the most significant of which are the provision of a chain-of-ponds habitat linkage along the southern boundary, and the addition of new stormwater basins, all of which are designed according to Sloane's Froglet habitat requirements. There are also numerous actions being incorporated into a CEMP, to instigate controls on protection of retained vegetation, erosion and sediment controls, limits of construction near identified threatened species, pre-clearance inspections of trees to ensure fauna impacts are minimised and injured fauna are handled appropriately, landscape plantings and habitat augmentation with nestboxes and locally indigenous species, noxious weed and disease controls (vehicle hygiene), as well as noise, dust, vibration and light spill controls.

To offset the losses being incurred due to the impacts being made to 0.26 hectare of native vegetation in C3 land, an offset of seven (7) ecosystem credits are required (**Table E1**). To offset the losses being incurred to threatened species habitat, the development will need to retire three (3) credits for Sloane's Froglet, six (6) credits for Regent Honeyeater, six (6) credits for Squirrel Glider, and seven (7) credits for Southern Myotis (**Table E2**). In addition to these, to offset prescribed impacts being incurred with regards to the loss of one dam and small impacts to two others, and the loss of some connectivity features for Sloane's Froglet, it is proposed that a further seven (7) Sloane's Froglet species credits and two (2) Southern Myotis species credits are retired to offset these prescribed impacts (**Table E3**), as well as ensuring habitat augmentation takes place to help replace lost habitats for these species.

Table E1 Impacts that require an offset – ecosystem credits

Vegetation zone	PCT	TEC/EC	Impact area (ha)	Number of ecosystem credits required
266_Remnant_Sth	266	TEC	0.04	1
266_Remnant_Nth	266	TEC	0.02	1
266_Wetland	266	TEC	0.01	1
266_Revegetation	266	TEC	0.05	1
266_Remnant_MQ	266	TEC	0.07	3

Table E2 Impacts that require an offset – species credits

Common name	Scientific name	Loss of habitat (ha) or individuals	Number of species credits required
Sloane's Froglet	<i>Crinia sloanei</i>	0.06ha	3
Regent Honeyeater	<i>Anthochaera phrygia</i>	0.18ha	6
Squirrel Glider	<i>Petaurus norfolcensis</i>	0.18ha	6
Southern Myotis	<i>Myotis macropus</i>	0.19ha	7

Table E3 Prescribed impacts and proposed offsets – species credits

Common name	Scientific name	Loss of habitat (ha) or individuals	Number of species credits required
Sloane's Froglet - Breeding habitat	<i>Crinia sloanei</i>	Prescribed impacts	2
Sloane's Froglet – Connectivity (migrational) habitat	<i>Crinia sloanei</i>	Prescribed impacts	5
Southern Myotis – Feeding habitat	<i>Myotis macropus</i>	Prescribed impacts	2

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Shortened forms

Abbreviation	Description
APZ	Asset protection zone
Assessment Area	The Subject Land plus a 1500 metre radius area, for the purposes of describing the local landscape and assessing potential indirect impacts from the development
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator
BC Act	<i>Biodiversity Conservation Act 2016 (NSW)</i>
BC Reg	<i>Biodiversity Conservation Regulation 2017 (NSW)</i>
BDAR	Biodiversity Development Assessment Report
BOAMS	Biodiversity Offsets and Agreement Management System
BOS	Biodiversity Offsets Scheme
CEEC	Critically endangered ecological community
DA	Development Application
DBH	Diameter at breast height over bark
EC	Ecological community listed under the EPBC Act
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)</i>
EP&A Act	<i>Environmental Planning and Assessment Act 1979 (NSW)</i>
EEC	Endangered ecological community
ha	Hectare
HTW	High threat weed
IBRA	Interim Biogeographic Regionalisation for Australia
LLS Act	<i>Local Land Services Act 2013 (NSW)</i>
LGA	Local Government Area
Local area	An area within a radius of 10 kilometres from the boundary of the Subject Land which is assessed to determine the possible presence of threatened species at the local scale.
MNES	Matters of national environmental significance
NPW Act	<i>National Parks and Wildlife Act 1974 (NSW)</i>
NSW	New South Wales
PCT	Plant community type
SAII	Serious and irreversible impact
SEARs	Secretary's Environmental Assessment Requirements
Subject Land	The land being developed at Williams Road, Thurgoona, NSW 2640.
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened ecological community
VEC	Vulnerable ecological community

Declarations

i. Certification under clause 6.15 *Biodiversity Conservation Act 2016*

Biodiversity Assessment Method and clause 6.15 of the *Biodiversity Conservation Act 2016* (BC Act) and finalised as at 28/4/2025, and this date is within 14 days of the report being submitted to the decision-maker. The finalisation of the BAM-C has also been completed within this 14 day timeframe.

Signature: 

Date: 28/4/2025

BAM Assessors Accreditation no: BAAS24052 and BAAS18081

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 of the BAM Manual.

ii. Details and experience of author/s and contributors

Authors and contributors

Name	BAAS no.	Position/Role	Tasks performed	Relevant qualifications
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Stuart Mendham	BAAS 24052	Senior Environmental Consultant at Red-Gum Environmental Consulting Pty Ltd	<ul style="list-style-type: none"> Project lead and report writer Floristic survey of site. PCT determinations. BAM plots. Targeted species surveys. Mapping and analysis. BAM-C data entry and analysis. 	Bach of App Science (Parks, Recreation and Heritage), Honours in Applied Science (Parks, Recreation & Heritage).
Breanna Fisher	NA	Environmental Officer at Red-Gum Environmental Consulting Pty Ltd	<ul style="list-style-type: none"> Attended site start-up / client meeting. Assist with report background searches. 	Bachelor of Environmental Science and Management (Ecology and Conservation)
Olivia Hynam	NA	Environmental Officer at Red-Gum Environmental Consulting Pty Ltd	<ul style="list-style-type: none"> Assisted with targeted threatened fauna and flora surveys. 	Bachelor of Environmental Science & Management (Applied Earth Science)
Dr Emily Mendham	NA	Environmental Consultant at Red-Gum Environmental Consulting Pty Ltd	<ul style="list-style-type: none"> Assisted with mapping and analysis. Assisted with targeted surveys. Internal report review and QA. GIS and systems support. 	Bach Applied Science (Parks, Recreation & Heritage), Honours in Applied Science (Parks, Recreation & Heritage), PhD Environmental Sociology.

iii. Conflict of interest

I declare that I have considered the circumstances and there is no actual, perceived, or potential conflict of interest between myself or my staff and the proponent for this development.

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

Damian Wall (Director)



Signature:

Date: 28/4/2025

BAM Assessor Accreditation no: BAAS18081

Stage 1: Biodiversity assessment

1. Introduction

1.1 Proposed development

1.1.1 Development overview

This Biodiversity Development Assessment Report (BDAR) relates to the proposed subdivision of an approximately 85 hectare (ha) Subject Land area located at Williams Road, Thurgoona, NSW (**Figure 1**). The majority of the development site is vacant agricultural land that is currently used for cropping, set-stock grazing and fodder production, resulting in very little native vegetation remaining on site, aside from mostly scattered remnant trees. Works are also impacting small areas of the Environmental Management (C3) zoned road reserve associated with Williams Road, where remnant native vegetation including some native understorey species are persisting along much of the roadside. There are also small impacts being incurred to a thin area of mapped C3 land within General Residential (R1) land, in the small development area (Stage 8) located east of Eight Mile Creek. However, the mapped area is dominated by exotic grasses, and there are minimal native vegetation impacts in this area. There is also an area dedicated to a future educational precinct, located between the main development area on the southern side of Williams Road, and the C3 lands that border the development area to the east, west of Eight Mile Creek.

A Test of Significance (ToS) was produced by Hamilton Environmental Services (in 2023) for the subdivision development. However, feedback from Albury City Council (Council) outlined several shortcomings in the scope of the ToS (the scope was restricted to C3 land impacts only), and broader assessment of the entire Subject Land was requested to include the entire footprint (all R1 and C3 zoned lands being impacted). In addition, Council also required a BDAR be produced, and an assessment be undertaken of all native vegetation on site and all BAM-C generated threatened species on the areas of C3 land, and a select number of threatened species on R1 land (the 12 species listed under the *Biodiversity Conservation Act 2016* (BC Act) since the R1 land was biocertified in 2011). Furthermore, Council required an assessment of listed Significant and Irreversible Impact (SII) candidates under the BC Act, including Box Gum Woodlands (based on conservation values), Sloanes Froglet and the Regent Honeyeater (based on important habitat mapping), with the latter two species listed as SII entities since the original DA was submitted. The BDAR has included the above requirements, and been undertaken to accompany a Development Application (DA) under Part 4 of the *Environmental Planning and Assessment Act 1979* (EPA Act), to be submitted to Council.

The development site includes two land use zones under the *Albury Local Environmental Plan 2010*, with the predominant land being impacted by the development footprint zoned R1 land; and the Williams Road reserve and Eight Mile Creek reserve, which are receiving a small degree of impact, zoned Environmental Management (C3). The R1 zoned land is biocertified land, meaning the vegetation losses associated with development on this land have already been accounted for via the biocertification process under the LEP. However, threatened entities and prescribed impacts from development of these areas must still be factored into the assessment, including the 12 threatened species listed in the BC Act, since the biocertification was approved in 2011.

Native vegetation is to be removed (or in some circumstances, retained but deemed to be lost) as a part of the proposed residential development. However, according to the Native Vegetation Regulatory Map, the entire Subject Land is excluded from the LLS Act. Therefore, native vegetation is to be assessed through the *State Environmental Planning Policy (Biodiversity and Conservation) 2021*.

With regards to the education precinct development, all of the land in that area is identified as R1 land, and as with other R1 areas, it is “biodiversity compliant development” (within the meaning of section 28 of the *Environmental Planning and Assessment Regulation 2021*), except for 12 threatened species that were added to the BC Act subsequent to the 2011 biocertification declaration. The precinct is identified as a “future private high school and primary school” in the *Thurgoona Wirlinga Precinct Structure Plan* (RPS 2013). No development is to occur within the educational precinct and no existing vegetation or dams are proposed to be removed from the area at this time. Any future development within the precinct land, in accordance with the *Thurgoona Wirlinga Precinct Structure Plan*, will be the subject of a separate DA and biodiversity assessment, as relevant and when required. No protection or loss of any biodiversity features in the precinct is to be assumed as part of this BDAR. As part of this BDAR, all of the Subject Land has been assessed in regard to impacts arising from the proposed adjoining residential subdivision works, including C3 land impacts and the subject 12 species on R1 lands (pers.com James Laycock, January 2025).

There is also a proposed arterial road (Thurgoona Link Road) which is to provide future access into the Subject Land off Table Top Road, running south of the Subject Land in a east-west direction, then swinging around and heading north (along the western edge of the Subject Land), eventually linking up with Davey Road and the Hume Highway to the north. The impacts associated with this arterial road are also not included in this BDAR, as they have been addressed through a separate approval process (also a BDAR) which has been prepared by Biosis Pty Ltd for Albury City Council. Therefore, impacts associated with these works (which include services installation works in the road reserve of Table Top Road in the far south-eastern corner of the Subject Land), are not discussed further in this report. There are also two late changes to designs to account for additional sewer connections. These two connections which cross Williams Road (see **Appendix S**), are being under bored with all impacts (bore pads) to be located in R1 farmland and there are no C3 land impacts from these additional sewer connection works.

1.1.2 Location

The proposed subdivision is located at 65 Williams Road, Thurgoona, which is approximately 10 kilometres north-east of the town centre of Albury, and 1.5 kilometres east of the location of Ettamogah. The development is occurring within agricultural, road reserve and environmental lands in a peri-urban area on the northern outskirts of Thurgoona, NSW 2640. Houses are planned in the large and predominantly cleared parcels of farmlands on the north (Lot 2 DP1189190) and south sides (Lot 301 DP1124543 and Lot 302 DP1124543) of Williams Road, and in a small predominantly cleared farmland parcel (also Lot 302 DP1124543) on the western side of Table Top Road (far eastern part of the Subject Land), near the intersection of Table Top Road and Williams Road. The C3 land parcels being impacted are Lot 101 DP1128114 and Lot 303 DP1124543 (reserves on and adjoining Williams Road) and Lot 205 DP1112899 (reserve around Eight Mile Creek). See **Figure 3** (Site Map) and **Figure 4a** and **4b** (Location Map).

1.1.3 Proposed development and the Subject Land

Topography

The site is gently sloping land with some slight undulations and lower-lying drainage areas, with an elevation range of 185 to 215 metres. The north-western part of the site is slightly higher than the south-eastern part, with all surrounding parts of land being in the same landform. Five (5) farm dams are scattered across the Subject Land, and a small unnamed drainage line intersects the central area of the proposed subdivision flowing north to south, through the Thurgoona Training Academy land, and flowing onto farmland in the south-eastern part of the Subject Land. There are several other dams located just beyond the Subject Land, to the west, south and east of the development.

Eight Mile Creek separates the main development stages (Stages 1 to 7) from the small Stage 8 development area in the far eastern corner. For the most part, the C3 land is being avoided in this Stage 8 area. However, there are some minor impacts to mapped C3 land that overlaps with the farmland in Stage 8, and a small area of impact occurring on the western side of Eight Mile Creek, where the overflow outfall from the proposed water detention basins are planned to direct flows into the creek, in the far south-eastern corner of the development. The majority of waterways, drainage lines and farm dams in the study area are considered Sloane's Froglet habitat, with numerous records of the species found on the Subject Land, and in the broader vicinity.

Hydrology

The Subject Land consists of four sub-catchment areas (see the predevelopment catchment plan in **Appendix Q**). Sub-catchment area 1 covers the majority of the Subject Land, running north to south through the centre of the proposed development and draining towards Eight Mile Creek in the south-east corner. Sub-catchment area 2 occurs immediately west of sub-catchment 1, and drains from the north to south-west, through three existing large dams and eventually into Seven Mile Creek to the south. Sub-catchment area 3 drains the far eastern corner of the development, which flows south into a large dam (just beyond the development footprint), and then flows west into Eight Mile Creek, then south. Sub-catchment area 4 drains the far north-eastern part of the main northern section of the development, and flows in an easterly direction into Eight Mile Creek.

There are five (5) existing farm dams located within the Subject Land, and seven (7) farm dams located just outside of the Subject Land boundary. There are also two (2) farm dams located centrally in the Thurgoona Training Academy property, which is not part of the development or Subject Land. Of the five (5) dams within the Subject Land, one (1) in the northern section of the proposed estate is being partially impacted (re-shaped for the stormwater detention basin), but is to be retained as a stormwater detention basin; one (1) centrally located dam just south of Williams Road is being retained but may undergo minor impacts from drainage installations in its immediate vicinity; one (1) dam is being lost to development (to become house lots and roadway within Stage 1), and two (2) dams in the education precinct are being avoided by the housing development, and are instead earmarked for a future school development (education precinct), in the eastern part of the main southern block of the development (which is future development not considered in this assessment).

The majority of the proposed development area is above the flood risk level (see the flood overlay plan and flood mitigation plan in **Appendix Q**). The far southern part of the Stage 1 development, where it connects with the proposed Thurgoona Link arterial road, is within the 1% AEP flood level (+500mm) and would therefore currently flood in the more serious of flooding events. To remedy this, the low-lying areas in this vicinity are to be filled with clean fill and raised above the 1% AEP flood level, while still allowing adequate fall through the chain of ponds drainage line which runs west to east along the southern-most boundary of the development, and channels stormwater into the large stormwater detention basin proposed in the south-east corner of Stage 1 (south of the education precinct). In addition to stormwater management, the chain of ponds is also augmented habitat for use as the Sloane's Froglet movement corridor, being developed to the species' habitat standards and will establish suitable habitat to provide connectivity along the southern boundary of the housing estate for these endangered frogs.

Geology & Soils

The geology of the majority of the Subject Land is Silurian-Devonian sedimentary and volcanic rocks lithology, which consists of mixed volcanic and sedimentary rocks. In addition to this, there is a thin area of Cenozoic Shepparton Formation, which consists of poorly consolidated clay, silt, sand and gravel lithology, which roughly follows the alignment of Eight Mile Creek, and covers the eastern one third of the Subject Land area (NSW Government 2024). There were no significant or unusual geological features on or nearby the Subject Land recorded during site assessments or noted during

the desktop assessment. There were also no karst, caves, deep crevices, cliffs or other areas of geological significance within the Subject Land or within the 1500 metre buffer area surrounding the Subject Land (although the entire 1500 metre area was not fully assessed due to private property access issues).

The soils of the local area are mapped as possessing predominantly sodosoils, which are soils with strong contrast in texture between the A horizons and the sodic B horizons, which are not strongly acidic. The dominant colour classes are red, brown, yellow and grey soils, with black soils at greater depth (SSA 2024). The soil is generally well-drained at this site, and carries a relatively low erosion hazard. The topsoil displaced from construction may be stockpiled (high in the catchment area within the Subject Land to ensure sediment devices are effective) and reused on site during rehabilitation, and all cleared vegetation will be removed from the site, but where possible deposited in adjoining environmental areas for use as ground habitat, or donated to local environmental management agencies, if appropriate.

Current and previous land uses

After European settlement of the Albury region, the R1 land (and much of the C3 land) in the Subject Land was predominantly cleared of native vegetation and historically grazed by sheep and cattle in a set-stock management regime. Large trees left standing were restricted to areas of C3 land along Williams Road and along Eight Mile Creek, as well as some scattered paddock trees in the R1 land. In the more recent decades, the R1 land has been widely cultivated and cropped with grain and fodder crops, which has left the entire R1 land areas with effectively no native species in the understorey, with pasture species and weeds dominating. Scattered and mostly isolated paddock trees now remain in R1 areas, of which a number are dead or in poor condition. The only patch of native vegetation in R1 land is the patch of forty-five (45) Blakey's Red-gum in the southern section, near where the main entry road into the state is proposed to enter off the future Thurgoona Link. This patch of trees is now being retained as a future reserve, and only one (1) tree in the reserve will be considered lost due to Tree Protection Zone (TPZ) impacts from the nearby road (but is still to be retained)¹.

The northern part of the road reserve of Williams Road has been revegetated in the last 20 years, between the northern side of the remnant canopy area of the roadside and the R1 land boundary fence, with varying success rates for plantings. Generally, locally indigenous species of trees and some shrubs have been planted, with some non-local species planted on occasion. Most of the revegetation areas have an exotic dominated understorey, with some small patches along the interface with the remnant areas retaining some native grasses. There are numerous large remnant trees along the bank of Eight Mile Creek, however the remainder of the C3 reserve areas in the vicinity of these trees have been revegetated, with mostly canopy species and only very occasional shrub species. The C3 land just outside of the north-west corner of the Subject Land also has some old remnant trees along the creek line, with large areas of revegetation either side, a small area of which is encroaching into the R1 land and will be impacted by development along that western boundary.

¹ Note: TPZ areas and are calculated (12 x tree diameter (cm) at breast height (dbh) to a 15 metre maximum) and development impacts in TPZs are assessed based upon the Australian Standard (AS4970 2009) for the protection of trees on development sites (SAI 2009)

Development impacts

The 85 hectare Subject Land area is proposed to be subdivided via an eight stage development called 'Williams Park Estate' and will provide four hundred and sixty two (462) residential lots, and one (1) englobo school lot (education precinct), with residential lots ranging in size from 700 to 1561 square metres. The development footprint also includes several open spaces and natural reserves, the most significant of which will be the existing road reserve of Williams Road (approximately seven (7) hectares in size) which is being closed to vehicle traffic and protected (**Figure 5**). The works will also include the development of an internal road network, construction of footpaths and bicycle paths, underground services, stormwater detention basins and Sloane's Froglet wetlands (habitat and connectivity purposes), infilling of a farm dam, revegetation areas and general rehabilitation works for the developed areas. The proposed works will require a small amount of native vegetation removal over both C3 and R1 parts of the site, significant earthworks in R1 land to level the construction areas of the site and to create water basins and wetlands, and the installation of underground utilities required for the residential lots. The proposed access roads for the lots will enter the southern part of the development in two locations from a future arterial road (Thurgoona Link), with one vehicle access point being provided through the proposed Williams Road reserve into the development stages (Stages 4, 6 and 7) on the northern side of Williams Road.

Throughout the main development footprint, there are eighty-nine (89) native trees which are within the R1 zones part of the development area, including forty-five (45) trees in a patch of Blakely's Red-gum near the proposed estate entry road (all trees in the patch are being retained, but one (1) is considered lost), and thirty-four (34) scattered trees located throughout the paddocks, eleven (11) of which are being removed, and seventeen (17) are being deemed lost due to unpredictable TPZ impacts, but are to be retained for aesthetics and habitat purposes. Impacts in these R1 areas will range from moderate to significant, with varying levels of excavation required, including shaping and reforming the land surface, some trenching and under boring for services, as well as the ongoing impacts of the development as the estate is built and starts to function, including from physical construction of houses and gardens to the ongoing use of the residential lots and roadways for day-to-day living for its residents. It is for this reason that, although some trees are being retained for aesthetic and biodiversity benefits, many of these trees have to be considered lost for impact assessment purposes, as people are not restricted in what they do near or with these trees on their lots after construction is complete (i.e. removal of the tree, or undertake construction within their TPZ or SRZ), as well as the potential for ongoing use of some lots being likely to render these trees as unlikely to, or less likely to, survive in the long-term. In total 0.26 hectares of native vegetation on C3 land will be removed/impacted from the proposed development, and a total of fifty-nine (59) trees are deemed lost (36 to be removed and 23 deemed lost but are to be retained).

All significant trees on site, those being mature native canopy trees (30cm dbh or greater) that are to be removed as part of construction, must undergo preclearance checks, to ensure the risks of trees containing fauna is minimised, and that any fauna harbouring in tree hollows or nests can be appropriately handled, checked for injuries and relocated to nearby habitat by a qualified ecologist or wildlife handler. Furthermore, it is recommended that timber (large trees) that are removed be placed into adjoining reserves for ground habitat, or that Fisheries NSW and Murray Local Land Services are contacted to ascertain if they would like to retain the large hollow trees being removed from the site for their waterway habitat restoration and re-snagging programs.

In addition to the main impacts from the development (such as construction of internal roads and lots), there are numerous other small yet specific impacts taking place across C3 zoned parts of the Subject Land, some of which contain areas native vegetation. The places where C3 impacts are occurring, and types of impacts being made are listed below in **Table 1**, with more detailed impact descriptions in the section further below. Note the impact areas in **Table 1** are the total impact areas, and not necessarily reflective of the total area of native vegetation being impacted/lost.

To arrive at the native vegetation impact area figures, the impact areas were overlaid with the mapped native vegetation patches and tree locations. Where trees were removed or deemed lost, the entire canopy of the tree being lost/removed was factored into the vegetation loss area.

Table 1: Summary of impacts associated with specific works areas

C3 site no.	Works impact type and location	Construction machinery required	Construction disturbed ground, including machinery access*		
			Linear width (m)	Total area (m ²)	Trench depth (m)
1	Reticulated stormwater drainage outfall (south-east section)	Excavator, posi-track	15	450	-
2	Wetland embankment (south-east section)	Excavator, posi-track	15	840	-
3	Reticulated stormwater drainage outfall (far east section)	Excavator, posi-track	10	220	-
4	Road overlap (two sections) with C3 (far east section)	Trencher, excavator, grader, truck, roller, posi-track	12	620 ⁽ⁱ⁾	-
5	Road, footpath, reticulated water and stormwater, inc. electricity and data (main access and linkage between north and south sections)	Trencher; excavator grader, truck, roller, posi-track	22	1300 ⁽ⁱⁱ⁾	1.5
6	Reticulated sewer and stormwater linear trench (between north and south sections)	Trencher; excavator, posi-track	7	630	2.0
7	Road overlap with C3 (northern part of south section)	Excavator, grader, truck, roller, posi-track	12	700	-
8	Stormwater detention basin (central north section)	Excavator, posi-track	20	600	-
9	Stormwater linear trench (north section)	Trencher; excavator, posi-track	5	150	1.5
10	Footpath, and reticulated water and stormwater, inc. electricity and data (linking north and south section across Williams Road)	Trencher; excavator, posi-track	20	1000	1.5

C3 site no.	Works impact type and location	Construction machinery required	Construction disturbed ground, including machinery access*		
			Linear width (m)	Total area (m ²)	Trench depth (m)
11	Road overlap with C3 (southern part of north section)	Excavator, grader, truck, roller, posi-track	25	600	-
12	Stormwater detention basin embankment (existing main dam – northern section)	Excavator, posi-track	6	250	-
13	Footpath (linking western (south) section to Williams Road)	Excavator, posi-track	5	50	-
14	Footpath (linking western (north) section to Williams Road)	Excavator, posi-track	7	660	-
15	Stormwater detention basin embankment (far north-western section)	Excavator, posi-track	7	900	-
16	Fence lines (see design plans in Appendix Q)	Post-hole digger (strainer posts only), star-steel picket post driver.	1*	NA ⁽ⁱⁱ⁾	-
17	Asset Protection Zones (see design plans in Appendix Q)	Ongoing maintenance of vegetation in these areas around development perimeter for bushfire protection.	13m (woodland areas) and 11m grassland areas ^(iv)	NA	-

* Construction linear and area measurements are total impacts, and do not reflect impact areas for native vegetation

(i) No native vegetation is present in this C3 overlap area, thus no losses are being incurred.

(ii) No understorey in impact area. Losses restricted to two scattered saplings only.

(iii) Fence line development footprint to be approximately 1 metre width, however nearly all impacts (except strainer post holes) are low and temporary in nature. Only the main post hole areas will impact native vegetation. Regeneration is likely in all impacted areas, thus no quantifiable vegetation losses are expected for the perimeter fence installation.

(iv) The majority of these APZ areas are internal and factored into the development footprint, where no native vegetation persists. However, the APZ along the northern boundary of the Subject Land is external. This area does contain some scattered trees. However, these are being retained and grass cutting will not impact these trees.

The impact areas associated with C3 lands as described in **Table 1**, are shown in an overview map at **Figure 1**, and are listed and described in more detail in the sections below. Each C3 impact area has a more detailed map available in **Appendix P**. For impacts to the R1 land, which are limited to scattered trees (BAM-C scattered tree module) and one patch tree, see **Section 8** (Impact Assessment) and **Figure 2**. Note that the impacts to native vegetation occurring on R1 land are impacts to biocertified land, and as such, native vegetation offsets are not required for these losses, with only those (twelve, 12) threatened species and SAI entities which were added to the BC Act since the conferring of the biocertification of land to be considered as part of the R1 land assessment.

Site 1 - Reticulated stormwater drainage outfall (south-east section)

The reticulated stormwater drainage outfall in this area is the main drainage area from the proposed stormwater detention basins (wetlands) in the south-eastern part of the Subject Land. Works will consist of a rock chute to channel water overflows out of the wetlands and into the Eight Mile Creek. The impact area is a revegetated area within C3 land, with effectively no native groundcover present. There is a very large remnant Blakey's Red-gum just east of the impact area, on the eastern side of the creek, which has a small part of its TPZ being impacted by the impact area. However, this tree is situated well onto the opposite side of the creek to the proposed works, and the works are very unlikely to be impacting actual root zones in the mapped TPZ on the higher creek bank on the western side of the creek (as the tree roots will not be up the bank on that side of the creek). This tree is therefore retained, and the only impacts in this C3 area will be the 0.047 hectare area of revegetation (zone '278_Revegetation'). See **Appendix P1**.

Site 2 - Wetland embankment (south-east section)

Closely connected to the above described impact area, is the wetland embankment impact area, which intersects an area of mapped C3 land, and is in fact situated within the cleared paddock and thus does not contain any native vegetation. The areas of revegetation immediately east of the proposed embankment (in the C3 land) are not expected to be impacted negatively from the creation of the embankment. Therefore, no native vegetation impacts are being incurred in this area. This area is also covered in more detail in the **Appendix P1** map.

Site 3 - Reticulated stormwater drainage outfall (far east section)

There is a small, reticulated stormwater outfall being installed to flow into the existing drainage area that is connected to the two dams just south the Subject Land. This impact area is within C3 land, however the entire impact area is exotic vegetation, and therefore there are no vegetation impacts being incurred. See **Appendix P2** for a site map of proposed impacts.

Site 4 - Road overlap with C3 (far east section – Stage 8)

There is part of a proposed road in this area (two small sections) which overlap with mapped C3 land, despite the road impact area being located beyond the reserve boundary fence, and entirely within the current exotic paddock. However, there are two (2) small Blakey's Red-gum trees (revegetated) just inside the reserve, which will be considered lost due to TPZ impacts from construction. This area consists of a total of 0.013 hectares of zone '278_Revegetation'. Despite this deemed a loss, efforts will be made to retain the trees, if viable to do so. See **Appendix P2** for a site map of proposed impacts.

Site 5 - Road, footpath, reticulated water and stormwater, inc. electricity and data (main link between north and south estate sections)

This impact area is the main road connection between the estate's northern and southern sections. The impact area consists of the connecting roadway and associated works such as curb and channel, pedestrian path, and installation of reticulated water and stormwater. The impact area impacts very little native ground vegetation, but there is a single (multi-stemmed) young Blakey's Red-gum in the centre of the area that is being removed. There is also a 20cm dbh tree immediately west of the works area, which is being deemed lost due to TPZ impacts (but is being retained). Combined, these losses areas equate to a loss of 0.005 hectares (zone '266_Remnant_MQ'). The other small trees to the east and west of the impact area are not expected to be impacted by works, and are thus being retained. See **Appendix P3** for a site map of proposed impacts.

Site 6 - Reticulated sewer and stormwater linear trench (between north and south sections)

This impact area consists of a narrow footprint to provide connection of reticulated sewer and stormwater via a linear trench installation, connecting the northern section across Williams Road into the southern section of the estate. The impact area associated with the trench, which includes tracking of machinery through the works area, is a width of seven (7) metres. Impacts to vegetation from these works involves a total of 0.054 hectares of revegetation being lost, consisting of 0.026 hectares of zone '266_Remnant_MQ' (also NSW Grassy Woodland), 0.017 hectares of zone '266_Revegetation' and 0.011 hectares of 'Remnant02_Sth'. The loss amount also includes the loss of five small trees due to direct impacts from trenching works, and the deemed loss of one 60cm dbh tree in proximity to the works due to TPZ impacts (but is being retained). There are also some minor impacts to the edge of the existing dam, where stormwater drains will be constructed. This is Sloane's Froglet habitat, and is addressed further in the prescribed impacts section. It is important to note that Plant Community Type (PCT)/NSW Grassy Woodlands loss areas are overestimated, as the mapping incorporates a large area of road, yet the canopy mapping covers the road area under the overhanging canopy. So actual impacts are lower than those being measured, due to absence of understorey across much of the mapped area being impacted. See **Appendix P3** for a site map of proposed impacts.

Site 7 - Road overlap with C3 (northern part of south section)

There is part of a proposed road in this area (one small section) which overlaps with mapped C3 land, despite the road impact area being located beyond the reserve boundary fence, and entirely within the current exotic paddock. There is one sapling and one large Blakely's Red-gum just east of the proposed road, within the C3 reserve, which will be considered retained due to the TPZ of these trees beyond outside (>15 metres) of the proposed impact zone for the construction. There is 20 metres between the proposed road edge and the large tree trunk. There are also two trees just north of the proposed road (which has an exotic understorey), the nearest of which is 15 metres from the road edge, which are also being retained due to lack of TPZ impacts. Therefore, given the exotic vegetation in this area, and provided these four (4) trees are adequately protected from works impacts, there are no native vegetation impacts expected from this works impact area. See **Appendix P3** for a site map of proposed impacts.

Site 8 - Stormwater detention basin (central north section)

This impact area involves the construction of a stormwater detention basin in the central part of the northern section of the development, across parts of both C3 and R1 land (see **Appendix Q**). Despite part of the basin footprint intersecting with mapped C3 land, there is no native vegetation in the impact area. There is a large Blakely's Red-gum beyond the fence just west of the proposed basin, which is being retained. This tree's trunk is more than 15 metres from the basin impact area and as such, its 15 metre TPZ will not be breached by the construction. Therefore, there are no native vegetation impacts associated with this impact area. See **Appendix P4** for a site map of proposed impacts.

Site 9 - Stormwater linear trench (north section)

This impact involves a narrow (5 metre-wide) linear trench being constructed just south of the Blakey's Red-gum mentioned above, for the installation of a stormwater pipe linking part of the western part of the northern section of the estate, to the stormwater detention basin just east of the large Blakely's Red-gum (described above). There is no native vegetation in the impact area for this trench work, and the trench works area is outside of the TPZ of the large Blakely's Red-gum just to the north of the works. Therefore, there are no native vegetation impacts associated with this impact area. See **Appendix P4** for a site map of proposed impacts.

Site 10 - Footpath, and reticulated water and stormwater, inc. electricity and data (linking north and south section across Williams Road)

This impact area involves the construction of a footpath to link the northern and southern sections of the estate, as well as construction of a trench (combined works to be a maximum of 20 metres wide impact area) to house reticulated stormwater, potable water, electricity and data services. The works are located immediately south of the proposed stormwater detention basin mentioned above (site 8). The ground vegetation in this area is dominated by exotic species in the revegetated area, and some scattered natives under a native canopy along the remnant areas adjacent to Williams Road. There are a number of planted Blakely's Red-gum just west of the impact area in the revegetation patch, all of which are being avoided by the works. There are two young (naturally regenerated) Blakey's Red-gum and two sapling-sized Red Box which are being lost within the remnant part of the impact area, and one 40cm dbh Red Box is being deemed lost (but being retained) due to TPZ impacts expected from the works. The footprint of impacted area through the mapped PCT 266 (and BC Act Grassy Woodland) is 0.03 hectares (zone '266_Remnant_MQ'). See **Appendix P4** for a site map of proposed impacts.

Site 11 - Road overlap with C3 (southern part of north section)

There is part of a proposed road in this area (one small section) which overlaps with mapped C3 land, despite the road impact area being located beyond the reserve boundary fence, and entirely within the current R1 exotic paddock. There is one large Blakely's Red-gum just east of the proposed road, within the C3 reserve, which will be considered retained due to the TPZ of the tree being beyond the proposed impact zone for the construction. There is 17 metres between the proposed road edge, and the large tree trunk. There are also four (4) young, planted Blakey's Red-gum in the revegetation area just south of the proposed road. Only one of the TPZs of these trees are being impacted significantly, and therefore is being deemed lost as a result of works (but retained). Therefore, given the exotic vegetation in this area, and provided these remaining nearby trees are adequately protected from works impacts, the native vegetation impacts expected from this works impact area are limited to the

deemed loss of one (1) 15cm dbh Blakely's Red-gum. See **Appendix P4** for a site map of proposed impacts.

Site 12 - Stormwater detention basin embankment (existing main dam – northern section)

This impact area is associated with the construction of an embankment along the southern (downhill) side of the proposed storm water detention basin. There is a large existing farm dam in this area, which is being re-shaped to become a detention basin, and an embankment is being constructed along the boundary between R1 and C3 land. There is also a small area of derived marshland to the west of the existing dam (zone '266_Wetland'), 0.003 hectares of which is being impacted (lost) by the works (however losses are calculated as 0.01, based on that being the smallest figure able to be input into BAM-C – therefore losses are overestimated). There is a large Blakey's Red-gum and a sapling to the north-east of the basin, which are being retained. There are two saplings to the north-west of the basin, both of which are being considered lost due to likely impacts from the re-shaped detention basin. Therefore, given the dominance of exotic vegetation in this area, and provided these nearby retained trees are adequately protected from works impacts, the native vegetation impacts expected from this impact area is limited to two (2) saplings and the small derived marsh area. See **Appendix P5** for a site map of proposed impacts.

Site 13 - Footpath (linking western (south) section to Williams Road)

This impact area is associated with a short and narrow (maximum 5 metre wide impact area) footpath linking the northern part of the southern-western section of the estate, to the proposed reserve along Williams Road. This area consists of a mixture of native (mostly grasses) and exotic species, as well as a patch of overstorey consisting of one White Box (89cm DBH) in the immediate vicinity of the works, a White Box (33cm DBH) just west of the impact area, and two (2) Blakely's Red-gum just east of the impact area. The one (1) large White Box, despite being retained, will be considered lost due to works impacting a significant amount of its TPZ area, and the other nearby trees are being retained with little to no impact being made to their TPZs. The losses associated with this impact area are approximately 0.023 hectares of PCT 266 (zone '266_Remnant02_Sth'), including one (1) small tree, two (2) saplings, and one (1) large tree that is deemed lost (but being retained). See **Appendix P6** for a site map of proposed impacts.

Site 14 - Footpath (linking western (north) section to Williams Road)

This impact area is associated with a short and narrow (maximum 5 metre wide impact area) footpath linking the western part of the northern section of the estate, to the proposed reserve along Williams Road. This area is dominated by bare ground, some native grasses as well as the edge of a patch of naturally regenerating Blakely's Red-gum in the R1 land, and a patch of thick young Blakely's Red-gum and Red Box growth, located in the C3 land immediately adjacent to Williams Road. The losses associated with this impact area are approximately 0.023 hectares of PCT 266 (zone 266_Remnant01_Nth), 0.006 hectares of PCT 266 (zone 266_Remnant_MQ), and includes four (4) sapling trees that are being removed. See **Appendix P6** for a site map of proposed impacts.

Site 15 - Stormwater detention basin embankment (far north-western section)

This impact area is associated with the construction of an embankment along the southern and western (downhill) sides of the proposed storm water detention basin in the far western part of the northern section of the estate. The embankment impact area runs just along the R1 side of the boundary fence between R1 and C3 land. There is no understorey native vegetation in this area,

however there are several young gum trees (Blakey's Red-gum and White Box) just inside the boundary fence at four locations along the embankment alignment. A total of 0.031 hectares of PCT 266 (zone '266_Revegetation') is being removed or deemed lost, as well as six (6) small trees being lost due to impacts (one is being deemed lost due to TPZ impacts), despite the majority of these trees being likely to be retained. See **Appendix P7** for a site map of proposed impacts.

Site 16 - Fence line (not on Figure 1 or in Appendix P – see Appendix Q)

There will be approximately 8,750 metres of fencing installed around the perimeters of the development and in between the development and Williams Road, and to separate the area of private property in the centre of the development (Currently the Thurgoona Training Academy) from the estate. The majority (8,375 metres) of the fencing will consist of a fauna-friendly 1.5 metre wire netting fence (project wire) with a single plain wire at the top, and standard steel posts. There will also be three smaller sections of 1.8 metre high Colourbond fencing, located along the eastern boundary of the Thurgoona Training Academy, and two sections of residential fencing that borders the Sloanes Froglet chain of ponds reserve in the south, near the future arterial road, totalling approximately 375 metres of Colourbond fence. In addition to fencing, there will also be a section of bollards at either end of Williams Road, to prevent entry of vehicular traffic into the future reserve. See design plans in **Appendix Q** (fencing plan) for a site map of proposed fence alignments.

In addition to the above impact areas, there will be other works related impacts that will take place on the Subject Land, including temporary structures, parking areas, dirt stockpiles, laydown areas, (for road surfacing, culvert sections, pipes etc), fencing and/or barriers and temporary roads. However, these structures/facilities will all be situated in R1 zoned land, which are all areas that do not contain native vegetation, except for scattered paddock trees. Vegetation within impact zones within these R1 areas are generally considered lost, unless that vegetation has been earmarked as being retained as a result of protections from the development impacts. This includes numerous trees that are being considered lost due to likely or unpredictable future impacts, but are being retained for aesthetic and biodiversity purposes. As such, all impacts to native vegetation in non-biocertified C3 lands is captured in the descriptions in the section above and have been used to calculate total losses and offset obligations. Impacts to R1 native vegetation (**Figure 2**) is addressed in other sections, including **Section 4.4**, **4.5** and **Section 8**.



Figure 1: Overview of C3 land impacts, overlaid over an aerial image and subdivision layout (see Appendix P for C3 site details)

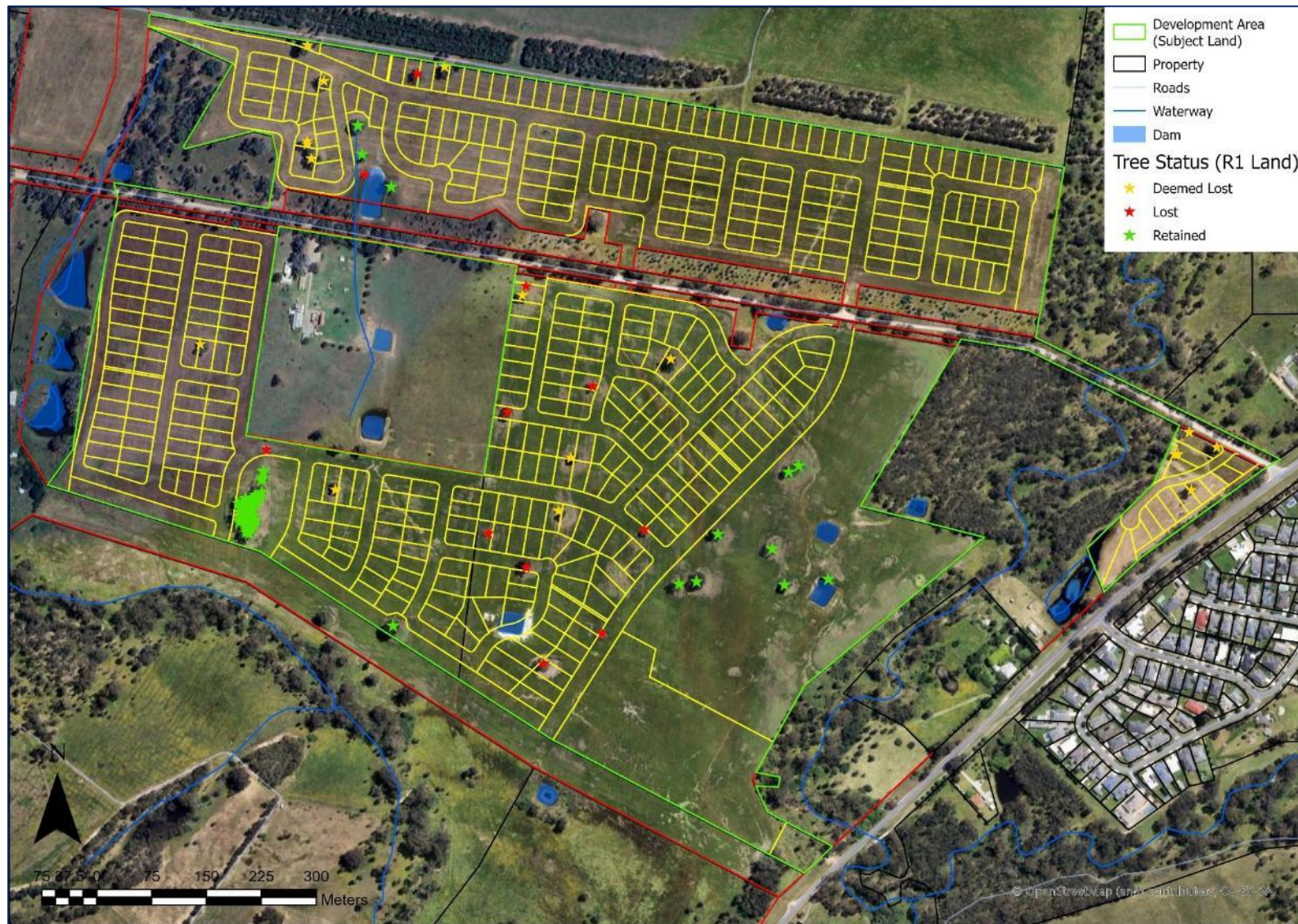


Figure 2: R1 tree impacts, resulting in lost (11), deemed lost (18), and retained (60) trees

1.1.4 Other documentation

There have been a number of supporting reports utilised and other documentation developed as part of the approvals process, the most relevant of which include:

- Development Application (DA) Planning Report (Blueprint Planning Pty Ltd)
- Test of Significance (ToS) (Hamilton Environmental Services)
- Stormwater Management Plan (EDM Group)
- Sloane's Froglet Habitat Management Plan (EDM Group)
- Thurgoona Wirringa Precinct Structure Plan (RPS 2017)
- Subdivision Development Plan (EDM Group).

This BDAR is in response to Council's request for a BDAR, following their RFI for the ToS which was originally submitted on 16 May 2023 to Council. Council in their response letter dated 4 December 2023 (PAN-287404), stated that the ToS scope was not broad enough, in that due to R1 land being effectively void of native vegetation, it focussed exclusively on impacts to C3 land, rather than impacts across the entire Subject Land. On this basis, Council requested that a BDAR be the next level of assessment for the proposal, to capture the full suite of impacts to R1 and C3 areas. Council requested that the BDAR is to include assessments of Squirrel Gliders, based on their known existence within the road reserve of Williams Road. Council then specified that all R1 and C3 areas be assessed, and must include assessment of all twelve (12) species that were added to the BC Act for R1 land, and the usual BDAR assessment for C3 areas. In other words, it would need to consider all threatened species and communities likely to occur on C3 land, but only consider the 12 new species (since the biocertification in 2011) on R1 land. The relevant twelve species to undergo assessment on R1 land were then listed by Council in their letter, and are provided for reference below:

Despite the Council RFI listing only four (4) of the twelve (12) species to be relevant for assessment, all twelve (12) species were fully assessed as part of the BDAR. The four (4) species that were considered relevant out of the twelve (12) according to Council's RFI are:

- a. Dusky Woodswallow
- b. Flame Robin
- c. Scarlet Robin
- d. Sloane's Froglet.

Listed candidates for Significant and Irreversible Impact (SAIL) status (BC Act 2016):

- a. Box Gum Woodland, Biodiversity Conservation Values
- b. Regent Honeyeater, Important Habitat Mapping
- c. Sloane's Froglet (Note: not part of the Council RFI, but has since been added as an SAIL candidate, given the change of its status in late 2024 to a SAIL entity).

There were a number of other issues raised and comments provided by Council in response to the ToS and the overall DA, which have been summarised below:

Native vegetation removal – Inadequate attempts were made to retain trees (little evidence of avoid and minimise efforts) in the first iteration of the development plans. Furthermore, Council requested that an arborist assessment be completed for all retained trees that are subject to construction impacts. An arborist assessment has not been completed for retained trees, and instead, impacts have been assessed based on AS4970-2009. In instances where tree impacts are impacting more than 10%

of a tree TPZ area, then the tree has been considered lost, even if the tree is being retained as part of the development. R1 vegetation losses are not being offset due to prior offsetting via the biocertification process, but have been factored into the potential impacts upon threatened entities. Impacts to native vegetation on C3 lands are being offset via credits within the BOS, as are threatened species and Threatened Ecological Community (TEC) impacts that are a result of these habitat impacts.

Sloane's Froglet – Council requested that a Sloane's Froglet management plan be developed, with a focus on maintaining connectivity for the local population, and that the BDAR adequately assess the indirect and prescribed impacts on the important population of Sloane's Froglet that exists in the area. There is now a management plan for Sloane's Froglet, and this BDAR has assessed direct, indirect and prescribed impacts that are occurring to Sloane's Froglet breeding and migrational (corridor) habitat.

Lack of public open space/connectivity – Council requested design changes to include better accessibility and connectivity, and more open space in the overall subdivision design. Designs have incorporated these requests, including the protection of the only patch of trees on R1 land, to now be protected and conserved in an environmental reserve in perpetuity.

Footpath/bicycle connections – Council requested that additional pedestrian connections between the northern and southern sections of the subdivision, across Williams Road, are to be included in the next design iterations. Final designs have added new connections between the northern and southern estate sections, both of which now link into the road reserve of Williams Road.

The contents of the Council RFI letter has been provided in **Appendix O**. As briefly described above, Council's requests have been met, through the application of the BAM 2020 method, the development of a BDAR and Sloane's Froglet Management Plan, and through redesigns to the development plans to address the changes that Council sought to have included in the overall estate design.



Figure 3: Site Map showing the Subject Land, habitat connectivity pathways and key site features. Scale 1:13,500.

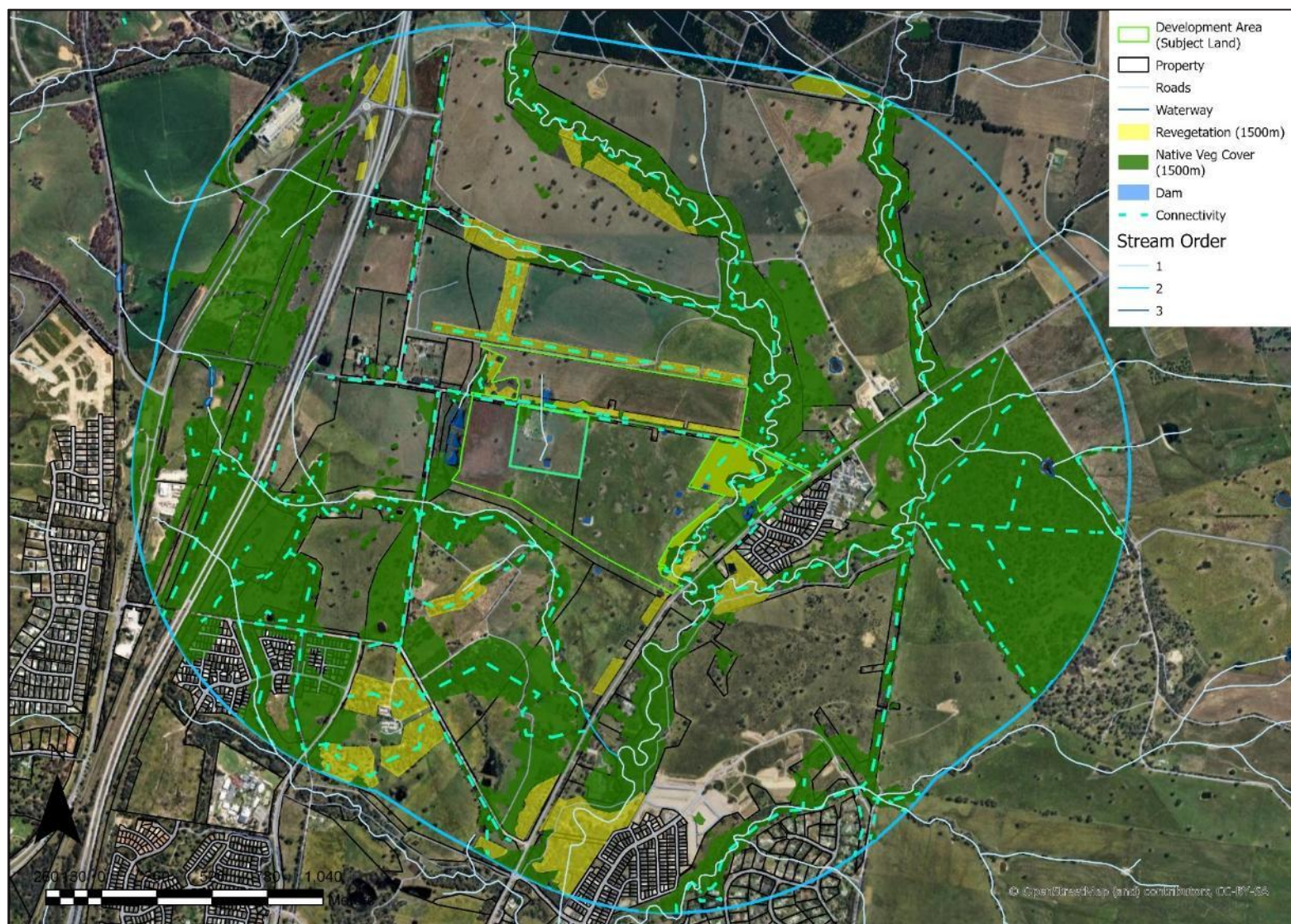


Figure 4a: Location Map 1 showing the Subject Land, native vegetation and habitat connectivity within 1500 metres of the Subject Land. Scale 1:21,500.



Figure 4b: Location Map 2 showing IBRA Region and Subregion, Mitchell Landscape and riparian buffers within 1500 metres of the Subject Land. Scale 1:21,500.

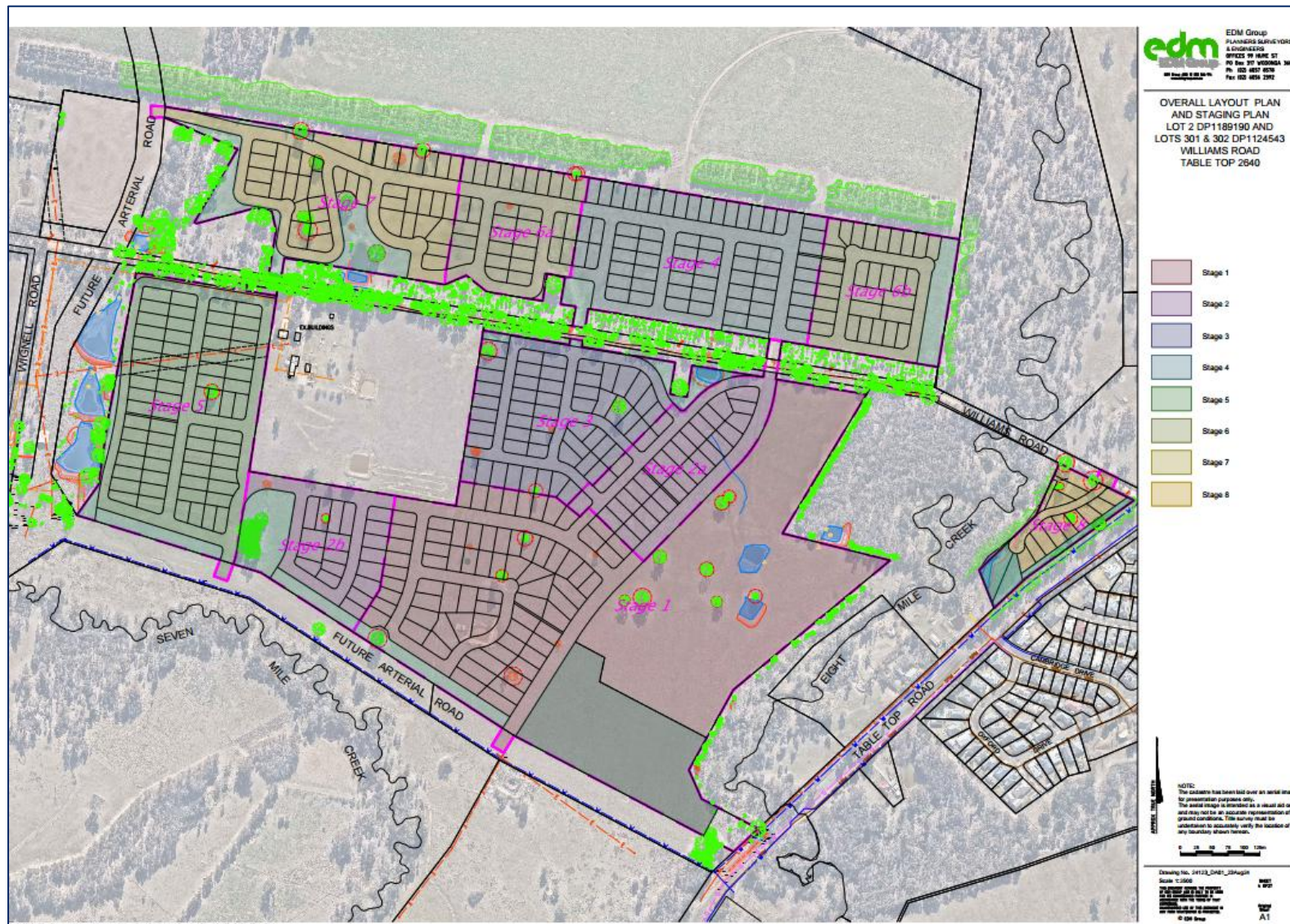


Figure 5: Development Map showing proposed lots, roads, estate stages and associated construction on the Subject Land

1.2 Biodiversity Offsets Scheme entry

Section 7.2 of the BC Act provides that development under the *Environmental Planning and Assessment Act 1979* (EP&A Act) is likely to significantly affect threatened species if:

- a) it is likely to significantly affect threatened species or ecological communities, or their habitats, or
- b) the development exceeds the biodiversity offsets scheme threshold if the biodiversity offsets scheme applies to the impacts of the development on biodiversity values, or
- c) it is carried out in a declared area of outstanding biodiversity value.

In this DA's case, because the area being cleared is predominantly R1 land that is biocertified land under the Albury LEP, and only a small amount of clearing (and assumed loss) is occurring in the C3 land, which is not part of the permitted area under the biocertification, the cleared area of C3 land produces losses greater than the trigger for the BOS. For this project (activity under Part 4 of the EP&A Act), the proposed development works occur predominantly in R1 General Residential Zone, which has a minimum lot size of 450 square metres. The area proposed to be cleared of native vegetation in R1 is biocertified land, which does not contribute to the BOS threshold calculation. Impacts being made to C3 land will result in approximately 0.26 hectares of patch vegetation loss, which contributes to the BOS threshold calculation. As the loss on C3 land is equal to or more than 0.25 hectares (0.26 hectares of proposed clearing), the clearing does exceed the BOS threshold, and therefore a BDAR is required for this development. A BDAR is also being developed at Council's request (see **Appendix O**).

1.2.1 Biodiversity Values Map and Threshold (BMAT) Tool

The Biodiversity Offsets Scheme Threshold (BOSET) is a test used to determine when it is necessary to engage an accredited assessor to apply the Biodiversity Assessment Method (the BAM) to assess the impacts of a proposal. It is most commonly used for local developments (development applications submitted to councils) and clearing that does NOT require development consent in urban areas and areas zoned for environmental conservation (under the *State Environmental Planning Policy (Biodiversity and Conservation) 2021*).

The *Biodiversity Conservation Regulation 2017* sets out threshold levels for when the Biodiversity Offsets Scheme (BOS) will be triggered. The threshold has two (2) elements:

1. Whether the amount of native vegetation being cleared exceeds a threshold area, or
2. Whether the impacts occur on an area mapped on the Biodiversity Values Map published by the Chief Executive of the NSW Office of Environment and Heritage (**Figure 6**).

If clearing and other impacts exceed either trigger, the BOS applies to the proposed development including biodiversity impacts prescribed by clause 6.1 of the *Biodiversity Conservation Regulation 2017*. The area threshold applies to all proposed native vegetation clearing associated with a proposal, regardless of whether this clearing is across multiple lots.

If the land on which the proposed development is located has different minimum lot sizes, the smaller or smallest of those minimum lot sizes is used to determine the area clearing threshold to apply to the project. If the BOS is not triggered, the ToS must be used to determine whether a local development is likely to significantly affect threatened species.

The area threshold varies depending on the minimum lot size (shown in the lot size maps made under the relevant LEP) or actual lot size (where there is no minimum lot size provided for the relevant land under the LEP) (**Table 2**).

Table 2: Clearing thresholds for minimum lot size categories (relevant category highlighted)

Minimum lot size associated with the property	Threshold for vegetation clearing, above which the BAM and BOS apply
Less than 1 hectare (ha)	0.25 ha or more
1 ha to less than 40 ha	0.5 ha or more
40ha to less than 1000 ha	1 ha or more
1,000 ha or more	2 ha or more

The proposed subdivision occurs on an allotment with a minimum lot size that is less than one hectare (only 450 square metres in this case), meaning that the maximum threshold for clearing in this case is 0.25 hectares (**Figure 4 and Table 2**). The full BMAT report is available in **Appendix B**. Despite the BOS not applying to the R1 zone within the Subject Land (as per Section 2.6(3) of the *SEPP (Biodiversity and Conservation) 2021*, the BOS trigger of 0.25 hectares applies to C3 zoned land proposed to be impacted (as per Section 7.2 (3)(c) of the *Biodiversity Conservation Regulation 2017*). The C3 zone, in this case, has a minimum lot size of 100 hectares, where a BOS clearing threshold of 1 hectare would otherwise apply.

The native vegetation loss value for the Subject Land was calculated by mapping around the drip line of the trees that are proposed to be removed, or around the patch of native vegetation where native ground covers were persisting under and/or near a canopy. In total 0.26 hectares of native vegetation on C3 land will be removed/impacted from the proposed development, and a total of fifty-nine (59) trees are deemed lost (36 to be removed and 23 deemed lost but are to be retained). The vegetation losses situated on R1 zoned land (biocertified land) do not require offsetting, whereas losses on C3 zoned land are being offset through the BOS. However, impacts on R1 land that may impact the twelve (12) threatened species (and SAI entities) recently added to BC Act, but not to the biocertification, still need to be considered. Whereas the losses on C3 land must consider all items required via the BOS, including offsets for lost vegetation and any threatened community and threatened species impacts deemed to be offsetable.

In its current form, the proposal DOES impact on an area(s) mapped on the NSW Biodiversity Values map (**Figure 6**), those being the connected vegetation areas where impacts are occurring in the C3 land associated with Williams Road and Eight Mile Creek. However, at the time of the DA lodgement (30 November 2022), only the areas mapped on the BV Map as of this date apply to the development (refer to Section 7.3(5) of the BC Regulations). Furthermore, the majority of these works areas do not contain native vegetation (exotic dominated areas were selected for any significant works in the C3 areas) and thus the recently mapped B Biodiversity Value areas will not be significantly impacted by works. Of the Biodiversity Values mapped areas that contain some native vegetation and which are being impacted by works, total impacts (vegetation losses including deemed losses) equates to 0.26 hectares of patch vegetation loss. There are also vegetation losses associated with the R1 zoned land, which are limited to scattered trees and one patch tree that is deemed to be lost (but is being retained). Therefore, the proposal will require the removal of an amount of native vegetation which exceeds the threshold identified in the *Biodiversity Conservation Regulation 2017* (0.25 hectares), therefore entry into the BOS is required.

1.3 Excluded impacts

The site occurs along the interface of agricultural land and a number of environmental reserves, including the road reserve of Williams Road, which is a mixture of remnant vegetation and revegetated areas. The development area falls under the definition of a non-rural area, under the *State Environmental Planning Policy (Biodiversity and Conservation) 2021*, and therefore the LLS Act does not apply. There are no excluded impacts for the proposed site. There is no 'Category 1-exempt land' as defined under Part 5A of the *Local Land Services Act 2013* (LLS Act), in which native vegetation would be allowed to be cleared without the approval from Murray Local Land Services.

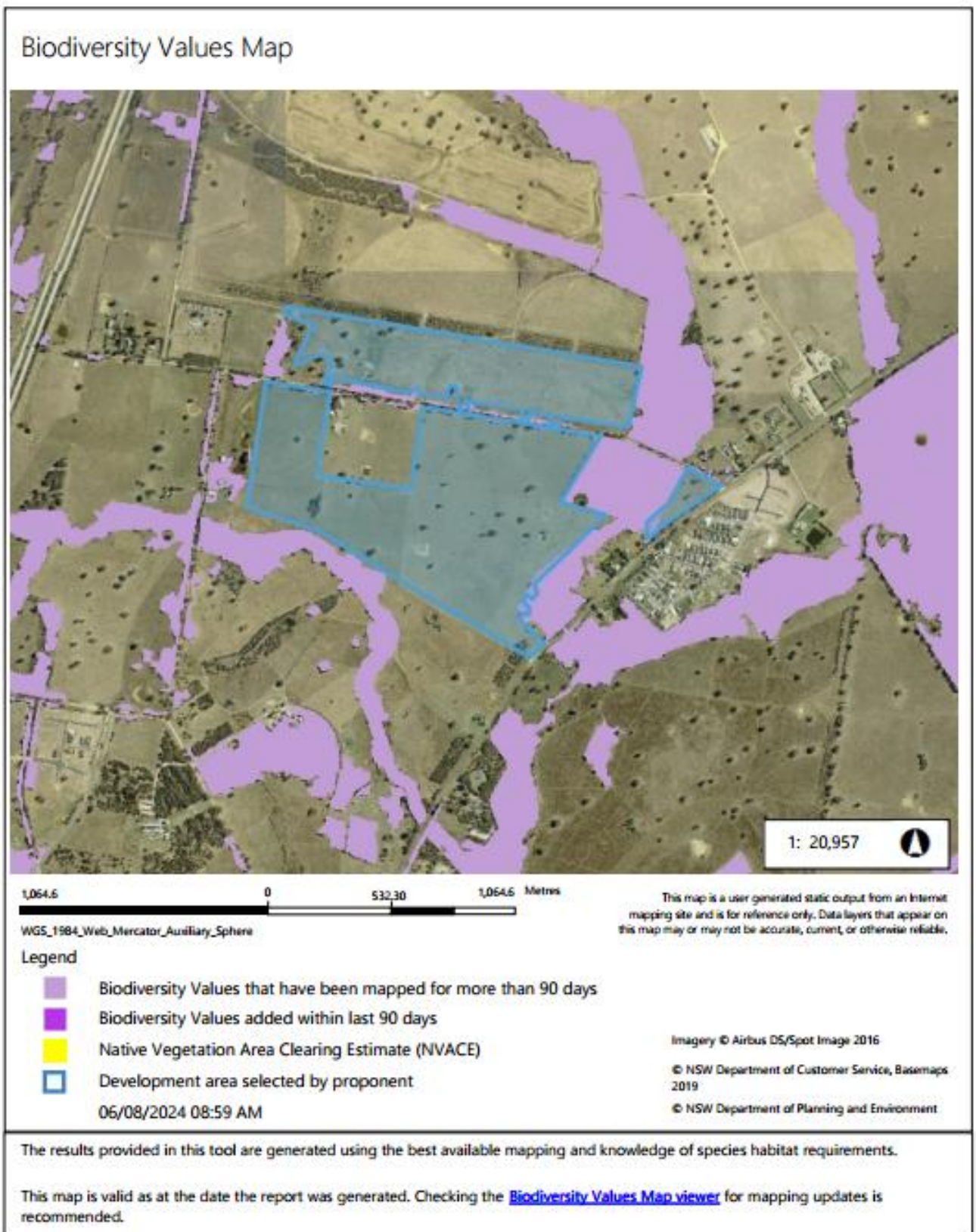


Figure 6: Biodiversity Values Map from the BOSET report, and the Subject Land. Source: BMAT, 2022

1.4 Matters of National Environmental Significance (MNES)

An assessment of potential Matters of National Environmental Significance (MNES) occurring within the Subject Land has been conducted. The potential White Box Yellow Box Blakely's Red Gum Woodland on the site is a Critically Endangered Ecological Community (CEEC) under the BC Act, and is also listed under Section 178 of the EPBC Act as Critically Endangered. However, the woodland did not meet the listing criteria to be considered representative of this EPBC Act listed TEC (see **Section 2.3.2** for the assessment against the criteria). The vegetation on site consists of a native overstorey with a combination of exotic and native understorey which is degraded from a long history of clearing and set-stock grazing. On the basis of the best quality area of this potential MNES being found to NOT contain 12 or more native ground cover species (excluding grasses), the area (and all lesser quality areas) of this vegetation type did not meet the criteria for this MNES. Despite not being considered a MNES, it is still constituting part of a viable BC Act listed NSW Box Gum Woodland TEC, therefore the works are being conducted in a fashion that will only remove small areas of viable habitat, minimally impacting the remaining woodland area as much as possible. Furthermore, closing off Williams Road as a reserve will help enhance the natural values in that area in the long term.

Sloane's Froglet is a MNES, as well as an SAI entity, and it was found to be present throughout much of the development area, including in all of the creeks and dams, and most of the drainage lines during its migrational season (winter movements). To help reduce impacts, no subdivision construction works are to be undertaken during the Sloane's Froglet breeding season. The Regent Honeyeater is another MNES which was given additional consideration in this report, despite not being recorded on site. It is presumed present, however, based on the presence of areas of vegetation (habitat) that are mapped on the Regent Honeyeater important habitat map, and some of its preferred feed tree species are present.

In summary, the woodland areas in the Subject Land do not qualify as being an EPBC Act listed TEC or MNES on the basis of much of it not having a predominantly native understorey, and in instances where there was a native understorey, the size of these better quality areas did not meet the 0.1 hectare requirement nor were there 12 or more native understorey species (excluding grasses), as required by the stricter EPBC Act TEC listing criteria. It is deemed that Regent Honeyeater is an MNES at potential risk from development. Sloane's Froglet is also a MNES and a SAI entity, on the basis of the species being present throughout the development area, the species having a very limited national distribution of which the population makes up part of its known stronghold, and given the potential for the species to be fragmented and otherwise impacted (potentially significantly) by the proposed development (see SIC assessments in **Appendix N** and **Appendix E**). Based on a potential significant impact to Sloane's Froglet, the proposed development is likely to be deemed a controlled action, and referral to the Commonwealth Environment Minister under the EPBC Act is required.

1.5 Information sources

Sources of information for this report included:

- NSW Planning Portal (NSW Dept. of Planning and Environment 2018);
- BioNet Atlas of NSW Wildlife (NSW Office of Environment and Heritage 2018a);
- BioNet TBDC;
- Murray vegetation extant (VIS_ID 2907). The dataset shows extant vegetation of the NSW South Western Slopes (NSS) IBRA bioregion within the Murray CMA;
- IBRA Bioregions (Commonwealth Government 2012)
- NSW (Mitchell) Landscapes data - version 3.1;
- NSW Government Web Services (SEED Map and SIX Maps);
- Biodiversity Assessment Method (BAM) 2020;
- *Biodiversity Conservation Act 2016*;

- *Local Land Services Act 2013*;
- NSW Fisheries threatened species and communities portal and data (NSW DPI 2025).

2. Methods

2.1 Site context methods

2.1.1 Landscape features

Desktop assessments of the area and field assessments done of the Subject Land during numerous visits to the site determined that the site is gently sloping with some low-lying areas and slight undulations, but is fairly homogenous, with little significant changes in habitats or landscape features. Elevation ranges between approximately 210 and 190 metres (not including the lower riparian areas of Eight Mile Creek), with the northern and north-western parts of the development being slightly more elevated, draining towards the southern and south-eastern parts of the development.

The surrounding landscape in the Assessment Area is relatively similar in topography, with gently rolling hills and the absence of any steep or rocky terrain. There are five (5) farm dams in the development area footprint. Of these, one (1) in the northern parcel is being partially impacted, but retained for the most-part after a re-design; one (1) just south of Williams Road is being retained but may undergo minor impacts from drainage installations; one (1) is being infilled and developed (to become lots and roadway); and two (2) are being avoided by the housing development, and are instead earmarked for a future school development (education precinct), which will occur in the eastern part of the main southern block of the development, and will include a primary and secondary school. The soil is compacted yet well drained across most of the site, with a more water-retentive area in the far south-eastern corner of the site, where the proposed stormwater detention basins are being located. The soils across the Subject Land are considered a relatively low erosion hazard.

2.1.2 Native vegetation cover

There is a relatively connected thin strip of native overstorey extending along Williams Road which is dominated by Yellow Box (*Eucalyptus melliodora*) and White Box (*E. albens*), with some scattered Blakely's Red Gum (*E. blakelyi*) and occasional Red Box (*E. polyanthemus*). To the north of the remnant trees, in many parts there are large areas of revegetation, which consist of a diversity of indigenous trees and some shrubs (including some non-local species) with a mixture of exotic groundcovers, and patches that still contain native grass species among other exotic ground covers (predominantly pasture grasses/weeds). There is also a moderately connected native overstorey located along the banks of Eight Mile Creek, which is also surrounded by thick revegetation, consisting predominantly of overstorey species, with only occasional shrubs in the northern part, and dense shrub plantings in the southern part. However, unlike the Williams Road areas, much of the understorey near Eight Mile Creek is exotic dominated, with just a few small areas that still retain some native grasses and sedges.

Within the Assessment Area, which includes the Subject Land and a 1500 metre buffer area around the boundary of the proposed development boundary, through the use of aerial imagery (images dated August 2020 from ArcPro and images dated 2024 from Google) accessed during the desktop assessment, it was established that native vegetation cover was present across 577.6 hectares of the 1493 hectare Assessment Area. Within the 577.6 hectares, 468.4 hectares is remnant vegetation, and 109.2 hectares is revegetation. Therefore, native vegetation makes up approximately 38% of the Assessment Area. This figure includes remnant vegetation, revegetation and other likely native plantings (although some may have been exotic). Patch size for the native vegetation patches on C3 lands was determined to be in the zero to five (0-5) hectare category, as despite the patches being adequately connected to numerous native vegetation patches in the broader neighbourhood, all of

the patches were missing strata (i.e. shrubs), meaning they didn't meet the criteria for a patch according to the BAM.

Efforts were made to ensure BAM assessments were conducted in all vegetation patches (nearly all of which are within C3 land) that were to be impacted in some way by proposed development impacts. Locations and extents of development impacts were ascertained in close discussions with project engineers, and care was taken to ensure impacts were accurate, and in no way underestimated. At the development (Subject Land) level, of the approximately 85 hectare development footprint, 10.32 hectares of the site is native (i.e. those areas other than scattered trees that contain greater than 15% cover of native species, and including the Williams Road C3 areas and revegetated areas). This equates to 11.4 % native vegetation across the development area. However, it must be noted that the vast majority of this total is being protected from the impacts of development.

According to the assessment of proposed impacts where they involve loss of trees and patches of vegetation in C3 land, only 0.26 hectares will be cleared (or deemed lost due to impacts) and will need to be offset, with the remaining areas of habitat being retained and turned into a reserve within the development area (Williams Road reserve). In the R1 land, a large patch of trees (45 trees) is to be retained at the southern entry point into the estate (with just one tree deemed lost in the patch), and some scattered trees throughout the development footprint are also to be retained and protected throughout the main development. Furthermore, some trees that are to be deemed lost in the residential development areas are to be retained for habitat and aesthetics purposes, despite them being included in the vegetation and habitat loss assessment.

2.2 Native vegetation, threatened ecological communities & vegetation integrity methods

2.2.1 Existing information

Desktop assessments using PCT spatial data showed that the site contains predominantly exotic vegetation (PCT 0), with native vegetation occurring in the C3 environmental lands which consist of areas along Williams Road, and areas either side of Eight Mile Creek. Where native vegetation has been mapped, the PCTs included:

- **PCT 266** – 'White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion' along the majority of Williams Road;
- **PCT 277** – 'Blakeley's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion' along Eight Mile Creek (northern section), along an unnamed creek just west of the development, and also the clump of remnant trees in the south of the main southern parcel (being retained); and
- **PCT 278** – Riparian Blakeley's Red Gum – box – shrub – sedge – grass tall open forest of the central NSW South Western Slopes Bioregion' along the southern part of Eight Mile Creek.

Field reconnaissance confirmed that the modelled areas of vegetation cover are fairly accurate in their spatial locations, with just minor alterations required where vegetation was missed (due to coarseness of spatial data), or where exotic vegetation was mistakenly mapped as native vegetation. In particular, the numerous scattered trees located throughout much of the R1 land was not mapped, and was allocated to PCT 0 (exotic) in the modelled spatial data. There was also a small marsh (derived wetland) near the main dam in the northern section, for which the PCT based on existing species composition was not appropriate (PCT 12 - Shallow marsh wetland of regularly flooded depressions on floodplains mainly in the semi-arid (warm) climatic zone (mainly Riverina Bioregion and Murray Darling

Depression Bioregion) was the closest match), given the area was a derived wetland that is the result of a spill area alongside a man-made dam.

Allocating the modelled PCT to this area, which is PCT 266, was done as to be reflective of the vegetation present prior to man-made disturbances, and an assessment against the derived PCT (PCT 266) would generate more realistic vegetation integrity scores.

The native vegetation condition across the site is relatively varied, with high quality patches (native vegetation dominant), moderate quality patches (native canopy over a mixture of native and exotic understorey), low-moderate quality (native canopy over exotic understorey), and moderate quality – derived wetland (marsh area dominated by native wetland plants) vegetation zones present, as well as two revegetation zones in two PCTs (PCT 266 and 278). BAM plots were assessed in each of these vegetation types (zones), where areas were being impacted or potentially impacted by works associated with the development.

Review of modelled PCT data in conjunction with ground truthing and targeted assessments during fieldwork identified one BC Act listed TEC as being present (in numerous locations) within the Subject Land, that being the NSW 'White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions'. This TEC is listed as critically endangered, and includes areas of PCT 266 and 277. The assessment against EPBC Act Grassy Woodland TEC criteria determined that the synonymous EPBC Act listed 'White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland' was NOT present, on the basis of the patches being too small, they lacked the density of large trees, and none contained the required twelve (12) native understorey species (not including grasses). There was an area of PCT 278 which was not considered part of the aforementioned TEC, as it was dominated by revegetated species only.

2.2.2 Mapping native vegetation extent

The identification of PCTs on site was conducted in accordance with the NSW PCT classification as described in the BioNet Vegetation Classification (OEH 2018). Determination of the most appropriate PCT for vegetation communities within the Subject Land used the BioNet Vegetation Classification database to identify PCT types which matched the geographic distribution (based upon IBRA subregions), vegetation formation and suite assessed floristics (BAM plots) of vegetation within the Subject Land.

The data for the potential PCT including vegetation formation, descriptive attributes and distribution information were then reviewed to determine the most appropriate PCT for the vegetation community sampled within the Subject Land. Observations of vegetation structure and composition made during traverses of the Subject Land, as well as immediately adjacent areas, also informed the determination of most appropriate PCT for the vegetation community within the Subject Land. As a final step, BAM plots were conducted to help confirm selected PCTs. Consequently, the identification of vegetation communities was based on the above inputs, as well as the expert opinion of an experienced assessor of the Murray Catchment vegetation types.

Assessment and mapping of PCTs was undertaken over a number of site assessments between June 2024 and January 2025. The Subject Land was traversed to identify the areas that contained native vegetation versus areas dominated by exotic cover, and vegetation structure and dominant species within the patches of native vegetation were recorded. The extent of the vegetation patches on the site were traversed to sample any spatial variation, identify boundaries between vegetation communities and to identify and map vegetation zones (within PCT areas) in accordance with the BAM (accounting for variation in the broad condition state of vegetation polygons). Based upon numerous

traverses of the entire Subject Land, it was found that three (3) different PCTs are present on the Subject Land (**Figure 7** and **10**), not including exotic vegetation (PCT 0) which dominates. The three PCTs, as well as their various condition states, are outlined below:

PCT 266 – ‘White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion’

Much of the Williams Road area immediately north and south of the road edge consists of this PCT. On the south of the road, the majority of the vegetation is overstorey trees only (numerous hollow trees), with a predominantly exotic understorey. On the northern side, there is more variation in the quality of the vegetation, including areas of overstorey only, areas with overstorey and scattered native understorey (herbs and grasses), small patches of higher quality vegetation dominated by native species, and some small patches that lacked overstorey but contained scattered or moderate quality cover of native species (mostly grasses). There are also several large areas of revegetation along the northern side of the remnant PCT 266, most of which is a mixture of trees and some shrubs over an exotic groundcover, but some patches of remnant native grasses are scattered throughout.

There was a small section of this PCT that was a better match for PCT 12, based on floristics present. However, PCT 12 is restricted to floodplain areas near major creeks and rivers, whereas this small area of marsh (derived wetland) vegetation is located along the outflow of the main dam in the northern section of the Subject Land, thus is a result of man-made development, and is well away from a floodplain. This area was dominated by wetland plants, especially thick cover of Common Swamp Wallaby Grass (*Amphibromus nervosus*). As per the BAM method, it was determined that the original PCT in this area was PCT 266, as per the surrounding vegetation. The construction of the dam, and the resulting alterations of the water regime over many years in this area, means the vegetation was more aligned with that of PCT 12. This patch was mapped and assessed as PCT 266 (derived wetland), as required, which gave an accurate vegetation integrity score based on the vegetation and structure that was originally present.

PCT 277 – ‘Blakeley’s Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion’.

This PCT is present in the lower-lying (higher fertility) areas in the vicinity of the drainage lines in the west and east of the study area, as well as the patch of remnant Blakeley’s Red-gum in the south near the main estate entrance road. The patch along the north-western boundary (just beyond the Subject Land) is of moderate-high quality, with native grasses, sedges and herbs in the understorey, which then becomes overstorey only further south, also just outside the western perimeter of the Subject Land. Along the northern section of Eight Mile Creek in the east, the remnant trees are restricted to the edges of the creek, with the remaining vegetation in the C3 reserve in that area being revegetation of mostly overstorey species, with occasional shrubs, and mostly exotic species in the ground layer.

PCT 278 – ‘Riparian Blakeley’s Red Gum – box – shrub – sedge – grass tall open forest of the central NSW South Western Slopes Bioregion’.

This PCT is present further south along the Eight Mile Creek, and only a small area of Subject Land intersects this PCT (where the wetland outfall structure is to be constructed). The broader patch is of low to moderate quality, with native grasses, sedges and herbs in the understorey in some areas, and other areas that are limited to overstorey over a predominantly exotic understorey. In this section of Eight Mile Creek, the remnant trees are consistently located along the edges of the creek, with others also scattered throughout most of the reserve area. There are also significant areas of revegetation throughout this block, which includes tree and shrub plantings. The impact area occurring in this PCT is dominated by vegetation, and contains no remnant trees or shrubs and very little remnant groundcover.



Figure 7: NSW modelled Plant Community Types (PCTs - numbered) within and adjoining the Subject Land. Scale: 1:6,400

2.2.3 Plot-based vegetation survey

The floristics of the vegetation communities (PCTs) was sampled within seven plot-based floristic vegetation surveys (400m² BAM plots), consistent with Section 5.2.1.9 of the BAM. The plots were also the location of vegetation integrity plots (1000m² transects) in accordance with Section 5.3 of the BAM (**Figure 8**). Some of the plots had to be extended in length and narrowed in width, to ensure they captured the narrow linear vegetation areas in some places. For example, the BAM plot for vegetation zone '266_Wetland' was 10 metres by 40 metres instead of the standard 20 x 20, to capture the thin linear nature of the vegetation zone (but still totalled 400m²). Another roadside plot (266_Remnant_Sth) was assessed using dimensions of 15 metres by 26.6 metres, to ensure that plot areas were restricted to native vegetation areas only, and did not encroach onto the adjoining road to the north, or exotic dominated paddock to the south to ensure plot metrics were representative. Despite the changes to plot dimensions, the overall assessed areas was as per the BAM requirements.

The location of the floristic vegetation plots was not based upon randomly sampled areas, given that the quality of various areas was variable, and the impacts being made were only being made to very specific locations where native vegetation was persisting. As such, plot locations were targeted at exact areas where development impacts were occurring in patch vegetation, nearly all of which is located in C3 lands. In doing so, we were ensuring that the plot-based survey included representative areas of the community and the various vegetation zones, and vegetation that was actually being impacted was being assessed. Given the linear nature of the roadside vegetation, edge effects (i.e. areas located close to edges of vegetation zones) or ecotones with adjacent vegetation zones were very difficult if not impossible to avoid, and we focussed on getting as much of the target PCT and impact area into the plot area as we could, while trying to exclude less representative areas that were dominated by exotics, bare ground or roads.

2.2.4 Vegetation integrity survey

Vegetation integrity survey plots of 50 x 20 metres (1000m²) were completed within the site where impacts to patch vegetation were occurring, and were applied to meet the requirements of the BAM. Seven (7) plots were completed, all of which were located at and extended through the BAM 400m² floristic plots (**Figure 8**). The number of integrity plots surveyed within each vegetation zone is consistent with the requirements outlined within the BAM.

