EASTERN CREEK REP: RECYCLING INFRASTRUCTURE OPTIMISATION PROJECT

Biodiversity Development Assessment Report Amendment – *September 2025 update*

SEPTEMBER 2025

EASTERN CREEK RECYCLING INFRASTRUCTURE OPTIMISATION PROJECT

Biodiversity Development Assessment Report – Amendment September 2025 update

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REVISIONS

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0	30/09/21	Eastern Creek Recycling Infrastructure Optimisation Project BDAR – Draft for internal review	E. Lanham and M. Leal	K. Carroll
01	01/11/21	Eastern Creek Recycling Infrastructure Optimisation Project BDAR – Draft	E. Lanham and M. Leal.	C. Vahtra
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03	01/05/23	Eastern Creek Recycling Infrastructure Optimisation Project BDAR – Amendment - Draft	W. Terry	E. Lanham
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05	24/09/2025	Eastern Creek Recycling Infrastructure Optimisation	K. Mauger	E. Elias

Revision	Date	Description	Prepared by	Approved by
		Project BDAR – Addendum ASR Sept 2025 update		

Declaration

Certification under Section 6.15 of the *Biodiversity Conservation Act 2016*

I certify that this report has been prepared on the basis of the requirements of, and information provided under, the Biodiversity Assessment Method (BAM) and s6.15 of the NSW *Biodiversity Conservation Act 2016.*

In preparing this assessment I have acted in accordance with the Accredited BAM Assessor Code of Conduct. I declare that I have considered the circumstances and there is no actual, perceived or potential conflict arising from my preparation of this Biodiversity Development Assessment Report.

Elijah Elias

Date: 24/09/2025

BAM Assessor Accreditation no: BAAS20012

TABLE OF CONTENTS

TABLES

FIGURES

GLOSSARY AND ACRONYMS

Term	Meaning
Acronyms	
BAM	Biodiversity Assessment Method as specified under the BC Act
BAM-C	Biodiversity Assessment Method Calculator
BC Act	NSW *Biodiversity Conservation Act 2016*
BC Reg	NSW *Biodiversity Conservation Regulation 2017*
BC (Savings and Transitional) Reg	NSW *Biodiversity Conservation (Savings and Transitional) Regulation 2017*
BDAR	Biodiversity Development Assessment Report
BOS	Biodiversity Offset Scheme
CEMP	Construction Environmental Management Plan
DAWE	Commonwealth Department of Agriculture, Water and the Environment
DPI	NSW Department of Primary Industries
DPE (EES)	NSW Department of Planning and Environment (Environment, Energy and Science)
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
FM Act	NSW *Fisheries Management Act 1994*
GDE	Groundwater Dependent Ecosystem
IBRA	Interim Biogeographically Regionalisation of Australia
MNES	Matters of National Environmental Significance
OEH	NSW Office of Environment and Heritage (now DPE (EES))
PCT	Plant Community Type
SAII	Serious and Irreversible Impact
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SSD	State Significant Development
SSI	Stage Significant Infrastructure
Subject land	The area of land subject to investigation and defined in BAM (DPE 2020)
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened Ecological Community
VIS	Vegetation Information System

EXECUTIVE SUMMARY

Introduction

Dial-A-Dump (EC) (DADEC) Pty Ltd (the Applicant) (as owned by Bingo Industries Pty Ltd (Bingo)) are seeking approval to optimise the existing Eastern Creek Recycling Ecology Park (Eastern Creek REP) by increasing the throughput from the current two million tonnes per annum (Mtpa) by an additional 950,000 tonnes per annum (tpa), and by optimising internal infrastructure such as roads and stormwater (SSD-11606719).

An Environmental Impact Statement (EIS) was prepared for the Proposal in accordance with Part 4, Division 4.7 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Division 4.7 of the EP&A Act identifies the Minister for Planning, through the New South Wales (NSW) Department of Planning and Environment (DPE), as the consent authority for development that is identified as State Significant Development (SSD).

The EIS included a Biodiversity Development Assessment Report (BDAR) prepared by Arcadis Australia Pacific Pty Limited (Arcadis), on behalf of the Applicant to support an application for the approval of the Proposal. It was prepared in accordance with the Amended Secretary's Environmental Assessment Requirements (SEARs) issued on 1 October 2021 by the DPE, the EP&A Act, and Section 192 of the *Environmental Planning and Assessment Regulations 2021* (EP&A Regulations). The BDAR was prepared by Dr Elvira Lanham, an Accredited Person (BAAS20012) under the New South Wales (NSW) *Biodiversity Conservation Act 2016* (BC Act).

The EIS was publicly exhibited between 14 July 2022 and 10 August 2022. During this exhibition period, submissions were invited from all stakeholders including members of the community and government agencies.

In response to stakeholder consultation, and further design development as the approvals process has progressed, several amendments to the Proposal presented in the EIS have been undertaken. Under clause 37(1) of the EP&A Regulation, an application for approval for SSD may be amended or varied with the approval of the Planning Secretary, before the application is determined. The Proposal with amendments is hereafter referred to as the amended Proposal.

Amended Proposal

- Bingo is proposing to enhance resource recovery outcomes across the Greater Sydney area by optimising throughput at the Eastern Creek REP to capitalise on the underutilised state-of-the-art processing facilities (namely MPC2), and plant and equipment within the Eastern Creek REP. The Applicant is therefore proposing to increase the total throughput of the Eastern Creek REP by 950,000 tpa and carry out infrastructure upgrade works across the Proposal Site (the Proposal). An overview of the Proposal is provided in Figure 1-1. The Proposal would be developed in three stages: **Stage 1: Initial throughput**: Stage 1 would comprise 500,000 tpa of additional throughput to be received at the Eastern Creek REP to enhance resource recovery outcomes by increasing utilisation of onsite processing capabilities. No infrastructure upgrades are required under Stage 1.
- **Stage 2: Internal site optimisation**: Stage 2 would facilitate the remaining throughput increase (an additional 450,000 tpa of the total 950,000 tpa proposed) to be received and processed across the Eastern Creek REP. Stage 2 would include:
  - Upgrade of existing internal roads as required
  - Earthworks for Stage 3 site establishment
  - Additional carparking and amenities
- **Stage 3: Installation of supporting infrastructure**: Stage 3 would comprise the redevelopment of the northeastern corner of the Proposal Site. This would comprise:
  - Construction and operation of a Site Workshop (relocating this existing activity from elsewhere within the Proposal Site to a dedicated enclosed facility)
  - Construction and operation of a skip bin Maintenance and Manufacturing Workshop

- Construction of Basin B, a 2,150 m^3 stormwater detention basin inclusive of a 400 m^2 bio-retention system, located in the northeastern portion of the Proposal Site
- Installation of landscaping, signage, security fencing and finishing works.

Purpose of this assessment

This amended BDAR (referred to as the ASR BDAR 2025) supports the Amendment and Submissions Report (ASR) and has been prepared to assess the amended Proposal, respond to stakeholder feedback and address the SEARs as they relate to biodiversity, including:

- An assessment of the proposal's biodiversity impacts in accordance with the *Biodiversity Conservation Act 2016,* including the preparation of a Biodiversity Development Assessment Report (BDAR) where required under the Act, except where a waiver for preparation of a BDAR has been granted.

The Amended Proposal meets the criteria for SSD under the *Environmental Planning and Assessment Act 1979*, triggering the need for a BDAR under the *Biodiversity Conservation Act 2016* and entry into the Biodiversity Offsets Scheme (BOS).

Existing environment

The subject land (being the Proposal Site and the area of land that would be directly impacted by the Proposal) contains approximately 22.57 hectares of vegetation which consists of native (0.40 hectares) and non-native (22.18 hectares) vegetation. The native vegetation required to be cleared is consistent with the Plant Community Type 3320 – Cumberland Shale Plains Woodland.

Surveys were undertaken on and included vegetation plot data, fauna habitat assessment, targeted threatened flora and fauna surveys, modified Koala Spot Assessment Technique, Spotlighting and microbat echolocation call analysis.

The vegetation within the subject land comprises one Plant Community Type (PCT) and two vegetation zones within the Cumberland subregion of the Sydney Basin Interim Biogeographic Regionalisation for Australia (IBRA) region. The only native vegetation to be removed is 0.20 hectares of PCT 3320_planted. Two non-native vegetation communities that are not equivalent to a PCT are also present in the subject land. Vegetation zones within the subject land, their PCT and their calculated vegetation integrity scores are summarised in Table 0-1 below.

Table 0-1 PCTs and vegetation zones identified in the subject land

PCT ID	PCT Name	Vegetation zone	Vegetation integrity score	Extent in the subject land (ha)	Extent in the impact area (ha)
3320	Cumberland Shale Plains Woodland	3320_planted	33.5	0.38	0.20
		3320_moderate/good	58.4	0.02	0
Other vegetation types		Exotic grassland	N/A	20.63	6.52
		Exotic/planted trees and shrubs	N/A	1.54	0.91
Total area native vegetation				**0.40**	**0.20**
Total area vegetation				**22.57**	**7.63**

The area of PCT 3320 present in the subject land is consistent with the Threatened Ecological Community (TEC), Cumberland Plain Woodland in the Sydney Basin Bioregion, listed as Critically Endangered under the NSW *Biodiversity Conservation Act 2016* (BC Act). It does not meet the condition criteria to be listed under Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Offsets for the Amended Proposal were calculated using the Biodiversity Assessment Method Calculator (BAM-C). Six ecosystem credits were originally required as part of the EIS Proposal, but the Amended Proposal has reduced the footprint within the area of PCT 3320 and as such, four ecosystem credits are required to offset the removal of 0.20 hectares of the PCT 3320.

One threatened flora species, *Eucalyptus scoparia,* was tentatively identified within the subject land. This species is locally indigenous to the Tenterfield region within the New England Tablelands and is not native to the Sydney area and therefore individuals should be treated as planted vegetation and not of conservation significance.

No additional threatened flora species were recorded within the subject land during targeted surveys. Another species, *Dichanthium setosum* (Bluegrass) was also identified opportunistically on-site, but this species is also planted and outside of its natural range and therefore not of conservation significance.

Fifty-nine fauna species have the potential to occur on the subject land and were assessed for potential occurrence and impact as part of this assessment. An additional ten migratory species, listed under the EPBC Act, were also assessed. One migratory species was observed on the subject land – Rufous Fantail (*Rhipidura rufifrons*). Potential impacts from construction and operation of the Amended Proposal on this species are considered to be minimal, given the habitat that will be cleared is highly modified and consists of only a small area, which does not constitute important habitat for this species. Therefore, a referral to the Commonwealth Department of Climate Change, Energy, the Environment and Water is not recommended. No other threatened species listed under the EPBC Act were recorded or considered likely to occur.

Two microbat species listed as Vulnerable under the BC Act were recorded as possibly occurring using echolocation call analysis – the Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*) which is an ecosystem species and Large Bent-wing Bat (*Miniopterus orianae oceanensis)* which is a dual credit species under the Biodiversity Assessment Method (BAM). As no breeding habitat for Large Bent-wing Bat would be impacted by the Proposal, offsets for these species comprise ecosystem credits and are accounted for in the vegetation offsets for the Amended Proposal in accordance with the BAM-C.

BAM (STAGE 1): BIODIVERSITY ASSESSMENT

1 INTRODUCTION

1.1 Overview

Dial-A-Dump (EC) (DADEC) Pty Ltd (the Applicant) (as owned by Bingo Industries Pty Ltd (Bingo)) are seeking approval to optimise the existing Eastern Creek Recycling Ecology Park (Eastern Creek REP) by increasing the throughput from the current two million tonnes per annum (Mtpa) by an additional 950,000 tonnes per annum (tpa), and by optimising internal infrastructure such as roads and stormwater (SSD-11606719) ('the Proposal').

An Environmental Impact Statement (EIS) was prepared for the Proposal in accordance with Part 4, Division 4.7 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Division 4.7 of the EP&A Act identifies the Minister for Planning, through the New South Wales (NSW) Department of Planning and Environment (DPE), as the consent authority for development that is identified as State Significant Development (SSD).

The EIS included a draft Biodiversity Development Assessment Report (BDAR) prepared by Arcadis Australia Pacific Pty Limited (Arcadis), on behalf of the Applicant to support an application for the approval of the Proposal. It was prepared in accordance with the Amended Secretary's Environmental Assessment Requirements (SEARs) issued on 1 October 2021 by DPE, the EP&A Act, and Section 192 of the *Environmental Planning and Assessment Regulations 2021* (EP&A Regulations). The BDAR was prepared by Dr Elvira Lanham, an Accredited Assessor (BAAS20012) under the NSW *Biodiversity Conservation Act 2016* (BC Act).

The EIS was publicly exhibited between 14 July 2022 and 10 August 2022. During this exhibition period, submissions were invited from all stakeholders including members of the community and government agencies.

1.2 Purpose of this amended report

In response to stakeholder consultation on the draft BDAR, and further design development as the approvals process has progressed, several amendments to the Proposal presented in the EIS have been undertaken. Under clause 37(1) of the EP&A Regulation, an application for approval for SSD may be amended or varied with the approval of the Planning Secretary, before the application is determined.

This amended BDAR (referred to as the ASR BDAR 2025) supports the Amendment and Submissions Report (ASR) and has been prepared to assess the amended Proposal, respond to stakeholder feedback and address the SEARs as they relate to biodiversity. Updates to desktop searches, status of threatened entities, and an update to the BAM Calculator (BAM-C) which has included new candidate and predicated species is also included in this report.

Table 1-1 provides a summary of the relevant SEARs which relate to biodiversity and where these have been addressed in this report.

Table 1-1: SEARs

SEARs	Where addressed
Biodiversity	
An assessment of the proposal's biodiversity impacts in accordance with the *Biodiversity Conservation Act 2016*, including the preparation of a Biodiversity Development Assessment Report (BDAR) where required under the Act, except where a waiver for preparation of a BDAR has been granted.	ASR BDAR 2025 (this report)

Further to the above, during preparation of the EIS BDAR, the Environment, Energy and Science Group) (now Environment and Heritage) required further details on specific requirements relating to their authority. These requirements are discussed throughout the report as indicated in Table 1-2.

Following exhibition of the EIS, the Department of Planning and Environment (Environment and Heritage) provided feedback on the BDAR. This feedback and actions undertaken to address the feedback is outlined in Table 1-3.

Table 1-2: Local and State authority requirements and relevant report sections

Biodiversity	Where addressed
Environment, Energy and Science Group	
Biodiversity impacts related to the proposed development are to be assessed in accordance with Section 7.9 of the Biodiversity Conservation Act 2017 the Biodiversity Assessment Method and documented in a Biodiversity Development Assessment Report (BDAR).	ASR BDAR
The BDAR must document the application of the avoid, minimise and offset framework including assessing all direct, indirect and prescribed impacts in accordance with the Biodiversity Assessment Method.	Sections 9 and 10
The BDAR must include details of the measures proposed to address the offset obligations.	Sections 12 and 13
The BDAR must be submitted with all spatial data associated with the survey and assessment as per the BAM.	This report
The BDAR must be prepared by a person accredited in accordance with the Accreditation Scheme for the Application of the Biodiversity Assessment Method Order 2017 under s6.10 of the *Biodiversity Conservation Act 2016*.	Section 1.5
The EIS must map the following features relevant to water and soils including rivers, streams, wetlands, estuaries (as described in s4.2 of the Biodiversity Assessment Method), Wetlands as described in s4.2 of the Biodiversity Assessment Method and Groundwater dependent ecosystems.	This report

Table 1-3 Environment and Heritage Group EIS feedback

Biodiversity	Where addressed
Department of Planning and Environment (Environment and Heritage Group)	
EHG has reviewed the Biodiversity Development Assessment Report (BDAR) dated June 2022. EHG notes that the Biodiversity Assessment Method (BAM) credit summary report provided in Appendix F indicates the status of the case in the BAM-Calculator is 'to be finalised'. Prior to submission of the BDAR, the case should be finalised and submitted to the consent authority, which for cases in the Sydney area, is Greater Sydney - Compliance & Regulation.	Appendix F has been updated to reflect the Amended Proposal and is now finalised.
EHG also requires, as set out in Table 25 of the BAM, that the BDAR includes a table of credit class and matching credit profiles, to assist in the preparation of any consent conditions. This can be achieved by including a copy of the 'Biodiversity Credit Report (like for like)' in the BDAR	Appendix F
EHG has reviewed the surface water impact assessment. EHG notes the site is not impacted by flooding and has no comments regarding this aspect	Noted

1.3 Amended Proposal

Bingo is proposing to enhance resource recovery outcomes across the Greater Sydney area by optimising throughput at the Eastern Creek REP to capitalise on the underutilised state-of-the-art processing facilities (namely MPC2), and plant and equipment within the Eastern Creek REP. The Applicant is therefore proposing to increase the total throughput of the Eastern Creek REP by 950,000 tpa and carry out infrastructure upgrade works across the Proposal Site ('the Proposal'). An overview of the Proposal is provided in Figure 11. The Proposal would be developed in three stages:

- **Stage 1: Initial throughput**: Stage 1 would comprise 500,000 tpa of additional throughput to be received at the Eastern Creek REP to enhance resource recovery outcomes by increasing utilisation of onsite processing capabilities. No infrastructure upgrades are required under Stage 1.
- **Stage 2: Internal site optimisation**: Stage 2 would facilitate the remaining throughput increase (an additional 450,000 tpa of the total 950,000 tpa proposed) to be received and processed across the Eastern Creek REP. Stage 2 would include:
  - Upgrade of existing internal roads as required
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- **Stage 3: Installation of supporting infrastructure**: Stage 3 would comprise the redevelopment of the northeastern corner of the Proposal Site. This would comprise:
  - Construction and operation of a Site Workshop (relocating this activity from elsewhere within the Proposal Site to a dedicated enclosed facility)

- Construction and operation of a skip bin Maintenance and Manufacturing Workshop
- Construction of Basin B, a 2,150 m^3 stormwater detention basin inclusive of a 400 m^2 bio-retention system, located in the northeastern portion of the Proposal Site
- Installation of landscaping, signage, security fencing and finishing works.

An overview of the Amended Proposal is shown on Figure 1-1.

The Amended Proposal removed the OSD tank, bioretention basin, storage dam and sediment basin in the western portion of the subject land from further assessment.

All credit calculations have been undertaken using the BAM Calculator in case number 00056072/BAAS21012/25/00056073.

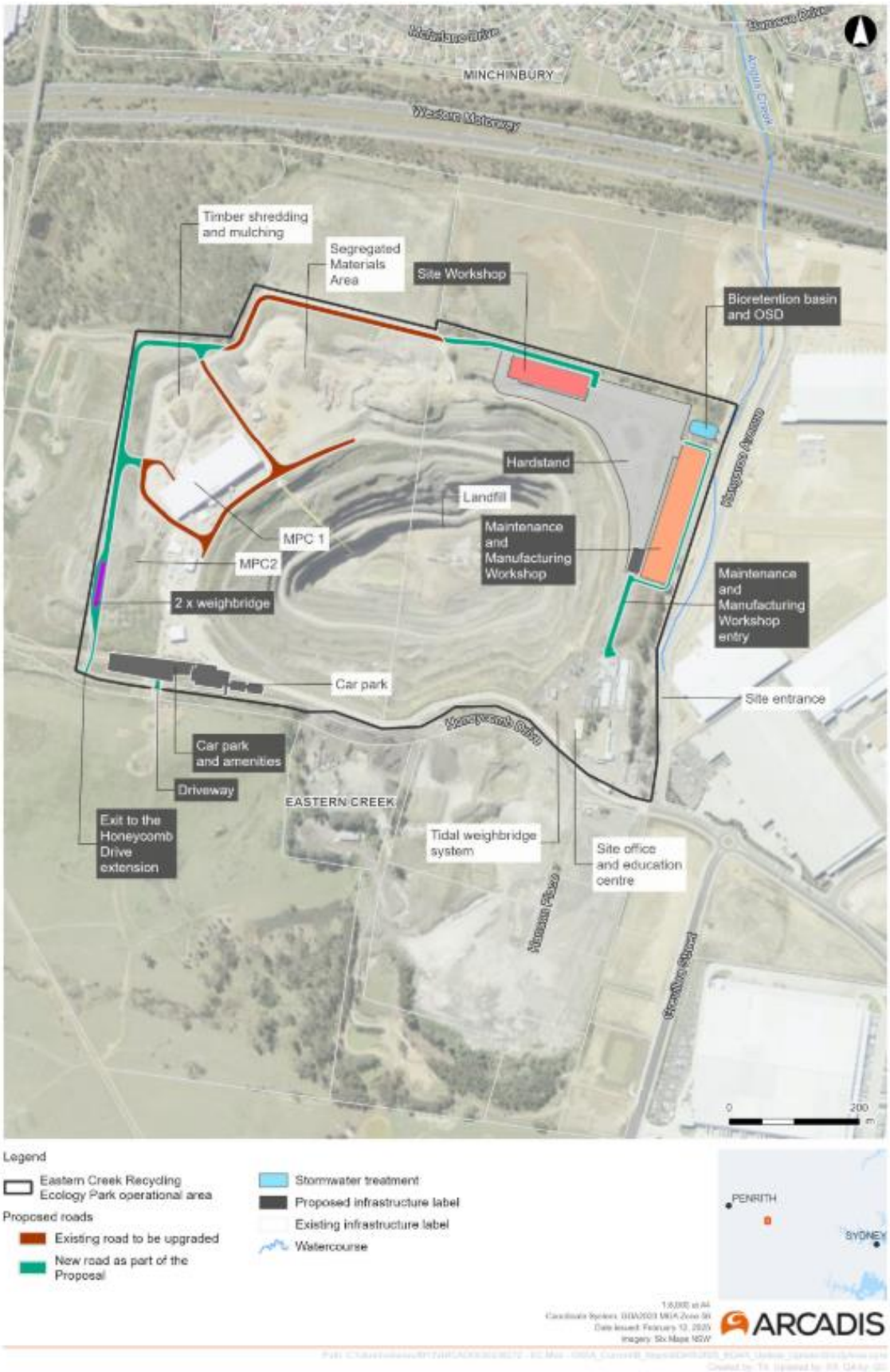

Figure 1-1: The Amended Proposal

1.4 Site location

The Eastern Creek REP key operational area comprises three parcels of land at 1 Kangaroo Avenue, Eastern Creek (Lot 1 DP1145808, Lot 2 DP1247691 and part of Lot 2 DP 1145808), shown in Figure 1-1. The Proposal Site is located within the Eastern Creek industrial precinct / M7 business hub and is surrounded by a large range of industrial developments, primarily to the east. These industrial developments include Techtronic Industries, H&M distribution warehouse, Kuehne + Nagel (Australia) Pty Ltd warehouse, Kmart distribution centre, Bunnings distribution centre and DB Schenker warehouse. Immediately to the west of the operational area of the Eastern Creek REP is vacant land that form part of the broader Eastern Creek REP. Further, to the west of the Eastern Creek REP is the Fulton Hogan asphalt batching plant and a vacant area of undeveloped land.

The Eastern Creek REP is bounded by the Western Motorway (M4) to the north, Kangaroo Avenue to the east and Honeycomb Drive to the south. The planned future Archbold Road extension will run parallel to the western boundary of the Proposal Site (Transport for NSW (TfNSW), 2019). The Eastern Creek REP is enclosed by commercial and industrial buildings to the immediate north, east and south. The closest residential receivers are located across the M4 Motorway approximately 400 m to the north in the suburb of Minchinbury and approximately 1.2 kilometres west in the suburb of Erskine Park.

Existing access to the Eastern Creek REP is from Kangaroo Avenue which connects to Honeycomb Drive to the south and provides access to the broader arterial road network including the M4 and M7 motorways.

The surrounding area has generally low relief with no major hills or ridgelines, other than amenity berms adjacent to the landfill that were created from quarry overburden. Angus Creek, a small ephemeral drainage line is located immediately east of the Eastern Creek REP (between the landfill area and Kangaroo Avenue) which drains to the north into Eastern Creek. There are several other ephemeral drainage lines west of the Eastern Creek REP which drain towards Ropes Creek, which is approximately 700 metres west of the Eastern Creek REP.

The Eastern Creek REP is located within the Blacktown Local Government Area however is not zoned under the *Blacktown Local Environmental Plan 2015* as it falls within the boundary of the *State Environmental Planning Policy (Industry and Employment) 2021*.

1.5 Site history

During the 1800s, the Eastern Creek REP site was used for both agricultural and breccia quarrying purposes. The quarrying activities had expanded by the 1930s and were then operated by the Ray Fitzpatrick Quarriers in the 1950s. Quarrying activities continued until September 2006, with the final quarry void estimated to be 12 million cubic metres (m^3).

In November 2009, Dial-A-Dump Industries (DADI) acquired the Eastern Creek REP site and gained approval for the construction and operation of the Genesis Xero Waste Management Facility (WMF) (now named the Eastern Creek REP) (MP 06_0139), comprising a resource recovery facility and non-putrescible landfill with a material handling capacity of 700,000 tpa. This facility commenced operations in 2012.

Bingo acquired DADI in February 2019, including all its NSW waste and recycling assets. Bingo took over the operation of the Eastern Creek REP following completion of the acquisition process.

The Eastern Creek REP was originally approved (MP 06_0139) under Part 3A (now repealed) of the EP&A Act in 2009 and commenced operations in 2012 (Project Approval). Following the repeal of Part 3A of the EP&A Act on 1 October 2011, the project was subject to the transitional arrangements provided by the *Environmental Planning and Assessment Regulations 2000* (EP&A Regulations). The transitional arrangements provided by EP&A Regulations have now ceased, and the project was transitioned to a State Significant Development (SSD) on 2 October 2020.

Since the original project approval (MP 06_0139), fourteen modifications have been submitted, twelve of which have been approved (most recently on 1 May 2024), and one was withdrawn. Modification 9 to expand the operational area of the Eastern Creek REP into Lot 2 DP1145808 is currently under assessment.

1.6 Personnel and qualifications

Table 1-4 below lists the personnel and their roles in preparation of this ASR BDAR.