In some instances, like BAM plots, the vegetation integrity transects had to be extended in length and narrowed in width, as the narrow and linear nature of much of the remnant habitat meant the normal width transect areas would not be appropriate (would branch out into fully exotic areas) and would otherwise have impacted the results.

For instance, the integrity plot for zone '266_Remnant_MQ' was 10 metres wide by 100 metres long. Despite the occasional changes to transect dimensions, the overall assessed areas was still 1000m², as per the BAM requirements. While **Figure 8** shows eight (8) BAM plots locations, one (the eastern-most plot) was not used owing to design changes, which avoided impacts being made in this assessed area.



Figure 8: The seven (7) BAM vegetation assessment plots and transect locations. Scale 1:6,400

2.3 Threatened flora survey methods

2.3.1 Review of existing information

To identify threatened flora that have previously been recorded within 10 kilometres of the Subject Land and that may occur within the site or around the site, searches were undertaken using the EPBC Protected Matters Online Search Tool (PMST) and NSW BioNet, to identify *flora* species and *threatened communities* within that spatial scale. The EPBC PMST returned five (5) *Vulnerable* and three (3) *Endangered flora* species, and three (3) Threatened Ecological Communities (TECs) (EPBC Act status) whose habitat may occur within the 10 kilometre radius of the site. A search of the NSW BioNet, the website for the Atlas of NSW Wildlife for *flora* records, three (3) *Vulnerable flora*, three (3) *Endangered flora*, and seven (7) TECs that may be present within the 10-kilometre buffer (BC Act Status).

For each of these TECs and flora species listed under the EPBC Act and NSW BC Act that potentially occur within the 10-kilometre search radius, their likelihood of occurring on the site has been assessed and is presented in **Section 4.7** (where applicable) and **Appendix L** and **Appendix M**.

The categories for likelihood assessments (likelihood of a species or community being present in or in close proximity to the Subject Land) are based on recorded sightings listed in credible databases, the presence or absence of suitable habitat, other features of the site, results of the field survey and professional judgement from ecologists. The five categories are:

‘Recorded’	The species/community was or has been previously observed on the site.
‘Likely’	A medium to high probability that a species uses the site.
‘Potential’	Some suitable habitat for a species occurs on the site, but there is insufficient information to categorise the species as ‘likely’ or ‘unlikely’ to occur.
‘Unlikely’	A very low to low probability that a species uses the site.
‘No’	Habitat on the site and in the vicinity is unsuitable for the species.

Where a threatened community or species has a likelihood ranking of ‘likely’ or ‘recorded’, they have been considered in more detail in Section 4.6 as well as in **Appendix N** (SIC assessments) for EPBC Act listed entities.

2.3.2 Habitat constraints assessment

The EPBC Act listed ‘*White Box Yellow Box – Blakely’s Red Gum Grassy Woodland and Derived Native Grassland TEC*’, which is classified as Critically Endangered, was considered a possibility of persisting on site. After detailed assessment during field surveys and putting the parts of site that had potential to be this TEC through the listing criteria for the TEC, the determination was that none of the smaller individual patches (various condition states) or the broader combined patch area met the TEC criteria, for reasons as follows:

1. *Is or was previously, at least one of the most common overstorey species White Box, Yellow Box or Blakely’s Red-gum?* – **YES. All three species present.**
2. *Does the patch have a predominantly native understorey?* – **YES and NO. There were a number of small patches that had a predominantly native understorey (>50% cover), but the majority of the potential TEC areas were dominated by exotic cover. The overall patch, when considered together, does not have an average of >50% native understorey cover).** The broader patch and most smaller individual patches eliminated at the above point. For those

few small patches remaining that had >50% native understorey cover that met this point:

3. *Is the patch 0.1 hectares or greater in size?* **YES and NO.** The overall patch of the potential TEC is large, however all but one of the small and fragmented patches that met the native groundcover dominance criteria were small. The higher-quality zone with good understorey is just over 0.1 hectares.
 - All but the one larger higher-quality patch eliminated at this point.
4. *There are 12 or more native understorey species present (excluding grasses) –* **NO.** There were only eight native understorey species (excluding grasses) present in the higher-quality patch.
 - The > 0.1 hectare 'higher quality' vegetation zone eliminated at the above point. For the broader patch, the below criteria are not relevant, as the broader patch when combined, does not have an average 50% of native vegetation in the understorey (see step 2).
5. *Is the patch greater than 2 hectares in size?* – **NA (the overall patch when all condition states are combined is >2 hectares, but it does not meet Step 2 requirements).**
6. *Does the patch have an average of 20 or more mature trees (= \geq 125cm dbh) per hectare –* **NO/NA;** *or is there natural regeneration of the dominant overstorey eucalypts?* **YES/NA.** There are numerous (albeit patchy across the entire patch) naturally regenerating canopy species (not including those in the revegetated areas) including various cohorts of different ages, ranging from small saplings, young trees greater than 15cm dbh, and larger yet immature gum trees. However, the patch does not meet Step 2 requirements.

The majority of the potential TEC patch has an understorey that is dominated by exotic weeds and pasture grasses, aside from the occasional scattered higher quality patches, which are mostly along the northern side of Williams Road. On this basis, many of the patches are eliminated at step two of the TEC listing criteria. Of the remaining patches where more than 50% of the understorey is native, all but one patch is small in size, and did not meet the 0.1 hectare size requirement at step three. Within that remaining slightly larger and higher quality patch, there were fewer than 12 native understorey species (excluding grasses) present (eight species in total), so this patch is also excluded from the TEC classification at point four. As a result of the above assessment against the EPBC Act listing criteria, the site does qualify as being representative of the EPBC Act-listed TEC.

There are six (6) EPBC Act listed flora species that are listed as candidate species for assessment in the BAM-C, those being the *Critically Endangered* Euphrasia sp. (*Euphrasia arguta*), *Critically Endangered* Tumut Grevillea (*Grevillea wilkinsonii*), *Critically Endangered* Wybong Leek Orchid (*Prasophyllum* sp. *Wybong*), *Endangered* Small Purple-pea (*Swainsona recta*), *Endangered* Tarengo Leek Orchid (*Prasophyllum petilum*), and the *Vulnerable* Yass Daisy (*Ammobium craspedioides*), all of which required further consideration. Targeted surveys for these species was undertaken over several assessments in 2024 and 2025, and none of the species were found to be present.

2.3.3 Field surveys

There are seven (7) BC Act listed flora species that were listed as candidate species for assessment in the BAM-C. These included the *Critically Endangered* Euphrasia sp. (*Euphrasia arguta*), *Endangered* Small Purple-pea (*Swainsona recta*), *Endangered* Small Scurf-pea (*Cullen parvum*), *Endangered* Tarengo Leek Orchid (*Prasophyllum petilum*), *Vulnerable* Ausfield's Wattle (*Acacia ausfeldii*), *Vulnerable* Yass Daisy (*Ammobium craspedioides*), and the *Vulnerable* Silky Swainsona Pea (*Swainsona sericea*).

Targeted surveys for these species were undertaken over several assessments in 2024 and 2025, and none of the species were found to be present. Field survey methods used and the species targeted for flora surveys are outlined in **Section 0**.

There was one BC Act listed threatened community (associated with PCT 266 , 277 and 278) that is considered likely to be persisting in or within close proximity to the Subject Land, that being '*White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions*' (NSW Grassy Woodland). This TEC is considered present along Williams Road, in the retained patch of Blakey's Red-gum on R1 land, and along the western boundary of the Subject Land, and areas bordering the Eight Mile Creek where large remnant trees are present.

2.4 Threatened fauna survey methods

2.4.1 Review of existing information

To identify threatened fauna that have previously been recorded within 10 kilometres of the site, searches of the EPBC PMST and NSW BioNet were conducted. The EPBC PMST returned nine (9) *Migratory*, eighteen (18) *Vulnerable*, thirteen (13) *Endangered* and five (5) *Critically Endangered* fauna species whose habitat may occur within the 10 kilometre search radius (EPBC Act status). NSW BioNet, the website for the Atlas of NSW Wildlife returned 46 fauna species records within the specified geographic range, including thirty-three (33) *Vulnerable*, seven (7) *Endangered* and one (1) *Critically Endangered* species (BC Act status). For each of these species listed under the EPBC Act and NSW BC Act that may occur within the 10-kilometre search radius, their likelihood of occurring on or adjacent the site has been assessed (using the same categories as in Section 2.3) and results are presented in **Appendix L** and **Appendix M**. Species that had a likelihood assessment of 'likely', or 'recorded' have been considered further below and in **Section 4.7**, and SIC assessments for those listed under the EPBC Act are available in **Appendix O**.

2.4.2 Habitat constraints assessment

Numerous days of field survey and assessments were undertaken during preparation for this BDAR. During these assessments, the proposed development site was walked and assessed for habitat constraints and microhabitats that may be on site, including searches of scattered trees in search of hollows and stick nests. Some microhabitats, such as fallen branches, native grasslands, farm dams and areas of pooled water, were present on site. In terms of habitat constraints that may affect the presence of threatened flora species, nearly the entire R1 zoned land area, which is the vast majority of the development footprint, contains significant disturbance from historical clearing and agricultural uses, and no longer contains any native vegetation or valuable habitat features for native species, other than some large, scattered paddock trees and a patch of Blakely's Red-gum. Many of the trees located on the R1 land are hollow-bearing.

The areas of C3 zoned land, along Williams Road and Eight Mile Creek, have a mixture of condition states, ranging from exotic dominated understorey to relatively intact native vegetation in some small remnant patches (on Williams Road). There was therefore a reasonable likelihood that threatened species may be persisting in some of these better areas, but there was a lower likelihood of their presence in the lesser quality areas, due to historical clearing, grazing and weed invasion/dominance. However, even in the higher-quality patches in the C3 areas, there were missing or had altered habitat features, and especially absent was large logs and ground timber in general, likely as a result of historical firewood collection (probably due to the urban fringe location).

In addition, there is considerable rabbit, kangaroo and livestock browsing pressure, even in the C3 areas, and it is therefore deemed unlikely that the more grazing sensitive threatened flora species would persist anywhere in the Subject Land.

2.4.3 Field surveys

Surveys for BAM-C candidate species

There were seven (7) candidate *flora* species listed in the BAM-C which were the subject of targeted flora field surveys (**Table 18**). In addition to these species, targeted searches were also undertaken for the species listed in the 10 kilometre radius search results from the NSW BioNet database, with particular focus on those which had a likelihood of occurrence of 'likely' or higher (as per **Appendix L** and **M**). During these targeted surveys and other general vegetation surveys and habitat assessments that were undertaken throughout 2024 and early 2025, no threatened flora species were identified. This is a reflection of the degraded nature of the habitats that remain in the Subject Land, with all of the areas having undergone significant historical and ongoing disturbances.

There were twenty (20) candidate *fauna* species listed in the BAM-C which were the subject of targeted field surveys. Surveys were conducted as per the **Table 3** (survey seasonal windows) and **Table 4** (survey methodology). In addition to these species, targeted searches were also undertaken for the species listed in the 10 kilometre radius search results from the NSW BioNet database, with greatest emphasis on those with a 'likely' or higher likelihood of occurrence score in **Appendix L** and **M**. During these targeted surveys and other general fauna surveys and habitat assessments that were undertaken throughout 2024 and into 2025, four (4) threatened fauna species were identified on the Subject Land, those being Squirrel Glider, Sloane's Froglet, Scarlet Robin and Flame Robin.

Surveys for other EPBC Act and BC Act listed threatened species within 10 kilometres

As mentioned above, targeted surveys for candidate species and other threatened fauna species were conducted following modelled results from the BAM Calculator (BAM-C) (**Table 3**) as well as consideration of species that were assessed as 'likely' (via the database searches and likelihood assessment) to be using habitat within the Subject Land (**Appendix L** and **Appendix M**). Survey month requirements for each species are provided in **Table 3**, and a summary of methodologies employed on site between June 2024 and January 2025² consist of thirteen (13) days and six (6) night of surveys, with these efforts presented in **Table 4**.

All surveys were conducted by Stuart Mendham, with assistance from Damian Wall, Emily Mendham, and Olivia Hynam (Red-Gum Environmental Consulting). Please note, that while one amphibian species was listed on the BAM-C lists of species for the site (Booroolong Frog), Sloane's Froglet (*Crinia sloanei*) was not on the list, and was subsequently added as a candidate species manually in BAM-C. Targeted surveys for the Sloane's Froglet were conducted according to its winter survey timing requirements (positive surveys were also conducted as part of the ToS). Four (4) species of threatened fauna were recorded on site during the surveys, consisting of Sloane's Froglet, Squirrel Glider, Scarlet Robin and Flame Robin.

² Survey effort was guided by the 2018 OEH publication 'Field survey methods for environmental consultants and surveyors when assessing proposed developments or other activities on sites containing threatened species'.

Table 3: Survey periods for candidate threatened flora and fauna species (BAM-C)

Name	Presence	Survey Months
<i>Anthochaera Phrygia</i> Regent Honeyeater	Assumed present (IHM)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec
<i>Acacia ausfeldii</i> Ausfeld's Wattle	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input checked="" type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec
<i>Ammobium craspeoides</i> Yass Daisy	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input type="checkbox"/> Dec
<i>Aprasia parapulchella</i> Pink-tailed Legless Lizard	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec
<i>Burhinus grallarius</i> Bush Stone-curlew	No (surveyed)	<input checked="" type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input checked="" type="checkbox"/> Jun <input checked="" type="checkbox"/> Jul <input checked="" type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec
<i>Callocephalon fimbriatum</i> Gang-gang Cockatoo	No (surveyed)	<input checked="" type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec
<i>Calyptorhynchus lathami lathami</i> SE Glossy Black Cockatoo	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input checked="" type="checkbox"/> Jun <input checked="" type="checkbox"/> Jul <input checked="" type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec
<i>Crinia sloanei</i> Sloane's Froglet	YES (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input checked="" type="checkbox"/> Jul <input checked="" type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec
<i>Euphrasia arguta</i> Euphrasia sp.	No (surveyed)	<input checked="" type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec
<i>Grevillea wilkinsonii</i> Tumut Grevillea	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec
<i>Haliaeetus leucogaster</i> White-bellied Sea-eagle	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input checked="" type="checkbox"/> Jul <input checked="" type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec
<i>Hieraaetus morphnoides</i> Little Eagle	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input checked="" type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec

Name	Presence	Survey Months
<i>Litoria booroolongensis</i> Booroolong Frog	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec
<i>Keyacris scurra</i> Key's Matchstick Grasshopper	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec
<i>Pophoicnta isura</i> Square-tailed Kite	No (surveyed)	<input checked="" type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec
<i>Myotis Macropus</i> Southern Myotis	Assumed present	<input checked="" type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec
<i>Ninox connivens</i> Barking Owl	No (surveyed)	<input checked="" type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input checked="" type="checkbox"/> Jun <input checked="" type="checkbox"/> Jul <input checked="" type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec
<i>Petaurus norfolcensis</i> Squirrel Glider	YES (surveyed)	<input checked="" type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input checked="" type="checkbox"/> Jun <input checked="" type="checkbox"/> Jul <input checked="" type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec
<i>Phascogale tapoatafa</i> Brush-tailed Phascogale	No (surveyed)	<input checked="" type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec
<i>Phascolarctos cinereus</i> Koala	No (surveyed)	<input checked="" type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input checked="" type="checkbox"/> Jun <input checked="" type="checkbox"/> Jul <input checked="" type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec
<i>Polytelis swainsonii</i> Superb Parrot	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input type="checkbox"/> Dec
<i>Prasophyllum sp. Wybong</i> Wybong Leek Orchid	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec
<i>Pteropus poliocephalus</i> Grey-headed Flying-fox	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec
<i>Swainsona recta</i> Small Purple-pea	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input type="checkbox"/> Dec

Name	Presence	Survey Months
<i>Swainsona sericea</i> Silky Swainsona-pea	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input type="checkbox"/> Dec
<i>Synemon plana</i> Golden Sun Moth	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec
<i>Tyto novaehollandiae</i> Masked Owl	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input checked="" type="checkbox"/> Jun <input checked="" type="checkbox"/> Jul <input checked="" type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec

Threatened species that were listed as candidate species in BAM-C but were assessed as not occurring on site include Swift Parrot (*Lathamus discolor*), as the Subject Land does not intersect with the Important Habitat Map for the species; the Large-eared Pied Bat (*Chalinolobus dwyeri*), due to habitat constraints (lack of mines, caves and cliffs); and Squirrel Glider in the Wagga Wagga Local Government Area (*Petaurus norfolcensis* – endangered population) due to the project not occurring within the Wagga Wagga LGA (see **Appendix H**). Despite not being on the candidate list, Swift Parrot was still included in the species targeted searches, which consisted of incidental searches for birds and four days of point counts across ten set points in the Subject Land.

The BAM-C candidate species report for R1 land (**Appendix H**), which only consisted of impacts to on one deemed tree loss from the patch of Blakely's Red-gum on R1 land, lists numerous threatened species as 'assessed as not on site'. The reason for this is that only those twelve (12) species that have come onto the BC Act since this land was biocertified in 2011 were considered as candidate species in these areas. Therefore, only Grey-headed Flying Fox, Little Eagle and Sloane's Froglet were candidate species from the list of 12 species, and these were the candidate species for R1 land. Despite this, efforts were undertaken to search for all candidate species (i.e. including those from the C3 BAM-C assessment) during targeted surveys. There was no candidate species list available for the BAM-C scattered tree assessment, which was applied to the scattered trees throughout the R1 land.

Table 4: Survey methodology - Overview

Intended Target	Methodology	Survey Period Notes
Diurnal Birds <i>(Targets: Square-tailed Kite, Little eagle, White-Bellied Sea Eagle, Glossy Black Cockatoo, Gang-Gang Cockatoo, Bush Stone-curlew, Regent Honeyeater, Superb Parrot, Swift Parrot, Barking Owl, Masked Owl)</i>	Area search: Observers walked around and throughout the site four (4) times in its entirety, and also smaller targeted areas on nine (9) occasions (through C3 lands creeks, dam areas).	See Table 5 and Table 6 for weather conditions. Detailed observation counts were made over the duration of fieldwork, with 58 birds being recorded on the incidental species list (Appendix K). Many peri-urban species including Noisy Miner co-existing with common rural species such as Magpies, Magpie Larks, Red-Wattle Bird and Galah.
	Point Count Method: Observations were made from ten (10) points for 15 minutes each, on four separate days (entire site searches).	Ten (10) point count sites (see Appendix I) were visited at various times during daylight hours, with survey conducted for approximately 15 minutes per point count site. All sites were visited four times, once on 13/6/2024, 26/7/2024, 1/8/2024, and 17/10/2024.
	Remote cameras: 23 remote cameras were placed in habitat trees along Williams Rd and in the patch of trees on R1 land.	Cameras along Williams Road recorded for 12 days/nights, and cameras in R1 land recorded for 35 days/nights. Several birds were recorded on cameras that were not detected through other methods of survey, including Yellow-faced Honeyeater (<i>Caligavis chrysops</i>), and Little Friarbird (<i>Philemon cineogularis</i>).
Nocturnal Birds/Bats <i>(Targets: Masked Owl, Barking Owl, Bush Stone-curlew, Southern Myotis, Grey-headed Flying Fox)</i>	Broadcast surveys: Calls of both owl species and Bush Stone-curlew were played through a speaker at numerous locations across the site.	Surveys were conducted on the nights of 26/7/2024, 12/8/2024, 19/8/2024 and 26/8/2024. Calls were played over a speaker at increasing volumes and at different times and locations from dusk to 8:15pm (typically 2-3 hours duration after sunset).
	Remote cameras: 23 remote cameras were placed in habitat trees along Williams Rd and in the patch of trees on R1 land.	Cameras along Williams Road recorded for 12 days/nights, and cameras in R1 land recorded for 35 days/nights. There was one nocturnal bird recorded on cameras that was not detected through other methods of survey, that being Tawny Frogmouth (<i>Podargus strigoides</i>).
	Passive acoustic device: A Mini Bat2 recorder was placed in a tree beside the large dam, to detect any potential Southern Myotis (and other species) in that area.	The acoustic device was placed on site on 14/12/2024 and was collected on 10/1/2025 (27 days of recording from 1 hour before dusk to one hour after sunrise). The device captured 10,736 sounds, many of which were bat calls. Calls were analysed by an expert (Dr Greg Ford) using specialised software. Difficulty in identifying/distinguishing Southern Myotis from other calls meant that further surveys would not be assured of proving either presence or absence of this species. Therefore, the species has been assumed present.
Mammals <i>(Targets: Squirrel Glider, Brush-tailed Phascogale, Koala, Eastern Pygmy Possum)</i>	Spotlighting: Transects driven and walked for 2-3 hours on four (4) nights	Entire site was transversed over 2 to 3.5 hour periods on the nights of 26/7/2024, 12/8/2024, 19/8/2024 and 26/8/2024, with particular emphasis on walking higher quality habitat along Williams Road. R1 areas were spotlighted from a vehicle given the scale of the property. The spotlighting was done with hand held spotlights and binoculars. Periodic stops were taken, to focus on larger hollow-bearing and habitat trees. Some spotlighting was also conducted on 19/11/2024 and 9/12/2024, but mammals were not the main focus of survey effort on these nights.

Intended Target	Methodology	Survey Period Notes
	Remote cameras: 23 remote cameras were placed in habitat trees along Williams Rd and in the patch of trees on R1 land.	Cameras along Williams Road recorded for 12 days/nights, and cameras in R1 land recorded for 35 days/nights. Three marsupial species were recorded on cameras, including Brush-tail and Ringtail Possums. Squirrel Gliders were captured on the majority (13) of recovered cameras, not including the three cameras which were stolen.
Amphibians (Targets: Sloane's Froglet, Booroolong Frog, Southern Bell Frog*)	Call Playback: Dusk recording of calls at dams, creeks. Frog calls played at various locations throughout the site where suitable habitat is located.	Surveys targeting Sloane's Froglet were completed on the nights of the 26/7/2024, 12/8/2024, 19/8/2024 and 26/8/2024. Sloane's Froglet were widespread and inhabit all of the main dams and creeks in the Subject Land. Surveys targeting Booroolong Frog and Southern Bell Frog were completed over two nights in late spring and early summer, on 19/11/2024 and 9/12/2024. The absence of suitable habitat for these species on the Subject Land meant that further surveys were not warranted.
Reptiles (Targets: Pink-tailed Legless Lizard)	Habitat searches: Limited ground habitat available (timber and rock). Searches conducted under and near any habitat detected during general searches.	Surveys were conducted on 13/6/24, 8/11/24 and 10/1/2025. Very limited suitable or marginal habitat present on site was a limiting factor. This was reflected by the very low numbers of reptiles detected, which was limited to one common lizard (Garden Skink) and one common snake (Eastern Brown).
Invertebrates (Targets: Sun Moth and Key's Matchstick Grasshopper)	Traverses and sweeps: Traverses through suitable grassland habitat on hot clear days searching for distinctive flight patterns of Sun Moth. Traverses looking for grasshoppers (flightless) and conducting sweep netting and searching for suspect species.	Focus was in suitable habitat along Williams Road, especially areas that were dominated by native grasses, and those small patches that contained Kangaroo Grass. Targeted surveys were conducted over six (6) days, on 1/11/2024, 8/11/2024, 21/11/2024, 14/12/2024, 15/12/2024 and 10/1/2024, as well as incidental searches while completing other surveys and vegetation assessments. Sun Moth surveys took place until (unsuitable) gusty winds started in late morning on 8/11/2024 and 4/12/2024, but other survey days were still and remained suitable throughout the survey periods.
Flora (Targets: Ausfeld's Wattle, Yass Daisy, Euphrasia arguta, Tumut Grevillea, Wybong Leek Orchid, Small Purple-pea, Silky Swainsona-pea)	Traverses and suitable habitat searches: Traverses for conspicuous species and grid searches for inconspicuous species were conducted throughout the entire Subject Land.	On a number of occasions, and during all surveys except for nighttime surveys, targeted searches were conducted for candidate flora species. Traverses were undertaken through all C3 areas, including along remnant areas beyond the Subject Land around Seven and Eight Mile Creeks, and along the western boundary. Targeted grid searches were also conducted in all better quality habitat areas in the C3 parts of the Subject Land. Surveys were undertaken over twelve (12) days on 13/6/24, 26/7/24, 29/7/24, 1/8/24, 17/10/24, 1/11/24, 8/11/24, 21/11/24, 4/12/24, 14/12/24, 15/12/24 and 10/1/25.

*Not a candidate species but opportunistic call playback surveys conducted in vegetated dam and creek.

2.5 Weather conditions

The weather leading up to the survey period was fairly typical of autumn weather in the Albury region (Table 5 and 6 provides weather conditions as noted during surveys and as sourced from BOM 2025). During the winter (13/6/24 to 26/8/2024) and spring (17/10/24 to 21/11/24) survey periods, weather was also fairly typical for the region, with no significant spikes or dips in ambient air temperatures, and no unusual/extreme frosts or heavy rain periods. The weather during the summer survey period (4/12/2024 to 10/1/2025) was also fairly typical summer weather for the region, although there were some extended periods of higher humidity than long-term averages during this time (early in the summer period). This is not uncommon however, with increasing humidity in summer in the past ten to twenty years, likely as a result of climate change factors and shifting weather patterns. These changes are unlikely to have had a noticeable effect on flora or fauna species presence throughout the survey period.

Table 5: Weather conditions during surveys (Albury Airport weather station (station no. 072160))

Date	Type	Temperature (°C)		Rain (mm)
		Min	Max	
13/06/2024	Diurnal	-0.3	10.7	0
26/07/2024	Diurnal & Nocturnal	4.3	15.0	2.6
29/07/2024	Diurnal	-1.4	13.4	0
1/08/2024	Diurnal	-1.9	14.8	0
12/08/2024	Nocturnal	2.3	19.7	0
19/08/2024	Nocturnal	6.5	17.8	0*
26/08/2024	Nocturnal	10.2	14.5	19.6
17/10/2024	Diurnal	11.8	27.0	0.2
1/11/2024	Diurnal	7.8	25.0	0
8/11/2024	Diurnal	9.5	22.9	0
19/11/2024	Nocturnal	9.1	27.6	0.2
21/11/2024	Diurnal	14.2	32.8	0
4/12/2024	Diurnal	18.0	32.3	5.6
9/12/2024	Nocturnal	12.5	25.1	0*
14/12/2024	Diurnal	14.2	33.1	0
15/12/2024	Diurnal	16.1	35.3	0
10/01/2025	Diurnal	18.6	33.3	0

*These surveys followed rain events from the previous 1-2 days to enhance amphibian detections.

Table 6: Environmental conditions during threatened species surveys

Survey undertaken (e.g. method / targeted species)	Date	Time	Temperature (min. & max.)	Wind (light, mod...)	Rainfall (mm)	Other conditions relevant to the species
Flora, birds, reptiles and site recon	13/06/2024	10:00 - 14:30	Clear, 12-14C	3-8km westerly	0	
Sloanes, birds (Scarlet Robin month), owls playback	26/07/2024	14:00 - 19:00	Mostly Clear, 12-16C	0-5km westerly	0	
Birds, frogs, vegetation	29/07/2024	10:00 - 14:00	Clear, 11-14C	0-2km southerly	0	
Birds, frogs, vegetation	1/08/2024	10:00 - 14:00	Clear, 6-15C	0-2km southeasterly	0	
Sloanes and Gliders, owls	12/08/2024	16:45 - 20:15	Clear, 8-15C	0-2km north- westerly	0	
Sloanes and gliders, owls	19/08/2024	17:00 - 20:00	Clear, 8-15C	0-1km north- westerly	0	Followed rain event from prior 2 days
Sloanes and gliders, owls	26/08/2024	16:45 - 19:00	Cloudy, 9- 13C	Still, no wind	0	
Birds, BAM plots	17/10/2024	09:00 - 16:30	Clear then mostly cloudy 12- 21C	0-5kph NNW	0	
Birds, Amphibromus sampling, sun moth, matchstick grasshopper, and ID grass	1/11/2024	14:00- 15:00	Warm, partly cloudy 28C	0-5kph NNW	0	
Keys grasshopper, Sun moth, Koala scats, GG Frog, A fluitans, reptiles, birds, orchids	8/11/2024	8:00 - 11:00	Warm, mostly sunny 16-24C	5-10, increasing to 10-15. westerly	0	
Booroolong Frog, Owls, Curlew	19/11/2024	20:15 - 11:00	Warm- clear 25-15C	0-5km southerly	0	
Keys grasshopper, Sun moth, Koala scats, GG Frog, A fluitans, birds, orchids	21/11/2024	8:30 - 10:30	Warm, sunny 18 to 28C	5-10, increasing to 10-15. Northerly	0	
Birds. R1 tree mapping. EPBC criteria check C3. Camera installations	4/12/2024	9:00 - 13:00	Warm, sunny 18 to 28C	0-5, increasing to 5-10. West then north- west	0	

Survey undertaken (e.g. method / targeted species)	Date	Time	Temperature (min. & max.)	Wind (light, mod...)	Rainfall (mm)	Other conditions relevant to the species
Camera installations	4/12/2024	9:00 - 16:00	Warm, sunny 18 to 28C	0-5, increasing to 5-10. West then north- west	0	
Booroolong Frog, Owls, Curlew	9/12/2024	20:30 - 11:00	Mild, partly cloudy 22- 16C	0-5km south- westerly	0	Followed rain event from prior 2 days
Bat detector installation, birds, sun moth, grasshopper, Southern Bell Frog	14/12/2024	15:30 - 16:30	Hot sunny 32-33C	Still, no wind	0	
Remove cameras on roadside trees, birds, sun moth, grasshopper, Southern Bell Frog	15/12/2024	6:00 - 9:00	Warm 18- 25C	Still, no wind	0	
Flora, birds, frogs, reptiles, moth, grasshopper, plants	10/01/2025	9:00 - 14:00	Warm to hot 18-32C	Still, increasing to gusts of 1- 5kph SW	0	

2.6 Limitations

When assessing the vegetation on site and conducting flora surveys, the thick growth of exotic pasture grasses in some areas, especially around the water ways (Eight Mile Creek) and throughout the cropped areas on R1 land, made assessing some areas of the site difficult. However, in these densely grassed areas native species were scarce or absent, due to this exotic species pressure. The fauna surveys were designed to attempt to observe as many targets as possible in a simultaneous survey effort, because of the similar habitats frequented by the species, the narrow (linear) arrangement of most of the remaining habitat on site, and the homogenous nature of the habitats present. The addition of remote sensing equipment was also used to bolster survey effort, however data from three cameras were lost, when these cameras were stolen out of trees. The impacts on the overall survey from this lost data was minimal, as targeted species (Squirrel Gliders) were detected throughout much of the area.

The loss of cameras and the resulting removal of all but four cameras early to prevent further losses (only four remained up for the full survey period) did reduce the period of survey for Brush-tailed Phascogale. However, the high numbers of cameras deployed in a small thin strip of the only potential habitat for this species in the Subject Land (along Williams Road and in the R1 patch of trees), means survey efforts are still considered adequate to prove this species is absent. When combined with spotlighting results, and the absence of ground timber or records from the local area, confidence is high that Brush-tailed Phascogale are not present in or adjacent to the Subject Land (as is supported by communications with another local ecologist from DM Ecological, Dylan McWhinney, who explained that there have been no detection of Brush-tailed Phascogales in the local area since monitoring began in 2018 (Pers.com email 24/10/2024)).

No licences were required to undertake the survey. There were no other limitations on the survey or assessment process which would be considered influential upon the outcome.

3. Site context

3.1 Assessment Area

To assist in identifying and assessing the context of the site, a 1500 metre buffer was created around the Subject Land, known as the Assessment Area. The total area of the Assessment Area is 1,493 hectares and includes sections of Seven Mile Creek, Eight Mile Creek, Nine Mile Creek, and Woolshed Creek, with their respective vegetation corridors, and it also includes the northern-most areas of the township of Thurgoona, and the small suburb of Spring Park, which occurs immediately east of the Subject Land. The western part of the Assessment Area is intersected by several transport corridors, including the major Hume Freeway, the Melbourne to Sydney rail line, and Wagga Road. The Assessment Area is used in the following sections to show the context of the site in the local landscape and for assessment of any potential direct and indirect impacts that may result from the development upon the various assets within that area. Refer to **Figure 4a** and **4b** (Location Map) for details about the Assessment Area.

3.2 Landscape features

In accordance with the BAM, a number of features are assessed within the Assessment Area which includes the Subject Land and the area within the 1500 metre buffer. Provided below are details related to IBRA region and subregion, and NSW landscape regions (Mitchell Landscapes). Other features, such as rivers, streams, estuaries and wetlands, habitat connectivity, karst areas or areas of outstanding biodiversity value are also considered, where appropriate.

Landscape features identified within the Subject Land and Assessment Area are shown on **Figure 1 – Overview of C3 land impacts**

Shows the following:

- the boundary of the Subject Land
- development designs
- impacts from development in C3 areas (numbered impact sites)

Figure 2 – Overview of R1 land tree impacts

Shows the following:

- the boundary of the Subject Land
- development designs
- tree status (lost, deemed lost, retained) across the R1 areas

Figure (Site Map) and **Figures 4a** and **4b** (Location Map), respectively. A discussion of relevant landscape features is provided below.

3.2.1 IBRA bioregions and IBRA subregions

Interim Biogeographic Regionalisation for Australia (IBRA) regions represent a landscape-based approach to classifying the land surface, including attributes of climate, geomorphology, landform, lithology, and characteristic flora and fauna species present (NSW Government 2025g). The Subject

Land is located entirely within the Inland Slopes subregion within the NSW South Western Slopes (NSS) IBRA region (version 7). The majority of the broader Assessment Area (1500 metre buffer) is in the Inland Slopes of the NSS, although there is also a thin sliver of Lower Slopes subregion of NSS which occurs in the far north-western corner of the Assessment Area.

3.2.2 Rivers, streams, estuaries and wetlands

There are a number of formal (named) waterways within the Assessment Area, including sections of Seven Mile Creek (running east to west just beyond the southern boundary of the Subject Land), Eight Mile Creek (intersecting the eastern part of the Subject Land), Nine Mile Creek (which occurs south and east of Spring Park Estate, east of the Subject Land), and Woolshed Creek (which occurs in the far southern corner of the Assessment Area, near Brooklyn Fields Estate). The only one of these waterways which occurs in the Subject Land is Eight Mile Creek, which flows south through the C3 land (road reserve of Williams Road) in the eastern part of the Subject Land, between the main development area for the estate, and the small development area in the far east, associated with Stage 8 of the subdivision.

There are several informal (unnamed) creeks and several small drainage lines that flow through the Assessment Area, all of which are direct or indirect tributaries to the larger named waterways nearby. Within the far north-western corner then immediately adjacent to the Subject Land, there is a swampy drainage line that flows north to south along the western boundary of the Subject Land, through three large dams, then into Seven Mile Creek to the south. There is also a drainage line that runs north to south through the middle of the main development area, starting north of Williams Rd, entering then exiting the main dam on site, crossing the road then flowing through two dams on the neighbouring Thurgoona Training Academy land, then heads south-east through the Subject Land, through a dam, before spreading out and weakly flowing (mostly via seepage rather than creek /drain flows) in the direction of Eight Mile Creek. There is also a small drainage line that flows from the eastern part of the development, north of Williams Road, across the road into a small dam, then in a south-easterly direction, through two large dams situated in the proposed educational precinct area of the Subject Land, before flowing (via overland seepage) into Eight Mile Creek, just north of where the proposed large detention basin is to be situated.

There are five (5) main dams within the development footprint (in or very near impacted areas), of which one (1) is being developed (lost), two (2) are being impacted to a small extent but retained as detention basins, and two (2) are being retained untouched in the education precinct area. There are also eight (8) medium to large dams situated just beyond the Subject Land boundary. The majority of farm dams would retain water year round in all but the driest drought periods, whereas the Eight Mile Creek (and the others in the broader Assessment Area) is an ephemeral waterway, which would only flow during the wetter seasons and after rainfall events during the warmer months, and would otherwise be dry or limited to some shallow pools during droughts and during warm periods. Mapped dams and waterways in the Assessment Area and Subject Land are available in **Figure 3, 4a and 4b**. Proposed changes to drainage flows and water storages (detention basins) are available in the development designs (**Appendix Q**).

3.2.3 Habitat connectivity

The site has some habitat connectivity, but nearly all of the connectivity values occur in C3 land areas, with the highly developed and predominantly cleared R1 land containing little connectivity opportunities for species that move through native vegetation and tree canopies, with the scattered trees that remain being mostly widely spaced (greater than 50 metres apart) and mostly disconnected from the corridors that run along nearby C3 lands. This was reflected during spotlighting surveys, with numerous species found in C3 trees, and very few animals detected in trees within R1 lands. Within the Subject Land, Williams Road is the strongest movement corridor, with consistent large trees along the road edge, many of which contain hollows, and there is also connectivity through vegetation along

Eight Mile Creek in the east. Beyond the Subject Land, there is good connectivity along the riparian areas associated with the local named waterways, and moderate to good (albeit mostly narrow) connectivity along a number of road reserves in the broader Assessment Area. Refer to **Figure 2** for mapped connectivity values in the Assessment Area.

3.2.4 Karst, caves, crevices, cliffs, rocks or other geological features of significance

As part of the desktop assessment, aerial photographs and mapping resources such as SixMaps, SEED maps, and MinView (Geoscience NSW) maps were consulted for the presence or potential presence of features of significance within Assessment Area. Accessible roads in the Assessment Area were driven to assess the area for the presence of significant features. The Subject Land (and Eight Mile Creek reserve area) was walked in its entirety on a number of occasions and examined for the presence of significant features. These assessments found no areas containing karst, caves, crevices, cliffs, rocks or other geological features of significance within the Assessment Area or Subject Land.

3.2.5 Areas of outstanding biodiversity value

There are no areas of Areas of Outstanding Biodiversity Value (AOBV) in the Assessment Area, and none are mapped for a considerable distance in any direction from the Subject Land according to the NSW AOBV Register. Therefore, the proposal will NOT impact on any areas mapped as AOBV under the BC Act.

3.2.6 NSW (Mitchell) Landscape

The Subject Land contains only two NSW Mitchell Landscapes, the predominant one being 'Albury – Oaklands Hills and Footslopes' Mitchell Landscape, which occurs over all but the far north-eastern edge of the Assessment Area, and the 'Burrumbuttock Hills and Footslopes' Mitchell Landscape, which occurs in the northeastern corner (Mitchell Landscapes V3) (**Figure 3**). The 'Albury – Oaklands Hills and Footslopes' Mitchell Landscape was entered into the BAM-C due to it being the only Mitchell Landscape occurring within the Subject Land.

3.2.7 Additional landscape features identified in SEARs

This section does not apply, as there are no Secretary's Environmental Assessment Requirements (SEARs) for the development.

3.2.8 Soil hazard features

Based on a search of the NSW EPA website, no contaminated land is present within or near the Subject Land, with the nearest four contaminated land sites being located well to the south, in the built up areas of Albury. A search of the NSW SEED Map and eSpade2 Map, revealed there were no soil hazard features such as acid sulphate soils (no risk data mapped on the Subject Land) or significant erosion risk soil landscapes (Subject Land has an average soil loss of 0.13 tonnes per year per hectare) that occur within the Subject Land or within the broader Assessment Area.

3.3 Native vegetation cover

The extent of native vegetation in the Assessment Area (1500 metre buffer around the Subject Land) was determined through a desktop assessment that mapped the native vegetation using recent aerial photographs (2020 and 2024) and the Murray vegetation extant (VIS_ID 2907) spatial layer, with edits made to the layer where obvious changes in vegetation extent occurred, including the addition of sometimes large polygons of revegetation areas which were often not captured in the extant vegetation dataset (**Table 7**). However, using this technique, it means that the native vegetation mapped is predominantly woody vegetation, and areas of non-woody vegetation (e.g. native grasses), if present, could potentially not be adequately captured. The reasoning for this is that by using aerial

imagery, the changes in woody vegetation cover is easier to distinguish, due to obvious variations in colour. However, native grasses and other smaller native plants away from canopy areas are difficult to distinguish from exotic vegetation using aerial imagery, and are often under-estimated as a result. Despite this, given the generally high disturbance levels of the Assessment Area, there is a general absence of native grass areas, with the majority of canopy-less areas being dominated by exotic pasture species as a result of historical grazing, cultivation and other intensive land uses.

To counter the potential under-reporting of canopy-less native vegetation, native vegetation mapping polygons included areas of grassland within open woodland vegetation patches, and some grassed areas that are adjacent to larger patches of bushland in the Assessment Area, as these are much more likely to retain some of their native grass (and herb) cover.

Therefore, the estimate of native vegetation cover is considered to be reasonably accurate, at 38% coverage across the Assessment Area, and if anything, is a slight overestimation of the native vegetation cover that is persisting in the area. **Table 7** summarises the extent of estimated native vegetation cover within the Assessment Area, including a breakdown of remnant vegetation and planted revegetation. **Figure 9** also shows native vegetation cover that was mapped within the Assessment Area.

Table 7: Native vegetation cover in the 1500m buffer Assessment Area

Assessment Area (ha)	1,493 ha
Total area of native vegetation cover (ha)	464 ha*
Total area of revegetation (ha)	109.2 ha
Combined – Native vegetation cover total	573.2 ha
Percentage of native vegetation cover (%)	38.3%
Class (0-10, >10-30, >30-70 or >70%)	>30-70%

*Percentage cover of just native vegetation is 31%, also in the >30-70% category

4. Native vegetation, threatened ecological communities & vegetation integrity

4.1 Native vegetation extent

The extent of native vegetation within the Subject Land has been assessed using the same GIS layers and digital aerial imagery as used for determining vegetation cover in the Assessment Area. It was determined that there is 7.28 hectares of native vegetation, and 3 hectares of native revegetation, within the Subject Land, the majority of which is located within C3 land. When the areas are combined, there is a native vegetation coverage of approximately 13% across the Subject Land (or 9% if excluding revegetation). The highest quality areas of native vegetation occur in small patches along Williams Road, and along Eight Mile Creek's riparian zone, where large old trees still remain. Other than in some of the revegetation areas, there are few to no shrubs remaining in areas of native vegetation (hence all but the revegetation areas with shrubs are assessed as missing this strata). In the R1 land, other than a small patch of trees near the main entry into the estate (off the proposed Thurgoona Link), native vegetation is limited to mostly large, scattered paddock trees. Refer to **Figure 12** to see native vegetation extent within the Subject Land.

4.1.1 Changes to the mapped native vegetation extent

Analysis of aerial imagery shows that the site is located in a landscape that contains some areas of relatively well-connected native vegetation, along creeks and some roadsides, areas of poorly connected open farmland and areas of roadways and housing estates. Where trees are persisting, except for some small pine plantations in the area to the north, the overstorey is all native, but a shrub layer is very sparse or non-existent in most treed areas, except for areas of revegetation, some of which have a shrub layer. Within the Subject Land, different areas of the site have different levels of exotic and native understory (and very little to no shrub layer), which guided the breaking up of the PCTs on site into various vegetation zones, based on these differing characteristics. The data for the potential PCTs including vegetation formation, descriptive attributes and distribution information were reviewed during the process of determining the most appropriate PCT within the Subject Land.

BAM plots, and observations of vegetation structure and composition that were made during traverses of the Subject Land, as well as adjacent areas, also informed the determination of most the appropriate PCT for the vegetation community within the Subject Land.

It is noted that identification of vegetation communities and PCT's was slightly hindered by the fact that the site has been subject to significant previous disturbance and fragmentation, with some previously cleared stands of vegetation that are regenerating, some remnant areas with large trees still remaining, and large areas that have been entirely revegetated. Consequently, the identification of vegetation communities was based on the above inputs, as well as expert opinion of an experienced observer of the Murray Catchment vegetation types.

Due to the modified state of the vegetation onsite, which in some instances was predominantly canopy trees over exotic pasture with either no natives, or sparse occurrences of native forbs and grasses, a quantitative analysis comparing PCTs at the floristic level was not undertaken (as it was not appropriate given the absence of suitable floristic diversity or structure), nor is it considered likely to change the determination of the dominant PCTs on site (i.e. PCT 266 and 277). As a result, there was little variation in PCT determination compared to PCT spatial data, except where edits were made to improve the coverage of PCT mapping at the finer scale. Refer to **Figure 12**, Native Vegetation Extent.

4.1.2 Areas that are not native vegetation

Exotic grassland (crops and pastures) was identified within large areas of the Subject Land and was not assigned its own management area, zone, vegetation community or an equivalent PCT. This grassland occurs throughout the R1 zoned land, due to its heavy history of clearing, grazing and cropping, and also occurs in C3 land in patches between the woodland areas, or as the dominant understory below a native canopy. The majority of the revegetation areas contain an exotic understory. These exotic areas do not contain any native species (or at best, in the C3 areas, contain very few scattered native species), being made up of a variety of exotic grasses and herbaceous weeds including Phalaris (*Phalaris aquatica*), Annual Rye Grass (*Lolium perenne*), Barley (*Hordeum* sp.) and Wild Oat (*Avena fatua*) (see **Appendix K** for species that occur across the site, and photos in **Section 4.4** for vegetation present in various areas).

For the purposes of the BAM, a clear delineation between native and exotic was determined based on the guideline that anything with less than 15% cover of native vegetation is considered exotic vegetation. However vast areas contained close to zero percent native cover, and many better areas had well over 15% native groundcover. Therefore, distinguishing between patches of native versus exotic vegetation was very straightforward during field assessments.



Figure 9: Native vegetation and revegetation areas within and adjoining the Subject Land. Scale 1:6,500

4.2 Plant community types

4.2.1 Overview and descriptions

Vegetation within the Subject Land has been assessed as aligning closely with the BioNet Vegetation Classification modelled PCTs identified within **Table 8**, and their extent is shown in **Figure 7** (modelled) and **Figure 10** (actual). The extent of PCT coverage was altered after adequate survey was completed during site assessments to better capture the fine scale changes in where these PCTs did and did not occur. Detailed descriptions of each PCT are provided in the following subsections.

Table 8: Overview of PCTs identified within the Subject Land

PCT ID	PCT name	Area of PCT in Subject Land (ha)
PCT 266	'White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion'	3.98 ha
PCT 277	'Blakeley's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion'	3.12 ha
PCT 278	'Riparian Blakeley's Red Gum – box – shrub – sedge – grass tall open forest of the central NSW South Western Slopes Bioregion'	0.17 ha
Total area of PCTs (and percentage PCT cover in Subject Land)		7.28 ha (9%)

PCT 266 - 'White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion'

Moderate to tall woodland dominated by Blakeley's Red Gum (*Eucalyptus blakelyi*), White Box (*Eucalyptus albens*), Yellow Box (*Eucalyptus melliodora*) and occasional Red Box (*Eucalyptus polyanthemus*) dominates the overstorey. Shrubs are not present within the site's remnant areas, however scattered shrubs are generally present in the areas of revegetation. In most areas of the site, the groundcover is dominated by exotic species like Rye Grasses (*Lolium* spp.), Phalaris (*Phalaris aquatica*), Brome grasses (*Bromus* spp.), Paspalum (*Paspalum dilatatum*), Silver Grasses (*Vulpia* spp.), and a variety of annual herbaceous weeds. However, in several zones of this PCT, native grasses and herbs are also present at varying densities and diversities, from scattered occurrences among the exotic species, to the moderate quality zone (266_Remnant_MQ) where native grasses and forbs are dominating, such as Plains Grass (*Austrostipa aristiglumis*), Rough Spear Grass (*Austrostipa scabra*), Wallaby Grasses (*Rytidosperma* spp.), Shiny Everlasting (*Xerochrysum viscosum*), Black-anther Flax-lily (*Dianella revoluta*), and Mat-rush (*Lomandra* spp.) dominate the understorey (**Table 9**).

The identified vegetation community changed throughout the site, with the PCT being classified into vegetation zones consisting of 266_Remnant02_Sth (canopy with only scattered native grasses and herbs in the understorey), 266_Remnant01_Nth (native grassland with some naturally regenerating young canopy species), remnant trees only (only isolated canopy species in paddocks), 266_Remnant MQ (moderate quality with remnant canopy including large trees with native grasses and herbs in the understorey), 266_Revegetation (previously cleared areas that have been planted with mostly indigenous trees and shrubs), and 266_Wetland (a swampy area of dam outflow which is PCT 266 derived wetland).

Identification of the corresponding PCT was based on a review of vegetation mapping, local knowledge and review of the BioNet Vegetation Classification and specifically PCTs which occur within the Inland Slopes subregion within the NSW South Western Slopes IBRA region (version 7) and included the species listed above as a dominant species. Based upon this search, and the results from the BAM plots conducted in PCT 266, PCT 266 was identified as the most appropriate PCT based upon the floristic description and the assessed site data, and sites were broken into vegetation zones based on their floristics, structure, and condition.

PCT 277 – ‘Blakely's Red Gum - Yellow Box Grassy Tall Woodland of the NSW South Western Slopes Bioregion’

Tall woodland dominated by Blakely's Red-gum in the overstorey, and occasionally Yellow Box, with it tending to occur in depressions, drainage lines or break of slope areas that retain a little more soil moisture than the drier areas that are dominated by PCT 266. Shrubs are not present within the PCT where it occurs in the Subject Land. This vegetation community was consistent throughout the site, with the PCT being classified into one single condition class, 277_Trees_only (canopy only with an exotic understorey). There are some scattered shrubs in this PCT in the adjoining riparian areas of Eight Mile Creek, albeit at significantly reduced levels from benchmark cover amounts (**Table 10**).

The majority of the occurrences of PCT 277 within the Subject Land consist of isolated paddock trees, however there is a small patch of this PCT near the main estate entry point, just south of the Thurgoona Training Academy, which is limited to a dense patch of remnant trees and some regrowth, including numerous hollow-bearing trees (mostly small hollows). This area is being retained and for the most part protected from development impacts, except for one tree on the western side, which is being retained, but considered lost due to impacts from the proposed road development occurring within much of its TPZ. In all areas of this PCT on the Subject Land, the groundcover is dominated by exotic species like Rye Grasses (*Lolium* spp.), Phalaris (*Phalaris aquatica*), Brome grasses (*Bromus* spp.), Paspalum (*Paspalum dilatatum*), Silver Grasses (*Vulpia* spp.), and a variety of annual herbaceous weeds. None of the areas of this PCT in the Subject Land contained any native plants in the mid or understoreys.

Identification of the corresponding PCT was based on a review of vegetation mapping, local knowledge and review of the BioNet Vegetation Classification and specifically PCTs which occur within the Inland Slopes subregion within the NSW South Western Slopes IBRA region (version 7) and included the species listed above as a dominant species. Based upon this search, and the results from the BAM plot conducted in the lone patch of PCT 277 on the Subject Land, PCT 277 was confirmed as the most appropriate PCT based upon the floristic description and the assessed site data.

PCT 278 - ‘Riparian Blakely's Red Gum – box – shrub – sedge – grass tall open forest of the central NSW South Western Slopes Bioregion’

Tall woodland dominated by Blakely's Red-gum (*Eucalyptus blakelyi*), which dominates the overstorey. The only part of the Subject Land which contains this PCT is the small area of revegetation alongside the Eight Mile Creek, in the location where the proposed outfall from the large detention basins will be constructed, to channel overflows directly into the creek. The identified vegetation community only occurred once in the Subject Land, with the PCT being classified into PCT 278 revegetation (278_Revegetation). There is a slight overlap in mapped remnant PCT 278 on the very eastern edge of the outfall impact zone, however this is from overhanging canopy from a large tree well away from the impact area, and as such, that remnant strip of mapped PCT 278 is not being impacted by this development. Shrubs are present and dominate within the area of PCT 278, given its formation as an area of revegetation. Dominant species in this area include planted specimens of Blakely's Red-gum, Drooping She-oak (*Allocasuarina verticillata*), Silver Wattle (*Acacia dealbata*), Red-stem Wattle (*Acacia rubida*) and Bottlebrush (*Callistemon sieberi*), with most of the site's

groundcovers generally dominated by exotic species (as per the species described in previous PCTs), except for several very small patches of Weeping Grass (*Microlaena stipoides*) (Table 11).

Identification of the corresponding PCT was based on a review of vegetation mapping, local knowledge and review of the BioNet Vegetation Classification and specifically PCTs which occur within the Inland Slopes subregion within the NSW South Western Slopes IBRA region (version 7) and included the species listed above as a dominant species, based on those in the adjacent remnant areas of the PCT. Based upon this search, and the results from the BAM plot conducted in the lone patch of PCT 278 (278_Revegetation), PCT 278 was confirmed as the most appropriate PCT based upon the vegetation adjacent to the site (in remnant areas), the floristic description and the assessed site data.

Table 9: PCT 266 'White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion'

PCT ID	266
PCT name	'White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion'
Vegetation formation	KF_CH3 Grassy Woodlands
Vegetation class	Western Slopes Grassy Woodlands
Per cent cleared value (%)	94
Extent within Subject Land (ha)	3.98



Photo 1: PCT 266 - 'White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion'

Table 10: PCT 277 - 'Blakely's Red Gum - Yellow Box Grassy Tall Woodland of the NSW South Western Slopes Bioregion'

PCT ID	277
PCT name	'Blakely's Red Gum - Yellow Box Grassy Tall Woodland of the NSW South Western Slopes Bioregion'
Vegetation formation	KF_CH3 Grassy Woodlands
Vegetation class	Western Slopes Grassy Woodland
Per cent cleared value (%)	94
Extent within Subject Land (ha)	3.12

**Photo 2: PCT 277 - 'Blakely's Red Gum - Yellow Box Grassy Tall Woodland of the NSW South Western Slopes Bioregion'**

Table 11: PCT 278 'Riparian Blakely's Red Gum – box – shrub – sedge – grass tall open forest of the central NSW South Western Slopes Bioregion'

PCT ID	278
PCT name	'Riparian Blakely's Red Gum – box – shrub – sedge – grass tall open forest of the central NSW South Western Slopes Bioregion'
Vegetation formation	KF_CH3 Grassy Woodlands
Vegetation class	Western Slopes Grassy Woodland
Per cent cleared value (%)	80
Extent within Subject Land (ha)	0.17

**Photo 3: PCT 278 - 'Riparian Blakely's Red Gum – box – shrub – sedge – grass tall open forest of the central NSW South Western Slopes Bioregion'**

4.2.2 Condition states

Terrestrial habitat assessment was undertaken to develop an understanding of the extent and condition of habitats within each of the mapped PCT areas (and vegetation zones) and across the general assessment site, the results of which assisted in our analysis of the likelihood of occurrence of threatened and migratory species as well as documenting habitat condition, to facilitate accurate calculations of vegetation impacts and offset liabilities. The assessment included the identification of important habitat features such as movement corridors and important microhabitat features in mapped vegetation zones, such as the presence of mistletoe, standing or fallen timber, or shrubby vegetation.

Terrestrial habitat assessment enables fauna habitat condition mapping where the Subject Land was classified relative to habitat quality/characteristics variation within PCTs, and their extent was mapped. Habitat condition was determined through the habitat assessment using factors such as the availability of microhabitat including fallen timber and mistletoe, amount of exotic vegetation, presence of native groundcover (and in particular whether native groundcovers were absent, present but scattered, or dominant), presence of tree hollows, bird nests and any threatened species records collected during the survey. Also taken into consideration are the known habitat requirements of the threatened species previously recorded in the Assessment Area, and the experience of the assessors.

Condition states of PCT patches facilitated the dividing up of the areas of native vegetation into vegetation zones (see **Section 4.4**) based on PCT and structural characteristics. The vegetation zones include remnants of moderate quality (containing all strata except shrubs), remnant overstorey with patches of native groundcovers, remnant overstorey with no native understorey, derived wetland (only groundcovers), derived grassland with young natural regeneration, areas of revegetation, and scattered trees. Two vegetation zones were not impacted by development and were therefore not BAM assessed. The remaining seven vegetation zones were BAM assessed to determine losses from the impact areas occurring within these zones. Photographs of the vegetation zones, which are effectively condition states, are provided in **Section 4.4**.



Figure 10: Actual PCTs in the Subject Land, based on modelled data and ground truthing assessments. Scale 1:6,500

4.2.3 Justification of PCT selection

Review of NSW vegetation mapping spatial data (SVTM_NSW_Extant_PCT_Quickview) identified three native vegetation communities as modelled (or previously mapped) within the Subject Land (Figure 9):

- PCT 266 – ‘White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion’
- PCT 277 – ‘Blakeley’s Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion’
- PCT 278 – ‘Riparian Blakeley’s Red Gum – box – shrub – sedge – grass tall open forest of the central NSW South Western Slopes Bioregion’.

Identification of vegetation communities within the Subject Land (listing criteria) and community nomenclature followed the vegetation classification of NPWS (2002) for NSW species and communities, and the classification under EPBC Act for Commonwealth MNES. Based on the floristic composition of the vegetation in the Subject Land, the three PCTs that are modelled as present on the Subject Land are present, as confirmed by numerous site assessments (Figure 9).

In reality, the areas that the PCTs cover is slightly different than what was originally displayed by the NSW PCT data layer, which is not unusual given the broader scale at which this data is mapped at. The PCT coverage was expanded (or reduced), as required, to include the areas that were mapped as exotic but actually contained native species, and to remove some of the areas mapped as being native, but in fact were dominated by exotics and therefore did not meet the criteria for native vegetation or the PCT in question (Figure 9).

To avoid duplication, please refer to **Sections 2.2.1** and **2.2.2**, which provided evidence-based justification of the decision pathways used for identification and delimitation of PCTs in the Subject Land.

4.2.4 Alignment with NSW TECs

Consultation of the NSW BioNet in January 2025 revealed seven (7) potential TECs which are predicted to occur, or could potentially occur, within 10 kilometres of the Subject Land. These TECs are listed in **Table 12** below. Based on site assessments and comparing vegetation on site to the listing criteria for each community, only one TEC, ‘White Box - Yellow Box - Blakeley’s Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions’, was assessed as being present on the Subject Land. This TEC is described further below.

Table 12: Potential TECs within 10km of Subject Land according to BioNet

Community Name	BC Act Status	Justification
Mallee and Mallee-Broombush dominated woodland and shrubland, lacking Triodia, in the NSW South Western Slopes Bioregion	Critically Endangered	Does not contain TEC's key indicator species
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and	Critically Endangered	Recorded at numerous locations on Subject Land
Coolac-Tumut Serpentine Shrubby Woodland in the NSW South Western Slopes and South Eastern Highlands Bioregions	Endangered	Does not contain TEC's key indicator species
Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	Endangered	Does not contain TEC's key indicator species
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Penepine, Nandewar and Brigalow Belt South Bioregions	Endangered	Does not contain TEC's key indicator species
Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Penepine, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	Endangered	Does not contain TEC's key indicator species
Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions	Endangered	Does not contain TEC's key indicator species

PCT 266, PCT 277 and PCT 278 are all aligned with the BC Act listed critically endangered 'White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions' TEC, hereby referred to as NSW Grassy Woodlands TEC. The vegetation on site consists of patches of remnant canopy trees with a combination of exotic and native understorey, but none of which contained shrubs (except for revegetated areas). The criteria for NSW Grassy Woodlands differs from the EPBC Grassy Woodlands, in that the NSW version includes lesser quality remnant areas (including treed and derived grasslands) as part of the TEC, whereas the EPBC version limits qualifying areas to larger, or higher quality remnant woodlands or high quality derived native grasslands. In this case, there are numerous patches which qualify as the NSW Grassy Woodlands TEC, but there are no patches which qualify as the EPBC Grassy Woodlands. **Figure 11** illustrates the locations of the NSW Grassy Woodland TEC patches.

Some of the woodland areas DO qualify for the NSW Box Gum Woodland TEC listed under the NSW BC Act, and efforts have been made to reduce the impacts to this woodland in reflection of the importance of this vegetation community at the local and regional scale. The majority of these patches occur along Williams Road, which is being closed to traffic and reserved as a conservation area, and another patch in R1 land has since been removed from the development and will also be secured as a reserve. Given the designs are avoiding most of these patches, and only small remaining impacts are occurring in these areas from development, there will not be significant impacts for these areas of TEC.

4.2.5 Alignment with EPBC Act listed ECs

PCT 266, PCT 277 and PCT 278 are all aligned with the EPBC Act listed Critically Endangered 'White Box-Yellow Box-Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands' TEC, now referred to as EPBC Grassy Woodlands TEC. The vegetation on site consists of patches of remnant canopy trees with a combination of exotic and native understorey, but none of which contained shrubs (except for revegetated areas, which lack a mature canopy). A review of the approved Conservation Advice (TSSC 2015) and listing criteria concluded that the areas of potential EPBC Act Grassy Woodlands TEC on the Subject Land, including the highest quality patch along Williams Road, do not meet the condition requirements (criteria) to be categorised as the EPBC Act listed TEC or as a MNES. See **Section 2.3.2** for the listing criteria flow-chart, which outlines the step-by-step decision-making process for assessment (and failure to meet criteria) of the remnant areas, including the highest quality patches. All lesser quality patches also failed to qualify as the TEC based on assessment against the listing criteria. In summary, the patches did not contain enough large trees, were too small, and/or did not contain twelve (12) or more native species in the understorey (not including grasses).

Other EPBC Act listed TECs that were assessed after being considered potentially on site according to the PMST database search within 10 kilometres of the site included Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia, and Weeping Myall Woodlands. However, site assessment revealed that the key indicator species of these TECs were not present anywhere on or near the Subject Land, and therefore these two communities were not present.

The remnant woodland areas within the Subject Land do not meet the criteria for the EPBC Act listed TEC and therefore does not require assessment in accordance with the Commonwealth Government's Significant Impact Guidelines.

4.3 Threatened ecological communities

See **Appendix L (EPBC Act)** and **Appendix M (BC Act)** for threatened community likelihood assessments. As discussed above, there is one TEC identified within the Subject Land, that being the NSW BC Act listed 'White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions' TEC, which as of 2025 is listed as a critically endangered ecological community. This community closely resembles the EPBC Act listed TEC of a similar name, however the woodland in the Subject Land did not meet the criteria to be considered part of the Federally listed TEC. The NSW TEC (NSW Box Gum Woodland TEC) within the Subject Land is listed in **Table 13** and the extent of the NSW TEC is shown in **Figure 11**.

Table 13: TECs within the Subject Land

TEC name	BC Act status	EPBC Act status	Subject Land PCT associations	Vegetation zones with TEC present within the Subject Land	Area of TEC within Subject Land (ha)
<i>White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions</i>	Critically Endangered	Not listed	PCT 266, 277, 278	All remnant vegetation zones* *Note the TEC does not include scattered trees or two or less trees, and does not include revegetation areas that occur in the 'PCT 278 - Revegetation' zone, and 'PCT 266 - Revegetation' zone, both of which are revegetation with no remnant species (in PCT 278) or only scattered specimens/areas of remnant native grasses (in PCT 266).	Total 4.837 ha PCT 266 = 4.08 ha PCT 277 = 0.337 ha *PCT 278 = 0.42 ha
<i>White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland</i>	Not listed	Critically Endangered	NA	Nil (does not qualify)	Nil

4.4 Vegetation zones

Table 14 describes the vegetation zones that were mapped within the Subject Land, noting that these only include patches of vegetation. Where fewer than three canopy trees occur (i.e. two or less scattered trees), or where vegetation contains too little native vegetation (less than 15% cover), these areas are not included in native vegetation zone mapping.

Table 14: Summary of mapped vegetation zones occurring within the Subject Land

Name of vegetation zone	Brief description of structure	Zone Area (ha)
266_Remnant_MQ	Contains native overstorey, grasses and herbs, some exotics	1.894
266_Remnant02_Sth	Contains native overstorey, with scattered native grasses among exotics	1.189
266_Remnant01_Nth (derived grassland)	Contains native grassland dominating, few exotics, with patch of young regenerating overstorey	0.135
266_Revegetation	Formerly cleared, revegetated area with trees and shrubs, exotics dominate groundcover	2.877
266_Wetland (derived)	Derived wetland containing semi-aquatic grasses and sedges, some herbs, surrounded by exotics	0.0284
Sub-total for PCT 266 vegetation zones		6.13 ha
278_Revegetation	Thick shrub and tree plantings in previously cleared area	0.053

Name of vegetation zone	Brief description of structure	Zone Area (ha)
278_Regenerating_remnant	Scattered remnant overstorey with natural regeneration, and scattered native grasses and herbs in understorey	0.017
Sub-total for PCT 278 vegetation zones		0.057 ha
277_Trees_only	Only contains native canopy species, with exotic understorey	0.531
277_Remnant_MQ	Contains native overstorey, with scattered native grasses (some herbs) among exotics	0.254
Sub-total for PCT 277 vegetation zones		0.79 ha
Scattered trees (patches of 2 or less trees)	Not included in vegetation zone mapping – dealt with via the BAM-C scattered tree module	NA
Total area of vegetation zones mapped in Subject Land		6.98 ha

The following section describes the mapped vegetation zones (named as per their entry in the BAM-C system, where relevant) across the Subject Land, as per **Table 14**, which were assigned to homogenous areas that were of the same PCT and shared similar attributes, and are listed in order of highest value to lowest value:

266_Remnant_MQ (moderate quality)

- PCT 266 with vegetation integrity score of 61.5
- Patch size zero (0 hectares) due to shrub strata missing.
- Large trees and tree hollows present.
- Habitat is well connected to other areas of habitat, albeit a thin linear strip along each side of Williams Road (266_Remnant_MQ mostly occurs on north side of road, with southern side mostly lacking native groundcover).
- Shrubs are absent.
- Weed species are present, but natives are dominant.
- Little fallen timber present (no substantial timber), scattered mistletoe present, high leaf litter cover and generally low bare ground cover.
- Given the absence of shrubs, ground timber and the dominance of native grasses, there are limited ground microhabitats available for most fauna.
- Contains levels of habitat that are likely to be supporting breeding, feeding and/or roosting opportunities for threatened species that are known to, or are likely to occur in the Subject Land.
- Threatened species are known to occur there from this survey, as well as previous records or according to assessor's knowledge.



Photo 4: Representative photo of an area of 266_RemnantMQ

266_Remnant02_Sth

- PCT 266 with vegetation integrity score of 47.1
- Patch size zero (0 hectares) due to shrub strata effectively missing (except for lone planted specimen).
- Large trees and trees with hollows present.
- Habitat is well connected to other areas of habitat, albeit a thin linear strip along each side of Williams Road (266_Remnant_Sth only occurs on south side of road, with northern side containing greater native groundcover in most areas).
- Shrubs are effectively absent.
- Native groundcover species are present (mostly scattered grasses/grass-like), but weeds are dominant.
- Some fallen timber present (no substantial timber), scattered mistletoe present, moderate leaf litter cover and low bare ground cover (heavy exotic grass cover in most areas).
- Given the effective absence of shrubs, large ground timber, and the dominance of thick exotic grass cover, there are limited ground microhabitats available for fauna.
- Contains levels of habitat that are likely to be supporting breeding and/or roosting opportunities for threatened species that are known to, or are likely to occur in the Subject Land.
- Threatened species are known to occur there from this survey, previous records or according to assessor's knowledge.



Photo 5: Representative photo of an area of 266_Remnant02_Sth

266_Remnant01_Nth

- PCT 266 with vegetation integrity score of 38.3
- Patch size zero (0 hectares) due to shrub strata missing and no mature overstorey.
- Large trees and tree hollows absent.
- Habitat is limited to native grasses and a patch of young regenerating gum trees, with some connection to other areas of habitat (a thin linear strip of overstorey along each side of Williams Road (266_Remnant01_Nth only occurs on north side of road, mostly in a small area that is proposed to receive a footpath as part of the development)).
- Shrubs are absent.
- Weed species are present, but natives are dominant.
- No fallen timber present (and no substantial timber), no mistletoe present, low to moderate leaf litter cover (higher near the adjacent trees to the south) and moderate to high bare ground cover (typical of a derived grassland).
- Given the absence of shrubs, ground timber and the dominance of low biomass native grasses, there are limited ground microhabitats available for fauna.
- Native grass cover suitable habitat for Sun Moth and Key's Matchstick Grasshopper, but not considered high-value habitat (vegetation zone very small and absence of *Themeda triandra* in zone).
- Contains levels of habitat that are unlikely to be supporting breeding and/or roosting opportunities for threatened species that are known to, or are likely to, occur in the Subject

Land. May be feeding habitat for seed-dependant native birds (albeit limited in size).

- Threatened species are not known to occur there from this survey, previous records or according to assessor's knowledge.



Photo 6: Representative photo of an area of 266_Remnant01_Nth (beyond gate)

266_Revegetation

- PCT 266 with vegetation integrity score of 37.6
- Patch size four hectares (0-5 hectares class) due to all strata being present, but being surrounded by vegetation with missing strata.
- Large trees and trees with hollows absent.
- Habitat is well connected to other areas of habitat, which is a thin linear strip along each side of Williams Road (266_Revegetation only occurs on north side of road).
- Shrubs are present, but scattered.
- Low levels of fallen timber present (no substantial timber), mistletoe absent (due to young and immature canopy species), moderate leaf litter cover and low bare ground cover (heavy exotic grass cover in most areas).
- Given the absence of large ground timber, and the dominance of thick exotic grass cover, there are limited ground microhabitats available for fauna.
- Contains levels of habitat that are unlikely to be supporting breeding and/or roosting opportunities for threatened species that are known to, or are likely to, occur in the Subject Land. May provide feeding opportunities for some threatened species (such as Squirrel

Glider).

- Threatened species are not known to occur there from this survey, however based on previous records and observations of threatened species in adjacent remnants, according to the assessor's knowledge, threatened species are likely to forage in this area regularly or on occasion.



Photo 7: Representative photo of an area of 266_Revegetation

266_Wetland (derived)

- PCT 266 with vegetation integrity score of 36.2
- Patch size zero (0 hectares) due to overstorey and midstorey strata being absent.
- Large trees and trees with hollows absent.
- Habitat is moderately connected to other areas of habitat, which is a thin linear strip along each side of Williams Road (266_Wetland only occurs in the main dam outflow in a small area on north side of road).
- Shrubs are absent.
- No fallen timber present (no substantial timber), mistletoe absent (due to young absence of canopy species), low leaf litter cover and low to moderate bare ground cover.
- Given the dominance of thick semi-aquatic native grass and rush cover, there are some limited suitable ground microhabitats available for fauna (although cover is seasonal).
- Contains levels of habitat that are likely to be supporting breeding and/or roosting opportunities for threatened species that are known to, or are likely to, occur in the Subject Land (Sloane's Froglet).
- Threatened species are known to occur there from this survey.



Photo 8: Representative photo of an area of 266_Wetland (Common Swamp Wallaby Grass just emerging)

278_Revegetation

- PCT 278 with vegetation integrity score of 4.5
- Patch size zero (0 hectares) due to not having all strata being present (native groundcover effectively absent).
- Large trees and trees with hollows absent.
- Habitat is well connected to other areas of habitat, which is a thin linear strip of mature remnant trees along each side of Eight Mile Creek, and surrounded by revegetated areas to the east.
- Shrubs are present, and dominant (thick plantings).
- Fallen timber absent, mistletoe absent (due to young and immature canopy species), moderate leaf litter cover and moderate bare ground cover (heavy exotic grass cover in most areas, but some bare areas where tree and shrub plantings are dense).
- Despite the absence of large ground timber, and the dominance of thick exotic grass cover, there are some limited ground microhabitats available for fauna in the form of dense shrub thickets.
- Contains levels of habitat that are likely to be supporting breeding (Sloane's Froglet) and/or roosting opportunities for threatened species that are known to, or are likely to, occur in the Subject Land. May provide feeding opportunities for some threatened species.
- Threatened species are known to occur there (regularly or on occasion) from this survey, based on previous records and observations of threatened species in adjacent areas, and according to the assessor's knowledge.



Photo 9: Representative photo of an area of 278_Revegetation

In addition to the above categories, there were three other categories of vegetation (vegetation zones) that were mapped on site. These occur on R1 zoned land, and of the three (below), only one was entered into the BAM-C to determine threatened species impacts as the remaining two were undergoing no impacts from the development. The zone '277_Trees_only' is being protected from development and reserved as a conservation area. However, one (1) tree is being 'deemed lost' based on TPZ impacts from nearby works associated with a road, despite the tree being retained. This small loss (entered into BAM-C as the minimum allowed impact area of 0.01 ha) generated no ecosystem or species credit obligations.

278_Regenerating remnant (former development area – removed from designs)

- PCT 278 with remnant regrowth, including a large old tree. Vegetation integrity score not calculated as it was not entered/calculated in BAM-C
- Patch size zero (0 hectares) due to not having all strata being present (shrubs were absent).
- Large trees and trees with hollows absent.
- Habitat is well connected to other areas of habitat, which is a thin linear strip of mature remnant trees along each side of Eight Mile Creek, and surrounded by revegetated areas to the east.
- Shrubs are absent, but are present in revegetation areas nearby.

- Fallen timber present, but no large logs. Mistletoe present in low numbers (due to mostly young and immature canopy species), moderate leaf litter cover and moderate bare ground cover (heavy exotic grass cover in most areas, but some bare areas where tree regeneration is dense).
- Despite the absence of large ground timber and the dominance of thick exotic grass cover, there are some limited ground microhabitats available for fauna in the form of dense blackberry thicket and rushes along the drainage line.
- Contains levels of habitat that are likely to be supporting breeding and/or roosting opportunities for threatened species that are known to, or are likely to, occur in the Subject Land. May provide feeding opportunities for some threatened species (such as Squirrel Glider).
- Threatened species are not known to occur there from this survey. However, based on previous records and observations of threatened species in adjacent areas, according to the assessor's knowledge, threatened species are likely to forage in this area regularly or on occasion. No tree hollows for Squirrel Glider.
- **NOTE:** this vegetation zone was subsequently dropped from the BAM-C, as after detention basin redesigns, the project engineers removed the impact area that was originally proposed to affect this area.



Photo 10: Representative photo of an area of 278_Regenerating_remnant

277_Trees_only

The majority of native vegetation, where it occurs in the R1 land, consists of large old scattered trees (mostly Blakely's Gum and Yellow Box), with the only exception being the patch of Blakely's Red-gum near the main proposed estate entrance. There are no native species in the groundcover under these trees, or anywhere else in the R1 land. Being scattered trees, BAM plots were not able to be undertaken to assess the condition of the large paddock trees. However, a BAM plot was undertaken in the patch of Blakely's Red-gum. This patch contained the following value:

- Patch size zero (0 hectares) due to shrub and groundcover strata missing.
- Large trees and trees with hollows present.
- Habitat is not connected to other areas of habitat.
- Native shrubs and ground covers are absent (trees only).
- Weeds are heavily dominant, with many high-threat pasture weed species present.
- Some fallen timber present (including timber with hollows), scattered mistletoe present, moderate leaf litter cover and low bare ground cover (heavy exotic grass cover in most areas).
- Given the presence of large ground timber and numerous small to medium hollows, there are some important microhabitats available for fauna.
- Contains levels of habitat that are likely to be supporting breeding and/or roosting opportunities for threatened species that are known to, or are likely to, occur in the Subject Land.
- Threatened species are not known to occur there from this survey or from previous records.



Photo 11: Representative photo of an area of 277_Trees_only

277_Remnant_MQ

- PCT 277 with vegetation integrity not assessed (no impacts from development occurring in zone).
- Patch size zero (0 hectares) due to shrub strata missing.
- Large trees and trees with hollows present.
- Habitat is well connected to other areas of habitat, albeit a thin linear strip along each side of Williams Road (vegetation zone occurs on south side of road in two locations).
- Shrubs are effectively absent.
- Native groundcover species are present (mostly scattered grasses/grass-like), but weeds are heavily dominant.
- Some fallen timber present (no substantial timber), scattered mistletoe present, moderate leaf litter cover and low bare ground cover (heavy exotic grass cover in most areas).
- Given the absence of shrubs, large ground timber, and the dominance of thick exotic grass cover, there are limited ground microhabitats available for fauna.
- Contains levels of habitat that are likely to be supporting breeding and/or roosting opportunities for threatened species that are known to, or are likely to, occur in the Subject Land.
- Threatened species are known to occur there from this survey, previous records or according to assessor's knowledge.



Photo 12: Representative photo of an area of 277_Remnant_MQ (Source: Google 2025)

Scattered trees

As mentioned above, the majority of the native vegetation in the R1 land are large, isolated paddock trees, predominantly Blakey's Red-gum, but also Yellow Box, White Box and Red Box. As the R1 land is exempt from the requirements of vegetation offsets (being biocertified land, with losses already offset), native vegetation in R1 land, including the patch and the numerous scattered trees, are being considered for impacts to, and potential offset obligations for, the twelve (12) threatened species that were listed by the BC Act AFTER the land was biocertified. In other words, these species were not adequately assessed or offset as part of the biocertification process, as they were not listed as threatened species at that time. Assessment of impacts from scattered tree losses was assessed via the BAM-C scattered tree module.



Photo 13: Representative photo of a typical scattered paddock tree (Blakely's Red-gum)

Patch assessment

Patch sizes were determined by assessing each vegetation zone against the patch size definition and criteria in the BAM Operational Manual – Stage 1. A 'patch' is defined by the BAM as "an area of intact native vegetation that occurs on the Subject Land. The patch may extend onto adjoining land beyond the footprint of the Subject Land, and for woody ecosystems, includes native vegetation separated by ≤ 100 metres from the next area of intact native vegetation. For non-woody vegetation, this gap is reduced to ≤ 30 metres." An area of 'Intact' native vegetation "must contain all structural layers (strata) characteristic of the PCT" (NSW Government 2018). As all vegetation zones (other than some revegetation areas) lacked shrub cover, as did the surrounding areas of remnant vegetation, the majority of vegetation zones were considered to not meet the definition of a patch, and hence have no patch size. These areas were therefore assigned the <5 hectare patch category when entering them in the BAM-C. The vegetation zone '266 - Revegetation' did contain all the strata of the TEC (albeit no mature canopy or large trees) and was therefore given a patch size of four (4) hectares, which is also in the <5 hectare category. Vegetation zone characteristics are described in **Table 15**.

Table 15: Patch size, PCT and other characteristics of vegetation zones

Vegetation zone ID	PCT ID number and name	Condition / other defining feature	Area (ha)	Patch size class (select multiple if areas of native vegetation are discontinuous)	No. vegetation integrity plots required	No. vegetation integrity plots completed	No. vegetation integrity plots used in assessment	Plot IDs of vegetation integrity plots used in assessment
266_Remnant_MQ	266 - 'White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion'	Low weed cover, all strata present except shrubs	1.894	<input checked="" type="checkbox"/> <5 ha <input type="checkbox"/> 5–24 ha <input type="checkbox"/> 25–100 ha <input type="checkbox"/> >100 ha	1	1	1	266MQ1
266_Remnant02_Sth	266 - 'White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion'	Remnant overstorey, high weed cover, scattered native groundcovers	1.189	<input checked="" type="checkbox"/> <5 ha <input type="checkbox"/> 5–24 ha <input type="checkbox"/> 25–100 ha <input type="checkbox"/> >100 ha	1	1	1	266Sth1
266_Remnant01_Nth	266 - 'White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion'	Derived grassland with patch of regenerating trees, low weed cover	0.135	<input checked="" type="checkbox"/> <5 ha <input type="checkbox"/> 5–24 ha <input type="checkbox"/> 25–100 ha <input type="checkbox"/> >100 ha	1	1	1	266Nth1
266_Revegetation	266 - 'White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion'	Revegetated areas with all strata present in some areas, but generally exotic groundcover	0.287	<input checked="" type="checkbox"/> <5 ha <input type="checkbox"/> 5–24 ha <input type="checkbox"/> 25–100 ha <input type="checkbox"/> >100 ha	1	1	1	266Rev1

Vegetation zone ID	PCT ID number and name	Condition / other defining feature	Area (ha)	Patch size class (select multiple if areas of native vegetation are discontinuous)	No. vegetation integrity plots required	No. vegetation integrity plots completed	No. vegetation integrity plots used in assessment	Plot IDs of vegetation integrity plots used in assessment
266_Wetland	266 - 'White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion'	Derived wetland (treeless) with native grasses and sedges dominating	0.028	<input checked="" type="checkbox"/> <5 ha <input type="checkbox"/> 5–24 ha <input type="checkbox"/> 25–100 ha <input type="checkbox"/> >100 ha	1	1	1	266Wet1
277_Trees_only	277 - 'Blakely's Red Gum - Yellow Box Grassy Tall Woodland of the NSW South Western Slopes Bioregion'	Remnant trees with a 100% exotic groundcover.	0.531	<input checked="" type="checkbox"/> <5 ha <input type="checkbox"/> 5–24 ha <input type="checkbox"/> 25–100 ha <input type="checkbox"/> >100 ha	1	1	1	277Trees1
278_Revegetation	278 - 'Riparian Blakely's Red Gum – box – shrub – sedge – grass tall open forest of the central NSW South Western Slopes Bioregion'	Revegetated areas with thick shrubs, some canopy plantings and mostly exotic groundcover	0.053	<input checked="" type="checkbox"/> <5 ha <input type="checkbox"/> 5–24 ha <input type="checkbox"/> 25–100 ha <input type="checkbox"/> >100 ha	1	1		278Rev1
278_Regenerating_Remnant (since removed from development footprint)	278 - 'Riparian Blakely's Red Gum – box – shrub – sedge – grass tall open forest of the central NSW South Western Slopes Bioregion'	Regenerating canopy species and patches of native grasses and sedges, and one large canopy tree	0.017 ha	<input checked="" type="checkbox"/> <5 ha <input type="checkbox"/> 5–24 ha <input type="checkbox"/> 25–100 ha <input type="checkbox"/> >100 ha	1	1	0*	278RegRem1

*vegetation zone removed from development footprint after further design changes, hence not used for assessment



Figure 11: Areas of BC Act listed TEC – Grassy Woodlands. Scale 1:6,500



Figure 12: Vegetation zones and patch sizes within the Subject Land. Scale 1:6,500

4.5 Scattered Trees

To assess the likely impacts and determine the potential offset obligations from the proposed clearing (including deemed losses) of 29 trees that are on biocertified R1 land, a separate assessment was produced through the BAM-C using the scattered tree module. The application of the module was appropriate, as all of the R1 trees were either individual scattered trees 50 metres or more from other trees, or were a group of three or less trees, from which the nearest vegetation or trees were 50 metres or more away. The only exception was the patch of trees near the southern boundary (near the proposed access road), which were instead dealt with via a separate assessment in the BAM-C, given this area was a patch and did not contain vegetation that meets the scattered tree definitions. Trees were categorised based on their PCT (three PCTs across R1 land), dbh class, and their presence or absence of hollows, and were entered into BAM-C based on their scattered tree PCT group.

The BAM-C generated lists of predicted threatened species (ecosystem credits), and candidate threatened species (species credits). The predicted species list is available in **Appendix H**. Targeted surveys were conducted for the candidate threatened species at the same time as surveys across the entire Subject Land was taking place. No threatened species were identified in any of the scattered trees in the R1 land during surveys. Based on the 28 trees being lost on R1 land (not including the one tree deemed lost in the patch, which is considered separately), there were no species credits generated by the BAM-C. Tree losses did incur 24 ecosystem credits for the three PCTs being impacted, however, being biocertified land, these losses have already been offset as part of the biocertification process under the Albury LEP.