Table 1-4: Relevant personnel

Personnel	Qualifications	Experience/Role
Elvira Lanham	B. Environmental Science (Life Sciences) (Hons.) PhD Reptile Ecology – Flinders University of South Australia BAM Accredited Assessor (BAAS20012)	Elvira has been involved in ecological consultancy and research for the past 25 years and has completed projects throughout Australia and overseas, including QLD, NSW, Victoria and South Australia. She has been the project manager and primary author on more than 400 reports ranging from Environmental Impact Assessments, Review of Environmental Factors (REFs) and a range of biodiversity assessments. She has recently been the primary author on several Commonwealth EPBC referrals. She is an accredited Biodiversity Assessment Method (BAM) assessor and is overseeing the development of this BDAR as part of the ecological assessment for the project. Elvira wrote the fauna section of the BDAR and provided oversight and project management.
Meredith Leal	Bachelor of Environmental Management/Arts (Ecology)	Meredith Leal is an Ecologist with four years of ecological consulting experience and has delivered biodiversity assessments for a range of projects across NSW. She has undertaken extensive flora and fauna surveys with a focus on targeted threatened flora surveys, BAM vegetation plots and PCT and TEC identification. Meredith has completed numerous technical biodiversity reports under the BAM including BDARs and is informed in current biodiversity acts and legislation. Meredith wrote the flora component of the BDAR.
Kate Carroll	Bachelor of Science (Honours) (Ecology) BAM Accredited Assessor (BAAS17070)	Kate has led and delivered biodiversity assessments for a range of projects, with a focus on linear infrastructure, including road, rail, renewable energy, gas, urban development and waste during the past 13 years as an environmental consultant. With over 19 years of experience in ecological surveys, Kate has extensive knowledge of the flora and fauna of New South Wales. Kate is an Accredited Assessor for the Biodiversity Assessment Method (BAM) under the *Biodiversity Conservation Act 2016*. Kate provided technical review and input, field survey and also analysed the microbat echolocation call recordings.
Kate Mauger	Bachelor of Science (Biology and Geology/Geophysics) Master of Environment	Kate is a flora ecologist with five years of ecological consulting experience and has delivered biodiversity assessments for a range of projects across NSW. She has undertaken extensive flora surveys including targeted threatened flora surveys, identification of Plant Community Types and Threatened Ecological Communities, and targeted threatened fauna surveys. Kate has completed numerous technical biodiversity reports under the BAM and is informed in current biodiversity acts and legislation. Kate has extensive experience conducting biodiversity assessments in the Sydney Basin Bioregion and other areas of NSW.

2 METHODS

2.1 Subject land

The land in which biodiversity values have been assessed by this ASR BDAR 2025 is known as the subject land. The subject land is defined in DPE (2020a) and shown in Figure 2-1. It is made up of the construction (temporary) and operational footprint.

The subject land consists of land that may be directly or indirectly impacted by construction and operation of the Amended Proposal, including activities such as vegetation clearing, earthworks, establishment of access roads and operation of facilities within the Proposal Site.

For the ASR BDAR 2025 amendments, the additional area added in the June 2023 BDAR (the northwest treatment train) has been removed from the subject land and is no longer being assessed as part of this BDAR.

2.2 Assessment area

The assessment area is also a requirement under the BAM (DPE 2020a) for a BDAR and consists of the subject land and adjacent areas within a 1,500-metre buffer of the subject land, which may be subject to indirect impacts. The assessment area for the Amended Proposal is shown in Figure 4-2.

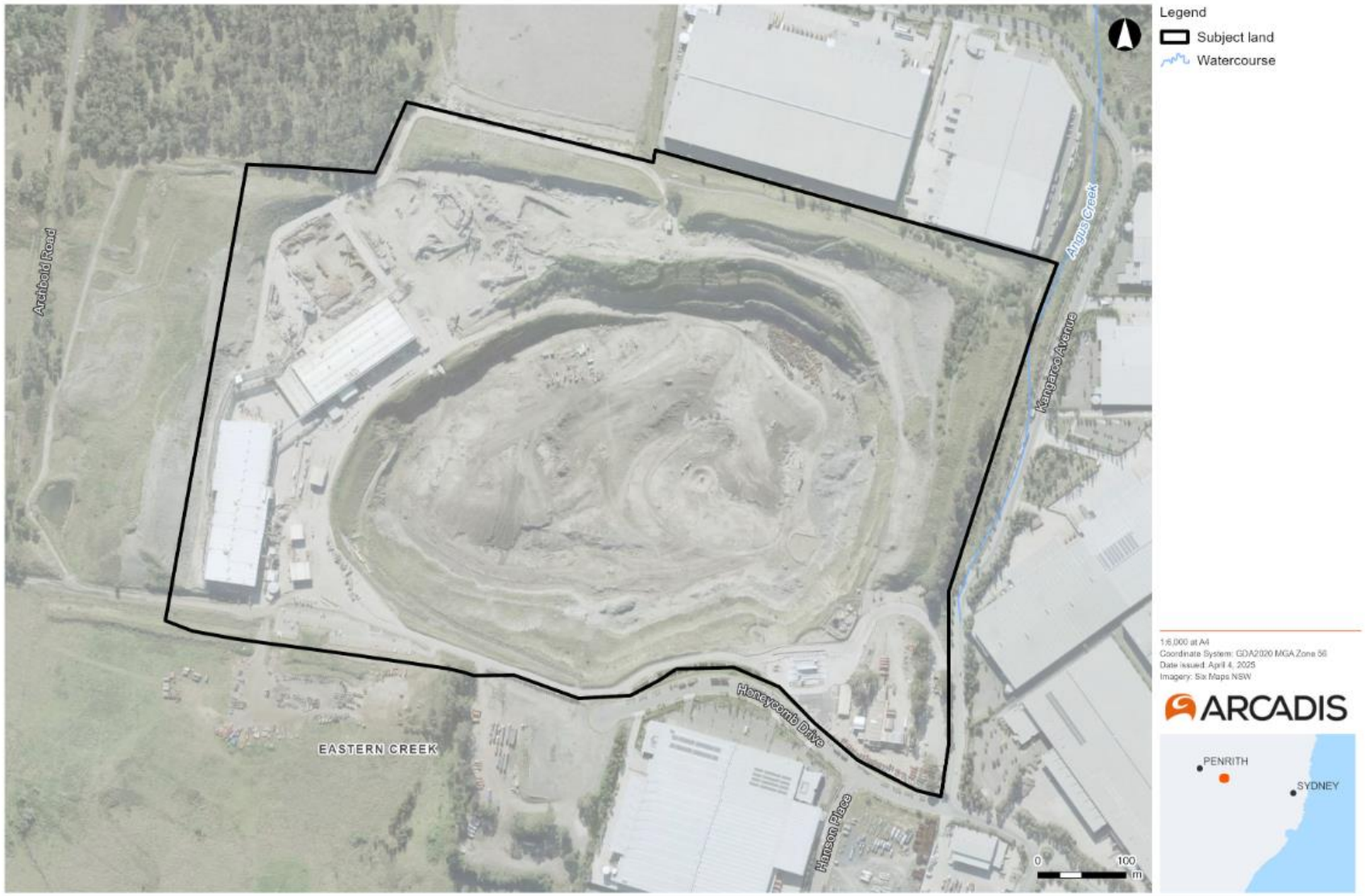

Figure 2-1: Subject land

2.3 Assessment guidelines and information sources

The assessment presented in this ASR BDAR 2025 was carried out in accordance with the requirements of the BAM (DPE, 2020a). Other assessment guidelines and information sources used to inform his ASR BDAR 2025 include:

- Biodiversity Assessment Method Calculator (BAM-C) (results shown in Appendix F)
- Biodiversity Assessment Method (BAM) (DPIE, 2020a)
- Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities working draft (DEC, 2004)
- NSW Surveying threatened plants and their habitats (DPIE, 2020b)
- Survey Guidelines for Australia's Threatened Birds (CoA, 2010a), Mammals (CoA, 2011) and Bats (CoA, 2010b)
- Matter of National Environmental Significance Significant Impact Guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth of Australia, 2013
- 'Species credit' threatened bats and their habitats: NSW survey guide for the Biodiversity Assessment Method (OEH, 2018)
- Remnant Vegetation of the western Cumberland subregion, 2013 update (DPIE, 2015b)
- Key Fish Habitat Mapping (DPI, n.d.)
- DPIs Fisheries Portal
- NSW Soil and Land Information eSPADE (DPIE, 2021c).

2.4 Database searches

Database searches were undertaken by Arcadis in July 2021, April 2023 and October 2024 to identify State and Commonwealth records of threatened entities and Commonwealth Matters of National Environmental Significance (MNES) that occur or have the potential to occur within 10 kilometres of the subject land. Databases and reports interrogated for this purpose are listed below in Table 2-1.

Table 2-1: Database searches carried out by Arcadis

Database	Purpose of search	Date of database search
NSW BioNet Wildlife Atlas *Managed by the NSW Department of Planning and Environment (DPE), Environment and Heritage Group (EHG)*	Used to compile a list of threatened species records listed under the BC Act to within 10 km of the subject land (Appendix D, Appendix E).	23 July 2021 & 26 April 2023
Bureau of Meteorology's Ground Water Dependent Ecosystem Atlas	Used to map any Groundwater Dependent Ecosystems (GDE) within the subject land.	23 July 2021
Protected Matters Search Tool (DAWE, 2021) *Managed by the Commonwealth Department of Climate Change, Energy, the Environment and Water*	Used to compile a list of potentially occurring MNES listed under the EPBC Act to within 10 km of the subject land (Appendix C).	July 2021 & April 2023

Database	Purpose of search	Date of database search
NSW BioNet Vegetation Information System (VIS) Classification database *Managed by DPE (EHG)*	Provides information on Plant Community Types (PCTs) and their relationship to a vegetation formation and vegetation class (managed and maintained in the Vegetation Information Systems (VIS) Classification database).	N/a
NSW BioNet Threatened Biodiversity Data Collection (TBDC) *Managed by DPE (EHG)*	Contains information for all listed threatened species, populations, and communities.	April 2023
NSW WeedWise (DPI 2023) *Managed by NSW Department of Primary Industries (DPI)*	Identifies species listed as priority weeds for a LGA and their control requirements.	April 2023
BAM-C (DCCEEW 2024) *Managed by NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW)*	Identifies ecosystem credits and candidate species credits for the subject land. An update to the BAM-C was issued by DCCEEWW in October 2024, which has consequently added candidate species and/or changed survey requirements for certain candidate species.	October 2024

2.5 Native vegetation

Key activities carried out as part of the ASR BDAR 2025 relating to the identification and assessment of native vegetation are discussed below and include:

- Mapping the extent of native vegetation cover
- Identifying plant community types

2.5.1 Definition of native vegetation

Under the BAM, native vegetation has the same meaning as in Section 1.6 of the BC Act which states that native vegetation and clearing native vegetation have the same meanings as in Part 5A of the *Local Land Services Act 2013* (LLS Act). Part 5A 60B of the LLS Act defines the meaning of native vegetation as any of the following types of plants native to New South Wales:

a) Trees (including any sapling or shrub or any scrub)

b) Understorey plants

c) Groundcover (being any type of herbaceous vegetation)

d) Plants occurring in a wetland.

A plant is native to New South Wales if it was established in New South Wales before European settlement. This includes planted vegetation which is important as the subject land and assessment area contains several native species plantings.

2.6 Field surveys

2.6.1 Survey timing

Field-based vegetation surveys of the subject land were carried out by Arcadis ecologists on 15 April 2021, 22 November 2024, 17 December 2024, 31 January 2025 and 22 and 23 September 2025.

2.6.2 Mapping extent of native vegetation cover

Field-based vegetation surveys of the subject land were carried out by Arcadis ecologists on 15 April 2021. The extent of native vegetation in the subject land was ground truthed and mapped using up to date aerial imagery. Vegetation within the subject land and landscape buffer was mapped at a regional scale using the following regional vegetation mapping for the area:

- Remnant Vegetation of the western Cumberland subregion, 2013 Update (OEH, 2013).

Recent aerial imagery was used to validate and refine the native vegetation extent within the assessment area where required.

2.7 Vegetation surveys

2.7.1 Vegetation mapping and PCT identification

During this assessment, vegetation within the subject land was initially stratified based on the composition of the canopy and vegetation structure (key elements in PCT assignment). It was then compared to recognised and accepted PCTs, as described in the BioNet Vegetation Classification (DPIE, 2021b). The identification of PCTs and vegetation types in the subject land was predominantly based on:

- Structure and species composition consistent with descriptions in the BioNet Vegetation Classification and other published references
- Characteristic tree species present
- Previous regional mapping as an equivalent vegetation type
- Landscape position.

In accordance with the BioNet Vegetation Classification System (DPIE, 2021b), field surveys were used to collect information on geology, dominant canopy species, native species richness, vegetation structure and condition. This information was used to validate and refine the existing vegetation mapping to determine the associated PCTs present on the subject land. Where applicable, PCTs were assigned to the relevant corresponding Threatened Ecological Community (TEC).

Once the vegetation present within the subject land was assigned to a PCT, the vegetation broad condition states (as defined in the BAM) were applied to determine vegetation zones within the subject land.

2.7.2 Revisions to eastern NSW Plant Community Types

In June 2022, DPE completed an update to the BAM-C to include revised Plant Community Types (PCTs) in eastern NSW and developed version 1.2 vegetation integrity benchmarks. The new PCTs seek to address feedback from assessors on the difficulty with assigning vegetation to the old PCTs and provide greater confidence, certainty, and transparency for the wide range of applications that use them in day-to-day business functions (DPE 2023).

The new eastern NSW PCTs that fit the PCTs from the subject land are shown in Table 2-2.

Table 2-2 Comparison of updated PCTs and legacy PCTs

Legacy PCT Number	PCT name (legacy)	Updated PCT Number	Updated PCT name	Vegetation formation class
849	Grey Box – Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	3320	Cumberland Shale Plains Woodland	Grassy Woodlands – Coastal Valley Grassy Woodlands

2.7.3 BAM plots

Two BAM plots were used to sample the vegetation of the subject land. This quantitative survey was conducted in accordance with the methodology described in the BAM Section 4.2 as summarised in Table 2-3 below. Figure 2-2 illustrates the plot layout of nested 20 metres by 50 metres, 20 metres by 20 metres and 1 metre by 1 metre sub-quadrats used for the assessment of condition attributes at the plot.

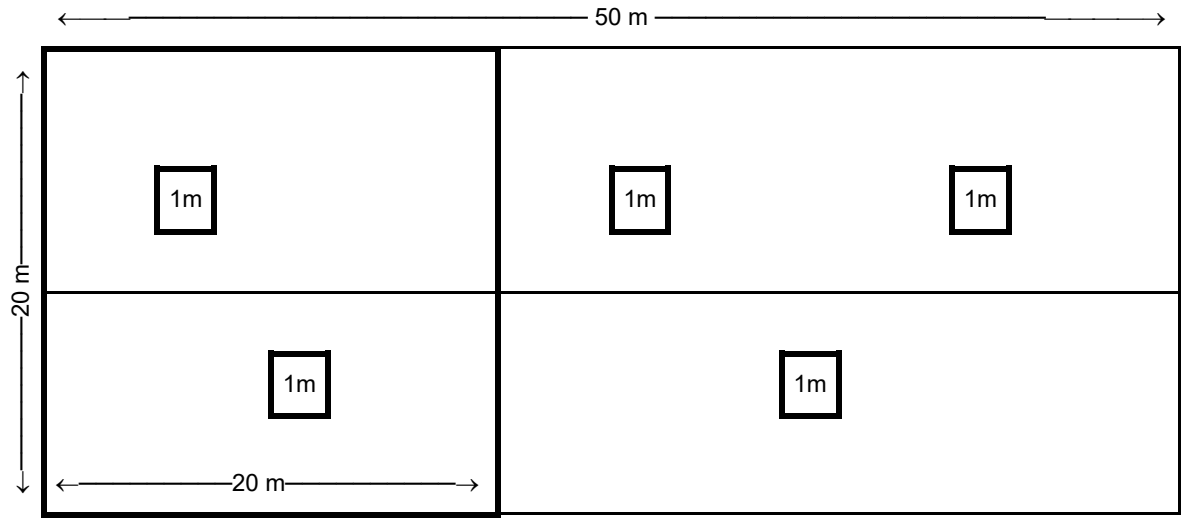

Figure 2-2: Schematic diagram illustrating the BAM vegetation plot layout

Flora species identified in the BAM vegetation plot are listed in the flora species inventory provided in Appendix A. The location of the BAM vegetation plots is shown in Figure 2-3.

Table 2-3: Data collected from the BAM vegetation plots

Attribute	Data collected
Location	Geographic co-ordinates (easting and northing; grid type MGA 94, Zone 56) – collected using GPS.
Native and exotic species richness and cover	All plant species identified within the 20-metre x 20-metre nested quadrat were recorded. The cover (percentage of area of quadrat covered) and abundance of each species present was estimated. The growth form, stratum/layer and whether each species was native, exotic, or a high threat weed was recorded.
Number of trees with hollows	The number of living and dead trees with hollows within the 50-metre x 20-metre quadrat was recorded. A hollow was only recorded if: (a) the entrance could be seen; (b) the estimated entrance width was at least five centimetres; (c) the hollow appeared to have depth; (d) the hollow was at least one metre above the ground; and the (e) the centre of the tree was located within the sampled quadrat.
Tree stem size diversity and number of large trees	Tree stem size diversity was recorded by measuring the diameter at breast height (dbh) (i.e. 1.3 metres from the ground) of living trees (greater than five centimetres dbh) within each 50-metre x 20-metre quadrat. For multi-stemmed living trees, only the largest stem was included in the count. The number of large trees was determined by counting all trees with a dbh greater than the specified dbh of large trees for each vegetation formation, as noted in the VIS Classification Database (DPIE, 2021b).

Attribute	Data collected
Evaluation of regeneration:	Presence/absence of overstorey species present at the subject land that were regenerating (defined as seedlings or saplings with a dbh less than or equal to five centimetres).
Total length of fallen logs	Cumulative total of logs within each 50-metre x 20-metre quadrat with a diameter of at least 10 centimetres and a length of at least 0.5 metres.
Litter cover	Estimation of the average percentage groundcover of litter (i.e., leaves, seeds, twigs, branchlets and branches with a diameter less than 10 centimetres which is detached from a living plant) from within five sub-plots that measured one metre x one metre square spaced evenly on either side of the 50-metre central transect.

2.7.4 Survey effort

Native vegetation within the subject land was classified into PCTs and then separated into vegetation zones based on broad condition classes. The size of each vegetation zone determines the sampling effort required, as outlined in Table 3.1 of the BAM. Table 2-4 below provides a summary of the vegetation zones present within the subject land and the sampling effort that was applied. Two BAM vegetation plots were completed. Due to the small area of one vegetation zone within the subject land, 3320_moderate/good, this vegetation zone was sampled with a plot undertaken just outside the subject land in adjoining vegetation (Table 2-4).

Table 2-4: Comparison of number of transects/plots required and completed per vegetation zone (Arcadis)

Vegetation Zone name and number (legacy)	Plant community type name (legacy)	Broad condition class	Vegetation zone area in subject land (ha)	Minimum number of plots required under the BAM	Number of plots completed
1) 3320_moderate/good	Grey Box – Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	Moderate/ good	0.02	1	1 (EC01)
2) 3320_planted	Grey Box – Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion	Poor	0.38	1	1 (EC02)

2.7.5 Vegetation integrity assessment

The vegetation integrity score is a measure of the condition of native vegetation and is assessed for each vegetation zone by calculating the scores for the composition, structure and function attributes collected in plots within the vegetation zone against the benchmark values for the associated PCT. Benchmark data was obtained from the BioNet Vegetation Classification.

The vegetation plot data was entered into the BAM-C to generate vegetation integrity scores.

According to Section 9.2.1 of the BAM (DPIE, 2020a) the assessor must determine an offset for all impacts of proposals on PCTs that are associated with a vegetation zone that has a vegetation integrity score of:

- ≥15, where the PCT is representative of an EEC or a CEEC
- ≥17, where the PCT is associated with threatened species habitat (as represented by ecosystem credits) or represents a vulnerable ecological community
- ≥20, where the PCT does not represent a TEC and is not associated with threatened species habitat.

2.8 Threatened species habitat assessment – determining candidate species

The candidate threatened species for assessment in this ASR BDAR 2025 were identified using the BAM-C. A review of database searches (BioNet, PMST) was also undertaken in July 2021 and then updated in April 2023 to identify threatened species and habitat with potential to occur in the subject land (refer to Section 2.4 for more information). These database searches informed the targeted threatened species surveys and assessment.

In October 2024 the BAM-C was updated and several new candidate species not previously considered were added to the calculator. This report assess these species as per the below criteria.

As outlined in Section 6.4.1.3 of the BAM, the following criteria (a – f) were used to predict the threatened species that require assessment:

a. The distribution of the species includes the IBRA subregion which the development site is, in the opinion of the assessor, mostly located within, and
b. The development site is within any geographic constraints of the distribution of the species within the IBRA subregion, and
c. The species is associated with any of the PCTs identified by the assessor as occurring within the development site, and
d. The native vegetation cover within an assessment area 1,500 metres wide surrounding the boundary of the subject land as determined by the assessor in accordance with subsection 4.3.2 of the BAM is equal to or greater than the minimum class that is required for the species (unless the development is, or is part of, a linear shaped development), and
e. The patch size which the vegetation zone is part of, as identified in subsection 5.3.2 of the BAM is equal to or greater than the minimum specified for that species, and
f. The species is identified as an ecosystem or species credit species in the Threatened Biodiversity Data Collection.

A threatened species was predicted as requiring assessment if that species meets all the criteria (a to f) that are relevant to the species. The BAM-C was used to derive the list of candidate species based on criteria a to f. If any one of the criteria (a to f) relevant to a species was not met, the subject land was considered not to be suitable habitat for the threatened species, and no further assessment was undertaken for that species.

The results of the BioNet and PMST searches were also used to inform development of the candidate species list. Some species returned from the database searches (i.e., BioNet and PMST) were removed from the assessment due to the absence of suitable habitat in the subject land. Most of the subject land is highly modified and developed, and as a result, lacks large areas of high-quality natural habitats. Based on the lack of these high-quality habitats, some species which are known to no longer occur in the Sydney area were removed from the assessment.

The threatened species suitability assessment and candidate list of threatened species for assessment is included in Section 6.1.

2.9 Targeted threatened species surveys

Targeted threatened species surveys were conducted for all species identified in Section 6.1 of this ASR BDAR 2025 as requiring survey. In total, this comprised of seven threatened flora species and two threatened fauna species.

2.9.1 Targeted threatened flora surveys

Targeted threatened flora surveys were undertaken over one day in April 2021, and over three days in November and December 2024 and January 2025. These surveys follow the methods described in *NSW Surveying threatened plants and their habitats* (DPIE, 2020b), and relevant survey comments provided in the TBDC. Targeted flora surveys were completed for all threatened flora species considered likely to occur in the subject land, including species returned by the BAM-C and require survey in accordance with Section 5.2 of the BAM.

These threatened flora species and the survey effort undertaken are detailed below in Table 2-5, with locations of threatened flora surveys are displayed in Figure 6-1.

2.9.1.1 Parallel field traverses

Areas of potential habitat for threatened flora species considered likely to occur within the subject land were surveyed using the parallel field traverse technique. This survey technique consists of walking in parallel traverses using both a GPS and tablet. The spacing between traverses is determined in accordance with Table 1 of the *NSW Surveying threatened plants and their habitats* (DPIE, 2020b).

Table 2-5: Targeted threatened flora species survey details

Scientific name	BC Act status	EPBC Act status	SAII	Minimum survey requirements	Associated PCTs within the subject land	Survey method	Seasonal survey requirements	Survey timing	Adequacy against guidelines
Acacia pubescens	V	V	No	For a medium shrub in open vegetation, the recommended maximum distance between traverses is 20 metres	PCT 3320	Parallel field traverses at 5 metres spacing	All year	15 April 2021	Adequate
Deyeuxia appressa	E	E	Yes	For a small grass in open vegetation, the recommended maximum distance between traverses is 10 metres	PCT 3320	Parallel field traverses at 5 metres spacing	December	17 December 2024	Adequate
Grevillea juniperina subsp. *juniperina*	V	-	No	For a sub-shrub in open vegetation, the recommended maximum distance between traverses is 15 metres	PCT 3320	Parallel field traverses at 5 metres spacing	All year	15 April 2021	Adequate
Marsdenia viridiflora subsp. *viridiflora*	EP	-	No	For a climber in open vegetation, the recommended maximum distance between traverses is 10 metres	PCT 3320	Parallel field traverses at 5 metres spacing	November - February	15 April 2021	Adequate. While surveys were undertaken outside recommended timing, species can be detected and identified outside this timing based on other identifying

Scientific name	BC Act status	EPBC Act status	SAII	Minimum survey requirements	Associated PCTs within the subject land	Survey method	Seasonal survey requirements	Survey timing	Adequacy against guidelines
									features (e.g., leaves, stem). To further increase detectability, the width of traverses was reduced to 5 metres.
Micromyrtus minutifolia	E	V	Yes	For a medium shrub in open vegetation, the recommended maximum distance between traverses is 20 metres	PCT 3320	Parallel field traverses at 10 metres spacing	All year, requires at least 3 surveys	22 November, 17 December 2024 and 31 January 2025	Adequate

V = Vulnerable, E = Endangered, EP= Endangered Population

2.9.2 Threatened fauna surveys

2.9.2.1 Fauna habitat assessment

Fauna habitat assessments were conducted in the subject land which included an assessment of the following fauna habitat features:

- Vegetation type, structure and extent
- Identification of any, watercourses, natural and artificial ponds, dams, soaks and drainage channels
- Adjacent habitats and barriers (natural or artificial) between the subject land and adjacent lands
- Arboreal resources including nectar, fruit and presence of mistletoe
- Artificial microbat roosts (culverts, bridges and buildings)
- Terrestrial shelter habitat such as coarse woody debris, rocky outcrops and artificial shelter (i.e., corrugated iron sheets, building refuse, rubbish) for invertebrates, amphibians, reptiles and small terrestrial mammals.

During fauna habitat assessments, the following general fauna surveys were also undertaken to detect threatened species and/or important fauna habitat:

- **Hollow-bearing tree surveys:** hollow-bearing trees were recorded opportunistically across the subject land to detect potential sheltering, roosting and/or breeding habitat for threatened and non-threatened fauna. Hollow-bearing tree surveys involved traversing the subject land and identifying tree hollows with the naked eye and binoculars.
- **Canopy searches:** canopy searches were undertaken across the subject land to detect individual Koalas (in addition to targeted surveys for the species, see below). Canopy searches were also undertaken to detect the presence of important fauna habitat features such as large stick nests. Canopy searches involved carefully inspecting the canopy of all trees with the naked eye and binoculars to detect presence of Koalas and/or important fauna habitat features.

2.9.2.2 Incidental fauna surveys

Field surveys also included incidental searches for indirect evidence of fauna, such as scats, nests, burrows, tracks, scratches, chewed cones and diggings. Incidental diurnal fauna surveys also involved recording all fauna species opportunistically seen or heard during surveys (Appendix B).

2.9.2.3 Targeted threatened fauna surveys

Targeted threatened fauna surveys were undertaken for all species credit/dual credit threatened fauna species likely to occur in the subject land, including species returned by the BAM-C and requiring survey in accordance with Section 5.2 of the BAM.

Targeted fauna surveys were designed to address the requirements outlined in the *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities Working Draft* (DEC, 2004). The following guidelines were also used to determine appropriate survey requirements for threatened fauna:

- *Threatened Biodiversity Data Collection* (DPIE, 2021g)
- EPBC Act referral guidelines for the vulnerable koala (CoA, 2014)
- Species credit threatened bats and their habitats: NSW survey guide for the Biodiversity Assessment Method (OEH, 2018).

The methodologies applied for each targeted threatened fauna species within the subject land are described below. Specifically, survey effort and threatened fauna targeted during field surveys are

summarised in Table 2-7. Table 2-7 also outlines each species reason for inclusion, that is, generated by the BAM-C and assessed in Section 6.1 as requiring survey, or determined through database searches as likely to occur in the subject land. Locations of threatened species surveys are displayed in Figure 2-3.

The following targeted fauna surveys were all conducted during the initial survey in 2021 with the addition of Spotlighting in September 2025. Weather conditions relevant to survey guidelines have been included in *Table 2-6*.

Table 2-6 Weather conditions during targeted fauna surveys (Horsley Park Weather Station (station: 067119))

Date	Observers	Survey	Temperature (°C)		Rainfall (mm)	Wind	
			Min	Max		Direction	Max (km/hr)
15/04/2021	M. Leal, W. Terry	Diurnal Snail and Koala scat searches	11.8	25.5	0	SSE	28
22/09/2025	K. Mauger	Spotlighting	7.8	21.6	0	SSE	37
23/09/2025	A. Jennings	Spotlighting	5.5	19.0	9.6*	SSW	30

**Weather conditions at time of survey were clear and calm despite weather station indicating rain that day.*

Anabat survey

Passive ultrasonic recording of echolocation calls of *Microchiroptera* bats (microbats) was carried out using an Anabat detector deployed within native vegetation in the subject land. The detector was positioned to sample a potential fly way near the eastern boundary of the subject land adjacent to Angus Creek.

Bat call analyses was completed by Kate Carroll of Arcadis. *The Australasian Bat Society: Bat Calls of New South Wales: region-based guide to the echolocation calls of microchiropteran bats* (Pennay et al., 2004) was used as a reference collection for bat call identification. The level of confidence for call identification was identified as Definite or Possible (complex), where the call could not be distinguished between two species.

All 'definite' bat calls were identified with a high degree of confidence as they were typical call frequencies and shapes for each species identified and within the known distribution and habitat types for these species. Species identified through Anabat recordings including the confidence for call identification is presented in Appendix B.

Koala surveys

Suitable habitat for Koala includes associated PCTs (as listed in the species profile in the Threatened Biodiversity Database Collection (TBDC)), and Koala use tree species, such as *Corymbia maculata* (Spotted Gum) (as listed for the Central Coast Koala Management Areas in the *State Environmental Planning Policy (Koala Habitat Protection) 2021* (DPIE, 2021)).

Modified Spot Analysis Technique (SAT) surveys

SAT surveys were not conducted in accordance with the method prescribed by Steve Phillips and John Callaghan (2011) as there was insufficient habitat to complete the assessment of 30 trees. Suitable habitat is restricted the eastern boundary of the subject land. As such, targeted searches for Koala (*Phascolarctos cinereus*) scats were undertaken within PCT vegetation on this eastern boundary. Searches were conducted at the base of eucalypt trees, searching beneath bark and leaf litter accumulations.

Spotlighting

Spotlighting transects were conducted over two nights in September 2025. Spotlighting surveys commenced a minimum of 30 minutes after last light. The surveys were conducted on foot using high-powered hand torches, and binoculars. Spotlighting transects were undertaken at a pace of 2 hours per 500 metres. Transects were streamed using Field Maps on an iPad. Spotlighting survey effort is shown below in Figure 2-3.

Cumberland Plain Land Snail survey

Targeted searches for Cumberland Plain Land Snail (*Meridolum corneovirens*) consisted of diurnal and nocturnal searches in accordance with the TBDC (DPE, 2025b). Diurnal searches consisted of meandering transects across suitable habitat to locate empty shells. Leaf litter at the base of large eucalypts was also searched for shells while searching for Koala scats. Nocturnal surveys were conducted in warm weather, similarly to diurnal surveys this consisted of meandering transects across suitable habitat, spotlighting along the ground for live individuals and for glistening reflections from snail residue trails and was conducted in conjunction with Koala spotlighting. Locations of snail spotlighting surveys are shown in Figure 2-3.

Diurnal roost searches

Diurnal roost searches were conducted across the subject land in initial habitat assessments to identify roosting and/or breeding habitat for the Grey-headed Flying-fox (*Pteropus poliocephalus*). The subject land was traversed to identify individuals and/or potential habitat. Initial database searches were also undertaken to identify breeding camps. No breeding camps were located within the subject land.

Table 2-7: Species credit threatened fauna species (including dual credit species) targeted in surveys and methods

Scientific name	Common name	BC Act status	EPBC Act status	Minimum survey requirements	Seasonal survey requirements	Survey timing and effort appropriate?
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	Habitat assessment and diurnal searches for Flying-fox camps in areas of suitable habitat.	All year (optimal October – December)	Yes
Phascolarctos cinereus	Koala	V	V	Methods include targeted scat searches and nocturnal spotlighting for individuals in areas of suitable habitat. Both diurnal and nocturnal surveys must be undertaken.	All year (scat searches) August to January (searches for individuals)	Yes for size of subject land and impact.
Miniopterus orianae oceanensis	Large Bent-winged Bat	V	-	Ultrasonic call detectors for a minimum of four nights.	October – March (optimal December – February)	Yes for size of subject land and impact. This species was possibly detected.
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	Ultrasonic call detectors for a minimum of four nights. Minimum total effort of 16 detector nights in areas <50ha (e.g. four detectors deployed for four nights).	October – March (optimal November – January)	Yes for size of subject land and impact. This species was possibly detected.
Miniopterus australis	Little Bent-winged Bat	V	-	Ultrasonic call detectors for a minimum of four nights.	October – March (optimal December – February)	Yes for size of subject land and impact.
Myotis macropus	Southern Myotis	V	-	Ultrasonic call detectors for a minimum of four nights. Minimum total effort of 16 detector nights in areas <50ha (e.g., four detectors deployed for four nights).	October – March	Yes for size of subject land and impact.

Scientific name	Common name	BC Act status	EPBC Act status	Minimum survey requirements	Seasonal survey requirements	Survey timing and effort appropriate?
Meridolum corneovirens	Cumberland Plain Land Snail	E	-	Both diurnal and nocturnal surveys must be undertaken for the species. Diurnal surveys are used to locate empty shells and nocturnal surveys to locate live individuals.	All year and weather conditions	Yes for size of subject land and impact.

V = Vulnerable, E= Endangered

2.9.3 Survey limitations

Field surveys and survey effort was conducted in accordance with the BAM and relevant guidelines where possible.

As some species are only present or apparent at certain times of the year (e.g., migratory birds), species recorded in the subject land should be treated as an indication of species presence at the time of field surveys, not a fully comprehensive list. Further, some species require specific conditions for optimum detection. For example, owls can be detected year-round however the optimal seasonal timing to detect breeding is between May and August, during nesting. In addition, peak activity periods for fauna can also be correlated with weather conditions.

The conclusions of this report are based upon available data and field surveys and are therefore indicative of the environmental condition of the subject land at the time of the survey. It should be recognised that conditions, including the presence of threatened species, could change with time. To address this limitation, a precautionary approach has been used which aimed to identify the presence and suitability of the habitat for threatened species (Appendix D and Appendix E).

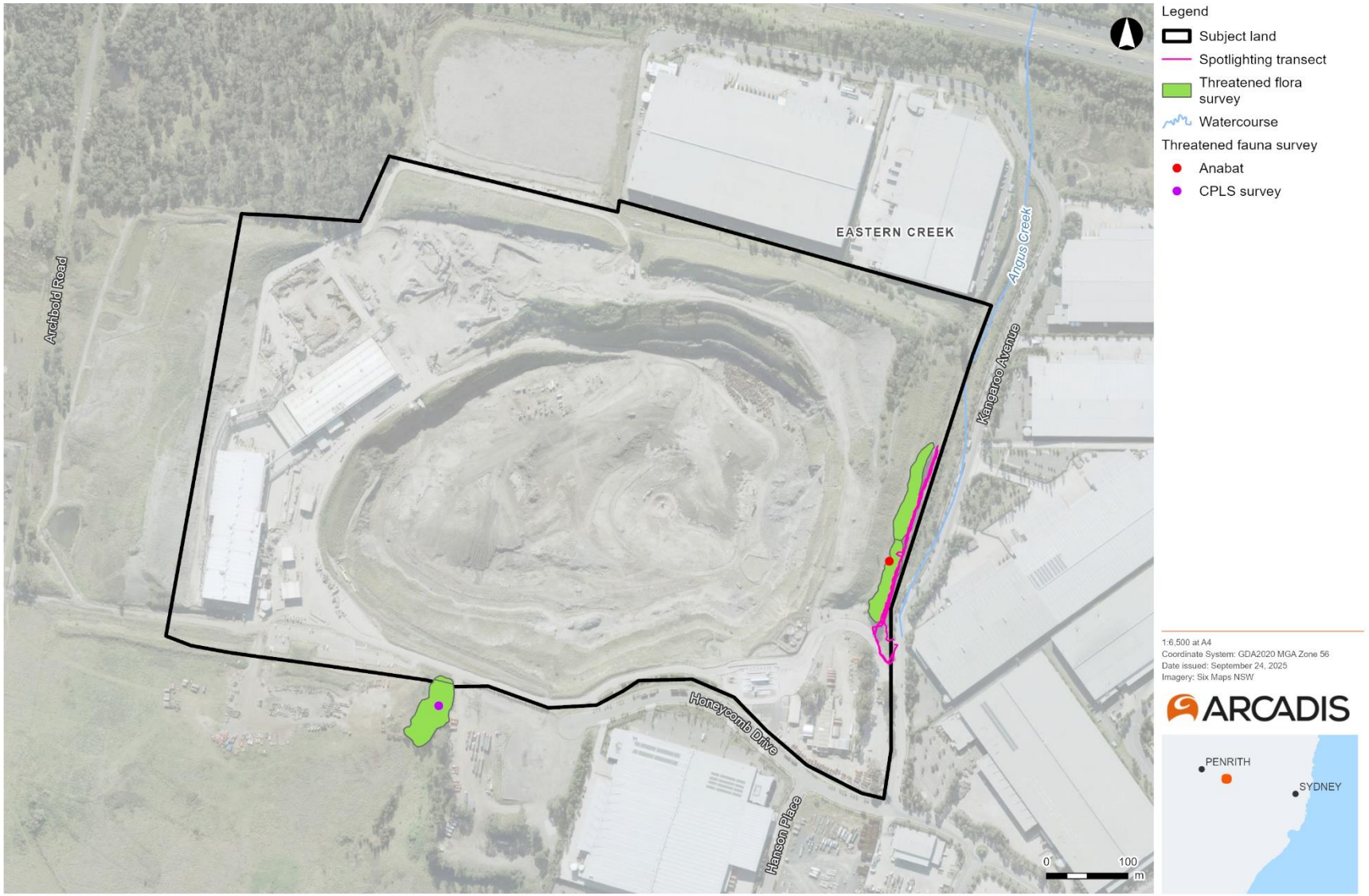

Figure 2-3: Threatened species survey effort

3 LEGISLATIVE CONTEXT

3.1 Overview

Field surveys and the preparation of this assessment have been undertaken in accordance with, or with reference to, the legislative acts and guidelines listed within this section. All work was carried out under the appropriate licenses, including scientific licenses as required under Section 2 of the BC Act (license number SL100646) and in accordance with the NSW DPI Animal Ethics Committee (AEC) (licence TRIM 13/339).

The SEARs, which set out the requirements of the EIS, were issued on 1 October 2021 for the Eastern Creek REP Recycling Infrastructure Optimisation Project. SEARs relating to biodiversity, and where they are addressed within this report, are listed below in Table 3-1.

Table 3-1: SEARs (Biodiversity)

Agency Requirement	Details	Where addressed within this report
DPIE (now DPHI)	An assessment of the proposal's biodiversity impacts in accordance with the *Biodiversity Conservation Act 2016*, including the preparation of a Biodiversity Development Assessment Report (BDAR) where required under the Act, except where a waiver for preparation of a BDAR has been granted.	This report

3.2 Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities, and heritage places, defined in the EPBC Act as MNES. MNES identified in the Act include:

- World heritage properties
- National heritage places
- Wetlands of international importance (listed under the Ramsar Convention)
- Threatened species and communities
- Migratory species protected under international agreements
- Commonwealth marine areas
- The Great Barrier Reef Marine Park
- Nuclear actions (including uranium mines).

In accordance with Sections 67 and 67A of the EPBC Act, any works that have the potential to result in an impact on any MNES or on Commonwealth land are considered 'controlled actions' and require a referral to the Federal Minister for the Environment for approval. Consideration of the potential for the Amended Proposal to result in a significant impact to MNES has been addressed in Section 7 of this report.

3.3 Biodiversity Conservation Act 2016

The BC Act seeks to establish a framework for assessment and offsetting of development impacts as well as investment in biodiversity conservation, specifically:

- The NSW BOS (established under Part 6 of the BC Act)
- The BAM (established under Section 6.7 of the BC Act).

Entry to the NSW BOS is triggered by developments, projects and activities that meet one or more of the following thresholds for significant impacts:

- Local development assessed under Part 4 of the NSW EP&A Act that triggers the BOS threshold or is likely to significantly affect threatened species based on the 'Test of significance' outlined in Section 7.3 of the BC Act
- SSD and State Significant Infrastructure (SSI) projects, unless the Secretary of the DPIE and the environment agency head determine that the project is not likely to have a significant impact
- Biodiversity certification proposals
- Clearing of native vegetation in urban areas and areas zoned for environmental conservation that exceeds the BOS threshold and does not require development consent
- Clearing of native vegetation that requires approval by the Native Vegetation Panel under the *Local Land Services Act 2013*
- Activities assessed and determined under Part 5 of the EP&A Act (generally, proposals by government entities) if proponents choose to 'opt in' to the Scheme.

Under the NSW BOS, an accredited assessor must apply the BAM in assessing the proposed impacts of the development. The purpose of the BAM is to assess certain impacts on threatened species and Threatened Ecological Communities (TECs), and their habitats, and the impact on biodiversity values, where required under the BC Act.

The Amended Proposal is considered to meet the definition of an SSD and on this basis, the Amended Proposal would trigger entry into the BOS. The Proposal therefore needs to be supported by a BDAR, prepared in accordance with the requirements of the BAM (DPIE, 2020a) as outlined in the corresponding sub-section below.

Given the small area of native vegetation impacted, the Amended Proposal may meet the criteria as a small area and be eligible for a streamlined assessment (Appendix C of the BAM (DPE, 2020a)). However, as there is not clarity on minimum lot sizes for the subject land and surrounds, we have elected to provide a full assessment.

3.4 Fisheries Management Act 1994

The NSW *Fisheries Management Act 1994* (FM Act) provides for the protection, conservation, and recovery of threatened species defined under the Act. It also makes provision for the management of threats to threatened species, populations, and ecological communities, as well as the general protection of fish and fish habitat.

Consideration of entities listed under the FM Act, and potential impacts as a result of the Proposal, have been addressed in Section 7.4 of this report.

3.5 Biosecurity Act 2015

The primary objective of the *Biosecurity Act 2015* is to provide a framework for the prevention, elimination and minimisation of biosecurity risks posed by biosecurity matter, dealing with biosecurity matter, carriers and potential carriers, and other activities that involve biosecurity matter, carriers, or potential carriers. Division 2 of the *Biosecurity Act 2015* defines local control authorities for weeds. Schedule 1 of the *Biosecurity Act 2015* outlines special provisions relating to weeds, including the duty of land occupiers to control and manage weeds.

Section 5.7 of this report outlines weeds of significance recorded within the subject land.

3.6 State Environmental Planning Policy (Biodiversity and Conservation) 2021

On 1 March 2020, the *State Environmental Planning Policy (Koala Habitat Protection) 2019* (Koala SEPP 2019) came into effect, repealing the former *State Environmental Planning Policy No. 44 – Koala Habitat Protection* (SEPP 44). In November 2020, the NSW Government replaced and repealed the Koala SEPP 2019 and introduced the *State Environmental Planning Policy (Koala Habitat Protection) 2020* (Koala SEPP 2020) which largely reinstated the former SEPP 44. However, as of 17 March 2021, a new policy the *State Environmental Planning Policy (Koala Habitat Protection) 2021* (Koala SEPP 2021) came into effect to apply to certain lands. The Koala SEPP 2021 reinstates the policy framework of the Koala Habitat Protection SEPP (2019). Ultimately, as of 1 March 2022, both Koala SEPP 2020 and Koala SEPP 2021 were consolidated by the NSW Government into the *State Environmental Planning Policy (Biodiversity and Conservation) 2021* (Biodiversity and Conservation SEPP), respectively to Chapters 3 and 4.

Blacktown LGA is not within the LGAs covered by the Biodiversity and Conservation SEPP and as such, it does not apply to this Proposal.

3.7 Biodiversity Assessment Method requirements

The BAM (DPIE, 2020a) is the assessment manual that outlines how an accredited person assesses impacts on biodiversity at subject lands. The BAM provides:

- A consistent method for the assessment of biodiversity on a proposed development, major project, or clearing subject land
- Guidance on how a proponent can avoid and minimise potential biodiversity impacts
- The number and class of biodiversity credits that need to be offset to achieve a standard of 'no net loss' of biodiversity.

An accredited assessor must document the results of the BAM in a BDAR. The BDAR identifies how the proponent proposes to avoid and minimise impacts, any potential impact that could be characterised as serious and irreversible (according to specified principles) and the offset obligation required to offset the likely biodiversity impacts of the development or clearing proposal, expressed in biodiversity credits.

The requirements for a BDAR are listed in Appendix 10 (Table 25 and Table 26) of the BAM. Table 3-2 below identifies where each requirement has been met within this report.

Table 3-2: Minimum information requirements for a BDAR (DPIE, 2020a)

Biodiversity Assessment Method Requirement		Where addressed in this ASR BDAR 2025
Section	**Information to be included**	
Introduction	Introduction to the biodiversity assessment including: • Brief description of the proposal • Identification of the subject land boundary including: – Operational footprint – Construction footprint indicating clearing associated with temporary construction facilities and infrastructure.	Section 1.2
	General description of subject land.	Section 1.4 Section 2.1
	Sources of information used in the assessment, including reports and spatial data.	Section 2.3

Biodiversity Assessment Method Requirement Section	Information to be included	Where addressed in this ASR BDAR 2025
Landscape features	Identification of subject land context components and landscape features, including: • General description of subject land topographic and hydrological setting, geology and soils • Percent native vegetation cover in the assessment area • IBRA bioregions and subregions • Rivers and streams classified according to stream order • Wetlands within, adjacent to and downstream of the subject land • Connectivity of different areas of habitat • Karst, caves, crevices, cliffs, rocks and other geological features of significance and for vegetation clearing proposals, soil hazard features • Areas of outstanding biodiversity value occurring on the subject land and assessment area • Any additional landscape features identified in any SEARs for the proposal • NSW (Mitchell) landscape on which the subject land occurs.	Section 4
Native vegetation	Identify native vegetation extent within the subject land, including cleared areas and evidence to support differences between mapped vegetation extent and aerial imagery.	Section 5
	Provide justification for all parts of the subject land that do not contain native vegetation.	Section 5
	Review of existing information on native vegetation including references to previous vegetation maps of the subject land and assessment area.	Section 5
	Describe the systematic field-based floristic vegetation survey undertaken in accordance with BAM Section 4.2.	Section 2.7
	Where relevant, describe the use of more appropriate local data, provide reasons that support the use of more appropriate local data and include the written confirmation from the decision-maker that they support the use of more appropriate local data.	N/A
	Describe PCTs within the subject land.	Section 5.3
	Describe the vegetation integrity assessment of the subject land.	Section 5.4
Threatened species	Identify ecosystem credit species likely to occur on the subject land.	Section 6.1
	Identify species credit species likely to occur on the subject land.	Section 6.1
	From the list of candidate species credit species, identify: • Species assumed present within the subject land (if relevant) • Species present within the subject land on the basis of being identified on an important habitat map for a species • Species for which targeted surveys are to be completed to determine species presence • Species for which an expert report is to be used to determine species presence.	Section 6.1
	Present the outcomes of species credit species assessments from:	Section 6.2

Biodiversity Assessment Method Requirement		Where addressed in this ASR BDAR 2025
Section	**Information to be included**	
	• Threatened species survey • Expert reports (if relevant).	
	Where survey has been undertaken include detailed information on survey method, effort and timing and justification of this method, effort and timing in relation to the requirements in the TBDC or the Department's taxa-specific survey guides. Information on survey personnel, relevant experience and any limitations on the surveys must also be provided.	Section 2.9
	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).	N/A
	Identify the biodiversity risk weighting for each species credit species identified as present within the subject land.	N/A
Prescribed impacts	Identify potential prescribed biodiversity impacts on threatened entities.	Section 8
	Identify a list of threatened entities that may be dependent upon or may use habitat features associated with any of the prescribed impacts.	N/A
	Describe the importance of habitat features to the species including, where relevant, impacts on life cycle or movement patterns.	N/A
Avoid and minimise impacts	Demonstration of efforts to avoid and minimise impacts on biodiversity values (including prescribed impacts) associated with the proposal location in accordance with Chapter 7.	Section 9
	Describe efforts to avoid and minimise impacts (including prescribed impacts) to biodiversity values through proposal design.	Section 9.1
	Identification of any other subject land constraints that the proponent has considered in determining the location and design of the proposal.	Section 9.1.1 and 9.1.2
Assessment of impacts	Determine the impacts on native vegetation and threatened species habitat.	Section 10.1
	Assessment of indirect impacts on vegetation and threatened species and their habitat.	Section 10.2
	Assessment of prescribed biodiversity impacts.	N/A
Mitigation and management of impacts	Identification of measures to mitigate or manage impacts.	Section 11
Impact summary	Identification and assessment of impacts on TECs and threatened species that are at risk of a serious and irreversible impacts.	Section 10.1.4
	Identification of impacts requiring offsets.	Section 12.1
	Identification of impacts not requiring offsets.	Section 12.2
	Identification of areas not requiring further assessment.	Section 12.2
	Ecosystem credits and species credits that measure the impact of the development on biodiversity values.	Section 12.1
Biodiversity credit report	Description of credit classes for ecosystem credits and species credits at the development or clearing subject land.	Section 13

4 LANDSCAPE CONTEXT

4.1 Native vegetation cover

Regional vegetation mapping (OEH, 2013) has been used for the purposes of mapping native vegetation within the assessment area. Recent aerial imagery was used to validate and refine the native vegetation extent within the assessment area where required. The area of native vegetation cover within the assessment area is outlined below in Table 4-1 and shown in Figure 4-2. Native vegetation in the landscape is in the '<30 per cent cover' class.

Table 4-1: Native vegetation cover within the assessment area

Location	Extent of assessment area (ha)	Native vegetation extent within assessment area (ha)	Per cent native vegetation cover within assessment area
Assessment area (refer to Figure 4-2)	1169	191.63	16.39

4.2 IBRA bioregions and subregions

The Interim Biogeographic Regionalisation for Australia (IBRA) bioregion and subregion associated with the subject land is mapped below in Figure 4-1. The subject land is located within the Cumberland IBRA subregion of the Sydney Basin IBRA bioregion.

4.3 Rivers and streams

Angus Creek, a first order stream, runs adjacent to the subject land along the eastern boundary and traverses the north east corner of the subject land (Figure 4-1). Angus Creek is an ephemeral, partially defined waterway which sits within a modified concreted channel and is approximately one to three metres wide (Photograph 1). Ropes Creek is the next nearest waterway to the subject land and is located approximately 700 metres to the west of the subject land.

Photograph 1 Angus Creek running adjacent to the subject land

4.4 Wetlands

There are no wetlands listed under the *State Environment Planning Policy (Resilience and Hazards) 2021* (Resilience and Hazard SEPP) or important wetlands listed in the Directory of Important Wetlands in Australia (DIWA) within the assessment area. No wetlands of international importance (Ramsar) are located within the assessment area. The closest Ramsar wetland is located approximately 25 kilometres to the east at Sydney Olympic Park, which contains a waterbird refuge listed under Ramsar.

4.5 Connectivity features

Connectivity features within the subject land are limited. Although some limited connectivity exists for flying species (such as birds and bats), the subject land has little direct connectivity with vegetated corridors.

Areas of native vegetation are located immediately adjacent to the south and north west of the subject land. However, these areas of native vegetation are isolated, and surrounded by industrial and commercial development (including the subject land), the M4 Motorway and cleared and disturbed lands.

Approximately 700 metres to the west of the subject land is Ropes Creek, which provides a vegetated corridor running in a north-south orientation. This corridor is also identified as a biodiversity corridor of regional significance within the Biodiversity Investment Opportunities Map (BIO Map) for the Cumberland subregion (DPIE, 2015a) (Figure 4-2).

To the east, the study area is cut off from the Western Sydney Parklands by the M7 Motorway and a large section of commercial and industrial development and the M4 Motorway is located immediately to the north of the subject land. The Western Sydney Parklands is also identified as a biodiversity corridor of regional significance (DPIE, 2015a).

4.6 Areas of geological significance and soil hazard features

The subject land does not contain any areas of geological significance, including crevices, cliffs, karst, or caves. There are no areas of geological significance near the subject land.

The subject land is not mapped as containing acid sulfate soils or potential acid sulfate soils.

The subject land is located on two soil landscape types ‘Blacktown’ and ‘Disturbed Terrain’ (DPIE, 2021c). The Blacktown soil landscape covers the south-western portion of the subject land, while the remainder is on land mapped as Disturbed Terrain.

Table 4-2 below summarises landscape, soil, and hazard features of each soil landscape type within the subject land.

Table 4-2: Summary of soil landscape types within the subject land and their associated descriptions

Soil landscape type	Landscape	Soils	Hazards
Blacktown	Gently undulating rises on Wianamatta Group shales. Local relief to 30 metres, slopes usually >5%. Broad rounded crests and ridges with gently inclined slopes. Cleared Eucalypt woodland and tall open-forest (dry sclerophyll forest).	Shallow to moderately deep (>100 cm) hardsetting mottled texture contrast soils, red and brown podzolic soils on crests grading to yellow podzolic soils on lower slopes and in drainage lines.	Moderately reactive high plastic subsoil, low soil fertility, poor soil drainage and seasonal waterlogging.
Disturbed Terrain	Varies from level plains to undulating terrain and has been disturbed by human	N/A	Dependent on nature of fill material which may include mass movement hazard

Soil landscape type	Landscape	Soils	Hazards
	activity to a depth of at least 100 cm. The original soil has been removed, greatly disturbed, or buried. Most of these areas have been levelled to slopes of <5%. Landfill includes a wide variety of soil, rock, building and waste material. The original vegetation has been completely cleared.		(subsidence), soil impermeability leading to poor drainage, low fertility and toxic material. Care must be taken when the subject land is developed. The management of this soil type is outside the scope of this report.

4.7 Areas of Outstanding Biodiversity Value (AOBVs)

Areas of Outstanding Biodiversity Value (AOBVs) are defined under the BC Act. No AOBVs occur within or surrounding the subject land.

4.8 NSW Landscape regions (Mitchell Landscapes)

The majority of the subject land is situated within the Cumberland Plains NSW Landscape (DPIE, 2016) (Figure 4-1). The Cumberland Plains NSW Landscape is an over cleared landscape with 89 per cent of the landscape currently cleared. It consists of low rolling hills and valleys in a rain shadow area between the Blue Mountains and the coast on horizontal Triassic shales and lithic sandstones forming a down-warped block on the coastal side of the Lapstone monocline with a general elevation 30 to 120 metres, and a local relief of 50 metres (DPIE, 2016).