4.6 Vegetation integrity (vegetation condition)

4.6.1 Vegetation integrity survey plots

Seven vegetation integrity survey plots were completed within the site, with all but one being used to meet the requirements of the BAM (**Appendix J**). Five of the plots were assessed in October 2024, and two were assessed in January 2025. With all vegetation zones being under two (2) hectares in size, one (1) BAM plot was completed for each vegetation zone. Given fairly uniform levels of disturbance, and that site conditions within vegetation zones were homogenous, no additional plots in these zones were deemed necessary. Furthermore, plot locations were focussed closely around the areas that were to be impacted by the development footprint, thus providing the most accurate representations of the quality of vegetation in vegetation zones in the vicinities of the proposed impact areas (**Figure 14** and **15**). The number of plots surveyed within each vegetation zone is consistent with the requirements outlined within the BAM.

There were two plots conducted that were not used as part of the assessment. The first plot was incorrectly conducted across two different vegetation zones (mistakenly placed across 266_Remnant_MQ and 266_Revegetation zones). Therefore, its use was not appropriate, and these vegetation zones were subsequently assessed separately (in January 2025) with one BAM plot in each. The other plot that was not used as part of the assessment was plot '278_Regenerating_Remnant', which was no longer applicable after subdivision design changes (changes to the large detention basin) meant that this area was no longer in the development designs, thus it was no longer being impacted by development. Remnant_LQ zone was mapped, but not assessed due to absence of development impacts.

4.6.2 Scores

Vegetation integrity scores were calculated based on the vegetation integrity survey plots collected for the seven (7) unique vegetation zones within the Subject Land (assigned to each area of native vegetation (PCT) that shared the same characteristics and condition). The vegetation integrity scores for each vegetation zone are provided in **Table 16**. The vegetation integrity score is based off the composition condition score, the structure condition score, the function condition score and the presence/absence of hollow-bearing trees, all of which is calculated from the vegetation integrity survey plots (Bam plots). As discussed, two vegetation zones lack BAM-C data as they were not being entered into BAM-C due to lack of development impacts being incurred in these areas/vegetation zones.

Table 16: Vegetation integrity scores

Vegetation zone ID	Composition condition score	Structure condition score	Function condition score (where relevant)	Vegetation integrity score	Hollow bearing trees present?
266_Remnant_MQ	41.3	88.5	63.6	61.5	Yes
266_Remnant02_Sth	37.3	38.6	72.5	47.1	Yes
266_Remnant01_Nth (derived grassland)	33.9	60.5	27.4	38.3	No
266_Revegetation	30.3	40.4	43.5	37.6	No
266_Wetland (derived)	43.6	63.2	17.2	36.2	No
278_Revegetation	16.2	1.8	3	4.5	No
278_Regenerating_remnant*	NA	NA	NA	NA	No
277_Trees_only	3.2	32.8	85.5	20.7	Yes
277_Remnant_MQ #	NA	NA	NA	NA	Yes

* Removed from development designs and not entered into BAM-C

Not entered into BAM-C as no impacts being made in the two areas of this vegetation zone

4.6.3 Use of benchmark data

The benchmark data used to assess the vegetation integrity attributes in all the vegetation zones and to assess the PCT, was the BioNet Vegetation Classification benchmark values for respective PCTs of each vegetation zone. See **Appendix H**.

4.7 Risk assessments for threatened entities with 'likely' or higher likelihood of occurrence

This section gives consideration to the potential for impacts to occur to a range of threatened ecological communities and threatened species which are considered as having a likely or higher likelihood of occurring on the Subject Land, either being present on occasion during migrational movements or while sourcing food or hunting for prey, or some may be resident. Where EPBC Act listed threatened entities are dealt with, these MNES are discussed in more detail in **Appendix N**, according to the relevant Significant Impact Criteria for the entity, which varies depending on its threat status.

4.7.1 Sloane's Froglet (*Crinia sloanei*)

See SIC assessment in **Appendix N**.

4.7.2 Regent Honeyeater (*Anthochaera Phrygia*)

See SIC assessment in **Appendix N**.

4.7.3 Gang Gang Cockatoo (*Callocephalon fimbriatum*)

See SIC assessment in **Appendix N**.

4.7.4 Swift Parrot (*Lathamus discolor*)

See SIC assessment in **Appendix N**.

4.7.5 Superb Parrot (*Polytelis swainsoni*)

See SIC assessment in **Appendix N**.

4.7.6 Diamond Firetail (*Stagonopleura guttata*)

See SIC assessment in **Appendix N**.

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

See **Section 4.2.4** and **Section 4.3**. There are areas of the Subject Land that contain this BC Act listed TEC, some of which is being impacted by the proposed development (see **Figure 11** for a map). The small number of impacts to the TEC are being offset through the BOS, and impacts to the NSW Grassy Woodlands TEC are not expected to be significant due to avoidance (impacts trying to avoid better areas of the TEC) and minimisation efforts (controls in place via the CEMP to minimise remaining impacts on the TEC).

4.7.8 Dusky Woodswallow (*Artamus cyanopterus cyanopterus*)

The Dusky Woodswallow is listed as vulnerable under the BC Act, and despite not being detected during targeted surveys, with its migratory patterns, it is considered likely to frequent the site on occasion, especially given there is suitable habitat present. In particular, this species likes open eucalypt forests with open to sparse understories, tending to occur on the interface between forested areas and farmland (NSW Government 2025). There are very few impacts occurring to this species' preferred habitat areas in the Subject Land, which mostly occur along Williams Road. However, the TBCD lists paddock trees as also being important habitat for the species. Given there are a number of paddock trees being removed as part of the development, this species may experience a small reduction in breeding (nesting) habitat within the Subject Land.

In terms of reducing the risks to this species from development, actions to minimise construction impacts (such as from noise, dust and vibration) are to be included and implemented via the project CEMP. Pre-clearance checks before felling of trees must take place to ensure there are no occupied nests present in trees. If Dusky Woodswallow are observed or suspected to be present on or adjacent to works areas, an ecologist must be engaged to confirm identification of the species. If confirmed, works must halt within 200 metres of the birds, and cannot recommence until the bird(s) leave the area, or if breeding, once the fledglings have left the nest.

4.7.9 Speckled Warbler (*Chthonicola sagittata*)

The Speckled Warbler is listed as vulnerable under the BC Act, and despite not being detected during targeted surveys, it is considered likely to frequent the site on occasion, especially given there is some suitable habitat present. In particular, this species likes open eucalypt dominated vegetation communities with open to sparse understories and sparse shrub cover, and eucalypt regrowth. However, the species is not likely to be regularly present, or resident in the area, as it tends to require larger and relatively high quality undisturbed areas of remnant vegetation (NSW Government 2025b). Nevertheless, the species may frequent the site to forage when moving between neighbouring large remnant patches, tending to occur on the interface between large forested areas and farmland (NSW Government 2025). There are very few impacts occurring to this species' preferred habitat areas in the Subject Land, which occur along Williams Road. However, the TBCD lists paddock trees as being important habitat for the species. Given there are a number of paddock trees being removed as part of the development, this species may experience a small reduction in linkages between suitable foraging habitat within the Subject Land.

In terms of reducing the risks to this species from development, actions to minimise construction impacts (such as from noise, dust and vibration) are to be included and implemented via the project CEMP. Pre-clearance checks before felling of trees must take place to ensure there are no occupied nests present in trees. If Speckled Warbler are observed or suspected to be present on or adjacent to works areas, an ecologist must be engaged to confirm identification of the species. If confirmed, works must halt within 200 metres of the birds, and cannot recommence until the bird(s) leave the area, or if breeding, once fledglings have left the nest.

4.7.10 Brown Treecreeper (*Climacteris picumnus victoriae*)

See SIC assessment in **Appendix N**.

4.7.11 Varied Sitella (*Daphoensitta chrysoptera*)

The Varied Sitella is listed as vulnerable under the BC Act, and despite not being detected during targeted surveys, it is considered likely to frequent the site on occasion, especially given there is suitable habitat present. In particular, this species likes open eucalypt forests and woodlands with preference for areas containing rough-barked gums, standing dead trees and smooth-barked gums with dead branches (NSW Government 2025c), all of which are present along the bushland areas of Williams Road. There are very few impacts occurring to this species' preferred habitat areas in the Subject Land, which mostly occur along Williams Road. However, the TBCD lists paddock trees as being important habitat for the species. Given there are a number of paddock trees being removed as part of the development, this species may experience a small reduction in breeding and/or feeding habitat within the Subject Land.

In terms of reducing the risks to this species from development, actions to minimise construction impacts (such as from noise, dust and vibration) are to be included and implemented via the project CEMP. Pre-clearance checks before felling of trees must take place to ensure there are no occupied nests present in trees. If Varied Sittella are observed or suspected to be present on or adjacent to works areas, an ecologist must be engaged to confirm identification of the species. If confirmed, works must halt within 200 metres of the birds, and cannot recommence until the bird(s) leave the area, or if breeding, once fledglings have left the nest.

4.7.12 Purple-crowned Lorikeet (*Glossopsitta porphyrocephala*)

The Purple-crowned Lorikeet is listed as vulnerable under the BC Act, and despite not being detected during targeted surveys, and despite being at the eastern limits of its preferred areas of distribution, it is considered somewhat likely to frequent the site on occasion, especially given there is suitable feeding habitat present. In particular, this species likes open eucalypt forests and woodlands with large productive flowering gums (NSW Government 2025d), which are present, especially along Williams Road and the nearby creek lines. There are very few impacts occurring to this species' preferred habitat areas in the Subject Land. However, the TBCD lists paddock trees as being important habitat for the species. Given there are a number of paddock trees being removed as part of the development, this species may experience a small reduction in breeding (nesting) habitat within the Subject Land, as a result of some lost trees containing suitable small hollows.

In terms of reducing the risks to this species from development, actions to minimise construction impacts (such as from noise, dust and vibration) are to be included and implemented via the project CEMP. Pre-clearance checks before felling of trees must take place to ensure there are no occupied nests present in trees. If Purple-crowned Lorikeet are observed or suspected to be present on or adjacent to works areas, an ecologist must be engaged to confirm identification of the species. If confirmed, works must halt within 200 metres of the birds, and cannot recommence until the bird(s) leave the area, or if breeding, once fledglings have left the nest.

4.7.13 Little Lorikeet (*Glossopsitta pusilla*)

The Little Lorikeet is listed as vulnerable under the BC Act, and despite not being detected during targeted surveys, it is considered likely to frequent the site on occasion, especially given there is suitable feeding habitat present, and the nomadic species occupies an enormous area along the eastern parts of Australia. In terms of habitat preferences, this species likes open eucalypt forests and woodlands with large productive flowering gums, with paddock trees and urban plantings also considered important habitat (NSW Government 2025e), and suitable feeding and breeding (small hollows) habitat is present along Williams Road, in some scattered trees, and along the nearby creek lines. There are very few impacts occurring to this species' preferred habitat areas in the Subject Land. However, given there are a number of paddock trees being removed as part of the development, this species may experience a small reduction in breeding (nesting) and roosting habitat within the Subject Land, as a result of some trees containing suitable small hollows.

In terms of reducing the risks to this species from development, actions to minimise construction impacts (such as from noise, dust and vibration) are to be included and implemented via the project CEMP. Pre-clearance checks before felling of trees must take place to ensure there are no occupied nests present in trees. If Little Lorikeet are observed or suspected to be present on or adjacent to works areas, an ecologist must be engaged to confirm identification of the species. If confirmed, works must halt within 200 metres of the birds, and cannot recommence until the bird(s) leave the area, or if breeding, once fledglings have left the nest.

4.7.14 Little Eagle (*Hieraaetus morphnoides*)

The Little Eagle is listed as vulnerable under the BC Act, and despite not being detected during targeted surveys, with its large territory and occupation of nearly every part of Australia, it is considered likely to frequent the site on occasion, especially given there is suitable nesting habitat present as well as open areas for hunting of prey. Targeted surveys found that there were no large stick nests present on or adjacent to the Subject Land, but the species occupying the site for breeding cannot be ruled out, given the presence of suitable large trees. There are very few impacts occurring to this species' preferred habitat areas in the Subject Land, which occur predominantly along Williams Road. However, the TBCD lists paddock trees as being potential breeding habitat for the species. Given there are a number of paddock trees being removed as part of the development, this species may experience a small reduction in potential breeding (nesting) habitat within the Subject Land, as well as a reduction in the open areas that it may hunt for prey.

In terms of reducing the risks to this species from development, actions to minimise construction impacts (such as from noise, dust and vibration) are to be included and implemented via the project CEMP. Pre-clearance checks before felling of trees must take place to ensure there are stick nests in trees, and if present, no occupied nests are present in trees. If Little Eagle are observed or suspected to be present on or adjacent to works areas, an ecologist must be engaged to confirm identification of the species. If confirmed, works must halt within 200 metres of the birds, and cannot recommence until the bird(s) leave the area, or if breeding, once fledglings have left the nest.

4.7.15 Barking Owl (*Ninox connivens*)

The Barking Owl is listed as vulnerable under the BC Act, and despite not being detected during targeted surveys, with its very large home ranges and its presence across a large part of the country, especially given there is suitable habitat present, this species may be present on occasion in the area. In particular, this species likes open woodland and eucalypt forests with open to sparse understories (for hunting prey), tending to prefer areas with abundant large tree hollows for both breeding, and due to higher numbers of prey in remnants with tree hollows (such as possums and gliders) (NSW Government 2025f). There are low levels of impacts occurring to this species' preferred habitat areas in the Subject Land, which occur predominantly along Williams Road. However, the TBCD lists paddock trees as being important habitat for the species, especially those with large hollows (roosting and nesting habitat). Given there are a number of paddock trees being removed as part of the development, including some with large hollows,

this species may experience a small reduction in roosting and breeding (nesting) habitat within the Subject Land.

In terms of reducing the risks to this species from development, actions to minimise construction impacts (such as from noise, dust and vibration) are to be included and implemented via the project CEMP. Pre-clearance checks before felling of trees must take place to ensure there are no occupied nests (tree hollows) present in trees. If Barking Owl are observed or suspected to be present on or adjacent to works areas, an ecologist must be engaged to confirm identification of the species. If confirmed, works must halt within 200 metres of the birds, and cannot recommence until the bird(s) leave the area, or if breeding, once fledglings have left the nest (hollow).

4.7.16 Scarlet Robin (*Petroica boodang*)

The Scarlet Robin is listed as vulnerable under the BC Act, and was detected during targeted surveys, moving within the interface of revegetated areas along Eight Mile Creek and the cleared paddocks along the eastern edge of the main development area. There are minor impacts occurring to this species' preferred habitat areas in the Subject Land, which occur along Williams Road and the adjoining creek areas. However, the TBCD lists paddock trees as also being important habitat for the species. Given there are a number of paddock trees being removed as part of the development, this species may experience a small reduction in roosting and feeding habitat within the Subject Land, and the development of cropping areas may also reduce foraging habitat available.

In terms of reducing the risks to this species from development, actions to minimise construction impacts (such as from noise, dust and vibration) are to be included and implemented via the project CEMP. Pre-clearance checks before felling of trees must take place to ensure there are no occupied nests present in trees. If Scarlet Robin are observed or suspected to be present on or adjacent to works areas, an ecologist must be engaged to confirm identification of the species. If confirmed, works must halt within 200 metres of the birds, and cannot recommence until the bird(s) leave the area, or if breeding, once fledglings have left the nest.

4.7.17 Flame Robin (*Petroica phoenicea*)

The Flame Robin is listed as vulnerable under the BC Act, and was detected during targeted surveys, moving within the interface of revegetated areas along Eight Mile Creek and the cleared paddocks along the eastern edge of the main development area. There are minor impacts occurring to this species' preferred habitat areas in the Subject Land, which occur along Williams Road. However, the TBCD lists paddock trees as being important habitat for the species. Given there are a number of paddock trees being removed as part of the development, this species may experience a small reduction in breeding (nesting) habitat within the Subject Land, and the development of cropping areas may also reduce foraging habitat available.

In terms of reducing the risks to this species from development, actions to minimise construction impacts (such as from noise, dust and vibration) are to be included and implemented via the project CEMP. Pre-clearance checks before felling of trees must take place to ensure there are no occupied nests present in trees. If Flame Robin are observed or suspected to be present on or adjacent to works areas, an ecologist must be engaged to confirm identification of the species. If confirmed, works must halt within 200 metres of the birds, and cannot recommence until the bird(s) leave the area, or if breeding, once fledglings have left the nest.

4.7.18 Squirrel Glider (*Petaurus norfolcensis*)

The Squirrel Glider is listed as vulnerable under the BC Act, and was detected during targeted surveys, with it being captured by the majority of remote cameras in C3 land, and was also detected via spotlighting along Williams Road and in the reserve just south of the development along Seven Mile Creek. The Squirrel Glider is considered present throughout all connected vegetation along Williams Road, Tabletop Road, Eight Mile Creek and Seven Mile Creek, but is not present in the scattered trees on R1 land given they are all disconnected from the adjoining habitat trees by a distance of 50 metres or more. There are very few

impacts occurring to this species' preferred habitat areas in the Subject Land, which are limited to minor impacts occurring along Williams Road, but none of which include significant habitat trees (hollow trees). Therefore, the species is unlikely to experience any significant impacts to habitat as part of the development, with no impacts to connectivity in the canopy and impacts limited to a small reduction in feeding (small trees) habitat within the Subject Land.

There are some risks associated with indirect impacts, such as increased noise and light spill from the estate, where these impacts occur along the interface between the estate and habitat areas along Williams Road. In terms of reducing the risks to this species from development, actions to minimise construction impacts (such as from noise, dust, light spill and vibration) are to be included and implemented via the project CEMP. Pre-clearance checks before felling of trees must take place to ensure there are no occupied hollows present in trees, or that gliders are given an opportunity to leave the tree prior to felling via a staged removal process. It must be noted that trees being removed (all of which are in the R1 zone) are extremely unlikely to contain Squirrel Gliders, given their distance from suitable connected habitat. Experienced ecologists or wildlife handlers must be present during tree felling, to ensure any Squirrel Gliders (and other fauna) that are harbouring in hollows are adequately handled post felling, or injured and juvenile specimens are appropriately cared for via qualified persons such as WIRES. Furthermore, it is recommended that artificial nestboxes with suitable opening sizes are located (habitat augmentation) along Williams Road, to further supplement nesting habitat for the species post construction.

5. Habitat suitability for threatened species

5.1 Identification of threatened species for assessment

Under the BAM, threatened species are separated into two classes, 'ecosystem' credit species and 'species' credit species. Those 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 a targeted survey has a low probability of detection, are identified as 'ecosystem credit species'. Targeted surveys are not required for ecosystem credit species (predicted species) and potential impacts to these species are assessed in conjunction with impacts to vegetation/habitat of PCTs.

Threatened species, where the likelihood of occurrence of a species or elements of suitable habitat for the species cannot be confidently predicted by vegetation surrogates and landscape features, and instead can be reliably detected by appropriate survey, are identified as 'species credit species', also called candidate species. A targeted survey or an expert report is required to confirm the presence or absence of these species on the Subject Land. Alternatively, species credit species can also be 'assumed present', if their presence is considered likely, or in situations where survey requirements still leave some ambiguity about the species' presence or absence (such as in the case of Southern Myotis for this development).

For some threatened species, they are identified as 'dual credit species', which are effectively both ecosystem and species credit species, with different aspects of the habitat and life cycle representing different credit types. Commonly, threatened fauna species may have foraging habitat as an ecosystem credit, while their breeding habitat represents a species credit and thus the breeding habitat will appear on the candidate species list in BAM-C. Threatened species that require assessment are initially identified based upon the following criteria:

- The distribution of the species includes the IBRA subregion in which the Subject Land is located;
- Whether the Subject Land is within any geographic constraints of the distribution of the species within the IBRA subregion;
- The species is associated with any of the PCTs identified within the Subject Land;
- The native vegetation cover within an Assessment Area including a 1500 metre buffer around

the Subject Land is *equal to or greater than* the minimum required for the species;

- The patch size that each vegetation zone is part of is equal to or greater than the minimum required for that species; and
- The species is identified as an ecosystem credit species or species credit species in the NSW TBCD.

The process for identifying threatened species which meet the above criteria is completed through the BAM-C system. The PCTs identified within the Subject Land, patch sizes and native vegetation cover were entered into the BAM-C and a preliminary list of threatened species were identified. Several changes were made to vegetation zones and other BAM-C inputs after further vegetation assessments and BAM plots were undertaken in October, the inputs of which subsequently changed the list of candidate species required for assessment. Survey methodologies were adapted to ensure additional species were adequately surveyed during subsequent survey efforts and according to their seasonal survey windows, where applicable.

In addition to the species that were populated in the BAM-C as species credit species and ecosystem credit species, searches of EPBC Act (PMST) and BC Act (BioNet) online threatened species and communities databases were also undertaken, with searches completed within a 10 kilometre radius (Local Area). The purpose of these searches were to identify all potential threatened entities, and other at risk landscape characteristics, that may potentially occur on or near the Subject Land. These searches informed field assessments, and also informed the BDAR likelihood assessment which was conducted for all threatened entities that had a 'likely' or higher likelihood of being present in or adjoining the Subject Land. Likelihood assessments consider the potential presence of threatened flora, fauna and TECs in or adjoining the Subject Land based on species habitat requirements and the habitat present on site, and are available in **Appendix L** and **M**.

5.1.1 Ecosystem credit species

The ecosystem credit species predicted on site by the BAM-C are provided in **Table 17** and **Appendix H**. All of the predicted ecosystem credit species were retained for further assessment and for calculation of offset obligations based on areas of habitat being lost. Some vegetation zones were not applicable to some ecosystem credit species, however all listed species had at least one vegetation zone which they were suited to. Additionally, given significant disturbances and lack of microhabitat, areas of exotic grassland were not considered as habitat for any ecosystem credit species. Justification for the exclusion of potential threatened species is provided in **Table 17**.

Table 17 lists the ecosystem credit species likely to occur on or use the Subject Land and the source of information (e.g. automatically populated in BAM-C, recently listed under the BC Act and not yet added to the TBCD, previous ecological reports (environmental impact statements, scientific literature, Council reports, site survey, etc.). Identification and justification of species added to the BAM-C auto-populated list or removed from the list in accordance with BAM Subsections 5.2.1 and 5.2.2 is provided, where applicable.

Table 17: Predicted ecosystem credit species

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species excluded from	Sensitivity to gain class
		BC Act	EPBC Act						
Magpie Goose	<i>Anseranas semipalmata</i>	vu	-	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (To be assessed on biocertified R1 land only)	Excluded from C3 land	Moderate
Black Falcon	<i>Falco subniger</i>	vu	-	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (Assessed on R1 and C3 lands)	Nil	Moderate
Brown Treecreeper (eastern subspecies)	<i>Climacteris picumnus victoriae</i>	vu	VU	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial (when a species is retained within one vegetation zone but not another)	NA (To be assessed on C3 land only)	266_Wetland Excluded from R1 land	High
Diamond Firetail	<i>Stagonoplura guttata</i>	vu	VU	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input checked="" type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (To be assessed on C3 land only)	Excluded from R1 land	Moderate
Dusky Woodswallow	<i>Artamus cyanopterus cyanopterus</i>	vu	-	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial (when a species is retained within one vegetation zone but not another)	NA (Assessed on R1 and C3 lands)	266_Wetland	Moderate

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species excluded from	Sensitivity to gain class
		BC Act	EPBC Act						
Flame Robin	<i>Petroica phoenicea</i>	vu	-	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input checked="" type="checkbox"/> Current survey	Yes	NA (Assessed on R1 and C3 lands)	Nil	Moderate
Gang-gang Cockatoo (foraging)	<i>Callocephalon fimbriatum</i>	en	EN	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial (when a species is retained within one vegetation zone but not another)	NA (To be assessed on C3 land only)	266_Wetland Excluded from R1 land	Moderate
Grey-crowned Babbler (eastern subspecies)	<i>Pomatostomus temporalis temporalis</i>	vu	-	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial (when a species is retained within one vegetation zone but not another)	NA (To be assessed on C3 land only)	266_Wetland Excluded from R1 land	Moderate
Grey-headed Flying Fox (foraging)	<i>Pteropus poliocephalus</i>	vu	VU	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial (when a species is retained within one vegetation zone but not another)	NA (Assessed on R1 and C3 lands)	266_Wetland	High
Large Bent-winged Bat (foraging)	<i>Miniopterus orianae oceanensis</i>	vu	-	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial (when a species is retained within one vegetation zone but not another)	NA (To be assessed on C3 land only)	Excluded from R1 land	High

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species excluded from	Sensitivity to gain class
		BC Act	EPBC Act						
Little Eagle (foraging)	<i>Hieraetus morphnoides</i>	vu	-	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (Assessed on R1 and C3 lands)	Nil	Moderate
Little Lorikeet	<i>Glossopsitta pusilla</i>	vu	-	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial (when a species is retained within one vegetation zone but not another)	NA (Assessed on R1 and C3 lands)	266_Wetland	High
Little Pied Bat	<i>Chalinolobus picatus</i>	vu	-	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial (when a species is retained within one vegetation zone but not another)	NA (To be assessed on C3 land only)	Excluded from R1 land	High
Painted Honeyeater	<i>Grantiella picta</i>	vu	VU	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial (when a species is retained within one vegetation zone but not another)	NA (To be assessed on C3 land only)	278_Revegetation, 266_Wetland and 266_Revegetation Excluded from R1 land	Moderate
Purple-crowned Lorikeet	<i>Glossopsitta porphyrocephala</i>	vu	-	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial (when a species is retained within one vegetation zone but not another)	NA (To be assessed on C3 land only)	266_Wetland Excluded from R1 land	High

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species excluded from	Sensitivity to gain class
		BC Act	EPBC Act						
Regent Honeyeater (foraging)	<i>Anthochaera phrygia</i>	ce	CE	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial (when a species is retained within one vegetation zone but not another)	NA (To be assessed on C3 land only)	266_Wetland Excluded from R1 land	High
Scarlet Robin	<i>Petroica boodang</i>	vu	-	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input checked="" type="checkbox"/> Current survey	Yes	NA (Assessed on R1 and C3 lands)	Nil	Moderate
South-eastern Glossy Black Cockatoo (foraging)	<i>Calyptorhynchus lathami lathami</i>	vu	VU	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial (when a species is retained within one vegetation zone but not another)	NA (To be assessed on C3 land only)	All excluded except for 266_Revegetation Excluded from R1 land	High
South-eastern Hooded Robin	<i>Melanodryas culcullata culcullata</i>	en	EN	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial (when a species is retained within one vegetation zone but not another)	NA (To be assessed on C3 land only)	Excluded from R1 land	Moderate
Speckled Warbler	<i>Chthonicola saggitata</i>	vu	-	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial (when a species is retained within one vegetation zone but not another)	NA (To be assessed on C3 land only)	266_Wetland Excluded from R1 land	High

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species excluded from	Sensitivity to gain class
		BC Act	EPBC Act						
Spotted Harrier	<i>Circus assimilis</i>	vu	-	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (Assessed on R1 and C3 lands)	Nil	Moderate
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	vu	EN	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (To be assessed on C3 land only)	Excluded from R1 land	High
Square-tailed Kite (foraging)	<i>Lophoictinia isura</i>	vu	-	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (To be assessed on C3 land only)	Excluded from R1 land	Moderate
Superb Parrot (foraging)	<i>Polytelis swainsonii</i>	vu	VU	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial (when a species is retained within one vegetation zone but not another)	NA (To be assessed on C3 land only)	Excluded from R1 land	Moderate
Swift Parrot (foraging)	<i>Lathamus discolor</i>	en	CE	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial (when a species is retained within one vegetation zone but not another)	NA (To be assessed on C3 land only)	266_Wetland Excluded from R1 land	Moderate

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species excluded from	Sensitivity to gain class
		BC Act	EPBC Act						
Turquoise Parrot	<i>Neophema pulchella</i>	vu	-	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial (when a species is retained within one vegetation zone but not another)	NA (To be assessed on C3 land only)	Excluded from R1 land	High
Varied Sitella	<i>Daphoenositta chrysoptera</i>	vu	-	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial (when a species is retained within one vegetation zone but not another)	NA (Assessed on R1 and C3 lands)	266_Wetland Excluded from R1 land	Moderate
White-bellied Sea-eagle (foraging)	<i>Haliaeetus leucogaster</i>	vu	-	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial (when a species is retained within one vegetation zone but not another)	NA (To be assessed on C3 land only)	278_Revegetation, 266_Wetland and 266_Revegetation Excluded from R1 land	High
White-throated needle-tail	<i>Hirunadpus caudacutus</i>	vu	vu	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Partial (when a species is retained within one vegetation zone but not another)	NA (To be assessed on C3 land only)	266_Wetland Excluded from R1 land	High
Yellow-bellied Sheathtail-bat	<i>Saccolaimus flaviventris</i>	vu	-	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (To be assessed on C3 land only)	Excluded from R1 land	High

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species excluded from	Sensitivity to gain class
		BC Act	EPBC Act						
Eastern False Pipistrelle	<i>Falsistrellis tasmaniensis</i>	vu	-	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (To be assessed on biocertified R1 land only)	Excluded from C3 land	High

5.1.2 Species credit species

As outlined in **Section 5.1**, species credit species are predicted in the BAM-C following assessment of site features including geographic and habitat features in the credit calculator, such as site location (IBRA subregion), PCTs and condition, patch size and the area of surrounding vegetation within the 1500 metre buffer of the Subject Land. Some species require further assessment of habitat constraints and/or geographic limitations before being confirmed as candidate species for assessment, whereas others are locked in based on BAM-C inputs. One species, Sloane's Froglet, was added to the BAM-C manually as it was known from and detected on site, but not listed in the original BAM-C candidate species list. Three species were assessed as not on site (not candidate species), those being Large Bent-wing Bat (habitat constraints), Squirrel Glider in the Wagga Wagga LGA (site is not located within that LGA), and Swift Parrot (habitat constraints, site not on the Important Habitat Map for this species). Despite being excluded, Swift Parrot was surveyed for and is therefore included in the following tables. **Table 18** outlines the questions asked for the potential candidate species, and whether the species is confirmed as a candidate species, and also outlines the justification behind excluding species from the candidates species list (where applicable). No flora species recommended by the BAM-C were excluded from survey.

Table 18: Candidate flora 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
		BC Act	EPBC Act				
Ausfelds's Wattle	<i>Acacia ausfeldii</i>	vu	-	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA	All
Yass Daisy	<i>Ammobium craspedioides</i>	vu	VU	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA	All
Euphrasia arguta	<i>Euphrasia arguta</i>	ce	CE	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA	All
Tumut Grevillea	<i>Grevillea wilkinsonii</i>	ce	CE	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA	All
Prasophyllum sp. Wybong	<i>Prasophyllum sp. Wybong</i>	-	CE	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA	All

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
		BC Act	EPBC Act				
Small Purple-pea	<i>Swainsona recta</i>	en	EN	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA	All
Silky Swainsona-pea	<i>Swainsona sericea</i>	vu	-	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA	All

Table 19: Candidate fauna species credit species

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Regent Honeyeater	<i>Anthochaera phrygia</i>	ce	CE	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (To be assessed on C3 land only)	Excluded from R1 land
Pink-tailed Legless Lizard	<i>Aprasia parapulchella</i>	vu	VU	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (To be assessed on C3 land only)	Excluded from R1 land

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Bush Stone-curlew	<i>Burhinus grallarius</i>	en	-	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (To be assessed on C3 land only)	Excluded from R1 land
Gang-gang Cockatoo (breeding)	<i>Callocephalon fimbriatum</i>	en	EN	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (To be assessed on C3 land only)	Excluded from R1 land
South-eastern Glossy Black-Cockatoo (breeding)	<i>Calyptorhynchus lathami lathami</i>	vu	VU	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (To be assessed on C3 land only)	Excluded from R1 land
Sloane's Froglet	<i>Crinia sloanei</i>	en	EN	No	<input type="checkbox"/> BAM-C <input checked="" type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input checked="" type="checkbox"/> Current survey	Yes	NA (To be assessed on C3 and R1 land)	Nil
White-bellied Sea-eagle (breeding)	<i>Haliaeetus leucogaster</i>	vu	-	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (To be assessed on C3 land only)	Excluded from R1 land
Little Eagle (breeding)	<i>Hieraaetus morphnoides</i>	vu	-	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (To be assessed on C3 and R1 land)	Nil

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Key's Matchstick Grasshopper	<i>Keyacris scurra</i>	en	EN	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (To be assessed on C3 land only)	Excluded from R1 land
Swift Parrot (breeding)	<i>Lathamus discolor</i>	en	CE	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (To be assessed on C3 land only)	Excluded from R1 land
Booroolong Frog	<i>Litoria booroolongensis</i>	en	EN	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (To be assessed on C3 land only)	Excluded from R1 land
Square-tailed Kite (breeding)	<i>Lophoictinia isura</i>	vu	-	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (To be assessed on C3 land only)	Excluded from R1 land
Large Bent-wing Bat (breeding)	<i>Miniopterus orianae ocenaensis</i>	vu	-	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	No	No breeding habitat within Subject Land or adjoining areas.	NA

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Southern Myotis	<i>Myotis macropus</i>	vu	-	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (To be assessed on C3 land only)	Excluded from R1 land
Barking Owl	<i>Ninox connivens</i>	vu	-	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (To be assessed on C3 land only)	Excluded from R1 land
Squirrel Glider	<i>Petaurus norfolcensis</i>	vu	-	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input checked="" type="checkbox"/> Previous survey <input checked="" type="checkbox"/> Current survey	Yes	NA (To be assessed on C3 land only)	Excluded from R1 land
Squirrel Glider in the Wagga Wagga LGA	<i>Petaurus norfolcensis</i> – endangered population	en (pop)	-	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	No	Site not within or near the Wagga Wagga LGA	NA
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	vu	-	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (To be assessed on C3 land only)	Excluded from R1 land
Koala	<i>Phascolarctos cinereus</i>	en	EN	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (To be assessed on C3 land only)	Excluded from R1 land

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Superb Parrot (breeding)	<i>Polytelis swainsonii</i>	vu	VU	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (To be assessed on C3 land only)	Excluded from R1 land
Grey-headed Flying-fox (breeding)	<i>Pteropus poliocephalus</i>	vu	VU	Yes	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (To be assessed on C3 and R1 land)	Nil
Golden Sun Moth	<i>Synemon plana</i>	vu	VU	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (To be assessed on C3 land only)	Excluded from R1 land
Masked Owl	<i>Tyto novaehollandiae</i>	vu	-	No	<input checked="" type="checkbox"/> BAM-C <input type="checkbox"/> TBDC <input type="checkbox"/> Previous survey <input type="checkbox"/> Current survey	Yes	NA (To be assessed on C3 land only)	Excluded from R1 land

5.2 Presence of candidate species credit species

From the list of candidate species in **Table 18** and **19**, the species which were retained for further assessment are then categorised as candidate species credit species (all but two species and one endangered population were accepted as candidate species). The assessor then determined whether each remaining candidate species credit species is present on the site. This can be done a few different ways:

- Assume the species is present;
- Conduct targeted field surveys for threatened species;
- Obtain an expert report that shows whether a species is present or not present within the site; or
- For candidate species, including dual credit species, where the TBDC indicates that an important habitat map identifies the species credit component, the assessor must confirm whether the Subject Land is within an area identified on the important habitat map.

From the remaining list of candidate species credit species, **Table** (flora) and **Table** (fauna) identify the species determined to be present or absent within the Subject Land, and outlines the method upon which the respective determination was made, and whether any further assessment is required.

Table 20: Determining the presence of candidate flora species credit species on the Subject Land

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required?
		BC Act	EPBC Act			
Ausfelds's Wattle	<i>Acacia ausfeldii</i>	vu	-	Targeted threatened species survey	No	No
Yass Daisy	<i>Ammobium craspedioides</i>	vu	VU	Targeted threatened species survey	No	No
Euphrasia arguta	<i>Euphrasia arguta</i>	ce	CE	Targeted threatened species survey	No	No
Tumut Grevillea	<i>Grevillea wilkinsonii</i>	ce	CE	Targeted threatened species survey	No	No
Prasophyllum sp. Wybong	<i>Prasophyllum sp. Wybong</i>	-	CE	Targeted threatened species survey	No	No
Small Purple-pea	<i>Swainsona recta</i>	en	EN	Targeted threatened species survey	No	No
Silky Swainsona-pea	<i>Swainsona sericea</i>	vu	-	Targeted threatened species survey	No	No

Table 21: Determining the presence of candidate fauna species credit species on the Subject Land

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required?
		BC Act	EPBC Act			
Regent Honeyeater	<i>Anthochaera phrygia</i>	ce	CE	Within important habitat mapped area	Assumed present	No
Pink-tailed Legless Lizard	<i>Aprasia parapulchella</i>	vu	VU	Targeted threatened species survey	No	No
Bush Stone-curlew	<i>Burhinus grallarius</i>	en	-	Targeted threatened species survey	No	No
Gang-gang Cockatoo (breeding)	<i>Callocephalon fimbriatum</i>	en	EN	Targeted threatened species survey	No	No
South-eastern Glossy Black-Cockatoo (breeding)	<i>Calyptorhynchus lathami lathami</i>	vu	VU	Targeted threatened species survey	No	No
Sloane's Froglet	<i>Crinia sloanei</i>	en	EN	Targeted threatened species survey	Yes	No
White-bellied Sea-eagle (breeding)	<i>Haliaeetus leucogaster</i>	vu	-	Targeted threatened species survey	No	No
Little Eagle (breeding)	<i>Hieraaetus morphnoides</i>	vu	-	Targeted threatened species survey	No	No
Key's Matchstick Grasshopper	<i>Keyacris scurra</i>	en	EN	Targeted threatened species survey	No	No
Swift Parrot (breeding)	<i>Lathamus discolor</i>	en	CE	Targeted threatened species survey	No	No
Booroolong Frog	<i>Litoria booroolongensis</i>	en	EN	Targeted threatened species survey	No	No

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required?
		BC Act	EPBC Act			
Square-tailed Kite (breeding)	<i>Lophoictinia isura</i>	vu	-	Targeted threatened species survey	No	No
Southern Myotis	<i>Myotis macropus</i>	vu	-	Targeted threatened species survey	Assumed present	No
Barking Owl	<i>Ninox connivens</i>	vu	-	Targeted threatened species survey	No	No
Squirrel Glider	<i>Petaurus norfolcensis</i>	vu	-	Targeted threatened species survey	Yes	No
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	vu	-	Targeted threatened species survey	No	No
Koala	<i>Phascolarctos cinereus</i>	en	EN	Targeted threatened species survey	No	No
Superb Parrot (breeding)	<i>Polytellis swainsonii</i>	vu	VU	Targeted threatened species survey	No	No
Grey-headed Flying-fox (breeding)	<i>Pteropus poliocephalus</i>	vu	VU	Targeted threatened species survey	No	No
Golden Sun Moth	<i>Synemon plana</i>	vu	VU	Targeted threatened species survey	No	No
Masked Owl	<i>Tyto novaehollandiae</i>	vu	-	Targeted threatened species survey	No	No

5.3 Threatened species surveys

5.3.1 Flora

No candidate threatened flora species were identified by the assessors during the numerous targeted survey efforts and general site assessment processes. The detection of 121 flora species across the moderately to heavily degraded site is a good indicator of the survey integrity and effort undertaken across the Subject Land, with a high level of confidence that close to if not all flora species present on site have been detected and recorded. Additionally, vegetation surveys and habitat assessments found only very marginal or no suitable habitat for the majority of the flora species credit species and other species considered potentially present in the Local Area. Given these factors, it is not unexpected that no threatened flora species were recorded on the Subject Land, despite considerable survey time allotted to searching for threatened flora.

Targeted threatened flora surveys which were undertaken on the dates and times list in **Table 4**, **Table 22** and **Table 23**, and where relevant, were conducted in accordance with the BAM flora survey guidelines NSW DPIE document titled 'Surveying threatened plants and their habitats' (NSW Government 2020). There were instances when recommended guidelines were not appropriate for species survey on the Subject Land, owing to the limited areas of viable habitat (especially in the linear strip of C3 land along Williams Road). However, species survey timing was guided by this document, as well as the BAM-C survey months recommendation in the survey tab. Surveys focused on areas of suitable or marginal potential habitat, and therefore much of the R1 land was excluded due to it being highly modified and degraded, and not viable habitat for any threatened native flora species.

Factors that affected survey effort included lack of viable habitat, and the often linear arrangement of viable or marginal habitat, where present. Transects were not as viable compared to traverses of the areas of habitat in a roughly linear or zig-zag fashion. However, due to this arrangement of habitat areas (or lack of), confidence is high that the coverage of the site for inspection of potential threatened flora was highly effective, and the resulting species list is an accurate representation of all flora species present across all seasons.

Table 22: Threatened species surveys for candidate flora species credit species on the Subject Land

Common name	Scientific name	Threatened flora species surveys			Present (yes/no)	Further assessment required
		Survey method (transects or grids)	Timing of survey – within recommended period? (BAM-C / TBDC)	Effort (hours)		
Ausfelds's Wattle	<i>Acacia ausfeldii</i>	Transects in viable habitat, and traverses entire site.	<input checked="" type="checkbox"/> Yes 13/6/24 (10:00-14:30) 29/7/24 (10:00-14:00) 1/8/24 (10:00-14:00) 17/10/24 (09:00-16:30) 10/1/24 (9:00-14:00)	<input type="checkbox"/> No 25 hours	No	No
Yass Daisy	<i>Ammobium craspedioides</i>	As above	<input checked="" type="checkbox"/> Yes. Dates & times as above	<input type="checkbox"/> No 25 hours	No	No
Euphrasia arguta	<i>Euphrasia arguta</i>	As above	<input checked="" type="checkbox"/> Yes. Dates & times as above	<input type="checkbox"/> No 25 hours	No	No
Tumut Grevillea	<i>Grevillea wilkinsonii</i>	As above	<input checked="" type="checkbox"/> Yes. Dates & times as above	<input type="checkbox"/> No 25 hours	No	No
Prasophyllum sp. Wybong	<i>Prasophyllum Wybong</i> sp.	As above	<input checked="" type="checkbox"/> Yes. Dates & times as above	<input type="checkbox"/> No 25 hours	No	No
Small Purple-pea	<i>Swainsona recta</i>	As above	<input checked="" type="checkbox"/> Yes. Dates & times as above	<input type="checkbox"/> No 25 hours	No	No
Silky Swainsona-pea	<i>Swainsona sericea</i>	As above	<input checked="" type="checkbox"/> Yes. Dates & times as above	<input type="checkbox"/> No 25 hours	No	No

Method and survey effort for flora

Flora survey methods involved walking in a transect (where habitat allowed) and meander fashion, ensuring that all parts of the Subject Land were covered on multiple occasions, and across different seasons or months, as was informed by the NSW Guidelines and the BAM-C recommended months for survey. Numerous site visits were conducted for a combination of flora and fauna assessments, and opportunistic assessments of vegetation present was conducted during all survey efforts, even though only the dedicated flora assessments are recorded against the specific species survey effort in **Table 22** above. There was good to very good visibility in all vegetation zones, except in thick exotic pasture areas (which have no natives persisting), and there is a high confidence level that all flora species present on the Subject Land have been located and recorded in the incidental flora list (**Appendix K**). Flora surveys were undertaken by Stuart Mendham, Red-Gum Environmental Senior Botanist with over 15 years' experience with flora surveys throughout south-eastern Australia and northern and central Western Australia.

Flora survey results

Targeted flora survey results did not detect any threatened flora species on or immediately adjoining the Subject Land. The areas of higher quality remnant vegetation with little disturbance, and thus being more suitable for threatened flora, were very scarce and patches were small, where present. It is with high confidence that Red-Gum Environmental concludes the likely presence of threatened flora on the Subject Land is extremely low.

5.3.2 Fauna

Targeted surveys for candidate threatened fauna species were conducted following modelled results from the BAM-C. All fauna surveys were conducted by Stuart Mendham, with assistance from Damian Wall, Olivia Hynam and Emily Mendham (all from Red-Gum Environmental Consulting). Assistance with remote sensor data analysis was provided by Greg Ford (Balance Environmental) for bat identifications, and Dr Rodney van der Ree (WSP Australia) for mammal identification (confirmation of unusual/unclear photos), and for loan of camera equipment. Expert guidance was also provided by both experts in their relative fields of expertise. Survey effort was guided by the NSW Threatened Biodiversity Survey and Assessment Guidelines (NSW Government 2004) and documents such as;

- Commonwealth Survey Guidelines for Australia's Threatened Birds (2010),
- Commonwealth Survey Guidelines for Australia's Threatened Mammals (2004),
- Bat Calls of NSW: A Region-based Guide to the Echolocation Calls of Microchiropteran Bats (2009)
- Threatened Species Survey and Assessment Guidelines: Field Survey Methods for Fauna; Amphibians (2009).
- The Department of Sustainability and Environment Approved Survey Standards: Masked Owl *Tyto novaehollandiae* (2011),
- Koala (*Phascolarctos cinereus*): Biodiversity Assessment Method Survey Guide (2022);
- 'Species Credit' Threatened Bats and Their Habitats: NSW Survey Guide for the Biodiversity Assessment Method (2018).

For a more in-depth description of the methods used for the targeted surveys and the locations of where these surveys were undertaken, please refer back to **Section 2.4.3**, **Table 4** and **Table 23**. Four (4) threatened fauna species were recorded during the survey effort, which consisted of numerous records for Squirrel Glider (15 of the 18 retrieved cameras in C3 land detected them), Sloane's Froglet (detected throughout much of the Subject Land areas, in dams, drainage lines and paddocks), and both Scarlet Robin and Flame Robin (which were detected at the interface of the R1 and C3, along the eastern edge of the main northern and southern development areas). Survey efforts for candidate

threatened fauna are provided in **Table 19** and **Table 23**. Regent Honeyeater was not detected, but is assumed present in parts of the C3 land based on Important Habitat Mapping (IHM). Southern Myotis was surveyed for via spotlighting and remote sensing equipment. However, due to the complexity of confirming presence or absence of this species (distinguishing their call from other common bat species is very difficult), it was assumed to be present in suitable parts of C3 land.

Method and survey effort for fauna

Targeted surveys using spotlighting methods and species call playback were conducted for Masked Owl, Barking Owl and Bush Stone-curlew in suitable areas of habitat (mostly C3 lands, as well as in scattered trees in R1 lands) on nights where conditions were appropriate for the species, such as nights that were not too cold, or too windy, to ensure call playback had suitable distance penetration and that return calls could be clearly heard. Four survey nights were undertaken at suitable times of year for the species being targeted. One ecologist walked transects and traverses through all suitable habitat areas over four survey nights, using a spotlight to detect movement and eye-shine. Call playback was conducted for each species, and included a 5 minute silent period after each playback to listen for returned calls. Playbacks were conducted in series of threes, before pausing, then transitioning to the next targeted species, which also underwent a series of three calls followed by short pauses.

Targeted surveys for Squirrel Glider, Brush-tailed Phascogale and Koala were conducted using spotlighting method (described above) and remote detection with 21 remote cameras which were set up mostly along the better quality habitat of Williams Road, as well as several locations in R1 land that possessed trees. Scat searches were also conducted through habitat areas during flora and invertebrate searches.

Diurnal species such as birds and insects were assessed using transects and meanders through suitable habitat areas at appropriate times of year, and spot surveys were completed while the assessor was stationary for 15 minutes at ten set locations. All species that were observed were recorded (seen and heard). In addition to these methods, scats, pellets and owl whitewash were also searched for during transects and meanders through vegetated areas.

For amphibian species, searches and call playback were conducted for Sloane's Froglet in conjunction with spotlighting nights for owls and mammals. Sloane's Froglet were identified on night one at the majority of dams and drainage lines on the site, and required little subsequent survey effort after that, as they were found to be occupying the majority of available habitats. Spotlight and visual surveys for Booroolong Frog were undertaken, despite the Subject Land consisting of no suitable breeding habitat (no rocky creek/river habitat) for the species and none of the creeks were being impacted. Despite not being listed as a candidate species, Southern Bell Frog (*Litoria raniformis*) was also searched for and call playback was used. However, there was little to no suitable habitat available for the species in the Subject Land, given the high disturbance levels and lack of emergent vegetation in the water bodies.

Habitat searches were conducted to search for hollow trees and other microhabitats such as rocks, logs and other structures. Limited ground habitat, including no large timber of any note and very little woody debris, and no rock outcrops or other suitable substrates were present in the C3 areas. Some timber was present in the R1 land. However the Pink-tailed Worm-lizard is only being surveyed for in C3 land, and where timber was present in R1 land, the area is being protected from development via reservation and active ongoing management. Despite this, ground searches were conducted, and very few reptiles were detected as part of the survey, in fact, Garden Skink (*Lampropholis guichenoti*) was the only reptile detected.

Table 23: Threatened species surveys for candidate fauna species credit species on the Subject Land

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required?	
		Survey method	Timing of survey – within recommended period? (BAM-C / TBDC)	Effort (hours & no. people)			
Regent Honeyeater	<i>Anthochaera phrygia</i>	Traverses, spot counts	<input checked="" type="checkbox"/> Yes 13/6/24 (10:00 – 14:30) 26/7/24 (14:00 – 19:00) 29/7/24 (10:00 – 14:00) 1/8/24 (10:00 – 14:00) 17/10/2024 (09:00 – 16:30) 1/11/24 (14:00 – 15:00) 8/11/24 (08:00 – 11:00) 21/11/24 (08:30 – 10:30) 4/12/24 (15:30 – 16:30) 15/12/24 (06:00 – 9:00) 10/1/25 (09:00 – 14:00)	<input type="checkbox"/> No	1 person x 35 hours	Assumed present	No
Pink-tailed Legless Lizard	<i>Aprasia parapulchella</i>	Visual habitat searches	<input checked="" type="checkbox"/> Yes 13/6/24 (10:00 – 14:30) 8/11/24 (08:00 – 11:00) 10/1/25 (09:00 – 14:00)	<input type="checkbox"/> No	1 person x 11.5	No	No
Bush Stone-curlew	<i>Burhinus grallarius</i>	Call playback (nocturnal), traverses, spot counts, spotlighting	<input checked="" type="checkbox"/> Yes 26/7/24 (17:00 - 19:00) 12/8/24 (16:45 – 20:15) 19/8/24 (17:00 – 20:00) 26/8/24 (16:45 – 19:00) 19/11/24 (20:15 – 11:00) 9/12/24 (20:30 – 11:00)	<input type="checkbox"/> No	Diurnal: 1 staff x 35 hours Nocturnal: 1 staff x 17 hours	No	No
Gang-gang Cockatoo (breeding)	<i>Callocephalon fimbriatum</i>	Traverses, spot counts	<input checked="" type="checkbox"/> Yes See Regent HE dates/times	<input type="checkbox"/> No	1 staff x 35 hours	No	No
South-eastern Glossy Black-Cockatoo (breeding)	<i>Calyptorhynchus lathami lathami</i>	Traverses, spot counts	<input checked="" type="checkbox"/> Yes See Regent HE dates/times	<input type="checkbox"/> No	1 staff x 35 hours	No	No

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required?
		Survey method	Timing of survey – within recommended period? (BAM-C / TBDC)	Effort (hours & no. people)		
Sloane's Froglet	<i>Crinia sloanei</i>	Traverses, call playback (nocturnal)	<input checked="" type="checkbox"/> Yes 26/7/24 (14:00 – 19:00) 12/8/24 (16:45 – 20:15) 19/8/24 (17:00 – 20:00) 26/8/24 (16:45 – 19:00)	<input type="checkbox"/> No 1 staff x 13.75 hours	Yes	No
White-bellied Sea-eagle (breeding)	<i>Haliaeetus leucogaster</i>	Traverses, spot counts	<input checked="" type="checkbox"/> Yes See Regent HE dates/times	<input type="checkbox"/> No 1 staff x 35 hours	No	No
Little Eagle (breeding)	<i>Hieraaetus morphnoides</i>	Traverses, spot counts	<input checked="" type="checkbox"/> Yes See Regent HE dates/times	<input type="checkbox"/> No 1 staff x 35 hours	No	No
Key's Matchstick Grasshopper	<i>Keyacris scurra</i>	Traverses, sweeps	<input checked="" type="checkbox"/> Yes 1/11/24 (14:00 – 15:00) 8/11/24 (08:00 – 11:00) 21/11/24 (08:30 – 10:30) 14/12/24 (15:30 – 16:30) 10/1/24 (09:00 – 14:00)	<input type="checkbox"/> No 1 staff x 12 hours	No	No
Swift Parrot (breeding)	<i>Lathamus discolor</i>	Traverses, spot counts	<input checked="" type="checkbox"/> Yes See Regent HE dates/times	<input type="checkbox"/> No 1 staff x 35 hours	No	No
Booroolong Frog	<i>Litoria booroolongensis</i>	Traverses, call playback (nocturnal)	<input checked="" type="checkbox"/> Yes 26/7/24 (14:00 – 19:00) 12/8/24 (16:45 – 20:15) 19/8/24 (17:00 – 20:00) 26/8/24 (16:45 – 19:00) 19/11/24 (20:15 – 11:00) 9/12/24 (20:30 – 11:00)	<input type="checkbox"/> No Some surveys outside period 1 staff x 19 hours	No	No
Square-tailed Kite (breeding)	<i>Lophoictinia isura</i>	Traverses, spot counts	<input checked="" type="checkbox"/> Yes See Regent HE dates/times	<input type="checkbox"/> No 1 staff x 35 hours	No	No
Southern Myotis	<i>Myotis macropus</i>	Acoustic recorder, spotlighting	<input checked="" type="checkbox"/> Yes Recordings taken 14/12/24 to 28/12/24	<input type="checkbox"/> No 15 nights acoustic recordings	Assumed present	No

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required?	
		Survey method	Timing of survey – within recommended period? (BAM-C / TBDC)	Effort (hours & no. people)			
Barking Owl	<i>Ninox connivens</i>	Call playback, spotlighting	<input checked="" type="checkbox"/> Yes 26/7/24 17:00 - 19:00 12/8/24 16:45 – 20:15 19/8/24 17:00 – 20:00 26/8/24 16:45 – 19:00 19/11/24 20:15 – 11:00 9/12/24 20:30 – 11:00	<input type="checkbox"/> No	Nocturnal: 1 staff x 17 hours	No	No
Squirrel Glider	<i>Petaurus norfolcensis</i>	Spotlighting, remote cameras	<input checked="" type="checkbox"/> Yes 26/7/24 (17:00 - 19:00) 12/8/24 (16:45 – 20:15) 19/8/24 (17:00 – 20:00) 26/8/24 (16:45 – 19:00) 19/11/24 (20:15 – 11:00) 9/12/24 (20:30 – 11:00) Cameras recorded 4/12/24 to 10/1/25*	<input type="checkbox"/> No	Spotlighting: 1 staff x 17 hours Cameras: 23 cameras (19 on C3 land recorded for 12 nights (3 cameras and data stolen), 4 cameras on R1 land recorded for 35 nights).	Yes	No
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	Spotlighting, remote cameras	<input checked="" type="checkbox"/> Yes 26/7/24 17:00 - 19:00 12/8/24 16:45 – 20:15 19/8/24 17:00 – 20:00 26/8/24 16:45 – 19:00 19/11/24 20:15 – 11:00 9/12/24 20:30 – 11:00 Cameras recorded 4/12/24 to 10/1/25*	<input type="checkbox"/> No	Spotlighting: 1 staff x 17 hours Cameras: 23 cameras (19 on C3 land recorded for 12 nights (3 cameras and data stolen), 4 cameras on R1 land recorded for 35 nights).	No	No
Koala	<i>Phascolarctos cinereus</i>	Call playback, scat searches, spotlighting, traverses	<input checked="" type="checkbox"/> Yes 26/7/24 17:00 - 19:00 12/8/24 16:45 – 20:15 19/8/24 17:00 – 20:00 26/8/24 16:45 – 19:00 19/11/24 20:15 – 11:00 9/12/24 20:30 – 11:00	<input type="checkbox"/> No	Spotlighting and call playback: 1 staff x 17 hours	No	No

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required?	
		Survey method	Timing of survey – within recommended period? (BAM-C / TBDC)	Effort (hours & no. people)			
Superb Parrot (breeding)	<i>Polytellis swainsonii</i>	Traverses, spot counts	<input checked="" type="checkbox"/> Yes See Regent HE dates/times	<input type="checkbox"/> No	1 staff x 35 hours	No	No
Grey-headed Flying-fox (breeding)	<i>Pteropus poliocephalus</i>	Traverses, spot counts, spotlighting	<input checked="" type="checkbox"/> Yes See Regent HE dates/times Spotlighting: 26/7/24 17:00 - 19:00 12/8/24 16:45 – 20:15 19/8/24 17:00 – 20:00 26/8/24 16:45 – 19:00 19/11/24 20:15 – 11:00 9/12/24 20:30 – 11:00	<input type="checkbox"/> No	Spotlighting: 1 staff x 17 hours Traverses and spot counts: 1 staff x 35 hours	No	No
Golden Sun Moth	<i>Synemon plana</i>	Traverses, sweeps	<input checked="" type="checkbox"/> Yes 1/11/24 14:00 – 15:00 8/11/24 08:00 – 11:00 21/11/24 08:30 – 10:30 14/12/24 15:30 – 16:30 10/1/24 09:00 – 14:00	<input type="checkbox"/> No	1 staff x 12 hours	No	No
Masked Owl	<i>Tyto novaehollandiae</i>	Call playback, spotlighting	<input checked="" type="checkbox"/> Yes 26/7/24 17:00 - 19:00 12/8/24 16:45 – 20:15 19/8/24 17:00 – 20:00 26/8/24 16:45 – 19:00 19/11/24 20:15 – 11:00 9/12/24 20:30 – 11:00	<input type="checkbox"/> No	Nocturnal: 1 staff x 17 hours	No	No

*Four cameras left for more than full 30-day period (4/12/24 to 10/1/25), 17 cameras recorded in C3 for 11 nights, but removed early after three cameras were stolen.

Fauna survey results

There are a number of various sized tree hollows present on the Subject Land (small, medium, large and extra-large), mostly located along Williams Road, but there were also some scattered trees with hollows, and numerous small to medium sized hollows in the patch of Blakely's Red-gum in the R1 land. These hollows provide habitat for Squirrel Gliders (present) (except the disconnected hollows across the R1 land) and potential habitat for other hollow-dependant fauna such as owls, bats and some birds. Beyond these values, faunal habitats were relatively limited throughout the entire Subject Land, and were nearly completely void across R1 land, except for dams, scattered trees and a patch of trees. Given the linear nature of the remaining patch habitat along Williams Road, edge effects have impacted vegetation quality throughout these areas, with very few areas containing natives as the dominant vegetation in the understorey. Shrubs were absent across the majority of the study area, except for some of the revegetation areas, which contains some shrubs, but also contained a relatively low diversity of species.

Table 19 and **Appendix H** provide a list of the candidate fauna species credit species that were the subject of targeted survey assessment as part of this BDAR, with **Table 21** also outlining the required survey methods for each species and the specific survey period, where applicable. The following section discusses results of surveys for each class of animal.

Bats

Numerous bats were identified via the analysis of acoustic detection device data, which was conducted by Dr Greg Ford. Of the 10,736 calls that were recorded over the bat sensor deployment period, 10 species of bat were confirmed as present, and two bats were identified to genus level but were not able to be fully identified. A deceased Little Red Flying Fox was also detected during habitat meanders, found stuck on barbed wire across Eight Mile Creek. Regarding the target species Southern Myotis, there are significant difficulties with positively identifying Southern Myotis calls from other similar bat species (this was confirmed by both bat experts engaged). To improve certainty about presence or absence, if suspect Southern Myotis calls are detected by the remote sensor, follow-up surveys are required with spotlighting and specialised infra-red video equipment that is also synced with simultaneous acoustic recordings. These surveys come at considerable cost from a time, equipment and resourcing perspective. Furthermore, even if these methods fail to detect Southern Myotis feeding over waterbodies (of which those on site are of limited habitat value), it would still likely provide insufficient evidence to be certain that the highly mobile species does not frequent the site on occasion, or on a regular basis. It is for these reasons that Southern Myotis was presumed present. Presumed presence was also supported by experts. Other bats identified during surveys are listed in **Appendix K**, and the Southern Myotis survey data analysis report is available in **Appendix R**.

Birds

There were a large number of bird species detected across the numerous survey days (and nights), with several also being captured by remote cameras. Given the distances between suitable habitat areas, spot searches were generally less productive than meander searches, especially where little habitat persisted on R1 land. There were fifty-eight (58) birds detected through surveys and site assessments, with only two being introduced species, and two of those being threatened native species. They include Scarlet Robin and Flame Robin (both vulnerable under BC Act). Regent Honeyeater, although not detected during surveys, is assumed to be present given that its preferred feed trees are present along the road verge of Williams Road, and this vegetation is also mapped on the species' important habitat map.

Reptiles

Due to the lack of suitable habitat, and in particular lack of woody debris, fallen logs and surface rock, there were very few reptiles recorded during surveys. This is a general reflection of the high disturbance levels that have been experienced throughout the entire Subject Land, and many of these disturbances (such as grazing and compaction) continue to occur, even in the road reserve of Williams Road, which is limiting the ability of these species to recolonise these areas. Being on the outskirts of a large urban area, historic and ongoing firewood collection is a significant factor in the lack of woody habitat for ground-dwelling species. In total, one turtle, one snake and one lizard were detected during surveys (**Appendix K**).

Mammals

Numerous mammals were detected by spotlighting and remote camera deployment. Squirrel Gliders (vulnerable under BC Act) were recorded on 13 of the 14 cameras that were placed and retrieved from the road reserve of Williams Road (not including the data lost from the other three stolen cameras). Several different individuals were present, indicating a healthy population. Spotlighting also revealed Squirrel Gliders along Seven Mile Creek, to the south of the development, as well as two sightings on Williams Road. Other species that were spotlighted or caught on remote camera included Brush-tail Possum, Ring-tail Possum, and Black Rat (exotic species). Despite high numbers of cameras deployed for a small thin strip of habitat along Williams Road, there were no detections of Brush-tailed Phascogales. This is not unexpected, given the absence of records in the local area, the lack of strong historic connectivity across the local area, and the almost complete absence of shrubs and ground timber habitat in the Subject Land. Other than common large mammals like kangaroos and Swamp Wallaby, the majority of mammals detected, and listed in **Appendix K**, are bat species.

Invertebrates

Given the inherent complexity involved with searching for and identifying all invertebrate species across a large area such as the Subject Land, searches for invertebrates and identifications were limited to only those two species being targeted by surveys. The only grasshoppers detected on site were of the winged flying varieties, and none matched the characteristics of the Key's Matchstick Grasshopper. Numerous butterflies and moths were detected during surveys. The project ecologist is highly experienced in surveying for Sun Moth (*Synemon* spp.), and is well versed in their preferred habitats, flight patterns and mannerisms during sunny, windy and cloudy periods. Despite numerous searches through the areas of suitable grassland habitat on clear hot and sunny days, no Sun Moth were detected.

Amphibian

Surveys detected six (6) different species of frog, with call identification being the most successful method of identification. Despite there being no suitable stony river or deep creek habitat present, surveys were still undertaken on two nights for Booroolong Frog. Surveys were also conducted for Southern Bell Frog, which was not a listed candidate species. Not surprisingly given the lack of habitat, neither of these species were detected. Only one threatened species of frog was present on the Subject Land, that being Sloane's Froglet. This species was present in all the dams surveyed on and adjoining the site, as well as in all the main drainage lines, and nearby creeks (Eight Mile and Seven Mile Creeks). It is clear that there is a significant and healthy population of Sloane's Froglet present on and adjoining the Subject Land.

Limiting factors for fauna surveys

The most significant factor that affected survey effort was the theft of three remote cameras along Williams Road. Twenty-one (21) cameras were set-up on the Subject Land, 17 of which were in large habitat trees along Williams Road. During bait refreshing activities after two weeks had lapsed, it was noted one of the cameras was stolen. Staff returned the next morning and a further two cameras had been stolen. Given the expense involved, and the fact the cameras were leased from a third party, the decision was made to immediately remove all of the cameras that were located on C3 lands, to limit further losses. The four cameras on the R1 land were left for more than the full 30-day period (4/12/24 to 10/1/25). Although the survey requirements of 30 nights for phascogale surveys were not met across the entire site due to early removal of 17 cameras after thefts, considering a very high number of cameras were placed in a very thin strip of habitat (every large hollow-bearing habitat tree), and with the addition of spotlighting surveys on six nights, as well as the fact that the Subject Land contains marginal habitat for the species and there are no records in the local area, Red-Gum are of the opinion that survey effort was sufficient and that if Phascogale were present, they would have been captured on one of the abundant cameras.

5.4 Expert reports

An expert report was sought for Brush-tailed Phascogale from Dr Rodney van der Ree on 22 October 2024. However, the expert in this instance expressed his inability to conduct the work to write the report in an appropriate timeframe to meet the project timelines (expected availability in the six month range). This expert was the only expert registered on the expert list for NSW. Another expert, Dr Martin Schulz was contacted on 22 October 2024 for a quote on expert report production for Eastern Pygmy Possum (which was subsequently dropped off the candidate list in the BAM-C after alterations to input data were made). However, he also expressed an inability to perform the work for a six month period or more. Again, no other experts were available on the BioNet list for this species.

5.5 More appropriate local data (where relevant)

Data on local Squirrel Glider records were provided by Albury Conservation Company. This data showed numerous records in the local area, including two records from 2022 in the Subject Land, located centrally along Williams Road. An Albury City report titled 'Squirrel Glider Connectivity and Structure Report' (via DM Ecological) was also provided by Albury Conservation Company, and helped inform ecologists of the habitat values and the likely presence of gliders throughout the connected parts of the local area. As part of the communications with local experts, Principal Ecologist from DM Ecological Dylan McWhinney explained that there have been no detection of Brush-tailed Phascogales in the local area since monitoring began in 2018 (Pers.com email 24/10/2024). This lack of records supports our opinion that there is a high confidence level for Brush-tailed Phascogale not being present in the Assessment Area or Subject Land.

5.6 Area or count, and location of suitable habitat for a species credit species (a species polygon)

There are no threatened flora present, and four (4) threatened fauna species were detected during surveys, two of which (Flame Robin and Scarlet Robin) are ecosystem credit species (i.e. did not require targeted surveys). In addition to the two species credit species detected (Squirrel Glider and Sloane's Froglet – the latter was manually added to BAM-C), there are also two species that were not detected but are assumed to be present. Regent Honeyeater is assumed present on the basis of the Subject Land containing its preferred feeding trees (and important habitat mapping), and Southern Myotis, which was assumed present after difficulties in identifying calls in the bat sensor data by experts, and the onerous requirements (and fallibility) of follow-up survey methods. Each respective candidate threatened species that was detected or assumed present has a species polygon (see **Figures 13a to 13d**) which show the locations and extent of suitable habitat for each of these species within the Subject Land. These polygon features are described further below and details are listed in **Table 24**.

The species polygon for Southern Myotis was established as per the technique for determining its species polygon in the 'Species Credit Threatened Bats and Their Habitats – NSW Guide for the Biodiversity Assessment Method'. The method includes a buffer of 200 metres from any permanent creek, river, lake or other waterway. In this instance, the surrounding creeks do not contain any permanent three-metre wide pools of water, so habitat features which were buffered to produce the species polygon were limited to farm dams within and adjoining the Subject Land which contain some permanent water in all but the most serious drought periods. All PCTs on the Subject Land that are associated with Southern Myotis, which fall within the 200 metre buffer of the habitat features (large farm dams), are what make up the species polygon area for the species. The species polygon includes areas from all vegetation zones present on the Subject Land.

The species polygon for Sloane's Froglet was established as per the recommendations in the 'NSW Survey Guide for Threatened Frogs'. As records were detected through all waterbodies on site, as well as the main drainage lines through the paddocks, the species polygon boundary was drawn as a buffer within 100 metres of these suitable habitat areas (dams, creeks and drainage lines). As per the guidelines, where the drainage lines were traversing through non-native vegetated areas, linking the main waterbodies, these drainage lines were buffered by a minimum of 50 metres from the centre-line of the drainage line. As a result of numerous dams, creeks and drainage lines being on or nearby the Subject Land, the species polygon for Sloane's Froglet is a large area when the buffers are included. The species polygon includes areas from all vegetation zones present on the Subject Land.

The species polygon for Squirrel Glider was established as per the guidelines in the TBCD, and includes the areas that contain connected habitat trees and areas of adjoining revegetation (feeding resources), but does not include scattered trees that are at a distance from patches of connected vegetation which are beyond the gliding distance for the species (a gap of 50 metres or more), as recommended by the TBCD. The species polygon includes areas from all vegetation zones present on the Subject Land except for '277_Trees_only' and '266_Wetland' zones.

There is also one species, Regent Honeyeater, which is a dual credit species and although it was not detected, it has habitat in the Subject Land that is mapped on the Regent Honeyeater important habitat map, and this entire area (where it occurs on Subject Land) has been mapped as a species polygon for this species. The species polygon for Regent Honeyeater includes the mapped habitat on the Subject Land as per the species IHM, as well as slight adjustments to include any other areas of suitable habitat (large flowering gums) in that vicinity. The species polygon includes areas from all vegetation zones present on the Subject Land except for '277_Trees_only', which contains a non-preferred gum species, and '266_Wetland' zone which lacked habitat (flowering gums).

Table 24: Results for present species credit species (recorded within the Subject Land) and species polygon details

Common name	Scientific name	Biodiversity risk weighting (BAM-C & TBDC*)	SAII entity** (BAM-C & TBDC)	Habitat constraints / microhabitats present on the Subject Land / vegetation zone	Abundance – No. individual plants present on Subject Land	Extent (ha) of suitable habitat present on site (area of species polygon)	TBDC species specific recommendations e.g. buffers, general comments (where relevant)	Habitat condition (vegetation integrity score for each vegetation zone in the polygon – area species only)
Sloane's Froglet	<i>Crinia sloanei</i>	Very High (3)	Yes	Dams, creeks and drainage lines as well as a buffer of 100 metres from these habitats (where they are within native vegetation) and 50 metres when they are within exotic vegetation.	NA	48.82ha	100m (native vegetation) and 50m (exotic vegetation) buffers applied to form species polygon.	Veg zone/VI: 266_Remnant_Sth/47.1 266_Remnant_Nth/38.3 278_Revegetation/4.5 266_Wetland/36.2 266_Revegetation/37.6 266_Remnant_MQ/61.5
Squirrel Glider	<i>Petaurus norfolcensis</i>	High (2)	No	Connected remnant areas with hollow-bearing trees where species is recorded or expected to be present based on detections and previous records.	NA	6.0ha	All suitable connected habitat forms the species polygon.	Veg zone/VI: 266_Remnant_Sth/47.1 266_Remnant_Nth/38.3 278_Revegetation/4.5 266_Revegetation/37.6 266_Remnant_MQ/61.5
Southern Myotis	<i>Myotis macropus</i>	High (2)	No	Waterbodies with permanent water pools more than 3 metres wide (large farm dams).	NA	7.37ha	200 metre waterway buffers applied, overlaid with PCT areas, to form species polygon.	Veg zone/VI: 266_Remnant_Sth/47.1 266_Remnant_Nth/38.3 278_Revegetation/4.5 266_Wetland/36.2 266_Revegetation/37.6 266_Remnant_MQ/61.5
Regent Honeyeater	<i>Anthochaera phrygia</i>	Very High (3)	Yes	Preferred feed trees (White Box, Yellow Box, Red Box) present, habitat present that is mapped in the IHM.	NA	6.14ha	IHM mapped area for species, plus additional mapped areas of suitable habitat forms species polygon.	Veg zone/VI: 266_Remnant_Sth/47.1 266_Remnant_Nth/38.3 278_Revegetation/4.5 266_Revegetation/37.6 266_Remnant_MQ/61.5



Figure 13a: Species polygon for Squirrel Glider within the Subject Land. Scale 1:6,500

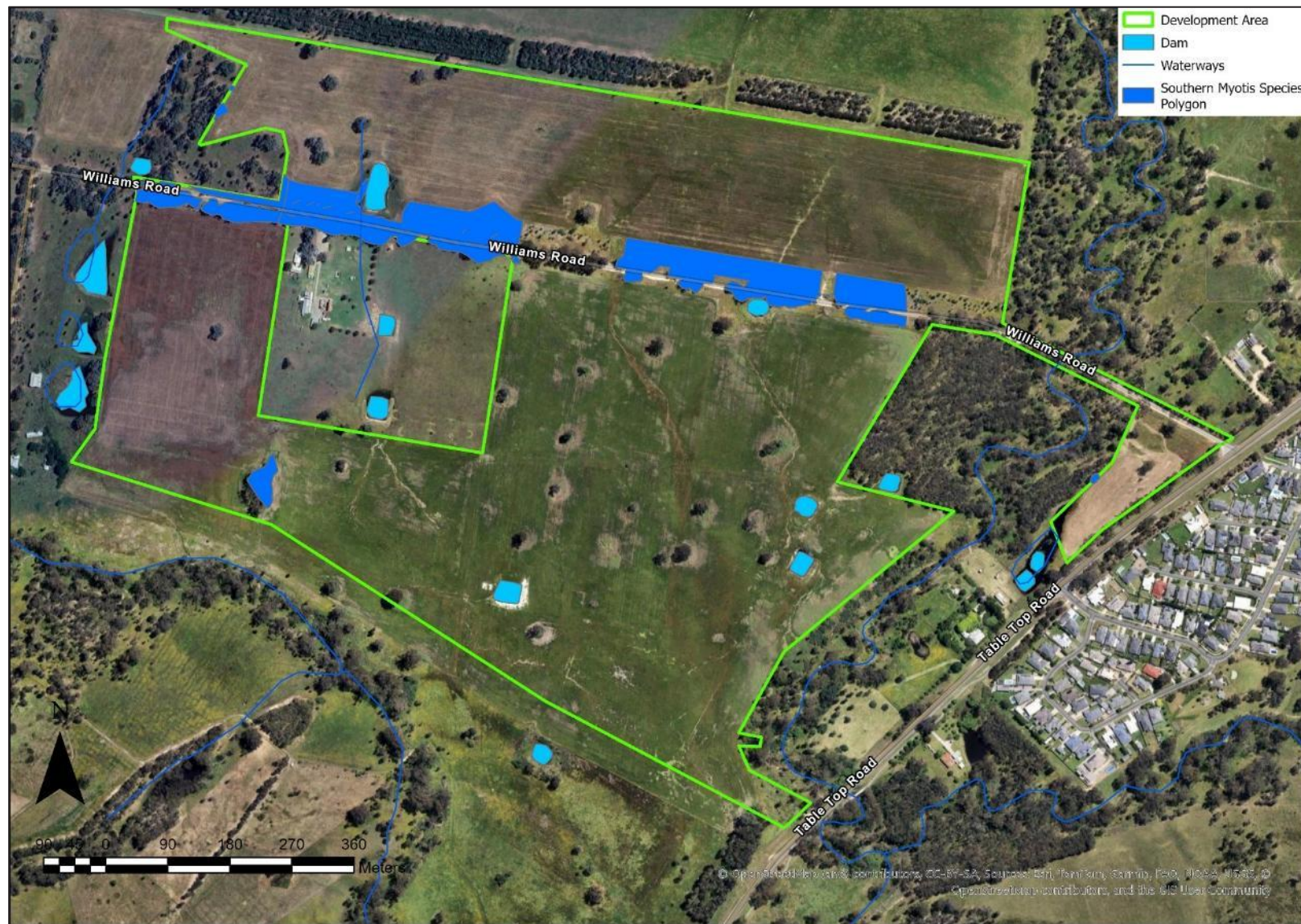


Figure 13b: Species polygon for Southern Myotis within the Subject Land. Scale 1:6,500

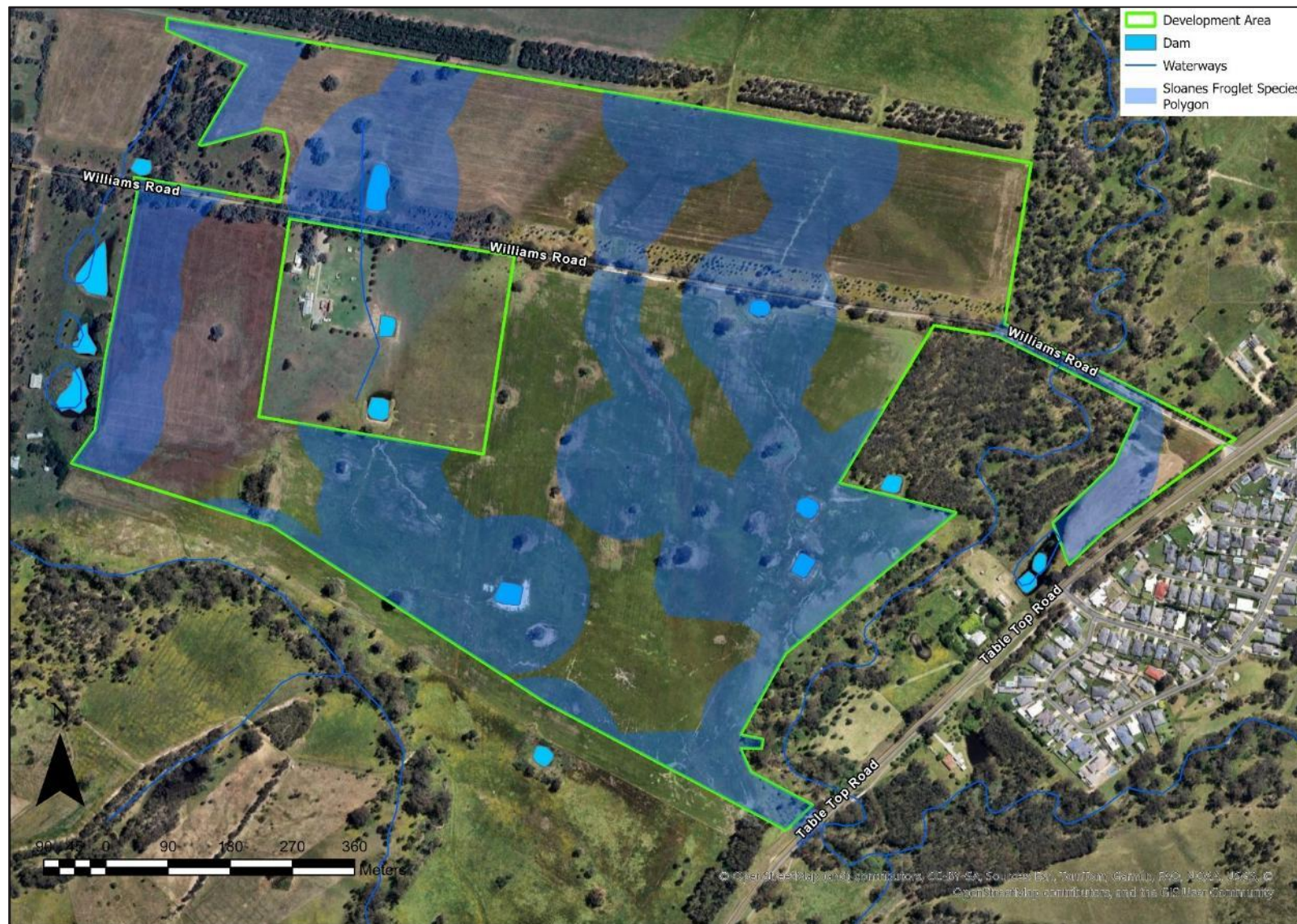


Figure 13c: Species polygon for Sloanes Froglet within the Subject Land. Scale 1:6,500



Figure 13d: Species polygon for Regent Honeyeater (and IHM area) within the Subject Land. Scale 1:6,500

Table 25: Results for EPBC Act listed species present (recorded within the Subject Land)

Common name	Scientific name	Abundance – No. individual plants present on Subject Land (flora with unit of measure as count)	Extent (ha) of suitable habitat present on site (flora or fauna with unit of measure as area)
Sloane's Froglet	<i>Crinia sloanei</i>	NA	48.82ha (including buffer areas of important habitat features)

6. Identifying prescribed impacts

There are several prescribed impacts associated with the development, including farm dams, vehicle strike risks/impacts, non-native vegetation, connectivity (for Sloane's Froglet) impacts, and impacts associated with waterbodies, water quality and hydrological processes. **Table 26** outlines the prescribed impacts that apply, and do not apply, to the proposed development project. Impacts on threatened entities from prescribed impacts are described in more detail below.

Table 26: 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. Where relevant, threatened species or fauna that are part of a TEC or EC, that are at risk of vehicle strike
Farm dams	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	Small farm dams occur within the Subject Land.	Southern myotis (feeding), and Sloane's Froglet, are both potentially impacted by the changes and loss of/impact to the farm dams. Impacts associated with losses to farm dams are being dealt with in Section 8 .
Vehicle strikes	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	With the development including numerous roads associated with residential housing, and the proposed Thurgoona Link being located just south, there is a risk of vehicle strikes for some terrestrial species.	Sloane's Froglet at moderate risk of vehicle strikes (from new estate roads), and Squirrel Glider is at low-moderate risk, due to lower likelihood of the species entering the estate areas. There is a low risk for Scarlet and Flame Robin, Southern Myotis and Regent Honeyeater, given their lower likelihood of entering into the new estate areas to forage. Mobile fauna broadly associated with the TEC on site may also be at risk of vehicle strike, but the risks are considered relatively low, given the lack of suitable habitat within the development areas.

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature. Where relevant, threatened species or fauna that are part of a TEC or EC, that are at risk of vehicle strike
Karst, caves, crevices, cliffs, rocks or other geological features of significance	<input type="checkbox"/> Yes / <input checked="" type="checkbox"/> No	Not present.	Not present in or near Subject Land. The project will not cause impacts to threatened entities that are associated with these features.
Human-made structures	<input type="checkbox"/> Yes / <input checked="" type="checkbox"/> No	Not present.	Not present in or near Subject Land. The project will not cause impacts to threatened entities that are associated with these features.
Non-native vegetation	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	Dominates the R1 zoned land, and is present at varying densities in C3 land.	Sloane's Froglet were recorded in paddocks that were dominated by exotic pasture grasses (moving between dams). Limited habitat for other threatened entities exists in areas of exotic vegetation. Impacts associated with losses to exotic connectivity areas between dams is being dealt with in Section 8 .
Habitat connectivity	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	Connected canopy along Williams Road, and along Eight Mile Creek. Connections (including those through exotic vegetation) between dams for Sloane's Froglet being impacted.	Vehicle strike risk for fauna is to be reduced when Williams Road gets closed off to all but pedestrian traffic, and connectivity values to be protected via reservation. Sloane's Froglet are exposed to impacts to connectivity features between dams and creeks, and movement corridors being replaced along southern part of development to counter some of this impact. Impacts associated with losses to connectivity areas between dams is being dealt with in Section 8 .
Waterbodies, water quality and hydrological processes	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	Site run-off drains into Seven Mile Creek and Eight Mile Creek. Drainage to be altered across the development, with stormwater flows being diverted into new detention basins, but high flow event outflows into surrounding creeks not likely to be altered significantly. Some impacts to dams and drainage from development. CEMP to include measures to protect water quality.	Southern Myotis may feed in dams. Sloane's Froglet present in all dams, creeks and drainage lines at different times of year. New detention basins and movement corridor ponds to be designed to Sloane's Froglet habitat standards. CEMP controls will limit excessive impacts to water quality and hydrological processes. Impacts associated with losses to dam areas is being dealt with in Section 8 .