An area in the east of the subject land is situated within the Sydney Basin Diatremes NSW Landscape. This landscape is associated with circular volcanic vents filled with layered, brecciated country rock cemented by a fine-grained basaltic matrix. It is estimated to be 32 per cent cleared (DPIE, 2016).

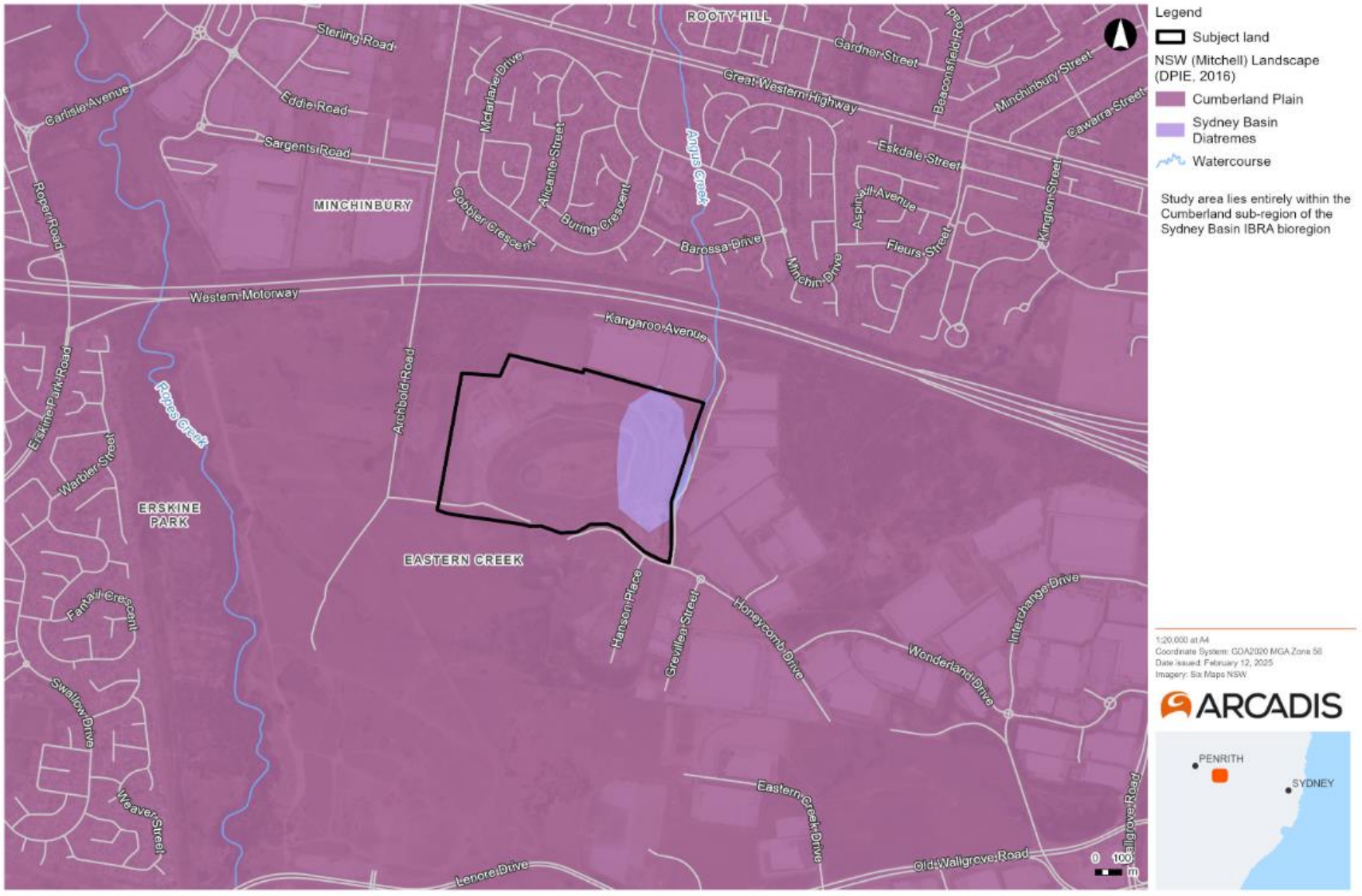

Figure 4-1: *Locality with Mitchell Landscapes*

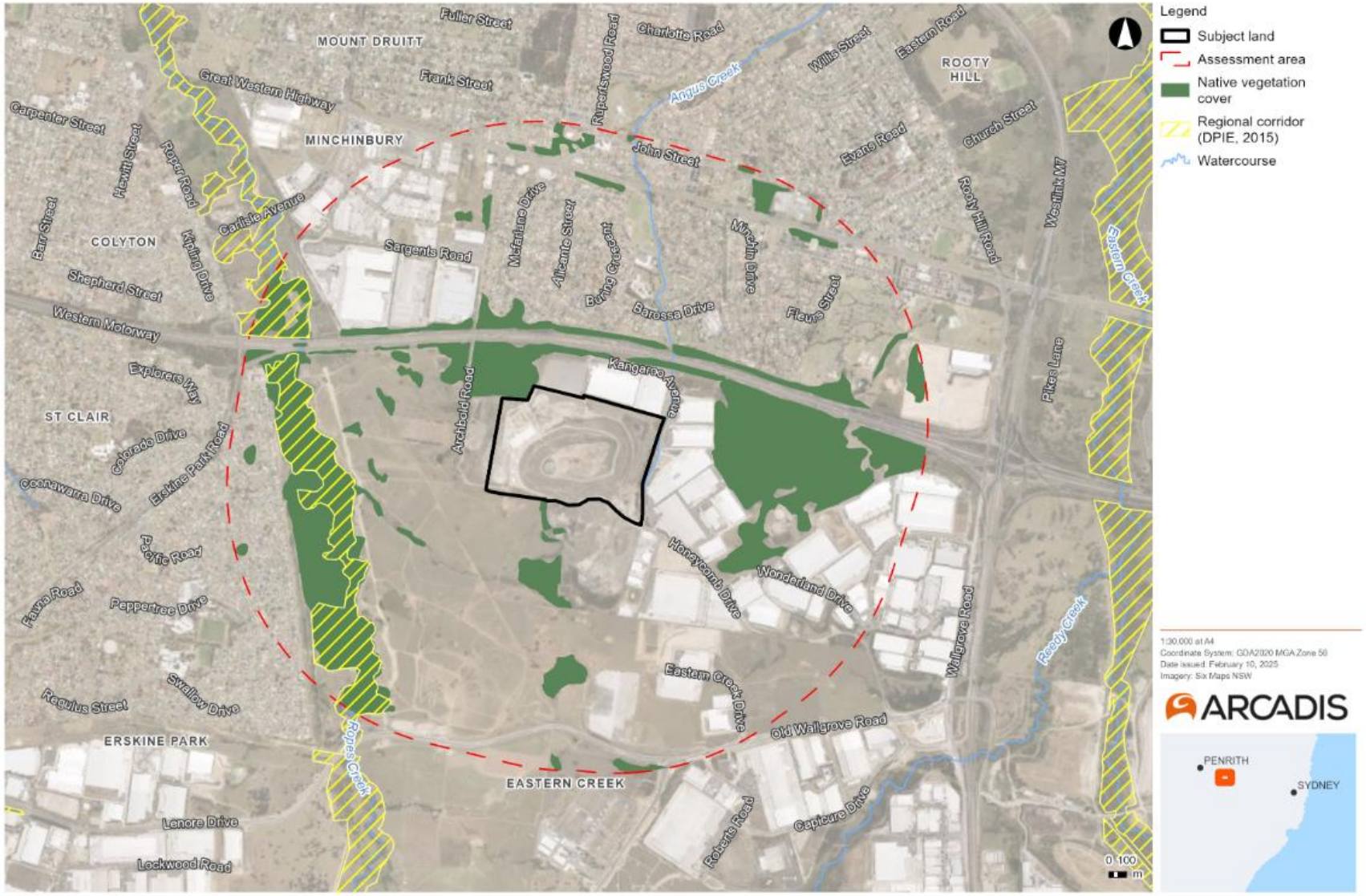

Figure 4-2: *Location map*

5 NATIVE VEGETATION

5.1 Native vegetation extent

Areas of native vegetation within the subject land are shown on Figure 5-1. Other vegetated areas within the subject land consist of non-native grassland and shrubs on highly disturbed soil as described in Section 5.6. Remaining areas on the subject land are cleared and comprise infrastructure related to the waste facility. These areas are shown on Figure 5-1 and their extent listed in Table 5-1.

Table 5-1: Vegetation extent within the subject land

Vegetation extent	Area (ha)
Native vegetation	0.42
Non-native vegetation	22.18
Cleared areas	54.54

Figure 5-1: *Native vegetation extent*

5.2 Regional vegetation mapping

Original regional vegetation mapping (*Remnant Vegetation of the western Cumberland subregion, 2013 Update* (OEH, 2013)*)* used in prior iterations of this BDAR identified one Plant Community Type (PCT) as occurring within the subject land:

- PCT 849 - Grey Box - Forest Red Gum grassy woodland on flats of the Cumberland Plain, Sydney Basin Bioregion

However, as the eastern PCTs have been updated (see Section 2.7.2), all references of PCT 849 have been updated to reflect the new PCT number. As per the BioNet Vegetation Classification database, PCT 849 directly relates to PCT 3320 – Cumberland Shale Plains Woodland.

5.3 Plant Community Type within the subject land

Following the field surveys, one PCT was identified:

- PCT 3320 – Cumberland Shale Plains Woodland

The location of this PCT as identified from the ground truthed vegetation mapping is shown in Figure 5-2. A summary of its attributes and extent in the subject land are provided in Table 5-2 and a more detailed description on condition within the section below.

Table 5-2: Attribute information for PCT 3320 in the subject land

Attribute	PCT 3320 in the subject land
Vegetation formation	Grassy Woodlands
Vegetation class	Coastal Valley Grassy Woodlands
PCT Name	Cumberland Shale Plains Woodland
PCT	3320
Conservation status	BC Act: Critically Endangered – forms Cumberland Plain Woodland in the Sydney Basin Bioregion EPBC Act: Critically Endangered – patches that meet size and condition thresholds form Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest.
Estimate of percent cleared	93 per cent
Condition	Planted to moderate/good
Extent in the subject land (ha)	0.40
Quadrats completed in vegetation zones	Two (EC01, EC02)
Vegetation zones	3320_moderate/good 3320_planted
Species relied upon for PCT identification	*Eucalyptus moluccana, Eucalyptus tereticornis, Corymbia maculata, Brunoniella australis, Themeda triandra, Microlaena stipoides*
Description	A tall sclerophyll open forest or woodland with a sparse mid-stratum of soft-leaved shrubs and small trees with a grassy ground cover on the undulating Wianamatta Group shale plains of western Sydney. The canopy very frequently includes *Eucalyptus tereticornis* and *Eucalyptus moluccana*, with ironbarks (*Eucalyptus crebra* and *Eucalyptus fibrosa*) occasionally present and sometimes prominent in localised areas. The sparse shrub to small tree layer very frequently includes *Bursaria spinosa* and one or more species of *Acacia*, of which *Acacia parramattensis*, *Acacia decurrens* and *Acacia*

Attribute	PCT 3320 in the subject land
	falcata are the most frequent and abundant. Presence of these *Acacia* species helps to distinguish this PCT from the related PCT 3319 on rises of the southern Cumberland Plain which typically includes *Acacia implexa*. The mid-dense ground layer typically includes grasses, forbs, twiners and hardy small ferns. *Microlaena stipoides* is almost always present and *Themeda triandra*, *Dichondra repens*, *Brunoniella australis*, *Cheilanthes sieberi* subsp. *sieberi*, *Desmodium varians*, *Aristida vagans* and *Glycine tabacina* are very frequent. This is the most widespread PCT on the Cumberland Plain, occupying much of the plain between Bankstown and the Hawkesbury and Nepean rivers. It typically occurs in a warm, moist climate below 120 metres asl however can occur up to 200 metres asl on the undulating terrain between Douglas Park and Campbelltown to the east of the Nepean River. A northern outlier occurs near Maroota on a small remnant on a narrow shale ridge. While widespread on the main part of the plain, this PCT primarily occurs in small, often disturbed patches within a rural or urban matrix. In the hilly country to the west of the Nepean River, this PCT is replaced by PCT 3319. On thinner shales above sandstone around the periphery of the Cumberland Plain, it grades into PCT 3321. Ironbarks are very frequent and *Eucalyptus punctata* is common in the canopy of PCT 3321, and *Eucalyptus moluccana* and *Eucalyptus tereticornis* are both rare.

Vegetation zone 1

Vegetation Zone 1 – PCT 3320_moderate/good is present in a small patch along the southern boundary of the subject land. This patch is largely situated outside the subject land except for the overhanging canopy of mature *Eucalyptus* species. To assess this vegetation, a vegetation plot was conducted within the patch but outside the subject land, with 0.02 hectares of this patch being situated in the subject land.

Vegetation Zone 1 – PCT 3320_moderate/good is characterised by a canopy of *Eucalyptus moluccana* and *Eucalyptus tereticornis.* The shrub layer is absent, while the ground layer is dominated by the native grass *Microlaena stipoides* (Weeping Grass) (Photograph 2). Other commonly occurring native species present within the ground layer include *Themeda triandra* (Kangaroo Grass)*, Brunoniella australis* (Blue Pincushion), *Commelina cyanea, Cynodon dactylon* (Couch) and *Dichanthium sericeum* (Queensland Bluegrass). Exotic species are also present within the ground layer with a total cover of approximately 18 per cent, and include *Setaria parviflora, Pennisetum clandestinum* (Kikuyu)*, Paspalum dilatatum* (Paspalum) and *Sida rhombifolia* (Paddy's Lucerne).

The canopy of Vegetation Zone 1 – PCT 3320_moderate/good is consistent with PCT 3320 as described in the Vegetation Classification Database. Furthermore, many of the ground layer species recorded are also associated with PCT 3320, including *Microlaena stipoides* which is dominant in the ground layer with a cover of 65 per cent. The 0.02 hectares of this patch which is situated within the subject land is of low biodiversity value as the native vegetation present is largely limited to the overhanging *Eucalyptus* canopy, and the groundcover is dominated by exotic species.

Vegetation zone 2

Vegetation Zone 2 - PCT 3320_planted forms a narrow strip of vegetation near the eastern boundary of the subject land (Figure 5-4). This vegetation is situated on a batter and is likely planted, dominated by *Corymbia maculata* (Spotted Gum) with a sparse occurrence of other commonly planted trees in the Sydney region, including *Lophostemon confertus* (Brush Box) and *Eucalyptus cinerea* (Argyle Apple) (Photograph 3). *Eucalyptus tereticornis,* a species associated with Cumberland Plain Woodland, was also recorded within this vegetation zone.

A shrub layer is largely absent in this vegetation zone, while the ground layer is dominated by exotic species. Native groundcover is very low (approximately one per cent) within Vegetation Zone 2 – PCT 3320_planted, and comprises *Dichondra repens* (Kidney Weed), *Brunoniella australis* (Blue Trumpet), *Cynodon dactylon* (Couch), *Microlaena stipoides* and *Oxalis perennans.* Exotic species particularly

abundant within this vegetation zone include *Hydrocotyle bonariensis, Pennisetum clandestinum* (Kikuyu), *Eragrostis curvula* (African Lovegrass) and *Chloris gayana* (Rhodes Grass).

While this vegetation zone has a low cover of native species, particularly in the ground layer, and a largely planted canopy, it has been identified as PCT 3320 on a precautionary basis. This is because while the canopy is planted, the dominant *Eucalyptus* species present are associated with PCT 3320 (*Corymbia maculata* and *Eucalyptus tereticornis).* All the native species recorded within the ground layer are also associated with PCT 3320. Therefore, while in low condition and heavily modified, this vegetation zone can be assigned to PCT 3320.

Photograph 2 PCT 3320_moderate/good at plot EC01 just outside the subject land

Photograph 3 PCT 3320_planted with a canopy dominated by planted Corymbia maculata

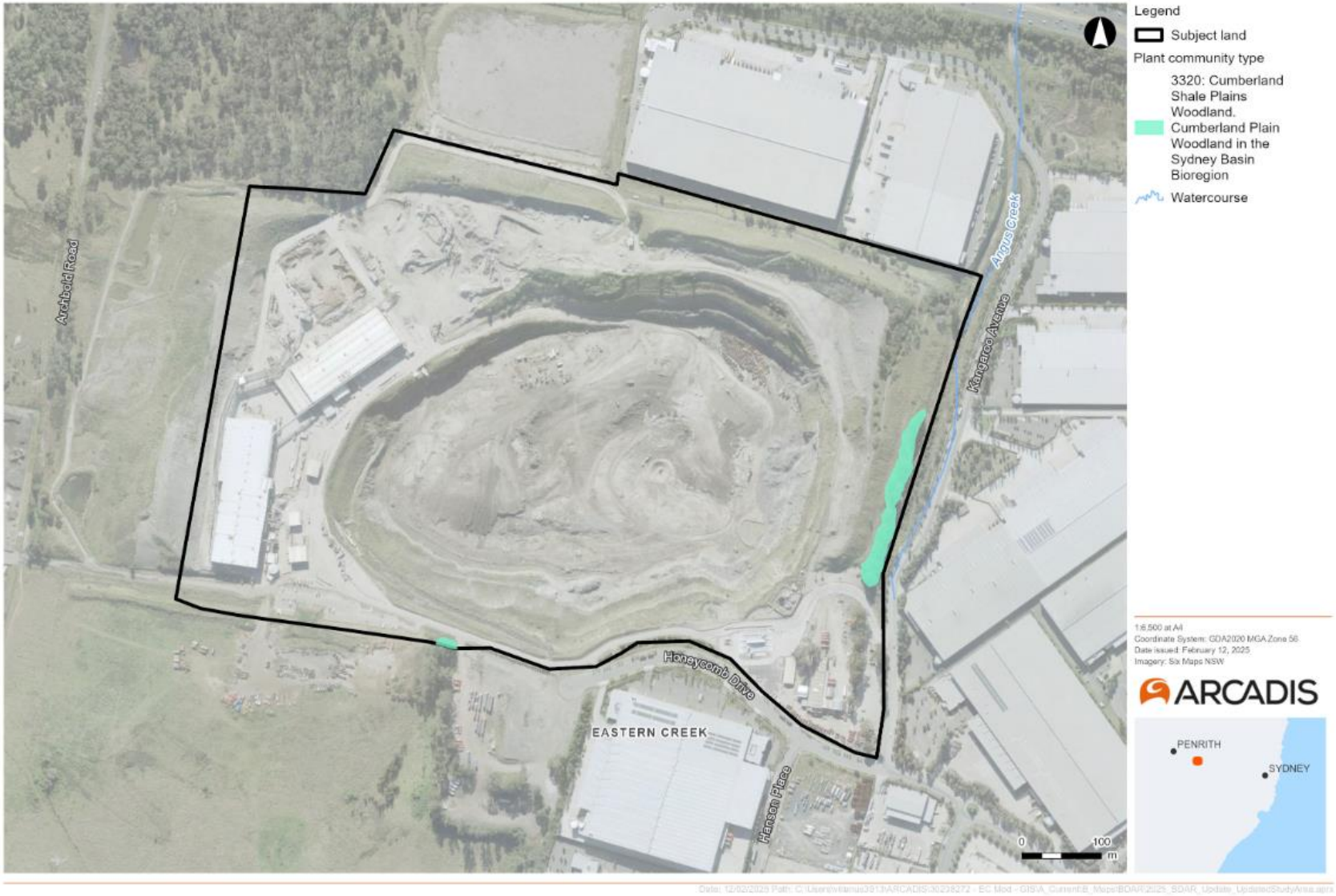

Figure 5-2: Plant Community Types

5.4 Vegetation Integrity assessment

The Vegetation Integrity (VI) score is a measure of the condition of native vegetation and is assessed for each vegetation zone by calculating the scores for the composition, structure, and function attributes from BAM plots in each vegetation zone. Details of how the VI scores are calculated are outlined in Section 2.7.5. The VI scores for each vegetation zone is shown in Table 5-3.

All native vegetation has an integrity score above 15 and therefore requires offsets to be calculated where impacts occur, in accordance with Section 9.2.1 of the BAM.

Table 5-3: *Vegetation integrity scores for vegetation zones within the subject land*

Attribute	Vegetation zone 1 - PCT 3320_moderate/good	Vegetation zone 2 - PCT 3320_planted
PCT ID/ name	Cumberland Shale Plains Woodland (PCT 3320)	Cumberland Shale Plains Woodland (PCT 849)
Broad condition class	Moderate/good	Planted
Patch size	6	1
Composition condition score	33	18.2
Structure condition score	82.5	37.2
Function condition score	73.3	55.5
Presence of hollow bearing trees	No	No
VI score	**58.4 (note that this is no longer impacted)**	**33.5**

5.5 Threatened Ecological Community assessment

PCT 3320 – Cumberland Shale Plains Woodland was recorded within the subject land. The BioNet Vegetation Classification database (DPIE, 2021b) provides a description of each approved PCT within NSW, including its equivalence with NSW and Commonwealth listed threatened ecological communities (TECs). Notwithstanding, these equivalences must be treated with caution as they are applied at a high level and do not necessarily capture the nuance of every TEC permutation. Instead, the Final Determination (BC Act) and Commonwealth Conservation Advice/Listing Advice (EPBC Act) must be relied upon when determining whether an observed PCT is consistent with the legal definition of that TEC.

PCT 3320 is associated with the TEC Cumberland Plain Woodland in the Sydney Basin Bioregion, listed as Critically Endangered under the BC Act, and Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest, listed as Critically Endangered under the EPBC Act.

Table 5-5 provides a comparison of the location, structure and floristics of PCT 3320 in the subject land with the Final Determination for Cumberland Plain Woodland in the Sydney Basin Bioregion as listed under the BC Act.

Although in a degraded form and altered structure, the vegetation of PCT 3320 within the subject land is consistent with the floristic composition, distribution, landscape position and soil associations detailed in the Final Determination for Cumberland Plain Woodland in the Sydney Basin Bioregion (DPIE, 2010) (Figure 5-3).

The NSW Scientific Committee does not exclude patches of vegetation as Cumberland Plain Woodland on the basis of condition or structure thresholds. Therefore, all the vegetation within the subject land identified as PCT 3320 is considered Cumberland Plain Woodland in the Sydney Basin Bioregion under the BC Act.

This community also forms part of the Critically Endangered Cumberland Plain Shale Woodland and Shale-Gravel Transition Forest under the EPBC Act. This is discussed in Section 7.1.

Table 5-5: Comparison of areas mapped as PCT 3320 in the subject land with final determination for Cumberland Plain Woodland in the Sydney Basin bioregion

Extract from Final Determination (DPIE, 2010)	**Comparison with areas of PCT 3320 in the subject land**
Paragraph 2: Located in the Sydney Basin bioregion on the Cumberland Plain, a rainshadow area to the west of Sydney's Central Business District.	The subject land is on the Cumberland Plain in the Sydney Basin bioregion.
Paragraph 2: associated with clay soils derived from Wianamatta Group geology, or more rarely alluvial substrates. Typically occurs on flat to undulating or hilly terrain up to about 350 m elevation but may also occur on locally steep subject lands and at slightly higher elevations.	Areas of PCT 3320 in the subject land are situated on the Blacktown soil landscape which is associated with the gently undulating rises on Wianamatta Group shales. The elevation of PCT 3320 in the subject land is between 74 and 80 metres.
Paragraph 3: Cumberland Plain Woodland is characterised by the following assemblage of species: 112 species listed.	Of the 112 species listed in the Final Determination, 15 were recorded within PCT 3320 within the subject land.
Paragraph 5: characterised by an upper-storey that is usually dominated by *Eucalyptus moluccana* (Grey Box) and *E. tereticornis* (Forest Red Gum), often with *E. crebra* (Grey Ironbark), *E. eugenioides* (Narrow-leaved Stringybark), *Corymbia maculata* (Spotted Gum) or other less frequently occurring eucalypts, including *Angophora floribunda*, *A. subvelutina* (Broad-leaved Apple), *E. amplifolia* (Cabbage Gum) and *E. fibrosa* (Broad-leaved Ironbark).	Areas mapped as PCT 3320 within the subject land are characterised by a canopy of *Eucalyptus moluccana* and *Eucalyptus tereticornis,* or *Corymbia maculata* with sparse *Eucalyptus tereticornis* cover.

Extract from Final Determination (DPIE, 2010)	**Comparison with areas of PCT 3320 in the subject land**
Paragraph 6: The structure of the community varies depending on past and current disturbances, particularly clearing, fire and grazing. Contemporary tree-dominated stands of the community are largely relics or regrowth of originally taller forests and woodlands, which are likely to have had scattered shrubs and a largely continuous grassy groundcover. After total or partial clearing, the tree canopy may remain sparse or may regrow to form dense stands of saplings and small trees, which are typically associated with a ground layer of reduced cover and diversity. Either or both of the upper-storey and mid-storey may be absent from the community. Native grasslands derived from clearing of the woodland and forest are also part of this community if they contain characteristic non-woody species listed in paragraph 3.	Areas of PCT 3320 within the subject land are subject to historical and ongoing disturbances, resulting in an altered structure of the community. All areas of PCT 3320 within the subject land have an absent mid-storey. The area of 3320_planted has a ground layer which is dominated by exotic species and a planted canopy, although the native species present are associated with Cumberland Plain Woodland.

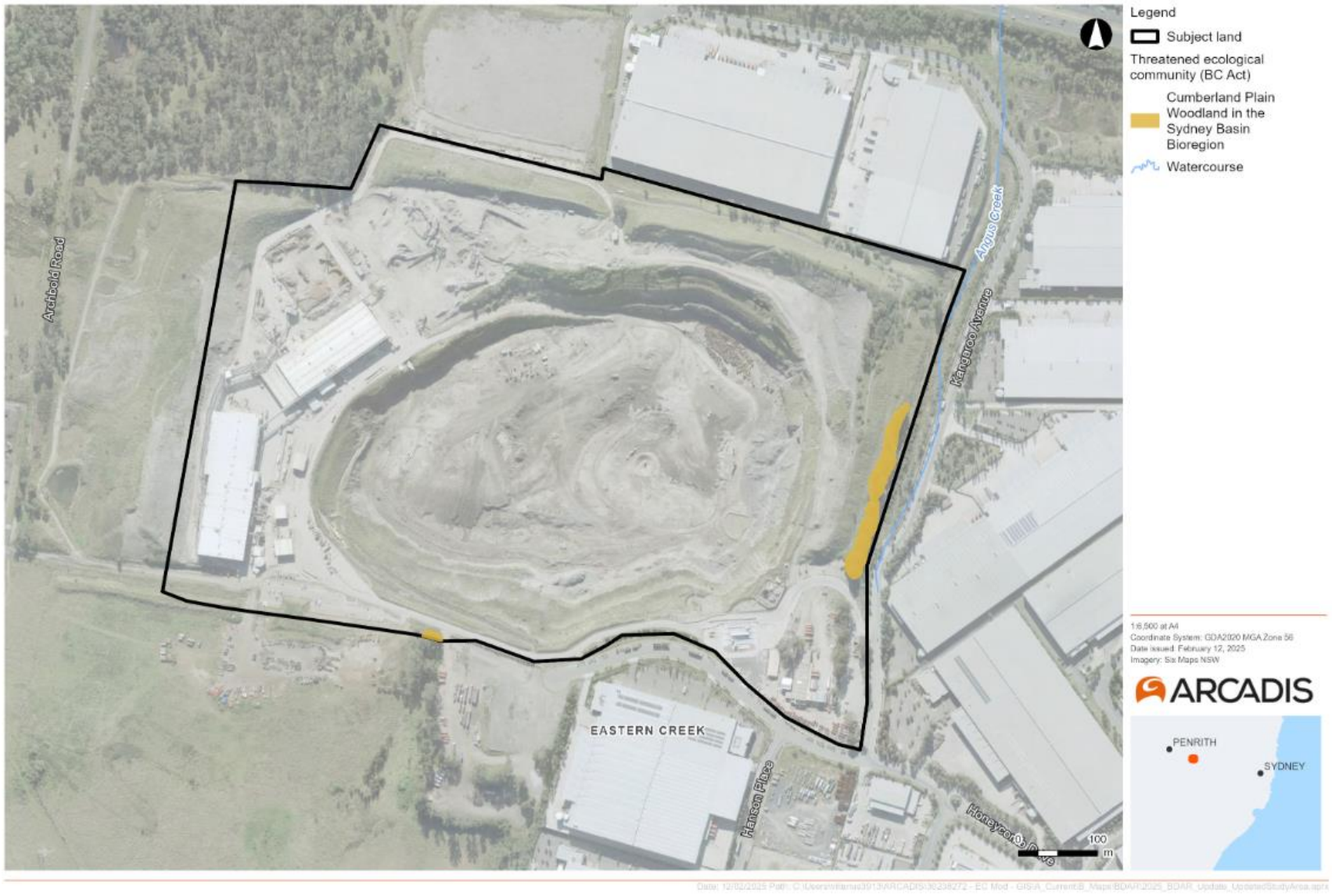

Figure 5-3: *Threatened Ecological Communities in the subject land*

5.6 Non-native vegetation

Non-native vegetation within the subject land forms two vegetation zones, exotic grassland and exotic/planted shrubs and trees (Figure 5-4). These vegetation zones predominantly consist of exotic vegetation and do not conform to the definition of any PCTs as listed in the BioNet Vegetation Classification Database.

5.6.1 Exotic grassland

Exotic grassland covers 20.64 hectares of the subject land and is situated within disturbed areas which have been historically cleared or positioned on areas of fill (Figure 5-4). These areas are dominated by the exotic grass *Cenchrus setaceus* (Fountain Grass) (Photograph 4). Other exotic grasses frequently present include *Cortaderia selloana* (Pampas Grass), *Alternanthera pungens* (Khaki Weed) and *Melinus repens* (Red Natal Grass). Exotic forbs and shrubs present include *Ricinus communis* (Castor Oil Plant), *Verbena bonariensis* (Purpletop) and *Foeniculum vulgare* (Fennel).

All areas of this vegetation zone are heavily disturbed and are largely situated on the slopes of the berm associated with the landfill. Here the soils comprise fill material which have become conducive to the establishment of exotic species.

This vegetation zone is therefore not consistent with any PCTs as defined in the BioNet Vegetation Classification Database and does not conform with the definition of any TECs listed under the BC Act or EPBC Act.

Photograph 4 Exotic grassland along the slopes of the berm

5.6.2 Exotic/planted shrubs and trees

This vegetation zone is situated in the north eastern corner of the subject land and covers a total of 1.54 hectares. The vegetation here is largely situated on the top of the berm associated with the landfill in areas of highly disturbed soils from the use of fill. The exotic/planted shrubs and trees vegetation zone comprise a sparse canopy of *Corymbia maculata* with an exotic shrub layer of *Olea europaea* subsp*. cuspidata* (African Olive), and *Acacia saligna* (Golden Wreath Wattle). The ground layer was dominated by exotic grasses mainly *Cenchrus setaceus* (Photograph 5).

While there are sparse occurrences of the native tree *Corymbia maculata* within this vegetation zone, there are no additional native species in the shrub or ground layer. This vegetation zone is therefore not consistent with any PCTs as defined in the BioNet Vegetation Classification Database and does not conform with the definition of any TECs listed under the BC Act or EPBC Act.

Photograph 5 Exotic/planted shrubs and trees at the top of the berm

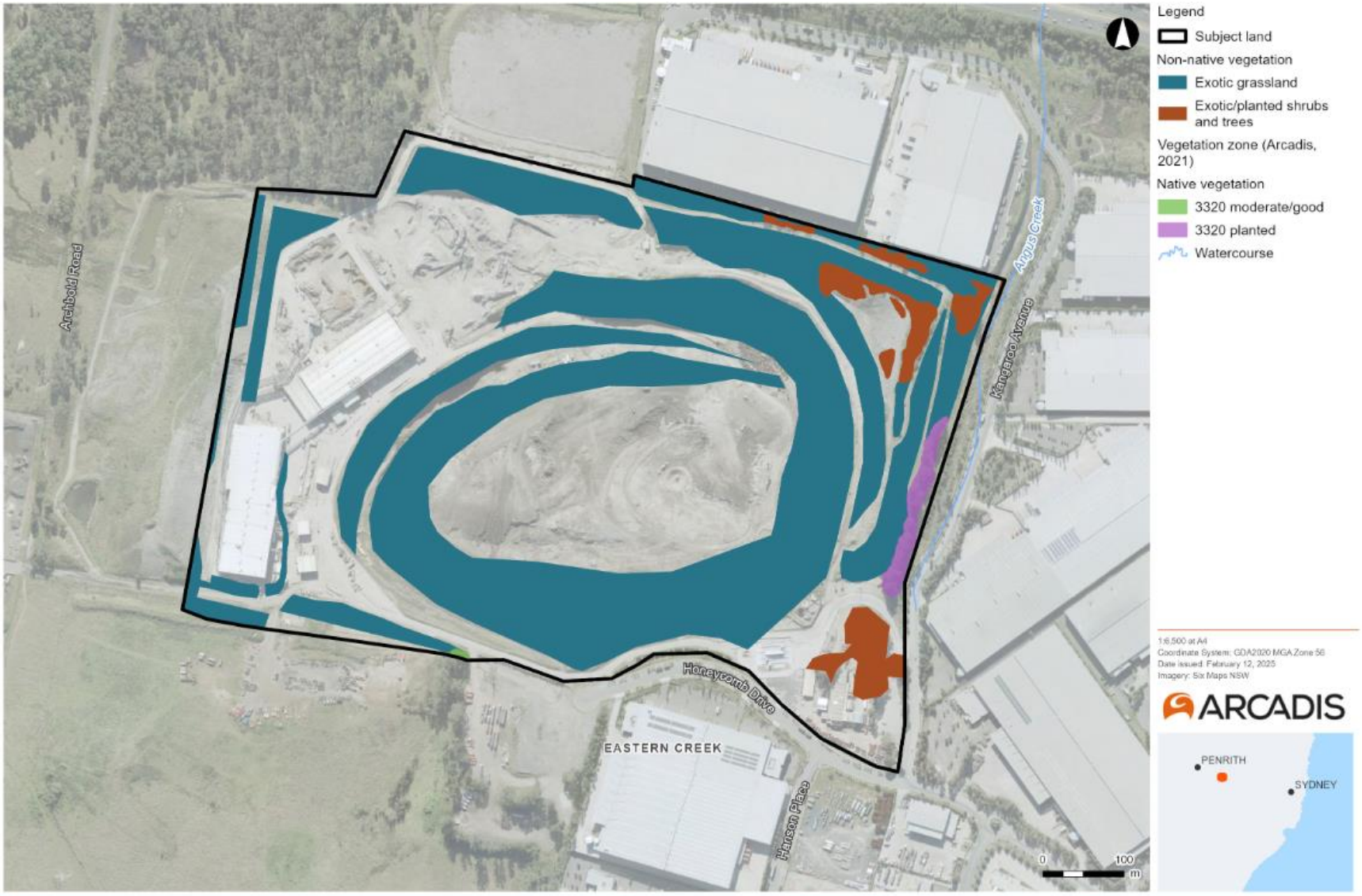

Figure 5-4: Vegetation Zones in the subject land

5.7 Weeds

Of the 22 exotic species recorded in the subject land, five are listed as Priority Weeds (DPIE, 2021f) under the NSW *Biosecurity Act 2015* for the Blacktown region, which includes the Blacktown LGA. Of these species, three are also listed as Weeds of National Significance (WoNS) (DPIE, 2021f). Exotic species recorded in the subject land are detailed in Table.

In addition, 15 species recorded within the subject land are recognised as High Threat Weeds (Table). High Threat Weeds are exotic species which are likely to have a significantly detrimental effect on native vegetation and are used when determining vegetation condition.

Exotic species were in all vegetation zones across the subject land, with particularly high abundance in non-PCT vegetation zones.

Table5-6: Exotic plant species recorded in the subject land (Arcadis and Ecoplanning data combined)

Scientific name	Common name	Listed as a WoNS?	Listed as an HTW?	Priority Weed category
Acacia saligna	Golden Wreath Wattle	No	No	N/A
Ageratina adenophora	Crofton Weed	No	Yes	N/A
Alternanthera pungens	Khaki Weed	No	Yes	N/A
Araujia sericiflora	Moth Vine	No	No	N/A
Asparagus asparagoides	Bridal Creeper	Yes	Yes	**Prohibition on certain dealings** Must not be imported into the state, sold, bartered, exchanged or offered for sale.
Bidens pilosa	Cobbler's Pegs	No	Yes	N/A
Briza subarista	Chilean Quaking Grass	No	Yes	N/A
Cenchrus setaceus	Fountain Grass	No	Yes	N/A
Chloris gayana	Rhodes Grass	No	Yes	N/A
Cirsium vulgare	Spear Thistle	No	No	N/A
Conyza bonariensis	Flaxleaf Fleabane	No	No	N/A
Cortaderia selloana	Pampas Grass	No	Yes	**Regional Recommended Measure** Land managers must mitigate the risk of the plant being introduced to their land. Land managers prevent spread from their land where feasible. Land managers reduce the impact on priority assets. The plant or parts of the plant are not traded, carried, grown or released into the environment.
Eragrostis curvula	African Lovegrass	No	Yes	N/A
Foeniculum vulgare	Fennel	No	No	N/A
Gomphocarpus fruticosus	Narrow-leaved Cotton Bush	No	No	N/A

Scientific name	Common name	Listed as a WoNS?	Listed as an HTW?	Priority Weed category
Hydrocotyle bonariensis		No	No	N/A
Hypericum perforatum	St John's Wort	No	Yes	N/A
Hypochoeris radicata	Catsear	No	No	N/A
Ligustrum lucidum	Large-leaved Privet	No	Yes	N/A
Lycium ferocissimum	African Boxthorn	Yes	Yes	**Prohibition on certain dealings** Must not be imported into the state, sold, bartered, exchanged or offered for sale
Melinus repens	Red Natal Grass	No	No	N/A
Olea europaea subsp. cuspidata	African Olive	No	Yes	**Regional Recommended Measure** An exclusion zone is established for all lands in Blue Mountains City Council local government area and in Penrith local government area west of the Nepean River. The remainder of the region is classified as the core infestation area. Whole region: The plant or parts of the plant are not traded, carried, grown or released into the environment. Exclusion zone: The plant is eradicated from the land and the land kept free of the plant. Core infestation area: Land managers prevent spread from their land where feasible. Land managers reduce impacts from the plant on priority assets.
Paspalum dilatatum	Paspalum	No	Yes	N/A
Pennisetum clandestinum	Kikuyu Grass	No	No	N/A
Pennisetum setaceum	Fountain Grass	No	No	N/A
Phoenix canariensis	Canary Island Date Palm	No	Yes	N/A
Plantago lanceolata	Lamb's Tongues	No	No	N/A
Ricinus communis	Castor Oil Plant	No	Yes	N/A
Senecio madagascariensis	Fireweed	Yes	Yes	**Prohibition on certain dealings** Must not be imported into the state, sold, bartered, exchanged or offered for sale.
Setaria parviflora		No	No	N/A
Setaria pumila	Pale Pigeon Grass	No	No	N/A
Sida rhombifolia	Paddy's Lucerne	No	No	N/A

Scientific name	Common name	Listed as a WoNS?	Listed as an HTW?	Priority Weed category
Solanum sisymbriifolium		No	No	N/A
Verbena bonariensis	Purpletop	No	No	N/A
Verbena rigida	Veined Verbena	No	No	N/A

5.8 Groundwater Dependent Ecosystems

Groundwater dependent ecosystems (GDEs) are ecological communities that are dependent, either entirely or in part, on the presence of groundwater for their health or survival.

As part of this assessment, The Bureau of Meteorology's GDE Atlas was reviewed to determine the occurrence of potential groundwater dependent ecosystems within and surrounding the subject land. The results of the review show that there are no potential terrestrial or subterranean GDEs within the subject land. There is one high potential terrestrial GDE directly northwest of the subject land and three more terrestrial GDEs in close proximity to the subject land. The GDEs in close proximity to the subject land are shown below in Figure 5-5.

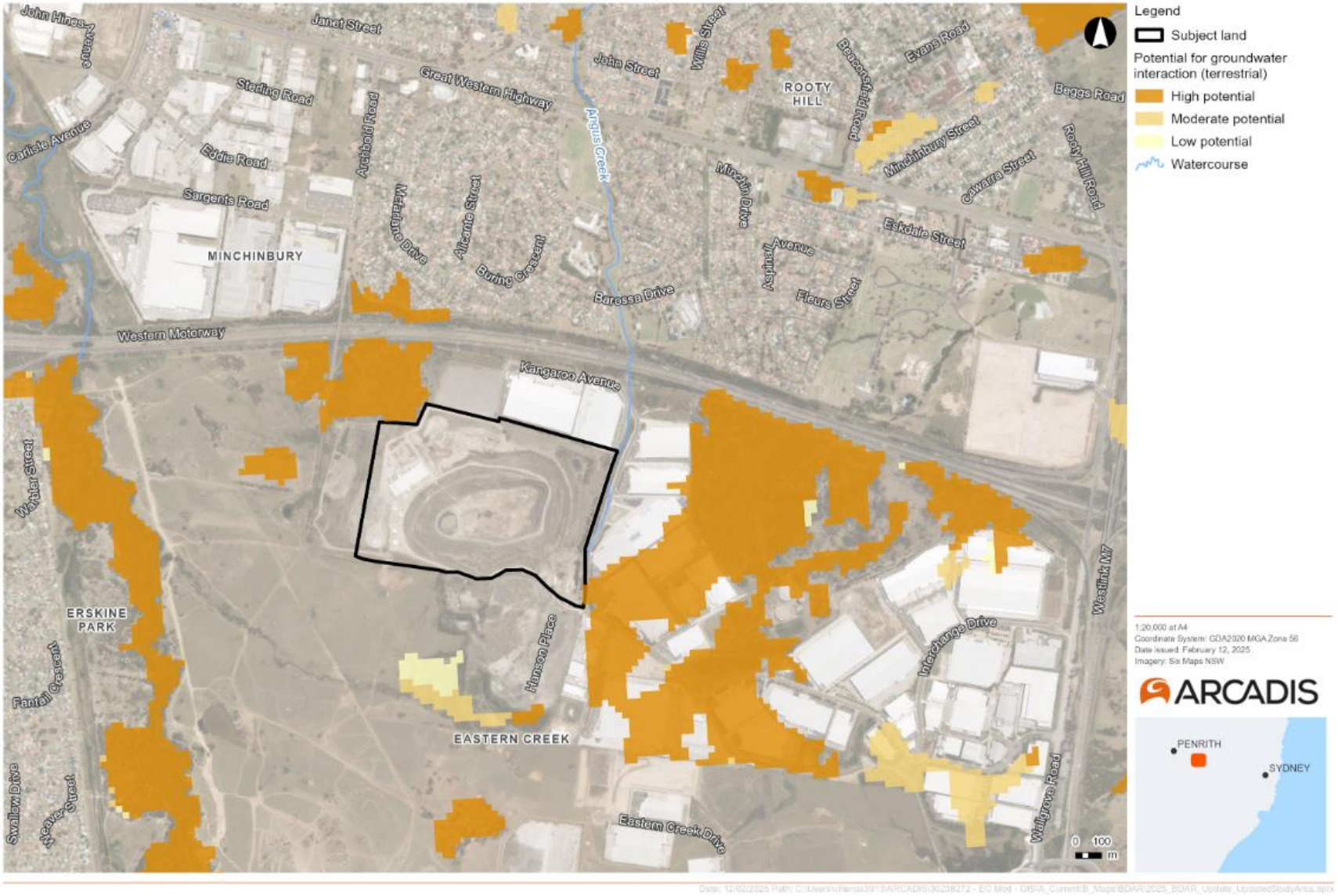

Figure 5-5: Potential groundwater dependent ecosystems (GDEs) in the vicinity of the subject land

6 THREATENED SPECIES

The candidate threatened species for assessment in this ASR BDAR 2025 were identified using the BAM-C (DPE, 2021e). A review of database searches (BioNet, PMST) was also undertaken in July 2021, and the BAM-C in October 2024, to identify threatened species and habitat with potential to occur in the subject land. These database searches informed the field surveys.

Threatened fauna species

A search of the Commonwealth Protected Matters Search Tool (PMST) undertaken in July 2021 identified 18 threatened fauna species and 15 migratory fauna species listed under the EPBC Act known or with the potential to occur within a 10-kilometre radius of the subject land (Appendix D). Another desktop search was undertaken in April 2022, and an additional nine fauna species were added to the 2021 data.

A search of BioNet and PMST identified 59 species listed under the BC Act within a 10-kilometre radius of the subject land (Appendix D).

The BAM-C identified a total of 41 threatened fauna species with potential to occur within the subject land. Assessment of candidate threatened fauna species is outlined in Section 6.1.2 below.

Threatened flora species

Database searches (BioNet, PMST) undertaken in July 2021 identified records (or potential occurrence) for 31 threatened flora species listed under the BC Act and/or EPBC Act within a 10-kilometre radius of the subject land (Appendix E). Another desktop search was undertaken in April 2022, and an additional two flora species were added to the 2021 data.

The BAM-C identified a total of 17 candidate threatened flora species credit species. Assessment of candidate threatened flora species is outlined in Section 6.1.2 below.

6.1 BAM-C results and habitat suitability assessment

This section outlines the species returned by the BAM-C including ecosystem credit species, species credit species, and dual credit species. An assessment of these species in accordance with Section 5.2 of the BAM has been undertaken where appropriate, to identify species for targeted surveys.

6.1.1 Ecosystem credit species

Ecosystem credit species represent fauna species that can be readily predicted to occur by the type and condition of vegetation present at the subject land (i.e. within a PCT based on the attributes of a given vegetation zone). The ecosystem credit species that are predicted to occur within the subject land, their associated habitat constraints, geographic limitations, and sensitivity to potential gain class are outlined below in Table 6-1. Dual credit species are those for which there is specialist foraging or breeding habitat that form species credits.

Sensitivity to gain scores consider the ability of a species to respond to management actions implemented at a biodiversity stewardship site and for ecosystem credit species, help to determine ecosystem credits for vegetation zones. The predicted ecosystem species with the highest sensitivity to gain score and the sensitivity to lose score for the relevant vegetation zone determines the biodiversity risk weighting for the vegetation zone. Ecosystem credits required for this vegetation zone are then calculated using this biodiversity risk weighting. This is outlined in Appendix I of the BAM.

All but one ecosystem credit species identified in the BAM-C are considered to have the potential to occur within the subject land and have therefore been retained as predicted species within the BAM-C. South-eastern Glossy Black-Cockatoo *Calyptorhynchus lathami lathami* has been excluded as an ecosystem credit species due to the absence of Allocasuarina and Casuarina species within the Subject Land.

Table 6-1: Ecosystem credit species, including ecosystem component of dual credit species, predicted to occur within the Subject Land

Common name	*Scientific name*	Ecosystem or dual credit species	BC Act Status	EPBC Act Status	Sensitivity to potential gain
Threatened fauna species					
Black-chinned Honeyeater (eastern subspecies)	*Melithreptus gularis gularis*	Ecosystem	V	-	Moderate
Black-necked Stork	*Ephippiorhynchus asiaticus*	Ecosystem	V	-	Moderate
Black Falcon	*Falco subniger*	Ecosystem	V	-	Moderate
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	Ecosystem	V	-	High
Diamond Firetail	*Stagonopleura guttata*	Ecosystem	V	-	Moderate
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	Ecosystem	V	-	Moderate
Eastern Coastal Free-tailed Bat	*Micronomus norfolkensis*	Ecosystem	V	-	High
Eastern Osprey (foraging)	*Pandion cristatus*	Ecosystem	V	-	Moderate
Flame Robin	*Petroica phoenicea*	Ecosystem	V	-	Moderate
Gang-gang Cockatoo (foraging)	*Callocephalon fimbriatum*	Dual	V	V	Moderate (foraging) High (breeding)
Grey-headed Flying-fox (foraging)	*Pteropus poliocephalus*	Dual	V	V	High
Large Bent-winged Bat (foraging)	*Miniopterus orianae oceanensis*	Dual	V	-	High (foraging) Very High (breeding)
Little Bent-winged Bat (foraging)	*Miniopterus australis*	Dual	V	-	High (foraging) Very High (breeding)
Little Eagle	*Hieraaetus morphnoides*	Dual	V	-	Moderate

Common name	*Scientific name*	Ecosystem or dual credit species	BC Act Status	EPBC Act Status	Sensitivity to potential gain
Little Lorikeet	*Glossopsitta pusilla*	Ecosystem	V	-	High
Regent Honeyeater (foraging)	*Anthochaera phrygia*	Dual	CE	CE	High
Rosenberg's Goanna	*Varanus rosenbergi*	Ecosystem	V	-	High
Scarlet Robin	*Petroica boodang*	Ecosystem	V	-	Moderate
Speckled Warbler	*Chthonicola sagittata*	Ecosystem	V	-	High
Spotted Harrier	*Circus assimilis*	Ecosystem	V	-	Moderate
Spotted-tailed Quoll	*Dasyurus maculatus*	Ecosystem	V	E	High
Square-tailed Kite (foraging)	*Lophoictinia isura*	Dual	V	-	Moderate
Swift Parrot (foraging)	*Lathamus discolor*	Dual	E	CE	Moderate
Turquoise Parrot	*Neophema pulchella*	Ecosystem	V	-	High
Varied Sittella	*Daphoenositta chrysoptera*	Ecosystem	V	-	Moderate
White-bellied Sea- Eagle	*Haliaeetus leucogaster*	Dual	V	-	High
White-throated Needletail	*Horrendous caudacutus*	Ecosystem	V		High
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	Ecosystem	V	-	High

V = Vulnerable, E = Endangered, CE = Critically Endangered

6.1.2 Species credit species

Species credit species represent species that cannot be readily predicted to occur within the subject land based on the PCTs present (i.e., suitable habitat cannot be confidently predicted by vegetation surrogates or landscape features) and must therefore be surveyed for where potential habitat is considered to be present.

An assessment of the species credit species returned by the BAM-C has been undertaken to determine whether they have the potential to occur based on the presence of necessary habitat components or habitat constraints, in accordance with BAM Section 5.2.2.

Table 6-2 provides the full list of candidate species credit species returned by the BAM-C and additional species considered likely to occur in the subject land and outlines their associated habitat constraints and the presence or absence of these habitat constraints within the subject land. Table 6-2 also provides requirements to conduct threatened species surveys, and where relevant the justification for targeted surveys not being conducted, in accordance with BAM Section 5.2.

Table 6-2: Species credit species (including dual credit species) predicted to occur within the subject land from the BAM-C, database searches

Species	BC Act Status	EPBC Act Status	Species or dual credit species	Reason for inclusion	Habitat degraded	Geographic and/or habitat constraint (BAM-C)	Survey undertaken or justification for removal
Threatened flora species							
Acacia pubescens	V	V	Species	BAM-C	No	-	Species surveyed. Only marginal habitat present but species surveyed due to tolerance to disturbance.
Deyeuxia appressa	E	E	Species	BAM-C	No	-	Species surveyed. Only marginal habitat present but species surveyed due to tolerance to disturbance.
Dillwynia tenuifolia	V	-	Species	BAM-C	Yes	-	Species removed. No suitable habitat present within subject land
Eucalyptus benthamii	V	V	Species	BAM-C	Yes	-	Species removed. No suitable habitat present within subject land.
Eucalyptus glaucina	V	V	Species	BAM-C	No	-	Species surveyed. Only marginal habitat present but species surveyed due to tolerance to disturbance.
Grevillea juniperina subsp. juniperina	V	-	Species	BAM-C	No	-	Species surveyed. Only marginal habitat present but species surveyed due to tolerance to disturbance.
Hibbertia puberula	E	-	Species	BAM-C	Yes	-	Species removed. Potential habitat within the subject land is degraded such that the species is unlikely to use the subject land.
Marsdenia viridiflora subsp. viridiflora – endangered population	EP	-	Species	BAM-C	No	Blacktown, Camden, Campbelltown, Canterbury-Bankstown, Cumberland, Fairfield, Liverpool and Penrith LGAs (as amended from the Determination))	Species surveyed. Only marginal habitat present but species surveyed due to tolerance to disturbance.

Species	BC Act Status	EPBC Act Status	Species or dual credit species	Reason for inclusion	Habitat degraded	Geographic and/or habitat constraint (BAM-C)	Survey undertaken or justification for removal
Micromyrtus minutiflora	E	V	Species	BAM-C	No	-	Species surveyed due to risk of SAII.
Persoonia nutans	E	E	Species	BAM-C	No	-	Species surveyed. Only marginal habitat present but species surveyed due to tolerance to disturbance.
Pimelea curviflora var. curviflora	V	V	Species	BAM-C	Yes	-	Species removed. No suitable habitat present within subject land.
Pimelea spicata	E	E	Species	BAM-C	Yes	-	Species removed. Potential habitat within the subject land is degraded such that the species is unlikely to use the subject land.
Pomaderris brunnea	E	V	Species	BAM-C	Yes	-	Species removed. No suitable habitat present within subject land.
Pomaderris prunifolia - endangered population *P. prunifolia in the Parramatta, Auburn, Strathfield and Bankstown Local Government Areas*	EP	-	Species	BAM-C	No	Parramatta, Auburn, Strathfield and Bankstown LGAs	Species removed. The subject land is located in the Blacktown LGA which is not listed as one of the LGAs known for this species to occur.
Pterostylis saxicola	E	E	Species	BAM-C	Yes	-	Species removed. No suitable habitat present within subject land.
Pultenaea parviflora	E	V	Species	BAM-C	Yes	-	Species removed. No suitable habitat present within subject land.