Stage 2: Impact assessment (biodiversity values and prescribed impacts)

7. Avoid and minimise impacts

7.1 Avoid and minimise direct and indirect impacts

7.1.1 Project location

The site for the proposed subdivision has been selected carefully based on the large expanse of previously cleared and historically farmed land which contains low cover of remnant native vegetation (no cover in most development areas), as well as its proximity to the proposed transport corridor called Thurgoona Link Road (assessed separately to this housing estate development). There have been several iterations of the subdivision design, as part of an iterative design process which has incorporated feedback from project ecologists, council planners, NSW government staff and other stakeholders. The selection of the development site has therefore effectively avoided and minimised its impacts upon native vegetation and biodiversity values in the local area, and measures are being put in place to protect the remaining habitat features on site, including closure and reservation of Williams Road transport corridor, protection and reservation of the only patch of native trees on R1 land, and construction of custom-designed retention basins and chain of ponds habitat linkages for Sloane's Froglet.

7.1.2 Project design

At the finer scale, the initial design earmarked the patch of Blakey's Red-gum on the R1 land to be cleared, however this was retained after discussions between engineers and project ecologists, based on the value of this area as part of a NSW Grassy Woodland TEC, despite this area being biodiversity certified and already offset. This area is now to be reserved and managed as a conservation area. Williams Road is to be closed to traffic in the final iteration of the estate design, and will also be managed as a conservation reserve. These efforts acknowledge the important threatened species habitat and connectivity values present in these areas, which are to be protected and adequately managed for into the future.

Design changes have also seen some other habitat losses avoided, including the realignment of a connecting path between the northern estate section and Williams Road, to capitalise on the position of an existing gate and disturbed area along a fence line (by moving the proposed path 5-7 metres further west), that is already cleared of any trees and significant grass cover, to reduce impacts from construction to trees and a moderate quality native grassland just east of the new alignment (now being protected). Numerous design changes and specific requirements have also been incorporated for Sloane's Froglet, including the creation of a chain-of-ponds style drainage system which is being constructed to Sloane's Froglet design standards (at the request of Council), and is aiming to replace some of the connectivity being lost as a result of developing through current movement corridors for the species. Furthermore, no subdivision construction works are to be undertaken during the Sloane's Froglet breeding season to help minimise impacts to this species and its habitat.

Efforts are being made to retain trees wherever possible, providing they do not pose a health and safety risk to future residents or users of the local area. There are numerous trees that have been deemed lost due to TPZ impacts or unpredictable future impacts from ongoing use of the estate by residents. However wherever possible, many of these trees are still being retained for aesthetic and habitat purposes. Late design changes at two specific locations in C3 land were added in April 2025, however these two areas will be fully under-bored, and will incur zero impacts as a result from development. See **Appendix S** for a map of the two areas being under-bored.

7.2 Other measures considered

In addition to the general threatening processes and habitat management practices applied to conservation reserve areas, it is recommended that nest boxes be installed in the two reserve areas, to enhance the habitat values in the area for hollow-dependant species. Hollows should be of various sizes to suit a range of hollow-dependant birds and mammals, including bats. It is also recommended that tree and shrub plantings in the estate focus on indigenous native species, including Ironbarks, Silver Banksia (*Banksia marginata*), Weeping Myall (*Acacia pendula*) and other sought-after flowering species for birds (such as Regent Honeyeater) and gliders, while consideration is given to safety and practicality of species selection for high human-use environments such as parks, paths and nature strips.

7.3 Summary of measures to avoid and minimise impacts

The development will have its own CEMP to formalise management actions to help minimise and mitigate environmental impacts from development. An Erosion and Sediment Management Plan (ESMP) may also be developed and put in place to ensure site values, soils, nearby waterways and retained habitat and vegetation are protected from the direct and indirect impacts of construction. Alternatively, and especially due to the low risks of erosion from construction, the CEMP could incorporate these erosion and sediment protection measures within its contents.

The CEMP is to include training and inductions for project staff, contractors and other people visiting the site, daily toolbox sessions on protecting retained values, installation of temporary fences and signage (if required), designation of no-go areas, erosion and sedimentation control measures (provided with greater site-specific detail in the ESMP if employed), and other impact measures including but not limited to:

- Site environmental inductions covering off on all the key components in this report and the actions to protect values on and adjoining the site such as large trees and other important retained features, as per the CEMP.
- Pre-clearance protocols for felling of large trees, including the required presence of an ecologist or qualified wildlife handler.
- Processes to monitor trees and other habitat during construction, and having systems in place (fauna salvage protocol) to address any inadvertent impacts to fauna during construction.
- Have protections in place, including barriers and regular monitoring, to ensure fauna are not trapped for extended periods in open trenches or other structures during construction.
- Have a system in place for unexpected finds during construction (including reporting to the appropriate authority) which relate to threatened species, European heritage, toxic substances, or Aboriginal cultural heritage.
- Erosion and sediment controls and monitoring, and have systems in place where erosion or sedimentation is detected because of construction.
- Measures to minimise the risks associated with flood events, high winds, storms, drought or extreme heat events.
- Noise and air pollution controls and monitoring.
- Light pollution and excess vibration monitoring and controls.
- Waste and pollution monitoring and controls, including a protocol for rapid response to accidental spills.
- Hygiene protocols to address pest plants, animals and disease introductions to or from the study site as a result of construction.

- Fire management processes and response plans in the event of a wildfire entering the site or starting as a result of construction works.
- Rehabilitation processes to ensure all areas of earthworks are adequately rehabilitated or as per best practice development standards, including revegetation with locally sourced indigenous plants, if and where appropriate.
- A process for allocation of roles and responsibilities for actions within the CEMP and the dedicated monitoring and reporting of the implementation of CEMP actions.

The above points and following measures in **Table 27** will become part of the CEMP for the project and will be formalised and applied post approval of the DA.

Table 27: CEMP avoidance and minimisation measures for direct, indirect and prescribed impacts

Impact	CEMP mitigation measures include, but not limited to:	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated
Removal of native vegetation	Total impact on native vegetation is low, at a total loss of 0.26 ha of patch vegetation on C3 land, and a total of 59 trees across the development site. Minor lopping is permissible for retained trees where they impede access or site safety, to ensure access to the work site is safe. However, all retained trees must be avoided where possible, and lopping must not exceed 30% of the canopy, including no main trunks. Work in tree TPZ areas must be avoided, and no laydowns or fill is to be located in these TPZ areas or in areas of retained native vegetation. Construction vehicles must remain within the mapped impact areas. Any mapped retained trees cannot be removed or have their TPZ area significantly impacted (by 10% or more of its area), otherwise approval must be sought and appropriate offsets acquired, as necessary.	Detailed design	Effective	Likely loss of up to 0.26 hectares in patch losses, loss of 36 trees, deemed loss of 23 trees, plus some sapling tree impacts.
	All tree lopping/ trimming is to be in accordance with the <i>Australian Standard AS4373 Pruning of amenity trees</i> . Efforts need to be made to minimise branch removal to only those that are absolutely necessary, noting that taking more than 30% of a retained tree canopy will constitute tree loss, and approval will need to be sought from authorities.	During construction	Effective	None anticipated
	All construction and development works near retained trees must abide by the <i>Australian Standard AS 4970-2009 Protection of trees on development sites</i> . Strictly no impacts to tree SRZ and minimal impacts to tree TPZ areas of retained trees.	During construction	Effective	None anticipated
	Pre-clearing checks and clearing supervision should be carried out by a suitably qualified ecologist or wildlife handler to minimise harm to wildlife, with a suitable unexpected flora and fauna discovery procedure to be put in place. Injured wildlife and displaced young must be kept secure in a low-stress environment, and contact is to be made with WIRES to ensure animals receive appropriate care. Uninjured fauna that are rescued must be placed in suitable nearby retained habitat.	During construction	Effective	None anticipated

Impact	CEMP mitigation measures include, but not limited to:	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated
	Vegetation removal will be undertaken in accordance with best practice, such as Guide 4: Clearing of vegetation and removal of bush rock of the <i>Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects</i> (RTA 2011). Staged removal of trees is required, to provide an opportunity for any fauna harbouring in trees to exit the tree prior to felling taking place.	During construction	Effective	None anticipated
	Native vegetation will be re-established in accordance with best practice, such as Guide 3: Re-establishment of native vegetation of the <i>Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects</i> (RTA 2011). Prospect of natural regeneration from existing soil seedbank is high in C3 areas.	Post construction	Effective	None anticipated
	The unexpected species find procedure is to be followed under best practice, such as <i>Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects</i> (RTA 2011) if threatened ecological communities, not assessed in the biodiversity assessment, are identified in the project site.	During construction	Proven	None anticipated
	Clearing limits, retained trees, retained vegetation and exclusion zones (no-go areas) are to be clearly identified prior to work within or adjacent to the study area.	Prior to construction	Effective	None anticipated
	<p>A Flora and Fauna Management Plan will be prepared in accordance with Roads and Maritime's <i>Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects</i> (RTA 2011) and implemented as part of the CEMP. It will include, but not be limited to:</p> <ul style="list-style-type: none"> Plans showing areas to be cleared and areas to be protected, including exclusion zones, protected habitat features and revegetation areas. Requirements set out in the <i>Landscape Guideline</i> (RTA 2008). Pre-clearing survey requirements (if applicable). Procedures for unexpected threatened species finds and fauna handling. Procedures addressing relevant matters specified in the policy and guidelines for fish habitat conservation and management (DPI 2013) (if applicable). Protocols to manage weeds and pathogens. 	Prior to construction	Effective	None anticipated

Impact	CEMP mitigation measures include, but not limited to:	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated
	Works shall be restricted to assessed (impact zone) or previously disturbed areas, and if works are required outside of the assessed area, the assessment may need to be revisited and further approval sought. Areas beyond the impact zone are to be fenced or clearly marked with bunting or paint (or other manner) and be considered no-go zones, to ensure no accidental impact occurs during construction.	Construction	Effective	None anticipated
	Implement dust control measures where necessary to protect adjacent retained vegetation and to prevent excessive dust moving into nearby business and residential areas.	Construction	Effective	None anticipated
	Strict erosion and sediment control measures should be implemented, monitored and maintained to prevent impacts on adjacent areas, particularly following vegetation clearing and grubbing and prior to unfavourable weather events.	Construction	Effective	Minor and temporary impacts to local creeks.
Removal of threatened species habitat and habitat features	<p>Impacts to threatened species and their habitats are expected to be relatively low, with the majority of habitat values occurring in C3 lands, which are to be protected for the most part (experiencing minor disturbance and loss only). However, more significant impacts are to occur to Sloane's Froglet habitat and corridor connections. To help minimise impacts, the following measures are required:</p> <ul style="list-style-type: none"> • No subdivision construction works are to be undertaken during the Sloane's Froglet breeding season. • Monitoring should be undertaken to ensure supplementary Sloane's Froglet habitat is be used and effective. • If threatened species are observed on site near work areas, including Regent Honeyeater, Scarlet and Flame Robins, Squirrel Gliders, or other threatened species, works must halt until the species has moved on from the area. • All trees and shrubs being impacted must be inspected (pre-clearance checks) to be free of bird nests. If nests are found in shrubs and small trees, an ecologist must 	Detailed design	Effective	None anticipated

Impact	CEMP mitigation measures include, but not limited to:	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated
	attend the site to inspect the nests and take appropriate action, prior to their removal. Ecologists must be present for all tree removals. <ul style="list-style-type: none"> Workers must be familiar with the appearance of Pink-tailed Worm-lizard. If found or suspected to be present during excavations, work must immediately halt, and an ecologist must attend the site to confirm the species' presence, if possible. If confirmed, contact must be made with state and/or Commonwealth authorities to determine the required actions, and actions are to be implemented PRIOR to any work resuming. 			
	Habitat removal will be undertaken in accordance with best practice, such as Guide 4: Clearing of vegetation and removal of bush rock of the <i>Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects</i> .	During construction	Effective	None anticipated
	Habitat will be replaced or re-instated in accordance with best practice, such as Guide 5: Re-use of woody debris and bush rock and Guide 8: Nest boxes contained in the <i>Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects</i> (RTA 2011).	During construction	Proven	None anticipated
	The unexpected species find procedure is to be followed under <i>Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects</i> (RTA 2011) if threatened fauna, not assessed/identified in the biodiversity assessment, are identified in the project site. Relevant authorities must be alerted, who will provide further guidance on actions required.	During construction	Proven	None anticipated
Aquatic impacts	Nearby aquatic habitat will be protected in accordance with Guide 10: Aquatic habitats and riparian zones of the <i>Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects</i> (RTA 2011) and Section 3.3.2 Standard precautions and mitigation measures of the policy and guidelines for fish habitat conservation and management; Update 2013 (DPI (Fisheries NSW) 2013).	During construction	Effective	Potential minor and temporary impacts to local creeks but CEMP measures will help to reduce/avoid these.

Impact	CEMP mitigation measures include, but not limited to:	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated
	A site specific Erosion and Sediment Control Plan/s will be prepared and implemented as part of the CEMP. The Plan will include arrangements for managing wet weather events, including monitoring of potential high risk events (such as storms) and specific controls and follow-up measures to be applied in the event of wet weather.	Prior to and during construction	Effective	Minor and temporary impacts to local creeks.
	An emergency spill kit is to be kept on site at all times. All staff are to be made aware of the location of the spill kit and trained in its use. If an incident (e.g. spill) occurs, the emergency spill procedure is to be followed and the Project Manager notified as soon as practicable.	During construction	Effective	None anticipated
	All erosion and sediment control devices shall be properly maintained for the duration of the work. All structures are to be inspected after rain events and sediment to be removed when the capacity has been reduced by 50% or more.	During construction	Effective	None anticipated
	Any temporary stockpiles should be positioned as high in the landscape as possible (allowing maximal run-off control downstream to occur within the site) and stabilised using sediment fencing or similar, and to be situated in areas that do not contain native vegetation (unless that vegetation is not being retained).	During construction	Effective	None anticipated
	Do not discharge water or wastewater to stormwater, watercourses or drainage channels.	During construction	Effective	None anticipated
	All construction vehicles and equipment are to be maintained in designated areas away from vegetation and watercourses.	During construction	Effective	None anticipated
	All sloped disturbed areas would be restored post construction with erosion control measures (plantings or engineering solutions).	Post construction	Effective	None anticipated
	Refuelling of machinery to be undertaken in a dedicated area within the construction compound appropriately protected, as outlined in the spill management plan.	During construction	Effective	None anticipated

Impact	CEMP mitigation measures include, but not limited to:	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated
	Fuels, lubricants and chemicals, including drilling fluids, shall be stored and, where practicable, handled within containment facilities such as bunded areas designed to prevent the release of spilled substances to the environment and capable of storing 120% of the volume of material stored there.	During construction	Effective	None anticipated
	Bunded areas are to be at least 50 metres from any waterway or drainage line, but this distance is to be maximised as much as possible.	During construction	Effective	None anticipated
	All concrete washout water and solids are to be collected and retained in leak proof containers and disposed of in accordance with the Waste Classification Guideline 2014 (NSW EPA, 2014).	During construction	Effective	None anticipated
Groundwater dependent ecosystems	Interruptions to water flows associated with groundwater dependent ecosystems will be minimised through detailed design.	Detailed design	Effective	None anticipated
Changes to hydrology	Changes to existing surface water flows will be minimised through detailed design, ensuring stormwater flows are diverted via detention basins and overflows flow into suitable drainage systems, mimicking the natural drainage patterns across the site as much as possible. These will not include changes to current hydrology on site.	Detailed design	Effective	Moderate drainage flows occurring to main drainage lines running through R1 land. Downstream outflows are not expected to be significantly impacted.

Impact	CEMP mitigation measures include, but not limited to:	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated
Fragmentation of identified biodiversity links and habitat corridors	There are no expected connectivity issues being produced by the development in C3 land, which is being protected as a conservation reserve. Some connectivity impacts are occurring for Sloane's Froglet, and attempts are being made to provide alternative connectivity habitat via stormwater drainage and detention systems, and with the installation of the chain-of-ponds system along the southern boundary. Connectivity measures to address any unforeseen impacts will be implemented in accordance with the <i>Wildlife Connectivity Guidelines for Road Projects</i> (RMS in prep). A further safeguard is ensuring no subdivision construction works are to be undertaken during the Sloane's Froglet breeding season.	Detailed design, during construction and post construction	Effective	Moderate to significant impacts to Sloane's Froglet movement corridors. Efforts being made to offset these with new movement corridor.
	Any connectivity measures implemented will be designed and installed under the supervision of an experienced ecologist. Sloane's Froglet corridor (and stormwater detention basins) are being designed according to Sloane's Froglet habitat requirements, as per Spiire's 2017 'Sloane's Froglet Stormwater Wetland Design Guidelines'	Detailed design and during construction	Effective	As above
Edge effects on adjacent native vegetation and habitat	Exclusion zones will be set up at the limit of clearing (for no-go zones) in accordance with best practice, such as the Guide 2: Exclusion zones of the <i>Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects</i> (RTA 2011).	During construction	Effective	None anticipated
Entrapment, injury and mortality of fauna	Pre-clearance checks are required for all potential habitat areas, including any significant shrubs and all significant trees (greater than sapling size). An ecologist or wildlife handler must be present when trees are being removed. Injured fauna are to be cared for in a low stress environment, and WIRES are to be contacted to ensure suitable treatment is provided. Unforeseen fauna impacts will be managed in accordance with best practice, such as Guide 9: Fauna handling of the <i>Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects</i> (RTA 2011).	During construction	Effective	None anticipated

Impact	CEMP mitigation measures include, but not limited to:	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated
	Trenches and other deep excavations must be routinely checked (daily) for trapped fauna. Trapped fauna must be rescued and relocated to nearby habitat. Efforts must be made to minimise the time that trenches are open, to reduce fauna entrapment risks.	During construction	Effective	None anticipated
	If unforeseen tree clearing is required, approval from authorities must first be granted. Clearing must then be implemented in a two stage clearing process to allow fauna to disperse from habitat voluntarily; with inspections of hollows before and after each stage by experienced ecologist/fauna spotter/catcher prior to and after clearing of trees/limbs/suckers to safely remove and relocate any displaced fauna. Injured fauna must be cared for and then transitioned to the care of a WIRES handler.	During construction	Effective	None anticipated
Invasion and spread of weeds	Weed species will be managed in accordance with best practice, such as Guide 6: Weed management of the <i>Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects</i> (RTA 2011)	During construction	Effective	None anticipated
	Establishment of clearing limits and exclusion zones within/adjacent to the works sites and in the lay down areas.	During construction	Effective	None anticipated
	To prevent the spread of weed seed, all weed material or soils from a site infested with a high-risk weed species that is removed will be disposed of in a suitable waste facility and not mulched on site. This is to avoid the reintroduction and further spread of weeds in the area.	During construction	Effective	None anticipated
	Machinery will be washed following best practice hygiene protocols prior to being brought onto site, to prevent the spread of weed seed, pathogens and fungi spores. Hygiene protocols will be undertaken in accordance with the requirements of best practice, such as the <i>Roads and Maritime Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects</i> (RTA 2011).	During construction	Effective	None anticipated

Impact	CEMP mitigation measures include, but not limited to:	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated
Invasion and spread of pests	Pest species will be managed as required within the project site.	During construction	Effective	None anticipated
Invasion and spread of pathogens and disease	Pathogens will be managed in accordance with best practice, such as Guide 2: Exclusion zones of the <i>Biodiversity Guidelines: Protecting and Managing Biodiversity on RTA Projects</i> (RTA 2011).	During construction	Effective	None anticipated
	Machinery that has been working in creeks, dams or other frog habitat must be adequately decontaminated via pressure-washing and spraying with a suitable product, such as Phytoclean, to lower the risk of introducing Chytrid Fungus onto the development site.	During construction	Effective	None anticipated
Topography, geology and soils (protection)	A detailed Erosion and Sediment Control Plan (ESCP) will be prepared as part of the Construction Environmental Management Plan in accordance with the 'Blue Book' Managing Urban Stormwater: Soils and Construction Guidelines (Landcom, 2004).	Prior to and during construction	Effective	None anticipated
	Erosion and sediment control measures would be established prior to works and would be maintained and regularly inspected (particularly following rainfall events) to ensure their ongoing functionality until the works are complete and areas are stabilised.	Prior to and during construction	Effective	None anticipated
	The contractor will use dust suppression techniques as required to minimise dust during construction.	During construction	Effective	None anticipated
	Trucks must be covered during the transport of soil material to or from the site.	During construction	Effective	None anticipated
	Vehicles and machinery would be properly maintained and routinely inspected to minimise the risk of fuel/oil leaks.	During construction	Effective	None anticipated
	All fuels, chemicals and hazardous liquids would be stored, and re-fuelling of plant and equipment shall be undertaken in a suitably bunded/contained area away from drainage lines (at least 50 metres away, but ideally more).	During construction	Effective	None anticipated

Impact	CEMP mitigation measures include, but not limited to:	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated
	A spill kit will be kept on site and staff trained in its use.	During construction	Effective	None anticipated
	All concrete pouring and casting activities shall be undertaken in a suitably constructed (contained) area of the site and shall be supervised by competent staff at all times. Dedicated facilities for storage of waste concrete (in liquid, slurry or solid form) shall be maintained on site and wash out of concrete delivery vehicles at the site shall not be permitted.	During construction	Effective	None anticipated
	In the event any material is imported to the site, it shall be clean and free of contaminants.	During construction	Effective	None anticipated
	In the event of a pollution incident, works would cease in the immediate vicinity and the Contractor would immediately notify the Project Manager.	During construction	Effective	None anticipated
Noise and vibration	Works are to be undertaken during standard construction hours: <ul style="list-style-type: none"> ○ 7:00am to 6:00pm Monday to Friday; ○ 8:00am to 1:00pm Saturday; and ○ No night works. 	Detailed design and during construction	Effective	None anticipated
	Where this is not possible, additional mitigation and management may be required. See below:			
	> Toolbox and induction of personnel prior to shift to inform of mitigation measures.	Prior to and during construction	Effective	None anticipated
	> All plant should be shut down when not in use. Plant to be parked/started at farthest point from relevant assessment locations.	During construction	Effective	None anticipated
	> Minimisation of UHF radio use.	During construction	Effective	None anticipated
	> Avoidance of yelling.	During construction	Effective	None anticipated
	> Operating plant in a conservative manner (no over-revving).	During construction	Effective	None anticipated
	> Selection of the quietest suitable machinery available for each activity.	During construction	Effective	None anticipated

Impact	CEMP mitigation measures include, but not limited to:	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated
	> Avoidance of metallic impact noise.	During construction	Effective	None anticipated
	> All plant are to utilise the broadband reverse alarm in lieu of the traditional 'tonal' type reverse alarm.	During construction	Effective	None anticipated
	> Where practicable, ensure those noisy plant/machinery are not working simultaneously in close proximity to sensitive receivers/areas.	During construction	Effective	None anticipated
	> Where queuing is required, for example due to safety reasons, engines are to be switched off to reduce their overall noise impacts on receivers.	During construction	Effective	None anticipated
Air quality	All construction machinery would be maintained in good working order and turned off when not in use so as to minimise emissions.	During construction	Effective	None anticipated
	Minimising the area of exposed soils and (where possible) sequentially stabilising cleared areas to minimise dust becoming airborne.	During construction	Effective	None anticipated
	Effective management of stockpiles, including stabilisation, covering and watering as required. Must occur high in the development area, in areas with no vegetation (or no retained vegetation).	During construction	Effective	None anticipated
	Trucks transporting construction materials should be covered.	During construction	Effective	None anticipated
	Minimising vehicle movements over exposed areas or unsealed surfaces.	During construction	Effective	None anticipated
	Cessation of construction activities which may result in dust generation during high wind conditions.	During construction	Effective	None anticipated
Traffic and access	Parking of vehicles and storage of plant/equipment is to occur away from vegetated areas and only within the impact zone. Vehicles and plant/equipment are to be kept away from environmentally sensitive areas and outside the dripline of trees.	During construction	Effective	None anticipated
	All vehicles transporting spoil would be covered and filled to (but not beyond) maximum capacity to minimise vehicle movements.	During construction	Effective	None anticipated

Impact	CEMP mitigation measures include, but not limited to:	Timing and duration	Likely efficacy of mitigation	Residual impacts anticipated
	All sealed roads would be kept clean and free of dust and mud at all times. Where material is tracked onto sealed roads at any time, it would be removed immediately so that road pavements are kept safe and trafficable.	During construction	Effective	None anticipated
	All roads would be rehabilitated post construction to a standard equivalent to or better than the preconstruction condition (not including closed sections of Williams Road).	Post construction	Effective	None anticipated
Waste management	The CEMP would include a waste management strategy. This would include details of the type of waste material likely to be generated, and how it would be managed (including sorting, storage and disposal), materials to be recycled, as well as measures to reduce or avoid waste generation.	During construction	Effective	None anticipated
	All waste, including excess spoil to be recycled if practicable or alternatively taken to a licensed waste disposal facility.	During construction	Effective	None anticipated
	All material proposed to be removed from the work site, for recycling or disposal or otherwise, must be waste classified in accordance with the relevant regulatory requirements.	During construction	Effective	None anticipated
	Trucks transporting waste off site would be covered.	During construction	Effective	None anticipated
	Waste receptacles for recyclable and non-recyclable waste are to be provided at the construction site for personnel waste.	During construction	Effective	None anticipated
	Routinely inspect waste locations to ensure they are maintained, in good condition and continue to be effective.	During construction	Effective	None anticipated
	Waste material will not to be left on site once the works have been completed.	Post construction	Effective	None anticipated
	EPA is to be notified immediately of any pollution incidents or harm to the environment (as defined under Part 5.7 of the POEO Act).	During construction	Effective	None anticipated

8. Impact assessment

8.1 Direct impacts

8.1.1 Residual direct impacts

Impacts to native vegetation are anticipated through the direct clearing or deemed loss of 0.26 hectares of native patch vegetation within the Subject Land (**Figure 14**) and the loss or deemed loss of 59 trees across the site, 23 of which are being retained. The direct clearing and subsequent development of the Subject Land would represent a *long-term* impact, or permanent loss, of this native vegetation and habitat. The 0.26 hectare loss figure is entirely located on C3 land (and is subject to the BOS), given the absence of patch vegetation on R1 land, except for the patch of Blakely's Red-gum which is being protected. Tree impacts (losses) can be further broken down into 29 trees being lost (18 of which are being retained) on R1 land, which is exempt from the BOS due to its biocertification status, and 30 trees being lost (5 of which are being retained) on C3 land, for which the losses are subject to the BOS.

For the purpose of this BDAR, the entire 85 hectare Subject Land has been assessed, as has the land immediately adjacent to the Subject Land which may also be directly or indirectly impacted, to ensure all potential impacts from the development project are adequately considered, as well as consideration of potential impacts for the broader Assessment Area (1500 metre buffer from the Subject Land). Combined, there is 7.28 hectares of patch vegetation present, which equates to 9% of the Subject Land. (**Table 7** and **Figure 9**), the vast majority of which (approximately 7 hectares) is the proposed Williams Road reserve, and almost all of this area is being protected (will not be cleared or significantly impacted). There are 89 trees throughout the R1 land, with 29 of these being removed or deemed lost (60 are to be retained, including retention of 18 trees which are being considered lost due to TPZ impacts from potential future development). The vegetation losses for the R1 land amount to 29 trees (including the 18 deemed lost but being retained), and being bio-certified land under the Albury LEP, these impacts do not require offsetting.

There will only be minor impacts to the vegetation in the Williams Road reserve which will result from services connections and estate access works (roads and footpaths). These impacts to vegetation in C3 lands amount to 0.26 hectares of low quality native patch vegetation being lost or deemed lost, all of which will be offset via the BOS. Impacts will consist of losses to the understorey and groundcover in impact areas, with very little impacts to trees to be incurred. Within this figure, there are 30 trees being lost (of which 5 are being retained). Trees being lost are mostly small trees, although two large trees are being considered lost (but retained) due to TPZ encroachment of works areas. The majority of impact areas in C3 zone is dominated by exotic groundcover vegetation.

The vegetation being lost on the Subject Land is from three PCTs, those being PCT 266 (0.19 hectares of losses), PCT 277 (0.01 hectares), and PCT 278 (revegetation area) (0.06 hectares). The remaining areas of the Subject Land are either exotic vegetation dominated by annual grasses, herbs and some woody weeds, and areas of native vegetation that are not being impacted by the proposed development activities.

Table 28: 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	SAIL entity	Project phase/timing of impact (e.g. construction, operation, rehabilitation)	Extent (ha, number of individuals)
Removal of 0.19 ha of non-biodiversity certified native vegetation on C3 lands which makes up part of the White Box Yellow Box Blakely's Red-gum Grassy Woodland TEC	Critically Endangered Ecological Community	Not listed (does not meet EPBC criteria)	Yes	Construction phase (installation of services, access connections).	0.19 ha
Removal of 0.01 ha of biodiversity certified native vegetation on R1 lands which makes up part of the White Box Yellow Box Blakely's Red-gum Grassy Woodland TEC	Critically Endangered Ecological Community	Not listed (does not meet EPBC criteria)	Yes	Construction phase	0.01 ha
Removal of 0.06 ha of non-biodiversity certified native vegetation on C3 lands which does NOT make up part of the White Box Yellow Box Blakely's Red-gum Grassy Woodland TEC	-	-	No	Construction phase	0.06 ha
Removal (or deemed loss) of 21 large hollow-bearing trees on R1 lands	-	-	No	Construction phase	21 HB trees
Removal of 0.1 ha of Sloane's Froglet breeding habitat and 48.2 ha of migrational habitat (dam and creek buffers)	en	EN	Yes	Construction, operation, rehabilitation	0.1 ha & 48.2 ha
Removal of 0.25 ha of Squirrel Glider habitat	vu	-	No	Construction phase (installation of services, access connections).	0.25 ha
Removal of 0.25 ha of Regent Honeyeater habitat	ce	CE	Yes	Construction phase (installation of services, access connections).	0.25 ha
Removal of 0.25 ha of Flame Robin habitat	vu	-	No	Construction phase	0.25 ha
Removal of 0.25 ha of Scarlet Robin habitat	vu	-	No	Construction phase	0.25 ha
Removal of 0.1 ha of potential Southern Myotis feeding habitat (R1 land) and 0.25 ha roosting habitat	vu	-	No	Construction phase	0.1 ha & 0.25 ha

8.1.2 Change in vegetation integrity score

Table 29 outlines the PCT impacts within vegetation zoned being impacted by development, and detailed the vegetation integrity score before development, and after development, for each zone.

Table 1 Impacts to vegetation integrity

Vegetation zone	PCT ID	Management zone	Area (ha)	Before development				After development				Change
				Composition	Structure	Function	VI score	Composition	Structure	Function	VI score	Change in VI score
266_Remnant_Sth	266	NA	0.04	37.3	38.6	72.5	47.1	0	0	0	0	47.1
266_Remnant_Nth	266	NA	0.02	33.9	60.5	27.4	38.3	0	0	0	0	38.3
278_Revegetation	278	NA	0.06	16.2	1.8	3	4.5	0	0	0	0	4.5
266_Wetland	266	NA	0.01	43.6	63.2	17.2	36.2	0	0	0	0	36.2
266_Revegetation	266	NA	0.05	30.3	40.4	43.5	37.6	0	0	0	0	37.6
266_Remnant_MQ	266	NA	0.07	41.3	88.5	63.6	61.5	0	0	0	0	61.5
277_Trees_only	Does not apply to this area as it is covered by the biocertification that applies to the R1 zoned land (impacts to PCTs already offset).											

8.2 Indirect impacts

It is difficult to quantify indirect impacts associated with the project, but these may include impacts such as noise and/or erosion and sedimentation associated with the construction phase of the project, changed surface water drainage with the installation of stormwater drains and redirections into detention basins, and the potential for ongoing degradation issues such as weed incursions into bushland from garden escapes or dumping of garden waste, and predation from mismanaged domestic cats and unrestrained dogs. The Subject Land is within a defined future residential area and is adjacent to existing residential infrastructure (Spring Park Estate). With the closure of Williams Road to vehicle traffic and the designation of the road as a conservation reserve, the development is considered unlikely to have significant negative impacts on adjacent areas of native vegetation and fauna habitat if all construction mitigation measures (pre, during and post construction) are implemented, fencing is installed to separate recreational users from high value bushland areas, and educational signage is provided, to educate reserve users to the expected behaviours for users and the values present that are being protected in the reserve.

Given the already heavily modified nature of the Subject Land and broader locality, and its proximity to urban areas, the project is considered unlikely to reduce the viability of any adjacent native vegetation or habitat due to edge effects, noise or dust, or cause significant disturbance to breeding habitats. There is likely to be contribution of moderate to significant changes in the light environment, with the addition of streetlights throughout the estate, and light spill of residential buildings and exterior lights. There is a potential for some impact to nocturnal species and invertebrate species from resultant light pollution, which may impact on the suitability for or preference of certain species to continue utilising the area for their nocturnal activities. It is therefore recommended that short to medium term monitoring of Squirrel Glider (and other nocturnal species) be conducted along Williams Road, to ascertain any drops in utilisation of these areas by nocturnal species.

Changes to the drainage and hydrology of the Subject Land will have some impact on species currently using these areas, especially Sloane's Froglet. However, the provision of new detention basins and connectivity features, all of which are being designed with Sloane's Froglet construction principles in mind, plus the construction of new water storages (to Sloane's Froglet habitat standards), mean the long-term impacts from the initial loss of some dams and drainage lines may be minimal. Ensuring no subdivision construction works are to be undertaken during the Sloane's Froglet breeding season will also reduce impacts to this species. The addition of detention basins and diverted stormwater drainage may have an impact on water flows across the Subject Land, and upon downstream habitats. It is possible that fewer (less regular) outflows will be received by the Seven Mile and Eight Mile Creeks, except during large rainfall events, when detention basins spill. Measures to mitigate and manage indirect impacts are discussed in **Section 8.4**.

Table 30: Summary of residual indirect impacts

Indirect impact (Describe impact, e.g. transport of weeds and pathogens from the site to adjacent vegetation)	Impacted entities (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	Extent (ha or zone reference)	Frequency	Duration	Project phase/ timing of impact (e.g. construction, operation, rehabilitation)	Likelihood and consequences
Changes to hydrology in Eight Mile Creek (increased high flows)	Eight Mile Creek	Downstream of main stormwater outflow structure	Flood events	Long term	Post construction	Localised increase in high-intensity creek flows in significant rainfall events that exceed stormwater basin capacities.
Changes to hydrology in Seven Mile and Eight Mile Creek (reduced overland inflows)	Seven and Eight Mile Creeks	Downstream of Subject Land	Dry periods, drought	Long term	Post construction	Localised decrease in overland flows (drainage) into nearby creeks (captured by stormwater systems). Stormwater outflows will not spill into creeks except after significant rainfall. Average creek flows likely to be reduced downstream of Subject Land.
Contribution of new weeds from garden escapes and dumping	May threaten the areas of BC Act TEC, but unlikely to impact threatened species.	Williams Road interface with private properties	Occasional	Long term	Post construction	Graden waste dumping over residential fences is common. Reserve management to monitor for instances of dumping and residents to be educated. Multiple offences to be pursued via local laws.
Light spill (pollution) from street lights and residential lighting	May impact on the nocturnal species, including Squirrel Glider, and some invertebrate species.	Williams Road interface with roads, private properties	Nightly	Long term	Nightly - Post construction	Light pollution may discourage some species such as Squirrel Glider from utilising Williams Road as a corridor. Recommend monitoring take place. If numbers decline, controls on light pollution may be required.

Indirect impact (Describe impact, e.g. transport of weeds and pathogens from the site to adjacent vegetation)	Impacted entities (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	Extent (ha or zone reference)	Frequency	Duration	Project phase/ timing of impact (e.g. construction, operation, rehabilitation)	Likelihood and consequences
Increased noise and vibration disturbances from increased human activity and addition of local traffic	General impacts likely for fauna, may have impact on threatened species including Squirrel Glider and birds.	Williams Road interface with roads, private properties	Daily	Long term	Construction, operation.	Most of the interface is buffered from roads, but some disturbances may still occur in habitat areas along Williams Road. May impact more sensitive species, which may no longer find the habitat suitable.
Predation risks from domestic animals (off-leash dogs and roaming domestic cats)	Potential impacts for fauna, including threatened birds and Squirrel Glider.	Williams Road, and other adjoining bush areas	Daily	Long term	Post construction.	Significant potential consequences for fauna and some threatened species. Cat curfews are recommended as a local law for estate. Signage required for keeping dogs on-leash. Non-compliance should be monitored, and local laws utilised where issues are detected.
Recreational (i.e. illegal MTB tracks) and other human behaviour impacts	May impact the values in the TEC, and may disturb some species of fauna.	Williams Road, and other adjoining bush areas	Daily	Long term	Post construction.	May contribute to spread of weeds, erosion and general degradation of bush areas. Illegal MTB track construction a significant issue in regional parklands. Signage, education and regular monitoring required.

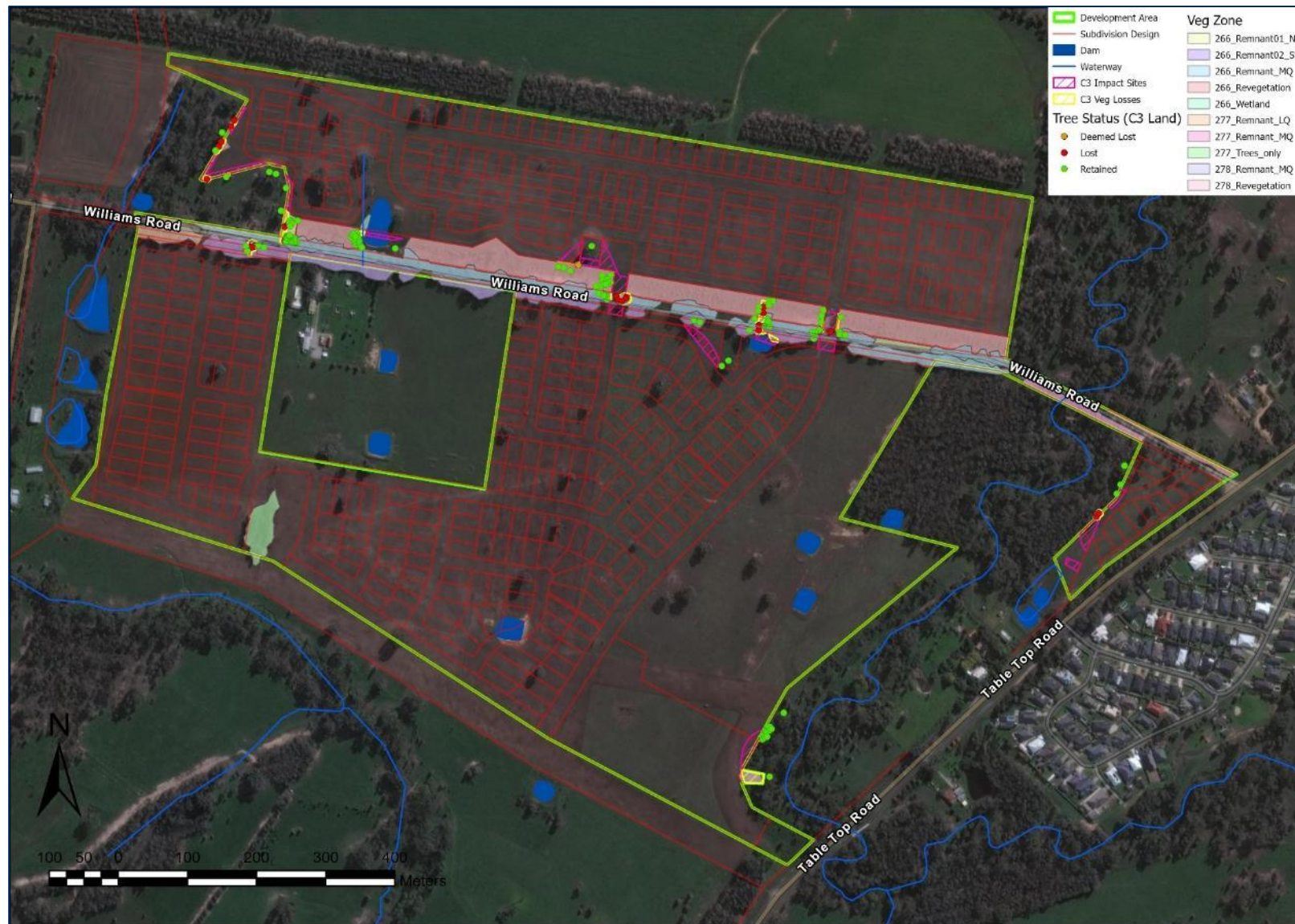


Figure 14: Development impact areas, trees status and lost vegetation within C3 zoned areas of the Subject Land. Scale 1:6,500

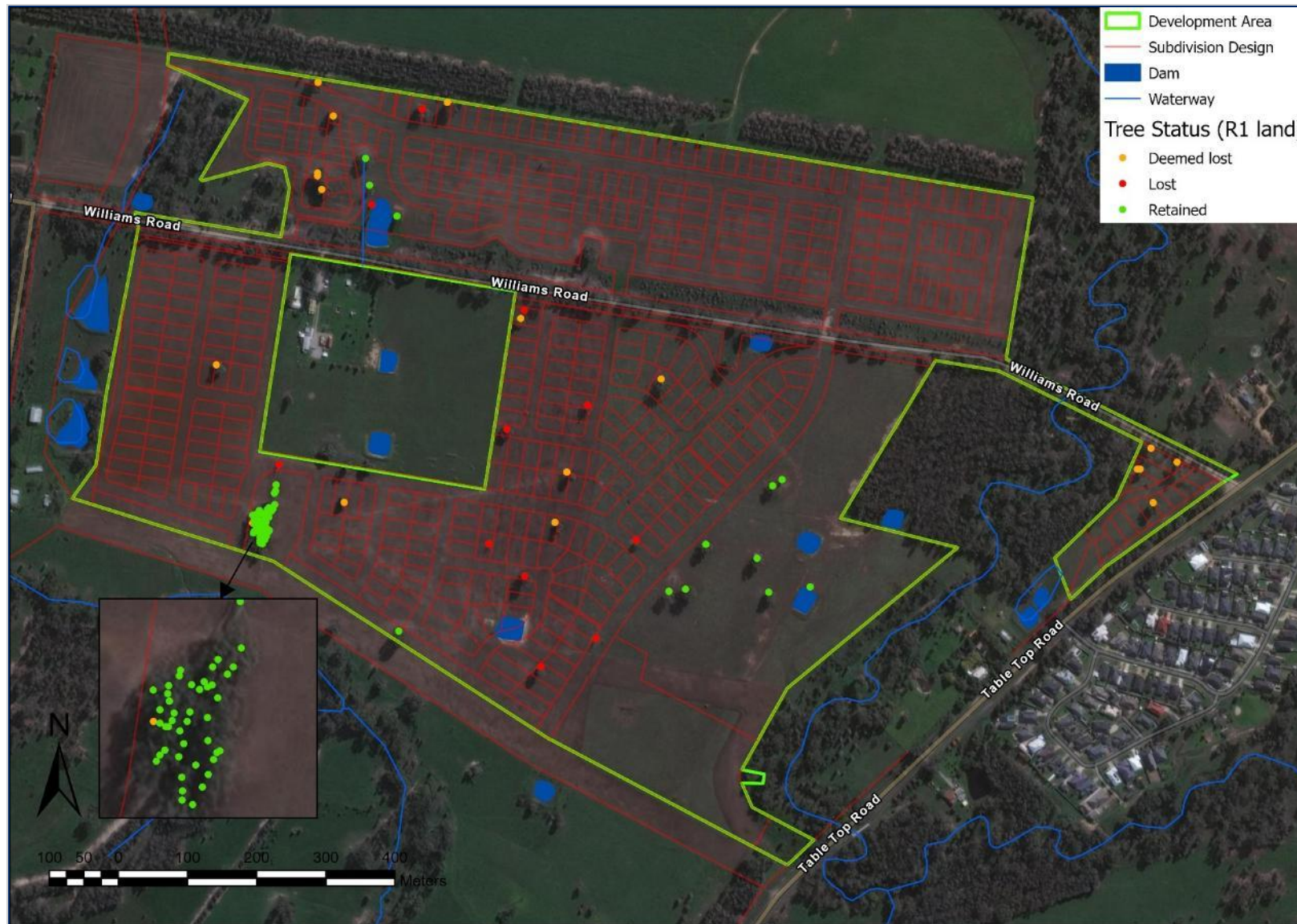


Figure 15: Development impact areas (lost and deemed lost trees) within R1 zoned areas of the Subject Land. Scale 1:6,500

8.3 Prescribed impacts

Section 6 identified the potential prescribed biodiversity impacts that are likely to have an effect on threatened species which may be using the site (refer to **Table 26**):

- **Farm dams:** There are five (5) small farm dams within the Subject Land, all of which are disturbed and heavily impacted by historic livestock grazing.
- **Vehicle strikes:** There are numerous new roads being constructed in the development area for access into and through the housing estate, which will have a small risk of vehicle strike to Sloane's Froglet and a low risk for threatened bird species.
- **Non-native vegetation:** Exotic vegetation dominates the R1 zoned land areas, and is also present and dominant on the ground layer in the majority of areas within C3 zoned land. Sloane's Froglet were recorded using exotic vegetation for movement corridors through the R1 paddock areas. Exotic areas in the C3 zoned lands are providing minimal important habitat for threatened species.
- **Habitat connectivity:** There is habitat connectivity for Sloane's Froglet through drainage lines and buffer areas within the R1 land in the Subject Land, some of which is being impacted (lost) as a result of development. There is also habitat connectivity via vegetation corridors along Williams Road, however, these connectivity values are not being impacted negatively by development.
- **Waterbodies, water quality and hydrological processes:** Site run-off drains into Seven Mile Creek and Eight Mile Creek. Drainage is being altered to varying extents across the development, with stormwater being captured (house rooves and street drains) and flows being diverted into swales, pipes and into new detention basins. Small inflows into nearby creeks are likely to be reduced in frequency and volume (due to detention basin capture and storage). However, high flow rain event outflows into surrounding creeks are not likely to be altered significantly. Some impacts to dams and drainage from development (addressed separately above) are expected. CEMP is to include measures to protect water quality.

The above prescribed impacts are dealt with in more detail in the following section below.

8.3.1 Farm dams

Nature

There are five (5) dams on the Subject Land, one (1) of which is being lost to development, one (1) is being partially impacted (re-shaped) but maintained as a detention basin, and one (1) is receiving minor impacts from stormwater development works in its vicinity. The remaining two (2) dams are within the education precinct, and are not being impacted as part of the current development.

Extent

One (1) dam is being lost to development, and the other (1 dam) being impacted will be maintained at a similar volume and surface area as the existing dam, albeit located a little further north than the current dam. However, that re-shaped dam, which is effectively being moved a small distance north, will be designed to Sloane's Froglet standards, will be revegetated with appropriate native species and along with the removal of livestock, will provide considerably better habitat values after the

development. The dam being lost is void of native emergent or fringing semi aquatic vegetation, is approximately 0.1 hectares when full, yet is relatively isolated in a cleared paddock and provides only low quality habitat for most waterbirds and other fauna. Sloane's Froglet were detected in this dam, and thus it does constitute potential breeding habitat for this species.

Duration

The duration of impacts for the partially impacted (re-shaped) dam will be several weeks, while the dam wall is reconstructed a small distance north of where the southern limits of the current dam are located. However, as discussed, the impacts will be short-term, and after rehabilitation with native species and the removal of cattle, the dam will be of higher habitat quality that it presently is. The other dam receiving stormwater will undergo minimal negative impacts, and the removal of cattle will improve the dam's habitat value once it is regenerated. The removal of the other lone dam is permanent, and will receive fill to allow the construction of roads and house lots in its vicinity.

Consequences

Some temporary impacts are expected for the large dam that is being re-shaped, which will include impact to Sloane's Froglet habitat. No subdivision construction works are to be undertaken during the Sloane's Froglet breeding season. It is also recommended that during works, efforts are made to relocate any frogs from the construction area into another nearby dam, and that construction of the new dam wall takes place in a period of low flows and minimal dam height (or after the dam is pumped out in coordination with fauna surveys are relocation efforts). There are expected to be minimal consequences for the small dam that is receiving stormwater works in its vicinity, and it is likely to improve in habitat value after construction is completed. The loss of the lone dam in the paddock is removing 0.1 hectares of potential Sloane's Froglet breeding habitat.

8.3.2 Vehicle strikes

Nature

There are numerous new residential area (50kph) roads being constructed in the development area for access into and through the housing estate, which will have a small risk of vehicle strike to Sloane's Froglet and a relatively low risk for threatened bird species and other fauna, given the low speeds that vehicles are expected to travel on these roads. There may also be vehicle strike risks associated with construction traffic movements along Williams Road. However, the CEMP will state requirements of low speed restrictions along the road to help minimise these risks to local fauna.

Extent

The risk of vehicle strikes extends along the length of Williams Road and along all temporary construction roads, and then formed estate roads after the development is completed. There are also risks associated with the Thurgoona Link access road. These risks are being addressed through a separate approvals process and BDAR.

Duration

The extent of impacts along Williams Road will remain until construction is completed and the road is closed off to traffic with bollards to be installed at either end. However, if the Thurgoona Link road is completed prior to construction starting on the housing estate, then all traffic is to be channelled through that entry point, and not through Williams Road, which will reduce vehicle strike risks during construction to just the main crossing point of Williams Road. These impacts will end after construction is completed (or earlier if Williams Road access for vehicles is not required). The duration of vehicle strike risks on roads within the new estate are ongoing.

However, the low speed limits mean impacts risks are relatively low for the majority of species. Small risks of vehicle strikes for Sloane's Froglet are ongoing, but actions are to be implemented (such as sloped gutters and barriers between waterbodies and adjacent roads) to reduce the potential risks of these impacts for the species.

Consequences

There are minor potential consequences for threatened fauna from vehicle strikes, due to the low speed nature of construction vehicles and equipment (as enforced via actions in the CEMP). Furthermore, the fauna impacts for the ongoing use of internal housing estate roads will be relatively low for the majority of fauna, as the roads are a maximum of 50kph, but the design of the estate means these speeds would only be reached in some areas on some occasions, with average vehicle speeds expected to be much lower. However, there are some higher risks involved with frog species that move through the environment after rains and during migration movements, including the threatened Sloane's Froglet. The provision of controls in the CEMP, adequate designs for curbing to ensure frogs are not trapped on a road surface, barriers between waterbodies and nearby roads, and the provision of the chain-of-ponds corridor will help lower risks of vehicle impacts to Sloane's Froglet. Indicative locations for Sloane's Froglet vehicle strikes are based on current drainage lines, and proposed retention basin locations, and areas where frog movement is likely in the vicinity of proposed roads (see **Figure 16** for potential impact strikes locations). Barriers in these areas are likely to reduce the risks of vehicle strikes for Sloane's Froglet.

8.3.3 Habitat connectivity

Nature

There is habitat connectivity for Sloane's Froglet through drainage lines and buffer areas within the Subject Land, some of which is being impacted (lost) as a result of development (majority of Sloane's Froglet connectivity losses are occurring in R1 land). There is also habitat connectivity via remnant vegetation corridors along Williams Road. However, these remnant connectivity values in the C3 areas are not being impacted negatively by development.

Extent

The majority of traversable habitat through the housing estate footprint is being lost to development, with provisions being made for movement (of Sloane's Froglet) down the existing drainage line and through the dams that run along the western side of the development, and the provision of a new chain-of-ponds linkage that travels along the southern boundary of the development. There are no significant changes being made to the remnant connectivity values along Williams Road, with only a few small trees being impacted, which do not currently contribute to connectivity values in that area.

Duration

Construction behaviours in the Williams Road corridor may temporarily disrupt mobile fauna in the vicinity. However, there is to be no construction permitted outside of daylight hours, therefore movement of Squirrel Gliders through the extent of Williams Road vegetation is not expected to be disrupted. There may be a permanent barrier created for less mobile fauna via the construction of the main access road through Williams Road reserve, as well as a small increase in vehicle strike risk on this road for non-flying fauna. The impacts to the current movement corridors for Sloane's Froglet through the R1 land will be permanent, with much of the infrastructure (houses, fences etc) being impenetrable to the movements of the species after construction is completed.

Consequences

There will be significant impacts to Sloane's Froglet movement through their traditional avenues of migration, along the drainage lines that link the dams through the centre of the Subject Land, and through the Thurgoona Training Academy land. To try to minimise connectivity impacts, drainage lines down the western boundary, and the provision of a new chain-of-ponds style connectivity corridor along the southern boundary, designed to Sloane's Froglet habitat standards, will help provide alternative movement opportunities for the species after construction is completed. Despite this, it must be noted that the uptake of the new corridor by Sloane's Froglet is not guaranteed. Therefore, the extent of ongoing impacts to the movement of the species is somewhat unknown. However, with designs to Sloane's Froglet standards and the creation of a natural style drainage swale, it is presumed that Sloane's Froglets will use this feature to complete their migration movements. Impacts are to be further minimised by ensuring no subdivision construction works are to be undertaken during the Sloane's Froglet breeding season.

There are no likely impacts for the movement of Squirrel Gliders through the extent of Williams Road vegetation, with gaps in canopy not being extended in any works areas. There may be a permanent barrier created for less mobile fauna via the construction of the main access road through Williams Road reserve, as well as a small increase in vehicle strike risk on this road for non-flying fauna that are moving east-west along the Williams Road connectivity corridor. It is recommended that road furniture be constructed at the crossing point on both approaches, to reduce vehicle speed to help limit vehicle strike risks, and to also reduce risks to pedestrians utilising the recreational path along Williams Road.

8.3.4 Waterbodies, water quality and hydrological processes

Nature

Dams have already been discussed, and are not further mentioned in this section. There are two significant (named) creeks within the vicinity of the development: Seven Mile Creek to the south (not being directly impacted); and Eight Mile Creek in the eastern section, which travels through part of the Subject Land, but is experiencing little direct impacts, limited only to the outfall (rock armoured channel) from the proposed stormwater detention basin which will flow into the creek. There are potential water quality impacts associated with the development, which would be typical of subdivision developments that involve broadscale earthworks and installation of new drainage systems (stormwater systems). The CEMP is to include strict controls to reduce potential impacts from erosion, sedimentation and pollution.

As far as broader hydrological processes, efforts have been made in the design process to maintain as much drainage flow through the existing overland drainage systems of the site, with the only major exception being the capture and diversion (stormwater) of flows through the area immediately south-east of the Thurgoona Training Academy, where development of roads and houses is completely covering the previous surface drainage area in this vicinity. With the maintenance of the majority of drainage patterns through and around the Subject Land, there are no significant impacts to groundwater or groundwater dependent ecosystems likely to result of the development.

Extent

There are very minor impacts happening at a narrow location on Eight Mile Creek, where the stormwater detention basin outflow structure will be constructed. Water quality impacts will be low, with strict controls in place in the CEMP, including regular monitoring of water quality and erosion control devices to ensure controls are working effectively. A small extent of existing drainage line through the central southern part of the development is being lost to development, which will impact Sloane's Froglet movement (discussed in other sections).

Duration

The loss of the southern central drainage line will be permanent. The impacts to the Eight Mile Creek area from the stormwater outflow will be temporary, limited to the excavation and installation of rock armouring, and some minor rehabilitation with native vegetation plantings. This is expected to be several weeks in duration. Water quality will be impacted (but managed) for the entire extent of construction, however with the staged delivery of construction, and with the strict CEMP controls, impacts are expected to be minimal and short term. With the removal of livestock and cropping and the addition of well vegetated detention basins and use of existing drainage lines, the medium to long-term hydrology of the site is not expected to be significantly impacted in the medium to long term.

Consequences

As far as threatened species impacts, there are no impacts expected to occur from the minor linear works near the banks of Eight Mile Creek, with works ending up on the western creek bank and not impacting the soils or vegetation of the creek bed area or the remnant vegetation located on the east of the creek. With CEMP controls, staged construction, and utilisation of existing drainage lines where possible, threatened species are not expected to be impacted by water quality issues. The loss of the southern central drainage line through the Subject Land will remove habitat that is currently being used by Sloane's Froglet to move through the landscape, from Eight Mile Creek, through the dams and drainage lines in the R1 land, up to the dams on Thurgoona Training Academy land, and beyond to the north. To minimise impacts in these areas during the development, no subdivision construction works are to be undertaken during the Sloane's Froglet breeding season.

8.3.5 Vehicle strikes predicted impacts

Table 31 below documents residual predicted impacts of vehicle strike on: 1) threatened fauna, and 2) protected fauna that are part of a TEC, identified in **Section 0**.

Table 31: Residual prescribed impacts – vehicle strikes

Threatened fauna or protected fauna that are part of a TEC that are at risk of vehicle strike (identified in Section 0)	SAIL entity	Likelihood	Estimated vehicle strike rates	Consequences
Sloane's Froglet – <i>Crinia sloanei</i>	Yes	Moderate	Occasional	Sloane's Froglet have the potential to be struck by vehicles during their migrational movements. Curbing of roads is being designed as to not trap frogs on the road surface. There is potential for occasional frog deaths (See Figure 16).
Squirrel Glider - <i>Petaurus norfolcensis</i>	No	Low	Rare	Squirrel Gliders unlikely to enter into the developed areas, therefore risks are low.
Regent Honeyeater – <i>Anthochaera phrygia</i>	Yes	Low	Rare	Regent Honeyeaters may enter into the developed areas in search of food (flowering trees and shrubs), however slow vehicle movements through the estate means risks are low.
Southern Myotis – <i>Myotis macropus</i>	No	Low	Very rare	Southern Myotis is unlikely to be frequently flying through the estate due to the absence of their preferred feeding habitat, but may frequent the stormwater basins. The risks of vehicle strikes in these areas, at the times this species feeds, and with its sensory systems, are highly unlikely.
Scarlet Robin – <i>Petroica boodang</i>	No	Low	Rare	Scarlet Robin may enter into the developed areas in search of food or water, however slow vehicle movements through the estate means risks are low.
Flame Robin – <i>Petroica phoenica</i>	No	Low	Rare	Flame Robin – as above.
Protected fauna associated with the TEC (White Box Yellow Box Blakey's Red-gum Grassy Woodlands).	Yes	Low	Rare	The areas of the TEC are being protected from development impacts. The roads in proximity to the Williams Road reserve are very short, meaning vehicle movements will be slow in these areas. Although unable to be ruled out entirely, vehicle strikes of fauna utilising the TEC habitat will be highly unlikely. Less mobile fauna may have slightly increased risk of vehicle strike where the main access road crosses Williams Road. Road furniture is recommended at the approaches to this crossing, to slow traffic and reduce the risks for faunal movements (and pedestrians).



Figure 16: Potential vehicle strike areas for Sloane's Froglet within the Subject Land. Scale 1:6,500

8.4 Mitigating residual impacts – management measures and implementation

To minimise the impact of the development on the identified threatened fauna, the footprint of the site will be clearly marked to prevent impacting any further vegetation outside of that which has been allowed and factored into offsets. Several measures will be implemented to reduce impacts where possible, such as appropriate pre-clearance protocols, habitat augmentation via revegetation with local indigenous and site-appropriate species, and numerous protective actions are to be enacted via a detailed project CEMP. Further specific details of mitigation measures are provided below.

8.4.1 Pre-clearance controls

Several non-threatened fauna species such as birds, arboreal mammals and amphibians are known to be, or likely to be, present at the development site. Appropriate pre-clearance protocols will be put in place at the time of construction to avoid and mitigate any potential harm or injury to these individuals. These protocols will include, as a minimum, pre-clearance surveys and staged (soft-felling) techniques, as well as clearing supervision by an ecologist or qualified wildlife handler, where any significant (groups of larger than sapling trees, or individual trees of 30cm dbh or more) trees are being removed. These measures are to be included as a component of the CEMP.

8.4.2 Habitat augmentation and monitoring – pre-clearance protocols

Larger trees (greater than 30cm dbh with no hollows) and trees with hollows will be felled in accordance with the following procedures:

- Prior to felling of the identified trees, the trees will be shaken and/or nudged several times by tree felling equipment with suitable pauses and checks in between, to encourage any fauna to vacate the trees;
- If no animals emerge from the hollows after shaking or nudging, then the tree will be felled and lowered to the ground if possible (all attempts made to avoid hard fall);
- If an animal emerges from a hollow following shaking or nudging of the tree, then at least 30 minutes will be allowed for the animal to leave the tree. If the animal comes to the ground, or when it is on the lower trunk, attempts will be made to capture the animal using a net. Captured animals will be immediately transferred to a suitably sized cotton/hessian bag and checked for obvious injury during the transfer process to alternative habitat nearby;
- Captured animals will be placed in individual bags unless they are a family group to which separation would risk the survival of the young (i.e. lactating female with young);
- Once the tree has been felled, a search will be made of the branches around the tree for any fleeing fauna and hollows should be inspected with a torch for the presence of any animals. Attempts will be made to capture any fleeing fauna with a net, and animals inside hollows should be carefully extracted by gloved hand. Captured animals will be immediately transferred to a suitably sized cotton/hessian bag and checked for obvious injury during the transfer process;
- Injured, shocked or immature captured animals will be placed in a bag secured at the top. Bags will be wrapped in appropriate insulating material such as blankets and placed in a quiet, warm and preferably dark place until the wildlife carer (WIRES) can collect them. Details on the location of the capture and proposed release areas will be provided to the wildlife carer; and
- Uninjured animals will be released in appropriate retained habitat as soon as practicable, as close as possible to the felled tree (and done so at night for nocturnal species).

8.4.3 Construction Environmental Management Plan (CEMP)

To avoid potential indirect offsite impact during construction, an appropriate ESCP will be in place following best practice protocols such as 'Managing Urban Stormwater: Soils and Construction' (Landcom 2004). It is recommended that this is included in a site CEMP, with actions to be instigated prior to any construction works taking place. The CEMP will be required to span the pre-construction, construction and post-construction periods, and will include the above pre-clearance and fauna management protocols.

8.4.4. Land stability

There is likely to be mobilisation of some soil given the nature of the proposal (construction). Mitigation measures are to extend (but not be limited to) the following:

- An ESCP developed and progressively implemented (or be built into the CEMP).
- Vehicle movements around the site will be restricted to clear areas and away from any existing trees, and flagging, barriers or exclusion fencing is to be installed to protect retained areas and other no-go zones.
- When rain is predicted, an assessment will be made prior to works beginning. If heavy rain is predicted, work will not commence.
- No stockpiles will be established on or under retained native vegetation in any area on site or within the vicinity of the Subject Land.
- Maintenance and checking of the ESCP (or CEMP) erosion and sedimentation controls will need to be undertaken on a regular basis. Sediment will be cleared from behind barriers on a regular basis and all controls will be managed in order to keep controls working effectively at all times.
- Drainage outflows must be monitored for turbidity and sediment accumulation on a regular basis and especially after every significant rainfall event, to ensure that the control measures being put in place are effectively restricting the sedimentation of drainage lines and nearby waterways.

Rehabilitation of any disturbed areas should be completed as soon as possible after completion of works, where practical to do so. All sloped areas (including topsoil or fill stockpiles) must be revegetated or treated with erosion control measures as soon as possible after excavation is completed.

8.4.5 Noxious weeds

The movement of vehicles, plant, equipment and people on and off the subject site has the potential to introduce noxious weeds to the area. The area is also impacted by numerous exotic weed species, such as African Lovegrass. Wherever possible, removal of weeds should be undertaken prior to seed developing, which for most species occurs during the warmer months (i.e. late spring and summer). Additionally, the following strategies are to apply to weed management within the site:

- All vehicles and machinery must be thoroughly decontaminated by pressure washer (and air blowers, where required) prior to entering the work site.
- Minimal impact techniques are to be used (i.e. no boom spraying), ensuring no native species are damaged during weed control activities.
- Soil disturbance by vehicles is to be prevented in retained areas, and pedestrian access is to be kept to a minimum outside the construction footprint.

- Herbicide application is to be administered by authorised personnel only (e.g. ChemCert Accreditation – AQF 3), and in accordance with the directions on the container (application rates, MSDS requirements) and any applicable WorkSafe NSW requirements.
- Any weeds removed (particularly those bearing seeds) from vehicles or the Subject Land are to be disposed of appropriately at the nearest waste management facility.
- If required, only topsoil from areas with no noxious or highly invasive weed species should be re-used in rehabilitation (it is generally assumed that if there is no evidence of noxious or invasive weeds in an area, the topsoil in this area is not contaminated with the seeds of such weeds).

Table 32: Summary of proposed mitigation and management measures for residual impacts (direct, indirect and prescribed)

Type of potential impact	Impact mitigation method/management technique	Responsibility	Likely efficacy (including risk of failure)	MNES (when relevant)
Removal of native vegetation, and impacts to flora and fauna habitat	<p>To be address via specific controls in the CEMP, including:</p> <ul style="list-style-type: none"> No subdivision construction works are to be undertaken during the Sloane's Froglet breeding season. Only trees deemed lost to be removed. Restrict lopping to <30% of canopy of retained trees. Retain as many trees as possible, even if deemed to be lost for offsetting purposes. All retained area to be protected (fenced) from works or vehicle encroachment. Clearly mark trees/vegetation being removed. Retain felled trees on site in suitable retained habitat areas. Consider offering large hollow trees to Fisheries NSW, if not deemed suitable to be retained on site. Protect trees near works areas according to TPZ area protection rules, as per AS4970-2009. Undertake pre-clearance inspections and spotting activities for all trees being cleared (greater than sapling size). Works to take place when soils are relatively dry. Avoid works during Sloane's Froglet breeding and migration times (winter and early spring). Conduct preclearance inspections in farm dam where works are taking place, with frogs (and other aquatic fauna) to be translocated to nearby dams. Works to be conducted in low flow periods. Proposed chain-of-ponds and stormwater basins to be designed to Sloane's Froglet habitat standards. 	Project Manager, CEMP compliance officer.	Measures are likely to be effective. Failures of any processes are expected to be picked up via ongoing monitoring of actions and outcomes.	Sloane's Froglet is a MNES which may be impacted.

Type of potential impact	Impact mitigation method/management technique	Responsibility	Likely efficacy (including risk of failure)	MNES (when relevant)
	<ul style="list-style-type: none"> Monitoring in winter and early spring to determine if new basins and chain-of-ponds connectivity features are being effectively utilised by Sloanes Froglet. If any threatened species are suspected or confirmed to be in works areas, works must stop and the ecologist or approval authority must be notified. No works until fauna moves from area, or upon direction from authority. No impacts are to occur beyond the trees and areas designated as lost in this report. Impacts to retained areas must not occur without prior approval from approval authorities. Stormwater basins and chain-of-ponds areas to be rehabilitated with Sloane's Froglet friendly local indigenous plantings. Curbs in estate to be designed to facilitate easy movement of Sloane's Froglet (prevent them being trapped on roads). Appropriate offsets in accordance with the BOS requirements are to be legally secured prior to any works taking place in the construction areas. Landscape plantings in the housing estate to be indigenous species that provide shade and pleasing aesthetics, but also provide potential food sources for threatened species (nectar producing). Fencing to be installed along Williams Road to restrict pedestrian access into retained areas. Signage to be installed to educate reserve users of the values of the reserve, and the reasons for restrictions of certain activities such as dogs off-lead and mountain-bike riding. 			

Type of potential impact	Impact mitigation method/management technique	Responsibility	Likely efficacy (including risk of failure)	MNES (when relevant)
Impacts to Sloanes Froglet habitat (a SAIL entity)	<ul style="list-style-type: none"> Furthermore, no subdivision construction works are to be undertaken during the Sloane's Froglet breeding season. All machinery that has previously been working in aquatic habitats (dams, creeks etc) must be high pressure washed, AND decontaminated with an appropriate anti-fungal treatment that can deal with Chytrid Fungus. Drainage areas to be searched prior to high impact works taking place. Pre-clearance inspections to occur in dams that are undergoing works, with specimens to be relocated to nearby retained dams Works in Sloane's Froglet habitat and mapped movement corridors not to take place during their breeding and migrational movement season (winter and early spring). Proposed chain-of-ponds and stormwater basins to be designed to Sloane's Froglet habitat standards. Monitoring in winter and early spring to determine if new basins and chain-of-ponds connectivity features are being effectively utilised by Sloanes Froglet. Stormwater basins and chain-of-ponds areas to be rehabilitated with Sloane's Froglet friendly local indigenous plantings. Curbs in estate to be designed to facilitate easy movement of Sloane's Froglet (prevent them being trapped on roads) Appropriate offsets in accordance with the BOS requirements are to be legally secured prior to any works taking place in the construction areas. 	Project Manager, CEMP compliance officer.	Measures are likely to be effective. Failures of any processes are expected to be picked up via ongoing monitoring of actions and outcomes. If Sloane's are not using basins or corridor, remedial works must be undertaken with advice from experts.	Sloane's Froglet is a MNES which may be impacted.
Impacts to Regent Honeyeater habitat (a SAIL entity)	See 'Removal of native vegetation, and impacts to flora and fauna habitat' above, and 'Impact to TECs and fauna within these areas (which is a potential SAIL)' below.	Project Manager, CEMP compliance officer, Ecologist.	Measures are likely to be effective. Failures of any processes are expected to be picked	Regent Honeyeater is a MNES which may be impacted.

Type of potential impact	Impact mitigation method/management technique	Responsibility	Likely efficacy (including risk of failure)	MNES (when relevant)
	<ul style="list-style-type: none"> Street trees are to be locally indigenous species which are preferred feed trees for Regent Honeyeater, where possible. Suspected sightings of Regent Honeyeater must be reported to the Project Manager, and confirmation sought by an ecologist. If confirmed, work must stop until the birds leave the area. 		up via ongoing monitoring of actions and outcomes.	
Impact to TECs and fauna within these TEC areas (which is a potential SAI)	<ul style="list-style-type: none"> Ensure strict adherence to no-go zones when construction is taking place in or near TEC areas (Williams Road and trees only patch in R1 land). Works to take place when soils are relatively dry, to minimise compaction and potential impacts to nearby tree TPZs. Machinery to enter TEC areas only after being decontaminated of weeds (wash-down). No works to occur outside of normal hours of work, and strictly no addition of light sources for early or late work. No obstacles to be left on site after hours that may cause strike issues or entanglement for Squirrel Gliders that are moving through the area. Any excavations and open trenches to be left open for as little time as possible. All open trenches to be inspected regularly (morning and night) to ensure fauna are not entrapped. 			
Inadvertent impacts to retained habitat within or adjacent to development areas	<p>See 'Removal of native vegetation, and impacts to flora and fauna habitat'</p> <ul style="list-style-type: none"> Clearly delineate retained areas and other no-go areas with fencing, paint and or signage 	Project Manager, CEMP compliance officer.	Measures are likely to be effective. Failures of any processes are expected to be picked	Sloane's Froglet is a MNES which may be impacted.

Type of potential impact	Impact mitigation method/management technique	Responsibility	Likely efficacy (including risk of failure)	MNES (when relevant)
	<ul style="list-style-type: none"> Develop and implement specific erosion and sedimentation controls in the CEMP All works and works impacts to be limited to the designated impact areas only. Strictly no impacts beyond the mapped works footprint. Dust suppression is to take place, with greater frequency of suppression activities in drier or windy conditions. No dust generating works if winds are excessive. Ensure addition of stormwater flows in natural drainage lines do not reduce the suitability of these areas for Sloane's Froglet. If monitoring results show a decline in Sloane's Froglet usage of these areas, works (under appropriate approvals) are to be considered to ensure these areas are constructed to Sloane's Froglet habitat requirements. 		up via ongoing monitoring of actions and outcomes. If Sloane's are not using adjoining corridors after stormwater additions, remedial works must be undertaken with approvals and advice from experts.	
Noise, dust, vibration, pollution and light spill impacts	<p>See 'Inadvertent impacts to retained habitat within or adjacent to development areas'</p> <ul style="list-style-type: none"> CEMP to detail specific measures to control risks from these potential outputs. Machinery not to be left running for extended periods when not in use. No earthworks or excessive vehicle movements in high winds or drought periods. No addition of artificial light sources and no works to be conducted outside of daylight hours. Avoid loud conversations across the work site and minimise other potential disruptions to neighbours (radios, doors slamming, reverse beeps left on etc.). Spill kits to be kept on site and staff to be trained in identifying and remediating any spills on site. 	Project Manager, CEMP compliance officer.	Measures are likely to be effective. Failures of any processes are expected to be picked up via ongoing monitoring of actions and outcomes. If Sloane's are not using adjoining corridors after stormwater additions, remedial works must be undertaken with approvals and advice from experts.	No MNES likely to be impacted.

Type of potential impact	Impact mitigation method/management technique	Responsibility	Likely efficacy (including risk of failure)	MNES (when relevant)
Potential creation of edge effects in retained habitat areas	<ul style="list-style-type: none"> Minimise works in remnant areas to the smallest extent possible to achieve the purpose. No works beyond the designated impact areas. Strictly no impacts within designated retained or no-go areas. Basins and chain-of-ponds margins and estate buffer areas to be revegetated (where appropriate) with locally sourced indigenous species, to enhance the thickness of the remnant vegetation patches and to add diversity, thus reducing potential for edge effects. 	Project Manager, CEMP compliance officer.	Measures are likely to be effective.	No MNES likely to be impacted.
Pest plant and animal and disease impacts	<ul style="list-style-type: none"> CEMP to include biosecurity measures to ensure pest plant and animal controls are in place, and actions are incorporated to reduce the risks of disease being spread onto the site. Any major infestations in impact areas to be adequately treated (with least impact method) prior to works being undertaken in that area. All machinery must only enter C3 areas for works after the machinery has been adequately decontaminated. 	Project Manager, CEMP compliance officer.	Measures are likely to be effective.	Sloane's Froglet is a MNES which may be impacted if Chytrid Fungus spreads into waterways.
Potential destruction or gradual degradation of retained areas by pedestrian movements and recreational behaviours (i.e. mountain bike riding and illegal track construction)	<p>See 'Inadvertent impacts to retained habitat within or adjacent to development areas'</p> <ul style="list-style-type: none"> Fencing to be constructed at strategic places to control unwanted vehicle and pedestrian traffic. Fencing to keep pedestrians to the existing road surface along Williams Road. Signage to be erected alerting reserve users to the values of the area and the need to observe restrictions, such as keeping out of areas and no riding of bikes, no dogs off lead. 	Project Manager, CEMP compliance officer (Council Rangers, if required)	Measures are likely to be effective.	The TEC that exists along Williams Road is a MNES which may be impacted if recreational behaviours are not adequately controlled.

Type of potential impact	Impact mitigation method/management technique	Responsibility	Likely efficacy (including risk of failure)	MNES (when relevant)
	<ul style="list-style-type: none"> Regular monitoring of retained areas for evidence of illegal activity such as firewood collecting, garden waste dumping, and illegal track construction. Liaison with Council rangers as required. 			
Degradation to or fragmentation of fauna movement corridors	<p>See 'Impact to TECs and fauna within these areas (which is a potential SAIL)' and 'Impacts to Sloanes Froglet habitat (a SAIL entity)'</p> <ul style="list-style-type: none"> CEMP to include monitoring actions to ensure impacts are not occurring in corridor areas. Monitor Sloane's Froglet usage of movement corridors. All wire fences must be plain strand wire and must not include any barbed wire strands. Supplementary planting to occur in areas of Williams Road that have weak connectivity. 	Project Manager, CEMP compliance officer	Measures are likely to be effective.	The TEC that exists along Williams Road is a MNES but significant impact is unlikely
Fauna injury or deaths from domestic animals	<p>See 'Potential destruction or gradual degradation of retained areas by pedestrian movements and recreational behaviours (i.e. mountain bike riding and illegal track construction)'</p> <ul style="list-style-type: none"> Develop a cat curfew for the estate, ideally in discussion and agreement with Council to have the support of a local law to aid enforcement. Install signage about the importance of cat curfews and keeping dogs on leads when walking in reserve areas. Install fencing around stormwater basins to limit entry, to prevent accidental drownings and limit the entry of dogs which may injure or kill sensitive aquatic fauna. 	Project Manager, CEMP compliance officer.	Measures are likely to be effective.	Sloane's Froglet is a MNES which may be impacted if uncontrolled predation by domestic animals occurs
Vehicle strikes for fauna on housing estate roadways	<ul style="list-style-type: none"> Curbs in estate to be designed to allow Sloane's Froglet movement from roadways. CEMP to enforce speed limits through the work site and mandatory reporting of any vehicle strikes to Project Manager. 	Project Manager, CEMP compliance officer.	Measures are likely to be effective.	Sloane's Froglet is a MNES which may be impacted by vehicle strikes.

Type of potential impact	Impact mitigation method/management technique	Responsibility	Likely efficacy (including risk of failure)	MNES (when relevant)
	<ul style="list-style-type: none"> Appropriate fencing to be installed, where applicable, to prevent or slow the movement of fauna into estate areas and in proximity to roadways. 			

Table 33: Mitigation actions that require monitoring of their implementation and success

Measure/action	Monitoring and evaluation strategy (Data, frequency, timing and reporting)	Performance criteria (linked to monitoring and evaluation strategy)	Adaptive management threshold (trigger for adaptive management plan/actions)	Adaptive management response (when triggered)
Monitoring of Sloane's Froglet numbers in new basins and utilisation during migration period of new and remaining corridors	Winter surveys of Sloane's Froglet in all basins and movement corridors. Estimate of numbers to be made at each feature. Records to be mapped using a GIS software program.	<ul style="list-style-type: none"> Sloane's Froglet expected to be present in all new basins and corridors after 12 months post construction. Sloane's Froglet expected to be present in existing basins and drainage channels. 	Lack of Sloane's Froglet in new basins and corridors after 12 months, or in existing basins and corridors immediately after construction, will trigger an immediate review.	The review must include inspection of the structures with engineers and Sloane's Froglet experts for design adequacy. If designs are considered adequate, detailed water quality testing (including for presence of Chytrid Fungus) must be conducted. If water quality issues, these must be addressed after seeking expert advice on suitable remediation.
Regular monitoring of retained areas for evidence of illegal activity such as firewood collecting, garden waste dumping, and illegal track construction	Reserve management works programs to include quarterly (or more often) inspections of retained bushland areas. Issues must be noted, mapped, and reported to reserve managers.	No impacts to remnant vegetation areas will indicate that management efforts are successful. Reported impacts are to be appropriately remedied.	If ongoing impacts are reported by reserve managers, a review will be triggered.	The review must consider further measures to limit the impacts of people and recreational behaviour upon the reserve areas. These may include improved fencing, signage, educational programs and signage, and a community-driven 'friends of' style stewardship program for the area.

8.5 Adaptive management strategy for uncertain impacts (where relevant)

Excluding the need for a CEMP and the adaptive management strategies mentioned in **Table 33** above, no additional adaptive management measures are proposed.

9. Serious and irreversible impacts

9.1 Assessment for serious and irreversible impacts on biodiversity values

Clause 6.7 of the BC Regulation specifies that a Serious and Irreversible Impact (SII) is likely for a SII entity if it is likely to contribute significantly to the risk of a threatened species or ecological community becoming extinct based on one or more of the following four principles:

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

Based on the site assessments, targeted surveys, vegetation mapping and the likelihood assessment available in **Appendix L**, there were two SII species and one SII ecological community that exist or potentially exist on site. These three entities are discussed further below.

According to the TBCD, Sloane's Froglet has been declared as an SII entity according to it meeting principle 3, in that it is known from three or less locations and/or has an area of occupancy (AOO) of less than 10 square kilometres, or extent of occurrence (EOO) of less than 100 square kilometres. See **Figure 17** for the species polygon which represents suitable habitat for this SII on the Subject Land. Based on the Significant Impact Criteria assessment in **Appendix N** indicating that a significant impact to this species is possible from the development, Sloane's Froglet clearly is an SII entity that is at risk of impact and requires further consideration, in terms of the risks posed by this proposal, and the adequacy of the suggested avoidance and mitigation measures. See **Table 34** below.

Regent Honeyeater, although not detected on site, is considered to be a potential SII based on habitat on site that is mapped as important habitat for the species, and thus it may require further consideration. Regent Honeyeater is listed in the TBCD as meeting SII principles 1 and 2. Principle 1 on the basis of a population reduction of equal to or greater than 80% in ten years or three generations, and principle 2 on the basis of having less than 50 individuals or less than 250 individuals where threats are known. See **Figure 17** for the species polygon which represents suitable habitat for this SII on the Subject Land, and **Table 34** below. Very little impacts are being made to mapped habitat of Regent Honeyeater, and avoidance and mitigation measures are to be put in place to reduce potential impacts on this SII. It is considered much less likely that the development will constitute a SII for Regent Honeyeater.

PCT 266, PCT 277 and PCT 278 are all aligned with the BC Act listed critically endangered 'White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions' TEC, which is

deemed present where patch vegetation persists on site. This TEC, which was present on site, has been identified as an SAI entity in the TBDC and the list of entities listed under the BC Act (listed as White Box Yellow Box Blakely's Red Gum Woodland). However, with the absence of any major impacts from development, the TEC is not considered to be an entity at risk of an SAI, especially when considering the likely improvement in extent and condition as a result of the development, rehabilitation and ongoing management of these TEC areas in conservation reserve areas.

Table 34: Entities at risk of an SAI

Common name	Scientific name	Reason for inclusion in assessment
Sloane's Froglet	<i>Crinia sloanei</i>	Included in current list of entities at risk of an SAI and is likely to be impacted by the proposal
Regent Honeyeater	<i>Anthochaera phrygia</i>	Included in current list of entities at risk of an SAI and is likely to be impacted by the proposal
White Box Yellow Box Blakely's Red Gum Woodland	<i>White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions</i>	Minimal impacts occurring to areas of the TEC, and with these two areas being protected via declaration as conservation reserves, the TEC is NOT considered to be at risk of an SAI

9.1.1. Additional impact assessment provisions for TECs at risk of an SAI

Not applicable. Very few quantifiable impacts to the TEC on site from the development, due to avoidance and minimisation measures. Therefore, the TEC present is not considered to be an entity at risk of a SAI.

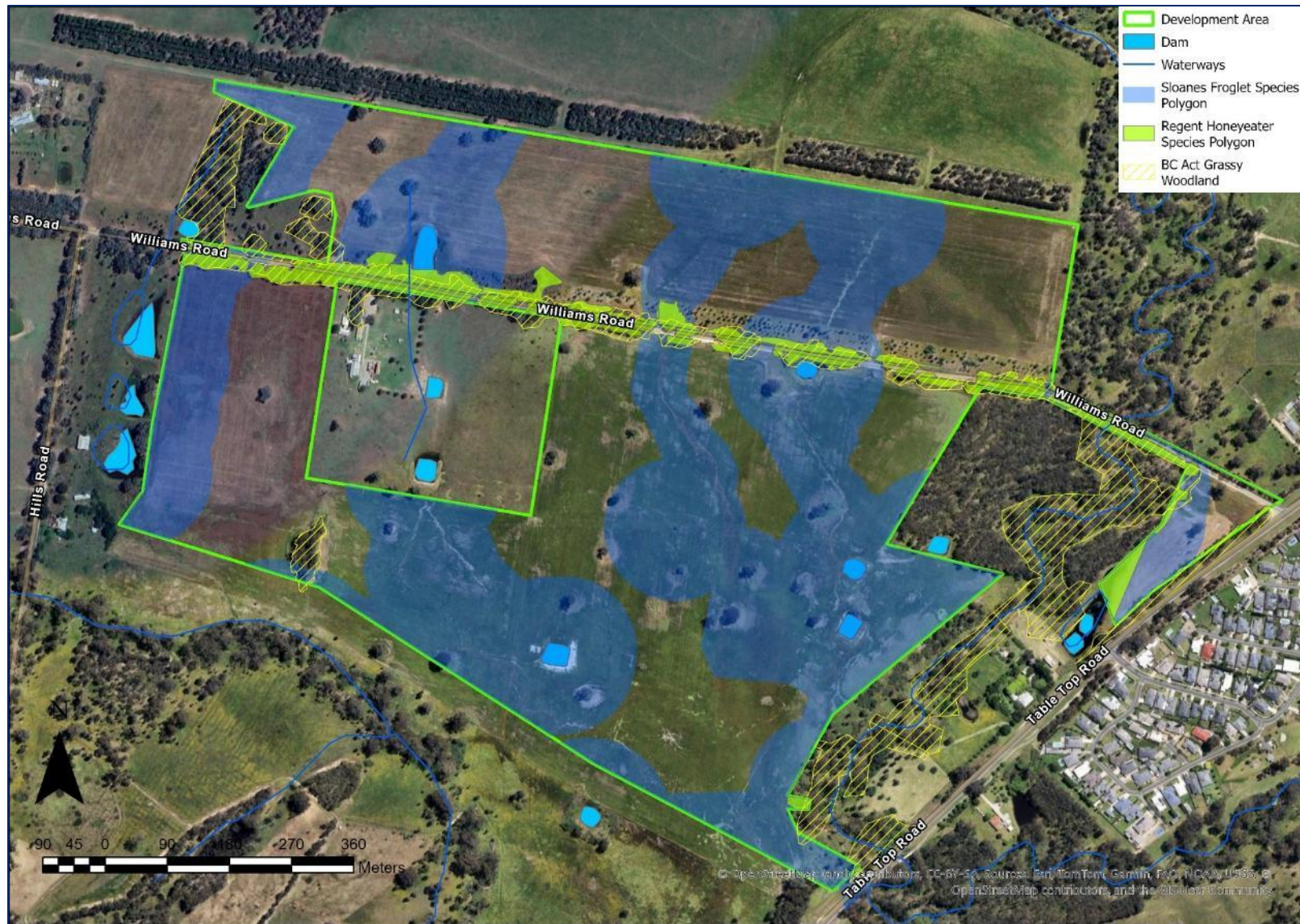


Figure 17: Potential SAIL entities (Sloane's Froglet and Regent Honeyeater habitat) within the Subject Land. Scale 1:6,500

9.1.2 Additional impact assessment provisions for threatened species at risk of an SAI

Additional impact assessment provisions for threatened species at risk of an SAI

Figure 16 – Potential vehicle strike areas for Sloane's Froglet

Shows the following:

- the boundary of the Subject Land
- the extent or location of potential vehicle strike areas.

Figure displays the two threatened species that are potentially at risk of serious and irreversible impacts, and shows the extent of species habitats (species polygons based on TBDC recommendations) at risk of an SAI within the Subject Land. The following section provides further information about these two SAI entities to assist the decision-makers to determine if an SAI for these entities is likely to result from the proposed development.

Sloane's Froglet – *Crinia sloanei*

Actions to avoid and minimise direct and indirect impacts for Sloane's Froglet

Refer to previous section of the BDAR and **Table 32** 'Summary of proposed mitigation and management measures for residual impacts (direct, indirect and prescribed)', which outlines the avoid and minimise impacts that relate to this threatened species at risk of an SAI.

Current status – Sloane's Froglet

Table 35: Current status – Sloane's Froglet

Criteria	Data/ information	Data sources	Details of data deficiency, assumptions, reasons for low confidence in information (e.g. TBDC indicates data is unknown or deficient)
Evidence of rapid decline (Principle 1)			
Change in population size in NSW in the past 10 years or 3 generations (indicate whether as a direct estimate of the population or if indicated by an index or surrogate)	NA	NA	NA
Evidence of small population size (Principle 2)			
Current population size in NSW	NA	NA	NA
Decline in species' population size in 3 years or one generation	NA	NA	NA
Number or percentage of mature individuals in each subpopulation or whether the species is likely to undergo extreme fluctuations	NA	NA	NA
Evidence of limited geographic range (Principle 3)			
Extent of occurrence (ha)	Not defined	TBCD	TBCD states AOO of <10km ² or an EOO of <100 km ² but does not specify which one applies.
Area of occupancy (ha)	Not defined	TBCD	As above

Criteria	Data/ information	Data sources	Details of data deficiency, assumptions, reasons for low confidence in information (e.g. TBDC indicates data is unknown or deficient)
Number of threat-defined locations	Not defined	TBCD	No data
Whether the species' population is likely to undergo extreme fluctuations	Not defined	TBCD	No data

Impacts assessment – Sloane's Froglet

Table 36: Impacts assessment – Sloane's Froglet

Impact	Data / information	Data sources	Details of data deficiency, assumptions or reasons for low confidence in information
Number of individuals (mature and immature) present in the subpopulation on the Subject Land	No counts were undertaken due to the inherent difficulty in making accurate counts based on calls. Estimates are in the 50 to 100 range across the Subject Land.	ToS assessment and this BDAR assessment found Sloane's Froglet in every dam, creek and main drainage line. This indicates a healthy population is present.	No attempt to accurately count numbers. Estimate is based on numerous frogs present in all suitable habitat areas, and utilisation of movement corridors was observed.
Number of individuals (mature and immature) present as a percentage of total NSW population (%)	Data deficient	NA	Sloane's Froglet population estimates not available.
Number of individuals (mature and immature) to be impacted by the proposal	Approximately 10-20 mature Sloane's Froglet may be impacted directly (in the three dams that involve works impacts). Works outside of breeding times should limit impacts to immature individuals. May be broader indirect impacts as a result of loss of current central movement corridor.	Estimates based on the estimate of 2-5 frogs being present in each of the three dams being impacted.	No counts performed for the species. Impact assessment based on estimates of number of individuals per dam.
Individuals (mature and immature) to be impacted by the proposal as a percentage of total NSW population (%)	Sloane's Froglet population estimates not available.	NA	NO population data available.
Area of habitat to be impacted (ha) (for species measured by area only)	Species polygon impacts total: 30.69 ha, made up of breeding (dams) habitat: 0.19ha, and movement	Areas of species habitat (dams, creeks) buffered by 100 metres, and drainage	Buffer areas likely to over-estimate the areas being used for species migrations, thus loss

Impact	Data / information	Data sources	Details of data deficiency, assumptions or reasons for low confidence in information
	(dam/creek buffer areas) habitat: 30.49ha	lines (buffered by 50 metres minimum), overlaid over permanent impact areas of the development. Note proposed basins do not contribute to habitat losses, as these are providing new habitat.	areas also likely to be overestimated.
Area of the species' geographic range to be impacted by the proposal (ha)	30.69 hectares of mapped Sloane's Froglet habitat being impacted (including direct impact of 0.19ha and indirect impact of 30.49ha)	As above.	As above.
Area of the species' geographic range to be impacted as a percentage of the total area or extent of occupancy (%)	AOO and EOO not defined in the TBCD or elsewhere.	TBCD, NSW Scientific Committee final determination (2008)	No data available for species' AOO or EOO.
Individuals impacted	Some individuals of subpopulation and habitat will be impacted	NA	Estimates only. No population count undertaken.
Viability of a fragmented population (see below)	A major movement corridor is being impacted (effectively closed off). However, the population is unlikely to be fragmented due to existing corridors remaining along adjoining creeks (west, south and east), and the creation of a new east-west connection via the chain-of-ponds structure, along the southern boundary.	NA	Post-constriction monitoring is needed to ensure Sloane's Froglet are still present in existing dams and creeks, that they are eventually present in new basins, and that they are using the chain-of-ponds movement corridor during their winter movement period. Provided new basins are found habitable, the net breeding habitat will significantly increase in size across the Subject Land.

Regent Honeyeater

Actions to avoid and minimise direct and indirect impacts for Regent Honeyeater

Refer to previous section of the BDAR and **Table 32** 'Summary of proposed mitigation and management measures for residual impacts (direct, indirect and prescribed)', which outlines the avoid and minimise impacts that relate to this threatened species at risk of an SAIL.

Current status – Regent Honeyeater

Table 37: Current status – Regent Honeyeater

Criteria	Data/ information	Data sources	Details of data deficiency, assumptions, reasons for low confidence in information
Evidence of rapid decline (Principle 1)			
Change in population size in NSW in the past 10 years or 3 generations (indicate whether as a direct estimate of the population or if indicated by an index or surrogate)	Population reduction of $\geq 80\%$ in the last 10 years or three generations.	TBCD	NA
Evidence of small population size (Principle 2)			
Current population size in NSW	Population < 50 individuals or < 250 individuals where threats are known.	TBCD	TBCD does not define which category Regent Honeyeater satisfies. Estimates of a population of 350-400 as of 2010 (Garnet et al. 2011, cited in Australian Government 2016). Estimates of 350 (stable) as of 2018 (NESPTRH 2019). These figures conflict with Principle 2 triggers (population higher than triggers).
Decline in species' population size in 3 years or one generation	According to NESPTRH (2019), population estimates over the last three years are stable, at 350 individuals.	(NESPTRH 2019).	Latest data from source is 2018. The trends in population since that publication (i.e. in the last 3 years) are unknown.
Number or percentage of mature individuals in each subpopulation or whether the species is likely to undergo extreme fluctuations	Subpopulation data unavailable, and potentially not relevant for this highly mobile species. Extreme fluctuations not described in TBCD.	TBCD	TBCD lack data.
Evidence of limited geographic range (Principle 3)			
Extent of occurrence (ha)	NA	NA	NA
Area of occupancy (ha)	NA	NA	NA

Criteria	Data/ information	Data sources	Details of data deficiency, assumptions, reasons for low confidence in information
Number of threat-defined locations	NA	NA	NA
Whether the species' population is likely to undergo extreme fluctuations	NA	NA	NA

Impacts assessment – Regent Honeyeater

Table 38: Impacts assessment – Regent Honeyeater

Impact	Data / information	Data sources	Details of data deficiency, assumptions or reasons for low confidence in information
Number of individuals (mature and immature) present in the subpopulation on the Subject Land	Unknown. Species not observed during surveys. Assumed present based on IHM and available habitat.	NA	Habitat present but not of high quality (no shrubs, habitat linear in nature). Highly mobile (transient) population makes counting or predicting numbers of birds using habitat areas unreliable.
Number of individuals (mature and immature) present as a percentage of total NSW population (%)	NA – as above	NA	As above
Number of individuals (mature and immature) to be impacted by the proposal	NA – as above	NA	As above
Individuals (mature and immature) to be impacted by the proposal as a percentage of total NSW population (%)	NA – as above	NA	As above
Area of habitat to be impacted (ha) (for species measured by area only)	Area of IHM in Subject Land plus adjoining suitable habitat that is being impacted: 0.47ha*	IHM, vegetation mapping.	This is an overestimate of the Regent Honeyeater habitat that is to be impacted/lost, and includes areas where only ground impacts are occurring. Loss of trees in the habitat area is very low, with only 13 trees being lost in habitat areas, of which all but 1 are young/sapling trees of limited habitat value. Therefore, confidence is high that 0.47ha losses are overestimated.
Area of the species' geographic range to be impacted by the proposal (ha)	<0.47 ha.	IHM, vegetation mapping.	As above. Very low impacts occurring to actual habitat values in the Regent Honeyeater species polygon.
Area of the species' geographic range to be	NA	NA	NA

Impact	Data / information	Data sources	Details of data deficiency, assumptions or reasons for low confidence in information
impacted as a percentage of the total area or extent of occupancy (%)			
Individuals impacted	No individuals will be directly impacted, some habitat will be impacted	NA	Controls to be put in place via CEMP means no individuals are likely to be impacted by the proposed development.
Viability of a fragmented population (see below)	No fragmentation of habitat in the mapped habitat areas is occurring.	IHM, vegetation mapping.	No fragmentation of habitat occurring.

10. Impact summary

10.1 Determine an offset requirement for impacts

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

The ecosystem credits required to offset the proposal are provided in **Table 40**. Three BAM-C assessments were created, the first to assess C3 land impacts and losses (Case 00054055), for which all impacts were included. The second assessment dealt with R1 land impacts and patch losses (Case 54536), for which only the SAIL entities and the 12 new species added to the BC Act since 2011 were considered, since the R1 land is biocertified under the Albury LEP, and vegetation/habitat impacts have already been offset. The third (case 00055011) was to assess the SAIL and 12 threatened species impacts occurring from the impacts to scattered trees on R1 land (via the scattered tree module in BAM-C). When offset obligations from the assessments were combined, a total of twenty-nine (29) credits are required to offset the development, made up of 7 ecosystem credits and 22 species credits. Impacts associated with PCT 266 will require offset under the BAM. Losses and credits are presented below and in **Table 39, 40 and 41**. The following offset rules apply:

For credit class 266 (C3 land):

- **Credits:** Seven (7)
- **Class:** White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands. This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 516, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 847, 851, 921, 1099, 1303, 1304, 1307, 1324, 1329, 1330, 1332, 1383, 1606, 1608, 1611, 1691, 1693, 1695, 1698, 3314, 3359, 3363, 3373, 3376, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150
- **Trading Group:** Western Slopes Grassy Woodlands - $\geq 70\%$ - $<90\%$ cleared group (including Tier 2 or higher threat status).
- **IBRA:** Inland Slopes, Bogan-Macquarie, Bongo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi; or any IBRA subregion that is within 100 kilometres

of the outer edge of the impacted site.

- **HBT:** One (1) credit out of the seven (7) credits to include hollow-bearing trees (HBT)

Regent Honeyeater

- **Area:** 0.18 ha
- **Credits:** Six (6)
- **Type:** Any in NSW

Sloane's Froglet

- **Area:** 0.06ha
- **Credits:** Three (3)
- **Type:** Any in NSW

Southern Myotis

- **Area:** 0.19ha
- **Credits:** Seven (7)
- **Type:** Any in NSW

Squirrel Glider

- **Area:** 0.18ha
- **Credits:** Six (6)
- **Type:** Any in NSW

Table 39: Impacts that do not require offset – ecosystem credits

Vegetation zone	PCT name	TEC	Impact area (ha)	TEC association	Entity at risk of an SAI?	Current VI score
278_Revegetation	PCT 278 (C3 land)	No	0.06	Does not qualify for associated TEC White Box Yellow Box Blakey's Red-gum Grassy Woodland.	No	4.5
277_Trees_only	PCT277 (R1 land)	Yes	0.01	One tree deemed lost (but retained). Losses already accounted for via biocertification in Albury LEP.	No	20.7

Table 40: Impacts that require an offset – ecosystem credits

Vegetation zone	PCT name	TEC	Impact area (ha)	Current VI score	Future VI score	Change in VI score	Biodiversity risk weighting	Number ecosystem credits required
266_Remnant_Sth	266	Yes	0.04	47.1	0	47.1	2.5	1
266_Remnant_Nth	266	Yes	0.02	38.3	0	38.3	2.5	1
266_Wetland	266	Yes	0.01	36.2	0	36.2	2.5	1
266_Revegetation	266	Yes	0.05	37.6	0	37.6	2.5	1
266_Remnant_MQ	266	Yes	0.07	61.5	0	61.5	2.5	3
Total credits								7

10.1.2 Impacts on threatened species and their habitat (species credits)**Table 41: 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	Number of species credits required
Sloane's Froglet	<i>Crinia sloanei</i>	en	EN	0.06	3	3
Regent Honeyeater	<i>Anthochaera phrygia</i>	ce	CE	0.18	3	6
Squirrel Glider	<i>Petaurus norfolcensis</i>	vu	-	0.18	2	6
Southern Myotis	<i>Myotis macropus</i>	vu	-	0.19	2	7
Total credits						22



Figure 18: Directly impacted areas used for determining BAM-C offsetting requirements within the Subject Land. Scale 1:6,500

10.1.3 Indirect and prescribed impacts

There are some indirect and prescribed impacts that remain after measures to avoid, minimise and mitigate have been applied, and these are able to be offset using additional biodiversity credits (above the credit requirement generated by the BAM-C for direct impacts) and/or via other conservation measures. **Table 42** explains the proposed offset for each of these impacts and the calculations and approach used to determine these amounts is justified in the section below.

Table 42: Summary of proposed offsets for residual indirect and prescribed impacts

Residual indirect or prescribed impact (identified in Table after mitigation)	Proposed offset (additional biodiversity credit requirement and/or other conservation measures)
Sloane's Froglet – Impacts to mapped (migratory) habitat in the species polygon (indirect and prescribed impacts)	Creation of the chain-of-ponds movement corridor will help offset some of the losses to habitat. In addition, a contribution (retirement) of 5 species credits for Sloane's Froglet is proposed to offset the indirect impacts being caused to Sloane's Froglet migration habitat.
Sloane's Froglet – Prescribed impacts to breeding habitat in three dams (one dam lost, two partially impacted).	Creation of new stormwater basins and the chain-of-ponds corridor, all being constructed to Sloane's Froglet habitat requirements, is providing (offsetting) a considerable amount more breeding habitat than that being lost. In addition, a contribution (retirement) of 2 species credits for Sloane's Froglet is proposed to offset the direct prescribed impacts being caused to Sloane's Froglet breeding habitat.
Southern Myotis– Prescribed impacts to feeding habitat in three dams (one dam lost, two partially impacted).	Creation of new stormwater basins is providing (offsetting) a considerable amount more feeding habitat than that being lost. In addition, a contribution (retirement) of 2 species credits is proposed to offset the direct prescribed impacts being caused to Southern Myotis breeding habitat (one dam loss, two partially impacted).
Sloane's Froglet – Potential impacts from vehicle strike during construction and ongoing as part of housing estate traffic movements	Curbs designed to Sloane's Froglet requirements to lower risk of frog entrapment on roads. Propose the construction of small frog barriers near roads to discourage the entry of frogs onto roads, to be constructed to channel frogs along desired migrational routes, and erected in the vicinity of waterbodies and expected migrational routes. No further retirement of species credits proposed, given likely impacts after conservation efforts is expected to be very low.

10.2 Impacts that do not need further assessment

There are no impacts that require further assessment as part of this development proposal.

11. Biodiversity credit report

Table 43 provides information required on the ecosystem and species credits and matching credit profiles. Refer also to **Appendix H**.

11.1 Ecosystem credits

Table 43: Ecosystem credit class and matching credit profile

Ecosystem credit	Attributes shared with matching credits						
	PCT name	PCT vegetation class	PCT vegetation formation	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	266	Western Slopes Grassy Woodland	Grassy Woodland	Yes	Not specified in BAM-C	Yes	Inland Slopes , Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
6	266	Western Slopes Grassy Woodland	Grassy Woodland	Yes	Not specified in BAM-C	No	As above.

11.2 Species credits

Table 44: Species credit class and matching credit profile

Species credit	Attributes shared with matching credits				
	Name of threatened species	Kingdom	BC Act status	EPBC Act status	IBRA region
6	<i>Anthochaera phrygia</i>	Animal	ce	CE	Any in NSW
3	<i>Crinia sloanei</i>	Animal	en	EN	Any in NSW
7	<i>Myotis macropus</i>	Animal	vu	-	Any in NSW
6	<i>Petaurus norfolcensis</i>	Animal	vu	-	Any in NSW
Additional proposed species credits for indirect and prescribed impacts					
7	<i>Crinia sloanei</i>	Animal	en	EN	Any in NSW
2	<i>Myotis macropus</i>	Animal	vu	-	Any in NSW

12. References

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13. Contents of Figures in Report

Figure 1 – Overview of C3 land impacts

Shows the following:

- the boundary of the Subject Land
- development designs
- impacts from development in C3 areas (numbered impact sites)

Figure 2 – Overview of R1 land tree impacts

Shows the following:

- the boundary of the Subject Land
- development designs
- tree status (lost, deemed lost, retained) across the R1 areas

Figure 3 - Site Map

The Site Map is based on digital aerial photography or the best available imagery, showing:

- the boundary of the Subject Land
- the cadastre boundaries within the Subject Land
- development designs
- habitat connectivity
- key site features

Figure 4a - Location Map 1 and Figure 4b - Location Map 2

The Location Map based on digital aerial photography or the best available imagery, spread across two maps for clarity, showing:

- the boundary of the Subject Land
- the Assessment Area
- landscape features identified in BAM Subsection 3.1.3, including:
 - IBRA bioregions and subregions
 - rivers, streams, estuaries and wetlands
 - habitat connectivity
 - karst, caves, crevices, cliffs, rocks and other geological features of significance
 - areas of outstanding biodiversity value
 - NSW (Mitchell) landscapes
 - additional features (if relevant)
 - additional relevant detail, such as local government area boundaries or other base data relevant at this scale
 - all areas of native vegetation cover within the Assessment Area, including all areas of planted native vegetation identified in accordance with BAM Appendix D.

Figure 5 - Development layout

Shows the following:

- the boundary of the Subject Land
- proposed lots
- development stages
- construction areas

Figure 6 - Biodiversity Values Map

Shows the following:

- the boundary of the Subject Land
- the Biodiversity Values Map results.

Figure 7 - Excluded impacts

Shows the following:

- the boundary of the Subject Land
- modelled PCTs
- areas identified as having excluded impacts (i.e. category 1 – exempt land).

Figure 8 – Floristic plot locations

Shows the following:

- the boundary of the Subject Land
- BAM plot locations
- Transect locations and directions

Figure 9 – Native vegetation extent

Shows the following:

- the boundary of the Subject Land
- native vegetation areas
- areas of revegetation
- areas of exotic vegetation

Figure 10 - Plant community types (actual)

Shows the following:

- the boundary of the Subject Land
- Verified PCTs (or most likely PCTs as per BAM Subsection 4.2.2) within the Subject Land.

Figure 11 – Areas of BC Act listed TEC – Grassy Woodlands

Shows the following:

- the boundary of the Subject Land
- areas that qualify for NSW Grassy Woodland TEC

Figure 12 - Vegetation zones

Shows the following:

- the boundary of the Subject Land
- vegetation zones within the Subject Land
- patch sizes within the Subject Land (where applicable).

Figures 13a to 13d - Candidate species credit species records and species polygons

Shows the following on four separate maps (one for each species):

- the boundary of the Subject Land
- species polygons within the Subject Land
- where relevant, habitat features that have been used to determine species polygons (e.g. hollow bearing trees, waterways)
- threatened species locations of all individuals of each candidate species credit species (or evidence thereof, e.g. koala scats, frog calls, etc.)
- listing status – BC/EPBC Act.

Figure 1 - Final impacts likely to occur on C3 areas of the Subject Land

Shows the following:

- the boundary of the Subject Land
- the extent of direct impacts, including management zones (if applicable)
- the extent of indirect impacts (if mapped)
- vegetation zones.

Figure 2 - Final impacts likely to occur on R1 areas of the Subject Land

Shows the following:

- the boundary of the Subject Land
- the extent of direct impacts, including management zones (if applicable)
- the extent of indirect impacts (if mapped)
- vegetation zones.

Figure 16 – Potential vehicle strike areas for Sloane’s Froglet

Shows the following:

- the boundary of the Subject Land
- the extent or location of potential vehicle strike areas.

Figure 17 - Serious and irreversible impacts (SAIL) entities

Shows the following:

- the boundary of the Subject Land
- the extent or location of SAIL entities or their habitat.

Figure 18 - Thresholds for assessing and offsetting impacts

Shows the following:

- the boundary of the Subject Land
- areas not requiring further assessment (e.g. cleared land, exotic vegetation)
- areas not requiring an offset (as per BAM Subsection 9.2.1(3.))
- areas requiring an offset (as per BAM Subsection 9.2.1(1.))

Figure 19 – Survey efforts and locations

Shows the following:

- the boundary of the Subject Land
- bird spot count point locations x 10
- remote fauna camera locations
- bat ultrasonic detector location

Appendix A: BDAR requirements compliance

Table 2: 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:	–
		<input checked="" type="checkbox"/> brief description of the proposal	1.1.1 Development overview
		<input checked="" type="checkbox"/> identification of Subject Land boundary, including:	1.1.2 Location
		<input checked="" type="checkbox"/> operational footprint	
		<input checked="" type="checkbox"/> construction footprint indicating clearing associated with temporary/ancillary construction facilities and infrastructure	
		<input checked="" type="checkbox"/> general description of the Subject Land	1.1.3 Proposed development and the Subject Land
		<input checked="" type="checkbox"/> sources of information used in the assessment, including reports and spatial data	1.5 Information sources
		<input checked="" type="checkbox"/> identification and justification for entering the BOS	1.2 Biodiversity Offsets Scheme entry
		Maps and tables	
		<input checked="" type="checkbox"/> 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	Figure 1: Overview of C3 land impacts, overlaid over an aerial image and subdivision layout (see Appendix P for C3 site details) Figure 2: R1 tree impacts, resulting in lost (11), deemed lost (18), and retained (60) trees Figure 14: Development impact areas, trees status and lost vegetation within C3 zoned areas of the Subject Land. Scale 1:6,500 Figure 15: Development impact areas (lost and deemed lost trees) within R1 zoned areas of the Subject Land. Scale 1:6,500

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:	–
		<input checked="" type="checkbox"/> general description of Subject Land topographic and hydrological setting, geology and soils	1.1.3 Proposed development and the Subject Land
		<input checked="" type="checkbox"/> per cent native vegetation cover in the Assessment Area (as described in BAM Section 3.2)	2.1.2 Native vegetation cover
		<input checked="" type="checkbox"/> IBRA bioregions and subregions (as described in BAM Subsection 3.1.3(2.))	3.2.1 IBRA bioregions and IBRA subregions
		<input checked="" type="checkbox"/> rivers and streams classified according to stream order (as described in BAM Subsection 3.1.3(3.) and Appendix E)	3.2.2 Rivers, streams, estuaries and wetlands
		<input checked="" type="checkbox"/> wetlands within, adjacent to and downstream of the site (as described in BAM Subsection 3.1.3(3.))	3.2.2 Rivers, streams, estuaries and wetlands
		<input checked="" type="checkbox"/> connectivity of different areas of habitat (as described in BAM Subsection 3.1.3(5–6.))	3.2.3 Habitat connectivity
		<input checked="" type="checkbox"/> 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.))	3.2.4 Karst, caves, crevices, cliffs, rocks or other geological features of significance
		<input checked="" type="checkbox"/> areas of outstanding biodiversity value occurring on the Subject Land and Assessment Area (as described in BAM Subsection 3.1.3(8–9.))	3.2.5 Areas of outstanding biodiversity value
		<input checked="" type="checkbox"/> any additional landscape features identified in any SEARs for the proposal	3.2.7 Additional landscape features identified in SEARs
		<input checked="" type="checkbox"/> NSW (Mitchell) landscape on which the Subject Land occurs	3.2.6 NSW (Mitchell) Landscape
		<input checked="" type="checkbox"/> 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)	2.2.3 Plot-based vegetation survey 2.2.4 Vegetation integrity survey

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		Maps and tables	
		<input checked="" type="checkbox"/> Site Map <input checked="" type="checkbox"/> Property boundary <input checked="" type="checkbox"/> Boundary of Subject Land <input checked="" type="checkbox"/> Cadastre of Subject Land (including labelling of Lot and DP or section plan if relevant) <input checked="" type="checkbox"/> Landscape features identified in BAM Subsection 3.1.3	Figure 1: Overview of C3 land impacts, overlaid over an aerial image and subdivision layout (see Appendix P for C3 site details)
		<input checked="" type="checkbox"/> Location Map <input checked="" type="checkbox"/> Digital aerial photography at 1:1,000 scale or finer <input checked="" type="checkbox"/> Boundary of Subject Land <input checked="" type="checkbox"/> Assessment Area (i.e. the Subject Land and either 1500 m buffer area or 500 m buffer for linear development) <input checked="" type="checkbox"/> Landscape features identified in BAM Subsection 3.1.3 <input checked="" type="checkbox"/> Additional detail (e.g. local government area boundaries) relevant at this scale	<p>Figure 4a: Location Map 1 showing the Subject Land, native vegetation and habitat connectivity within 1500 metres of the Subject Land. Scale 1:21,500.</p> <p>Figure 4b: Location Map 2 showing IBRA Region and Subregion, Mitchell Landscape and riparian buffers within 1500 metres of the Subject Land. Scale 1:21,500.</p>
		Landscape features identified in BAM Subsection 3.1.3 and to be shown on the Site Map and/or Location Map include:	–
		<input checked="" type="checkbox"/> IBRA bioregions and subregions <input checked="" type="checkbox"/> rivers, streams and estuaries <input checked="" type="checkbox"/> wetlands and important wetlands <input checked="" type="checkbox"/> connectivity of different areas of habitat <input checked="" type="checkbox"/> karst, caves, crevices, cliffs, rocks and other geological features of significance and if required, soil hazard features <input checked="" type="checkbox"/> areas of outstanding biodiversity value occurring on the Subject Land and Assessment Area <input checked="" type="checkbox"/> any additional landscape features identified in any SEARs for the proposal <input checked="" type="checkbox"/> NSW (Mitchell) landscape on which the Subject Land occurs	<p>Figure 3: Site Map showing the Subject Land, habitat connectivity pathways and key site features. Scale 1:13,500.</p> <p>Figure 4a: Location Map 1 showing the Subject Land, native vegetation and habitat connectivity within 1500 metres of the Subject Land. Scale 1:21,500.</p> <p>Figure 4b: Location Map 2 showing IBRA Region and Subregion, Mitchell Landscape and riparian buffers within 1500 metres of the Subject Land. Scale 1:21,500.</p>

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		Data	
		<input checked="" type="checkbox"/> All report maps as separate jpeg files	To be provided
		Individual digital shape files of:	To be provided
		<input checked="" type="checkbox"/> Subject Land boundary	To be provided
		<input checked="" type="checkbox"/> Assessment Area (i.e. Subject Land and 1500 m buffer area) boundary	To be provided
		<input checked="" type="checkbox"/> cadastral boundary of Subject Land	To be provided
		<input checked="" type="checkbox"/> areas of native vegetation cover	To be provided
		<input checked="" type="checkbox"/> landscape features	To be provided
Native vegetation	Chapter 4, Appendix A and Appendix H	Information	
		<input checked="" type="checkbox"/> 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 Native vegetation extent Table 7: Native vegetation cover in the 1500m buffer Assessment Area Figure 7: NSW modelled Plant Community Types (PCTs - numbered) within and adjoining the Subject Land. Scale: 1:6,400
		<input checked="" type="checkbox"/> 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 Areas that are not native vegetation
		<input checked="" type="checkbox"/> 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)	2.2.1 Existing information
		<input checked="" type="checkbox"/> Describe the systematic field-based floristic vegetation survey undertaken in accordance with BAM Section 4.2	2.2.3 Plot-based vegetation survey
		<input checked="" type="checkbox"/> 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-	5.5 More appropriate local data (where relevant) Appendix G: Decision-maker authorisation to use more appropriate local data

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		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:	–
		<input checked="" type="checkbox"/> PCT name and ID	4.2 Plant community types 4.2.1 Overview and descriptions
		<input checked="" type="checkbox"/> vegetation class	4.2 Plant community types 4.2.1 Overview and descriptions Table 8: Overview of PCTs identified within the Subject Land
		<input checked="" type="checkbox"/> extent (ha) within Subject Land	4.2.1 Overview and descriptions Table 8: Overview of PCTs identified within the Subject Land
		<input checked="" type="checkbox"/> evidence used to identify a PCT including any analyses undertaken, references/sources, existing vegetation maps (BAM Section 4.2(1–3.))	4.2.3 Justification of PCT selection
		<input checked="" type="checkbox"/> plant species relied upon for identification of the PCT and relative abundance of each species	Appendix F: Vegetation survey data 4.2 Plant community types 4.2.1 Overview and descriptions
		<input checked="" type="checkbox"/> if relevant, TEC status including evidence used to determine vegetation is the TEC (BAM Subsection 4.2.2(1–2.))	4.2.4 Alignment with NSW TECs 4.2.5 Alignment with EPBC Act listed ECs 4.3 Threatened ecological communities Table 13: TECs within the Subject Land Figure 11: Areas of BC Act listed TEC – Grassy Woodlands. Scale 1:6,500
		<input checked="" type="checkbox"/> estimate of per cent cleared value of PCT (BAM Subsection 4.2.1(5.))	4.2.1 Overview and descriptions

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
			<p>Table 9: PCT 266 'White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion'</p> <p>Table 10: PCT 277 - 'Blakely's Red Gum - Yellow Box Grassy Tall Woodland of the NSW South Western Slopes Bioregion'</p> <p>Table 11: PCT 278 'Riparian Blakely's Red Gum – box – shrub – sedge – grass tall open forest of the central NSW South Western Slopes Bioregion' Photo 3: PCT 278 - 'Riparian Blakely's Red Gum – box – shrub – sedge – grass tall open forest of the central NSW South Western Slopes Bioregion'</p>
		Describe the vegetation integrity assessment of the Subject Land, including:	–
		<input checked="" type="checkbox"/> identification and mapping of vegetation zones (as described in BAM Subsection 4.3.1)	<p>4.4 Vegetation zones</p> <p>Table 14: Summary of mapped vegetation zones occurring within the Subject Land</p> <p>Figure 12: Vegetation zones and patch sizes within the Subject Land. Scale 1:6,500</p>
		<input checked="" type="checkbox"/> description of vegetation zones within the Subject Land (as described in Operational Manual Stage 1 Table 2 and Subsection 3.3.2)	<p>4.4 Vegetation zones</p> <p>Table 15: Patch size, PCT and other characteristics of vegetation zones</p> <p>Figure 12: Vegetation zones and patch sizes within the Subject Land. Scale 1:6,500</p>
		<input checked="" type="checkbox"/> area (ha) of each vegetation zone	<p>4.4 Vegetation zones</p> <p>Table 14: Summary of mapped vegetation zones occurring within the Subject Land</p>
		<input checked="" type="checkbox"/> assessment of patch size (as described in BAM Subsection 4.3.2)	4.4 Vegetation zones

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<input checked="" type="checkbox"/> survey effort (i.e. number of vegetation integrity survey plots) as described in BAM Subsection 4.3.4(1–2.)	4.6 Vegetation integrity (vegetation condition)
		<input checked="" type="checkbox"/> use of relevant benchmark data from BioNet Vegetation Classification (as described in BAM Subsection 4.3.3(5.))	4.6.3 Use of benchmark data
		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):	–
		<input type="checkbox"/> identify the PCT or vegetation class for which local benchmark data will be applied	NA
		<input type="checkbox"/> identify published sources of local benchmark data (if benchmarks obtained from published sources)	
		<input type="checkbox"/> describe methods of local benchmark data collection (if reference plots used to determine local benchmark data)	
		<input checked="" type="checkbox"/> provide justification for use of local data rather than BioNet Vegetation Classification benchmark values	5.5 More appropriate local data (where relevant)
		<input type="checkbox"/> provide written confirmation from the decision-maker that they support the use of local benchmark data	NA
		Maps and tables	
		<input checked="" type="checkbox"/> 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 10: Actual PCTs in the Subject Land, based on modelled data and ground truthing assessments. Scale 1:6,500 Figure 12: Vegetation zones and patch sizes within the Subject Land. Scale 1:6,500
		<input checked="" type="checkbox"/> Map of PCTs within the Subject Land (as described in BAM Section 4.2(1.))	Figure 10: Actual PCTs in the Subject Land, based on modelled data and ground truthing assessments. Scale 1:6,500
		<input checked="" type="checkbox"/> Map of vegetation zones within the Subject Land (as described in BAM Subsection 4.3.1)	Figure 12: Vegetation zones and patch sizes within the Subject Land. Scale 1:6,500

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<input checked="" type="checkbox"/> Map the location of floristic vegetation survey plots and vegetation integrity survey plots relative to PCT boundaries	Figure 8: The seven (7) BAM vegetation assessment plots and transect locations. Scale 1:6,400
		<input checked="" type="checkbox"/> Map of TEC distribution on the Subject Land and table of TEC listing, status and area (ha)	Figure 11: Areas of BC Act listed TEC – Grassy Woodlands. Scale 1:6,500 Table 13: TECs within the Subject Land
		<input checked="" type="checkbox"/> Map of patch size locations for each native vegetation zone and table of patch size areas (as described in BAM Subsection 4.3.2)	Table 15: Patch size, PCT and other characteristics of vegetation zones Figure 12: Vegetation zones and patch sizes within the Subject Land. Scale 1:6,500
		Table of current vegetation integrity scores for each vegetation zone within the site and including:	–
		<input checked="" type="checkbox"/> composition condition score	Table 16: Vegetation integrity scores
		<input checked="" type="checkbox"/> structure condition score	
		<input checked="" type="checkbox"/> function condition score	
		<input checked="" type="checkbox"/> presence of hollow bearing trees	
		Data	
		<input checked="" type="checkbox"/> All report maps as separate jpeg files	To be provided
		<input checked="" type="checkbox"/> Plot field data (MS Excel format)	To be provided
		<input checked="" type="checkbox"/> Plot field datasheets	Appendix J: Field Sheets
		Digital shape files of:	To be provided
		<input checked="" type="checkbox"/> PCT boundaries within Subject Land	To be provided
		<input checked="" type="checkbox"/> TEC boundaries within Subject Land	To be provided
		<input checked="" type="checkbox"/> vegetation zone boundaries within Subject Land	To be provided
		<input checked="" type="checkbox"/> floristic vegetation survey and vegetation integrity plot locations	To be provided

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
Threatened species	Chapter 5	Information	
		Identify ecosystem credit species likely to occur on the Subject Land, including:	–
		<input checked="" type="checkbox"/> list of ecosystem credit species derived from the BAM-C (as described in BAM Subsection 5.1.1 and Section 5.2(1.))	5.1.1 Ecosystem credit species Table 17: Predicted ecosystem credit species
		<input checked="" type="checkbox"/> 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 Ecosystem credit species Table 17: Predicted ecosystem credit species
		<input checked="" type="checkbox"/> justification for addition of any ecosystem credit species to the list	5.1.1 Ecosystem credit species Table 17: Predicted ecosystem credit species>
		Identify species credit species likely to occur on the Subject Land, including:	–
		<input checked="" type="checkbox"/> list of species credit species derived from the BAM-C (as described in BAM Subsection 5.1.1)	5.1.2 Species credit species Table 18: Candidate flora species credit species Table 19: Candidate fauna species credit species
		<input checked="" type="checkbox"/> 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 Species credit species Table 18: Candidate flora species credit species Table 19: Candidate fauna species credit species>
		<input checked="" type="checkbox"/> 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 Species credit species Table 18: Candidate flora species credit species Table 19: Candidate fauna species credit species>
		<input checked="" type="checkbox"/> justification for addition of any species credit species to the list	5.1.2 Species credit species Table 18: Candidate flora species credit species

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
			Table 19: Candidate fauna species credit species
		From the list of candidate species credit species, identify:	–
		<input checked="" type="checkbox"/> species assumed present within the Subject Land (if relevant) (as described in BAM Subsection 5.2.4(2.a.))	5.2 Presence of candidate species credit species Table 20: Determining the presence of candidate flora species credit species on the Subject Land Table 21: Determining the presence of candidate fauna species credit species on the Subject Land
		<input checked="" type="checkbox"/> 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.))	
		<input checked="" type="checkbox"/> species for which targeted surveys are to be completed to determine species presence (BAM Subsection 5.2.4(2.b.))	
		<input checked="" type="checkbox"/> species for which an expert report is to be used to determine species presence (BAM Subsection 5.2.4(2.c.))	
		Present the outcomes of species credit species assessments from:	–
		<input checked="" type="checkbox"/> threatened species survey (as described in BAM Section 5.2.4)	5.3 Threatened species surveys Table 22: Threatened species surveys for candidate flora species credit species on the Subject Land Table 23: Threatened species surveys for candidate fauna species credit species on the Subject Land
		<input checked="" type="checkbox"/> 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)	5.4 Expert reports
		Where survey has been undertaken include detailed information on:	–
		<input checked="" type="checkbox"/> survey method and effort (as described in BAM Section 5.3)	2.4.3 Field surveys Table 4: Survey methodology - Overview Method and survey effort for flora (section 5) Method and survey effort for fauna (section 5) Table 22: Threatened species surveys for candidate flora species credit species on the Subject Land

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
			Table 23: Threatened species surveys for candidate fauna species credit species on the Subject Land
		<input checked="" type="checkbox"/> 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	5.3.1 Flora 5.3.2 Fauna 2.4.3 Field surveys Table 4: Survey methodology - Overview Method and survey effort for flora (section 5) Method and survey effort for fauna (section 5) Table 22: Threatened species surveys for candidate flora species credit species on the Subject Land Table 23: Threatened species surveys for candidate fauna species credit species on the Subject Land
		<input checked="" type="checkbox"/> 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	2.4.3 Field surveys Table 4: Survey methodology - Overview Method and survey effort for flora Method and survey effort for fauna Table 22: Threatened species surveys for candidate flora species credit species on the Subject Land Table 23: Threatened species surveys for candidate fauna species credit species on the Subject Land
		<input checked="" type="checkbox"/> survey personnel and relevant experience	2.4.3 Field surveys Table 4: Survey methodology - Overview Method and survey effort for flora Method and survey effort for fauna Declarations Authors and contributors

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<input checked="" type="checkbox"/> describe any limitations to surveys and how these were addressed/overcome	2.6 Limitations Limiting factors for fauna surveys (section 5)
		Where an expert report has been used in place of survey (as described in BAM Section 5.3, Box 3), include:	–
		<input type="checkbox"/> justification of the use of an expert report	NA
		<input type="checkbox"/> identify the expert, provide evidence of their expert credentials and departmental approval of expert status	
		<input type="checkbox"/> all requirements of Box 3 have been addressed in the expert report	
		Where use of local data is proposed (BAM Subsection 1.4.2):	–
		<input type="checkbox"/> identify relevant species	NA
		<input type="checkbox"/> identify data to be amended	
		<input type="checkbox"/> identify source of information for local data, e.g. published literature, additional survey data, etc.	
		<input type="checkbox"/> justify use of local data in preference to VIS Classification or TBDC data	
		<input type="checkbox"/> provide written confirmation from the decision-maker that they support the use of local data	NA
		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:	–
		<input checked="" type="checkbox"/> the unit of measure for each species is documented	Table 24: Results for present species credit species (recorded within the Subject Land) and species polygon details Figure 13a: Species polygon for Squirrel Glider within the Subject Land. Scale 1:6,500 Figure 13b: Species polygon for Southern Myotis within the Subject Land. Scale 1:6,500

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
			<p>Figure 13c: Species polygon for Sloane's Froglet within the Subject Land. Scale 1:6,500</p> <p>Figure 13d: Species polygon for Regent Honeyeater (and IHM area) within the Subject Land. Scale 1:6,500</p> <p>Figure 17: Potential SAI entities (Sloane's Froglet and Regent Honeyeater habitat) within the Subject Land. Scale 1:6,500</p> <p>5.6 Area or count, and location of suitable habitat for a species credit species (a species polygon)</p>
		for species assessed by area:	–
		<input checked="" type="checkbox"/> the polygon includes the extent of suitable habitat for the target species within the Subject Land (as described in BAM Subsection 5.2.5)	<p>Table 24: Results for present species credit species (recorded within the Subject Land) and species polygon details</p> <p>Table 36: Impacts assessment – Sloane's Froglet</p> <p>Table 38: Impacts assessment – Regent Honeyeater</p> <p>5.6 Area or count, and location of suitable habitat for a species credit species (a species polygon)</p>
		<input checked="" type="checkbox"/> 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	<p>2.3.2 Habitat constraints assessment</p> <p>2.4.2 Habitat constraints assessment</p> <p>Table 35: Current status – Sloane's Froglet</p> <p>Table 36: Impacts assessment – Sloane's Froglet</p> <p>Table 37: Current status – Regent Honeyeater</p> <p>Table 38: Impacts assessment – Regent Honeyeater</p> <p>Table 24: Results for present species credit species (recorded within the Subject Land) and species polygon details</p> <p>5.6 Area or count, and location of suitable habitat for a species credit species (a species polygon)</p>

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		for species assessed by counts of individuals:	–
		<input type="checkbox"/> the number of individual plants present on the Subject Land (as described in BAM Subsection 5.2.5(3.))	NA
		<input type="checkbox"/> the method used to derive this number (i.e. threatened species survey or expert report) and evidence-based justification for the approach taken	NA
		<input type="checkbox"/> 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	NA
		<input checked="" type="checkbox"/> 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 24: Results for present species credit species (recorded within the Subject Land) and species polygon details Table 41: Impacts that require an offset – species credits
		Maps and tables	
		<input checked="" type="checkbox"/> Table showing ecosystem credit species in accordance with BAM Subsection 5.1.1, and identifying:	Table 17: Predicted ecosystem credit species
		<input checked="" type="checkbox"/> the ecosystem credit species removed from the list	Table 17: Predicted ecosystem credit species
		<input checked="" type="checkbox"/> the sensitivity to gain class of each species	Table 17: Predicted ecosystem credit species
		<input checked="" type="checkbox"/> Table detailing species credit species in accordance with BAM Section 5.2 and identifying:	Table 18: Candidate flora species credit species Table 19: Candidate fauna species credit species
		<input checked="" type="checkbox"/> 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 18: Candidate flora species credit species Table 19: Candidate fauna species credit species>
		<input checked="" type="checkbox"/> the candidate species credit species not recorded on the Subject Land as determined by targeted survey, expert report or important habitat map	5.2 Presence of candidate species credit species Table 20: Determining the presence of candidate flora species credit species on the Subject Land

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
			Table 21: Determining the presence of candidate fauna species credit species on the Subject Land>
		<input checked="" type="checkbox"/> 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)	Table 3: Survey periods for candidate threatened flora and fauna species (BAM-C) Table 20: Determining the presence of candidate flora species credit species on the Subject Land Table 21: Determining the presence of candidate fauna species credit species on the Subject Land Table 22: Threatened species surveys for candidate flora species credit species on the Subject Land Table 23: Threatened species surveys for candidate fauna species credit species on the Subject Land Table 24: Results for present species credit species (recorded within the Subject Land) and species polygon details Table 24: Results for present species credit species (recorded within the Subject Land) and species polygon details
		<input checked="" type="checkbox"/> 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 13a: Species polygon for Squirrel Glider within the Subject Land. Scale 1:6,500 Figure 13b: Species polygon for Southern Myotis within the Subject Land. Scale 1:6,500 Figure 13c: Species polygon for Sloanes Froglet within the Subject Land. Scale 1:6,500 Figure 13d: Species polygon for Regent Honeyeater (and IHM area) within the Subject Land. Scale 1:6,500
		Data	
		<input checked="" type="checkbox"/> Digital shape files of suitable habitat identified for survey for each candidate species credit species	To be provided

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<input checked="" type="checkbox"/> Survey locations including GPS coordinates of any plots, transects, grids	To be provided
		<input checked="" type="checkbox"/> Digital shape files of each species polygon including GPS coordinates of located individuals	To be provided
		<input checked="" type="checkbox"/> Species polygon map in jpeg format	To be provided
		<input checked="" type="checkbox"/> Expert reports and any supporting data used to support conclusions of the expert report	NA
		<input checked="" type="checkbox"/> Field datasheets detailing survey information including prevailing conditions, date, time, equipment used, etc.	Appendix J: Field Sheets
Prescribed impacts	Chapter 6	Information	
		Identify potential prescribed biodiversity impacts on threatened entities, including:	–
		<input checked="" type="checkbox"/> karst, caves, crevices, cliffs, rocks and other geological features of significance (as described in BAM Subsection 6.1.1) <input checked="" type="checkbox"/> occurrences of human-made structures and non-native vegetation (as described in BAM Subsection 6.1.2) <input checked="" type="checkbox"/> corridors or other areas of connectivity linking habitat for threatened entities (as described in BAM Subsection 6.1.3) <input checked="" type="checkbox"/> waterbodies or any hydrological processes that sustain threatened entities (as described in BAM Subsection 6.1.4)	6. Identifying prescribed impacts Table 26: Prescribed impacts identified 8.3 Prescribed impacts
		<input checked="" type="checkbox"/> 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)	NA
		<input checked="" type="checkbox"/> 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)	6. Identifying prescribed impacts Table 26: Prescribed impacts identified 8.3 Prescribed impacts 8.3.2 Vehicle strikes 8.3.5 Vehicle strikes – predicted impacts

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
			Table 31: Residual prescribed impacts – vehicle strikes Figure 16: Potential vehicle strike areas for Sloane's Froglet within the Subject Land. Scale 1:6,500
		<input checked="" type="checkbox"/> Identify a list of threatened entities that may be dependent upon or may use habitat features associated with any of the prescribed impacts	Table 26: Prescribed impacts identified
		<input checked="" type="checkbox"/> 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)	Table 26: Prescribed impacts identified
		Where the proposed development is for a wind farm:	–
		<input type="checkbox"/> 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)	NA
		<input type="checkbox"/> provide details of targeted survey for candidate species of wind farm developments undertaken in accordance with BAM Subsection 6.1.5(2–3.)	NA
		<input type="checkbox"/> 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.))	NA
		Where the proposal may result in vehicle strike:	–
		<input checked="" type="checkbox"/> 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	6. Identifying prescribed impacts Table 26: Prescribed impacts identified 8.3 Prescribed impacts 8.3.2 Vehicle strikes 8.3.5 Vehicle strikes

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
			Table 31: Residual prescribed impacts – vehicle strikes Figure 16: Potential vehicle strike areas for Sloane's Froglet within the Subject Land. Scale 1:6,500
		Maps and tables	
		<input checked="" type="checkbox"/> Map showing location of any prescribed impact features (i.e. karst, caves, crevices, cliffs, rocks, human-made structures, etc.)	Figure 16: Potential vehicle strike areas for Sloane's Froglet within the Subject Land. Scale 1:6,500
		<input checked="" type="checkbox"/> Map showing location of potential vehicle strike locations	Figure 16: Potential vehicle strike areas for Sloane's Froglet within the Subject Land. Scale 1:6,500
		<input type="checkbox"/> 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)	NA
		Data	
		<input checked="" type="checkbox"/> Digital shape files of prescribed impact feature locations	To be provided
		<input checked="" type="checkbox"/> Prescribed impact features map in jpeg format	To be provided
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:	–
		<input checked="" type="checkbox"/> modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology	Actions to avoid and minimise direct and indirect impacts for Sloane's Froglet Actions to avoid and minimise direct and indirect impacts for Regent Honeyeater 7. Avoid and minimise impacts Appendix E: Matters of national environmental significance

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
			7.3 Summary of measures to avoid and minimise impacts
		<input checked="" type="checkbox"/> routes that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed route	7. Avoid and minimise impacts 7.1.1 Project location 7.1.2 Project design 7.3 Summary of measures to avoid and minimise impacts
		<input checked="" type="checkbox"/> alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location	7. Avoid and minimise impacts 7.1.1 Project location 7.1.2 Project design 7.3 Summary of measures to avoid and minimise impacts
		<input checked="" type="checkbox"/> 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. Avoid and minimise impacts 7.1.1 Project location 7.1.2 Project design 7.3 Summary of measures to avoid and minimise impacts
		<input checked="" type="checkbox"/> 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. Avoid and minimise impacts 7.1.1 Project location 7.1.2 Project design 7.2 Other measures considered 7.3 Summary of measures to avoid and minimise impacts

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
			Table 27: CEMP avoidance and minimisation measures for direct, indirect and prescribed impacts
		<input checked="" type="checkbox"/> 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. Avoid and minimise impacts
		<input checked="" type="checkbox"/> Detail measures or options considered but not implemented because they are not feasible and/or practical (e.g. due to site constraints)	NA
		Maps and tables	
		<input checked="" type="checkbox"/> Table of measures to be implemented to avoid and minimise the impacts of the proposal, including action, outcome, timing and responsibility	Table 27: CEMP avoidance and minimisation measures for direct, indirect and prescribed impacts
		<input checked="" type="checkbox"/> Map of alternative footprints considered to avoid or minimise impacts on biodiversity values; and of the final proposal footprint, including construction and operation	NA
		<input checked="" type="checkbox"/> Maps demonstrating indirect impact zones where applicable	Figure 14: Development impact areas, trees status and lost vegetation within C3 zoned areas of the Subject Land. Scale 1:6,500 Figure 15: Development impact areas (lost and deemed lost trees) within R1 zoned areas of the Subject Land. Scale 1:6,500
		Data	
		Digital shape files of:	To be provided
		<input checked="" type="checkbox"/> alternative and final proposal footprint	To be provided
		<input checked="" type="checkbox"/> direct and indirect impact zones	To be provided
		<input checked="" type="checkbox"/> Maps in jpeg format	To be provided
Assessment of impacts	Chapter 8, Sections 8.1 and 8.2	Information	

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<input checked="" type="checkbox"/> 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)	8.1 Direct impacts Table 28: Summary of residual direct impacts
		Assessment of indirect impacts on vegetation and threatened species and their habitat including (as described in BAM Section 8.2):	–
		<input checked="" type="checkbox"/> description of the nature, extent, frequency, duration and timing of indirect impacts of the proposal	8.2 Indirect impacts Table 30: Summary of residual indirect impacts
		<input checked="" type="checkbox"/> documenting the consequences to vegetation and threatened species and their habitat including evidence-based justifications	8.2 Indirect impacts Table 30: Summary of residual indirect impacts
		<input checked="" type="checkbox"/> reporting any limitations or assumptions, etc. made during the assessment	8.2 Indirect impacts 2.6 Limitations
		<input checked="" type="checkbox"/> identification of the threatened entities and their habitat likely to be affected	Table 26: Prescribed impacts identified 8.2 Indirect impacts Table 30: Summary of residual indirect impacts
		Assessment of prescribed biodiversity impacts (as described in BAM Section 8.3) including:	6. Identifying prescribed impacts 8.3 Prescribed impacts
		assessment of the nature, extent frequency , duration and timing of impacts on the habitat of threatened species or ecological communities associated with:	–
		<input checked="" type="checkbox"/> karst, caves, crevices, cliffs, rocks and other features of geological significance	6. Identifying prescribed impacts NA
		<input checked="" type="checkbox"/> human-made structures	6. Identifying prescribed impacts NA
		<input checked="" type="checkbox"/> non-native vegetation	6. Identifying prescribed impacts

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<input checked="" type="checkbox"/> connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range	6. Identifying prescribed impacts 8.3.3 Habitat connectivity
		<input checked="" type="checkbox"/> movement of threatened species that maintains their life cycle	6. Identifying prescribed impacts
		<input checked="" type="checkbox"/> water quality, waterbodies and hydrological processes that sustain threatened species and threatened ecological communities	6. Identifying prescribed impacts 8.3.4 Waterbodies, water quality and hydrological processes
		<input checked="" type="checkbox"/> assessment of the impacts of wind turbine strikes on protected animals	NA
		<input checked="" type="checkbox"/> assessment of the impacts of vehicle strikes on threatened species of animals or on animals that are part of a TEC	6. Identifying prescribed impacts Table 26: Prescribed impacts identified 8.3 Prescribed impacts 8.3.2 Vehicle strikes 8.3.5 Vehicle strikes Table 31: Residual prescribed impacts – vehicle strikes Figure 16: Potential vehicle strike areas for Sloane's Froglet within the Subject Land. Scale 1:6,500
		<input checked="" type="checkbox"/> evaluate the consequences of prescribed impacts	8.3 Prescribed impacts
		<input checked="" type="checkbox"/> describe impacts that are uncertain	8.5 Adaptive management strategy for uncertain impacts (where relevant)
		<input checked="" type="checkbox"/> document limitations to data, assumptions and predictions	2.6 Limitations
		Maps and tables	
		<input checked="" type="checkbox"/> Table showing change in vegetation integrity score for each vegetation zone as a result of identified impacts	Table 1 Impacts to vegetation integrity Table 40: Impacts that require an offset – ecosystem credits

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		Data	
		N/A	–
Mitigation management and 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:	–
		<input checked="" type="checkbox"/> techniques, timing, frequency and responsibility <input checked="" type="checkbox"/> identify measures for which there is risk of failure <input checked="" type="checkbox"/> evaluate the risk and consequence of any residual impacts	8.4 Mitigating residual impacts – management measures and implementation Table 27: CEMP avoidance and minimisation measures for direct, indirect and prescribed impacts 8.3 Prescribed impacts Table 30: Summary of residual indirect impacts Table 32: Summary of proposed mitigation and management measures for residual impacts (direct, indirect and prescribed)
		<input checked="" type="checkbox"/> document any adaptive management strategy proposed	8.5 Adaptive management strategy for uncertain impacts (where relevant) Table 33: Mitigation actions that require monitoring of their implementation and success
		Identification of measures for mitigating impacts related to:	–
		<input checked="" type="checkbox"/> displacement of resident fauna (as described in BAM Subsection 8.4.1(2.)) <input checked="" type="checkbox"/> indirect impacts on native vegetation and habitat (as described in BAM Subsection 8.4.1(3.)) <input checked="" type="checkbox"/> mitigating prescribed biodiversity impacts (as described in BAM Subsection 8.4.2)	8.4 Mitigating residual impacts – management measures and implementation 8.2 Indirect impacts

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<input checked="" type="checkbox"/> Details of the adaptive management strategy proposed to monitor and respond to impacts on biodiversity values that are uncertain (BAM Section 8.5)	Table 33: Mitigation actions that require monitoring of their implementation and success
		Maps and tables	
		<input checked="" type="checkbox"/> 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 27: CEMP avoidance and minimisation measures for direct, indirect and prescribed impacts Table 30: Summary of residual indirect impacts
		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:	–
		<input checked="" type="checkbox"/> addressing all criteria in Subsection 9.1.1 for each TEC listed as at risk of an SAII present on the Subject Land	9.1 Assessment for serious and irreversible impacts on biodiversity values Table 34: Entities at risk of an SAII
		<input checked="" type="checkbox"/> for each TEC, report the extent of the TEC in NSW	9.1.1. Additional impact assessment provisions for TECs at risk of an SAII
		<input checked="" type="checkbox"/> addressing all criteria in Subsection 9.1.2 for each threatened species at risk of an SAII present on the Subject Land	9. Serious and irreversible impacts Table 34: Entities at risk of an SAII Figure 17: Potential SAII entities (Sloane's Froglet and Regent Honeyeater habitat) within the Subject Land. Scale 1:6,500 9.1.2 Additional impact assessment provisions for threatened species at risk of an SAII Sloane's Froglet – <i>Crinia sloanei</i> Regent Honeyeater

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
			>
		<input checked="" type="checkbox"/> for each threatened species, report the population size in NSW	Table 35: Current status – Sloane’s Froglet Table 37: Current status – Regent Honeyeater
		<input checked="" type="checkbox"/> documenting assumptions made and/or limitations to information	Table 35: Current status – Sloane’s Froglet Table 37: Current status – Regent Honeyeater
		<input checked="" type="checkbox"/> documenting all sources of data, information, references used or consulted	
		<input checked="" type="checkbox"/> clearly justifying why any criteria could not be addressed	
		<input checked="" type="checkbox"/> Identification of impacts requiring offset in accordance with BAM Section 9.2	10.1 Determine an offset requirement for impacts Table 40: Impacts that require an offset – ecosystem credits Table 41: Impacts that require an offset – species credits Figure 18: Directly impacted areas used for determining BAM-C offsetting requirements within the Subject Land. Scale 1:6,500
		<input checked="" type="checkbox"/> Identification of impacts not requiring offset in accordance with BAM Subsection 9.2.1(3.)	Table 39: Impacts that do not require offset – ecosystem credits
		<input checked="" type="checkbox"/> Identification of areas not requiring assessment in accordance with BAM Section 9.3	4.4 Vegetation zones
		Maps and tables	
		<input checked="" type="checkbox"/> Map showing the extent of TECs at risk of an SAIL within the Subject Land	Figure 11: Areas of BC Act listed TEC – Grassy Woodlands. Scale 1:6,500
		<input checked="" type="checkbox"/> Map showing location of threatened species at risk of an SAIL within the Subject Land	Figure 17: Potential SAIL entities (Sloane’s Froglet and Regent Honeyeater habitat) within the Subject Land. Scale 1:6,500

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		Map/table showing location of:	–
		<input checked="" type="checkbox"/> impacts requiring offset	Table 40: Impacts that require an offset – ecosystem credits Table 41: Impacts that require an offset – species credits
		<input checked="" type="checkbox"/> impacts not requiring offset	Table 39: Impacts that do not require offset – ecosystem credits
		<input checked="" type="checkbox"/> areas not requiring assessment	Figure 12: Vegetation zones and patch sizes within the Subject Land. Scale 1:6,500
		Data	
		Digital shape files of:	To be provided
		<input checked="" type="checkbox"/> extent of TECs at risk of an SAI within the Subject Land	To be provided
		<input checked="" type="checkbox"/> location of threatened species at risk of an SAI within the Subject Land	To be provided
		<input checked="" type="checkbox"/> boundary of impacts requiring offset	To be provided
		<input checked="" type="checkbox"/> boundary of impacts not requiring offset	To be provided
		<input checked="" type="checkbox"/> boundary of areas not requiring assessment	To be provided
		<input checked="" type="checkbox"/> Maps in jpeg format	To be provided
Impact summary	Chapter 10	Information	
		Ecosystem credits and species credits that measure the impact of the development on biodiversity values, including:	–
		<input checked="" type="checkbox"/> future vegetation integrity score for each vegetation zone within the Subject Land (Equation 25 and Equation 26 in BAM Appendix H)	Table 40: Impacts that require an offset – ecosystem credits
		<input checked="" type="checkbox"/> change in vegetation integrity score (BAM Subsection 8.1.1)	

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<input checked="" type="checkbox"/> 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)	
		<input checked="" type="checkbox"/> biodiversity risk weighting for each	Table 40: Impacts that require an offset – ecosystem credits
		<input checked="" type="checkbox"/> number of required species credits for each candidate threatened species that is directly impacted on by the proposal (BAM Subsection 10.1.3)	10.1.1 Impacts on native vegetation and TECs or ECs (ecosystem credits) Table 41: Impacts that require an offset – species credits
		Maps and tables	
		<input checked="" type="checkbox"/> Table of PCTs requiring offset and the number of ecosystem credits required	Table 40: Impacts that require an offset – ecosystem credits
		<input checked="" type="checkbox"/> Table of threatened species requiring offset and the number of species credits required	Table 41: Impacts that require an offset – species credits
		Data	
		<input checked="" type="checkbox"/> Submitted proposal in the BAM Calculator	To be completed after initial review
Biodiversity credit report	Chapter 10	Information	
		<input checked="" type="checkbox"/> 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 43: Ecosystem credit class and matching credit profile Table 44: Species credit class and matching credit profile
		<input checked="" type="checkbox"/> BAM credit report in pdf format	Appendix H: BAM-C and credit reports
		Maps and tables	
		<input checked="" type="checkbox"/> Table of credit class and matching credit profile	Table 43: Ecosystem credit class and matching credit profile

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
			Table 44: Species credit class and matching credit profile
		Data	
		<input checked="" type="checkbox"/> BAM credit report in pdf format	Appendix H: BAM-C and credit reports

Appendix B: Biodiversity Values Map and Threshold tool 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 your local council 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 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		06/08/2024 8:59 AM
1. Biodiversity Values (BV) Map - Results Summary (Biodiversity Conservation Regulation Section 7.3)		
1.1	Does the development Footprint intersect with BV mapping?	yes
1.2	Was <u>ALL</u> BV Mapping within the development footprint added in the last 90 days? (dark purple mapping only, no light purple mapping present)	no
1.3	Date of expiry of dark purple 90 day mapping	N/A
1.4	Is the Biodiversity Values Map threshold exceeded?	yes
2. Area Clearing Threshold - Results Summary (Biodiversity Conservation Regulation Section 7.2)		
2.1	Size of the development or clearing footprint	843,032.4 sqm
2.2	Native Vegetation Area Clearing Estimate (NVACE) (within development/clearing footprint)	65,357.8 sqm
2.3	Method for determining Minimum Lot Size	LEP
2.4	Minimum Lot Size (10,000sqm = 1ha)	450 sqm
2.5	Area Clearing Threshold (10,000sqm = 1ha)	2,500 sqm
2.6	Does the estimate exceed the Area Clearing Threshold? (NVACE results are an estimate and can be reviewed using the Guidance)	yes
REPORT RESULT: Is the Biodiversity Offset Scheme (BOS) Threshold exceeded for the proposed development footprint area? (Your local council will determine if a BDAR is required)		yes

Page 1 of 4



Department of Planning and Environment

What do I do with this report?

- If the result above indicates the BOS Threshold has been exceeded, your local council **may require** a Biodiversity Development Assessment Report with your development application. Seek further advice from Council. An accredited assessor can apply the Biodiversity Assessment Method and prepare a BDAR for you. For a list of accredited assessors go to: <https://customer.lmbc.nsw.gov.au/assessment/AccreditedAssessor>.
- If the result above indicates the BOS Threshold **has not been exceeded**, you may not require a Biodiversity Development Assessment Report. This BMAT report can be provided to Council to support your development application. Council can advise how the area clearing threshold results should be considered. Council will review these results and make a determination if a BDAR is required. Council may ask you to review the area clearing threshold results. You may also 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*.
- If a BDAR is not required by Council, you may still require a permit to clear vegetation from your local council.
- If **all** Biodiversity Values mapping within your development footprint was less than 90 days old, i.e. areas are displayed as dark purple on the BV 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 1.3 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 or Council disagree with the area clearing threshold estimate results from the NVACE in Line Item 2.6 above (i.e. area of Native Vegetation within the Development footprint proposed to be cleared), review the results using the [Guide for reviewing area clearing threshold results from the BMAT Tool](#).

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: _____

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

Date: _____

06/08/2024 08:59 AM



Department of Planning and Environment

Biodiversity Values Map and Threshold Tool

The Biodiversity Values (BV) Map and Threshold Tool identifies land with high biodiversity value, particularly sensitive to impacts from development and clearing.

The BV map forms part of the Biodiversity Offsets Scheme threshold, which is one of the factors for determining whether the Scheme applies to a clearing or development proposal. You have used the Threshold Tool in the map viewer to generate this BV Threshold Report for your nominated area. This report calculates results for your proposed development footprint and indicates whether Council may require you to engage an accredited assessor to prepare a Biodiversity Development Assessment Report (BDAR) for your development.

This report may be used as evidence for development applications submitted to councils. You may also use this report when considering native vegetation clearing under the State Environmental Planning Policy (Biodiversity and Conservation) 2021 - Chapter 2 vegetation in non-rural areas.

What's new? For more information about the latest updates to the Biodiversity Values Map and Threshold Tool go to the updates section on the [Biodiversity Values Map webpage](#).

Map Review: Landholders can request a review of the BV Map where they consider there is an error in the mapping on their property. For more information about the map review process and an application form for a review go to the [Biodiversity Values Map Review webpage](#).

If you need help using this map tool see our [Biodiversity Values Map and Threshold Tool User Guide](#) or contact the Map Review Team at map.review@environment.nsw.gov.au or on 1800 001 490.

Biodiversity Values Map



1,064.6 0 532.30 1,064.6 Metres

WGS_1984_Web_Mercator_Auxiliary_Sphere

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

06/08/2024 08:59 AM

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.

Imagery © Airbus DS/Spot Image 2016

© NSW Department of Customer Service, Basemaps 2019

© NSW Department of Planning and Environment

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 C: Test of Significance

The most recent version (version 4) of the original ToS which was developed by Hamilton Environmental Services has been provided separately to this report, in the package of documentation that accompanies the development application submission.

Appendix D: Determination of excluded impacts

There is no category 1-exempt land on the Subject Land and this section is not applicable.

Appendix E: Matters of national environmental significance

Given the potential for impacts to Sloane's Froglet, an SAI entity listed under the EPBC Act, the project is deemed likely to be a controlled action, and the following section summarises 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.

MNES overview

The MNES that are relevant to the project (i.e. those being or potentially being impacted by the development) include Sloane's Froglet and Regent Honeyeater, as well as NSW Grassy Woodlands TEC. The impacts to the TEC, and to Regent Honeyeater and its habitat are considered low, and therefore the TEC, species or its habitat is not being significantly impacted or threatened by the development (but some offsets for habitat impacts are still required). Sloane's Froglet, however, is likely to experience more impacts, including some impacts to its breeding habitat (loss of one dam and impacts to two other dams), and impacts to its current migrational pathways through the Subject Land. Given the development impacts on numerous areas of Sloane's Froglet habitat, including breeding habitat, and the fact Sloane's Froglet is an entity that is considered a Significant and Irreversible Impact (SAII) candidate, the project is recommended to be referred to the Commonwealth Government and is therefore highly likely to become a controlled action.

Measures taken to avoid and minimise impacts to MNES

There are a number of avoid and minimise actions that have been taken throughout the design process right across the Subject Land, all of which will contribute to reducing the impacts made to Sloane's Froglet. These actions are discussed in **Section 7**. The specific actions undertaken to avoid and minimise impacts to Sloane's Froglet breeding and migrational habitat, and their ongoing survivability after the estate is developed, includes the following:

- No subdivision construction works are to be undertaken during the Sloane's Froglet breeding season.
- All machinery that has previously been working in aquatic habitats (dams, creeks etc) must be high pressure washed, AND decontaminated with an appropriate anti-fungal treatment that can deal with Chytrid Fungus (such as Phtyoclean)
- Drainage areas to be searched prior to high impact works taking place
- Pre-clearance inspections to occur in dams that are undergoing works, with specimens to be relocated to nearby retained dams
- Works in Sloane's Froglet habitat and mapped movement corridors not to take place during their breeding and migrational movement season (winter and early spring)
- Proposed chain-of-ponds and stormwater basins to be designed to Sloane's Froglet habitat standards

- Monitoring in winter and early spring to determine if new basins and chain-of-ponds connectivity features are being effectively utilised by Sloane's Froglet
- Stormwater basins and chain-of-ponds areas to be rehabilitated with Sloane's Froglet friendly local indigenous plantings.
- Curbs in estate to be designed to facilitate easy movement of Sloane's Froglet (prevent them being trapped on roads)
- Barriers (diversions) to be constructed between waterbodies and nearby roads to reduce the risks of vehicle strikes
- Appropriate offsets in accordance with the BOS requirements are to be legally secured prior to any works taking place in the construction areas.

MNES impacts

Minor impacts to 0.26 hectares of low quality Regent Honeyeater habitat are expected. The impacts that are expected to remain for Sloane's Froglet after the avoid and minimise actions are incorporated are:

- The loss of one small farm dam (current breeding habitat)
- Impact to a portion of a dam that is being re-shaped (impacts likely to be temporary)
- Minor impacts to a dam that is to receive stormwater outflows
- Impacts to current migrational pathways through R1 areas between dams and creeks
- Potential for vehicle strikes on roads within the future housing estate.

Risk mitigation measures to help protect MNES

There are a number of risk mitigation measures being addressed via the subdivision designs and the development and implementation of a detailed CEMP, the most relevant of which pertaining to Sloane's Froglet and its habitat include:

- No subdivision construction works are to be undertaken during the Sloane's Froglet breeding season.
- Creation of a chain-of-ponds style habitat corridor that utilised stormwater flows along the southern boundary, and is to be designed to Sloane's Froglet habitat requirements
- Curbing throughout the estate to be designed to ensure Sloane's Froglet have a reduced risk of being trapped on road surfaces (shallow sloping curbs)
- Installation of barriers near likely Sloane's Froglet routes into the estate and onto roads, to redirect the frogs along appropriate movement corridors, to reduce the risks of vehicle strikes and entrapment of frogs in inappropriate areas of the estate
- Strict pollution, erosion and sedimentation controls to be in place throughout the construction process, including regular monitoring to ensure measures are working and engineered structures are maintained in a working order
- Creation of new stormwater detention basins throughout strategic areas of the subdivision, designed to Sloane's Froglet habitat requirements and to provide additional higher-quality areas of breeding habitat
- Monitoring program to study the colonisation of all new stormwater detention basins post-development, monitoring to ensure frogs are still utilising existing corridors along creeks nearby

post-development, and monitoring to determine if frogs are using the designated chain-of-ponds corridor along the southern boundary during their annual movements.

- Triggers for review of the designs built into the monitoring programs, in the instances where Sloane's Froglet are not using existing basins, not colonising new detention basins, or not using existing movement corridors, or not being observed using the chain-of-ponds habitat corridor.

Final offset requirements for MNES impacts

In terms of offsets under the BC Act (BOS), these include a small amount of development impacts that were included via the assessments and calculations made in the BAM-C (where native vegetation is present and impacted), which consist of three (3) species credits for Sloane's Froglet, where impacts were occurring to Sloane's habitat in mapped native vegetation areas, and six (6) species credits for Regent Honeyeater to offset 0.26 hectares of impacts to important mapped habitat. Given the absence of native vegetation across other areas of the Subject Land that contain Sloane's breeding and movement habitat (and hence them not being calculable via BAM-C), prescribed impacts were also included, which consist of a proposal to retire 2 species credits for breeding habitat, and 5 species credits for migratory (movement corridor) habitat losses for Sloane's Froglet. As a likely controlled action, further offsets for Sloane's Froglet may be required under the EPBC Act.

Relevant sections of this BDAR which discuss MNES and impacts

The main sections of this report that discuss MNES and their impacts are **Section 4** (TECs), **Section 5** (habitat for threatened species), **Section 6** (prescribed impacts), **Section 7** (avoid and minimise measures), **Section 8** (impact assessment), **Section 9** (SAII), **Section 10** (impact summary), and **Section 11** (offset credits).

Appendix F: Vegetation survey data

Table 3: Vegetation survey data and locations

plot	pct	area	patchsize	condition class	zone	easting	northing	bearing	compTree	compShrub	compGrass	compForbs	compFerns	compOther	strucTree	strucShrub	strucGrass	strucForbs	strucFerns	strucOther	funLargeTrees	funHollowtrees	funLitterCover	funLenFallenLogs	funTreeStem5to9	funTreeStem10to19	funTreeStem20to29	funTreeStem30to49	funTreeStem50to79	funTreeRegen	funHighThreatExotic	Plot-based vegetation survey?	Vegetation integrity survey?
1	266	0.04	0-5	Remnant	266_Remnant01_Sth	499865	6014484	358	2	1	5	0	0	0	35	0.3	6.8	0	0	0	4	4	23	9	y	y	n	y	na	y	60	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2	266	0.02	0-5	Remnant	266_Remnant02_Nth	499833	6014464	270	1	0	7	1	0	0	5	0	41	0.1	0	0	0	0	17	2	y	y	n	n	na	y	15	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3	278	0.06	0-5	Reveg	278_Revegetation	500543	6013733	195	1	4	1	1	0	0	1	38.8	0.2	0.1	0	0	0	0	7.4	4	y	n	n	n	na	n	40	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
4	266	0.01	0-5	Wetland	266_Wetland	499970	6014482	4	0	0	6	4	0	0	0	0	60.1	3.7	0	0	0	0	0	0	y	n	n	n	na	y	28	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5	266	0.05	0-5	Reveg	266_Revegetation	500596	6014374	3	0	4	1	0	0	12	0	10.1	1	0	0	0	0	0	40	1	y	y	y	y	na	y	80	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6	266	0.07	0-5	Remnant	266_Remnant_MQ	500539	6014365	85	2	0	6	2	0	0	25	0	34	1	0	0	2	0	36	5	y	y	y	y	na	y	25	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
7 (R1)	277	0.01	0-5	Remnant	277_Trees_only	499818	6014045	2	1	0	0	0	0	0	40	0	0	0	0	0	4	10	7.4	140	y	y	y	y	na	y	90	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Table 47: Scattered tree data for trees located on R1 land (entered into BAM-Cscattered tree module)

Species	DBH	Hollows	Status	TreeClass	PCT
Blakely's Red-gum	104	N	Deemed lost	3	266
Blakely's Red-gum	297	Y	Deemed lost	3	266
Blakely's Red-gum	99	Y	Deemed lost	3	266
Blakely's Red-gum	103	Y	Lost	3	266
Dead	57	Y	Lost	3	266
Red Box	81	Y	Deemed lost	3	266
Red Box	104	Y	Deemed lost	3	266
White Box	59	Y	Lost	3	266
Yellow Box	69	N	Deemed lost	3	266
Yellow Box	151	Y	Deemed lost	3	266
Yellow Box	112	Y	Deemed lost	3	266
Yellow Box	112	Y	Lost	3	266
Blakely's Red-gum	236	Y	Deemed lost	3	277
Blakely's Red-gum	150	Y	Deemed lost	3	277
Blakely's Red-gum	116	Y	Deemed lost	3	277
Blakely's Red-gum	13	N	Lost	1	277
Blakely's Red-gum	49	Y	Lost	2	277
Blakely's Red-gum	97	Y	Lost	3	277
Dead	109	Y	Lost	3	277
Dead	62	Y	Lost	3	277
Dead	112	Y	Lost	3	277
Red Box	88	Y	Deemed lost	3	277
Yellow Box	90	N	Deemed lost	3	277
Yellow Box	18	N	Deemed lost	1	277
Yellow Box	81	Y	Deemed lost	3	277
Yellow Box	111	Y	Lost	3	277
Blakely's Red-gum	18	N	Deemed lost	1	278
Blakely's Red-gum	52	N	Deemed lost	3	278

Appendix G: Decision-maker authorisation to use more appropriate local data


Not applicable to this development.

Appendix H: BAM-C and credit reports

Appended in the following pages are copies (PDF format) of the following BAM-C credit reports with finalised status (one report for each of the three BAM-C assessments):

- Credits summary report
- Biodiversity credit report (Like-for-like)
- Candidate threatened species report (not available for the R1 scattered tree module)
- Predicted species report.