Species	BC Act Status	EPBC Act Status	Species or dual credit species	Reason for inclusion	Habitat degraded	Geographic and/or habitat constraint (BAM-C)	Survey undertaken or justification for removal
Pultenaea pedunculata	E	-	Species	BAM-C	Yes	-	Species removed. Potential habitat within the subject land is degraded such that the species is unlikely to use the subject land.
Wahlenbergia multicaulis - endangered population *Tadgell's Bluebell in the local government areas of Auburn, Bankstown, Baulkham Hills, Canterbury, Hornsby, Parramatta and Strathfield*	EP	-	Species	BAM-C	No	Auburn, Bankstown, Baulkham Hills, Canterbury, Hornsby, Parramatta and Strathfield LGAs	Species removed. The subject land is located in the Blacktown LGA which is not listed as one of the LGAs known for this species to occur.
Threatened fauna species							
Burhinus grallarius Bush Stone-curlew	E	-	Species	BAM-C	No	Habitat constraints absent from subject land	Species removed. No suitable habitat present within subject land.
Meridolum corneovirens Cumberland Plain Land Snail	E	-	Species	BAM-C	No	-	Species surveyed. Targeted surveys were conducted.
Cercartetus nanus	V	-	Species	BAM-C	Yes	-	Species removed. Habitat, especially suitable foraging habitat (i.e., *Banksia* species) is not present. See Appendix E for further justification.

Species	BC Act Status	EPBC Act Status	Species or dual credit species	Reason for inclusion	Habitat degraded	Geographic and/or habitat constraint (BAM-C)	Survey undertaken or justification for removal
Eastern Pygmy-possum							
Pandion cristatus Eastern Osprey (Breeding)	V	-	Dual	BAM-C	No	Habitat constraints absent from subject land	Species removed. This species relies on appropriate nesting resources (presence of sick nests in living and dead trees (>15m) or artificial structures within 100m of a floodplain for nesting), such resources are not present. Foraging is limited/minimal. Further justification in Appendix E.
Callocephalon fimbriatum Gang-gang Cockatoo	V	-	Dual	BAM-C	No	Habitat constraints absent from subject land	Species removed. This species relies on appropriate nesting resources (hollows greater than 9cm diameter), such resources are not present. Foraging is limited/minimal. Further justification in Appendix E.
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo *(Breeding)*	V	V	Dual	BAM_C	No	Habitat constraints absent from subject land	Species removed. This species relies on appropriate nesting resources (hollows greater than 15 cm diameter and higher than 8 m above ground), such resources are not present. Foraging is limited/minimal. Further justification in Appendix E.
Litoria aurea Green and Golden Bell Frog	E	V	Species	BAM-C	No	Habitat constraints absent from subject land	Species removed. Habitat does not occur for this species within the area of impact.
Pteropus poliocephalus Grey-headed Flying-fox	V	V	Dual	BAM-C	No	Habitat constraints absent from subject land	Species surveyed. Targeted diurnal (roost) surveys were conducted.
Phascolarctos cinereus Koala	V	V	Dual	BAM-C	No	-	Species surveyed. Modified SAT and Spotlighting surveys were conducted.

Species	BC Act Status	EPBC Act Status	Species or dual credit species	Reason for inclusion	Habitat degraded	Geographic and/or habitat constraint (BAM-C)	Survey undertaken or justification for removal
Miniopterus orianae oceanensis Large Bent-winged Bat	V	-	Dual	BAM-C	No	Habitat constraints absent from subject land	Species removed. No suitable habitat present within subject land that is associated with species credits.
Chalinolobus dwyeri Large-eared Pied Bat	V	V	Species	BAM-C	No	Habitat constraints absent from subject land	Species removed. No suitable habitat present within subject land.
Miniopterus australis Little Bent-winged Bat	V	-	Dual	BAM-C	No	Habitat constraints absent from subject land	Species removed. No suitable habitat present within subject land that is associated with species credits.
Hieraaetus morphnoides Little Eagle	V	-	Dual	BAM-C	No	Habitat constraints absent from subject land	Species removed. This species relies on large, old trees which are not present. See Appendix E for further justification.
Tyto novaehollandiae Masked Owl	V	-	Dual	BAM-C	No	Habitat constraints absent from subject land	Species removed. Suitable foraging and breeding habitat does not occur (e.g., hollows of at least 20cm diameter). Further justification is provided in Appendix E.
Ninox connivens *Barking Owl*	V	-	Dual	BAM-C	No	Habitat constraints absent from subject land	Species removed. Suitable foraging and breeding habitat does not occur (e.g., hollows of a depth of at least 50cm). Further justification is provided in Appendix E.
Ninox strenua Powerful Owl	V	-	Dual	BAM-C	No	Habitat constraints absent from subject land	Species removed. Suitable foraging and breeding habitat does not occur (e.g., hollows of a depth of at least 50cm). Further justification is provided in Appendix E.

Species	BC Act Status	EPBC Act Status	Species or dual credit species	Reason for inclusion	Habitat degraded	Geographic and/or habitat constraint (BAM-C)	Survey undertaken or justification for removal
Myotis macropus Southern Myotis	V	-	Species	BAM-C	No	Habitat constraints absent from subject land	Species removed. Suitable foraging and roosting habitat does not occur. Further justification is provided in Appendix E.
Lophoictinia isura Square-tailed Kite	V	-	Dual	BAM-C	No	Habitat constraints absent from subject land	Species removed. The subject land is in a disturbed area that would not be suitable for nesting. Foraging resources are scarce and it is considered unlikely this species would rely on this subject land for resources. Further justification is provided in Appendix E.
Petaurus norfolcensis Squirrel Glider	V	-	Species	BAM-C	Yes	-	Species removed. The Squirrel Glider is widely though sparsely distributed in eastern Australia. The species inhabits mature or old growth Box, Box-Ironbark woodlands and Blackbutt-Bloodwood forest with heath understorey in coastal areas. It prefers mixed species stands with a shrub or *Acacia* midstorey. The species requires an abundance of mature tree hollows for refuge and nest sites and relies on these trees being <50m apart for movement and dispersal. Suitable vegetation (e.g., *Acacia* midstorey) is largely absent from the subject land. Further, the subject land does not support substantial foraging resources (e.g., sap, nectar, honeydew) or suitable trees and tree hollows required for dispersal, sheltering and breeding.
Haliaeetus leucogaster White-bellied Sea-Eagle	V	-	Dual	BAM-C	No	Habitat constraints absent from subject land	Species removed. The White-bellied Sea-Eagle is a dual credit species. The species credit component is based on presence of suitable breeding habitat (e.g., living or dead mature trees within suitable vegetation within 1km of a rivers, lakes, large dams or creeks, wetlands and coastlines).

Species	BC Act Status	EPBC Act Status	Species or dual credit species	Reason for inclusion	Habitat degraded	Geographic and/or habitat constraint (BAM-C)	Survey undertaken or justification for removal
Lathamus discolor Swift Parrot	E	CE	Dual	BAM-C	No	No Important Habitat Mapping within the subject land	Species removed. The Swift Parrot migrates to the Australian south-east mainland between February and October, occurring in areas where eucalypts are flowering profusely or where there are abundant lerp infestations. The Swift Parrot is a dual credit species. The species credit component is based on areas of important habitat as described and mapped by DPE (EES). There are no areas of important habitat within the subject land or immediate surrounds. Suitable foraging habitat is minimal. Further justification is provided in Appendix E.
Anthochaera phrygia Regent Honeyeater	CE	CE	Dual	BAM-C	No	No Important Habitat Mapping within the subject land	Species removed. The Regent Honeyeater inhabits temperate woodlands and open forests of the inland slopes of south-east Australia, feeding on nectar, fruit, lerps, honeydew and insects. Breeding habitat is confined to three known areas, two of them in NSW (Capertee Valley and Bundarra-Barraba regions). The Regent Honeyeater is a dual credit species. The species credit component is based on areas of important habitat as described and mapped by DPE(EES). The subject land is outside of this area of important habitat and therefore this species habitat is covered as ecosystem species.

V = Vulnerable, E = Endangered, CE = Critically Endangered, EP = Endangered Population

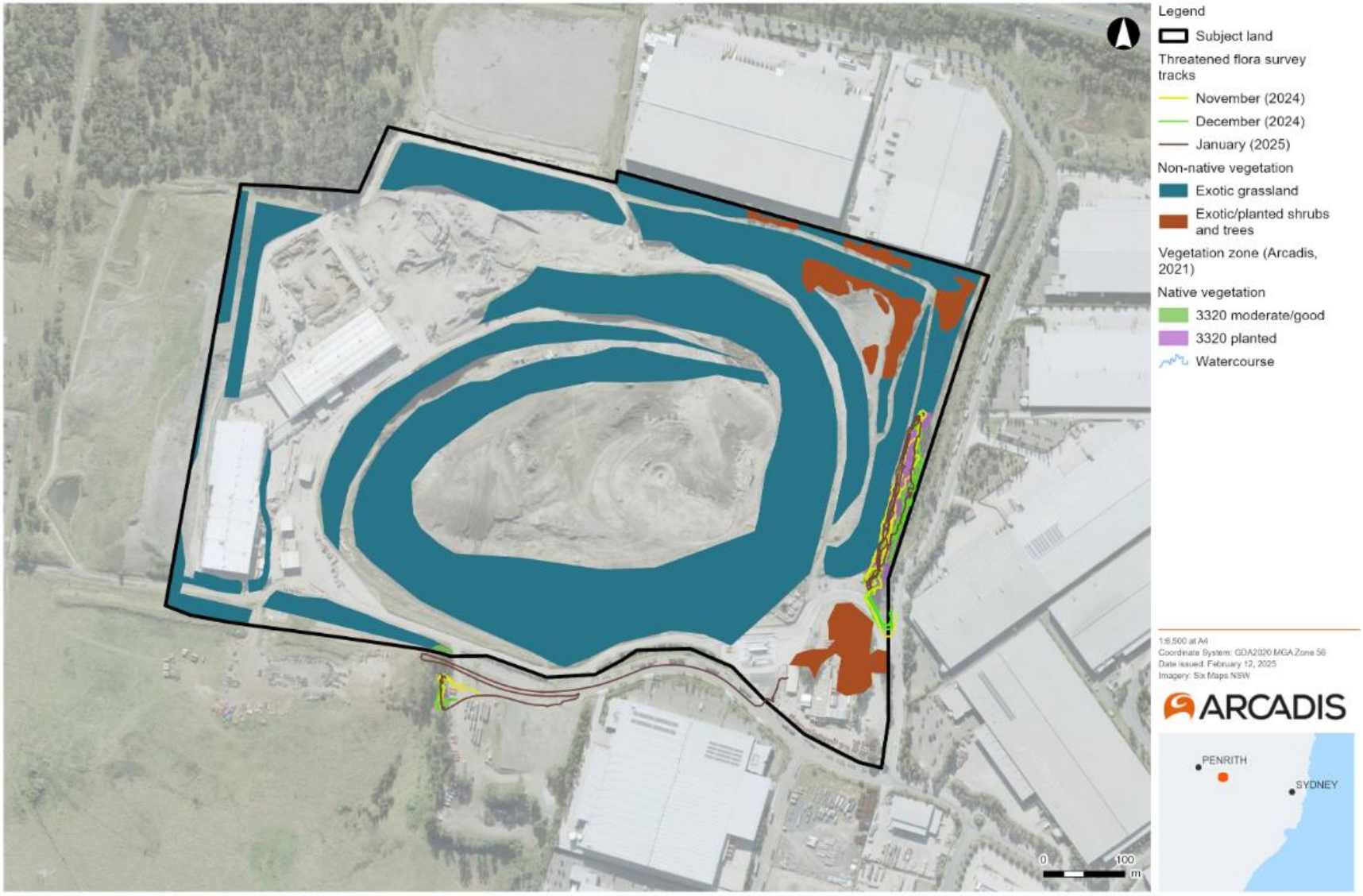

Figure 6-1: Threatened species survey effort

6.2 Threatened species survey results

6.2.1 Threatened fauna species

Targeted surveys resulted in the detection of two possible threatened microbat species on the subject land in 2021:

- Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*) which is an ecosystem species
- Large Bent-wing Bat (*Miniopterus orianae oceanensis*) which is a dual credit species. Breeding habitat does not occur, and this is the species component of the credits. Therefore, the potential occurrence of this species does not trigger offset requirements.

6.2.2 Threatened flora species

One threatened flora species, *Eucalyptus scoparia* (Wallangarra White Gum) was tentatively identified within the subject land. *Eucalyptus scoparia* is listed as Endangered under the BC Act and Vulnerable under the EPBC Act. In NSW it is indigenous to the Tenterfield region within the New England Tablelands. It is also a commonly planted urban tree in Sydney, but its natural distribution does not include western Sydney.

Within the subject land, two individuals suspected of being *Eucalyptus scoparia* were recorded. As no identifying features of buds or fruit could be obtained to confirm the identification, the individuals have been conservatively identified as *Eucalyptus scoparia* based on the bark and leaf size of the individuals. *Eucalyptus scoparia* is not native to the Sydney area and therefore these individuals should be treated as planted vegetation and not of conservation significance.

One threatened flora species identified opportunistically during surveys within the subject land was *Dichanthium setosum* (Blue Grass), listed as Vulnerable under the EPBC Act and not listed under the BC Act. This species' natural distribution is primarily within the northern tablelands of NSW, west of Armidale, with more scattered locations throughout the north-western, central western slopes and north-western plains of NSW, extending west to Narrabri (Ayres *et. al,* 1996 *in* TSSC 2008). This species does not naturally occur in the western Sydney region and therefore is not of conservation significance.

No further assessment is required for either of these two species.

For the ASR BDAR 2025 update the following candidate species were surveyed for:

- *Deyeuxia appressa*
- *Micromyrtus minutiflora*

These species are at risk of a Serious and Irreversible Impact (SAII) and were not removed from the candidate species list based on degraded habitat, or absence of suitable habitat. Surveys were conducted in accordance with the appropriate guidelines, and relevant comments in the TBDC.

7 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

Matters of National Environmental Significance (MNES) are environmental values that require approval from the Commonwealth Minister for the Environment if an action that may have a significant impact on one or more of these values is proposed. There are nine MNES categories listed under the EPBC Act:

- World heritage properties
- National heritage places
- Wetlands of international importance (listed under the Ramsar Convention)
- Listed threatened species and ecological communities
- Migratory species protected under international agreements
- Commonwealth marine areas
- The Great Barrier Reef Marine Park
- Nuclear actions (including uranium mines)
- A water resource, in relation to coal seam gas development and large coal mining development.

The only relevant MNES to the Amended Proposal is the assessment of potential occurrence of threatened and migratory species.

Other MNES, including World heritage places, National heritages places and Wetlands of international importance (declared Ramsar wetlands) are not relevant to the Proposal.

7.1 Threatened ecological communities

PCT 3320 is associated with the TEC Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest, listed as Critically Endangered under the EPBC Act. An analysis of PCT 3320 in the subject land against the condition and extent criteria required to be the listed TEC under the EPBC Act was undertaken. This analysis is outlined in Table 7-1 and concluded that PCT 3320 within the subject land does not meet the criteria to be Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest under the EPBC Act.

Table 7-1: Condition criteria for EPBC Act listed TECs within the subject land

TEC name (EPBC Act)	EPBC Act status	Summary of EPBC Act condition criteria	Meets criteria?
Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest	Critically Endangered	• Native tree species present with a minimum projected foliage cover of 10 per cent. • Patch 0.5 ha or greater in size. • One of the below applies: – Over 50 per cent of perennial understorey vegetative cover is made up of native species. – Patch greater than 5 ha in size and has over 30 per cent native perennial understorey vegetative cover. – Patch contiguous with a native vegetation patch greater than 5 ha in size and	No. All patches of PCT 3320 within the subject land are less than 0.5 hectares in size. The patch of 3320_moderate/good is 0.02 hectares and 3320_planted is 0.38 hectares. Therefore, the patches do not meet the size criteria of the EPBC Act listing.

TEC name (EPBC Act)	EPBC Act status	Summary of EPBC Act condition criteria	Meets criteria?
		has over 30 per cent native perennial understorey vegetative cover. – Patch contains at least one tree per ha that is large (>80 cm dbh) or has a hollow and has over 30 per cent native perennial understorey vegetative cover (CoA, 2010).	

7.2 Threatened species

7.2.1 Flora

Database searches included the Protected Matters and Threats (PMST) database which lists EPBC listed threatened species, identified 33 threatened flora species predicted to occur within 10 kilometres of the subject land (Appendix D). No species were considered likely to occur within the subject land during desktop research based on available information on the PCT present and other habitat information.

One threatened flora species identified opportunistically during surveys within the subject land was *Dichanthium setosum* (Blue Grass), listed as Vulnerable under the EPBC Act. This species' natural distribution is primarily within the northern tablelands of NSW, west of Armidale, with more scattered locations throughout the north-western, central western slopes and north-western plains of NSW, extending west to Narrabri (Ayres *et. al,* 1996 *in* TSSC 2008). This species does not naturally occur in the western Sydney region and therefore is not of conservation significance.

An additional threatened flora species listed under the EPBC Act, *Eucalyptus scoparia,* was tentatively identified within the subject land. As described in Section 6.2.2, *Eucalyptus scoparia* is not native to the Sydney area and therefore the individuals of this species should be treated as planted vegetation in this context and not of conservation significance.

These two species are not further assessed in this report or in the BAM-C.

7.2.2 Fauna

Database searches included the Protected Matters and Threats (PMST) database which lists EPBC listed threatened species was used to identify 59 listed threatened fauna species predicted to occur within 10 kilometres of the subject land. This consisted of 38 birds, 17 mammals, two amphibians, one reptile and one invertebrate (Appendix D). No fauna species listed under the EPBC Act were recorded during surveys and none were considered to have a moderate or higher likelihood of occurrence or impact.

7.3 Migratory species

The PMST and BioNet database searches identified 14 additional bird species with the potential to occur within 10 kilometres of the subject land that are listed as migratory only under the EPBC Act (which covers all species listed under the Bonn, CAMBA, JAMBA and/or ROKAMBA conventions) The likelihood of occurrence of listed migratory species within the subject land is provided in Table 7-2.

One migratory species, the Rufous Fantail (*Rhipidura rufifrons*), was recorded within the subject land during the fauna surveys. Further assessment is provided for this species in Section 8.4. Following

surveys, all other migratory species identified during database searches were determined to have a low likelihood of occurrence in the subject land (Table 7-2).

Table 7-2: Likelihood of occurrence of listed migratory species within the subject land (see Appendix D for all threatened fauna)

Common name	Scientific name	Habitat requirements	Number of records and source	Potential occurrence and/or impact
Fork-tailed Swift	*Apus pacificus*	In Australia, they mostly occur over inland plains but sometimes above foothills or in coastal areas. They often occur over cliffs and beaches and also over islands and sometimes well out to sea. They also occur over settled areas, including towns, urban areas and cities. They mostly occur over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh. They are also found at treeless grassland and sandplains covered with spinifex, open farmland and inland and coastal sand-dunes. The sometimes occur above rainforests, wet sclerophyll forest or open forest or plantations of pines (Higgins 1999). They forage aerially, up to hundreds of metres above ground, but also less than 1 m above open areas or over water. They often occur in areas of updraughts, especially around cliffs.	BioNet – 6 (2019)	Low. This species may occasionally fly over the subject land but is unlikely to utilise habitat within the subject land.
White-throated Needletail	*Hirundapus caudacutus*	Migratory and usually seen in eastern Australia from October to April. Breeds in forests in south-eastern Siberia, Mongolia, the Korean Peninsula and northern Japan June-August. Most often seen in eastern Australia before storms, low pressure troughs and approaching cold fronts and occasionally bushfire. These conditions are often used by insects to swarm (e.g., termites and ants) or tend to lift insects away from the surface which favours sighting of White-throated Needletails as they feed. More common in coastal areas, less so inland.	BioNet – 2 (2018) PMST	Low. This species may occasionally fly over the subject land but is unlikely to utilise habitat within the subject land.
Sharp-tailed Sandpiper	*Calidris acuminata*	In Australasia, the Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline salt lakes inland. They also occur in saltworks and sewage farms. They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry. They use intertidal mudflats in sheltered bays, inlets, estuaries or seashores, and also swamps and creeks lined with mangroves. They tend to occupy coastal mudflats mainly after ephemeral terrestrial wetlands have dried out, moving	BioNet – 1 (2018) PMST	Very low. No suitable habitat will be impacted.

Common name	Scientific name	Habitat requirements	Number of records and source	Potential occurrence and/or impact
		back during the wet season. Sometimes they occur on rocky shores and rarely on exposed reefs (Higgins & Davies 1996).		
Latham's Snipe	*Gallinago hardwickii*	In Australia, Latham's Snipe occurs in permanent and ephemeral wetlands up to 2,000 m above sea-level (Chapman 1969; Naarding 1981). They usually inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies) (Frith et. al. 1977; Naarding 1983; Weston 2006, pers. comm.). However, they can also occur in habitats with saline or brackish water, in modified or artificial habitats, and in habitats located close to humans or human activity (Frith et al. 1977; Naarding 1983).	BioNet – 11 (2018)	Very low. No suitable habitat will be impacted.
Common Greenshank	*Tringa nebularia*	The Common Greenshank is found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. Habitats include embayments, harbours, river estuaries, deltas and lagoons and are recorded less often in round tidal pools, rock-flats and rock platforms. The species uses both permanent and ephemeral terrestrial wetlands, including swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans and saltflats. It will also use artificial wetlands, including sewage farms and saltworks dams, inundated rice crops and bores. The edges of the wetlands used are generally of mud or clay, occasionally of sand, and may be bare or with emergent or fringing vegetation, including short sedges and saltmarsh, mangroves, thickets of rushes, and dead or live trees.	BioNet – 1 (2006)	Very low. No suitable habitat will be impacted.
Curlew Sandpiper	*Calidris ferruginea*	It generally occupies littoral and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats of sheltered coasts. It also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes inland. It forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed. It roosts on shingle, shell or sand beaches; spits or islets on the coast or in wetlands; or sometimes in salt marsh, among beach-cast seaweed, or on rocky shores.	PMST	Very low. No suitable habitat will be impacted.

Common name	Scientific name	Habitat requirements	Number of records and source	Potential occurrence and/or impact
Eastern Curlew	*Numenius madagascariensis*	It generally occupies coastal lakes, inlets, bays and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats and sometimes saltmarsh of sheltered coasts. Occasionally, the species occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets It forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed. It roosts on sandy spits and islets, especially on dry beach sand near the high-water mark, and among coastal vegetation including low saltmarsh or mangroves. May also roost on wooden oyster leases or other similar structures.	PMST	Very low. No suitable habitat will be impacted.
Pectoral Sandpiper	*Calidris melanotos*	The Curlew Sandpiper is distributed around most of the Australian coastline (including Tasmania). It occurs along the entire coast of NSW, particularly in the Hunter Estuary, and sometimes in freshwater wetlands in the Murray-Darling Basin. Inland records are probably mainly of birds pausing for a few days during migration. It generally occupies littoral and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats of sheltered coasts. It also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes inland. It forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed.	PMST	Very low. No suitable habitat will be impacted.
Oriental Cuckoo	*Cuculus optatus*	The Oriental Cuckoo usually frequents various forest types including coniferous, deciduous and mixed forests. It also occurs in farmland with scattered trees. In the winter range, it can be occasionally found in swamps, mangroves and plantations.	PMST	Very low. No suitable habitat will be impacted.

Common name	Scientific name	Habitat requirements	Number of records and source	Potential occurrence and/or impact
Black-faced Monarch	*Hirundapus caudacutus*	The Black-faced Monarch mainly occurs in rainforest ecosystems, including semi-deciduous vine-thickets, complex notophyll vine-forest, tropical (mesophyll) rainforest, subtropical (notophyll) rainforest, mesophyll (broadleaf) thicket/shrubland, warm temperate rainforest, dry (monsoon) rainforest and (occasionally) cool temperate rainforest. The species also occurs in selectively logged and 20—30 years old regrowth rainforest (Laurance et al. 1996). It is also sometimes found in nearby open eucalypt forests (mainly wet sclerophyll forests), especially in gullies with a dense, shrubby understorey as well as in dry sclerophyll forests and woodlands, often with a patchy understorey. The species especially occurs in 'marginal' habitats during winter or during passage (migration).	PMST	Low. Minimal suitable habitat occurs. Unlikely to occur and even less likely to be impacted.
Yellow Wagtail	*Motacilla flava*	The yellow wagtail likes damp marshes, meadows and farmland, and spends much of its time running about on the ground, chasing insects disturbed by the feet of livestock. Yellow wagtails nest on the ground or in long grass, using plants, grasses and stems to build a cup-shape which they line with fur.	PMST	Low. Minimal suitable habitat occurs. Unlikely to occur and even less likely to be impacted
Satin Flycatcher	*Myiagra cyanoleuca*	Satin Flycatchers mainly inhabit eucalypt forests, often near wetlands or watercourses. They generally occur in moister, taller forests than the Leaden Flycatcher, Myiagra rebecula, often occurring in gullies. They also occur in eucalypt woodlands with open understorey and grass ground cover and are generally absent from rainforest. In south-eastern Australia, they occur at elevations of up to 1,400 m above sea level, and in the ACT, they occur mainly between 800 m above sea level and the treeline.	PMST	Low. Minimal suitable habitat occurs. Unlikely to occur and even less likely to be impacted
Rufous Fantail	*Rhipidura rufifrons*	In east and south-east Australia, the Rufous Fantail mainly inhabits wet sclerophyll forests, often in gullies dominated by eucalypts such as Tallow-wood (*Eucalyptus microcorys*), Mountain Grey Gum (*E. cypellocarpa*), Narrow-leaved Peppermint (*E. radiata*), Mountain Ash (*E. regnans*), Alpine Ash (*E. delegatensis*), Blackbutt (*E. pilularis*) or Red Mahogany (*E. resinifera*); usually with a dense shrubby understorey often including ferns.	PMST	Recorded. Further assessment is provided.

Common name	Scientific name	Habitat requirements	Number of records and source	Potential occurrence and/or impact
Eastern Osprey	*Pandion haliaetus*	Eastern Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia. They require extensive areas of open fresh, brackish or saline water for foraging. They frequent a variety of wetland habitats including inshore waters, reefs, bays, coastal cliffs, beaches, estuaries, mangrove swamps, broad rivers, reservoirs and large lakes and waterholes. They exhibit a preference for coastal cliffs and elevated islands in some parts of their range, but may also occur on low sandy, muddy or rocky shores and over coral cays. They may occur over atypical habitats such as heath, woodland or forest when travelling to and from foraging subject lands.	PMST	Low. Minimal habitat occurs and even less will be impacted. Surveys found no sign of nesting material on or near the site.

7.4 Aquatic habitat and threatened species

Angus Creek is a first order ephemeral stream that runs down the eastern boundary of the subject land from a pipe culvert that passes under Kangaroo Avenue at the southern end of the subject land (Photograph 6). It flows in a northerly direction, as a modified, partially concreted channel. The channel width is on average 1.5 metres with a depth of about 30 centimetres. There was slow flow at the time of the field survey which occurred after some rain and small pools of water were present. The channel is partially fringed by grasses and sedges and emergent aquatic vegetation (*Typha orientalis*) is present (Photograph 7).

It is Type 3 – Minimally sensitive key fish habitat and Class 3 – Minimal key fish habitat, in accordance with DPI's *Policy and guidelines for fish habitat conservation and management*. It is not mapped as Key Fish Habitat or habitat for any threatened species on DPI's Fisheries Spatial Portal. Angus Creek does not provide habitat for any threatened species listed under the FM Act.

Photograph 6 Angus Creek at the Kangaroo Avenue culvert

Photograph 7 Channel of Angus Creek with Typha orientalis in view

8 PRESCRIBED BIODIVERSITY IMPACTS

Chapter 6 of the BAM (DPIE, 2020a) identifies the prescribed biodiversity impacts which must be assessed as part of the BOS. These prescribed impacts and their relevance to the Amended Proposal are described below in Table 8-1. As no prescribed impacts are relevant to this Proposal, they have not been assessed further as part of this ASR BDAR 2025.

Table 8-1: Prescribed impacts as identified in the BAM (DPIE, 2020a)

Prescribed impact	Relevance to the subject land
Impacts on the habitat of threatened entities including: • Karst, caves, crevices, cliffs and other geological features of significance	None
• Human-made structures	None
• Non-native vegetation	None – while there is non-native vegetation within the subject land, it does not provide habitat to threatened entities.
Impacts on areas connecting threatened species habitat, such as movement corridors	None
Impacts that affect water quality, water bodies and hydrological processes that sustain threatened entities (including from subsidence or upsidence from underground mining)	None
Impacts on threatened and protected animals from turbine strikes from a wind farm	None
Impacts on threatened species or fauna that are part of a TEC from vehicle strikes	None

BAM (STAGE 2): IMPACT ASSESSMENT (BIODIVERSITY VALUES)

9 AVOID AND MINIMISE IMPACTS

9.1 Measures to avoid and minimise impacts on native vegetation and habitat

The principles in Section 7.1 of the BAM (DPIE, 2020a) have been considered to avoid and minimise impacts on native vegetation and habitat, where possible, through the development process for the Proposal.

9.1.1 Locating the Proposal

As stated in Section 7.1.1 of the BAM (DPIE, 2020a), Proposal location decisions should be informed by knowledge of biodiversity values. Table 9-1 demonstrates how the Amended Proposal has avoided and minimised impacts through decisions on the Amended Proposal's location.

Table 9-1: Avoidance and minimisation measures implemented in determining the Proposal location

BAM principles	How addressed
(a) Locating the project in areas where there are no biodiversity values	Approximately 99 per cent of the subject land has been cleared of native vegetation and is currently used for industrial purposes. Biodiversity values within the subject land are limited to a small area of degraded, planted vegetation consistent with PCT 3320 and areas of non-native vegetation consisting of exotic grassland and exotic/planted shrubs and trees.
(b) Locating the project in areas where the native vegetation or threatened species habitat is in the poorest condition (i.e. areas that have a low vegetation integrity score)	Most of the subject land is situated in cleared areas and areas containing non-native vegetation. PCT 3320 is present within the subject land in two vegetation zones; Vegetation Zone 1 – PCT 3320_planted and Vegetation Zone 2 – PCT 3320_moderate/good. Vegetation Zone 1 – PCT 3320_planted has a vegetation integrity score of 33.5 while Vegetation Zone 2 – PCT 3320_moderate/good has a score of 58.4. The area of Vegetation Zone 2 – PCT 3320_moderate/good vegetation has been avoided and will not be directly impacted by the Proposal.
(c) Locating the project in areas that avoid habitat for species with a high biodiversity risk weighting or land mapped on the important habitat map, or native vegetation that is a TEC or a highly cleared PCT.	0.20 hectares of the TEC Cumberland Plain Woodland listed under the BC Act will be removed as a result of the amended proposal. This TEC does not meet the condition threshold to be listed under the EPBC Act. As part of the amended proposal, construction methods were reviewed, and a reduction in the area of PCT 3320 planted required to be cleared was able to be made. No areas mapped on an important habitat map will be impacted by the Amended Proposal. Potential foraging habitat for two threatened fauna species will be impacted by the Amended Proposal; the Eastern Coastal Free-tailed Bat and Large Bent-winged Bat. As only the ecosystem credit component of these species would be impacted by the proposal, there is no associated biodiversity risk weighting.
(d) Locating the project outside of the buffer area around breeding habitat features such as nest trees or caves.	No breeding habitat including nest trees, caves or hollow bearing trees are present within the subject land.

The BAM (DPIE, 2020a) also states that when selecting a Proposal's location, alternatives need to be considered. The consideration of these alternatives, and justification in determining the final location is outlined below in Table 9-2.

Table 9-2: Alternatives considered in determining the Proposal location

BAM principles	How addressed
(a) alternative modes or technologies that would avoid or minimise impacts on biodiversity values	The modes, technologies and activities associated with the Amended Proposal are required. There are no appropriate alternatives.
(b) alternative routes that would avoid or minimise impacts on biodiversity values	Existing roads within the subject land are being used and upgraded as part of the Amended Proposal where possible.
(c) alternative locations that would avoid or minimise impacts on biodiversity values	By locating the Amended Proposal in this location as opposed to a new or undeveloped site, impacts to biodiversity values are minimised, as the existing landfill and associated infrastructure is already present.
(d) alternative sites within a property on which the proposal is located that would avoid or minimise impacts on biodiversity values.	As most of the subject land is already cleared with existing infrastructure present, alternative sites within the subject land are limited.

9.1.2 Designing the Proposal

As stated in Section 7.1.2 of the BAM (DPIE, 2020a), project design (including the location of temporary and permanent ancillary construction and maintenance facilities) should avoid and minimise clearing of native vegetation and threatened species habitat. How these BAM principles have been addressed during design of the Amended Proposal is outlined in Table 9-3.

Table 9-3: Avoidance and minimisation measures implemented during project design

BAM principles	How addressed
(a) Reducing the clearing footprint of the project by minimising the number and type of facilities	The number and type of facilities has been limited to what is required for the Amended Proposal. Where possible, existing buildings and infrastructure are being used for operation of the Proposal.
(b) Locating ancillary facilities in areas where there are no biodiversity values	No ancillary facilities are located in areas of biodiversity value.
(c) locating ancillary facilities in areas where the native vegetation or threatened species habitat is in the poorest condition (i.e. areas with the lowest vegetation integrity scores)	No ancillary facilities are located in areas of native vegetation or threatened species habitat.
(d) locating ancillary facilities in areas that avoid habitat for species and vegetation that has a high threat status (e.g. an endangered ecological community (EEC) or critically endangered ecological community (CEEC) or is an entity at risk of a serious and irreversible impact (SAII)	No ancillary facilities are located in areas of native vegetation or threatened species habitat.
(e) actions and activities that provide for rehabilitation, ecological restoration and/or ongoing maintenance of retained areas of native vegetation, threatened species, threatened ecological communities and their habitat on the subject land.	A small area of native vegetation will be retained by the Amended Proposal (Figure 12-1). A Construction Flora and Fauna Management Plan will be prepared which will outline the management of this area of vegetation to avoid and minimise any potential impacts to this vegetation.

10 ASSESSMENT OF IMPACTS

10.1 Direct impacts

The Amended Proposal aims to improve site operations and vehicle movements through the Proposal Site by delivering new egress roads and utilising existing and approved operational areas. This will be done through the following infrastructure modifications:

- Construction of a new exit road to the Honeycomb Drive extension and installation of two associated outbound weighbridges
- Construction of a new exit connection to Kangaroo Avenue in the north east of the subject land and the installation of two associated outbound weighbridges and a dedicated weighbridge office
- Construction of additional carparking and amenities adjacent to MPC2
- Construction of a workshop and maintenance shed (relocating this activity from elsewhere within the subject land to a dedicated enclosed facility)
- Construction of a skip bin manufacturing and repair workshop
- Modified operations to include reorganisation of existing building use and storage areas combined with the construction of new associated road network to support improved operations and vehicle movements;
- Undertake associated environmental management works to include modified stormwater management devices combined with the relocation and modification of the approved western amenity berm; and
- Realignment of the western boundary of existing Lot 1 in DP1145808.

In order to carry out these modifications, the removal of native and non-native vegetation is required, as outlined below. This includes removal of threatened ecological communities and threatened species habitat.

10.1.1 Native vegetation

Clearing of native vegetation is required for the Amended Proposal. The areas of PCT 3320 to be cleared are listed in Table 10-1**.** No clearing of PCT_3320 moderate good is required.

Table 10-1: Direct impacts to native vegetation within the subject land

PCT ID	PCT Name	Vegetation zone	Vegetation integrity score	Extent in the subject land (ha)	Extent in the construction footprint (ha)
3320	Cumberland Shale Plains Woodland	3320_moderate/good	58.4	0.02	0 (not considered further)
		3320_planted	33.5	0.38	0.20
Total area native vegetation				**0.40**	**0.20**

10.1.2 Threatened flora and their habitat

No threatened flora species were recorded within the subject land or determined likely to occur within the subject land, including all species added during the ASR BDAR 2025 update. Therefore, no further assessment of impacts to threatened flora are required as part of this assessment.

10.1.3 Threatened fauna and their habitat

Two threatened microbat species may occur in the subject land: Eastern Coastal Free-tailed Bat and Large Bent-winged Bat. Eastern Coastal Free-tailed Bat is an ecosystem credit species and Large Bent-winged Bat is a dual credit species with only ecosystem credit habitat present. No species credits are required for either species, due to the absence of potential breeding habitat.

No other species were considered likely to occur or be impacted (Appendix E).

10.1.4 Serious and Irreversible Impacts (SAII)

To assist the consent authority to evaluate the nature of an impact on a potential entity at risk of a serious and irreversible impact (SAII), the BDAR must contain details of the assessment of serious and irreversible impact, in accordance with the assessment criteria set out in Section 9.1 of the BAM.

Cumberland Plain Woodland in the Sydney Basin Bioregion is identified in the TBDC as a SAII entity and has been recorded within the subject land. The location of this SAII entity is shown in Figure 5-3.

The following information addresses criteria set out in Section 9.1.1 of the BAM, which must be provided to assist the decision maker to evaluate the extent and severity of the impact on the SAII. Information used in this assessment is described in the following documents:

- Recovering Bushland on the Cumberland Plain: Best Practice guidelines for management and restoration of bushland (DEC, 2005)
- The native vegetation of the Cumberland Plain, western Sydney; systematic classification and field identification of communities (Tozer, 2003)
- *Cumberland Plain Recovery Plan* (DECCW, 2011)
- Cumberland Plain Woodland in the Sydney Basin Bioregion - critically endangered ecological community listing (DPIE, 2010)
- *DRAFT Cumberland Plain Conservation Plan - A Conservation Plan for Western Sydney to 2056* (DPIE, 2020)

It should be noted that under the *Draft Cumberland Plain Conservation Plan* (DPIE, 2020), the subject land is not included in the Plan Area.

1. The action and measures taken to avoid the direct and indirect impact on the potential entity for an SAII

Areas of PCT 3320 that would be cleared as a result of the Amended Proposal are relatively small and isolated patches of low condition vegetation. A larger area of higher quality PCT 3320 is present adjacent to the north-west of subject land and outside of the area of direct impact within a conservation area. Measures to avoid and minimise impacts on Cumberland Plain Woodland are discussed further in Section 9.

2. Current status of the SAII

a) Evidence of reduction in geographic distribution (Principle 1, Clause 6.7(2)(a) BC Reg, as the current geographic extent of the TEC in NSW and the estimated reduction since 1970 (excluding impacts from proposed development):

The reduction in geographic extent of Cumberland Plain Woodland from pre-European to present day is outlined below in Table 10-2. No data was available for the extent of Cumberland Plain Woodland in 1970.

Table 10-2: Geographic extent of Cumberland Plain Woodland

PCT	Estimated extent (ha)		Percent reduction	Source
	Pre-European	Current		
3320	44,000	6,800	84.5%	BioNet Vegetation Classification 2021
3319	27,200	4,400	83.8%	
Total (CPW)	**71,200**	**11,200**	**84.2%**	

b) Extent of reduction in ecological function (describing the degree of environmental degradation or disruption of biotic processes (Principle 2, Clause 6.7(2)(b) BC Reg)

Responses to the ecological functions listed in Section 9.1.1 of the BAM are provided below in Table 10-3.

Table 10-3: Evidence of reduced ecological function

Indicator	Extent/degree of reduction in ecological functions
Change in community structure	Changes in community structure are a large contributing factor in the reduction of ecological function of Cumberland Plain Woodland in the Sydney Basin. Almost all of the remaining Cumberland Plain Woodland is regrowth forest and woodland as a result of past clearing activities. Large trees representing the stature of the community prior to European settlement occur very sparsely within the remnant patches of vegetation or remain as isolated individuals within paddocks or urban areas. Mean tree densities in contemporary stands of the community have been found to be substantially higher than historical estimates and tree sizes thought to be smaller (DPIE, 2010). Other structural changes to the Cumberland Plain Woodland community include removal of fallen woody debris and standing dead trees, removal of woody understorey plants, or the development of regrowth stands with very high density of shrubs and eucalypt saplings, including *Bursaria spinosa,* which may suppress ground flora (DPIE, 2010).
Change in species composition	Changes in species composition are referred to above in changes in community structure. Change in species composition can also occur as a result of invasion and establishment of exotic species. In particular, these changes may include weed infestations leading to decreased native shrub layer and increased exotic shrub layer, increased pastural grasses, and reduced genetic diversity as a result of fragmentation and disruption to pollinations and dispersal of fruits or seeds.
Invasion and establishment of exotic species	The Cumberland Plain Woodland is particularly vulnerable to weed invasion and establishment of exotic species given its grassy understorey, relatively fertile soils and past land uses. Weeds such as Bridal Veil Creeper, Paddy's Lucerne, African Olive, Boxthorn, Rhodes Grass and African Lovegrass, have been able to establish widely in Cumberland Plain Woodland and displaced native plants, affecting the regeneration of communities (DECCW, 2011).
Degradation of habitat	Areas of Cumberland Plain Woodland have become heavily degraded, largely as a result of altered land uses including clearing, logging and grazing. These have resulted in structural changes to remnant patches of Cumberland Plain Woodland, such as absence of large old trees, woody debris, dead trees and woody understorey plants. Agricultural use of Cumberland Plain Woodland has also caused a decline in palatable plant species and compaction and erosion of topsoil as well as chemical modification of the soils. These agricultural practices continue to contribute to the habitat degradation of Cumberland Plain Woodland. Urban land use also contributes to habitat degradation across the Cumberland Plain, as urban runoff into remnant patches of Cumberland Plain Woodland is increased, leading to nutrient enrichment of soils and replacement of native flora by exotic species (DPIE, 2010).

Indicator	Extent/degree of reduction in ecological functions
	The degradation of habitat of Cumberland Plain Woodland as a result of these land uses results in the community being able to support fewer native flora and fauna species and provide the specific habitat features and microhabitats many species require (DPIE, 2010).
Fragmentation of habitat	Clearing has resulted in remaining areas of Cumberland Plain Woodland becoming severely fragmented. More than half of the remaining tree cover mapped by Tozer (2003) occurring in patches of less than 80 ha and half of all mapped patches being smaller than 3 ha.

c) Evidence of restricted geographic distribution (Principle 3. Clause 6.7(2)(c) BC Reg) based on the TEC's geographic range in NSW according to the:

i. Extent of occurrence
ii. Area of occupancy
iii. Number of threat-defined locations

Cumberland Plain Woodland is restricted to the Cumberland Plain within the Sydney Basin IBRA bioregion. It is currently known from the local government areas of Auburn, Bankstown, Baulkham Hills, Blacktown, Camden, Campbelltown, Fairfield, Hawkesbury, Holroyd, Liverpool, Parramatta, Penrith and Wollondilly (DPIE, 2010). The extent of occurrence of Cumberland Plain Woodland is estimated to be 2810 square kilometres, and the area of occupancy of under 2100 square kilometres (DPIE, 2010).

The NSW Scientific Committee published guidelines for interpreting listing criteria for species, populations and ecological communities under the BC Act and define a threat-defined location as a geographically or ecologically distinct area in which a single threatening event can rapidly affect all occurrences of an ecosystem type. The threshold for the number of threat-defined locations for an entity to be listed as critically endangered is one location. The threats defined in Section 2 of this assessment are likely to apply to most areas of Cumberland Plain Woodland, with the potential exception of areas of Cumberland Plain Woodland which are retained within conservation areas.

d) Evidence that the TEC is unlikely to respond to management (Principle 4. Clause 6.7(2)(d) BC Regulation)

The Final Determination for Cumberland Plain Woodland outlines that efforts to conserve the community through management of previously disturbed areas have had some success. These efforts have suggested that the community is capable of some recovery, provided the soils has not been disturbed by earthworks, cultivation, fertiliser application or other means of nutrient or moisture enrichment (DPIE, 2010). Where areas have undergone this soil disturbance, the community is unlikely to have a significant response to management. As most areas of the former distribution of Cumberland Plain Woodland have been subject to soil disturbance through agricultural use, or are now occupied by urban development, opportunities for successful restoration of the community are limited.

3. Record where the TBDC indicates data is 'unknown' or 'data deficient' for a TEC for a criterion.

Not applicable

4. In relation to the impacts from the proposal on the TEC at risk of an SAII, the following data and information is required:

e) The impact on the geographic extent of the TEC (Principles 1 and 3) by estimating the total area of the TEC to be impacted by the proposal:

i. In hectares, and
ii. As a percentage of the current geographic extent of the TEC in NSW

Cumberland Plain Woodland covers a total of 0.4 hectares within the subject land within two vegetation zones, Vegetation zone 1 – PCT 3320_moderate/good and Vegetation Zone 2 – PCT 3320_planted. 0.20 hectares of Vegetation Zone 2 – PCT 3320_planted would be directly impacted as a result of the Proposal. As stated in Table 10-2, there is currently approximately 11,200 hectares of Cumberland Plain Woodland within NSW. The area of Cumberland Plain Woodland to be impacted by the Amended Proposal equates to 0.0034 per cent of the estimated geographic extent of Cumberland Plain Woodland within NSW.

f) The extent that the proposed impacts are likely to contribute to further environmental degradation or the disruption of biotic processes (Principle 2) of the TEC by:

iii. Estimating the size of any remaining, but now isolated, areas of the TEC; including areas of the TEC within 500 metres of the development footprint or equivalent area for other types of proposals

One small patch (0.38 hectares) of PCT 3320 located in the north east of the subject land would be impacted as a result of the proposal. This patch consists of planted native *Corymbia maculata* and a largely exotic ground layer. About 0.20 hectares of this patch would be removed as part of the Proposal, leaving an area of approximately 0.1 hectares remaining. There are other patches of Cumberland Plain Woodland surrounding the subject land, particularly to the north west of the subject land within a conservation area and a small patch directly to the south of the subject land as shown in Figure 4-2. No additional areas of Cumberland Plain Woodland would be impacted by the Amended Proposal and therefore the Amended Proposal would not result in the any patches becoming isolated.

iv. Describing the impacts on connectivity and fragmentation of the remaining area of TEC measured by:

- *Distance between isolated areas of the TEC, presented as the average distance if the remnant is retained and the average distance if the remnant is removed as proposed*
- *Other information relevant to describing the impact on connectivity and fragmentation, such as the area to perimeter ratio for remaining areas of the TEC as a result of the development*

Patches of Cumberland Plain Woodland within 500 metres of the Amended Proposal are on average at a distance of approximately 393 metres from each other with the patch of PCT 3320 within the subject land retained. With the removal of most of the patch of PCT 3320 from within the subject land, the retained areas of Cumberland Plain Woodland will be on average 508 metres from each other. Due to the low habitat value of the Cumberland Plain Woodland within the subject land it is not anticipated to contribute significantly to dispersal of flora and fauna associated with Cumberland Plain Woodland.

As a large portion of the small patch of Cumberland Plain Woodland would be removed as a result of the Proposal, there would likely be an increase in the perimeter to area ratio of the remaining area. Furthermore, due to the small size of the remaining patch it is not anticipated to contribute significantly to connectivity in the area.

v. Describing the condition of the TEC according to the vegetation integrity score for the relevant vegetation zone(s)

The vegetation integrity scores for the Cumberland Plain Woodland vegetation zone to be cleared is 32.1 (Vegetation Zone 2 – PCT 3320_planted). Table 10-4 provides a summary of the attributes that contributed to the integrity score compared against the benchmark data for PCT 3320.

Table 10-4: Vegetation integrity scores for PCT 3320

Attribute	Benchmark	3320_planted
Tree richness	5	4
Shrub richness	8	0

Attribute	Benchmark	3320_planted
Grass and Grass Like Richness	12	2
Forb Richness	14	4
Fern Richness	2	0
Other Richness	5	0
Tree Cover	53	61.5
Shrub Cover	16	0
Grass and grass Like Cover	58	0.3
Forb Cover	9	0.5
Fern Cover	1	0
Other Cover	4	0
Total length of fallen logs	40	6
Litter Cover	40	56
Number of Large Trees	3	1
High Threat Weed Cover	0	2.9

10.2 Indirect impacts

The BAM (Section 8.2.2) identifies potential indirect impacts that, as a minimum, must be considered as a part of a BDAR. Of these potential indirect impacts, 12 are not relevant to the Amended Proposal and are therefore not considered further (Table 10-5). The remaining five potential indirect impacts can be minimised using standard management and mitigation measures that will be included in a CEMP for the project.

Table 10-5: Potential indirect impacts of the Proposal

Indirect impact type	Nature	Extent	Frequency	Duration	Timing
Impacts of the proposal on TECs/PCTs and/or threatened species and their habitat beyond the construction area, including but not limited to: (a) Inadvertent impacts on adjacent habitat or vegetation	Surrounding areas outside of the subject land are largely lacking in native vegetation, with either cleared and disturbed land or non-native vegetation. A small area to the south of the landfill area (and outside of the subject land) is native vegetation, but it is not adjacent to the area of vegetation clearance as part of the Amended Proposal (Figure 12-1). There is also a larger area of native vegetation within a conservation area immediately to the northwest of the subject land which is likely to comprise the Cumberland Plain Woodland TEC. With the appropriate mitigation measures implemented as outlined in Section 11.1, inadvertent impacts to this area are unlikely and considered to be minimal. Risks to surrounding vegetation as a result of the Amended Proposal is therefore considered to be low.	Adjacent non-native and native vegetation	During construction activities, mainly at the beginning during vegetation clearing	Throughout the construction period	Temporary
(b) Reduced viability of adjacent habitat due to edge effects	Surrounding areas are largely lacking in native vegetation. Native vegetation is present in a small area in the east and to the south of the landfill area (and outside of the subject land), as well as a larger area of native vegetation to the northwest. These areas are currently subject to high levels of edge effects. As little adjoining vegetation is to be removed, and construction and operational activities are fairly consistent with current activities of the site, edge effects are not anticipated to be enhanced by the Amended Proposal. Risks to surrounding vegetation are considered to be low. Appropriate mitigation measures as outlined in Section 11.1 will also be implemented and include updating the currently approved EMS and LVMP to include new areas of PCT which are to be protected and managed once construction is complete.	Adjacent non-native and native vegetation	On-going	Throughout construction and operation	Permanent (if they occur, risk is minimal)
(c) Reduced viability of adjacent habitat due to noise, dust or light spill	Adjacent habitat is primarily disturbed/cleared areas or non-native vegetation, providing limited resources for common flora and fauna. There is also an area of higher quality native vegetation to the northwest of the subject land. Construction	Adjacent non-native and native vegetation	During construction activities, mainly at the beginning	Throughout the construction period	Temporary

Indirect impact type	Nature	Extent	Frequency	Duration	Timing
	activities within the subject land will temporarily result in an increase in dust. However, impacts to surrounding vegetation are not likely to be significant, given the short-term nature of the construction and the existing impacts from the operational landfill experienced within the subject land. Standard dust and noise management will be part of the CEMP developed for the project.		during vegetation clearing		
(d) Transport of weeds and pathogens from the site to adjacent vegetation	This is a risk, since the subject land contains at least 22 weed species, five of which are priority weeds. Areas at risk are most likely to be areas of native vegetation offsite, or native vegetation adjacent to the construction footprint. This risk can be reduced significantly with the inclusion of weed and pathogen management protocols to prevent contaminated material inadvertently being taken off site, in vehicles, boots or topsoil.	Areas off-site of native vegetation	During construction activities, mainly at the beginning during vegetation clearing	Vegetation clearing component of construction	Potentially permanent if not managed adequately.
(e) Increased risk of starvation, exposure and loss of shade or shelter	N/A. Impact is small and unlikely to impact any significant fauna habitat	N/A	N/A	N/A	N/A
(f) Loss of breeding habitat	N/A. Impact is small and unlikely to impact any significant fauna habitat	N/A	N/A	N/A	N/A
(g) Trampling of threatened flora species	N/A. No threatened flora species detected or likely within adjacent vegetation.	N/A	N/A	N/A	N/A
(h) Inhibition of nitrogen fixation and increased soil salinity	N/A. The Amended Proposal is not expected to result in any inhibition of nitrogen fixation.	N/A	N/A	N/A	N/A
(i) Fertiliser drift	N/A. The Amended Proposal is not expected to result in any fertiliser drift.	N/A	N/A	N/A	N/A
(j) Rubbish dumping	N/A. The Amended Proposal is not expected to result in any additional rubbish dumping.	N/A	N/A	N/A	N/A
(k) Wood collection	N/A. The Amended Proposal is not expected to result in any wood collection.	N/A	N/A	N/A	N/A

Indirect impact type	Nature	Extent	Frequency	Duration	Timing
(l) Removal and disturbance of rocks, including bush rock	N/A. The Amended Proposal is not expected to result in any bush rock removal or disturbance.	N/A	N/A	N/A	N/A
(m) Increase in predators	N/A. The Amended Proposal is not expected to result in any increase in predatory species populations	N/A	N/A	N/A	N/A
(n) Increase in pest animal populations	Due to its current use as a landfill, pest species are already attracted to the subject land. The proposed modification is not expected to result in any increase in pest animal populations.	N/A	N/A	N/A	N/A
(o) Changed fire regimes	N/A. The Amended Proposal is not expected to result in any increased risk of fire.	N/A	N/A	N/A	N/A
(p) Disturbance to specialist breeding and foraging habitat, e.g. beach nesting for shorebirds.	N/A. The Amended Proposal is not expected to result in any disturbance to specialist breeding and foraging habitat.	N/A	N/A	N/A	N/A
(q) Injury and/or mortality of fauna	There is a risk the Amended Proposal may result in the injury and/or mortality of fauna species during the construction and operation. However, with the measures outlined in Section 11.1, the likelihood of this occurring is reduced.	Fauna species within the subject land	During construction and operation, particularly during vegetation clearing	Throughout construction and operation	Permanent

10.3 Aquatic impacts

Risks to aquatic biodiversity are considered to be minimal as Angus Creek has been assessed as providing minimal habitat. No threatened aquatic species listed under the FM Act would be impacted by the Amened Proposal. Standard mitigation and management measures, especially erosion and sedimentation minimisation will be employed to reduce the risks of indirect impacts to any surrounding waterways, mainly in reducing run off from the subject land. Indirect impacts are discussed further in Section 10.2.