Credits summary report (C3 land assessment – Case 00054055)



BAM Credit Summary Report

Proposal Details

Assessment Id

00054054/BAAS24052/24/00054055

Assessor Name

Stuart Mendham

Assessor Number

BAAS24052

Assessment Revision

3

Proposal Name

Williams Road_Thurgoona_BDAR_V2

Report Created

08/05/2025

BAM Case Status

Finalised

BOS entry trigger

Test of significance

BAM data last updated *

28/10/2024

BAM Data version *

Current classification (live - default) (80)

Date Finalised

02/05/2025

Assessment Type

Part 4 Developments (General)

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

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

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAIL	Ecosystem credits
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Assessment Id

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Proposal Name

Williams Road_Thurgoona_BDAR_V2

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BAM Credit Summary Report

Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion

3	278_Revegetation	Not a TEC	4.5	4.5	0.06	PCT Cleared - 80%	High Sensitivity to Gain			2.00		0
										Subtotal		0

White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion

1	266_Remnant01_Sth	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	47.1	47.1	0.04	Population size	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	1
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Assessment Id

00054054/BAAS24052/24/00054055

Proposal Name

Williams Road_Thurgoona_BDAR_V2

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BAM Credit Summary Report

2	266_Remnant02_Nth	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	38.3	38.3	0.02	Population size	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	1
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Assessment Id

00054054/BAAS24052/24/00054055

Proposal Name

Williams Road_Thurgoona_BDAR_V2

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BAM Credit Summary Report

4	266_Wetland	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	36.2	36.2	0.01	Population size	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	1
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Assessment Id

00054054/BAAS24052/24/00054055

Proposal Name

Williams Road_Thurgoona_BDAR_V2

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BAM Credit Summary Report

5	266_Revegetation	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands	37.6	37.6	0.05	Population size	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	1
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Assessment Id

00054054/BAAS24052/24/00054055

Proposal Name

Williams Road_Thurgoona_BDAR_V2

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BAM Credit Summary Report

6	266_Remnant_MQ	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	61.5	61.5	0.07	Population size	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	3
											Subtotal	7
											Total	7

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAIL	Species credits
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Assessment Id

00054054/BAAS24052/24/00054055

Proposal Name

Williams Road_Thurgoona_BDAR_V2

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BAM Credit Summary Report

Anthochaera phrygia / Regent Honeyeater (Fauna)

266_Remnant01_Sth	47.1	47.1	0.02	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Critically Endangered	Critically Endangered	True	1
266_Remnant02_Nth	38.3	38.3	0.02	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Critically Endangered	Critically Endangered	True	1
278_Revegetation	4.5	4.5	0.04	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Critically Endangered	Critically Endangered	True	1
266_Revegetation	37.6	37.6	0.05	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Critically Endangered	Critically Endangered	True	1
266_Remnant_MQ	61.5	61.5	0.05	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Critically Endangered	Critically Endangered	True	2
								Subtotal	6

Assessment Id

00054054/BAAS24052/24/00054055

Proposal Name

Williams Road_Thurgoona_BDAR_V2

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BAM Credit Summary Report

Crinia sloanei / Sloane's Froglet (Fauna)

266_Remnant01_Sth	47.1	47.1	0.02	Geographic Distribution	Ability to colonise improved habitat	Endangered	Endangered	True	1
266_Wetland	36.2	36.2	0.01	Geographic Distribution	Ability to colonise improved habitat	Endangered	Endangered	True	1
266_Remnant_MQ	61.5	61.5	0.03	Geographic Distribution	Ability to colonise improved habitat	Endangered	Endangered	True	1
Subtotal									3

Myotis macropus / Southern Myotis (Fauna)

266_Remnant01_Sth	47.1	47.1	0.02	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	1
266_Remnant02_Nth	38.3	38.3	0.02	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	1
278_Revegetation	4.5	4.5	0.04	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	1

Assessment Id

00054054/BAAS24052/24/00054055

Proposal Name

Williams Road_Thurgoona_BDAR_V2

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BAM Credit Summary Report

266_Wetland	36.2	36.2	0.01	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	1
266_Revegetation	37.6	37.6	0.05	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	1
266_Remnant_MQ	61.5	61.5	0.05	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	2
Subtotal									7
<i>Petaurus norfolcensis / Squirrel Glider (Fauna)</i>									
266_Remnant01_Sth	47.1	47.1	0.02	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	1
266_Remnant02_Nth	38.3	38.3	0.02	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	1
278_Revegetation	4.5	4.5	0.04	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	1

Assessment Id

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Proposal Name

Williams Road_Thurgoona_BDAR_V2

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BAM Credit Summary Report


266_Revegetati on	37.6	37.6	0.05	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	1
266_Remnant_ MQ	61.5	61.5	0.05	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	2
								Subtotal	6

Assessment Id
00054054/BAAS24052/24/00054055

Proposal Name
Williams Road_Thurgoona_BDAR_V2

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Credits summary report (R1 land assessment – Case 00054536)



BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00054054/BAAS24052/25/00054536	Williams Rd Thurgoona R1 Lands	28/10/2024
Assessor Name	Report Created	BAM Data version *
Stuart Mendham	08/05/2025	Current classification (live - default) (80)
Assessor Number	BAM Case Status	Date Finalised
BAAS24052	Finalised	02/05/2025
Assessment Revision	BOS entry trigger	Assessment Type
0	BOS Threshold: Area clearing threshold	Part 4 Developments (General)

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

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

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAIL	Ecosystem credits
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Assessment Id

Proposal Name

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Williams Rd Thurgoona R1 Lands



BAM Credit Summary Report

Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion

1	277_Trees _only	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	20.7	20.7	0.01	Population size	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	1
											Subtotal	1
											Total	1

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAIL	Species credits
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Assessment Id

00054054/BAAS24052/25/00054536

Proposal Name

Williams Rd Thurgoona R1 Lands

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Credit summary report (Like-for-like) (R1 scattered tree assessment – Case 00055011)



BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00054054/BAAS24052/25/00055011	Williams Road_Thurgoona_BDAR_R1_STs	28/10/2024
Assessor Name	Report Created	BAM Data version *
Stuart Mendham	08/05/2025	Current classification (live - default) (80)
Assessor Number	BAM Case Status	Date Finalised
BAAS24052	Finalised	02/05/2025
Assessment Revision	BOS entry trigger	Assessment Type
0	BOS Threshold: Area clearing threshold	Scattered Trees

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

Scattered Trees Credit Requirement

Class	Contains hollows	Number of trees	Ecosystem credits
277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion			
2	True	1.0	1
3	True	6.0	6
3	True	1.0	1
3	True	4.0	4
			12
278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion			
3	False	1.0	1
			1
266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion			
3	True	4.0	4
3	True	2.0	2
3	True	4.0	4

Assessment Id	Proposal Name	Page 1 of 2
00054054/BAAS24052/25/00055011	Williams Road_Thurgoona_BDAR_R1_STs	



BAM Credit Summary Report

3	True	1.0	1
			11
			24

Species credits for threatened species

The scattered tree module is not applicable. This species must be assessed using chapter 5 of the BAM and BAM-C development module

Anthochaera phrygia
Regent Honeyeater

Assessment Id


00054054/BAAS24052/25/00055011

Proposal Name

Williams Road_Thurgoona_BDAR_R1_STs

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Biodiversity credit report (Like-for-like) (C3 land assessment – Case 00054055)



BAM Biodiversity Credit Report (Like for like)

| Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00054054/BAAS24052/24/00054055	Williams Road_Thurgoona_BDAR_V2	28/10/2024
Assessor Name	Assessor Number	BAM Data version *
Stuart Mendham	BAAS24052	Current classification (live - default) (80)
Proponent Names	Report Created	BAM Case Status
	08/05/2025	Finalised
Assessment Revision	BOS entry trigger	Assessment Type
3	Test of significance	Part 4 Developments (General)
Date Finalised	* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.	
02/05/2025		

| Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	Critically Endangered Ecological Community	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion

Assessment Id

00054054/BAAS24052/24/00054055

Proposal Name

Williams Road_Thurgoona_BDAR_V2

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BAM Biodiversity Credit Report (Like for like)

Species

Anthochaera phrygia / Regent Honeyeater

Crinia sloanei / Sloane's Froglet

Additional Information for Approval

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT

No Changes

Predicted Threatened Species Not On Site

Name

No Changes

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

Assessment Id

00054054/BAAS24052/24/00054055

Proposal Name

Williams Road_Thurgoona_BDAR_V2

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BAM Biodiversity Credit Report (Like for like)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	0.2	1	6	7
278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion	Not a TEC	0.1	0	0	0

266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion

Like-for-like credit retirement options

Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267,	-	266_Remnant01_Sth	Yes	1	Inland Slopes, Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

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Proposal Name

Williams Road_Thurgoona_BDAR_V2

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BAM Biodiversity Credit Report (Like for like)

268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 516, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 847, 851, 921, 1099, 1303, 1304, 1307, 1324, 1329, 1330, 1332, 1383, 1606, 1608, 1611, 1691, 1693, 1695, 1698, 3314, 3359, 3363, 3373, 3376, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150					
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and		266_Remnant0 2_Nth	No	1	Inland Slopes, Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee,

Assessment Id

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BAM Biodiversity Credit Report (Like for like)

Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla					Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi.
This includes PCT's:					or
74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 516, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 847, 851, 921, 1099, 1303, 1304, 1307, 1324, 1329, 1330, 1332, 1383, 1606, 1608, 1611, 1691,					Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Assessment Id

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Proposal Name

Williams Road_Thurgoona_BDAR_V2

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BAM Biodiversity Credit Report (Like for like)

1693, 1695, 1698, 3314, 3359, 3363, 3373, 3376, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150					
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511,		266_Wetland	No	1	Inland Slopes, Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Assessment Id

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Proposal Name

Williams Road_Thurgoona_BDAR_V2

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BAM Biodiversity Credit Report (Like for like)

516, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 847, 851, 921, 1099, 1303, 1304, 1307, 1324, 1329, 1330, 1332, 1383, 1606, 1608, 1611, 1691, 1693, 1695, 1698, 3314, 3359, 3363, 3373, 3376, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150					
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267,		266_Revegetati on	No		1 Inland Slopes, Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

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Proposal Name

Williams Road_Thurgoona_BDAR_V2

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BAM Biodiversity Credit Report (Like for like)

268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 516, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 847, 851, 921, 1099, 1303, 1304, 1307, 1324, 1329, 1330, 1332, 1383, 1606, 1608, 1611, 1691, 1693, 1695, 1698, 3314, 3359, 3363, 3373, 3376, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150					
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and		266_Remnant_ MQ	No	3	Inland Slopes, Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee,

Assessment Id

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Proposal Name

Williams Road_Thurgoona_BDAR_V2

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BAM Biodiversity Credit Report (Like for like)

Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 516, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 847, 851, 921, 1099, 1303, 1304, 1307, 1324, 1329, 1330, 1332, 1383, 1606, 1608, 1611, 1691,					Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
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Assessment Id

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Proposal Name

Williams Road_Thurgoona_BDAR_V2

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BAM Biodiversity Credit Report (Like for like)

	1693, 1695, 1698, 3314, 3359, 3363, 3373, 3376, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150					
278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion	Like-for-like credit retirement options					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Western Slopes Grassy Woodlands This includes PCT's: 201, 202, 266, 267, 274, 275, 276, 277, 278, 280, 282, 283, 286, 301, 337, 383, 426, 433, 437, 441, 444, 483, 509, 516, 589, 590, 593, 599, 847, 955, 1303, 1304, 1315, 1329, 1383, 1695, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3404, 3405, 3406, 3485, 4147	Western Slopes Grassy Woodlands >=70% and <90%	278_Revegetation	No	0	Inland Slopes, Bogan-Macquarie, Bongo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Assessment Id

00054054/BAAS24052/24/00054055

Proposal Name

Williams Road_Thurgoona_BDAR_V2

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BAM Biodiversity Credit Report (Like for like)

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Anthochaera phrygia / Regent Honeyeater	266_Remnant01_Sth, 266_Remnant02_Nth, 278_Revegetation, 266_Revegetation, 266_Remnant_MQ	0.2	6.00
Crinia sloanei / Sloane's Froglet	266_Remnant01_Sth, 266_Wetland, 266_Remnant_MQ	0.1	3.00
Myotis macropus / Southern Myotis	266_Remnant01_Sth, 266_Remnant02_Nth, 278_Revegetation, 266_Wetland, 266_Revegetation, 266_Remnant_MQ	0.2	7.00
Petaurus norfolcensis / Squirrel Glider	266_Remnant01_Sth, 266_Remnant02_Nth, 278_Revegetation, 266_Revegetation, 266_Remnant_MQ	0.2	6.00

Credit Retirement Options

Like-for-like credit retirement options

Assessment Id

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Proposal Name

Williams Road_Thurgoona_BDAR_V2

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BAM Biodiversity Credit Report (Like for like)

Anthochaera phrygia / Regent Honeyeater	Spp	IBRA subregion
	Anthochaera phrygia / Regent Honeyeater	Any in NSW
Crinia sloanei / Sloane's Froglet	Spp	IBRA subregion
	Crinia sloanei / Sloane's Froglet	Any in NSW
Myotis macropus / Southern Myotis	Spp	IBRA subregion
	Myotis macropus / Southern Myotis	Any in NSW
Petaurus norfolcensis / Squirrel Glider	Spp	IBRA subregion
	Petaurus norfolcensis / Squirrel Glider	Any in NSW

Assessment Id


00054054/BAAS24052/24/00054055

Proposal Name

Williams Road_Thurgoona_BDAR_V2

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Biodiversity credit report (Like-for-like) (R1 land assessment – Case 00054536)



BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id

00054054/BAAS24052/25/00054536

Assessor Name

Stuart Mendham

Proponent Names

Assessment Revision

0

Date Finalised

02/05/2025

Proposal Name

Williams Rd Thurgoona R1 Lands

Assessor Number

BAAS24052

Report Created

08/05/2025

BOS entry trigger

BOS Threshold: Area clearing threshold

BAM data last updated *

28/10/2024

BAM Data version *

Current classification (live - default)
(80)

BAM Case Status

Finalised

Assessment Type

Part 4 Developments (General)

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

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	Critically Endangered Ecological Community	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion

Assessment Id

00054054/BAAS24052/25/00054536

Proposal Name

Williams Rd Thurgoona R1 Lands

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BAM Biodiversity Credit Report (Like for like)

Species

Nil

Additional Information for Approval

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT

No Changes

Predicted Threatened Species Not On Site

Name

No Changes

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

No Ecosystem Credit Data

Species Credit Summary

No Species Credit Data

Assessment Id

00054054/BAAS24052/25/00054536

Proposal Name

Williams Rd Thurgoona R1 Lands

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BAM Biodiversity Credit Report (Like for like)

Credit Retirement Options

Like-for-like credit retirement options

Assessment Id


00054054/BAAS24052/25/00054536

Proposal Name

Williams Rd Thurgoona R1 Lands

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Biodiversity credit report (Like-for-like) (R1 scattered tree assessment – Case 00055011)



BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00054054/BAAS24052/25/00055011	Williams Road_Thurgoona_BDAR_R1_STs	28/10/2024
Assessor Name	Assessor Number	BAM Data version *
Stuart Mendham	BAAS24052	Current classification (live - default) (80)
Proponent Names	Report Created	Date Finalised
	08/05/2025	02/05/2025
Assessment Revision	BOS entry trigger	Assessment Type
0	BOS Threshold: Area clearing threshold	Scattered Trees
BAM Case Status	* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.	
Finalised		

Potential Serious and Irreversible Impacts

Nil

Additional Information for Approval

PCTs With Customized Benchmarks

No Changes

Ecosystem Credit Summary

Assessment Id	Proposal Name	Page 1 of 4
00054054/BAAS24052/25/00055011	Williams Road_Thurgoona_BDAR_R1_STs	



BAM Biodiversity Credit Report (Like for like)

PCT	TEC	HBT Cr	No HBT Cr	Credits
266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	11	0	11
277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	12	0	12
278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	0	1	1

Credit classes for 266	Like-for-like options				
	TEC	Trading group	HBT	Credits	IBRA region

Assessment Id

00054054/BAAS24052/25/00055011

Proposal Name

Williams Road_Thurgoona_BDAR_R1_STs

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BAM Biodiversity Credit Report (Like for like)

	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	-	Yes	11	Inland Slopes, Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Credit classes for 277	Like-for-like options				
	TEC	Trading group	HBT	Credits	IBRA region
	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	-	Yes	12	Inland Slopes, Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Credit classes for 278	Like-for-like options				
	TEC	Trading group	HBT	Credits	IBRA region

Assessment Id

00054054/BAAS24052/25/00055011

Proposal Name

Williams Road_Thurgoona_BDAR_R1_STs

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BAM Biodiversity Credit Report (Like for like)

	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	-	No	1 Inland Slopes, Bogan-Macquarie, Bondo, Capertee Uplands, Capertee Valley, Crookwell, Hill End, Kerrabee, Lower Slopes, Murray Fans, Murrumbateman, Orange, Pilliga, Talbragar Valley and Wollemi. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
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Assessment Id

00054054/BAAS24052/25/00055011

Proposal Name

Williams Road_Thurgoona_BDAR_R1_STs

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Candidate threatened species report (C3 land assessment – Case 00054055)



BAM Candidate Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00054054/BAAS24052/24/00054055	Williams Road_Thurgoona_BDAR_V2	28/10/2024
Assessor Name	Report Created	BAM Data version *
Stuart Mendham	08/05/2025	Current classification (live - default) (80)
Assessor Number	Assessment Type	BAM Case Status
BAAS24052	Part 4 Developments (General)	Finalised
Assessment Revision	BOS entry trigger	Date Finalised
3	Test of significance	02/05/2025

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

List of Species Requiring Survey

Name	Presence	Survey Months
<i>Acacia ausfeldii</i> Ausfeld's Wattle	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input checked="" type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Ammobium craspedioides</i> Yass Daisy	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Anthochaera phrygia</i> Regent Honeyeater	Yes (assumed present)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?

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<i>Aprasia parapulchella</i> Pink-tailed Legless Lizard	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Burhinus grallarius</i> Bush Stone-curlew	No (surveyed)	<input checked="" type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input checked="" type="checkbox"/> Jun <input checked="" type="checkbox"/> Jul <input checked="" type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Callocephalon fimbriatum</i> Gang-gang Cockatoo	No (surveyed)	<input checked="" type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Calyptrorhynchus lathami lathami</i> South-eastern Glossy Black-Cockatoo	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input checked="" type="checkbox"/> Jun <input checked="" type="checkbox"/> Jul <input checked="" type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Crinia sloanei</i> Sloane's Froglet	Yes (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input checked="" type="checkbox"/> Jul <input checked="" type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Euphrasia arguta</i> Euphrasia arguta	No (surveyed)	<input checked="" type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?

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<i>Grevillea wilkinsonii</i> Tumut Grevillea	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Haliaeetus leucogaster</i> White-bellied Sea-Eagle	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input checked="" type="checkbox"/> Jul <input checked="" type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Hieraaetus morphnoides</i> Little Eagle	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input checked="" type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Keyacris scurra</i> Key's Matchstick Grasshopper	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Litoria booroolongensis</i> Booroolong Frog	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Lophoictinia isura</i> Square-tailed Kite	No (surveyed)	<input checked="" type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?

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<i>Myotis macropus</i> Southern Myotis	Yes (assumed present)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Ninox connivens</i> Barking Owl	No (surveyed)	<input checked="" type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input checked="" type="checkbox"/> Jun <input checked="" type="checkbox"/> Jul <input checked="" type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Petaurus norfolcensis</i> Squirrel Glider	Yes (surveyed)	<input checked="" type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input checked="" type="checkbox"/> Jun <input checked="" type="checkbox"/> Jul <input checked="" type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Phascogale tapoatafa</i> Brush-tailed Phascogale	No (surveyed)	<input checked="" type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Phascolarctos cinereus</i> Koala	No (surveyed)	<input checked="" type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input checked="" type="checkbox"/> Jun <input checked="" type="checkbox"/> Jul <input checked="" type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Polytelis swainsonii</i> Superb Parrot	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?

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<i>Prasophyllum sp. Wybong</i> Prasophyllum sp. Wybong	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Pteropus poliocephalus</i> Grey-headed Flying-fox	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Swainsona recta</i> Small Purple-pea	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Swainsona sericea</i> Silky Swainson-pea	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Synemon plana</i> Golden Sun Moth	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Tyto novaehollandiae</i> Masked Owl	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input checked="" type="checkbox"/> Jun <input checked="" type="checkbox"/> Jul <input checked="" type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?

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BAM Candidate Species Report

Threatened species Manually Added

Common Name	Scientific Name
Sloane's Froglet	Crinia sloanei

Threatened species assessed as not on site

Refer to BAR for detailed justification

Common name	Scientific name	Justification in the BAM-C
Large Bent-winged Bat	Miniopterus orianae oceanensis	Habitat constraints
Squirrel Glider in the Wagga Wagga Local Government Area	Petaurus norfolcensis - endangered population	Refer to BAR
Swift Parrot	Lathamus discolor	Habitat constraints

Assessment Id

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Candidate threatened species report (R1 land assessment – Case 00054536)



BAM Candidate Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00054054/BAAS24052/25/00054536	Williams Rd Thurgoona R1 Lands	28/10/2024
Assessor Name	Report Created	BAM Data version *
Stuart Mendham	08/05/2025	Current classification (live - default) (80)
Assessor Number	Assessment Type	BAM Case Status
BAAS24052	Part 4 Developments (General)	Finalised
Assessment Revision	BOS entry trigger	Date Finalised
0	BOS Threshold: Area clearing threshold	02/05/2025

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

List of Species Requiring Survey

Name	Presence	Survey Months
<i>Pteropus poliocephalus</i> Grey-headed Flying-fox		<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input checked="" type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Hieraaetus morphnoides</i> Little Eagle		<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input checked="" type="checkbox"/> Aug <input type="checkbox"/> Sep <input checked="" type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Crinia sloanei</i> Sloane's Froglet		<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input checked="" type="checkbox"/> Jul <input checked="" type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?

Assessment Id
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Proposal Name
Williams Rd Thurgoona R1 Lands

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BAM Candidate Species Report

Threatened species Manually Added

Common Name	Scientific Name
Sloane's Froglet	<i>Crinia sloanei</i>

Threatened species assessed as not on site

Refer to BAR for detailed justification

Common name	Scientific name	Justification in the BAM-C
Ausfeld's Wattle	<i>Acacia ausfeldii</i>	Refer to BAR
Barking Owl	<i>Ninox connivens</i>	Refer to BAR
Booroolong Frog	<i>Litoria booroolongensis</i>	Refer to BAR
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	Refer to BAR
Bush Stone-curlew	<i>Burhinus grallarius</i>	Refer to BAR
Eastern Pygmy-possum	<i>Cercartetus nanus</i>	Refer to BAR
Euphrasia arguta	<i>Euphrasia arguta</i>	Refer to BAR
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	Refer to BAR
Golden Sun Moth	<i>Synemon plana</i>	Geographic limitations
Key's Matchstick Grasshopper	<i>Keyacris scurra</i>	Refer to BAR
Koala	<i>Phascolarctos cinereus</i>	Refer to BAR
Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>	Refer to BAR
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	Refer to BAR
Masked Owl	<i>Tyto novaehollandiae</i>	Refer to BAR
Pink-tailed Legless Lizard	<i>Aprasia parapulchella</i>	Refer to BAR
Prasophyllum sp. Wybong	<i>Prasophyllum</i> sp. Wybong	Refer to BAR
Regent Honeyeater	<i>Anthochaera phrygia</i>	Refer to BAR
Silky Swainson-pea	<i>Swainsona sericea</i>	Refer to BAR
Small Purple-pea	<i>Swainsona recta</i>	Refer to BAR
Small Scurf-pea	<i>Cullen parvum</i>	Refer to BAR
Southern Myotis	<i>Myotis macropus</i>	Refer to BAR
Square-tailed Kite	<i>Lophoictinia isura</i>	Refer to BAR
Squirrel Glider	<i>Petaurus norfolcensis</i>	Refer to BAR

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BAM Candidate Species Report

Squirrel Glider in the Wagga Wagga Local Government Area	Petaurus norfolcensis - endangered population	Geographic limitations
Striped Legless Lizard	Delma impar	Geographic limitations
Superb Parrot	Polytelis swainsonii	Refer to BAR
Swift Parrot	Lathamus discolor	Refer to BAR
Tarengo Leek Orchid	Prasophyllum petilum	Refer to BAR
White-bellied Sea-Eagle	Haliaeetus leucogaster	Refer to BAR
Yass Daisy	Ammobium craspedioides	Geographic limitations

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Proposal Name

Williams Rd Thurgoona R1 Lands

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Candidate threatened species report (R1 scattered tree assessment – Case 00055011)

Report not available from BAM-C for the scattered tree module. Listed candidate species in the module were:

- Regent Honeyeater (breeding)
- Swift Parrot (breeding)
- *Prasophyllum* sp. Wybong

Predicted species report (C3 land assessment – Case 00054055)



BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00054054/BAAS24052/24/00054055	Williams Road_Thurgoona_BDAR_V2	28/10/2024
Assessor Name	Report Created	BAM Data version *
Stuart Mendham	08/05/2025	Current classification (live - default) (80)
Assessor Number	Assessment Type	BAM Case Status
BAAS24052	Part 4 Developments (General)	Finalised
Assessment Revision	BOS entry trigger	Date Finalised
3	Test of significance	02/05/2025

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

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Types(s)
Black Falcon	Falco subniger	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion 278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Diamond Firetail	Stagonopleura guttata	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion 278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Dusky Woodswallow	Artamus cyanopterus cyanopterus	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion 278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Flame Robin	Petroica phoenicea	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion

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Flame Robin	<i>Petroica phoenicea</i>	278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion 278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Grey-crowned Babbler (eastern subspecies)	<i>Pomatostomus temporalis temporalis</i>	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion 278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion 278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Little Eagle	<i>Hieraaetus morphnoides</i>	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion 278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Little Lorikeet	<i>Glossopsitta pusilla</i>	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
Little Pied Bat	<i>Chalinolobus picatus</i>	278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Painted Honeyeater	<i>Grantiella picta</i>	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
Purple-crowned Lorikeet	<i>Glossopsitta porphyrocephala</i>	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
Regent Honeyeater	<i>Anthochaera phrygia</i>	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
Scarlet Robin	<i>Petroica boodang</i>	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion

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Scarlet Robin	<i>Petroica boodang</i>	278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
South-eastern Glossy Black-Cockatoo	<i>Calyptrorhynchus lathamii lathamii</i>	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
South-eastern Hooded Robin	<i>Melanodryas cucullata cucullata</i>	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion 278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Speckled Warbler	<i>Chthonicola sagittata</i>	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion 278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Spotted Harrier	<i>Circus assimilis</i>	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion 278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion 278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Square-tailed Kite	<i>Lophoictinia isura</i>	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion 278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Superb Parrot	<i>Polytelis swainsonii</i>	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion 278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Swift Parrot	<i>Lathamus discolor</i>	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion 278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion

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BAM Predicted Species Report

Turquoise Parrot	<i>Neophema pulchella</i>	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion 278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Varied Sittella	<i>Daphoenositta chrysoptera</i>	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion 278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion
White-throated Needletail	<i>Hirundapus caudacutus</i>	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion 278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
Yellow-bellied Sheathtail-bat	<i>Saccolaimus flaviventris</i>	266-White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion

Threatened species Manually Added

None added

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Common Name	Scientific Name	Plant Community Type(s)
Painted Honeyeater	<i>Grantiella picta</i>	278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	278-Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Refer to BAR for detailed justification

Common Name	Scientific Name	Justification in the BAM-C
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Assessment Id

00054054/BAAS24052/24/00054055

Proposal Name

Williams Road_Thurgoona_BDAR_V2

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Predicted species report (R1 land assessment – Case 00054536)



BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00054054/BAAS24052/25/00054536	Williams Rd Thurgoona R1 Lands	28/10/2024
Assessor Name	Report Created	BAM Data version *
Stuart Mendham	08/05/2025	Current classification (live - default) (80)
Assessor Number	Assessment Type	BAM Case Status
BAAS24052	Part 4 Developments (General)	Finalised
Assessment Revision	BOS entry trigger	Date Finalised
0	BOS Threshold: Area clearing threshold	02/05/2025

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

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Types(s)
Black Falcon	Falco subniger	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Diamond Firetail	Stagonopleura guttata	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Dusky Woodswallow	Artamus cyanopterus cyanopterus	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Flame Robin	Petroica phoenicea	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Gang-gang Cockatoo	Callocephalon fimbriatum	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Grey-crowned Babbler (eastern subspecies)	Pomatostomus temporalis temporalis	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Grey-headed Flying-fox	Pteropus poliocephalus	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion

Assessment Id	Proposal Name	Page 1 of 3
00054054/BAAS24052/25/00054536	Williams Rd Thurgoona R1 Lands	



BAM Predicted Species Report

Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Little Eagle	<i>Hieraaetus morphnoides</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Little Lorikeet	<i>Glossopsitta pusilla</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Magpie Goose	<i>Anseranas semipalmata</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Painted Honeyeater	<i>Grantiella picta</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Regent Honeyeater	<i>Anthochaera phrygia</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Scarlet Robin	<i>Petroica boodang</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
South-eastern Hooded Robin	<i>Melanodryas cucullata cucullata</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Speckled Warbler	<i>Chthonicola sagittata</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Spotted Harrier	<i>Circus assimilis</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Square-tailed Kite	<i>Lophoictinia isura</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Superb Parrot	<i>Polytelis swainsonii</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Swift Parrot	<i>Lathamus discolor</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Turquoise Parrot	<i>Neophema pulchella</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Varied Sittella	<i>Daphoenositta chrysoptera</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
White-throated Needletail	<i>Hirundapus caudacutus</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion
Yellow-bellied Sheathtail-bat	<i>Saccolaimus flaviventris</i>	277-Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion

Threatened species Manually Added

Assessment Id

00054054/BAAS24052/25/00054536

Proposal Name

Williams Rd Thurgoona R1 Lands

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BAM Predicted Species Report

Common Name	Scientific Name
Magpie Goose	Anseranas semipalmata

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Refer to BAR for detailed justification

Common Name	Scientific Name	Justification in the BAM-C
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Assessment Id

00054054/BAAS24052/25/00054536

Proposal Name

Williams Rd Thurgoona R1 Lands

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Predicted species report (R1 scattered tree assessment – Case 00055011)



BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00054054/BAAS24052/25/00055011	Williams Road_Thurgoona_BDAR_R1_STs	28/10/2024
Assessor Name	Report Created	BAM Data version *
Stuart Mendham	08/05/2025	Current classification (live - default) (80)
Assessor Number	BAM Case Status	Date Finalised
BAAS24052	Finalised	02/05/2025
Assessment Revision	BOS entry trigger	Assessment Type
0	BOS Threshold: Area clearing threshold	Scattered Trees

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

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name
Black Falcon	Falco subniger
	Falco subniger
Black-chinned Honeyeater (eastern subspecies)	Melithreptus gularis gularis
	Melithreptus gularis gularis
	Melithreptus gularis gularis
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae
	Climacteris picumnus victoriae
	Climacteris picumnus victoriae
Dusky Woodswallow	Artamus cyanopterus cyanopterus
	Artamus cyanopterus cyanopterus
	Artamus cyanopterus cyanopterus
Eastern False Pipistrelle	Falsistrellus tasmaniensis
	Falsistrellus tasmaniensis
	Falsistrellus tasmaniensis
Flame Robin	Petroica phoenicea
	Petroica phoenicea
	Petroica phoenicea

Assessment Id
00054054/BAAS24052/25/00055011

Proposal Name
Williams Road_Thurgoona_BDAR_R1_STs

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BAM Predicted Species Report

Grey-crowned Babbler (eastern subspecies)	Pomatostomus temporalis temporalis
	Pomatostomus temporalis temporalis
	Pomatostomus temporalis temporalis
Little Eagle	Hieraaetus morphnoides
	Hieraaetus morphnoides
	Hieraaetus morphnoides
Little Lorieet	Glossopsitta pusilla
	Glossopsitta pusilla
Little Pied Bat	Chalinolobus picatus
Painted Honeyeater	Grantiella picta
	Grantiella picta
	Grantiella picta
Purple-crowned Lorieet	Glossopsitta porphyrocephala
Regent Honeyeater	Anthochaera phrygia
	Anthochaera phrygia
Scarlet Robin	Petroica boodang
	Petroica boodang
	Petroica boodang
South-eastern Glossy Black-Cockatoo	Calyptrorhynchus lathami lathami
South-eastern Hooded Robin	Melanodryas cucullata cucullata
	Melanodryas cucullata cucullata
	Melanodryas cucullata cucullata
Southern Whiteface	Aphelocephala leucopsis
	Aphelocephala leucopsis
Speckled Warbler	Chthonicola sagittata
	Chthonicola sagittata
	Chthonicola sagittata
Spotted Harrier	Circus assimilis
	Circus assimilis
	Circus assimilis
Superb Parrot	Polytelis swainsonii
	Polytelis swainsonii
	Polytelis swainsonii
Swift Parrot	Lathamus discolor
	Lathamus discolor

Assessment Id

00054054/BAAS24052/25/00055011

Proposal Name

Williams Road_Thurgoona_BDAR_R1_STs

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BAM Predicted Species Report

Swift Parrot	Lathamus discolor
Varied Sittella	Daphoenositta chrysoptera
	Daphoenositta chrysoptera
	Daphoenositta chrysoptera
White-bellied Sea-Eagle	Haliaeetus leucogaster
	Haliaeetus leucogaster
	Haliaeetus leucogaster
White-throated Needletail	Hirundapus caudacutus
	Hirundapus caudacutus
	Hirundapus caudacutus
Yellow-bellied Sheath-tail-bat	Saccolaimus flaviventris
	Saccolaimus flaviventris

Threatened species assessed as not within the vegetation zone(s) for the PCT(s)

Refer to BAR for detailed justification

Common Name	Scientific Name	Justification in the BAM-C
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Assessment Id

00054054/BAAS24052/25/00055011

Proposal Name

Williams Road_Thurgoona_BDAR_R1_STs

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Appendix I: Survey efforts

Table 48: Surveys dates, effort and targeted species

Date	Type	Time	Weather	Wind	Targets	Method(s)	Staff member(s)	Staff Hours
13/06/2024	Diurnal	10:00 - 14:30	Clear, 12-14C	3-8kph westerly	Flora, birds, reptiles and recon	Walk entire footprint. 10 x point count sites.	SM	4.5
26/07/2024	Diurnal & Nocturnal	14:00 - 19:00	Mostly Clear, 12-16C	0-5kph westerly	Sloanes, birds (Scarlet Robin month), owls playback	Walk entire footprint, walk dams, playback, diurnal birds. 10 x point count sites.	SM	5
29/07/2024	Diurnal	10:00 - 14:00	Clear, 11-14C	0-2kph southerly	Birds, frogs, vegetation	Walked C3 lands in entirety with binoculars, stationary and transects.	SM EM	8
1/08/2024	Diurnal	10:00 - 14:00	Clear, 6-15C	0-2kph south-easterly	Birds, frogs, vegetation	Walked entire, south and far east blocks recording tree DBH and native veg areas, recorded veg patches on proposed crossing of Williams Road and works above dam in that area. 10 x point count sites.	SM, EM	8
12/08/2024	Nocturnal	16:45 - 20:15	Clear, 8-15C	0-2kph north-westerly	Sloanes and gliders, owls	Drove entire property, walking around creeks and dams, spotlighting		3.5
19/08/2024	Nocturnal	17:00 - 20:00	Clear, 8-15C	0-1kph north-westerly	Sloanes and gliders, owls	Walked entire property, playback, spotlighting	SM	3
26/08/2024	Nocturnal	16:45 - 19:00	Cloudy, 9-13C	Still, no wind	Sloanes and gliders, owls	Walked main property, found Sloanes in paddocks and remaining dam	SM	2.25
17/10/2024	Diurnal	09:00 - 16:30	Clear then mostly cloudy 12-21C	0-5kph NNW	Birds, BAM plots	Surveyed entire footprint, and all areas of C3 land being impacted. 10 x point count sites.	SM	7.5
1/11/2024	Diurnal	14:00-15:00	Warm, partly cloudy 28C	0-5kph NNW	Birds, Amphibromus sampling, sun moth, matchstick grasshopper, and ID grass	Walk along Williams Rd, sampling and photos of Amphibromus sp	SM	1

Date	Type	Time	Weather	Wind	Targets	Method(s)	Staff member(s)	Staff Hours
8/11/2024	Diurnal	8:00 - 11:00	Warm, mostly sunny 16-24C	5-10, increasing to 10-15kph westerly	Keys grasshopper, Sun moth, Koala scats, GG Frog, A fluitans, reptiles, birds, orchids	Walk Williams Rd, sweep net grasslands, inspect dams and drainage lines	SM	3
19/11/2024	Nocturnal	20:15 - 11:00	Warm- clear 25-15C	0-5kph southerly	Booroolong Frog, Owls, Curlew	Owl and curlew call playback along Williams Rd, playback and listen for calls along Eight Mile Creek and along west boundary	SM	2.75
21/11/2024	Diurnal	8:30 - 10:30	Warm, sunny 18 to 28C	5-10, increasing to 10-15kph northerly	Keys grasshopper, Sun moth, Koala scats, GG Frog, A fluitans, birds, orchids	Walk Williams Rd, sweep net grasslands, inspect dams and drainage lines	SM	2
4/12/2024	Diurnal	9:00 - 13:00	Warm, sunny 18 to 28C	0-5, increasing to 5-10 kph. West then north-west	Birds. R1 tree mapping. EPBC criteria check C3. Camera installations	Walk Williams Rd, sweep net grasslands, inspect dams and drainage lines, install cameras	SM	4.5
4/12/2024	Diurnal	9:00 - 16:00	Warm, sunny 18 to 28C	0-5, increasing to 5-10 kph. West then north-west	Camera installations	Camera installations x 17 along C3 land and 4 x R1 land	DW & SM	17
9/12/2024	Nocturnal	20:30 - 11:00	Mild, partly cloudy 22-16C	0-5kph south-westerly	Booroolong Frog, Owls, Curlew	Post rain survey. Owl and curlew call playback along Williams Rd, playback and listen for calls along Eight Mile Creek and along west boundary	SM	2.5
14/12/2024	Diurnal	15:30 - 16:30	Hot sunny 32-33C	Still, no wind	Bat detector installation, birds, sun moth, grasshopper, Southern Bell Frog	Installation. Walk around dam. Slow drive down roadside for visual and audible detections	SM	1
15/12/2024	Diurnal	6:00 - 9:00	Warm 18-25C	Still, no wind	Remove cameras on roadside trees, birds, sun moth, grasshopper, Southern Bell Frog	Remove cameras, walk areas around cameras, listening.	SM & EM	6

Date	Type	Time	Weather	Wind	Targets	Method(s)	Staff member(s)	Staff Hours
16/12/2024	Analysis	13:00 - 16:00	NA	NA	Nocturnal, arboreal	Analyse camera footage	SM	3
10/01/2025	Diurnal	9:00 - 14:00	Warm to hot 18-32C	Still, increasing to gusts of 1-5kph SW	Flora, birds, frogs, reptiles, moth, grasshopper, plants	Walks through highest quality bush/grasslands. Vehicle through main property areas.	SM	5
Total survey hours								89.5



Figure 19: Survey efforts with bird point locations, remote camera locations and bat sensor location.

Appendix J: Field Sheets

BAM assessment sheets

BAM Site – Field Survey Form Site Sheet no: 1 of 1

Date		Survey Name		Zone ID		Recorders	
10 / 1 / 25		Williams Rd		266 Denham Rd		S. Mendenham	
Zone	55	Datum	GDA94	Plot ID	1	Plot dimensions	10x40
Easting	500596.17	Nothing		IBRA region	NSS	Midline bearing from 0 m	85°
Vegetation Class		Woodland		Confidence:		H M L	
Plant Community Type		266 NSW Grassy Woodland		Confidence:		H M L	
				EEC:			

Record easting and nothing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m ² plot)	Sum values
Trees	2
Shrubs	0
Grasses etc.	6
Forbs	2
Ferns	0
Other	0
Sum of Cover of native vascular plants by growth form group	25
High Threat Weed cover	25

BAM Attribute (1000 m ² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	-	1
50 – 79 cm	11	
30 – 49 cm	11T 11T 1111	NIL
20 – 29 cm	11T 11	
10 – 19 cm	11T 11T 11	
5 – 9 cm	11T 1111	
< 5 cm	11	n/a
Length of logs (m) (≥ 10 cm diameter, > 50 cm in length)	11T	Tally space

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30, ..., 100, 200, 300, ...). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	50 10 30 40 50	2 0 15 1 2	1 0 1 2 1	0 0 0 0 0
Average of the 5 subplots	36	4	1	0

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type	Landform Element	Landform Pattern	Microrelief
Lithology	Soil Surface Texture	Soil Colour	Soil Depth
Slope	Aspect	Site Drainage	Distance to nearest water and type

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Remnant MA1

400 m² plot: Sheet 1 of 25 Survey Name Williams Rd Plot Identifier Remnant MA1 Recorder SM

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
T	1 <i>E. albens</i>	N	5	2		
	2 <i>H. perforatum</i>	HTE				
G	3 <i>L. filiformis</i>	N	10	500		
	4 <i>A. fastua</i>	E				
	5 <i>E. curviflorus</i> ALG	HTE				
	6 <i>B. diandrum</i>	HTE				
	7 <i>Lolium</i>	HTE				
G	8 <i>Dianella</i>	N	1	8		
	9 <i>Paspalum dilatatum</i>	HTE				
	10 <i>Yulphia</i>	E				
	11 <i>Polygonum avic</i>	E				
F	12 <i>Juncus</i>	N	2	12		
	13 <i>A. billardianum</i>	N	0.5	15		
	14 <i>S. asper</i>	E				
	15 <i>P. lanceolata</i>	E				
F	16 <i>R. brownii</i>	N	0.5	20		
	17 <i>Sonchus oleraceus</i>	E				
	18 <i>Cirsium vulgare</i>	HTE				
G	19 <i>M. stipoides</i>	N	20	300		
	20 <i>B. catharticus</i>	HTE				
	21 <i>H. radicata</i>	E				
	22 <i>L. semida</i>	E				
	23 <i>Sclerum nigrum</i>	E				
	24 <i>Digitalis</i> serotina	E				
G	25 <i>A. aristatum</i>	N	0.5	5		
	26 <i>Dianella</i>					
T	27 <i>E. blakelyi</i>	N	20	12		
G	28 <i>Pyrodesperman</i> caen	N	0.5	5		
	29					
	30					
	31					
	32					
	33					
	34					
	35					
	36					
	37					
	38					
	39					
	40					

GF Code: see Growth Form definitions in Appendix 1 N: native, E: exotic, HTE: high threat exotic GF - circle code if 'top 3'

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ..., 100% (foliage cover); Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across

BAM Site – Field Survey Form Site Sheet no: 1 of 1

Date: 17/10/24		Survey Name: Williams Rd Remnant Nth		Zone ID: Smerdhen		Recorders: [initials]	
Zone: SS	Datum: 1964 ADGAD94	Plot ID: 1	Plot dimensions: 20x20	Photo #	Magnetic		
Easting: 499865.196014484.99		IBRA region: NSS	Midline bearing from 0 m: 358°	Confidence: H M L		Confidence: H M L	
Vegetation Class: Woodland		Plant Community Type: 266 (derived grassland)		EEC:		Confidence: H M L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha best plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	1
	Shrubs	—
	Grasses etc.	7
	Forbs	1
	Ferns	—
	Other	—
Sum of Cover of native vascular plants by growth form group	Trees	5
	Shrubs	—
	Grasses etc.	41
	Forbs	0.1
	Ferns	—
	Other	—
High Threat Weed cover		15

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80+ cm	0	1
50 – 79 cm	0	NIL
30 – 49 cm	0	
20 – 29 cm	0	
10 – 19 cm	13	
5 – 9 cm	19	
< 5 cm	11	n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)		2m

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30, ..., 100, 200, 300...). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)					Bare ground cover (%)					Cryptogam cover (%)					Rock cover (%)				
Subplot score (% in each)	20	10	35	10	10	20	30	5	20	50	2	20	10	5	0	0	0	0	0	0
Average of the 5 subplots	17					25					7.4					0				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type	Landform Element	Landform Pattern	Microrelief
Lithology	Soil Surface Texture	Soil Colour	Soil Depth
Slope	Aspect	Site Drainage	Distance to nearest water and type

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet of

Date 17/10/24 Survey Name Williams Rd Remnant Nth 1 Plot Identifier SM Recorder

GF Code	Top 3 native species in each growth form group. Full species name mandatory. All other native and exotic species. Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
G	1 <i>Austrostipa recta</i>	N	10	100		
	2 <i>Lolium</i> sp	HTW				
G	3 <i>Conandra filiformis</i>	N	0.3	20		
	4 <i>Eriarta longifolia</i>	HTW				
	5 <i>Hordeum</i> sp	HTW				
G	6 <i>Rytidosperma</i> sp tall	N	0.1	5		
	7 <i>Bromus diandrus</i>	HTW				
G	8 <i>Rytidosperma caespitosum</i>	N	0.2	10		
G	9 <i>Austrostipa scabra</i>	N	0.3	15		
G	10 <i>Rytidosperma setaceum</i>	N	30	200		
	11 <i>Hypochaeris radicata</i>	E				
T	12 <i>Eulalia</i>	N	5	6		
G	13 <i>Tuncia flavidus</i>	N	0.1	2		
	14 <i>Rumex acetosella</i>	E				
	15 <i>Hypericum perforatum</i>	HTW				
F	16 <i>Xerochrysium viscosum</i>	N	0.1	3		
	17 <i>Romulea rosea</i>	E				
	18					
	19					
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					
	32					
	33					
	34					
	35					
	36					
	37					
	38					
	39					
	40					

GF Code: see Growth Form definitions in Appendix 1 N: native, E: exotic, HTE: high threat exotic GF - circle code if 'top 3'.

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ..., 100% (foliage cover); Note: 0.1% cover represents an area of approximately 63 x 63 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.

Abundance: 1, 2, 3, ..., 10, 20, 30, ..., 100, 200, ..., 1000, ...

BAM Site – Field Survey Form Site Sheet no: 1 of 1

Date		17.10.24		Survey Name		Williams Rd 266, Penrith NSW		Zone ID		SM		Recorders		Photo #		✓	
Zone		WDA946		Datum		55		Plot ID		1		Plot dimensions		15 x 26.6		Magnetic	
Easting		499833.11		Northing		6014464.58		IBRA region		N55		Midline bearing from 0 m		270°		Confidence: H M L	
Vegetation Class		Woodland		Plant Community Type		266		EEC:				Confidence: H M L					

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	2
	Shrubs	1
	Grasses etc.	5
	Forbs	0
	Ferns	0
	Other	0
Sum of Cover of native vascular plants by growth form group	Trees	35
	Shrubs	0.3
	Grasses etc.	6.8
	Forbs	0
	Ferns	0
	Other	0
High Threat Weed cover		60

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	4	✓
50 – 79 cm	0	
30 – 49 cm	3	
20 – 29 cm	0	
10 – 19 cm	1	
5 – 9 cm	2	
< 5 cm	✓	n/a
Length of logs (m) (≥ 10 cm diameter, > 50 cm in length)		14 111 Tally space

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30, ..., 100, 200, 300, ...). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	34 20 30 20 15	1 0 0 0 0	20 0 5 1 2	0 0 0 0 0
Average of the 5 subplots	23	0.2	5.6	0

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type	Landform Element	Landform Pattern	Microrelief
Lithology	Soil Surface Texture	Soil Colour	Soil Depth
Slope	Aspect	Site Drainage	Distance to nearest water and type

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet of

Date 17/10/24 Survey Name Williams Rd 266 Remnant St Plot Identifier 8M Recorders

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
T	1 Eucalyptus	N	10	1		
T	2 Eucalyptus	N	25	6		
S	3 Acacia paradoxa (P)	N	0.3	1		
	4 Calum sp	HTW				
	5 Brachyglottis	HTW				
	6 Hypericum perforatum	HTW				
	7 Acaecia caladuta	HTW				
	8 Acaecia sp	E				
	9 Vulpia bromoides	HTW				
	10 Hypochaeris radicata	E				
G	11 Lonicera flandrus	N	0.5	6		
G	12 Microseris sp	N	5	25		
G	13 Austrostaphyle aristata	N	0.2	4		
	14 Ranunculus repens	E				
G	15 Comandra filiformis	N	1	50		
	16 Comandra longistylis	N	0.1	1		
17						
18						
19						
20						
21						
22						
23						
24						
25						
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27						
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35						
36						
37						
38						
39						
40						

GF Code: see Growth Form definitions in Appendix 1 N: native, E: exotic, HTE: high threat exotic GF - circle code if top 3
Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ..., 100% (foliage cover): Note: 0.1% cover represents an area of approximately 63 x 63 cm
a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m

BAM Site – Field Survey Form Site Sheet no: 1 of 1

Date	17.10.24	Survey Name	Williams Rd 266 wetland	Zone ID	SM	Recorders	transed 20x50
Zone	SS	Datum	GDA94	Plot ID	1	Plot dimensions	10x40
Easting	499970.89	Northing	6014482.1	IBRA region	NSS	Midline bearing from 0 m	4°
Vegetation Class	Woodland (denuded wetland)						Confidence: H M L
Plant Community Type	266						Confidence: H M L

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m² plot)	Sum values
Trees	0
Shrubs	0
Grasses etc.	6
Forbs	4
Ferns	1
Other	1
Sum of Cover of native vascular plants by growth form group	
Trees	1
Shrubs	1
Grasses etc.	60.1
Forbs	3.7
Ferns	1
Other	1
High Threat Weed cover	28

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		
50 – 79 cm		
30 – 49 cm		
20 – 29 cm		
10 – 19 cm		
5 – 9 cm		
< 5 cm		n/a
Length of logs (m) (≥10 cm diameter, >50 cm in length)		

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30, ..., 100, 200, 300, ...). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	3 1 1 1 1	2 5 5 10 5	10 0 1 1 0	0 0 0 0 0
Average of the 5 subplots	1.4	10	2.4	0

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type	Landform Element	Landform Pattern	Microrelief
Lithology	Soil Surface Texture	Soil Colour	Soil Depth
Slope	Aspect	Site Drainage	Distance to nearest water and type

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m ² plot: Sheet <u> </u> of <u> </u>		Survey Name	Plot Identifier	Recorders			
Date	17/10/24		Williams Rd 266 Wellad	3M			
GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable		N, E or HTE	Cover	Abund	stratum	voucher
G	1	<i>Juncus flavidus</i>	N	8	100		
F	2	<i>Lythrum hyssopifolia</i>	N	3	50		
	3	<i>Juncus bulbosus</i>	E				
	4	<i>Echium plantagineum</i>	HTW				
	5	<i>Coturn sp</i>	HTW				
	6	<i>Cyperus eragrostis</i>	E				
G	7	<i>Eleocharis acuta</i>	N	7	180		
G	8	<i>Amphibromus nervosus</i>	N	5	400		
G	9	<i>Carex</i>	N	5	50		
	10	<i>Cirsium vulgare</i>	HTW				
	11	<i>Plantago lanceolata</i>	E				
	12	<i>Briza minor</i>	E				
G	13	<i>Paspalum distichum</i>	N	5	50		
	14	<i>Bromus hordeaceus</i>	HTW				
	15	<i>Holcus lanatus</i>	HTW				
	16	<i>Sorghum asper</i>	E				
	17	<i>Hypochaeris radicata</i>	E				
	18	<i>Rumex acetosella</i>	N	0.1	2		
F	19	<i>Alternanthera sp</i>	N	0.5	10		
F	20	<i>Ludwigia peploides</i>	N	0.1	1		
G	21	<i>Carex appressa</i>	N	0.1	2		
F	22	<i>Pseudognaphalium luteoalbum</i>	N				
	23						
	24						
	25						
	26						
	27						
	28						
	29						
	30						
	31						
	32						
	33						
	34						
	35						
	36						

BAM Site – Field Survey Form Site Sheet no: 1 of 1

Date	17/10/24	Survey Name	Williams Rd 277 Trees	Zone ID	Sm	Recorders	
Zone	55	Datum	WDA94	Plot ID	1	Plot dimensions	20x20
Easting	499818.7	Northing	601404.99	IBRA region	NSS	Midline bearing from 0 m	2°
Vegetation Class	Woodland				Confidence:	H M L	
Plant Community Type	277 NSW Grassy woodshed				Confidence:	H M L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m ² plot)	Sum values
Trees	1
Shrubs	-
Count of Native Richness	
Grasses etc.	-
Forbs	-
Ferns	-
Other	-
Sum of Cover of native vascular plants by growth form group	
Trees	40
Shrubs	-
Grasses etc.	-
Forbs	-
Ferns	-
Other	-
High Threat Weed cover	90

DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	-	
50 – 79 cm	4	✓
30 – 49 cm	12	✓
20 – 29 cm	13	✓
10 – 19 cm	10	
5 – 9 cm	8	
< 5 cm	✓	n/a

Length of logs (m)
(≥ 10 cm diameter, > 50 cm in length) 140m Tally space

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30, ..., 100, 200, 300, ...). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	20 25 55	50 10 5	0 0 0 0 0	0 0 0 0 0
Average of the 5 subplots	7.4	2.2	0	0

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type	Landform Element	Landform Pattern	Soil	Soil Depth	Microrelief
Lithology	Soil Surface Texture	Soil Colour	Site Drainage	Distance to nearest water and type	
Slope	Aspect				

Plot Disturbance	Severity code	Age code	Observational evidence
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native/stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

high throat exertion

Site Sheet no: 1 of 1

BAM Site – Field Survey Form

Date		Survey Name		Zone ID		Recorders	
17.10.24		Williams Rd 278. Park		Sm			
Zone	Datum	Plot ID		Plot dimensions	Photo #	Magnetic	
SS	WDA94	1		20x20			
Easting	Northing	IBRA region		Midline bearing from 0 m		Confidence:	
60543.87	6013733.63	NSS		195°		H M L	
Vegetation Class		Plant Community Type		EEC:		Confidence:	
Woodland		278				H M L	

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m ² plot)		Sum values
Count of Native Richness	Trees	1
	Shrubs	4
	Grasses etc.	1
	Forbs	1
	Ferns	-
	Other	-
Sum of Cover of native vascular plants by growth form group	Trees	1
	Shrubs	38.8
	Grasses etc.	0.2
	Forbs	0.1
	Ferns	-
	Other	-
High Threat Weed cover		40

BAM Attribute (1000 m ² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	-	
50 – 79 cm	-	
30 – 49 cm	-	NK
20 – 29 cm	-	
10 – 19 cm	-	
5 – 9 cm	1	
< 5 cm	20	n/a
Length of logs (m) (≥ 10 cm diameter, > 50 cm in length)		1111

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30, ..., 100, 200, 300...). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	5 25 5 10 10	0 2 1 5 0	0 0 0 2 0	0 0 0 0 0
Average of the 5 subplots	7.4	1.6	0.4	0

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type	Landform Element	Landform Pattern	Microrelief
Lithology	Soil Surface Texture	Soil Colour	Soil Depth
Slope	Aspect	Site Drainage	Distance to nearest water and type

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native stock)			
Fire damage			
Storm damage			
Weediness			
Other:			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet _ of _

Date	Survey Name	Plot Identifier	Recorders
17/10/24	Williams Rd 278-282	Sm	

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
S	1 <i>Callistemon sieberi</i> (P)	N	30	12		
	2 <i>Bromus diandrus</i>	HTW				
	3 <i>Echium plantaginifolium</i>	HTW				
	4 <i>Galium aparine</i>	E				
	5 <i>Avena fatua</i>	E				
S	6 <i>Acacia dealbata</i> (P)	N	3	16		
S	7 <i>Acacia rubida</i> (P)	N	0.8	2		
	8 <i>Rosa rubinosa</i>	HTW				
	9 <i>Vulpia bromoides</i>	E				
	10 <i>Hypericum perforatum</i>	HTW				
	11 <i>Hypochaeris radicata</i>	E				
	12 <i>Coturn sp.</i>	HTW				
G	13 <i>Microseris stipoides</i>	N	0.2	10		
S	14 <i>Allocasuarina verticillata</i> (P)	N	5	2		
T	15 <i>Eucalyptus</i>	N	1	1		
	16 <i>Arctotheca calendula</i>	HTW				
	17 <i>Ranunculus rosea</i>	E				
F	18 <i>Epilobium billiardierianum</i>	N	0.5	5		
	19 <i>Bromus hordeaceus</i>	HTW				
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					
	32					
	33					
	34					
	35					
	36					
	37					
	38					
	39					
	40					

GF Code: see Growth Form definitions in Appendix 1
 Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ..., 100% (foliage cover); Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m
 GF - circle code if 'top 3'.
 N: native, E: exotic, HTE: high threat exotic

* NOT USED - REMOVED FROM DEVELOPMENT DESIGN 5.

BAM Site - Field Survey Form				Site Sheet no: 1 of 1	
Date	17/10/24	Survey Name	Williams Rd 178 Remnant	Zone ID	SM
Zone	SS	Datum	ADA 94	Plot ID	1
Easting	500580.36	Nothing	3797.52	Plot dimensions	20x20
IBRA region	NSS	Midline bearing from 0 m	195°	Photo #	✓
Vegetation Class	Woodland	Confidence:	H M L	Confidence:	H M L
Plant Community Type	278	EEC:	H M L		

Record easting and northing at 0 m on midline. Dimensions (Shape) of 0.04 ha base plot.

BAM Attribute (400 m ² plot)	Sum values
Trees	1
Shrubs	0
Grasses etc.	3
Forbs	1
Ferns	-
Other	-
Count of Native Richness	
Trees	15
Shrubs	-
Grasses etc.	5.3
Forbs	0.1
Ferns	-
Other	-
Sum of Cover of native vascular plants by growth form group	
High Threat Weed cover	70

BAM Attribute (1000 m ² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	1	✓
50 - 79 cm	-	
30 - 49 cm	-	
20 - 29 cm	8	
10 - 19 cm	15	
5 - 9 cm	1	
< 5 cm	✓	n/a
Length of logs (m) (≥ 10 cm diameter, > 50 cm in length)	11m	Tally space

Counts apply when the number of tree stems within a size class is ≤ 10. Estimates can be used when > 10 (eg. 10, 20, 30, ..., 100, 200, 300, ...). For a multi-stemmed tree, only the largest living stem is included in the count/estimate. Tree stems must be living.

For hollows, count only the presence of a stem containing hollows. For a multi-stemmed tree, only the largest stem is included in the count/estimate. Stems may be dead and may be shrubs.

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	5 10 20 25 10	0 10 1 1 0	0 1 1 0 0	0 0 0 0 0
Average of the 5 subplots	14	2.4	0.4	0

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type	Landform Element	Landform Pattern	Microrelief
Lithology	Soil Surface Texture	Soil Colour	Soil Depth
Slope	Aspect	Site Drainage	Distance to nearest water and type

Plot Disturbance	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood / CWD removal			
Grazing (identify native stock)			
Fire damage			
Storm damage			
Weediness			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe

Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

400 m² plot: Sheet of

Date 17/10/24 Survey Name Williams Rd Plot Identifier 278 reveg Recorders 3M

GF Code Top 3 native species in each growth form group: Full species name mandatory
All other native and exotic species: Full species name where practicable

GF Code	Top 3 native species in each growth form group: Full species name mandatory All other native and exotic species: Full species name where practicable	N, E or HTE	Cover	Abund	stratum	voucher
T	1 <i>Euc. blakei</i>	N	15	14		
	2 <i>Avena sativa</i>	E				
	3 <i>Sonchus oleraceus</i>	E				
	4 <i>Bromus diandrus</i>	HTW				
	5 <i>Rumex crispus</i>	E				
	6 <i>Galium sp</i>	HTW				
	7 <i>Rubus fruticosus</i> sp agg	HTW				
	8 <i>Rumex acetosella</i>	E				
	9 <i>Rosa rubiginosa</i>	HTW				
	10 <i>Hypochaeris radicata</i>	E				
	11 <i>Echium plantaginifolium</i>	HTW				
	12 <i>Vulpia bromoides</i>	E				
	13 <i>Hypericum perforatum</i>	HTW				
	14 <i>Samolus rosea</i>	E				
G	15 <i>Carex appressa</i>	N	S	20		
	16 <i>Plantago lanceolata</i>	E				
	17 <i>Bromus hordeaceus</i>	HTW				
	18 <i>Phalaris aquatica</i>	HTW				
G	19 <i>Juncus sp</i>	N	0.2	3		
F	20 <i>Rumex brownii</i>	N	0.1	1		
G	21 <i>Cyperus sp</i>	N	0.1	1		
	22 <i>Lactuca scariola</i>	E				
	23 <i>Galium aparine</i>	E				
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					
	32					
	33					
	34					
	35					
	36					
	37					
	38					
	39					

high threat exotic GF - native

Appendix K: Species lists

K(a): Incidental flora species identified in the Assessment Area

Species Name	Common Name	Class	Date	Status	BC Act	EPBC Act	Notes
<i>Crinia parinsignifera</i>	Eastern Sign-bearing Froglet	Amphibian	26/07/2024	N			
<i>Crinia signifera</i>	Common Eastern Froglet	Amphibian	26/07/2024	N			
<i>Crinia sloanei</i>	Sloane's Froglet	Amphibian	26/07/2024	N	vu	VU	
<i>Limodynastes interioris</i>	Spotted Marsh Frog	Amphibian	26/07/2024	N			
<i>Litoria paraewingi</i>	Victorian Tree Frog	Amphibian	26/07/2024	N			
<i>Litoria peronii</i>	Peron's Tree Frog	Amphibian	4/12/2024	N			R1 tree near dam near school site
<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	Bird	26/07/2024	N			
<i>Acanthiza nana</i>	Yellow Thornbill	Bird	29/07/2024	N			
<i>Accipiter novaehollandiae</i>	Grey Goshawk	Bird	26/07/2024	N			
<i>Alisterus scapularis</i>	King Parrot	Bird	1/08/2024	N			
<i>Anas gracilis</i>	Grey Teal	Bird	26/07/2024	N			
<i>Anas superciliosa</i>	Pacific Black Duck	Bird	26/07/2024	N			
<i>Anthochaera carunculata</i>	Red Wattle-bird	Bird	26/07/2024	N			
<i>Ardea intermedia</i>	Intermediate Egret	Bird	26/07/2024	N			
<i>Ardea pacifica</i>	White-necked Herron	Bird	17/10/2024	N			
<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	Bird	26/07/2024	N			
<i>Cacatua sanguinea</i>	Short-billed Corella	Bird	15/12/2024	N			
<i>Caligavis chrysops</i>	Yellow-faced Honeyeater	Bird	11/12/2024	N			C3- Camera detection
<i>Chenonetta jubata</i>	Australian Wood Duck	Bird	13/06/2024	N			
<i>Colluricincla harmonica</i>	Grey Shrikethrush	Bird	29/07/2024	N			
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	Bird	26/07/2024	N			
<i>Corcorax melanorhamphos</i>	White-winged Chough	Bird	13/06/2024	N			
<i>Corvus coronoides</i>	Australian Raven	Bird	13/06/2024	N			
<i>Corvus mellori</i>	Little Raven	Bird	26/07/2024	N			

Species Name	Common Name	Class	Date	Status	BC Act	EPBC Act	Notes
<i>Cracticus torquatus</i>	Grey Butcherbird	Bird	29/07/2024	N			
<i>Craticus nigrogularis</i>	Pied Butcherbird	Bird	8/11/2024	N			
<i>Dacelo novaeguineae</i>	Laughing Kookaburra	Bird	26/07/2024	N			
<i>Egretta novaehollandiae</i>	White-faced Heron	Bird	29/07/2024	N			
<i>Entomyzon cyanotis</i>	Blue-faced Honeyeater	Bird	29/07/2024	N			
<i>Eolophus roseicapilla</i>	Galah	Bird	13/06/2024	N			
<i>Gerygone olivacea</i>	White-throated Gerygone	Bird	26/07/2024	N			
<i>Gerygone olivacea</i>	White-throated Treecreeper	Bird	26/07/2024	N			
<i>Grallina cyanoleuca</i>	Magpie Lark	Bird	13/06/2024	N			
<i>Gymnorhina tibicen</i>	Australian Magpie	Bird	13/06/2024	N			
<i>Haliastur phenurus</i>	Whistling Kite	Bird	29/07/2024	N			
<i>Hirundo neoxena</i>	Welcome Swallow	Bird	13/06/2024	N			
<i>Malurus cyaneus</i>	Superb Fairywren	Bird	26/07/2024	N			
<i>Manorina melanocephala</i>	Noisy Miner	Bird	13/06/2024	N			
<i>Microeca fascians</i>	Jacky Winter	Bird	29/07/2024	N			
<i>Myiagra inquieta</i>	Restless Flycatcher	Bird	29/07/2024	N			
<i>Neochmia temporalis</i>	Red-browed Finch	Bird	29/07/2024	N			
<i>Ocyphaps lophotes</i>	Crested Pigeon	Bird	13/06/2024	N			
<i>Pachycephala pectoralis</i>	Golden Whistler	Bird	1/08/2024	N			
<i>Pardalotus punctatus</i>	Spotted Pardalote	Bird	29/07/2024	N			
<i>Pardalotus stiratus</i>	Striated Pardalote	Bird	13/06/2024	N			
<i>Petroica boodang</i>	Scarlett Robin	Bird	29/07/2024	N	vu		
<i>Petroica phoenica</i>	Flame Robin	Bird	26/07/2024	N	vu		In C3 land, foraging in R1
<i>Phalacrocorax carbo</i>	Great Cormorant	Bird	13/06/2024	N			
<i>Philemon cireogularis</i>	Little Friarbird	Bird	9/12/2024	N			C3- Camera detection
<i>Phylidonyris novaehollandiae</i>	New Holland Honeyeater	Bird	26/07/2024	N			
<i>Platycercus elegans</i>	Crimson Rosella	Bird	26/07/2024	N			

Species Name	Common Name	Class	Date	Status	BC Act	EPBC Act	Notes
<i>Platycercus elegans subsp. flaveolus</i>	Yellow Rosella	Bird	21/11/2024	N			
<i>Platycercus eximius</i>	Eastern Rosella	Bird	13/06/2024	N			
<i>Podargus strigoides</i>	Tawny Frogmouth	Bird	17/12/2024	N			C3 – Camera detection
<i>Psephotus haematonotus</i>	Red-Rumped Grass Parrot	Bird	13/06/2024	N			
<i>Ptilotula fusca</i>	Fuscous Honeyeater	Bird	1/08/2024	N			
<i>Rhipidura albiscapa</i>	Grey Fantail	Bird	29/07/2024	N			
<i>Strepera graculina</i>	Pied Currawong	Bird	26/07/2024	N			
<i>Sturnus vulgaris</i>	European Starling	Bird	13/06/2024	*			
<i>Tachybaptus novaehollandiae</i>	Australian Grebe	Bird	26/07/2024	N			
<i>Tadorna tadornoides</i>	Australian Shelduck	Bird	29/07/2024	N			
<i>Threskiornis spinicollis</i>	Straw-necked Ibis	Bird	26/07/2024	N			
<i>Trichoglossus moluccanus</i>	Rainbow Lorikeet	Bird	29/07/2024	N			
<i>Turdus merula</i>	European Blackbird	Bird	29/07/2024	*			
<i>Vanellus miles</i>	Masked Lapwing	Bird	29/07/2024	N			
<i>Abantiades atriplais</i>	Rain Moth	Insect	29/07/2024	N			
<i>Austroicetes sp.</i>	Small Grasshopper	Insect	8/11/2024	N			
<i>Cicada spp.</i>	Cicada	Insect	8/11/2024	N			
<i>Euploea core</i>	Common Crow Butterfly	Insect	8/11/2024	N			
<i>Heteronympha merope</i>	Common Brown Butterfly	Insect	8/11/2024	*			
<i>Lampides boeticus</i>	Tailed Blue Butterfly	Insect	8/11/2024	N			
<i>Phaulacridium vittatum</i>	Wingless Grasshopper	Insect	8/11/2024	N			
<i>Pieris Rapae</i>	Cabbage White	Insect	8/11/2024	N			
<i>Taractrocera papyria</i>	White-banded Grass-dart	Insect	8/11/2024	N			
<i>Vanessa cardui</i>	Painted Lady Butterfly	Insect	8/11/2024	N			
<i>Austronomus australis</i>	White-striped Free-tailed Bat	Mammal	1/12/2024 and 19/12/24	N			Heard; Dam - Ultrasonic sensor
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat	Mammal	Dec-24	N			Dam - Ultrasonic sensor
<i>Falsistrellus tasmaniensis</i>	Eastern Falsistrelle	Mammal	Dec-24	N			Dam - Ultrasonic sensor

Species Name	Common Name	Class	Date	Status	BC Act	EPBC Act	Notes
<i>Lepus europaeus</i>	European Hare	Mammal	29/07/2024	*			
<i>Macropus giganteus</i>	Eastern Grey Kangaroo	Mammal	13/06/2024	N			
<i>Nyctophilus sp.</i>	Unidentified long-eared bat (N. gouldii Gould's Long-eared Bat and N. geoffroyi Lesser Long-eared Bat both potentially present)	Mammal	Dec-24	N			Dam - Ultrasonic sensor
<i>Oryctolagus cuniculus</i>	European Rabbit	Mammal	26/07/2024	*			
<i>Ozimops planiceps</i>	Southern Free-tailed Bat	Mammal	Dec-24	N			Dam - Ultrasonic sensor
<i>Ozimops ridei</i>	Ride's Free-tailed Bat	Mammal	Dec-24	N			Dam - Ultrasonic sensor
<i>Petaurus norfolcensis</i>	Squirrel Glider	Mammal	12/09/2024	N	vu	VU	
<i>Pseudocheirus peregrinus</i>	Ringtail Possum	Mammal	12/09/2024	N			
<i>Pteropus scapulatus</i>	Little Red Flying Fox	Mammal	15/12/2024	N			Dead on barbed wire, creek crossing
<i>Rattus rattus</i>	Black Rat	Mammal	9/12/2024	*			C3- Camera detection
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	Mammal	Dec-24	N			Dam - Ultrasonic sensor
<i>Scotorepens balstoni</i>	Inland Broad-nosed Bat	Mammal	Dec-24	N			Dam - Ultrasonic sensor
<i>Trichosurus vulpecula</i>	Brush-tail Possum	Mammal	12/09/2024	N			
<i>Unidentified bat</i>	Bat unknown sp.	Mammal	26/07/2024	N			
<i>Vespadelus darlingtoni</i>	Large Forest Bat	Mammal	Dec-24	N			Dam - Ultrasonic sensor
<i>Vespadelus regulus</i>	Southern Forest Bat	Mammal	Dec-24	N			Dam - Ultrasonic sensor
<i>Vespadelus vulturnus</i>	Little Forest Bat	Mammal	Dec-24	N			Dam - Ultrasonic sensor
<i>Vombatus ursinus</i>	Common Wombat	Mammal	29/07/2024	N			
<i>Wallabia bicolor</i>	Swamp Wallaby	Mammal	29/07/2024	N			
<i>Chelodina longicollis</i>	Common Long-necked Turtle	Reptile	26/07/2024	N			Dead in net in dam near TT Road
<i>Lampropholis guichenoti</i>	Garden Skink	Reptile	17/10/2024	N			
<i>Pseudonaja textilis</i>	Brown Snake	Reptile	8/11/2024	N			

* denotes exotic

N denotes native

K(b): Incidental flora species identified in the Assessment Area

Species Name	Common Name	Date	Status	BC Act	EPBC Act	Notes
<i>Acacia acinacea</i>	Gold-dust Wattle	29/07/2024	P			C3 - Creek
<i>Acacia dealbata</i>	Silver Wattle	29/07/2024	N, P			C3 - Road reserve
<i>Acacia implexa</i>	Lightwood	29/07/2024	N, P			C3 - Road reserve
<i>Acacia paradoxa</i>	Hedge Wattle	29/07/2024	P			C3 - Road reserve
<i>Acacia podalyrifolia</i>	Queensland Silver Wattle	29/07/2024	#			C3 - Road reserve
<i>Acacia pycnantha</i>	Golden Wattle	29/07/2024	P			C3 - Road reserve
<i>Acacia saligna</i>	Golden Wreath Wattle	21/11/2024	#			C3 - planted
<i>Acacia verniciflua</i>	Varnish Wattle	29/07/2024	P			C3 - Road reserve
<i>Acaena echinata</i>	Sheep's Burr	29/07/2024	N			C3 - Road reserve
<i>Allocasuarina verticillata</i>	Drooping She-oak	21/11/2024	N, P			C3 - Revegetation
<i>Alternanthera denticulata</i>	Lesser Joyweed	21/11/2024	N			Dam near eastern block
<i>Amphibromus nervosus</i>	Common Swamp Wallaby-grass	19/08/2024	N			C3 wetland, creek west side, wetland north of boundary
<i>Amyema miquelii</i>	Box Mistletoe	29/07/2024	N			C3 - Road reserve
<i>Anthosachne scabra</i>	Wheat Grass	29/07/2024	N			C3 - Road reserve
<i>Arctotheca calendula</i>	Capeweed	21/11/2024	*			R1 land
<i>Aristida behriana</i>	Brush Wire-grass	8/11/2024	N			In the better grassland mid-way along Williams Rd
<i>Aristida ramosa</i>	Purple Wire-grass	29/07/2024	N			C3 - Road reserve
<i>Arthropodium strictum</i>	Chocolate Lily	8/11/2024	N			Roadside, numerous areas in mod to better grassland
<i>Austrostipa eristiglumis</i>	Plains Spear-grass	29/07/2024	N			C3 - Road reserve
<i>Austrostipa scabra</i>	Rough Spear-grass	29/07/2024	N			C3 - Road reserve
<i>Brachychiton populneus</i>	Kurrajong	29/07/2024	N			C3 - Road reserve
<i>Briza maxima</i>	Quaking Grass	29/07/2024	*			C3 - Road reserve
<i>Briza minor</i>	Small Quaking Grass	8/11/2024	*			C3
<i>Bromus diandrus</i>	Great brome	29/07/2024	*			C3 - Road reserve
<i>Callistemon sieberi</i>	Bottlebrush	29/07/2024	P			C3 - Road reserve

Species Name	Common Name	Date	Status	BC Act	EPBC Act	Notes
<i>Callitris endlicheri</i>	Black Cypress-pine	29/07/2024	P			C3 - Road reserve
<i>Callitris glaucophylla</i>	White Cypress-pine	29/07/2024	P			C3 - Road reserve
<i>Callitris glaucophylla</i>	White Cypress-pine	21/11/2024	N			C3 - Possibly planted as within hedge wattles
<i>Carex appressa</i>	Tall Sedge	29/07/2024	*			C3 - Road reserve
<i>Cerastium sp.</i>	Mouse-ear Chickweed	29/07/2024	N			C3 - Road reserve
<i>Cirsium vulgare</i>	Spear Thistle	29/07/2024	*			C3 - Road reserve
<i>Convolvulus erubescens</i>	Pink Bindweed	8/11/2024	N			C3 - Road reserve
<i>Cynodon dactylon</i>	Couch	29/07/2024	*			C3 - Road reserve
<i>Cynosaurus cristatus</i>	Rough Dog's Tail	29/07/2024	*			C3 - Creek
<i>Cynosurus echinatus</i>	Dog's Tail Grass	8/11/2024	*			C3 - Road reserve
<i>Dactylis glomerata</i>	Cocksfoot	29/07/2024	*			C3 - Road reserve
<i>Dianella sp.</i>	Flax-lily	29/07/2024	N			C3 - Road reserve
<i>Dodonaea viscosa subsp. angustissima</i>	Slender Hop-bush	29/07/2024	P			C3 - Road reserve
<i>Echium plantagineum</i>	Paterson's Curse	8/11/2024	*			R1 land
<i>Ehrharta longiflora</i>	Veldt Grass	29/07/2024	*			C3 - Road reserve
<i>Eleocharis acuta</i>	Spike-rush	8/11/2024	N			Wetland north of site, and creekline that runs south of that wetland towards chain of three ponds
<i>Epilobium billiardierianum</i>	Variable Willow-herb	29/07/2024	N			C3 - Road reserve
<i>Eragrostis curvula</i>	African Lovegrass	8/11/2024	*			R1 land
<i>Erigeron bonariensis</i>	Flax-leaf Fleabane	8/11/2024	*			R1 land
<i>Erigeron sumatrensis</i>	Tall Fleabane	8/11/2024	*			R1 land
<i>Erodium sp.</i>	Crane's Bill	1/08/2024	*			R1 land
<i>Eucalyptus polyanthemos</i>	Red Box	29/07/2024	N			R1 land
<i>Eucalyptus blakelyi</i>	Blakely's Red-gum	29/07/2024	N			R1 land
<i>Eucalyptus bridgesiana</i>	Apple Box	29/07/2024	N			C3 - Road reserve
<i>Eucalyptus meliodora</i>	Yellow Box	29/07/2024	N			R1 land
<i>Eucalyptus nicholii</i>	Narrow-leaved Black Peppermint	29/07/2024	P			C3 - Creek

Species Name	Common Name	Date	Status	BC Act	EPBC Act	Notes
<i>Eucalyptus nortonii</i>	Norton's Box	29/07/2024	N			C3 - Road reserve
<i>Eucalyptus viminalis</i>	Manna Gum	29/07/2024	P			C3 - Road reserve
<i>Euphorbia</i> sp.	Euphorbia	29/07/2024	*			C3 - Creek
<i>Ficus carica</i>	Fig Tree	29/07/2024	*			C3 - Creek
<i>Gallium aparine</i>	Cleavers	29/07/2024	*			C3 - Road reserve
<i>Gleditsia triacanthos</i>	Honey Locust	21/11/2024	*			Table Top Road and C3
<i>Glycine tabacina</i>	Variable Glycine	8/11/2024	N			Two plants just west of training academy entrance, south side of road
<i>Hyperchaeris radicata</i>	Flatweed	29/07/2024	*			R1 land
<i>Hypericum gramineum</i>	Small St Johns Wort	21/11/2024	N			Dam near eastern block
<i>Hypericum perforatum</i>	St John's Wort	21/11/2024	*			R1 land
<i>Indigofera australis</i>	Austral Indigo	29/07/2024	P			C3 - Road reserve
<i>Juncus bufonis</i>	Toad-rush	8/11/2024	*			Wetland north of site, and creekline that runs south of that wetland towards chain of three ponds
<i>Juncus</i> sp. 1	Rush	29/07/2024	N			C3 - Road reserve
<i>Juncus</i> sp. 2	Rush	29/07/2024	N			C3 - Road reserve
<i>Lachnagrostis filliformis</i>	Blown Grass	8/11/2024	N			Wetland north of site, and creekline that runs south of that wetland towards chain of three ponds
<i>Lactuca serriola</i>	Prickly Lettuce	21/11/2024	*			R1 land
<i>Ligustrum lucidum</i>	Broad-leaved Privet	29/07/2024	*			C3 - Creek
<i>Lolium</i> sp.	Rye Grass	29/07/2024	*			C3 - Road reserve
<i>Lomandra filliformis</i>	Wattle Mat-rush	29/07/2024	N			C3 - Road reserve
<i>Lomandra longifolia</i>	Spiny-headed Mat-rush	29/07/2024	N			C3 - Road reserve
<i>Lomandra multiflora</i>	Many-flowered Mat-rush	29/07/2024	N			C3 - Road reserve
<i>Ludwigia peploides</i> subsp. <i>peploides</i>	Ludwigia	21/11/2024	N			C3 and R1 (dam/wetland)
<i>Lythrum hisiopifolia</i>	Small Loosestrife	29/07/2024	N			C3 - Road reserve
<i>Malva</i> sp.	Mallow	1/08/2024	*			R1 land

Species Name	Common Name	Date	Status	BC Act	EPBC Act	Notes
<i>Marseillea drummondii</i>	Nardoo	12/08/2024	N			C3 - western dam/creek
<i>Melicytis dentatus</i>	Tree Violet	29/07/2024	N, P			C3 - Creek
<i>Mentha pulegium</i>	Pennyroyal	10/01/2025	*			R1 land
<i>Microleana stipoides</i>	Weeping Grass	29/07/2024	N			C3 - Road reserve
<i>Olea europaea subsp. europaea</i>	Common Olive	29/07/2024	*			C3 - Road reserve
<i>Oxalis pes-caprae</i>	Sour-sob	29/07/2024	*			C3 - Road reserve
<i>Panicum capillare</i>	Witchgrass	21/11/2024	*			R1 land
<i>Panicum effusum</i>	Hairy Panic	29/07/2024	N			C3 - Road reserve
<i>Paspalum dilatatum</i>	Paspalum	29/07/2024	*			C3 - Road reserve
<i>Paspalum distichum</i>	Water-couch	8/11/2024	N			Wetland north of site, and creekline that runs south of that wetland towards chain of three ponds
<i>Passiflora sp.</i>	Passion-fruit	29/07/2024	*			C3 - Road reserve
<i>Persicaria prostrata</i>	Creeping Knotweed	21/11/2024	N			C3 and R1 (dam/wetland)
<i>Phalaris aquatica</i>	Phalaris	21/11/2024	*			R1 land
<i>Plantago lanceolata</i>	Ribwort	29/07/2024	*			C3 - Road reserve
<i>Prunus cerasifera</i>	Cherry Plum	29/07/2024	*			C3 - Creek
<i>Prunus sp.</i>	Plum	29/07/2024	*			C3 - Creek
<i>Pseudognaphalium luteoalbum</i>	Jersey Cudweed	29/07/2024	N			C3 - Creek
<i>Romulea rosea</i>	Onion Grass	29/07/2024	N			C3 - Road reserve
<i>Rosa rubignosa</i>	Briar Rose	29/07/2024	*			C3 - Creek
<i>Rubus fruticosus sp. agg.</i>	Blackberry	29/07/2024	*WONS			C3 - Creek
<i>Rumex acetosella</i>	Sheep Sorrel	29/07/2024	*			C3 - Road reserve
<i>Rumex brownii</i>	Swamp Dock	29/07/2024				C3 - Creek
<i>Rumex crispus</i>	Curly Dock	29/07/2024	*			C3 - Road reserve
<i>Rytidosperma caespitosum</i>	White-top	21/11/2024	N			C3 - Road reserve
<i>Rytidosperma duttonianum</i>	Brown-back Wallaby Grass	21/11/2024	N			C3 - Road reserve and far NE corner

Species Name	Common Name	Date	Status	BC Act	EPBC Act	Notes
<i>Rytidosperma setaceum</i>	Small-flowered Wallaby Grass	21/11/2024	N			C3 - Road reserve
<i>Rytidosperma sp. 1</i>	Wallaby Grass	29/07/2024	N			C3 - Road reserve
<i>Rytidosperma sp. 2</i>	Wallaby Grass	29/07/2024	N			C3 - Road reserve
<i>Salix viminalis</i>	Basket Willow	29/07/2024	*			C3 - Creek
<i>Silybum marianum</i>	Variegated Thistle	29/07/2024	*			C3 - Creek
<i>Solanum nigrum</i>	Blackberry Nightshade	29/07/2024	*			C3 - Road reserve
<i>Sonchus asper</i>	Prickly Sow-thistle	29/07/2024	*			C3 - Road reserve
<i>Sonchus oleraceus</i>	Common Sow-thistle	21/11/2024	*			R1 land
<i>Sporobolus creber</i>	Slender Rat's-tail Grass	21/11/2024	N			C3
<i>Themeda triandra</i>	Kangaroo Grass	29/07/2024	N			C3 - Road reserve
<i>Tricoryne elatior</i>	Yellow Rush-lily	8/11/2024	N			Throughout better grassland areas, numerous places, occasional in small patches in east end of southern roadside
<i>Trifolium sp.</i>	Clover	21/11/2024	*			R1 land
<i>Typha orientalis</i>	Cumbungi	29/07/2024	N			C3 - Creek
<i>Urtica urens</i>	Small Nettle	21/11/2024	*			R1 land
<i>Verbascum virgatum</i>	Twiggy Mullein	29/07/2024	*			C3 - Road reserve
<i>Vicia sativa</i>	Common Vetch	29/07/2024	*			C3 - Road reserve
<i>Vinca major</i>	Blue Periwinkle	19/08/2024	*			C3 - Creek
<i>Walwhalleya proluta</i>	Rigid Panic	21/11/2024	N			C3
<i>Xanthium spinosa</i>	Bathurst Burr	21/11/2024	*			R1 land
<i>Xerochrysum viscosum</i>	Shiny Everlasting	29/07/2024	N			C3 - Road reserve

* denotes exotic

N denotes native

P denotes planted native

Appendix L: EPBC Act Protected Matters Database results and Likelihood Assessments

Consultation with the EPBC Protected Matters Online Search Tool (PMST) for the site (within a 10 kilometre radius) was conducted to determine which EPBC Act listed species and communities may occur within that specified geographic range. The following tables consider their likelihood of occurring in the proposed site, based on the results of the desk-top assessment and the results of the field assessments. Five categories for the 'likelihood of occurrence' of species have been used. The categories are based on recorded sightings listed in credible databases, the presence or absence of suitable habitat, other features of the site, results of the field survey and professional judgement.

The five categories are:

'Recorded/assumed present'	The species/community was or has been observed on the site, or is expected.
'Likely'	A medium to high probability that a species uses the site regularly, or may be resident.
'Potential'	Suitable limited habitat occurs on the site, but site does not constitute important/preferred habitat.
'Unlikely'	A very low to low probability that a species uses the site.
'No'	Habitat on the site and in the vicinity is absent or unsuitable for the species.

L1: EPBC Act Flora

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat Preference	Likelihood
<i>Amphibromus fluitans</i>	Floating Swamp Wallaby-grass	Vulnerable	Vulnerable	Grows in permanent swamps, moderately fertile wetlands, some bare ground and seasonally-fluctuating water levels. Habitats in south-western NSW include swamp margins in mud, dam and tank beds in hard clay and in semi-dry mud of lagoons.	Potential. Numerous records at the local scale, including a 2020 record just south of Subject Land. Not detected despite thorough searches.
<i>Caladenia concolor</i>	Crimson Spider Orchid	Endangered	Vulnerable	Regrowth woodland, granite ridge country with high diversity of other plants and orchids.	Unlikely. Site degraded and no orchid species were detected during site assessments.
<i>Leucochrysum albicans subsp. tricolor</i>	Hoary Sunray	Endangered	Endangered	Grasslands or grassy woodland at lower altitudes (below 900 metres).	Unlikely. Only one local record in Nail-can Hill from 1995. Site degraded and species not detected despite thorough searches.
<i>Myriophyllum porcatum</i>	Ridged Water-milfoil		Vulnerable	Occurs in shallow, ephemeral wetlands (including lakes, swamps, rock pools in granite outcrops, waterholes in claypans).	Unlikely. Suitable habitat is heavily degraded from historical grazing. No records from the local region.
<i>Prasophyllum petilum</i>	Tarengo Leek Orchid	Endangered	Endangered	Grassy woodlands and grasslands on fertile soils with low relief. Other <i>Prasophyllum</i> species are known to prefer moist sites in depressions and swamps.	Unlikely. Site degraded and no orchid species were detected during site assessments.
<i>Prasophyllum validum</i>	Sturdy Leek-orchid, Mount Remarkable Leek-orchid		Vulnerable	Dry woodland habitats, generally with a low sparse understorey.	Unlikely. Site degraded and no orchid species were detected during site assessments.
<i>Swainsona murrayana</i>	Slender Darling-pea, Slender Swainson, Murray Swainson-pea	Vulnerable	Vulnerable	A rare plant that prefers seasonally inundated soils on flats around lakes in Red to brown clay loams and clay soils that are usually seasonally waterlogged with little disturbance. Occurs often in native grassland, hermland, chenopod shrubland and open Black-box woodland.	Unlikely. Rarely recorded in region, and none local. Records further west. Not detected despite thorough searches.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat Preference	Likelihood
<i>Swainsona recta</i>	Small Purple-pea, Mountain Swainson-pea, Small Purple Pea	Endangered	Endangered	Grassy understorey of woodlands and open-forests dominated by Blakely's Red-gum, Yellow Box, Candlebark and Long-leaf box. Grows in association with an understorey dominated by Kangaroo Grass, poa tussocks and spear-grasses.	Unlikely. A grazing sensitive species for which there are no local records. Not detected despite thorough searches.

L2: EPBC Act Threatened Ecological Communities

Community Name	BC Act Status	EPBC Act Status	Likelihood
Grey Box (<i>Eucalyptus microcarpa</i>) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	-	Endangered	Unlikely. No indicator species. Occurs further west.
Weeping Myall Woodlands	-	Endangered	No. No indicator species present.
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	-	Critically Endangered	Potential. Indicator species are present in some areas.

L3: EPBC Act Fauna

Class	Scientific	Common Name	BC Act Status	EPBC Act Status	Habitat Preference	Likelihood
Amphibia	<i>Crinia sloanei</i>	Sloane's Froglet	Endangered	Endangered	A cryptic species, commonly associated with waterways and periodically inundated areas in grasslands, woodlands and also occurs in moderately disturbed habitats within its known range.	Present/recorded. Recorded throughout entire Subject Land.
Amphibia	<i>Litoria raniformis</i>	Southern Bell Frog	Endangered	Vulnerable	Permanent or ephemeral Black Box/ Lignum/Nitre Goosefoot swamps, Lignum/ Typha swamps and River Red-gum swamps.	Potential. One 1999 record just west. Some marginal habitat in nearby dams and better habitat in C3 creek lines. Not detected by surveys.
Aves	<i>Actitis hypoleucos</i>	Common Sandpiper		Migratory	Migrates to Australia over winter and prefers coastal and inland wetland habitats with mudflat margins, both saline and fresh.	Unlikely. No recent records from region. At best a rare visitor to better quality dams or adjoining creeks.
Aves	<i>Anthochaera phrygia</i>	Regent Honeyeater	Critically Endangered	Critically Endangered	Found in box-ironbark eucalypt associations. Flowering eucalyptus and mistletoe in forests and woodlands, with a preference for the box-ironbark forests and wet lowland coastal forests (Commonwealth Government 2016).	Assumed present on occasion (feeding)(IHM). Few local records. Not detected during surveys.
Aves	<i>Aphelocephala leucopsis</i>	Southern Whiteface	Vulnerable	Vulnerable	Arid and semi-arid acacia and eucalypt woodland and shrubland. Prefers relatively undisturbed open woodland and shrubland with grassy and shrubby understorey, including herbaceous species with low tree densities and numerous tree hollows.	Potential. Numerous local records, including from nearby Table Top. Not detected by surveys.
Aves	<i>Apus pacificus</i>	Fork-tailed Swift		Migratory	Almost exclusively an airborne species, roosting on cliffs and rock walls. Arid areas, inland plains and coastal areas.	Potential. Some local records. No important habitat present, but may visit airspace above site. Not detected by surveys.

Class	Scientific	Common Name	BC Act Status	EPBC Act Status	Habitat Preference	Likelihood
Aves	<i>Botaurus poeciloptilus</i>	Australasian Bittern	Endangered	Endangered	Permanent freshwater wetlands and marshes with tall, dense, fringing vegetation. Favours permanent and seasonal freshwater habitats.	Unlikely. No local records and only few from region. At best a rare visitor to better quality dams or adjoining creeks.
Aves	<i>Calidris acuminata</i>	Sharp-tailed Sandpiper		Vulnerable - Migratory	Shallow, grassy, vegetated fringes of inland freshwater wetlands and marshes. Also occurs on coasts on mudflats, mangroves, rocky shores and beaches..	Unlikely. Few local records associated with large waterbodies. At best a rare visitor to better quality dams or adjoining creeks.
Aves	<i>Calidris ferruginea</i>	Curlew Sandpiper	Critically Endangered	Critically Endangered - Migratory	Occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets. Estuaries, mudflats, swamps, lakes and lagoons on the coast but also sometimes occurring inland.	Unlikely. No local records and only few from region. At best a rare visitor to better quality dams or adjoining creeks.
Aves	<i>Calidris melanotos</i>	Pectoral Sandpiper		Migratory	Coastal lagoons, estuaries, bays, swamps, lakes and inundated grasslands.	Unlikely. No local records and few from region. At best a rare visitor to better quality dams or adjoining creeks.
Aves	<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	Endangered	Endangered	Found in tall mountain forests and woodlands, with dense shrubby understoreys in summer. In winter, will move to lower altitudes into drier, more open forests and woodlands.	Likely. Numerous local records, including a 2023 record just east. Suitable feeding habitat. Not detected by surveys.
Aves	<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (eastern subspecies)	Vulnerable	Vulnerable	Prefers Eucalyptus woodlands and open forests, particularly those containing box species and dominated by stringybarks for their foraging habitat, with fallen timber, and not too thick shrub cover and an open grassy understorey.	Potential. Local records tend to be from larger core areas. May be an occasional visitor to larger blocks of bushland in C3 areas. Not detected by surveys.
Aves	<i>Falco hypoleucos</i>	Grey Falcon	Vulnerable	Vulnerable	Prefers shrubland, grassland and tree-lined watercourses of arid and semi-arid regions.	Unlikely. Rarely recorded from the region. Rare visitor to the skies above the site. Not detected by surveys.

Class	Scientific	Common Name	BC Act Status	EPBC Act Status	Habitat Preference	Likelihood
Aves	<i>Gallinago hardwickii</i>	Latham's Snipe	Vulnerable	Vulnerable - Migratory	Inhabits freshwater wetlands on or near the coast, generally among dense cover.	Potential. Several local records. At best a rare visitor to better quality dams. May frequent vegetated areas in adjoining creeks.
Aves	<i>Grantiella picta</i>	Painted Honeyeater	Vulnerable	Vulnerable	Prefers Boree/Weeping Myall, Brigalow and Box-Gum woodlands and Ironbark forests. Feeds on Mistletoe species (fruits) that grow on Eucalypts and Acacias.	Potential. Only few local records. Mistletoe present. May frequent site. Not detected by surveys.
Aves	<i>Hirundapus caudacutus</i>	White-throated Needletail	Vulnerable	Vulnerable - Migratory	Species appears to primarily roost aerially, it has been recorded roosting in trees in forests and woodlands, both among dense foliage in the canopy or in hollows. Feed, drink and rest on the wing in large groups. May rest at night in forested country.	Potential. Several local records. May be a rare visitor to site or may occasionally roost in better areas. Not detected by surveys.
Aves	<i>Lathamus discolor</i>	Swift Parrot	Endangered	Critically Endangered	Occurs in a broad range of forest and woodland habitats dominated by winter flowering Eucalypts, and sometimes urban areas with abundant large trees.	Likely. Several local records, including a 2004 one just south. Likely to feed in Subject Land on occasion. Not detected by surveys.
Aves	<i>Melanodryas cucullata cucullata</i>	South-eastern Hooded Robin	Endangered	Endangered	Prefers lightly wooded, open landscapes, usually Eucalypt woodlands, Acacia scrub and mallee formations, often found in or near clearings in these landscapes.	Potential. Several records around the ranges west of Albury. Not detected by surveys.
Aves	<i>Motacilla flava</i>	Yellow Wagtail		Migratory	Damp habitats with low vegetation, favouring wet meadows, marshland, grassy and muddy lakeshores. Occurs in fields and often near livestock during migration.	Unlikely. No records from the broader region in any direction.
Aves	<i>Neophema chrysostoma</i>	Blue-winged Parrot	Vulnerable	Vulnerable	Prefer grasslands and grassy woodlands with a particular preference for areas near wetlands. The species over-summers in Tasmania.	Unlikely. Rarely recorded from local area. Tends to occur further west. Not detected by surveys.
Aves	<i>Pedionomus torquatus</i>	Plains-wanderer	Endangered	Critically Endangered	Inhabits sparse, treeless, lowland native grasslands. Increasingly rare species.	Unlikely. Heavy fox predation in area. Site does not contain suitable habitat.

Class	Scientific	Common Name	BC Act Status	EPBC Act Status	Habitat Preference	Likelihood
Aves	<i>Polytelis swainsonii</i>	Superb Parrot	Vulnerable	Vulnerable	Mainly inhabits River Red-Gum forests and Box-gum woodlands. Occurs (nests) in large River Red-gum forests along the Murray River and its nearby major river tributaries, but main foraging habitat is Mallee woodland within 20 km of riverine nesting habitat.	Likely. Several nearby local records. Likely to forage in site on occasion. Not detected by surveys.
Aves	<i>Rostratula australis</i>	Australian Painted Snipe	Endangered	Endangered	Fringes of swamps, lakes, dams, ponds, estuaries, waterlogged grasslands/pastures and marsh areas with a good cover of native grasses, Lignum, shrubs or open timber areas.	Unlikely. No local records, tends to occur further west. At best a rare visitor to better quality dams or adjoining creeks.
Aves	<i>Stagonopleura guttata</i>	Diamond Firetail	Vulnerable	Vulnerable	Forests, woodlands and grasslands. Grasslands and grassy woodlands including box-gum woodlands and Snow Gum (<i>Eucalyptus pauciflora</i>) woodlands.	Likely. Known from numerous records in the local area. Suitable grassland areas present. Not detected by surveys.
Aves	<i>Tringa nebularia</i>	Common Greenshank, Greenshank	Endangered	Endangered - Migratory	Coastal and inland sheltered wetlands, mudflats, river estuaries, lagoons, saltmarshes and inundated pastures.	Unlikely. No local records, and few in broader region. At best a rare visitor to better quality dams or adjoining creeks.
Fish	<i>Bidyanus bidyanus</i>	Silver Perch, Bidyan		Endangered	Generally prefer fast flowing waters like rapids and cascades, and more open sections of water. Overbank flooding is an important part of the breeding cycle.	No. Dams not suitable. No deep permanent water available.
Fish	<i>Craterocephalus fluviatilis</i>	Murray Hardyhead		Endangered	Prefers open water, shallow, slow flowing or still habitats, with sand or silt substrates.	Unlikely. Dams not suitable. May frequent nearby creeks during high flows.
Fish	<i>Galaxias rostratus</i>	Flathead Galaxias, Beaked Minnow, Flat-headed Galaxias, Flat-headed Jollytail		Critically Endangered	Still or slow-moving waters such as wetlands, billabongs, swamps, large creeks and any slow flowing waters.	Unlikely. Dams not suitable. May frequent nearby creeks during high flows.

Class	Scientific	Common Name	BC Act Status	EPBC Act Status	Habitat Preference	Likelihood
Fish	<i>Maccullochella macquariensis</i>	Trout Cod		Endangered	Prefer rapidly flowing waterways with rocky or gravel beds, containing deep pools and abundant in-stream woody debris such as logs and trees.	No. Dams not suitable. No deep permanent water available.
Fish	<i>Maccullochella peelii</i>	Murray Cod		Vulnerable	Occurs in a range of aquatic habitats from clear shallow rocky streams to deeper, turbid slow moving rivers and billabongs.	No. Dams not suitable. No deep permanent water available.
Fish	<i>Macquaria australasica</i>	Macquarie Perch		Endangered	Clear, deeper permanent waterbodies with abundant in-stream cover such as aquatic vegetation, logs and trees, boulders and vegetation overhanging stream banks.	No. Dams not suitable. No deep permanent water available.
Fish	<i>Nannoperca australis</i> <i>Murray-Darling Basin lineage</i>	Southern Pygmy Perch (Murray-Darling Basin lineage)		Vulnerable	Small aquatic systems, low flow rate, billabongs, streams and lakes.	Unlikely. No records from the broader area, with nearest associated only with major river systems (Murray and Kiewa). Dams on site not suitable. Possibility that it may frequent nearby creeks during high flows, but no permanent water holes present to sustain this species.
Insect	<i>Keyacris scurra</i>	Key's Matchstick Grasshopper	Endangered	Endangered	Native grasslands and grassy woodlands, with native grass understorey dominated by kangaroo grass.	Potential. Small areas of suitable grassland present. Not detected by surveys.
Insect	<i>Synemon plana</i>	Golden Sun Moth	Vulnerable	Vulnerable	Occurs in Natural Temperate Grasslands and grassy Box-Gum Woodlands in which ground layer is dominated by wallaby grasses <i>Rytidosperma</i> spp.	Potential. Small areas of suitable grassland present. Not detected by surveys.
Mammalia	<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	Vulnerable	Endangered	Primarily forest-dependent species that occupies a wide range of habitat types, although all appear to be characterised by relatively high (> 600mm/yr) rainfall.	Unlikely. Rarely recorded from region, with most records being old. Site lacks ground habitat. Not detected by surveys.

Class	Scientific	Common Name	BC Act Status	EPBC Act Status	Habitat Preference	Likelihood
Mammalia	<i>Nyctophilus corbeni</i>	Corben's Long-eared Bat, South-eastern Long-eared Bat	Vulnerable	Vulnerable	Occurs in a range of habitats including Mallee, Buloke and Box-gum dominated woodlands, but seems to prefer Box-Ironbark and Cypress vegetation types.	Potential. <i>Nyctophilus</i> spp. recorded during surveys, but <i>N. corbeni</i> not present.
Mammalia	<i>Phascolarctos cinereus</i>	Koala	Endangered	Endangered	Eucalypt forests and woodlands that contain some of their ~70 preferred Eucalyptus species.	Potential. Feed species and connectivity to core areas present. May visit site on occasion. Not detected by surveys.
Mammalia	<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	Vulnerable	Vulnerable	Requires foraging resources and roosting sites. Has wider ranging habitat, tending to prefer dense vegetation on waterways for roosting.	Potential. May feed in the site on occasion. No roost sites present. Not detected by surveys.
Reptilia	<i>Aprasia parapulchella</i>	Pink-tailed Legless Lizard	Vulnerable	Vulnerable	Rocky areas and outcrops are an important habitat requirement, but species has been found from ant nests in shrubland without rocks (Hay Plains). Prefers sloping open woodland areas with a grassy ground layer and partially buried rocks.	Potential. Limited to no ground timber or rocks present. Not detected by surveys.
Reptilia	<i>Delma impar</i>	Striped Legless Lizard, Striped Snake-lizard	Vulnerable	Vulnerable	Requires complex floristically diverse grass structures, including areas of tussocks, containing rocks with little to no disturbance.	Unlikely. No records from region. Very few reptiles present, little suitable habitat. Not detected by surveys.

Appendix M: BioNet Atlas of NSW Results and Likelihood Assessments

Consultation with the BC Act database (BioNet) for the site (within a 10 kilometre radius) was conducted to determine which BC Act listed species and communities may occur within that specified geographic range. The following tables consider their likelihood of occurring in the proposed site, based on the results of the desk-top assessment and the results of the field assessments. Five categories for the 'likelihood of occurrence' of species have been used. The categories are based on recorded sightings listed in credible databases, the presence or absence of suitable habitat, other features of the site, results of the field survey and professional judgement.

The five categories are:

'Recorded/assumed present'	The species/community was or has been observed on the site, or is expected.
'Likely'	A medium to high probability that a species uses the site regularly, or may be resident.
'Potential'	Suitable limited habitat occurs on the site, but site does not constitute important/preferred habitat.
'Unlikely'	A very low to low probability that a species uses the site.
'No'	Habitat on the site and in the vicinity is absent or unsuitable for the species.

M1: BC Act Flora Likelihood of Occurrence

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat Preference	Likelihood
<i>Amphibromus fluitans</i>	Floating Swamp Wallaby-grass	Vulnerable	Vulnerable	Grows in permanent swamps, moderately fertile wetlands, some bare ground and areas with seasonally-fluctuating water levels. Habitats in south-western NSW include swamp margins in mud, dam and tank beds in hard clay and in semi-dry mud of lagoons.	Potential. Numerous records at the local scale, including a 2020 record just south of Subject Land. Not detected despite thorough searches.
<i>Caladenia concolor</i>	Crimson Spider Orchid	Endangered	Vulnerable	Regrowth woodland, granite ridge country with high diversity of other plants and orchids.	Unlikely. Site degraded and no orchid species were detected during site assessments.
<i>Leucochrysum albicans</i> subsp. <i>tricolor</i>	Hoary Sunray	Endangered	Endangered	Grasslands or grassy woodland at lower altitudes (below 900 metres).	Unlikely. Only one local record in Nail-can Hill from 1995. Site degraded and species not detected despite thorough searches.
<i>Pilularia novae-hollandiae</i>	Austral Pillwort	Endangered		Damp mud within bogs and swamps, not always a conspicuous species and often difficult to see.	Potential. Although limited habitat and that there is highly degraded. Not detected during surveys.
<i>Senecio garlandii</i>	Woolly Ragwort	Vulnerable		Dry forest and open woodlands often in association with Red Stringybark, Long-leaved Box, Currawang, Lightwood and Kurrajong. Often on south and east facing upper slopes, especially granite outcrops.	Unlikely. Site heavily disturbed with historic grazing and clearing. Not present.
<i>Swainsona sericea</i>	Silky Swainson-pea	Vulnerable		Temperate grassland, Snow Gum woodland and Box-Gum woodland.	Unlikely. A grazing sensitive species for which there are no recent local records. Not detected despite thorough searches.

M2: BC Act Threatened Ecological Communities Likelihood of Occurrence

Community Name	BC Act Status	EPBC Act Status	Likelihood
Coolac-Tumut Serpentine Shrubby Woodland in the NSW South Western Slopes and South Eastern Highlands Bioregions	Endangered		No. Indicator species not present.
Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	Endangered		No. Indicator species not present.
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	Endangered		No. Indicator species not present. Occurs further west.
Mallee and Mallee-Broombush dominated woodland and shrubland, lacking Triodia, in the NSW South Western Slopes Bioregion	Critically Endangered		No. Indicator species not present.
Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	Endangered		No. Indicator species not present.
Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions	Endangered		No. Indicator species not present.
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and	Critically Endangered		Recorded. Low to moderate condition remnants of this TEC are present.

M3: BC Act Fauna Likelihood of Occurrence

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat Preference	Likelihood
Amphibia	<i>Crinia sloanei</i>	Sloane's Froglet	Endangered	Endangered	A cryptic species, commonly associated with waterways and periodically inundated areas in grasslands, woodlands and also occurs in moderately disturbed habitats within its known range.	Present. Recorded throughout entire Subject Land.
Amphibia	<i>Litoria raniformis</i>	Southern Bell Frog	Endangered	Vulnerable	Permanent or ephemeral Black Box/ Lignum/Nitre Goosefoot swamps, Lignum/ Typha swamps and River Red-gum swamps.	Potential. One 1999 record just west. Some marginal habitat in nearby dams and better habitat in C3 creek lines. Not detected by surveys.
Aves	<i>Anseranas semipalmata</i>	Magpie Goose	Vulnerable		Predominantly found in wet grasslands, swamps and other marshlands, sticking to coastal areas.	Unlikely. Limited suitable habitat.
Aves	<i>Anthochaera phrygia</i>	Regent Honeyeater	Critically Endangered	Critically Endangered	Found in box-ironbark eucalypt associations. Flowering eucalyptus and mistletoe in forests and woodlands, with a preference for the box-ironbark forests and wet lowland coastal forests.	Assumed present on occasion (feeding)(IHM). Few local records. Not detected during surveys.
Aves	<i>Apus pacificus</i>	Fork-tailed Swift		Migratory	Almost exclusively an airborne species, roosting on cliffs and rock walls. Arid areas, inland plains and coastal areas.	Potential. Some local records. No important habitat present, but may visit airspace above site. Not detected by surveys.
Aves	<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow	Vulnerable		Dry, open eucalypt forests and woodlands. Open or sparse understorey. Often on interface of forests and farmland.	Likely. Suitable habitat present. Not detected during surveys.
Aves	<i>Burhinus grallarius</i>	Bush Stone-curlew	Endangered		Open forests and woodlands with a sparse grassy ground layer and fallen timber.	Unlikely. High levels of fox predation. Limited ground timber available.

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat Preference	Likelihood
Aves	<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	Endangered	Endangered	Found in tall mountain forests and woodlands, with dense shrubby understoreys in summer. In winter, will move to lower altitudes into drier, more open forests and woodlands.	Likely. Numerous local records, including a 2023 record just east. Suitable feeding habitat. Not detected by surveys.
Aves	<i>Calyptrorhynchus lathami lathami</i>	South-eastern Glossy Black-Cockatoo	Vulnerable	Vulnerable	Heavily dependent on She-oak species.	Potential. Few regional records. Some revegetation areas contain planted she-oaks. Not detected during surveys.
Aves	<i>Chthonicola sagittata</i>	Speckled Warbler	Vulnerable		Eucalypt dominated communities, grassy understory, native tussock grasses, sparse shrub layer, open canopy.	Likely. Numerous local records. Suitable habitat present. Not detected during surveys.
Aves	<i>Circus assimilis</i>	Spotted Harrier	Vulnerable		Prefers grassy open woodlands in Acacia and Mallee remnants, grasslands, and shrub steppe. Also in agricultural land, foraging over open habitats.	Potential. Occasional records. Not detected during surveys.
Aves	<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (eastern subspecies)	Vulnerable	Vulnerable	Prefers Eucalyptus woodlands and open forests, particularly those containing box species and dominated by stringybarks for their foraging habitat, with fallen timber, and not too thick shrub cover and an open grassy understorey.	Likely. Numerous local records. Suitable habitat present. Not detected during surveys.
Aves	<i>Daphoenositta chrysoptera</i>	Varied Sittella	Vulnerable		Forests and woodlands. Prefer rough-barked trees like stringybarks and ironbarks or mature trees with hollows or dead branches.	Likely. Numerous local records. Suitable trees and habitat present. Not detected during surveys.
Aves	<i>Falco hypoleucos</i>	Grey Falcon	Vulnerable	Vulnerable	Prefers shrubland, grassland and tree-lined watercourses of arid and semi-arid regions.	Unlikely. Rarely recorded from the region. Rare visitor to the skies above the site. Not detected by surveys.
Aves	<i>Falco subniger</i>	Black Falcon	Vulnerable		Tree-lined watercourses and in isolated woodlands in arid and semi-arid areas.	Potential. Occasional local records, including 2006 record just outside study area, from Thurgoona Training Academy dam. Not detected by surveys.

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat Preference	Likelihood
Aves	<i>Gallinago hardwickii</i>	Latham's Snipe	Vulnerable	Vulnerable - Migratory	Inhabits freshwater wetlands on or near the coast, generally among dense cover.	Potential. Several local records. At best a rare visitor to better quality dams. May frequent vegetated areas in adjoining creeks.
Aves	<i>Glossopsitta porphyrocephala</i>	Purple-crowned Lorikeet	Vulnerable		Open dry eucalypt forest and woodlands or shrublands within temperate and semi-arid zones. Also in parks and gardens where suitable flowering plants occur.	Likely. Suitable habitat, and one record just south of Subject Land. Not recorded during surveys.
Aves	<i>Glossopsitta pusilla</i>	Little Lorikeet	Vulnerable		Prefers dry open forests and woodlands which are located along watercourses, also forages in open woodland and pastures.	Likely. Numerous local records, including 2006 record just outside study area, from Thurgoona Training Academy dam. Not detected by surveys.
Aves	<i>Grantiella picta</i>	Painted Honeyeater	Vulnerable	Vulnerable	Prefers Boree/Weeping Myall, Brigalow and Box-Gum woodlands and Ironbark forests. Feeds on Mistletoe species (fruits) that grow on Eucalypts and Acacias.	Potential. Only few local records. Mistletoe present. May frequent site. Not detected by surveys.
Aves	<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	Vulnerable		Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum Woodlands. Found in a wide range of habitats but nearly always within proximity to water sources.	Unlikely. Site lacks large waterbodies. At best, a rare visitor to the site.
Aves	<i>Hieraaetus morphnoides</i>	Little Eagle	Vulnerable		Wide habitat range including wooded farmlands and dry woodlands and open forests, nesting in mature trees on hillsides in open woodland and along tree-lined watercourses.	Likely. Numerous local records. Suitable hunting and nesting habitat. No nests or birds detected during surveys.

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat Preference	Likelihood
Aves	<i>Hirundapus caudacutus</i>	White-throated Needletail	Vulnerable	Vulnerable - Migratory	Species appears to primarily roost aerially, it has been recorded roosting in trees in forests and woodlands, both among dense foliage in the canopy or in hollows. Feed, drink and rest on the wing in large groups. May rest at night in forested country.	Potential. Several local records. May be a rare visitor to site or may occasionally roost in better areas. Not detected by surveys.
Aves	<i>Lathamus discolor</i>	Swift Parrot	Endangered	Critically Endangered	Occurs in a broad range of forest and woodland habitats dominated by winter flowering Eucalypts, and sometimes urban areas with abundant large trees.	Likely. Several local records, including from 2004, just south of Subject Land. Likely to feed in Subject Land on occasion. Not detected by surveys.
Aves	<i>Melanodryas cucullata cucullata</i>	South-eastern Hooded Robin	Endangered	Endangered	Prefers lightly wooded, open landscapes, usually Eucalypt woodlands, Acacia scrub and mallee formations, often found in or near clearings in these landscapes.	Potential. Several records around the ranges west of Albury. Not detected by surveys.
Aves	<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater (eastern subspecies)	Vulnerable		Upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts. Tends to prefer large core areas of bushland.	Unlikely. More likely to be residing in larger core areas of region. Rare visitor to site.
Aves	<i>Neophema chrysostoma</i>	Blue-winged Parrot	Vulnerable	Vulnerable	Prefer grasslands and grassy woodlands with a particular preference for areas near wetlands. The species over-summers in Tasmania.	Unlikely. Rarely recorded from local area. Tends to occur further west. Not detected by surveys.
Aves	<i>Neophema pulchella</i>	Turquoise Parrot	Vulnerable		Outskirts of eucalypt woodlands adjoining timbered ridges, clearings and farmland creeks.	Potential. Several local records. May frequent the site on occasion.
Aves	<i>Ninox connivens</i>	Barking Owl	Vulnerable		Woodland and open forest, with large home ranges that includes fragmented remnants and partially cleared farmland. Tends to occupy larger core areas of higher quality bushland.	Likely. Large range means species likely to hunt on site on occasion, or may nest.

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat Preference	Likelihood
Aves	<i>Oxyura australis</i>	Blue-billed Duck	Vulnerable		Deep water, large permanent wetlands and swamps. Dense aquatic vegetation.	Unlikely. Dams lack dense vegetation.
Aves	<i>Petroica boodang</i>	Scarlet Robin	Vulnerable		Dry forests and woodlands with an open grassy understorey and few scattered shrubs, with abundant logs and ground timber.	Recorded. Several birds recorded in R1 and C3 interface.
Aves	<i>Petroica phoenicea</i>	Flame Robin	Vulnerable		Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes.	Recorded. Several birds recorded in R1 and C3 interface.
Aves	<i>Polytelis swainsonii</i>	Superb Parrot	Vulnerable	Vulnerable	Mainly inhabits River Red-gum forests and Box-gum woodlands. Occurs (nests) in large River Red-gum forests along the Murray River and its nearby major river tributaries, but main foraging habitat is Mallee woodland within 20 km of riverine nesting habitat.	Likely. Several nearby local records. Likely to forage in site on occasion. Not detected by surveys.
Aves	<i>Pomatostomus temporalis temporalis</i>	Grey-crowned Babbler (eastern subspecies)	Vulnerable		Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodland.	Unlikely. No recent local records. Occurs further west.
Aves	<i>Stagonopleura guttata</i>	Diamond Firetail	Vulnerable	Vulnerable	Forests, woodlands and grasslands. Grasslands and grassy woodlands including box-gum woodlands and Snow Gum (<i>Eucalyptus pauciflora</i>) woodlands.	Likely. Known from numerous records in the local area. Suitable grassland areas present. Not detected by surveys.
Aves	<i>Stictonetta naevosa</i>	Freckled Duck	Vulnerable		Prefer permanent freshwater wetlands, swamps and creeks with dense vegetation, ideally containing heavy growth of Cumbungi, Lignum or Tea-tree.	Unlikely. Dams lack dense vegetation.
Mammalia	<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	Vulnerable	Endangered	Primarily forest-dependent species that occupies a wide range of habitat types, although all appear to be characterised by relatively high (> 600mm/yr) rainfall.	Unlikely. Tends to occupy larger core areas. Rare species locally. Limited ground habitat available.

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat Preference	Likelihood
Mammalia	<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	Vulnerable		Moist habitats with tall trees larger than 20 metres. Tree hollows are important for roosting, but also known to roost under loose bark or in buildings.	Unlikely. One lone 2014 record from Albury. Tends to occur in taller wet forests of the ranges.
Mammalia	<i>Petaurus norfolcensis</i>	Squirrel Glider	Vulnerable		Mature and old-growth Eucalypt woodlands and riparian forests with a shrub or Acacia understorey, abundant tree hollows required.	Recorded. Numerous sightings on cameras located along C3 land of Williams Road.
Mammalia	<i>Phascolarctos cinereus</i>	Koala	Endangered	Endangered	Eucalypt forests and woodlands that contain some of their ~70 preferred Eucalyptus species.	Potential. Feed species and connectivity to core areas present. May visit site on occasion. Not detected by surveys.
Mammalia	<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	Vulnerable	Vulnerable	Requires foraging resources and roosting sites. Has wide ranging habitat, tending to prefer dense vegetation on waterways for roosting.	Potential. May feed in the site on occasion. No roost sites present. Not detected by surveys.
Mammalia	<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	Vulnerable		Found individually or in groups, in tree hollows and buildings.	Potential. Rarely recorded from region, but likely under-reported. Not detected by sensor equipment.
Reptilia	<i>Aprasia parapulchella</i>	Pink-tailed Legless Lizard	Vulnerable	Vulnerable	Rocky areas and outcrops are an important habitat requirement, but species has been found from ant nests in shrubland without rocks (Hay Plains). Prefers sloping open woodland areas with a grassy ground layer and partially buried rocks.	Potential. Limited to no ground timber or rocks present. Not detected by surveys.

Appendix N: EPBC Act Significant Impact Criteria (SIC) Assessments (Entities with Likely or Recorded Rating)

O1: *Crinia sloanei* – Sloane's Froglet (Endangered) - **Recorded**

EPBC Significant Impact Criteria (for Critically and Endangered species)	Significant impact likely?	Justification of decision
Lead to a long-term decrease in the size of a population.	Likely	The development is taking place in an area that is the stronghold for the species locally, regionally and nationally. Sloane's Froglet was present in every dam and drainage line across the Subject Land and immediate surrounding area, as well as within paddocks during the migrational movements over winter. The development is likely to impact on the extent of the species and/or the size of a population in the short term, but the longer terms implications are hard to determine. Efforts are being made to include provisions for movement in the designs to provide a corridor for east-west movement. However, the loss of dams and existing movement corridors from development is likely to have a significant impact on this species. Furthermore, the adequacy of the constructed movement corridors and detention basin is untested and although likely to be suitable and effective, their success cannot be guaranteed.
Reduce the area of occupancy of the species.	Likely	As above. The project study area (Subject Land) does contain preferred habitat for the species, which is being impacted both directly and indirectly from the development. The loss of one dam and some internal drainage lines, and the barriers for movement created by the future roads and buildings in their current migrational pathways, means the area of occupancy of the species is likely to be reduced.
Fragment an existing population into two or more populations.	Potential	As above. The project is including chain of ponds style movement corridors along the southern boundary of the Subject Land, that leads between a north-south corridor that runs along the western boundary of the Subject Land, along the edge of the development, and links to the large water detention basin being created to the east of the main southern part of the development, which overflows into Eight Mile Creek to the east. There is a possibility that, despite the efforts to create movement corridors that run north south and east west, that the large subdivision may still fragment the existing populations into two or more populations due to restricted natural movements, or reluctance/inability to use the provided corridors.
Adversely affect habitat critical to the survival of a species.	Likely	As above. The project is impacting on the preferred habitat of the species, including dams, drainage lines, and movement corridors (paddocks between breeding habitat). Given the reduction in this species range, and its current limited distribution across NSW and Australia, any impacts to this species habitat may reduce the survival prospects for this species, at the local level and potentially more broadly if

EPBC Significant Impact Criteria (for Critically and Endangered species)	Significant impact likely?	Justification of decision
		the decline in numbers continues. The project is therefore expected to affect habitat that is critical to the survival of the species at the local level.
Disrupt the breeding cycle of a population.	Potential	As above. Some breeding habitat is being lost. There may also be indirect impacts (pollution, sedimentation, changed water regimes) encountered in retained habitat and provided habitat as a result of the construction and/or ongoing operation of the housing estate. The project CEMP will ensure that pollution, erosion and sedimentation controls are in place, and the provision of chain of ponds style linkages and detention basins will include Sloane's Froglet-friendly designs. Furthermore, no subdivision construction works are to be undertaken during the Sloane's Froglet breeding season. These actions should reduce the likelihood that breeding cycles of the species will be significantly interrupted. However, given the scale of the development and the location of works in key habitat for the species, there is a possibility that the breeding cycle may be disrupted in the short, medium and/or long term.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Potential	As above. The project is impacting on the preferred habitat of the species, including dams, drainage lines, and movement corridors (paddocks between breeding habitat). Given the reduction in this species' range, and its current limited distribution across NSW and Australia, any impacts to this species habitat may cause a decline in this species. The project is therefore expected to affect habitat that is critical to the survival of the species, and impacts may lead to a decline in this species at the local or regional scales.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat.	Potential	Through a project CEMP, controls will be in place during construction, rehabilitation and maintenance phases to minimise the risks of invasive species being introduced by project equipment or machinery, and that monitoring will take place to ensure any accidental introductions are adequately eradicated from the project area. However, ongoing use of the development as a residential housing estate, is likely to increase the risks of invasive species escaping or being introduced into the Sloane's Froglet habitat.
Introduce disease that may cause the species to decline.	Potential	Through a project CEMP, controls will be in place during construction, rehabilitation and maintenance phases to ensure all machinery and equipment arrives clean on site, and that any machinery or equipment previously working in a waterway/dam or a disease risk zone are appropriately decontaminated in a specific manner that will treat the disease being dealt with. Frogs are known to be under threat from the spread of Chytrid Fungus. Despite efforts being made to limit the introduction of this pest to work sites, the scale of the development and the high numbers of different vehicles and machinery being taken onto site, and the inherent difficulty in appropriately decontaminating earthworks machinery (or ensuring compliance with

EPBC Significant Impact Criteria (for Critically and Endangered species)	Significant impact likely?	Justification of decision
		requirements) means there is a risk that Chytrid Fungus could be introduced to the site. Such an introduction may lead to the decline of the species at the local scale.
Interfere with the recovery of the species.	Potential	As the above sections have described, the project will have moderate to significant levels of impact on the receiving environment including breeding habitat and movement corridors for Sloane's Froglet. There is a possibility that disease could be introduced, breeding could be impacted, or movement corridors may be ineffective. The Sloane's Froglet is being directly impacted by the development, and there are potential indirect impacts possible, both of a short-term and long-term nature. The combination of these risk factors, and the unknown extent of their likely impact, means an impact to the recovery of this species as a result of the development cannot be ruled out.
Summary of Sloane's Froglet Significant Impact Assessment		
<p>The project may have a significant impact upon Sloane's Froglet at the local and regional scales. The species' distribution is limited, and the development is taking place in an area that is the stronghold for the species locally, regionally and nationally. Sloane's Froglet was present in every dam and drainage line across the Subject Land and immediate surrounding area, as well as within paddocks during the migrational movements over winter. The development is likely to impact on the extent of the species and/or the size of a population in the short term, but the longer terms implications are hard to determine. Efforts are being made to include provisions for movement in the designs to provide a corridor for east-west movement. As well as protection of their current north-south movement along the western edge of the development. However, the loss of dams and existing movement corridors through the centre of the Subject Land due to the development is likely to have a significant impact on this species at the local level. Furthermore, the adequacy and success of the constructed movement corridors and detention basins, although likely to be suitable and effective, cannot be guaranteed. Despite efforts being made to prevent the introduction of diseases such as Chytrid Fungus, the fact there is a large extent of works and numerous types of equipment being introduced to the site, the risks of the disease entering the population is present, despite control efforts. The project is impacting on the preferred habitat of the species, including dams, drainage lines, and movement corridors (paddocks between breeding habitat). To reduce impacts, no subdivision construction works are to be undertaken during the Sloane's Froglet breeding season. However, given the reduction in this species' range, and its current limited distribution across NSW and Australia, any impacts to this species habitat may reduce the survival prospects for this species, at the local level and potentially more broadly if the decline in numbers continues. The project is therefore expected to affect habitat that is critical to the survival of the species at the local level. As a result of the above findings, it is recommended that this project be referred to the Commonwealth on the basis of a potential significant impact to Sloane's Froglet.</p>		

O2: *Anthochaera phrygia* - Regent Honeyeater (Critically Endangered) – Assumed Present (IHM)

EPBC Significant Impact Criteria (for Critically and Endangered species)	Significant impact likely?	Justification of decision
Lead to a long-term decrease in the size of a population.	Unlikely	The development is contributing to very low levels of impact to native vegetation on site, with most impacts occurring in exotic dominated R1 land. The areas of Regent Honeyeater important mapped habitat along Williams Road are experiencing very little impacts from development, with design processes ensuring that the impacts that are being made are being located in areas with little to no remnant tree cover and in areas dominated by exotic

EPBC Significant Impact Criteria (for Critically and Endangered species)	Significant impact likely?	Justification of decision
		groundcover. There are numerous large remnant trees that are of importance for foraging, however the majority of these are being retained across the site, and all are being retained in mapped important habitat areas. The 36 trees that are being lost, and 23 that are being assumed lost (but retained for habitat and aesthetic purposes) all occur in R1 land, many are Blakely's Red-gum (non-preferred species), and impacts from these losses to the species are expected to be minimal.
Reduce the area of occupancy of the species.	Unlikely	As above. The project study area does contain preferred habitat for the species, however very little of the species preferred habitat is being lost or impacted by the development. Efforts have been made to avoid important mapped habitat, and many large trees are being retained within the development footprint. Given the small scale of disturbance involved with the areas of important habitat, the project will therefore be unlikely to cause any reduction to the area of occupancy for Regent Honeyeater.
Fragment an existing population into two or more populations.	Highly unlikely	As above. The project is avoiding impacts to important habitat areas, and trying to minimise large tree losses where possible. Impact areas in C3 land have been designed to avoid higher quality vegetation by following existing disturbed areas (such as tracks and gateways) for the majority of the impact areas through Williams Road. Given the absence of impacts to areas of important mapped habitat, the impacts from the project will not fragment any populations of Regent Honeyeater into two or more populations.
Adversely affect habitat critical to the survival of a species.	Unlikely	As above. The project is not impacting on the preferred tree species (winter-flowering gums such as Iron-barks) of Regent Honeyeater. Additionally, efforts have been made to avoid all large trees in the areas of important mapped habitat, and trees being lost or deemed lost do not constitute important habitat, and many will be retained within the development, where possible. The reservation of Williams Road as part of the development is likely to help safeguard the areas of important Regent Honeyeater habitat. As such, the project is therefore not expected to affect any habitat that is critical to the survival of the species.
Disrupt the breeding cycle of a population.	Unlikely	As above. The impacts of the project upon the receiving environment are low, and very little impact is expected to occur for native vegetation in areas of important habitat. However, the development is likely to generate noise, vibration and dust issues. Therefore, it is recommended that the CEMP includes measures to control these impacts, to help safeguard potential breeding pairs of Regent Honeyeaters, during the August to January breeding season. If suspect Regent Honeyeaters are seen on the Subject Land or in areas adjacent to the development, work must be stopped and ecologists must be contacted to confirm the sighting. If found to be present, work must stop in the vicinity of the bird(s), until they move on, or in the event of fledglings in a nest, works must stop until fledglings leave the nest. Pre-clearance checks are also recommended prior to the removal of any large trees. With the site not recognised as an important breeding site for the species, and providing the controls are put in

EPBC Significant Impact Criteria (for Critically and Endangered species)	Significant impact likely?	Justification of decision
		place via the CEMP, the breeding cycle of the species should not be disrupted by the project.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	As above. The project is not impacting on the preferred tree species (winter-flowering gums such as Iron-barks) of Regent Honeyeater. Additionally, efforts have been made to avoid all large trees in the areas of important mapped habitat, and trees being lost or deemed lost do not constitute important habitat, and many will be retained within the development, where possible. The reservation of Williams Road as part of the development is likely to help safeguard the areas of important Regent Honeyeater habitat. As such, the project is therefore not expected to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species would be likely to decline.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat.	Unlikely	Through a project CEMP, controls will be in place during construction, rehabilitation and maintenance phases to reduce the risks of invasive species being introduced by project equipment or machinery, and monitoring will take place to ensure any accidental introductions are adequately eradicated from the project area. Controls will also be put in place to ensure no pollutants are introduced or spilled during all stages of the project, and that ongoing maintenance of the area will utilise the lowest impact methods for pest control that are available to do the job successfully. It is unlikely that the development will result in invasive species becoming established and threatening the Regent Honeyeater's habitat.
Introduce disease that may cause the species to decline.	Unlikely	Through a project CEMP, controls will be in place during construction, rehabilitation and maintenance phases to ensure all machinery and equipment arrives clean on site, and that any machinery or equipment previously working in a disease risk zone are appropriately decontaminated in a specific manner that will treat the disease being dealt with. Therefore, no diseases that pose a threat to Regent Honeyeater are likely to be introduced by project equipment or machinery, and the Regent Honeyeater will not be at risk of decline from introduced diseases.
Interfere with the recovery of the species.	Unlikely	As the above sections have described, the project will have low levels of impact on the receiving environment and only 59 trees are to be lost as part of the construction (including 23 that are deemed lost due to TPZ impacts, but will be retained), the majority of which are not the species' preferred winter-flowering species. No tree impacts are occurring in the mapped important habitat for the species, and the majority of vegetation impact in the Subject Land is occurring to relatively significantly disturbed understorey and ground cover species. The Regent Honeyeater is not likely to be directly impacted by the development. Additionally, the reservation of Williams Road is likely to facilitate better protection and management for the areas of important habitat, and risk of vehicle strike to birds in that area will be greatly reduced. Therefore, the development is unlikely to interfere with the recovery of Regent Honeyeater.
Summary of Regent Honeyeater Significant Impact Assessment		

EPBC Significant Impact Criteria (for Critically and Endangered species)	Significant impact likely?	Justification of decision
<p>The project will have minimal direct or indirect impacts for the Regent Honeyeater or its habitat. The development is contributing to very low levels of impact to native vegetation on site, with most impacts occurring in exotic dominated R1 land. The areas of Regent Honeyeater important mapped habitat along Williams Road is experiencing very little impacts from development, with design processes ensuring impacts that are being made are being in areas with little to no remnant tree cover and in areas dominated by exotic groundcover. There are numerous large remnant trees that are of importance for foraging, however the majority of these are being retained across the site, and all are being retained in mapped important habitat areas. The 36 trees that are being lost, and 23 that are being assumed lost (but retained for habitat and aesthetic purposes) all occur in R1 land, many are Blakely's Red-gum (non-preferred species), and impacts from these losses to the species are expected to be minimal. Additionally, the reservation of Williams Road is likely to facilitate better protection and management for the areas of important habitat, and risk of vehicle strike to birds in that area will be greatly reduced. Therefore, the development is unlikely to interfere with the recovery of Regent Honeyeater nor will it be likely to have a significant impact on the species at the local, regional or national scales.</p>		

O3: *Callocephalon fimbriatum* – Gang-gang Cockatoo (Endangered) – Likely

EPBC Significant Impact Criteria (for Critically and Endangered species)	Significant impact likely?	Justification of decision
Lead to a long-term decrease in the size of a population.	Unlikely	The Subject Land contains some suitable habitat, albeit not their preferred habitat of higher quality remnants with good quality shrubby understoreys. As such, the site represents some useful feeding and roosting habitat, and some potential nesting hollows, but lacks the shrub layer which forms an important part of their diet. The TBDC describes scattered trees as not important for this species. Nevertheless, impacts from dust, vibration and noise may pose a risk to the species, particularly if breeding pairs are on or near the site. Breeding season is October to January, and during this time efforts to identify any potential Gang-gang Cockatoos or nests (in hollows) should be made. If suspect birds are seen on the Subject Land or in areas adjacent to the development, work must be stopped, and ecologists must be contacted to confirm the sighting. If found to be present, work must stop in the vicinity of the bird(s), until they move on, or in the event of fledglings in a nest (tree hollow), works must stop until fledglings leave the nest. As most tree impacts are involving scattered trees, with all remnant patches being retained and protected, provided the above measures are included in the CEMP, the development is very unlikely to lead to a decrease in the size of a population.
Reduce the area of occupancy of the species.	Unlikely	As above. The project study area is in a known area of habitation, and the study area is likely to be frequented by Gang-gang Cockatoo during their seasonal migration into and out of the alpine regions to the east and south. However, efforts are being taken to avoid tree impacts and avoid higher quality bushland areas, where possible, meaning there will be minimal to no impacts to the species' feeding or breeding habitat. With scattered trees being a non-preferred habitat type for the species, the loss of some of these trees will not pose risks to occupancy rates in the study area. With efforts to protect and reserve the higher quality vegetation in the Subject Land, along with measures to be included in the CEMP to protect breeding pairs from disturbances, the development will be unlikely to cause any reduction to the area of occupancy for the Gang-gang Cockatoo.

EPBC Significant Impact Criteria (for Critically and Endangered species)	Significant impact likely?	Justification of decision
Fragment an existing population into two or more populations.	Highly unlikely	As above. The project is avoiding impacts to the species preferred habitat trees and where possible the subdivision is designed to avoid higher quality vegetation by following existing disturbed or lower quality areas in the few instances where works must take place in the Williams Road vegetated reserve area. The removal of some non-preferred scattered trees, and the narrow linear impacts from the project in the degraded parts of the potential habitat areas, will not fragment any populations of Gang-gang Cockatoo into two or more populations.
Adversely affect habitat critical to the survival of a species.	Unlikely	As above. The project is not impacting on areas that are considered core habitat for the species, and rather is located in an area that would be frequented on their migration between the alpine areas in summer and low lying areas in winter. With tree impacts being limited to non-preferred scattered trees, and avoidance of higher quality areas, where possible, the habitat impacts will be minimal to negligible for the Gang-gang Cockatoo. The project is therefore not expected to affect any habitat that is critical to the survival of the species.
Disrupt the breeding cycle of a population.	Unlikely	As above. The impacts of the project upon the receiving environment are low, and no impact is expected to occur for native vegetation that provides important breeding habitat (tree hollows). Paddock trees are not important for this species, and no significant impacts to large habitat trees are expected (no tree impacts for trees of any significant size), therefore no change to the species ability to complete its breeding cycle are expected to result from the project. The project CEMP will also ensure that if Gang-gang Cockatoos are identified within or near the study area during construction, all construction within 200 metres of the birds will be halted until the birds move on from the area.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	As above. The low impact nature of the works in the Williams Road area, and the low impact maintenance associated with the project in the habitat areas, will be highly unlikely to impact on the extent of the species habitat, or the quality of habitat to the extent that the species would decline or be at risk of decline. Efforts have been made to tailor the designs to avoid trees and, given the tree impacts that remain are scattered paddock trees (i.e. impacts contain no preferred hollow-bearing trees in remnant area), the project impacts on the species habitat will be very low to negligible.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat.	Unlikely	Through a project CEMP, controls will be in place during construction, rehabilitation and maintenance phases to reduce the risk of invasive species being introduced by project equipment or machinery, and that monitoring will take place to ensure any accidental introductions are adequately eradicated from the project area. Controls will also be put in place to ensure no pollutants are introduced or spilled during all stages of the project, and that ongoing maintenance of the area will utilise the lowest impact methods for pest control that are available to do the job successfully.
Introduce disease that may cause the species to decline.	Unlikely	Through a project CEMP, controls will be in place during construction, rehabilitation and maintenance phases to ensure all machinery and equipment arrives clean on site, and that any machinery or equipment previously working in a disease risk zone are appropriately decontaminated in a specific manner that will treat the disease being dealt with. Therefore,

EPBC Significant Impact Criteria (for Critically and Endangered species)	Significant impact likely?	Justification of decision
		no diseases are likely to be introduced by project equipment or machinery and the Gang-gang Cockatoo will not be at risk of decline from introduced diseases.
Summary of Gang-gang Cockatoo Significant Impact Assessment		
<p>The project is occurring within the species' known preferred range, however it will have minimal direct or indirect impacts for the Gang-gang Cockatoo or its habitat. The works associated with the project construction will not impact on any significant areas of habitat, with tree losses limited to non-preferred scattered paddock trees. No impacts are occurring to any significant trees in higher quality patches or remnant areas, meaning roosting and breeding (tree-hollows) will not be impacted. If Gang-gang Cockatoos are identified within the study area during construction, all construction within 200 metres of the birds will be halted until the birds move on from the area. There will be a project CEMP put in place to help minimise noise and vibration issues and other measures to minimise environmental disturbance, and any reports of potential sightings must be confirmed by an ecologist. Positive sightings will cause a stop work action, and works can only resume when birds leave the area, or if fledglings are in a nest (tree hollow), work cannot resume until fledglings leave the nest. As a result of the above measures, it is highly unlikely that a significant impact to the Gang-gang Cockatoo will occur from the development.</p>		

O4: *Lathamus discolor* – Swift Parrot (Endangered) – **Likely**

EPBC Significant Impact Criteria (for Critically and Endangered species)	Significant impact likely?	Justification of decision
Lead to a long-term decrease in the size of a population.	Unlikely	The important habitat map for Swift Parrot does not cover the Subject Land, although mapped habitat is located nearby to the south. Scattered trees are considered important habitat for this species, and there is suitable feeding (winter-flowering trees) and roosting habitats throughout the better quality areas along Williams Road, and along Eight Mile Creek and other adjoining creeks and drainage lines. The loss of 36 trees, and the deemed loss of 23 trees (being retained), is unlikely to significantly impact potential habitat for this species in the Subject Land. Impacts from dust, vibration and noise may pose a disturbance risk to the species. However, breeding for this species is exclusively undertaken in Tasmania over the warmer months, in October to December, and thus will not be disrupted by development. Nevertheless, efforts to identify any potential Swift Parrots should be made during the development stages. If suspect birds are seen on the Subject Land or in areas adjacent to the development, work must be stopped and ecologists must be contacted to confirm the sighting. If found to be present, work must stop in the vicinity of the bird(s), until they move on from the site. With the efforts being made to tailor the designs to avoid large trees where possible, the project is only removing 59 trees, most of which are small. Of the large trees being removed, many are being retained, despite being considered lost, therefore the impacts on the species are expected to be low.
Reduce the area of occupancy of the species.	Unlikely	As above. The development is impacting a small amount of habitat, which is restricted to scattered paddock trees, which are of limited value for Swift Parrot. The majority of the native vegetation within the Subject Land is being retained and protected (reserved), which is safeguarding the majority of Swift Parrot habitat into the future.

EPBC Significant Impact Criteria (for Critically and Endangered species)	Significant impact likely?	Justification of decision
		Given the very small scale of disturbance involved with the linear connectivity works in Williams Road, which is focussed on already disturbed and lower quality areas of the road reserve, the project will therefore be unlikely to cause any reduction to the area of occupancy for Swift Parrot.
Fragment an existing population into two or more populations.	Highly unlikely	As above. The project is impacting several scattered trees and no intact patches of native vegetation are being impacted by the development. As such, there is little risk of populations of Swift Parrot being fragmented into two or more populations by the development works or the ongoing operation of the housing estate.
Adversely affect habitat critical to the survival of a species.	Unlikely	As above. The project is impacting several scattered trees (of some limited habitat value) and no intact patches of native vegetation (higher quality habitat) are being impacted by the development. Furthermore, the estate will be vegetated along roadsides and in reserves with biodiverse indigenous plantings, which will in effect provide additional feeding resources for the species in the local area. The project is therefore not expected to affect any habitat that is critical to the survival of the species.
Disrupt the breeding cycle of a population.	Highly unlikely	As above. The impacts of the project upon the receiving environment are moderate to high, but nearly all impacts are occurring on highly degraded R1 land which contains no native species except for some scattered trees, and very little impact is expected to occur for areas of native vegetation. Furthermore, Swift Parrots do not breed on mainland Australia, therefore there are no risks of the project disrupting the breeding cycle of the species.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Unlikely	As above. The Subject Land contains roosting and feeding habitat, especially along the higher quality areas of Williams Road. The project is impacting several scattered trees (of some limited habitat value) and no intact patches of native vegetation are being impacted by the development. Furthermore, the estate will be vegetated along roadsides (nature strips) and in reserves with biodiverse indigenous plantings, which will in effect provide additional feeding resources for the species in the local area. There will therefore be very little modification or removal of Swift Parrot habitat, and the small impacts expected are unlikely to decrease the availability or quality of habitat to the extent that the species is likely to decline.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat.	Unlikely	Through a project CEMP, controls will be in place during construction, rehabilitation and maintenance phases to reduce the risk of invasive species being introduced by project equipment or machinery, and monitoring will take place to ensure any accidental introductions are adequately eradicated from the project area. Controls will also be put in place to ensure no pollutants are introduced or spilled during all stages of the project, and that ongoing maintenance of the area will utilise the lowest impact methods for pest control that are available to do the job successfully.
Introduce disease that may cause the species to decline.	Unlikely	Through a project CEMP, controls will be in place during construction, rehabilitation and maintenance phases to ensure all machinery and equipment arrives clean on site, and that any machinery or equipment previously working in a disease risk zone are appropriately decontaminated in a specific manner that will treat the disease being

EPBC Significant Impact Criteria (for Critically and Endangered species)	Significant impact likely?	Justification of decision
		dealt with. Therefore, no diseases are likely to be introduced by project equipment or machinery and the Swift Parrot will not be at risk of decline from introduced diseases.
Interfere with the recovery of the species.	Unlikely	As the above sections have described, the project will have low levels of impact on the habitat values of the receiving environment and only 36 trees are to be removed as part of the construction. The majority of vegetation impact is in small linear connectivity works which are already disturbed and limited to understorey and ground cover species, or exotic species. The Swift Parrot is not likely to be directly impacted by the development. Additionally, the development is likely to facilitate better feeding opportunities for the species, replacing biodiverse tree and shrub plantings into a generally shrub-deficient area. Ongoing management of the proposed reserve areas is also likely to improve the quality of the vegetation in the area, through more regular management works and improved threat controls. The development is therefore unlikely to interfere with the recovery of the species.

Summary of Swift Parrot Significant Impact Assessment

The important habitat map for Swift Parrot does not cover the Subject Land, although mapped habitat is nearby, to the south. Scattered trees are considered important habitat for this species, and there is suitable feeding (winter-flowering trees) and roosting habitats throughout the better quality areas along Williams Road, and along Eight Mile Creek and other adjoining creeks and drainage lines. The loss of 36 trees, and the deemed loss of 23 trees (retained), is unlikely to significantly impact potential habitat for this species in the Subject Land. Impacts from dust, vibration and noise may pose a disturbance risk to the species. However, breeding for this species is exclusively undertaken in Tasmania over the warmer months, in October to December, thus breeding will not be disrupted by development. Nevertheless, efforts to identify any potential Swift Parrots should be made during the development stages. If suspect birds are seen on the Subject Land or in areas adjacent to the development, work must be stopped and ecologists must be contacted to confirm the sighting. If found to be present, work must stop in the vicinity of the bird(s) until they move on from the site. With the efforts being made to tailor the designs to avoid large trees where possible, and given the project is only removing 36 trees, with many being retained, the impacts on the species will be very low to negligible. The development is likely to facilitate better feeding opportunities for the species, with biodiverse tree and shrub plantings being used for estate landscaping, which is putting feed species back into a generally shrub-deficient area. Ongoing management of the proposed reserve areas is also likely to improve the quality of the vegetation in the area, through more regular management works and improved threat controls. As a result of low habitat impacts, and efforts to minimise potential impacts through actions in the CEMP, it is unlikely that the development will significantly impact the Swift Parrot.

O5: *Polytelis swainsonii* - Superb Parrot (Vulnerable) – Likely

EPBC Significant Impact Criteria (for Vulnerable species)	Significant impact likely?	Justification of decision
Lead to a long-term decrease in the size of an important population of a species.	Unlikely	This species was not detected during field assessments and there are limited local records, although it may frequent the woodlands and small areas of grasslands within the study area on occasion, especially those areas along Eight Mile Creek and Williams Road. However, the local area does not contain their preferred species (<i>Eucalyptus largiflorens</i>), nor is it near a major waterbody, and the site is unlikely to provide important breeding habitat for the Superb Parrot. The loss of 36 trees, and the deemed loss of 23 trees (retained), is unlikely to significantly impact potential habitat for this

EPBC Significant Impact Criteria (for Vulnerable species)	Significant impact likely?	Justification of decision
		species in the Subject Land. Impacts from dust, vibration and noise may pose a disturbance risk to the species. However, the site does not represent preferred breeding habitat, and breeding for this species is unlikely to occur in the Subject Land. Nevertheless, efforts to identify any potential Superb Parrots should be made during the development stages. If suspect birds are seen on the Subject Land or in areas adjacent to the development, work must be stopped and ecologists must be contacted to confirm the sighting. If found to be present, work must stop in the vicinity of the bird(s), until they move on from the site. With the efforts being made to tailor the designs to avoid large trees and areas of native grasslands, where possible, and the project is only removing 36 trees, with many being retained, the impacts on the species will be very low to negligible.
Reduce the area of occupancy of an important population.	Unlikely	As above. The development is impacting a small amount of potential habitat, which is restricted to scattered paddock trees, which are of some limited value for Superb Parrot. The majority of the native vegetation within the Subject Land is being retained and protected (reserved), which is safeguarding the majority of Superb Parrot habitat into the future. Given the very small scale of disturbance involved with the linear connectivity works in Williams Road, which is focussed on already disturbed and lower quality areas of the road reserve, the project will therefore be unlikely to cause any reduction to the area of occupancy for Superb Parrot.
Fragment an existing important population into two or more populations.	Unlikely	As above. The project is impacting several scattered trees and no intact patches of native vegetation are being impacted by the development. As such, there is little risk of populations of Superb Parrot being fragmented into two or more populations by the development works or the ongoing operation of the housing estate.
Adversely affect habitat critical to the survival of a species.	Highly unlikely	As above. The project is impacting several scattered trees (of some limited habitat value) and no intact patches of native vegetation (higher quality habitat) are being impacted by the development. Furthermore, the grassland feeding habitat areas along Williams Road are being avoided by development impacts, and remaining areas will be protected and managed into the future as part of the new reserve. This should help to safeguard the feeding resources for the species in the local area. The project is therefore not expected to affect any habitat that is critical to the survival of the species.
Disrupt the breeding cycle of an important population.	Highly unlikely	As above. The impacts of the project upon the receiving environment are moderate to high, but nearly all impacts are occurring on highly degraded R1 land which contains no native species except for some scattered trees, and very little impact is expected to occur in areas of native vegetation. Furthermore, the Subject Land does not contain preferred breeding habitat of Superb Parrot, with breeding usually occurring in River Red-gum or Black Box trees along major watercourses. Therefore, the risk of the project disrupting the breeding cycle of the species is low.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Highly unlikely	As above. The Subject Land contains roosting and feeding habitat, especially along the higher quality areas of Williams Road. The project is impacting several scattered trees (of some limited habitat value) and no intact patches of native vegetation are being significantly impacted by the development. Furthermore, the grassland feeding habitat areas along Williams Road are being avoided by development impacts, and remaining areas will be protected and managed into the future as part of the new reserve. This should help to safeguard the feeding resources for the species in the local

EPBC Significant Impact Criteria (for Vulnerable species)	Significant impact likely?	Justification of decision
		area. There will therefore be very little modification or removal of Superb Parrot habitat, and the small impacts expected are unlikely to decrease the availability or quality of habitat to the extent that the species is likely to decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	Unlikely	Through a project CEMP, controls will be in place during construction, rehabilitation and maintenance phases to reduce the risk of invasive species being introduced by project equipment or machinery, and monitoring will take place to ensure any accidental introductions are adequately eradicated from the project area. Controls will also be put in place to ensure no pollutants are introduced or spilled during all stages of the project, and that ongoing maintenance of the area will utilise the lowest impact methods for pest control that are available to do the job successfully.
Introduce disease that may cause the species to decline.	Unlikely	Through a project CEMP, controls will be in place during construction, rehabilitation and maintenance phases to ensure all machinery and equipment arrives clean on site, and that any machinery or equipment previously working in a disease risk zone are appropriately decontaminated in a specific manner that will treat the disease being dealt with. Therefore, no diseases are likely to be introduced by project equipment or machinery and the Superb Parrot will not be at risk of decline from introduced diseases.
Interfere substantially with the recovery of the species.	Unlikely	As the above sections have described, the project will have low levels of impact on the habitat values of the receiving environment and only 36 trees are to be removed as part of the construction. The majority of vegetation impact is involving small linear connectivity works which are already disturbed and limited to understorey and ground cover species, or exotic species. The Superb Parrot is not likely to be directly impacted by the development. Additionally, the development is likely to facilitate better feeding opportunities for the species, protecting and safeguarding the remaining areas of native grasses along Williams Road, which is to be reserved and managed. Ongoing management of the proposed reserve areas is also likely to improve the quality of the vegetation in the area, through more regular management works and improved threat controls. The development is therefore unlikely to interfere with the recovery of the species.

Summary of Superb Parrot Significant Impact Assessment

Scattered trees are considered important habitat for this species, and there is suitable feeding (grassland areas) and roosting habitats throughout the better quality areas along Williams Road, and along Eight Mile Creek and other adjoining creeks and drainage lines. The loss of 36 trees, and the deemed loss of 23 trees (retained), is unlikely to significantly impact potential habitat for this species in the Subject Land. Impacts from dust, vibration and noise may pose a disturbance risk to the species. However, breeding for this species is unlikely to occur in the non-preferred habitat that occurs in the Subject Land and local area. Nevertheless, efforts to identify any potential Superb Parrots should be made during the development stages. If suspect birds are seen on the Subject Land or in areas adjacent to the development, work must be stopped and ecologists must be contacted to confirm the sighting. If found to be present, work must stop in the vicinity of the bird(s), until they move on from the site. With the efforts being made to tailor the designs to avoid large trees where possible, and the project is only removing 36 trees, with many being retained, the impacts on the species will be very low to negligible. The development is likely to facilitate better feeding opportunities for the species, with grasslands along Williams Road being protected and managed as part of a reserve into the future. Ongoing management of the proposed reserve areas is also likely to improve the quality of the vegetation in the area, through more regular management works and improved threat controls. As a result of low habitat impacts, and efforts to minimise potential impacts through actions in the CEMP, it is unlikely that the development will significantly impact the Superb Parrot.

O6: *Stagonopleura guttata* – Diamond Firetail (Vulnerable) – Likely

EPBC Significant Impact Criteria (for Vulnerable species)	Significant impact likely?	Justification of decision
Lead to a long-term decrease in the size of an important population of a species.	Highly unlikely	This species was not detected during field assessments, although it is known from the area and may frequent the woodlands and grasslands within the study area, especially those around Williams Road. The low impacts taking place in the species' preferred grassland habitat, due to avoidance and impact minimisation measures, means the project will be highly unlikely to impact on the extent of the species or the size of a population. Efforts are being made to tailor the designs to avoid trees and given the project is avoiding higher quality areas of bushland, wherever possible, the impacts on the species will be very low to negligible.
Reduce the area of occupancy of an important population.	Unlikely	As above. The project study area is in the species' area of habitation, and the Subject Land does contain viable woodland and grassland habitat for Diamond Firetail. There is some breeding habitat, including planted prickly shrubs such as Hedge Wattle, albeit at relatively low densities. With efforts being taken to avoid tree impacts and avoid higher quality bushland areas, where possible, there will be minimal impacts to the species' breeding habitat. Some impacts will be occurring to exotic pastures which is likely to provide feeding resources for the species, however their preferred native grassland areas are undergoing low levels of disturbance, and will be protected and managed along Williams Road into the future. Given the narrow footprints of works in Williams Road, and the protection of higher quality habitat areas, the project will be unlikely to cause any significant reduction to the area of occupancy for the Diamond Firetail.
Fragment an existing important population into two or more populations.	Unlikely	As above. The project is avoiding impacts to trees, and where possible the works have been designed to avoid higher quality vegetation by following existing disturbed or lower quality areas for the majority of the connectivity works areas. The narrow linear impacts from the project and short-term construction processes will not fragment any populations of Diamond Firetail into two or more populations.
Adversely affect habitat critical to the survival of a species.	Highly unlikely	As above. The project is not impacting on areas that are considered core habitat for the species, with the majority of impacts from development to occur in heavily cleared R1 areas that are dominated by monocrops of common pasture species. Lack of tree impacts and avoidance of higher quality areas, where possible, will mean habitat impacts will be minimal to negligible. The project is therefore not expected to affect any habitat that is critical to the survival of the species.
Disrupt the breeding cycle of an important population.	Highly unlikely	As above. The impacts of the project upon the habitat areas of this species are low, and no impact is expected to occur for native vegetation that provides breeding or preferred feeding habitat. The loss of several scattered trees are not considered to be a significant impact to its breeding potential, and therefore no change to the species ability to complete its breeding cycle are expected to result from the project. The project CEMP will also ensure that if Diamond Firetail are identified within the study area during construction, all construction within 200 metres of the birds will be halted until the birds move on from the area, or if breeding, construction to halt until fledglings leave the nest.
Modify, destroy, remove or isolate or decrease the availability or quality	Highly unlikely	As above. The construction is not significantly impacting upon areas that are considered to be important feeding or breeding habitat for the Diamond Firetail. Furthermore, the reservation of Williams Road and the ongoing maintenance of that area is likely to add to and protect the breeding and

EPBC Significant Impact Criteria (for Vulnerable species)	Significant impact likely?	Justification of decision
of habitat to the extent that the species is likely to decline.		foraging values in that area. The project will therefore be highly unlikely to impact on the extent of the species habitat, or the quality of habitat to the extent that the species would decline or be at risk of decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	Unlikely	Through a project CEMP, controls will be in place during construction, rehabilitation and maintenance phases to ensure no invasive species are introduced by project equipment or machinery, and that monitoring will take place to ensure any accidental introductions are adequately eradicated from the project area. Controls will also be put in place to ensure no pollutants are introduced or spilled during all stages of the project, and that ongoing maintenance of the area will utilise the lowest impact methods for pest control that are available to do the job successfully.
Introduce disease that may cause the species to decline.	Unlikely	Through a project CEMP, controls will be in place during construction, rehabilitation and maintenance phases to ensure all machinery and equipment arrives clean on site, and that any machinery or equipment previously working in a disease risk zone are appropriately decontaminated in a specific manner that will treat the disease being dealt with. Therefore, no diseases are likely to be introduced by project equipment or machinery and the Diamond Firetail will not be at risk of decline from introduced diseases.
Interfere substantially with the recovery of the species.	Unlikely	As above. The project study area is in the known area of habitation. However, efforts are being taken to avoid impacts to higher quality bushland areas, where possible, meaning there will be minimal to no impacts to the species' preferred feeding or breeding habitat. Given the narrow footprint of works along the connectivity sites in Williams Road, and the siting of impact areas in exotic dominated and already significantly disturbed areas, the project will be unlikely to interfere with the recovery of Diamond Firetail.

Summary of Diamond Firetail Significant Impact Assessment

The project is occurring within part of the species' known range. However, it will have minimal direct or indirect impacts for the Diamond Firetail or its preferred feeding and breeding habitat. The works associated with the project construction are almost exclusively located within heavily disturbed R1 areas, that are dominated by exotic pastures and weed species. Minimal impacts are occurring to trees, and higher value woodlands and shrub planting along Williams Road are being protected from the majority of impacts from the development, meaning roosting, foraging and breeding is unlikely to be significantly impacted. If Diamond Firetail are identified within the study area during construction, all construction within 200 metres of the birds will be halted until the birds move on from the area. If breeding, construction will halt until fledglings leave the nest. There will be a project CEMP put in place to help minimise noise and vibration issues and other measures to minimise environmental disturbance. As a result of the above measures, it is highly unlikely that a significant impact to the Diamond Firetail will occur from the development.

O7: *Climacteris picumnus victoriae* – South Eastern Brown Tree-creeper (Vulnerable) – Likely

EPBC Significant Impact Criteria (for Vulnerable species)	Significant impact likely?	Justification of decision
Lead to a long-term decrease in the size of an important population of a species.	Highly unlikely	This species was not detected during field assessments, although is known from the area and may frequent the woodlands and grasslands within the study area, especially those around higher quality patches of Williams Road. The low impacts taking place in the species' preferred habitat, due to avoidance and impact minimisation measures, means the project will be highly unlikely to impact on the extent of the species or the size of a population. Efforts are being made to tailor the designs to avoid trees, and given the project is avoiding higher quality areas of bushland, wherever possible, the impact on the species will be very low to negligible.
Reduce the area of occupancy of an important population.	Unlikely	As above. The project study area is in the species' area of habitation, and the Subject Land does contain viable woodland habitat for Brown Tree-creeper. There is some breeding habitat, including its preferred open box gum woodland, and trees with hollows. With efforts being taken to avoid tree impacts and avoid higher quality bushland areas, where possible, there will be minimal impacts to the species' breeding habitat. Some impacts will be occurring to exotic pastures which is likely to provide some feeding resources for the species, however, their preferred foraging areas are undergoing low levels of disturbance, and will be protected and managed along Williams Road into the future. Given the narrow footprints of works in Williams Road, and the protection of higher quality habitat areas, the project will be unlikely to cause any significant reduction to the area of occupancy for the Brown Tree-creeper.
Fragment an existing important population into two or more populations.	Unlikely	As above. The project is avoiding impacts to trees as much as possible, and where possible the works have been designed to avoid higher quality vegetation by following existing disturbed or lower quality areas for the majority of the connectivity works areas. The narrow linear impacts from the project and short-term construction processes will not fragment any populations of Brown Tree-creeper into two or more populations.
Adversely affect habitat critical to the survival of a species.	Highly unlikely	As above. The project is not impacting on areas that are considered core habitat for the species, with the majority of impacts from development to occur in heavily cleared R1 areas that are dominated by monocrops of common pasture species. Low amounts of tree impacts and avoidance of higher quality areas, where possible, will mean habitat impacts will be minimal. The project is therefore not expected to affect any habitat that is critical to the survival of the species.
Disrupt the breeding cycle of an important population.	Highly unlikely	As above. The impacts of the project upon the habitat areas of this species are low, and no impact is expected to occur for native vegetation that provides breeding habitat. The loss of several scattered trees are not considered to be a significant impact to its breeding potential, and therefore no change to the species ability to complete its breeding cycle are expected to result from the project. The project CEMP will also ensure that if Brown Tree-creeper are identified within the study area during construction, all construction within 200 metres of the birds will be halted until the birds move on from the area, or if breeding, construction to halt until fledglings leave the nest.
Modify, destroy, remove or isolate or decrease the availability or quality	Highly unlikely	As above. The development is not significantly impacting upon areas that are considered to be important feeding or breeding habitat for the Brown Tree-creeper. Furthermore, the reservation of Williams Road and the ongoing maintenance of that area is likely to add to and protect the

EPBC Significant Impact Criteria (for Vulnerable species)	Significant impact likely?	Justification of decision
of habitat to the extent that the species is likely to decline.		breeding and foraging values in that area. The project will therefore be highly unlikely to impact on the extent of the species' habitat, or the quality of habitat to the extent that the species would decline or be at risk of decline.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	Unlikely	Through a project CEMP, controls will be in place during construction, rehabilitation and maintenance phases to ensure no invasive species are introduced by project equipment or machinery, and that monitoring will take place to ensure any accidental introductions are adequately eradicated from the project area. Controls will also be put in place to ensure no pollutants are introduced or spilled during all stages of the project, and that ongoing maintenance of the area will utilise the lowest impact methods for pest control that are available to do the job successfully.
Introduce disease that may cause the species to decline.	Unlikely	Through a project CEMP, controls will be in place during construction, rehabilitation and maintenance phases to ensure all machinery and equipment arrives clean on site, and that any machinery or equipment previously working in a disease risk zone are appropriately decontaminated in a specific manner that will treat the disease being dealt with. Therefore, no diseases are likely to be introduced by project equipment or machinery and the Brown Tree-creeper will not be at risk of decline from introduced diseases.
Interfere substantially with the recovery of the species.	Unlikely	As above. The project study area is in the known area of habitation. However, efforts are being taken to avoid impacts to higher quality bushland areas, where possible, meaning there will be minimal to no impacts to the species' preferred feeding or breeding habitat. Given the narrow footprint of works along the connectivity sites in Williams Road, and the siting of impact areas in exotic dominated and already significantly disturbed areas, the project will be unlikely to interfere with the recovery of Brown Tree-creeper.
Summary of Brown Tree-creeper Significant Impact Assessment		
<p>The project is occurring within part of the species' known range. However, it will have minimal direct or indirect impacts for the Brown Tree-creeper or areas of its preferred habitat. The works associated with the project construction are almost exclusively located within heavily disturbed R1 areas, that are dominated by exotic pastures and weed species, and relatively disconnected scattered trees. Some impacts are occurring to trees, but given their low connectivity to higher quality areas of bushland, they are unlikely to provide significant amounts of preferred nesting habitat. Furthermore, higher value woodlands and shrub planting along Williams Road are being protected from the majority of impacts from the development, meaning roosting, foraging and breeding is unlikely to be significantly impacted in these areas, and may in fact be enhanced. If Brown Tree-creeper are identified within the study area during construction, all construction within 200 metres of the birds will be halted until the birds move on from the area. If breeding, construction will halt until fledglings leave the nest. There will be a project CEMP put in place to help minimise noise and vibration issues and other measures to minimise environmental disturbance. As a result of the above measures, it is highly unlikely that a significant impact to the Brown Tree-creeper will occur from the development.</p>		

Appendix O: Letter from ACC in Response to ToS



Parcel No: 49753
Portal Reference No: PAN-287404
Contact: Buddhika Perera

4 December 2023

Blueprint Planning
Unit 3
576 Kiewa Street
ALBURY NSW 2640

Dear Sir/Madam

**Subject: Development Application: 10.2022.39875.1
65 Williams Road THURGOONA
Four Hundred & Forty Five (445) Lot Torrens Title Subdivision, Vegetation Removal &
Planning Agreement for Local Recreational Park - Williams Road Estate Stages 1-8**

I refer to the development application described above, the previous information request on 16 May 2023 and the applicant's responses to the information requested.

Council has assessed the submitted information including ToS Version 4 prepared by Hamilton Environmental Services and would like to draw your attention to the following key issues which must be resolved to continue the assessment of this application.

1. Test of Significance (ToS) version 4

The submitted Test of Significance (ToS) version 4 does not describe the widespread construction and development impacts that could have been reasonably expected over the entire subject land. Therefore, a TOS for C3 segments of land is not sufficient for the assessment of this application and a Biodiversity Assessment Report (BDAR) is requested. As per previous advice provided by Council and the Department of Planning, a BDAR for the entire site is to be prepared by an Accredited Assessor according to the NSW BAM 2020 guidelines. This is considered a critical requirement to assess this application further.

The BDAR shall include all R1 and C3 zones, Biodiversity Certified and Excluded Lands, and will assess all twelve (12) species added to the BC Act 2016. Although it would have to consider all threatened species likely to occur on C3 zoned land, it would only have to consider the 12 new species on R1 zoned land listed below.

- i. Relevant candidates for review from 12 new species on R1 land (BC Act 2016),
 - a. Dusky Woodswallow,
 - b. Flame Robin,
 - c. Scarlet Robin,
 - d. Sloane's Froglet,
- ii. Listed candidates for SAIL status (BC Act 2016),
 - a. Box Gum Woodland, Biodiversity Conservation Values
 - b. Regent Honeyeater, Important Habitat Mapping

Given their threatened status and potential loss of important core habitat, the BDAR shall also include assessments for Squirrel Gliders, as recent Survey work and studies by Albury Conservation Company indicate their existence within the Williams Road reserve and nearby lands.

Council's previous advice that a BDAR is required across the entire development site was provided on December 2022: 6 February 2023, and 15 August 2023. If a BDAR is not lodged, then the Council will not be able to assess the proposal under the BC Act 2016.

However, if the applicant does not wish to provide a BDAR, please respond in writing advising Council that the BDAR will not be provided, and the application will be determined based on the information available.

Alternatively, the applicant also can withdraw the application before its determination.

2. Native Vegetation Removal

It is noted that 59 native trees are to be removed from C3 land and 67 trees (including 29 hollow-bearing trees) are to be removed from R1 zoned land. The R1 zoned land is described as containing "mostly large remnant hollow-bearing scattered trees of either Yellow Box and Blakely's Red Gum" (p. 37, 68, ToS v4). Although the removal of 29 hollow-bearing trees is stated throughout the ToS, no attempt has been made to retain any of them in perpetuity.

An arborist report must be submitted to the satisfaction of the Council for all trees within the proposal area that are likely to be impacted and/or removed as part of the subdivision works. The arborist report aims to determine the likely impact on the trees from the construction and operation of the project, suitability for their retention, required protection and management methodology, and a risk assessment of retained trees.

Eight out of the nine trees to be retained (p.15, ToS v4) are not located within the subdivision development site. The information provided does not demonstrate avoid and minimise in relation to trees on R1 zoned land. Retained trees have not been incorporated into parks, public open space and/or road reserves in order to ensure their long-term protection.

3. Sloane's Management Plan

A Sloane's Management Plan in line with the recommendations of the BDAR is requested.

Sloane's Froglet has not been adequately considered in the ToS. Although adherence to the Guidelines may offset direct on-site impacts to Sloane's Froglet, they are not considered adequate mitigation for the impacts to the core breeding habitat found on adjacent Council-managed land. Additional information provided by Premise (6 April 23) only refers to Sloane's Froglet basins on-site. The ToS has not assessed indirect and prescribed impacts on this important population. Connectivity will be critical for the remnant population of Sloane's Froglet in this area to remain extant and the proposed design does not improve the connectivity between existing habitats.

The movement, habitat provision and connectivity of Sloane's Froglet need to be considered in designing the subdivision as a requirement to avoid and minimise development impacts. Albury City Council's Subdivisions and Development Standards - Part 3 Stormwater Drainage Design (July 2009) requires stormwater to be managed under the principles of water-sensitive urban design and an offline chain of ponds could be designed to provide for connectivity and improve the long-term survivorship for the species (refer to 'Sloane's Froglet Stormwater Wetland Design Guidelines').

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ABN 92 965 474 349

4. Lack of public open space and connectivity

Please consider redesigning LRP2 and other public open spaces to improve accessibility and connectivity. Council would like to draw the applicant's attention to the lack of public open spaces within the subdivision and the lack of connectivity and significant separation between proposed LRP2 and proposed residential areas. The proposed Sloane's froglet basins and wetlands separate the parkland and create a physical barrier, notwithstanding the provision of a footpath to connect the residential area to the LRP2. A centralised open space area may be an advisable design inclusion.

5. Footpath / Bicycle connection

Please consider redesigning the footpath and bicycle paths to improve connectivity through the Williams Road reservation for public parkland.

There is only 1 current connection for pedestrian movement across Williams Road between the northern and southern portions of the development.

A response to this request would be appreciated within fourteen (14) days via NSW Planning portal (portal reference PAN-287404).

Please note that in accordance with clause 94 of the *Environmental Planning and Assessment Regulation 2021* the assessment period for this application is suspended from the date of this letter until the above information is provided, or Council is advised, in writing, that the information will not be provided.

Should any further information be required, please contact Buddhika Perera on 02 6023 8288.

Yours faithfully



Matt Wilson
Team Leader
Infrastructure, Planning & Environment

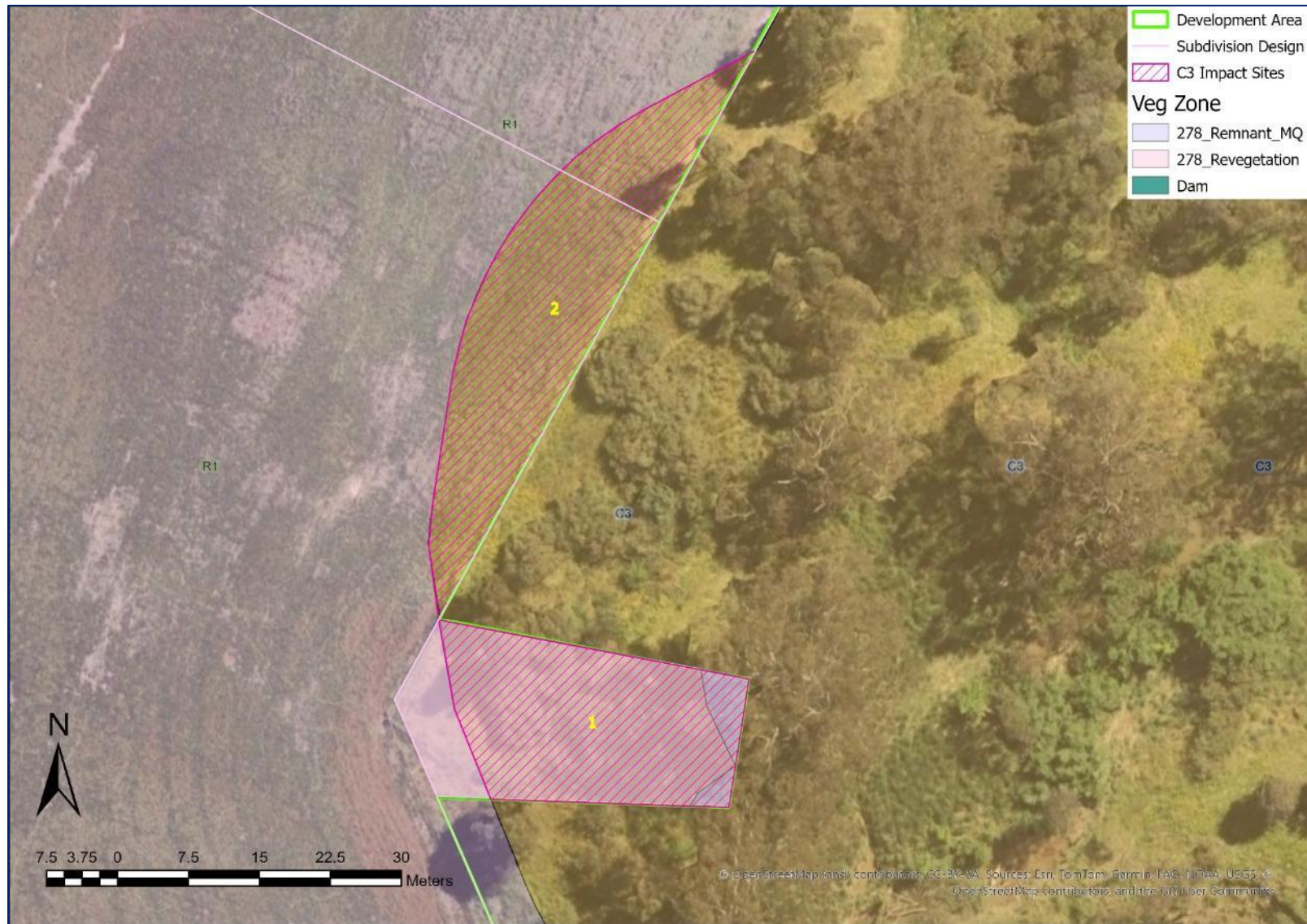
T 02 6023 8111
F 02 6023 8190
info@alburycity.nsw.gov.au
alburycity.nsw.gov.au

PO Box 323
553 Kiewa Street
Albury NSW 2640
ABN 92 965 474 349

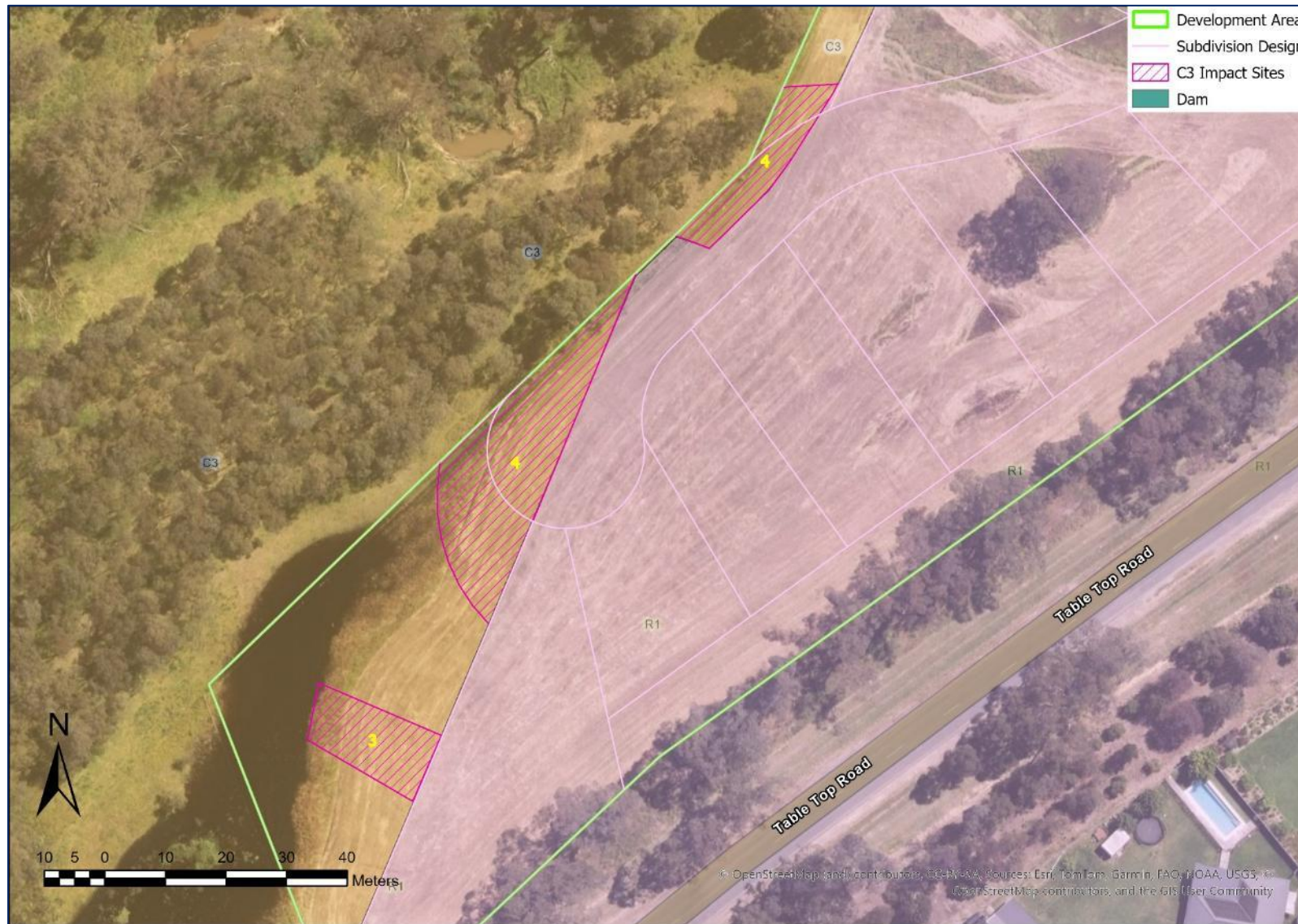
Appendix P: Additional detailed site maps of C3 zoned land vegetation impact areas

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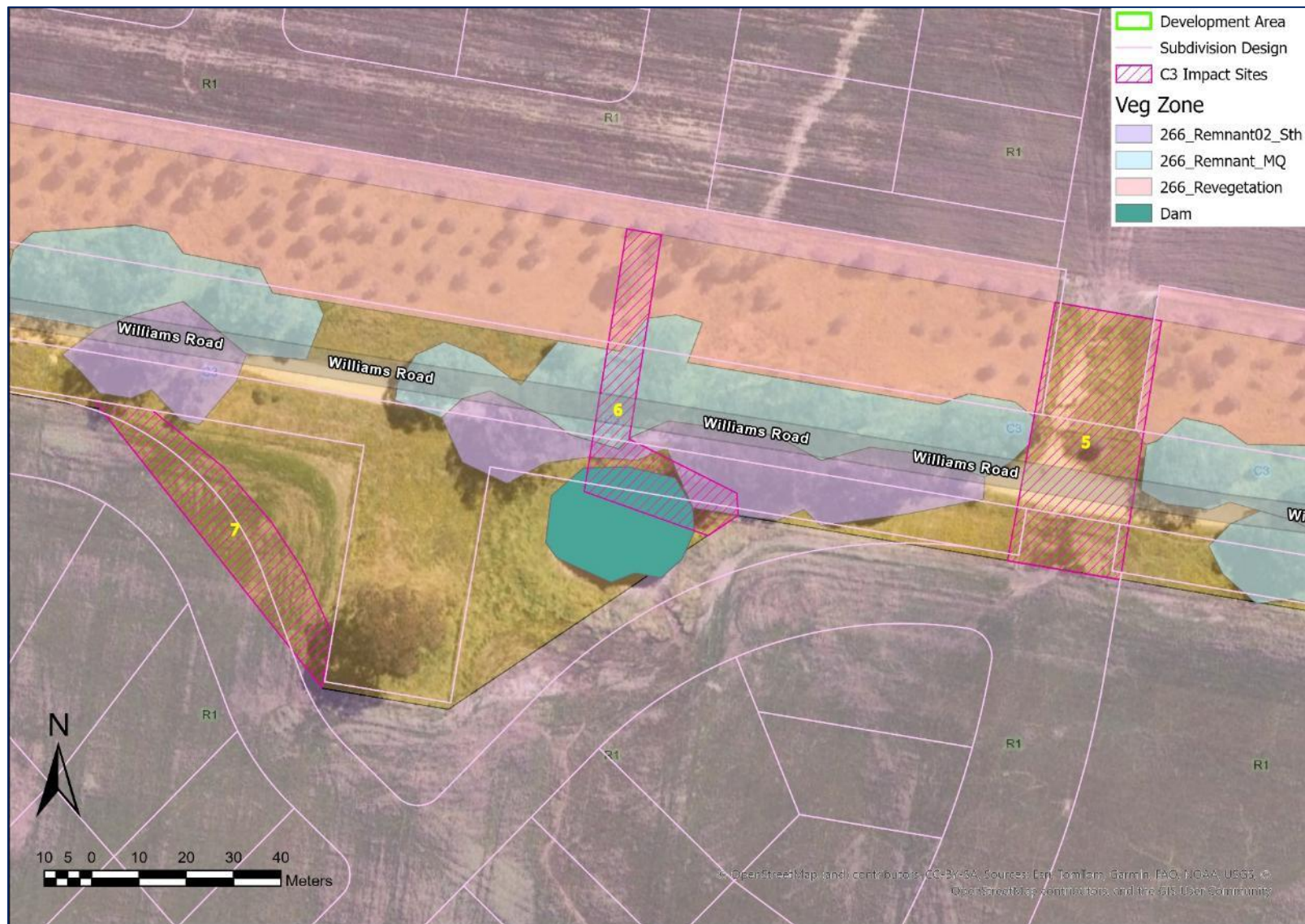
P1 – C3 zoned land impacts associated with impact sites 1 and 2



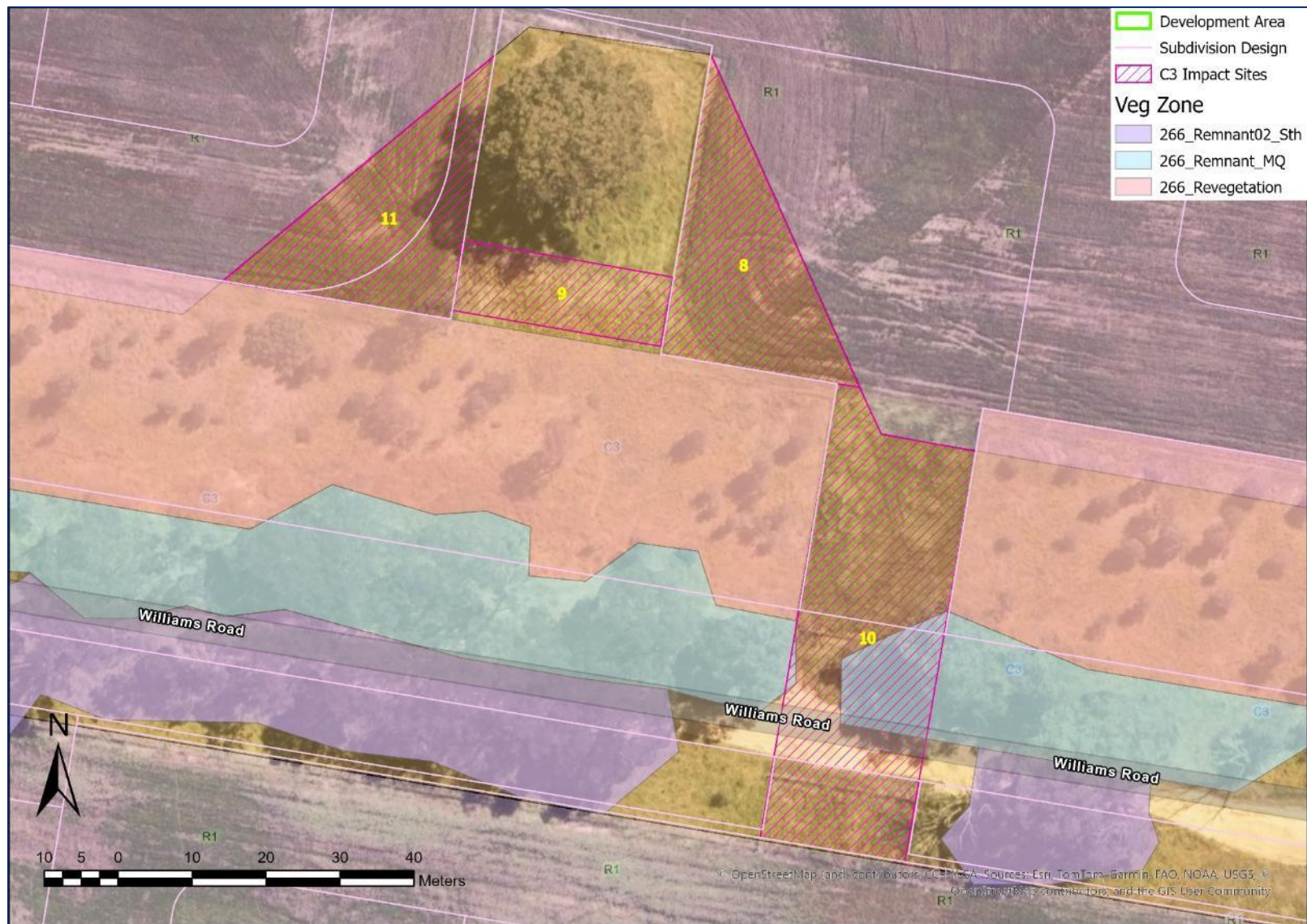
P2 – C3 zoned land impacts associated with impact sites 3 and 4 (no vegetation impacts)



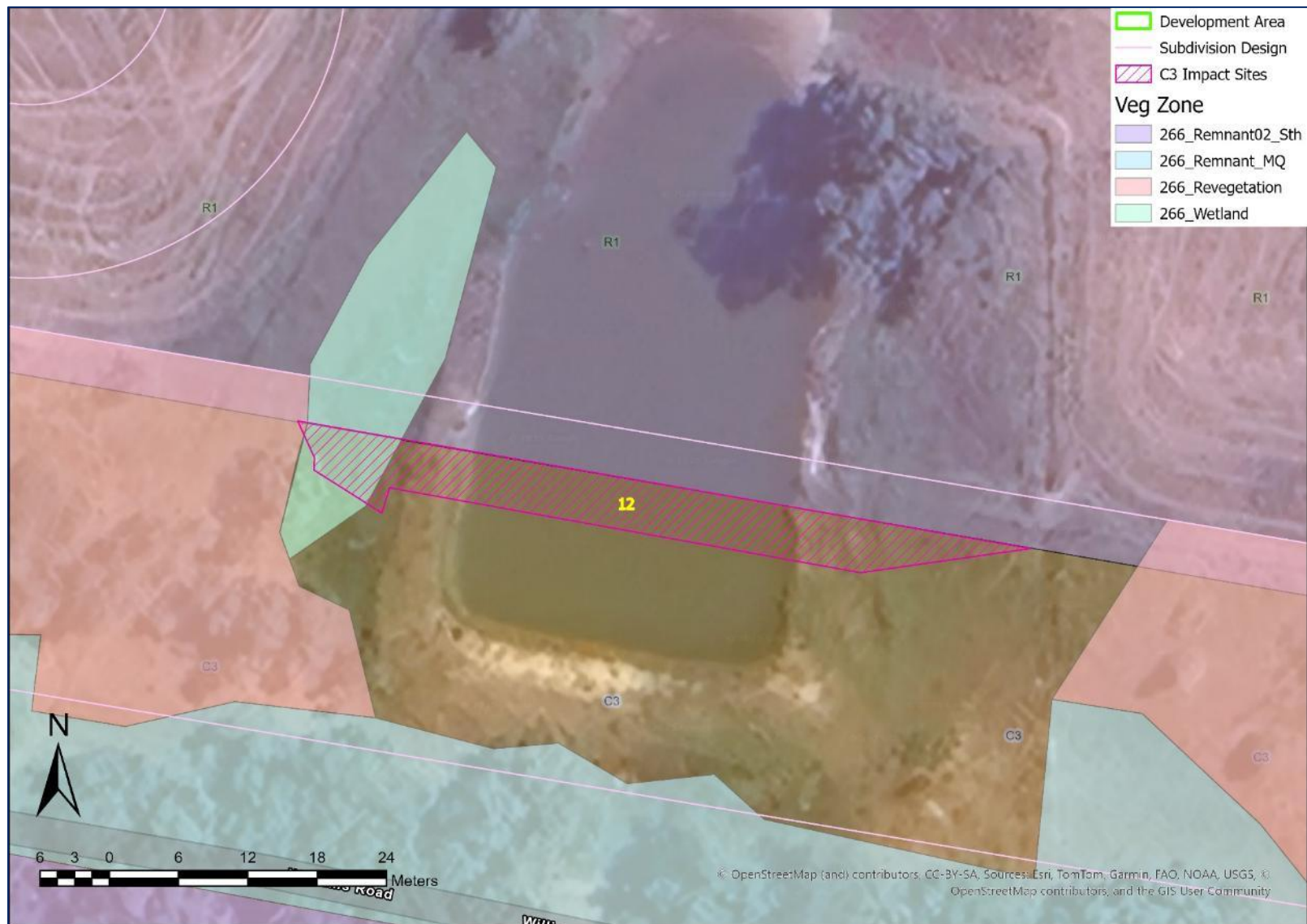
P3 – C3 zoned land impacts associated with impact sites 5, 6 and 7



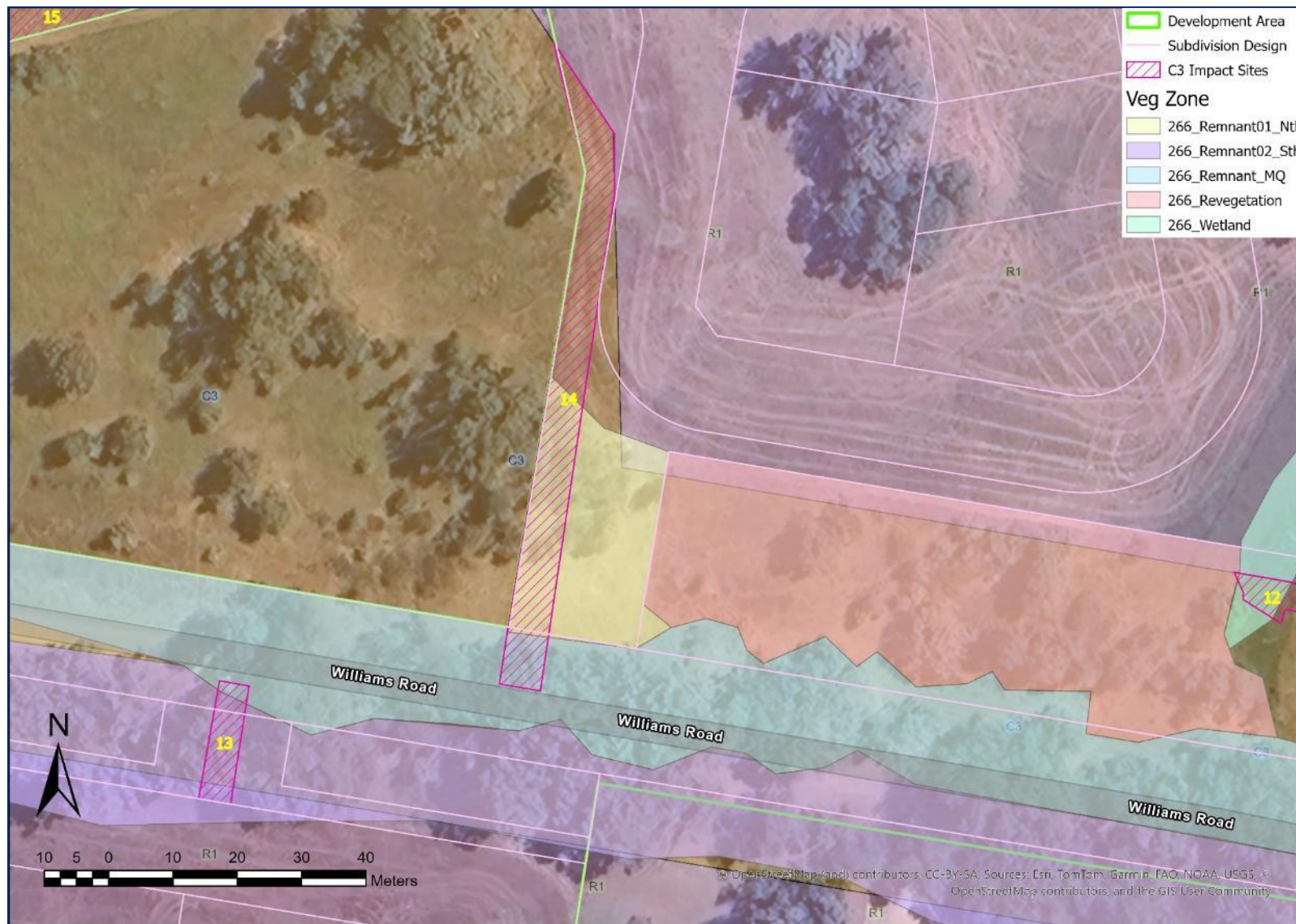
P4 – C3 zoned land impacts associated with impact sites 8, 9, 10 and 11



P5 – C3 zoned land impacts associated with impact site 12



P6 – C3 zoned land impacts associated with impact sites 13 and 14



P7 – C3 zoned land impacts associated with impact site 15



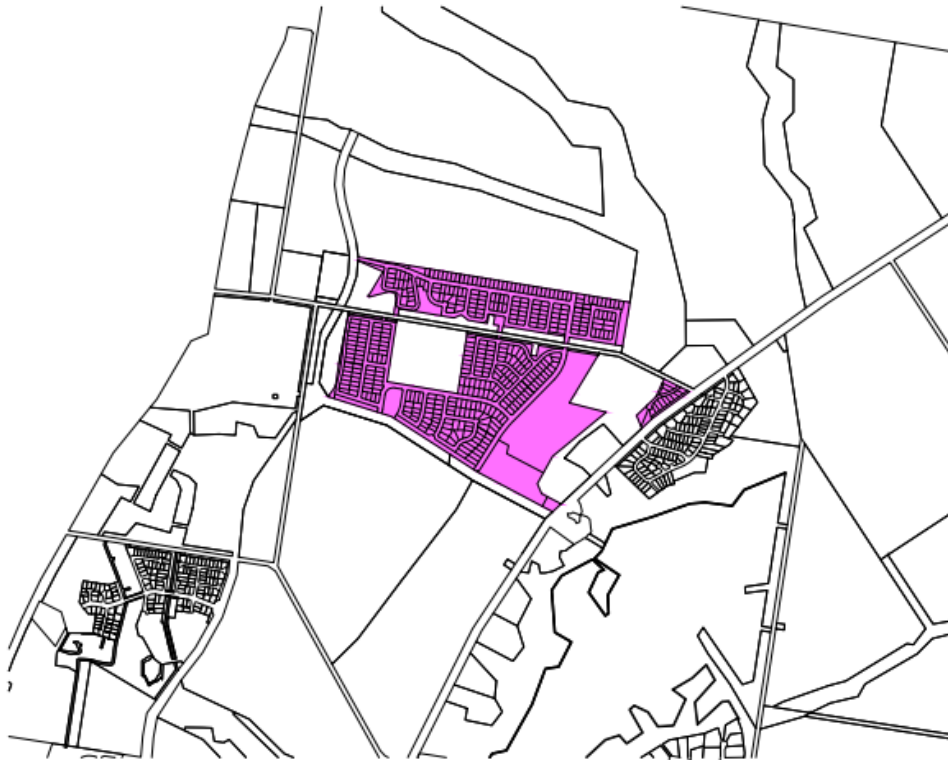
Appendix Q: Development plans (version current as at 28 March 2025)

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WILLIAMS ROAD RESIDENTIAL SUBDIVISION

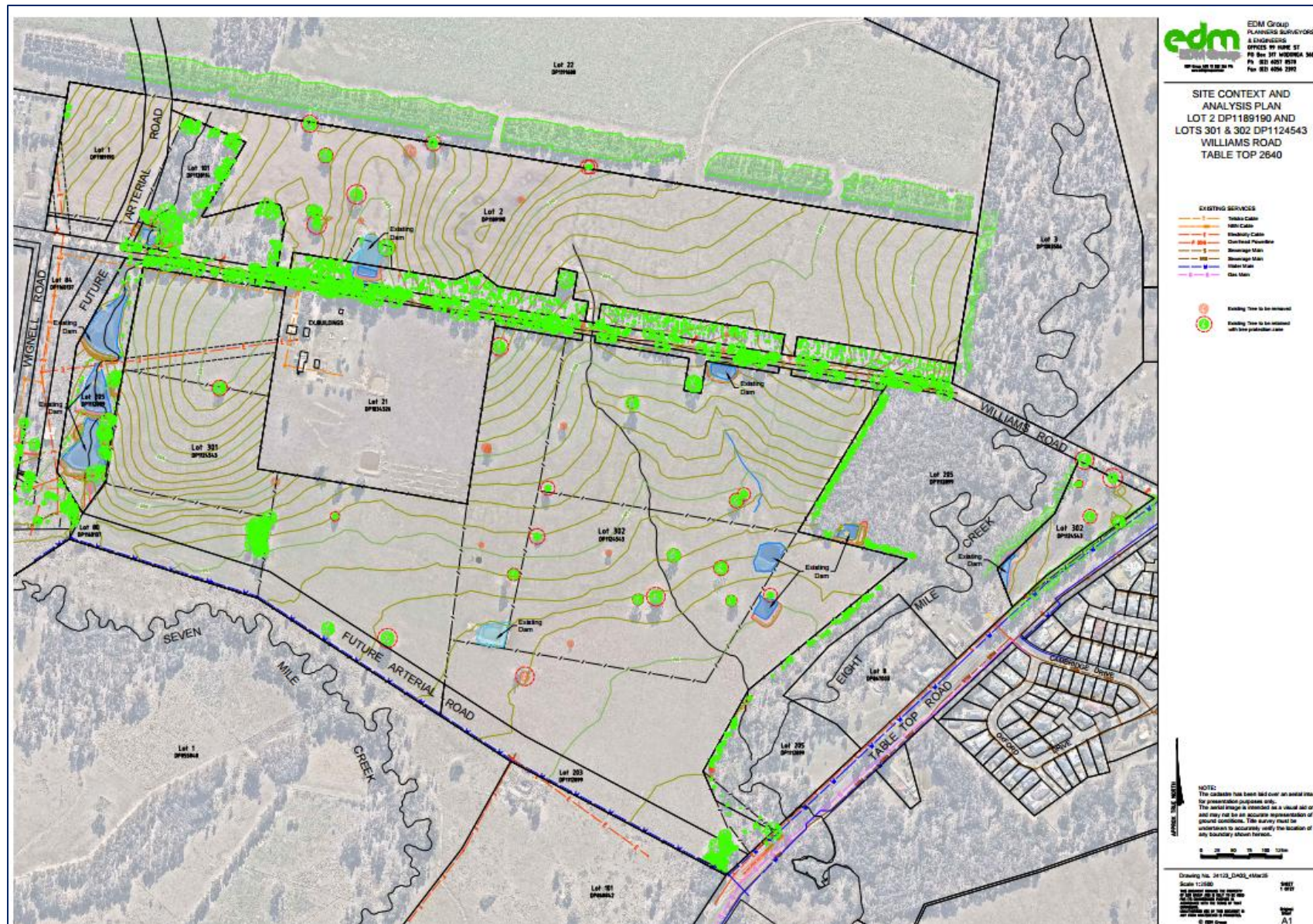
WILLIAMS ROAD, TABLE TOP 462 LOT RESIDENTIAL SUBDIVISION

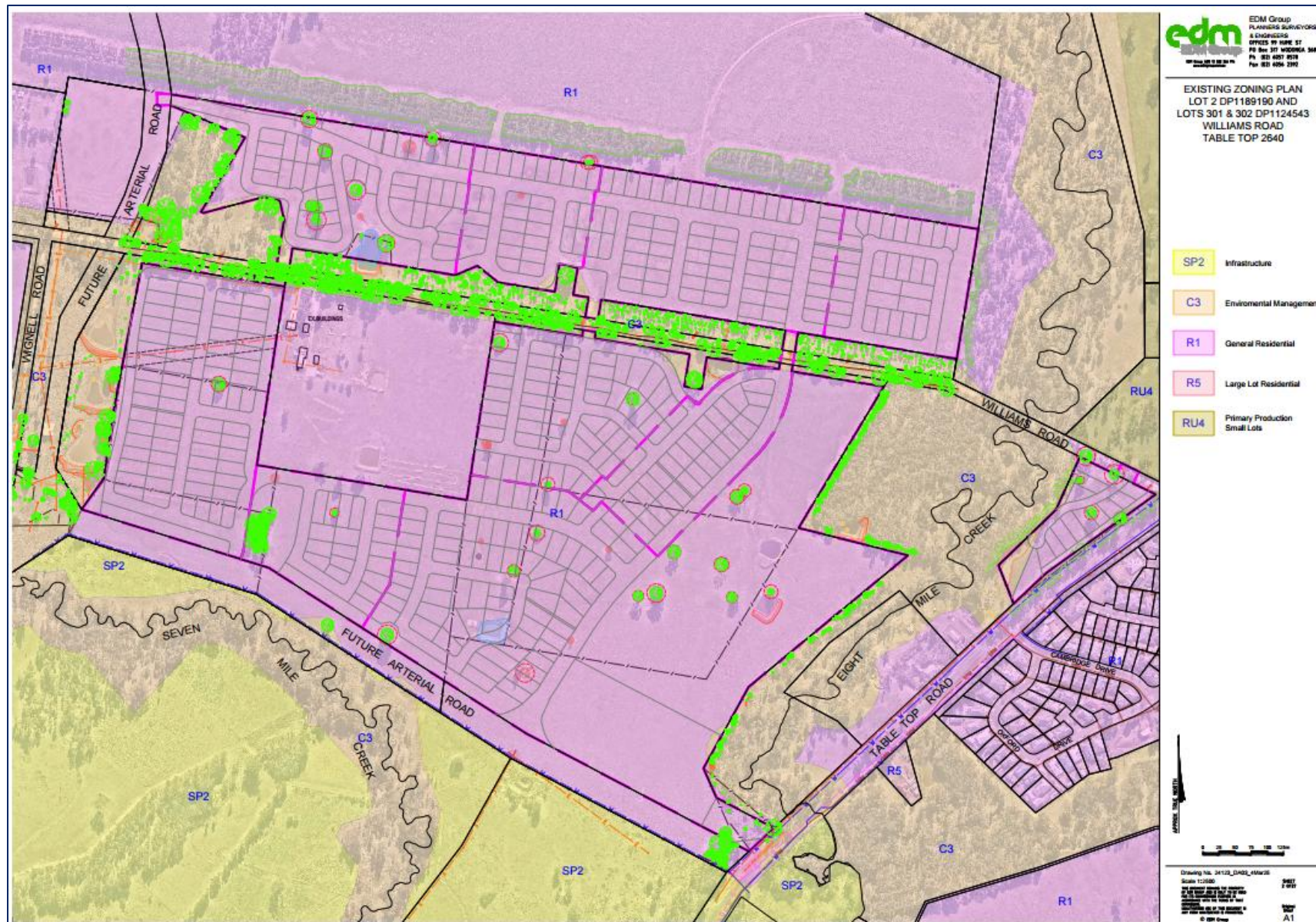


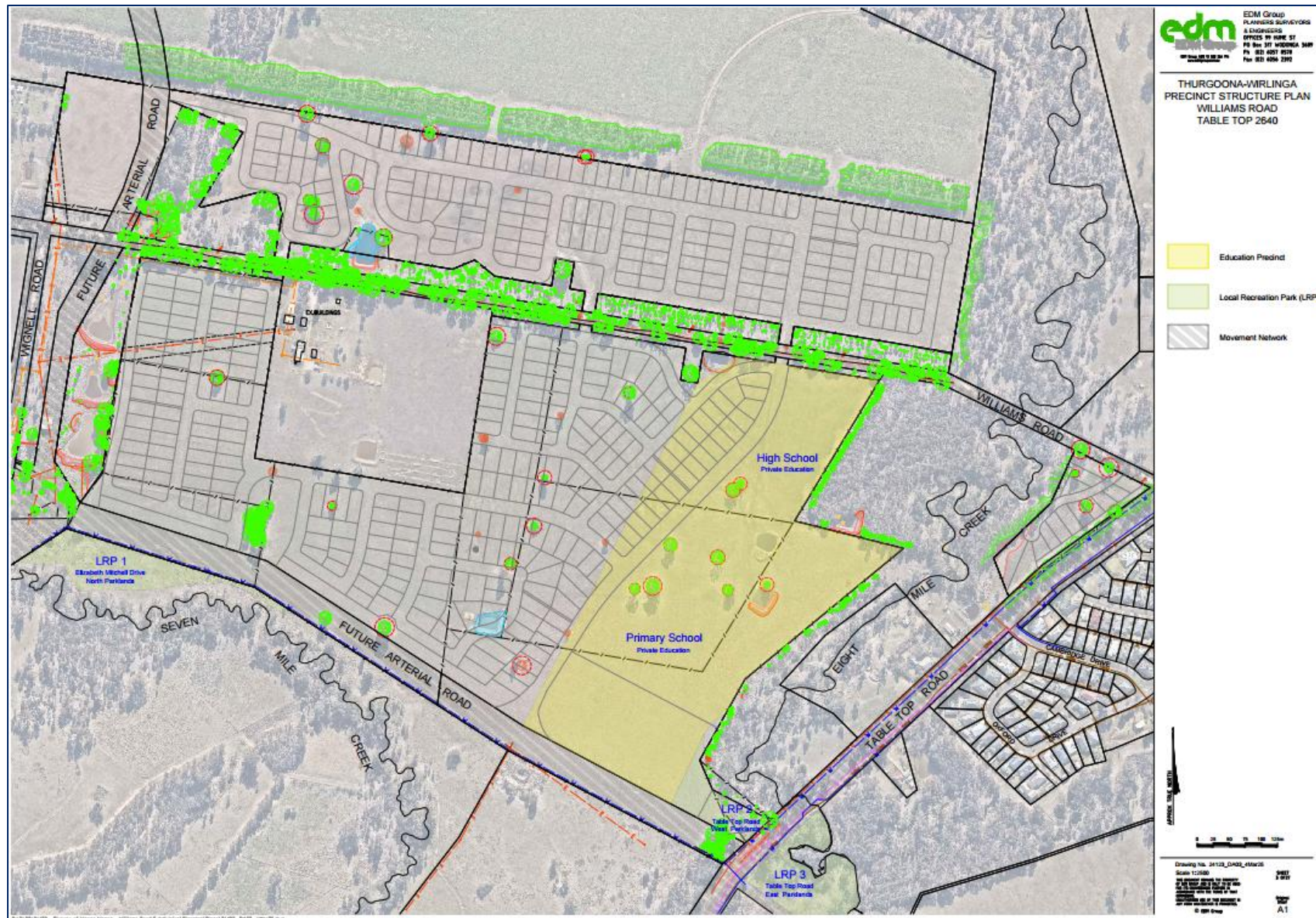
SCHEDULE OF DRAWINGS

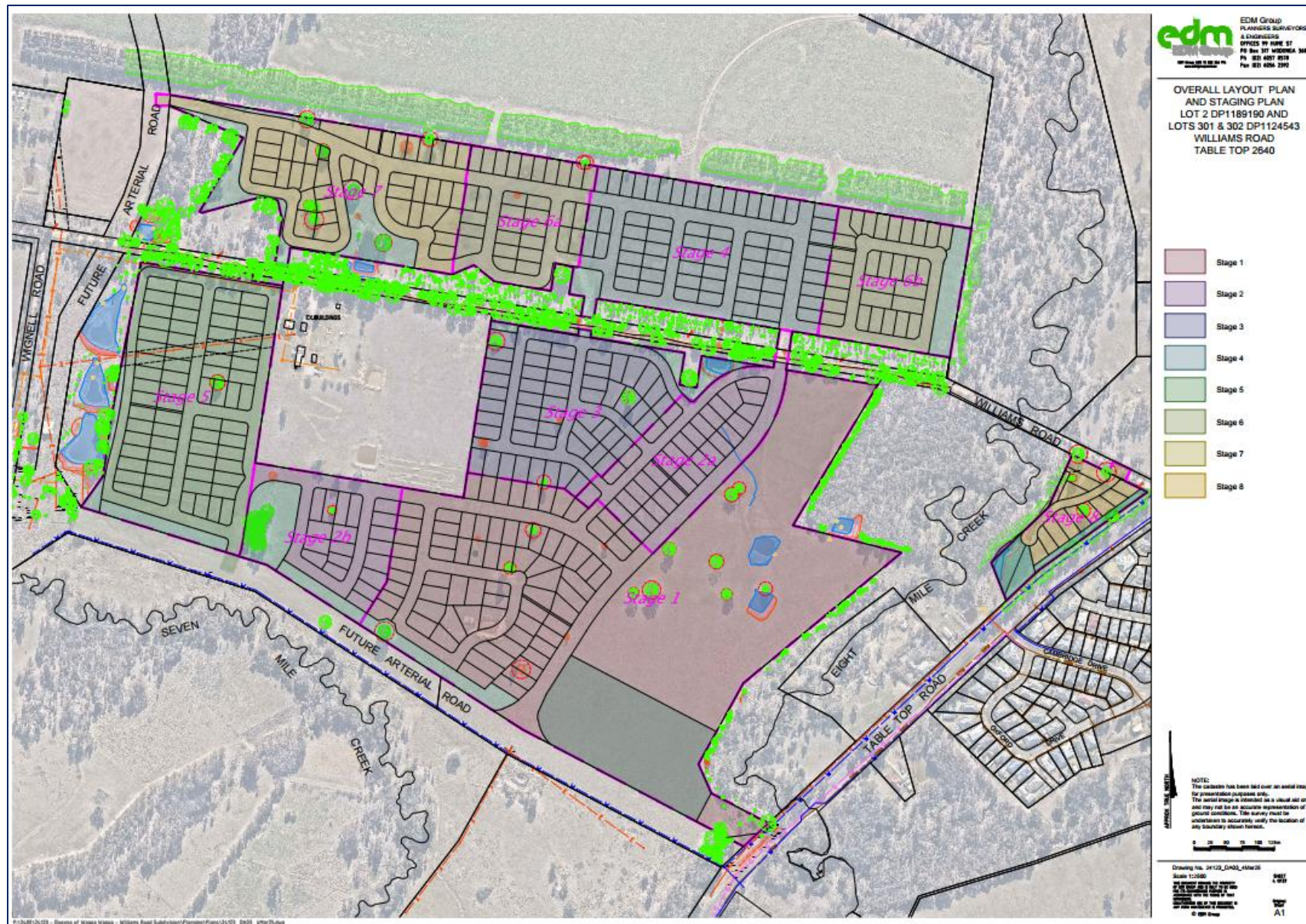
SHEET	DESCRIPTION
P-01	SITE CONTEXT PLAN
P-02	EXISTING ZONE PLAN
P-03	THURGOONA-WIRLINGA PRECINCT STRUCTURE PLAN
P-04	OVERALL LAYOUT PLAN AND STAGING PLAN
P-05	OVERALL LAYOUT PLAN AND STAGING PLAN
P-06	SHEET REFERENCE PLAN
P-07	LAYOUT 1 PLAN
P-08	LAYOUT 2 PLAN
P-09	LAYOUT 3 PLAN
P-10	LAYOUT 4 PLAN
P-11	LAYOUT 5 PLAN
P-12	CHAIN OF PONDS LONG SECTION AND LAYOUT PLAN
P-13	CHAIN OF PONDS LONG SECTION AND LAYOUT PLAN
P-14	WETLANDS LAYOUT PLAN
P-15	WETLANDS CROSS SECTIONS
P-16	OPEN SPACE PLAN
P-17	LOCAL REGIONAL PARK PLAN
P-18	TYPICAL ROAD CROSS SECTIONS
P-19	ASSET PROTECTION ZONES
P-20	FENCING PLAN
P-21	PRE DEVELOPMENT CATCHMENT PLAN
P-22	POST DEVELOPMENT CATCHMENT PLAN
P-23	MASTER DEVELOPMENT CATCHMENT PLAN
P-24	MASTER WATER SERVING PLAN
P-25	MASTER SEWER SERVING PLAN
P-26	FLOOD PLANNING OVERLAY PLAN
P-27	FLOOD MITIGATION PLAN





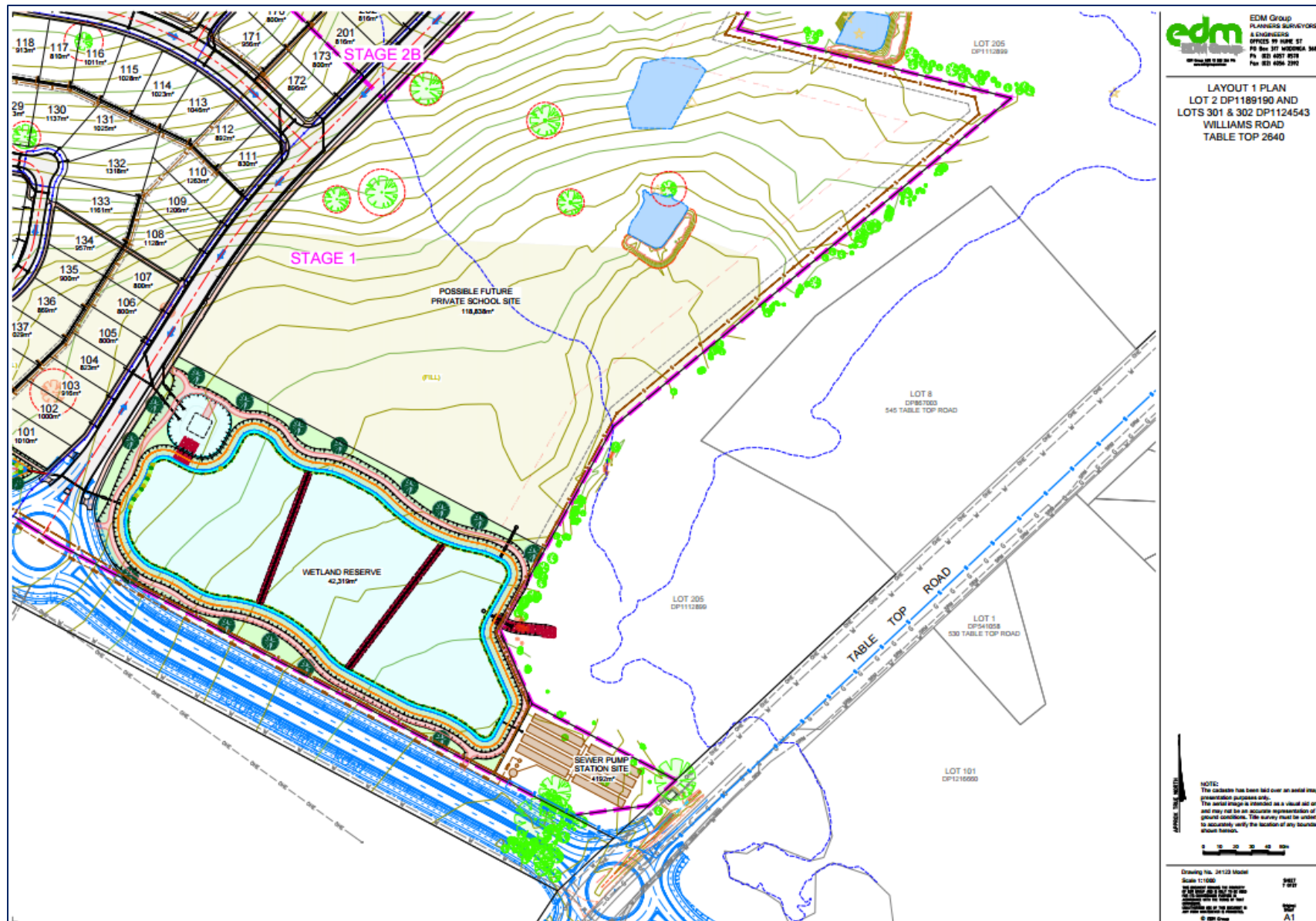




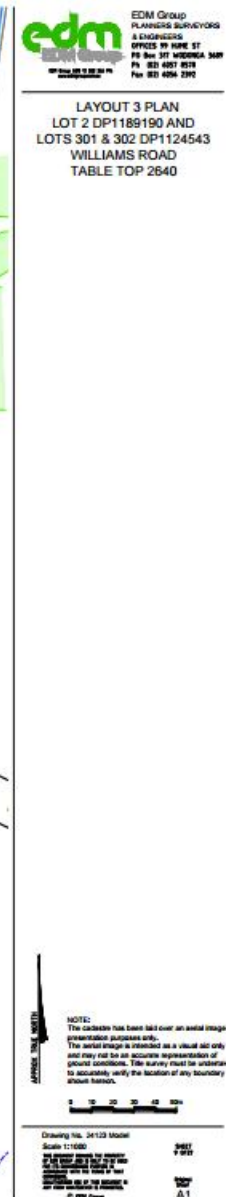








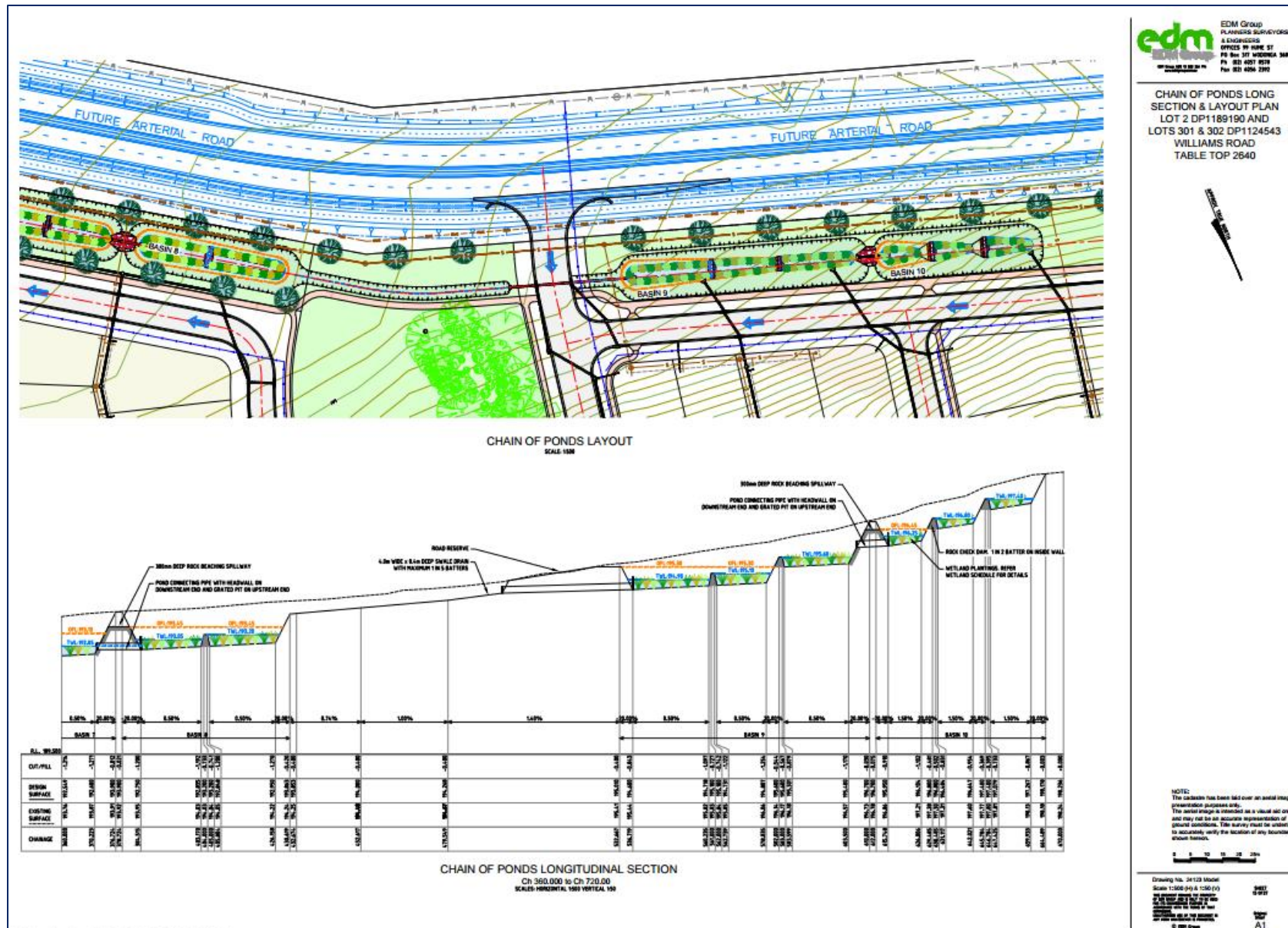






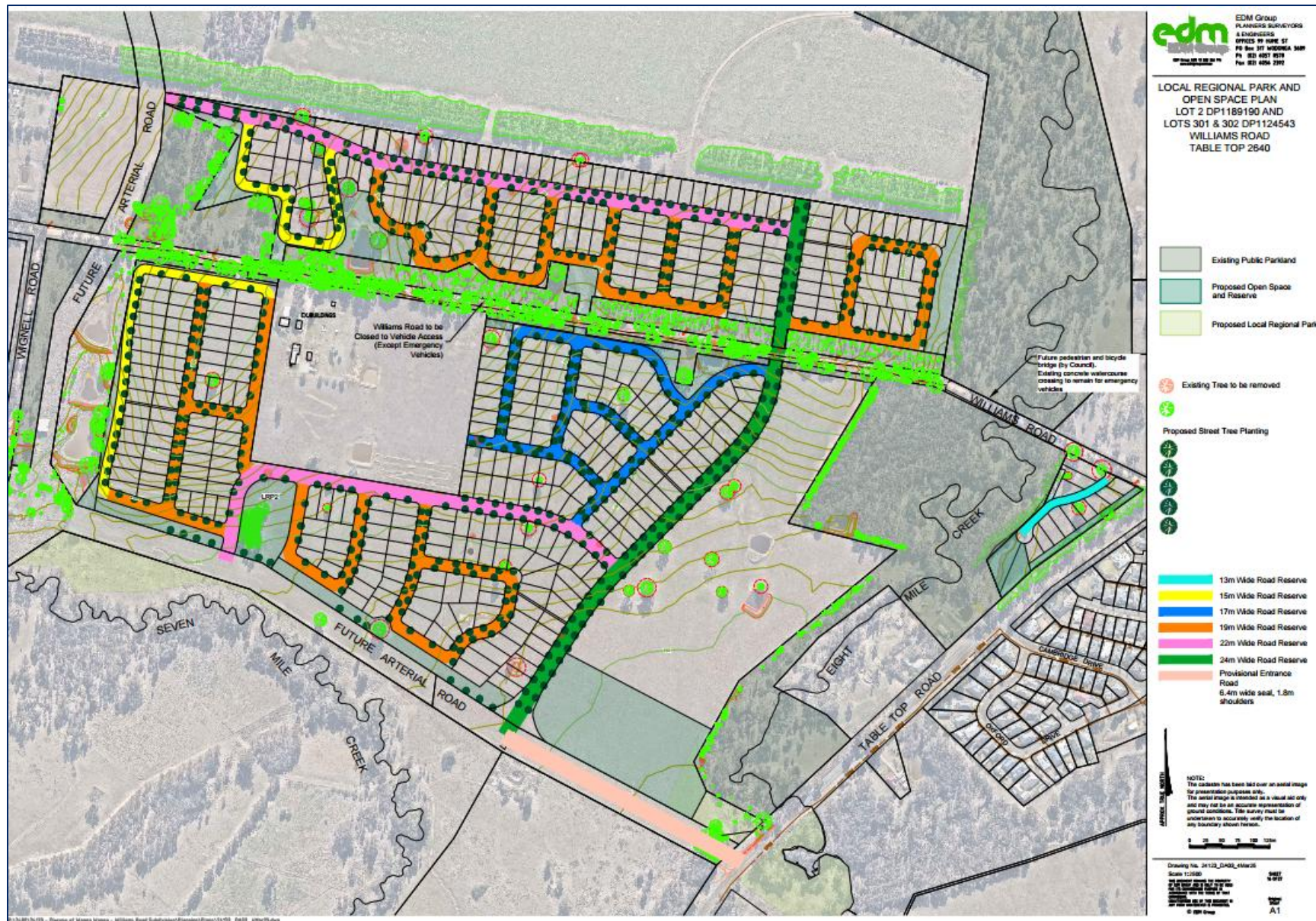






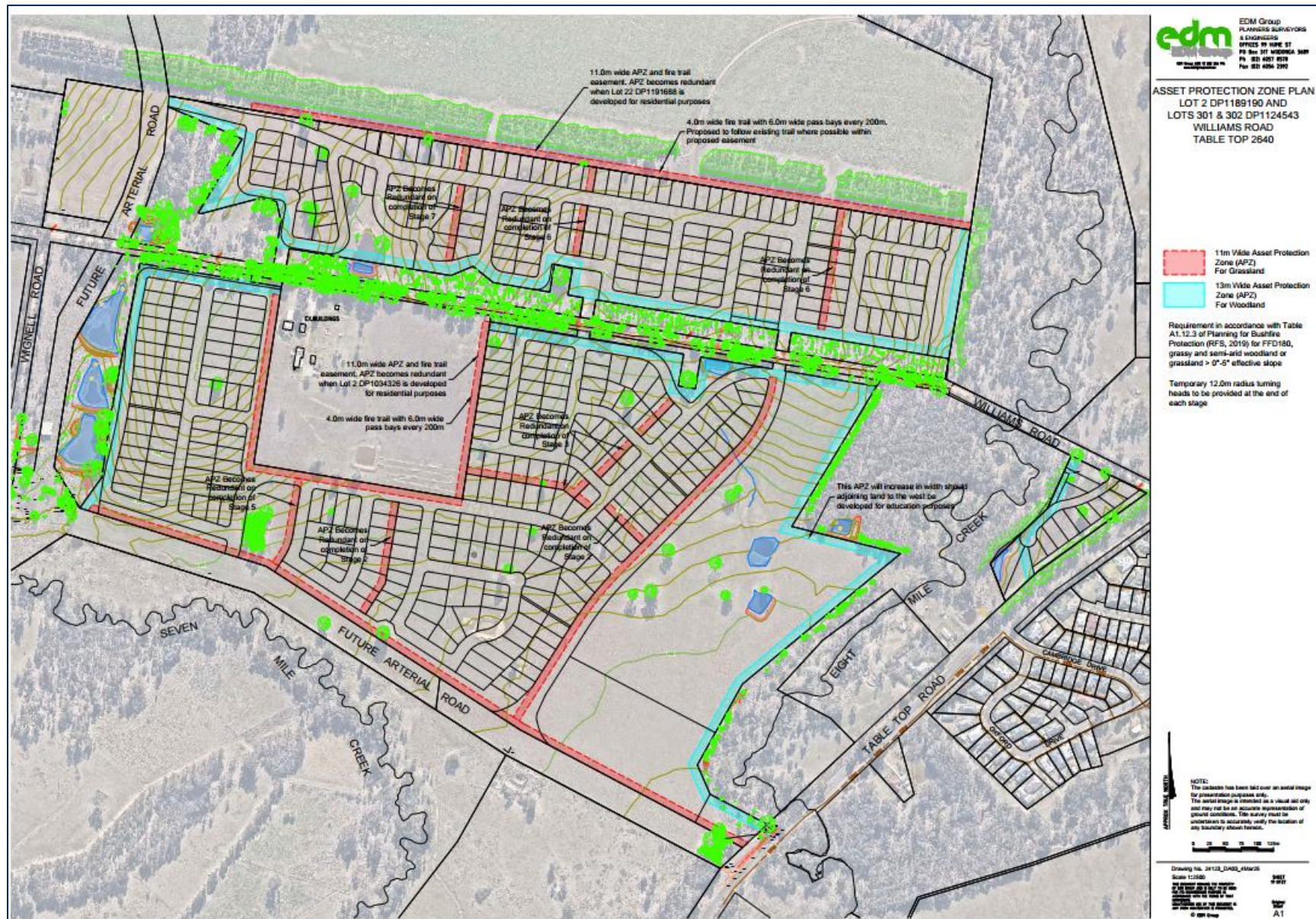


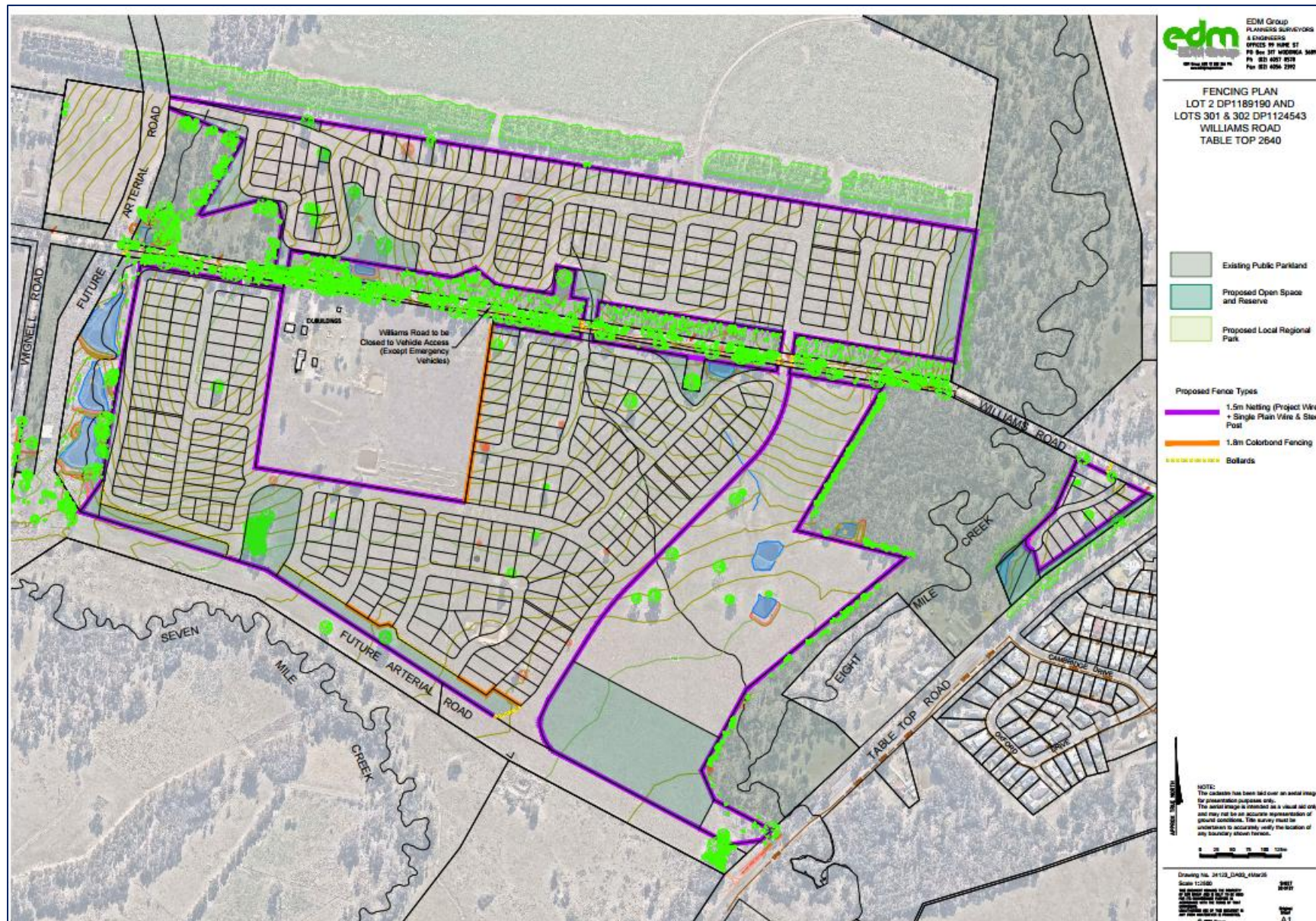


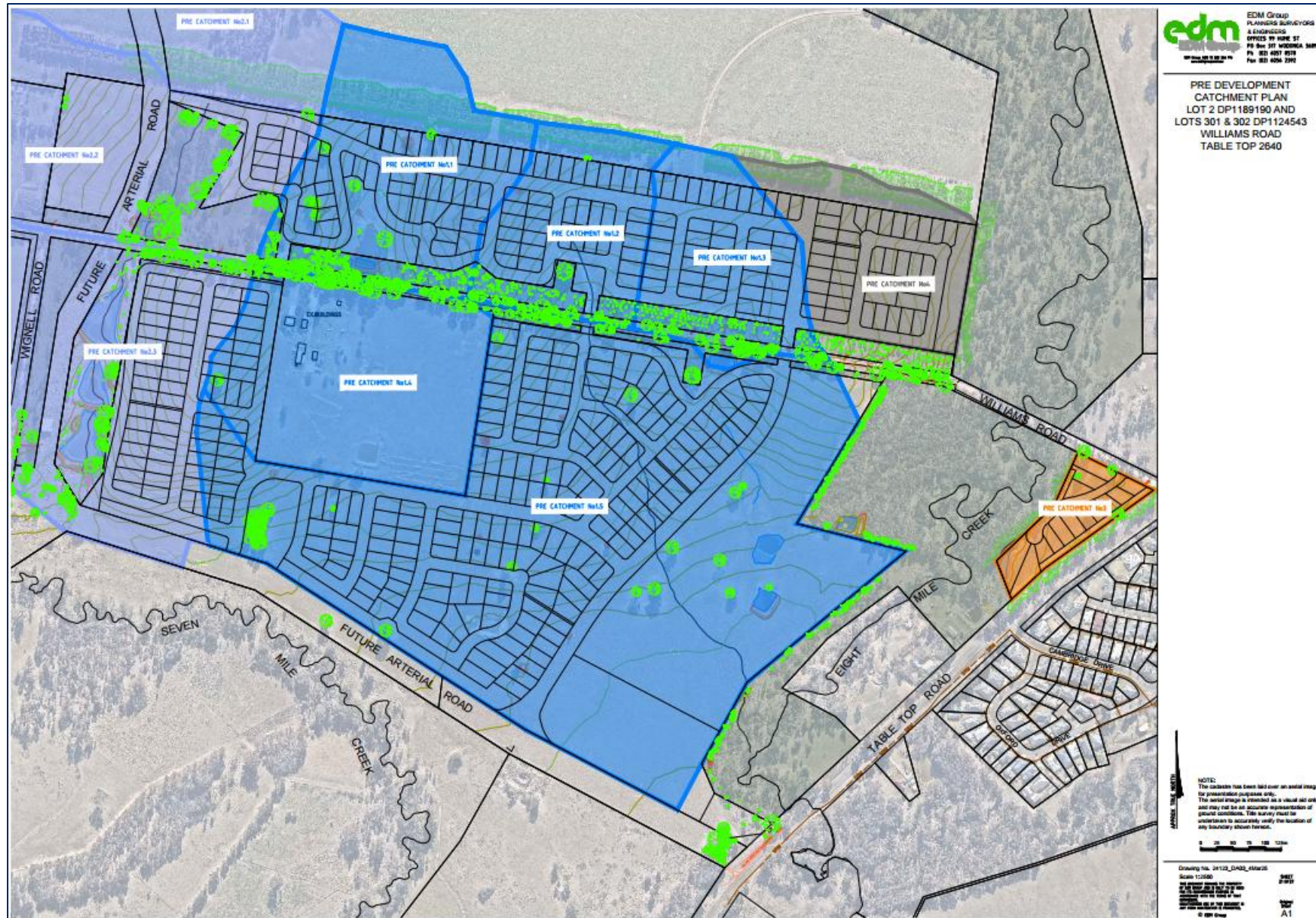








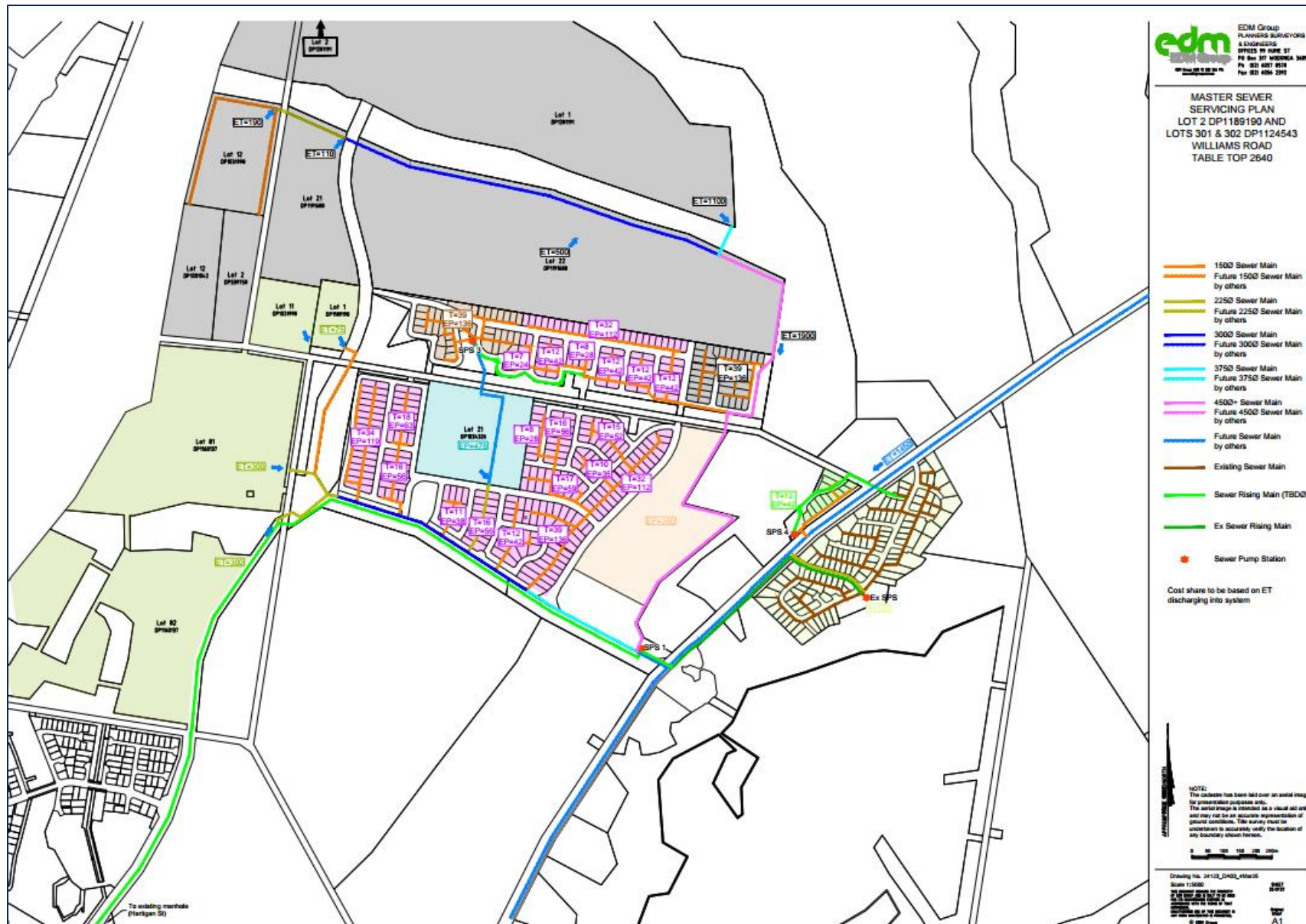


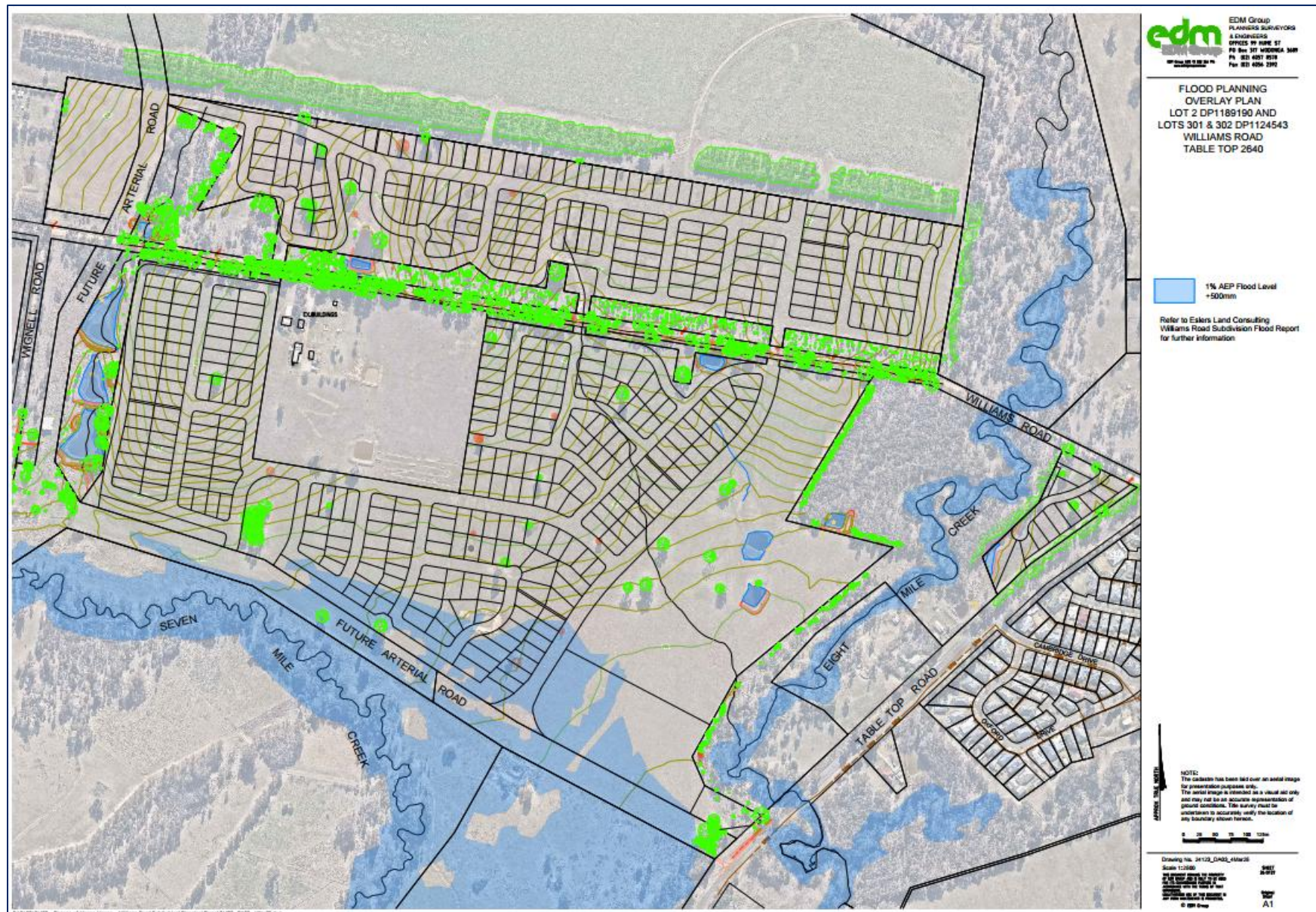














Appendix R: Southern Myotis survey data analysis report



Microbat Call Identification Report

Prepared for ("Client"):	Red-Gum Environmental Consulting Pty Ltd
Survey location/project name:	Thurgoona, NSW
Survey dates:	14 th – 27 th December 2024
Client project reference:	Myotis survey
Job no.:	RGEC-2501
Report date:	22 January 2025

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Methods

Data received

Balance! Environmental received some 10,000 full-spectrum acoustic files (WAV format), which were recorded at a single dam, near Thurgoona, NSW, using a Song Meter Mini Bat detector (Wildlife Acoustics, Maynard MA, USA). The detector was deployed on 14th December 2024 and collected 10th January 2025; however, recordings ceased on the night of 27th December 2024.

The brief for this analysis was to determine if the Southern Myotis (*Myotis macropus*) was foraging over the dam during the deployment period.

Acoustic analysis

Analyses were performed in *Anabat Insight* (Version 2.1.3; Titley Scientific, Brisbane). A generic noise filter was applied to all WAV files to mark and exclude any files that contained only non-bat sounds. The Search tool was then used to scan all WAV files with bat calls and mark any containing calls potentially belonging to Southern Myotis. Search filter criteria were as follows:

- Characteristic frequency (Fc) = 30-45 kHz
- Pulse duration (Dur) >2 ms
- Slope of characteristic section (Sc) >80 OPS (octaves per second)

To ensure the reliability of the Search filter, a full manual spectrogram review was performed on all WAV files recorded on three nights (16th, 20th and 25th December). This review of 1849 WAV files found only four potential calls that had not been already selected by the Southern Myotis Search filter. Consequently, it was determined that the Search filter performed adequately for this analysis.

All files containing potential Southern Myotis calls were reviewed manually, comparing the spectrograms and derived zero-crossing metrics of each call with those of reference calls from *M. macropus* (G. Ford unpublished data) as well as the call descriptions provided in Pennay *et al.* (2004) and Reinhold *et al.* (2001).

Southern Myotis calls are often very like those produced by the Long-eared Bats (*Nyctophilus* spp.), and differentiation is frequently impossible. The following call-pulse features, however, sometimes provide sufficient evidence to afford a reliable attribution of calls to Southern Myotis:

- Broad bandwidth (Fstart-Fend typically >>10kHz), near-vertical, frequency modulated (FM) pulses.
 - *Nyctophilus* species' calls also have this general characteristic.
- Pulse shapes (especially slope through the lower half of the pulse) typically quite variable in good-quality foraging search-phase calls.
 - In contrast, *Nyctophilus* species' calls typically have uniform, more-or-less parallel pulses throughout the call sequence.
- Notable "kink" about half-way to two-thirds of the way down the pulse, with the lower portion of the pulse distinctly lesser slope than the upper section.
 - In contrast, *Nyctophilus* species' calls generally don't "kink" until near the bottom quarter of the pulse, have a relatively brief, slightly "flatter" section, and then kink again to a steeper "tail" section.
- Foraging calls often include approach-phase and capture-phase ("feeding-buzz").
 - In contrast, *Nyctophilus* species' calls rarely include feeding buzz sequences.



When Southern Myotis is actively foraging over a favoured water body, it is often the case that numerous readily-identifiable foraging calls are recorded. If few individuals are present, and/or only brief visits are made at multiple waterbodies in the foraging area, fewer passes are usually encountered and these can often be difficult to reliably identify, especially if *Nyctophilus* species are present as well.

Results & Discussion

Twenty-two WAV files were found to contain calls potentially attributable to Southern Myotis. Those calls were spread across eight of the 14 detector-nights. It was not possible to attach a reliable identification to any of the calls; however:

- six calls were considered possibly representative of Southern Myotis;
- eight calls probably represented *Nyctophilus* spp. rather than Southern Myotis; and
- eight calls could belong to either taxon.

A full list of files containing potential Southern Myotis calls appears in **Table 1**. Sample spectrograms representing possible Southern Myotis and *Nyctophilus* calls are shown in **Figure 1** and **Figure 2**.

Given the random appearance of individual call passes amongst thousands of calls from other species, it is considered unlikely that any of these calls represent Southern Myotis. If the species was foraging at the dam, multiple calls in consecutive time sequences would be expected in the dataset. However, the inconclusive identity of the calls in this dataset means that Southern Myotis usage of the dam cannot be ruled out.

It is recommended that further investigation be undertaken, including a visual survey, preferably utilising thermal infra-red videography, to further clarify the presence or absence of Southern Myotis based on observation of flight and foraging patterns, coupled with time-synched acoustic recordings.

References

- Pennay, M., Law, B. and Reinhold, L. (2004). *Bat Calls of New South Wales*. Department of Environment and Conservation, Hurstville.
- Reinhold, L., Law, B., Ford, G. and Pennay, M. (2001). *Key to the bat calls of south-east Queensland and north-east New South Wales*. Department of Natural Resources and Mines, Brisbane.

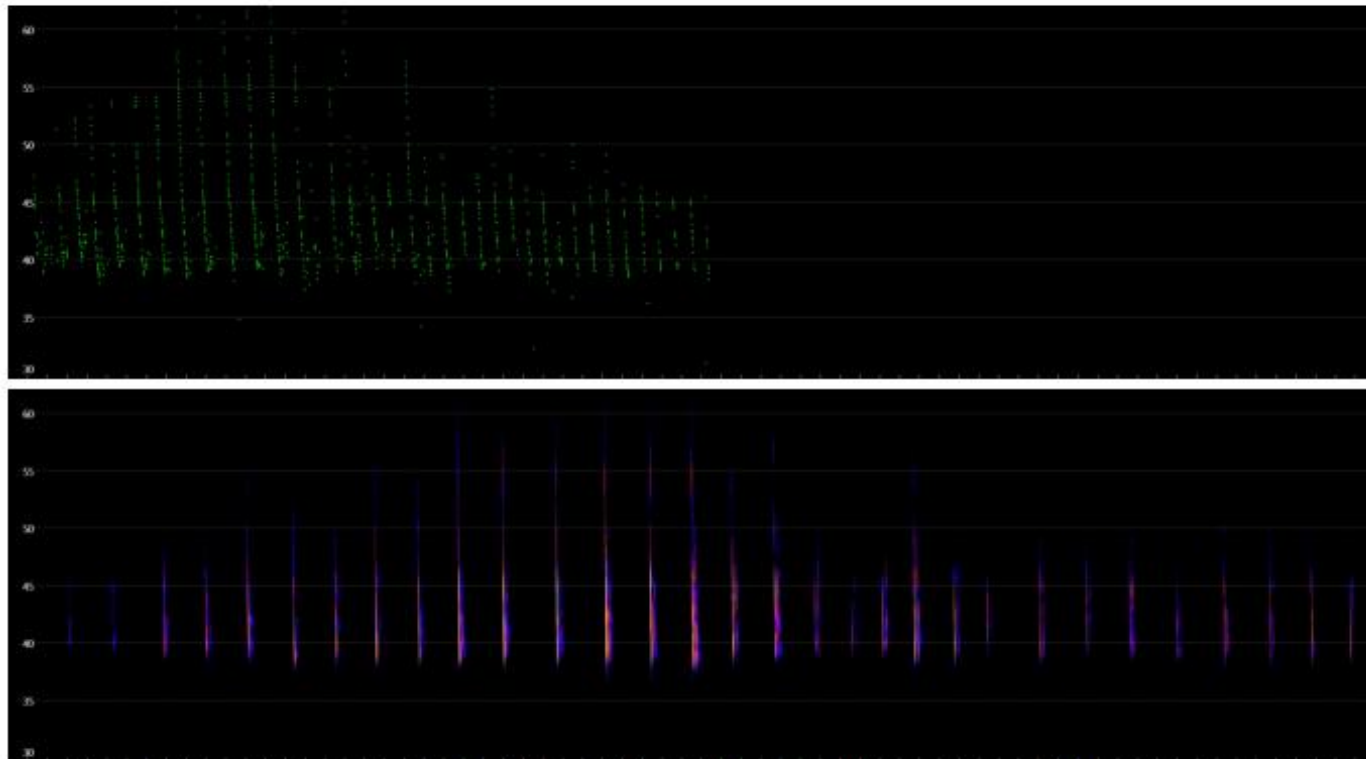


Figure 1 Possible *Myotis macropus* call recorded at 02:10:14 on 15th December 2024 (File 2LU01709REDG_20241215_021014.wav).
Top image is zero-crossing with time-scale (x-axis) = 10ms per tick-mark and time between pulses compressed.
Bottom image is spectrogram with time-scale = 50 ms per tick and time between pulses not compressed.

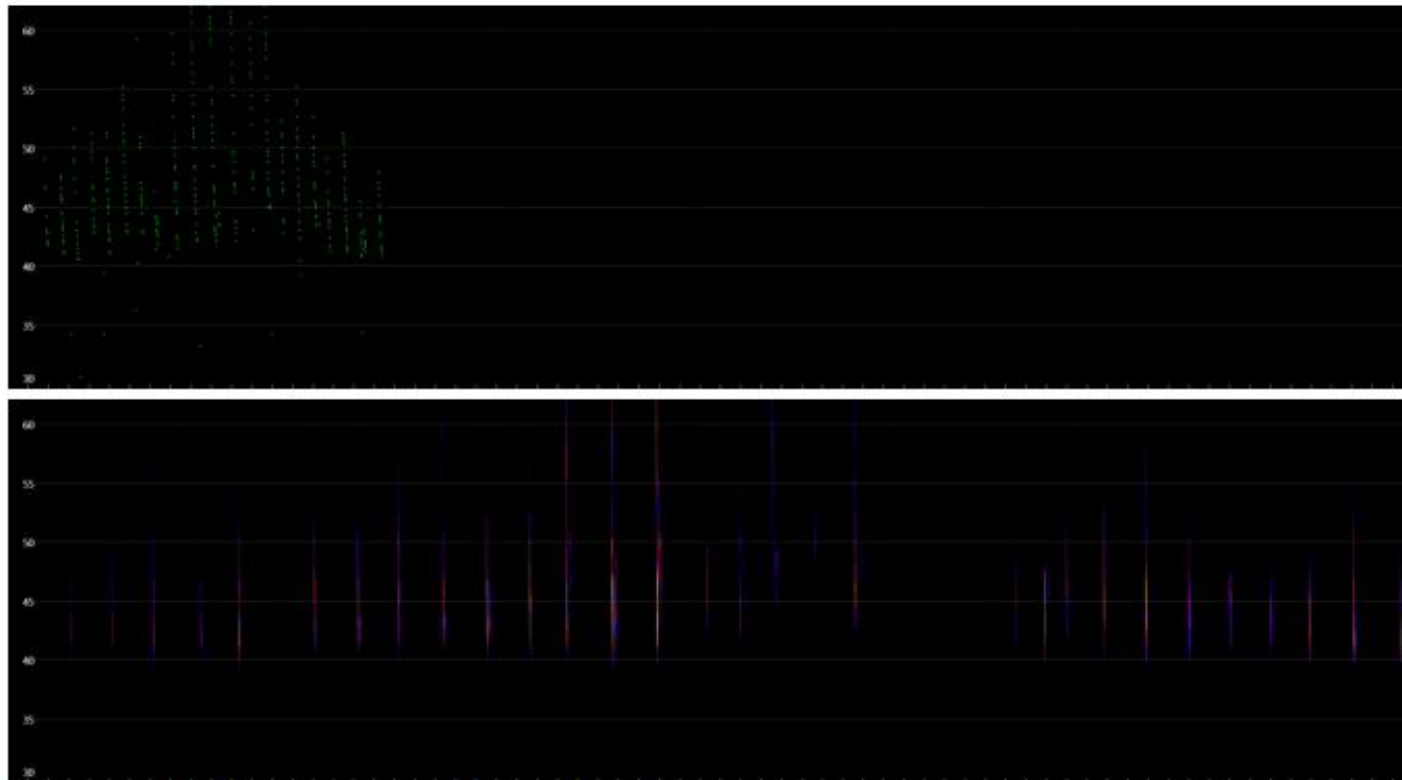


Figure 2 Possible *Nyctophilus* sp. call recorded at 03:41:01 on 21st December 2024.
Top image is zero-crossing with time-scale (x-axis) = 10ms per tick-mark and time between pulses compressed.
Bottom image is spectrogram with time-scale = 50 ms per tick and time between pulses not compressed.

**Table 1** Files containing potential Southern Myotis calls: Thurgoona survey, 14-27 December 2024.

File	Initial ID	Probable ID
2LU01709REDG_20241215_011439.wav	NyMy	either
2LU01709REDG_20241215_021014.wav	NyMy	Myotis
2LU01709REDG_20241218_234935.wav	NyMy	Myotis
2LU01709REDG_20241219_225843.wav	NyMy	either
2LU01709REDG_20241221_000531.wav	NyMy	Myotis
2LU01709REDG_20241221_001240.wav	NyMy	Myotis
2LU01709REDG_20241221_015203.wav	NyMy	either
2LU01709REDG_20241221_015358.wav	NyMy	either
2LU01709REDG_20241221_030219.wav	NyMy	either
2LU01709REDG_20241221_033204.wav	NyMy	Nyctophilus
2LU01709REDG_20241221_034101.wav	NyMy	Nyctophilus
2LU01709REDG_20241221_220347.wav	NyMy	Nyctophilus
2LU01709REDG_20241221_232709.wav	NyMy	Myotis
2LU01709REDG_20241223_020737.wav	NyMy	Nyctophilus
2LU01709REDG_20241224_005603.wav	NyMy	Nyctophilus
2LU01709REDG_20241225_213822.wav	NyMy	Nyctophilus
2LU01709REDG_20241225_233019.wav	NyMy	either
2LU01709REDG_20241226_004727.wav	NyMy	either
2LU01709REDG_20241226_022741.wav	NyMy	Nyctophilus
2LU01709REDG_20241226_023802.wav	NyMy	Nyctophilus
2LU01709REDG_20241226_042148.wav	NyMy	Myotis
2LU01709REDG_20241226_043055.wav	NyMy	either

Appendix S: Additional C3 works with no impacts (being under-bored)