10.4 Matters of National Environmental Significance

10.4.1 Overview

One EPBC Act listed migratory species was recorded within the subject land (Rufous Fantail). No additional threatened species, TECs or other MNES or their habitats were recorded within the subject land or considered likely to occur within the subject land.

Significant Impact Assessment using the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Significant Impact Guidelines 1.1 (DoE 2013) is provided below.

10.4.2 Significant impact assessment for Rufous Fantail

The Rufous Fantail occurs throughout coastal Australia from Adelaide around the east coast to Port Hedland in Western Australia. They also occur in the Solomon Islands, Guam and New Guinea, where they often spend the Australian winter. It is a small, insectivorous bird that gleans insects from rainforests, swamp woodlands, mangroves and wet sclerophyll forests throughout its range (BirdLife Australia 2023). It is similar to the Grey Fantail (*Rhipidura albiscapa*) but has a distinctive reddish-brown rump and bright red eyebrow.

The Rufous Fantail builds a small, compact cup nest of grasses, bound with spider webs that is built in the fork of a tree, about 5 metres from the ground. Both sexes share nest building, feeding and incubation duties, and one or two broods are raised each year (BirdLife Australia 2023).

Significant impact criteria as set out in the EPBC Significant Impact Guidelines 1.1 for migratory species - Rufous Fantail:

a. An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:
    i. substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species

Important habitat for Rufous Fantail is considered to include moist, dense mangroves, rainforest, riparian areas and wet eucalypt forests with a dense understorey (DoE, 2015). The high modified vegetation that occurs would be unlikely to constitute important habitat for this species. In addition, the threshold of area of important habitat impacted that may result in a significant impact to the species and require a referral to DAWE is 750 hectares.

The area of habitat for this species to be cleared for the Amended Proposal is 0.20 hectares and given the lack of potential habitat in the immediate area, it is unlikely that any areas of important habitat will be indirectly impacted. Given the small size, and highly modified nature of the habitat to be cleared, it is considered very unlikely that the project will significantly impact important habitat for this species. Areas of potentially important habitat for this species will remain along the riparian areas of Ropes Creek to the north of the subject land, and Western Sydney Parklands to the south east.

    ii. result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species,

The immediate surrounding areas are already highly disturbed and unlikely to provide significant habitat for this species. Therefore, there will be no important habitat impacted by indirect impacts as a

result of the Proposal. Further, standard measures to revegetate and manage weeds will form part of the construction environmental management plan for the Proposal, which will minimise the risk of an increase in invasive species as a result of the Proposal.

iii. seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

Breeding usually begins in September- October and occurs in humid places, such as dense creekside vegetation. The subject land does not contain this type of habitat and it is likely that the individual observed was foraging. Foraging resources within the subject land will be removed as part of clearing, however this represents only 0.20 hectares of habitat to be cleared. Alternative habitat is available nearby along Ropes Creek. The Amended Proposal would not seriously disrupt the life cycle of the species.

In summary, it is considered highly unlikely that the Amended Proposal will result in a significant impact on this species and a referral is not recommended.

11 MITIGATION OF IMPACTS

11.1 Mitigation measures

While the Amended Proposal will have relatively minor impacts on biodiversity, appropriate mitigation and management can reduce these even further. The measures in Table 11-1 have been developed to mitigate any remaining impacts as part of construction and operation of the Amended Proposal.

Table 11-1: Measures to be implemented to minimise impacts on biodiversity

Mitigation measure	Outcome	Timing	Responsibility
A Flora and Fauna Management sub-plan to the site-specific CEMP would be prepared. Clearing of native vegetation within the subject land would not occur until the CEMP, including the Flora and Fauna Management sub-plan was approved. The Flora and Fauna sub-plan would include, but not be limited to, the following: • Plans showing areas to be cleared and areas to be protected, including exclusion zones, protected habitat features and revegetation areas • Pre-clearing survey requirements for PCTs within and around the impact area • Procedures for unexpected threatened species finds and fauna handling • Protocols to manage weeds and pathogens.	Flora and fauna would be managed in accordance with the requirements of the CFFMP; prevention of over clearing of vegetation; prevention of weed establishment and invasion.	Pre-construction and construction	Construction contractor
Pre-clearing survey will be undertaken by an ecologist in the areas of identified as PCT 3320 and the eucalypt trees to be cleared in the north-east corner of the construction footprint.	Minimise fauna mortality and injury.	Pre-construction	Construction contractor Project ecologist
Site inductions for construction staff will include a briefing regarding the potential presence of, and protocols to be undertaken, if fauna are encountered.	Protect fauna species	Construction	Construction contractor
Directional lighting will be used where lighting is required in construction areas to reduce impacts on the local fauna.	Minimise disturbance to local native fauna.	Construction	Construction contractor
Mitigation measures to minimise the unnecessary generation of noise during construction will be incorporated in the CEMP.	Minimise disturbance to local native fauna.	Construction	Construction contractor
Any pits/trenches which may remain open overnight adjacent to native vegetation will be securely covered (if possible), or alternatively, fauna ramps (e.g., logs or wooden planks) will be installed to provide an escape for trapped fauna.	Prevent fauna injury/starvation/mortality	Construction	Construction contractor Project ecologist
ERSED (erosion and sediment) controls will be installed prior to the commencement of earthworks and construction, to minimise sediment	Protect waterways and retained vegetation	Construction	Construction contractor

Mitigation measure	Outcome	Timing	Responsibility
laden run-off into adjoining vegetation and waterways including Angus Creek.			
Where possible, earthworks would be undertaken during dry weather conditions.	Prevent erosion and downstream water quality impacts	Construction	Construction contractor
Clearing of vegetation should be avoided during overland flow events, if possible.	Prevent erosion and downstream water quality impacts	Construction	Construction contractor
If any animal is injured, contact the relevant local wildlife rescue agency (e.g., WIRES) and/or veterinary surgery as soon as practical. Until the animal can be cared for by a suitably qualified animal handler, if possible, minimise stress to the animal and reduce the risk of further injury by: • Handling fauna with care and as little as possible • Covering larger animals with a towel or blanket and placing in a large cardboard box • Placing small animals in a cotton bag, tied at the top • Keeping the animal in a quiet, warm, ventilated and dark location.	Minimise fauna mortality and injury	All stages	Construction contractor Project ecologist
The currently approved EMS and LVMP will be updated to include the new areas of PCT which are to be protected and managed once construction is complete.	Protect areas of retained native vegetation	Post construction / operation	Construction contractor

12 IMPACT SUMMARY AND OFFSETS

The following section summarises the impacts of the Amended Proposal and outlines the offsets required in accordance with the BAM.

12.1 Impacts requiring offset

12.1.1 Impacts on native vegetation

The impacts of the Amended Proposal on native vegetation that require offset (in accordance with Section 9.2 of the BAM and as determined using the BAM-C) are outlined below in Table 12-1 and Figure 12-1. The full biodiversity offset credit reports are provided in Appendix F of this BDAR.

Table 12-1: Impact summary for PCTs requiring offsets and the associated ecosystem credit requirements

Vegetation Zone	PCT Name	Area to be impacted (ha)	Change in vegetation integrity score	Ecosystem credits required
3320_planted	Cumberland Shale Plains Woodland	0.20	-33.5	4

With the Amended Proposal PCT 3320_moderate/good does not require offset credits as there is no longer a requirement to remove this vegetation as part of the construction footprint.

12.1.2 Impacts on species credit species

Impacts to species credit species as a result of the Amended Proposal can require offsetting in accordance with Section 10.1.1 of the BAM if there are impacts to these species. The full biodiversity offset credit reports are provided in Appendix F of this BDAR.

A dual credit species was recorded, the Large Bent-wing Bat (*Miniopterus orianae oceanensis*), however this species only requires species credits when breeding habitat is to be removed. Breeding habitat is not present within the subject land, only foraging habitat.

12.2 Impacts not requiring offsetting or further assessment

Impacts of the Amended Proposal on areas that are not native vegetation communities are not required to be assessed or offset (Section 9.3 of the BAM). The impacts on cleared land and exotic grassland within the subject land do not require offsetting (Table 12-3).

Table 12-3: Areas not requiring assessment

Vegetation zone	Extent in the subject land (ha)	Extent in the construction footprint (ha)
Exotic grassland	20.64	6.52
Exotic/planted trees and shrubs	1.54	0.91
Total area non-native vegetation	**22.18**	**7.43**

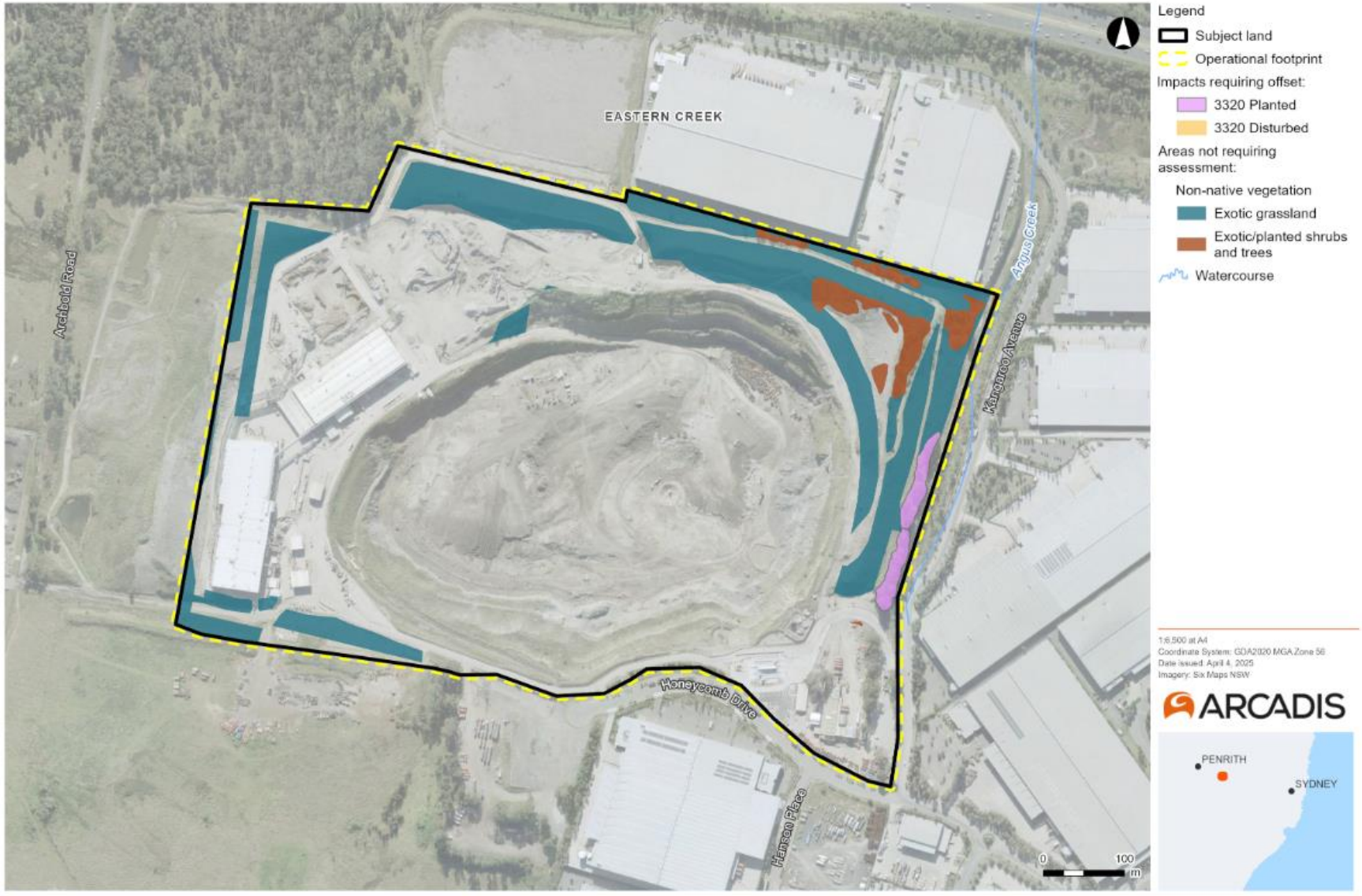

Figure 12-1: *Impact summary*

13 OFFSET STRATEGY

The impacts of the Amended Proposal have been assessed in accordance with the BC Act and the BAM. As such, the offset requirement presented in Section 13 of this ASR BDAR 2025 are in the form of BAM credits.

13.1 Biodiversity Conservation Fund

The available options for delivery of offsets under the Biodiversity Offset Scheme are as follows:

- An appropriate number and class of like-for-like biodiversity credits may be retired.
- If all the required like-for-like biodiversity credits cannot be sourced, an appropriate number and class of variation biodiversity credits may be retired
- The Biodiversity Offsets Payment Calculator (BOPC) was replaced by the BCF Charge System on 17 October 2022. The new BCF Charge System is now be used to determine the amount a proponent must pay into the BCF to meet a biodiversity offset obligation. BCF can be contacted to determine the amount required for payment
- The proponent can purchase credits from the market.

14 CONCLUSION

Arcadis was commissioned by Bingo to prepare a BDAR to support the preparation of a State Significant Development (SSD) Environmental Impact Statement (EIS) under Part 4, Division 4.7 of the of the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the upgrade and construction of supporting infrastructure to optimise the current operation at Eastern Creek REP and facilitate the increased throughput proposed to be received at the Proposal Site.

Arcadis has updated this BDAR to assess the Amended Proposal.

The subject land contains 22.57 hectares of vegetation which consists of native (0.40 hectares) and non-native vegetation (22.17 hectares). The native vegetation required to be cleared is consistent with the Plant Community Type 3320 – Cumberland Shale Plains Woodland.

PCT 3320 exists within two distinct vegetation zones within the subject land – planted and moderate/good condition. Only the planted vegetation will be removed as part of the Amended Proposal.

Two non-native vegetation communities that do not conform to a PCT are also present in the subject land. Vegetation zones within the subject land, their associated PCT and their calculated vegetation integrity scores are as follows:

PCT ID	PCT Name	Vegetation zone	Vegetation integrity score	Extent in the subject land (ha)	Extent in the impact area (ha)
3320	Cumberland Shale Plains Woodland	3320_planted	33.5	0.38	0.20
3320		3320_moderate/good	58.4	0.02	0
Other vegetation types		Exotic grassland	N/A	20.63	6.52
		Exotic/planted trees and shrubs	N/A	1.54	0.91
Total area native vegetation				**0.40**	**0.20**
Total area vegetation				**22.57**	**7.63**

The area of PCT 3320 present in the subject land are consistent with the Threatened Ecological Community (TEC), Cumberland Plain Woodland in the Sydney Basin Bioregion, listed as Critically Endangered under the NSW *Biodiversity Conservation Act 2016* (BC Act). It does not meet the condition criteria to be listed under Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Offsets for the Amended Proposal were calculated using the BAM-C. Six ecosystem credits for PCT 3320 were originally required as part of the previous Proposal, but the Amended Proposal has reduced the footprint within the area of PCT 3320 to only the planted component and as such, four ecosystem credits are required to offset the removal of 0.20 hectares of the PCT 3320 Cumberland Shale Plains Woodland.

One threatened flora species, *Eucalyptus scoparia,* was tentatively identified within the subject land. This species is locally indigenous to the Tenterfield region within the New England Tablelands and is not native to the Sydney area and therefore individuals should be treated as planted vegetation and not of conservation significance.

No additional threatened flora species were recorded within the subject land during targeted surveys. Another species, *Dichanthium setosum* (Bluegrass) was also identified opportunistically on-site, but this species is also obviously planted and outside of its natural range and therefore not of conservation significance.

Fifty-nine threatened fauna species have the potential to occur on the subject land and were assessed for potential occurrence and impact. An additional ten migratory species, listed under the

EPBC Act were also assessed. One migratory species was identified on subject land (Rufous Fantail - *Rhipidura rufifrons*). Potential impacts of the Amended Proposal on this species are considered to be minimal, therefore a referral to DCCEEW is not recommended. No threatened species listed under the EPBC Act were recorded or considered likely to occur.

Two microbat species listed as Vulnerable under the BC Act were recorded as possibly occurring using echolocation call analysis – the Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*) which is an ecosystem species and Large Bent-wing Bat (*Miniopterus orianae oceanensis)* which is a dual credit species under the BAM scheme. No breeding habitat exists on the subject land for this species. Offsets for these species are accounted for in the vegetation offsets above. No species credits are required for the Amended Proposal.

No threatened species listed under the FM Act would be impacted by the Amended Proposal.

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APPENDIX A: FLORA RECORDED IN THE SUBJECT LAND (ARCADIS, 2021)

Family	Scientific name	Common name	BC Act status	EPBC Act status	Cover in each plot	
					EC01	EC02
Acanthaceae	*Brunoniella australis*	Blue Trumpet	-	-	0.2	0.1
Amaranthaceae	*Alternanthera pungens*	Khaki Weed	-	-		
Apiaceae	*Foeniculum vulgare*	Fennel	-	-		
Apiaceae	*Hydrocotyle bonariensis*		-	-		25.0
Apocynaceae	*Araujia sericiflora*	Moth Vine	-	-	0.5	
Apocynaceae	*Gomphocarpus fruticosus*	Narrow-leaved Cotton Bush	-	-	0.1	
Arecaceae	*Phoenix canariensis*	Canary Island Date Palm	-	-		
Asparagaceae	*Asparagus asparagoides*	Bridal Creeper	-	-		0.1
Asteraceae	*Ageratina adenophora*	Crofton Weed	-	-		
Asteraceae	*Bidens pilosa*	Cobbler's Pegs	-	-	0.2	0.2
Asteraceae	*Cirsium vulgare*	Spear Thistle	-	-	0.2	0.1
Asteraceae	*Conyza bonariensis*	Flaxleaf Fleabane	-	-	0.1	

Family	Scientific name	Common name	BC Act status	EPBC Act status	Cover in each plot	
					EC01	EC02
Asteraceae	*Hypochoeris radicata*	Catsear	-	-	0.2	0.1
Asteraceae	*Senecio madagascariensis*	Fireweed	-	-	0.1	
Asteraceae	*Senecio spp.*	Groundsel, Fireweed	-	-	5.0	0.1
Chenopodiaceae	*Einadia nutans*	Climbing Saltbush	-	-		
Commelinaceae	*Commelina cyanea*	Native Wandering Jew	-	-	0.5	
Convolvulaceae	*Dichondra repens*	Kidney Weed	-	-	0.2	0.2
Cyperaceae	*Carex spp.*		-	-	0.1	
Euphorbiaceae	*Ricinus communis*	Castor Oil Plant	-	-		
Fabaceae (Faboideae)	*Glycine clandestina*	Twining glycine	-	-	0.2	
Fabaceae (Mimosoideae)	*Acacia saligna*	Golden Wreath Wattle	-	-		0.1
Geraniaceae	*Geranium homeanum*		-	-		
Geraniaceae	*Geranium solanderi*	Native Geranium	-	-	0.5	
Malvaceae	*Sida rhombifolia*	Paddy's Lucerne	-	-	1.0	0.1

Family	Scientific name	Common name	BC Act status	EPBC Act status	Cover in each plot	
					EC01	EC02
Myrtaceae	*Corymbia maculata*	Spotted Gum	-	-		59.0
Myrtaceae	*Eucalyptus cinerea*	Argyle Apple	-	-		1.0
Myrtaceae	*Eucalyptus moluccana*	Grey Box	-	-	30.0	
Myrtaceae	*Eucalyptus scoparia*	Wallangarra White Gum	Endangered	Vulnerable		
Myrtaceae	*Eucalyptus tereticornis*	Forest Red Gum	-	-	25.0	0.5
Myrtaceae	*Lophostemon confertus*	Brush Box	-	-		1.0
Oleaceae	*Ligustrum lucidum*	Large-leaved Privet	-	-		0.1
Oleaceae	*Olea europaea subsp. cuspidata*	African Olive	-	-	0.5	
Oxalidaceae	*Oxalis perennans*		-	-	0.1	0.1
Plantaginaceae	*Plantago lanceolata*	Lamb's Tongues	-	-	0.2	0.2
Poaceae	*Cenchrus setaceus*	Fountain Grass	-	-		
Poaceae	*Chloris gayana*	Rhodes Grass	-	-		0.5
Poaceae	*Cortaderia selloana*	Pampas Grass	-	-		

Family	Scientific name	Common name	BC Act status	EPBC Act status	Cover in each plot	
					EC01	EC02
Poaceae	*Cymbopogon refractus*	Barbed Wire Grass	-	-		
Poaceae	*Cynodon dactylon*	Common Couch	-	-	5.0	0.2
Poaceae	*Dichanthium sericeum*	Queensland Bluegrass	-	-	1.0	
Poaceae	*Dichanthium setosum*	Bluegrass	Vulnerable	Vulnerable	Opportunistically (Planted, not in natural range)	
Poaceae	*Dichelachne micrantha*	Shorthair Plumegrass	-	-	0.1	
Poaceae	*Eragrostis curvula*	African Lovegrass	-	-	0.2	2.0
Poaceae	*Melinus repens*	Red Natal Grass	-	-		
Poaceae	*Microlaena stipoides*	Weeping Grass	-	-	65.0	0.1
Poaceae	*Paspalum dilatatum*	Paspalum	-	-	5.0	
Poaceae	*Pennisetum clandestinum*	Kikuyu Grass	-	-	5.0	10.0
Poaceae	*Pennisetum setaceum*	Fountain Grass	-	-		1.0
Poaceae	*Setaria parviflora*		-	-	5.0	
Poaceae	*Setaria pumila*	Pale Pigeon Grass	-	-		

Family	Scientific name	Common name	BC Act status	EPBC Act status	Cover in each plot	
					EC01	EC02
Poaceae	*Themeda triandra*		-	-	5.0	
Polygonaceae	*Rumex brownii*	Swamp Dock	-	-		
Solanaceae	*Lycium ferocissimum*	African Boxthorn	-	-	0.1	
Solanaceae	*Solanum sisymbriifolium*		-	-	0.1	0.1
Verbenaceae	*Verbena bonariensis*	Purpletop	-	-		0.1
Verbenaceae	*Verbena rigida*	Veined Verbena	-	-		0.1

APPENDIX B: FAUNA RECORDED IN THE SUBJECT LAND (ARCADIS, 2021)

Common name	Scientific name	Status (BC Act)	Status (EPBC Act)	Observation type	Introduced (Yes/No)
Birds					
Australian Raven	*Corvus coronoides*	-	-	W	No
Welcome Swallow	*Hirundo neoxena*	-	-	O	No
Willie Wagtail	*Rhipidura leucophrys*	-	-	W	No
Rufous Fantail	*Rhipidura rufifrons*	-	Mi	O	No
Mammals					
Gould's Wattle Bat	*Chalinolobus gouldii*	-	-	U – Confident	No
Large Bent-winged Bat	*Miniopterus orianae oceanensis*	V	-	U – Possible (species complex)	No
Eastern Coastal Free-tailed Bat	*Micronomus norfolkensis*	V	-	U – Possible (species complex)	No
Ride's Free-tailed Bat	*Ozimops ridei*	-	-	U – Possible (species complex)	No
Southern Forest Bat	*Vespadelus regulus*	-	-	U – Possible (species complex)	No
Fox	*Vulpes vulpes*	-	-	P	Yes
Rabbit	*Oryctolagus cuniculus*	-	-	P	Yes
Domestic Cat	*Felis catus*	-	-	O	Yes
Amphibians					
Common Froglet	*Crinia signifera*	-	-	W	No
Invertebrates					
Garden Snail	*Helix aspersa*	-	-	O	Yes

W – Heard, O – Observed, U – Ultrasonic recording, P - Scat

APPENDIX C: PMST REPORT

APPENDIX D: DATABASE SEARCH RESULTS - FLORA

Scientific name	Common name	BC Act status	EPBC Act status	Database records	Habitat requirements	Likelihood of occurrence
Acacia byoeana	Bynoe's Wattle	E	V	PMST	Occurs in heath or dry sclerophyll forest on sandy soils. Seems to prefer open, sometimes slightly disturbed sites such as trail margins, edges of roadside spoil mounds and in recently burnt patches. Associated overstorey species include Red Bloodwood, Scribbly Gum, Parramatta Red Gum, Saw Banksia and Narrow-leaved Apple.	Species assessed in Section 6.1.2 as part of BAM-C species assessment.
Acacia pubescens	Downy Wattle	V	V	Bionet – 68 (2022) PMST	Occurs on alluviums, shales and at the intergrade between shales and sandstones. The soils are characteristically gravely soils, often with ironstone. Occurs in open woodland and forest, in a variety of plant communities, including Cooks River/Castlereagh Ironbark Forest, Shale/Gravel Transition Forest and Cumberland Plain Woodland. Longevity is unknown, but clonal species have been known to survive for many decades. Flowers from August to October. Pollination of Acacia flowers is usually by insects and birds. The pods mature in October to December.	Species assessed in Section 6.1.2 as part of BAM-C species assessment.
Allocasuarina glareicola		E	E	Bionet – 1 (2018) PMST	Grows in Castlereagh woodland on lateritic soil. Found in open woodland with *Eucalyptus parramattensis*, *Eucalyptus fibrosa*, *Angophora bakeri*, *Eucalyptus sclerophylla* and Melaleuca decora. Common associated understorey species include *Melaleuca nodosa*, *Hakea dactyloides*, *Hakea sericea, Dillwynia tenuifolia*, *Micromyrtus minutiflora*, *Acacia elongata, Acacia brownei, Themeda australis* and *Xanthorrhoea minor*. Not killed outright by fire but resprouts from the rootstock. Spreads by vegetative means, such that clumps of up to 100s of stems may be a single individual. The time taken for the plants to flower and set seed is not known, but only those plants growing in areas unburnt for some time produced substantial numbers of fruit.	Low – No suitable habitat present within the subject land.
Caaladenia tessellata	Thick Lip Spider Orchid	E	V	PMST	The Thick Lip Spider Orchid is known from the Sydney area (old records), Wyong, Ulladulla and Braidwood in NSW. Populations	Low – no suitable habitat

Scientific name	Common name	BC Act status	EPBC Act status	Database records	Habitat requirements	Likelihood of occurrence
					in Kiama and Queanbeyan are presumed extinct. It was also recorded in the Huskisson area in the 1930s. The species occurs on the coast in Victoria from east of Melbourne to almost the NSW border. Generally found in grassy sclerophyll woodland on clay loam or sandy soils, though the population near Braidwood is in low woodland with stony soil.	
Callistemon linearifolius	Netted Bottle Brush	V	Not Listed	Bionet – 1 (2013)	Grows in dry sclerophyll forest on the coast and adjacent ranges. Flowers spring – summer.	Low – No suitable habitat present within the subject land.
Cryptostylis hunteriana	Leafless Tongue-orchid	V	V	PMST	Does not appear to have well defined habitat preferences and is known from a range of communities, including swamp-heath and woodland. The larger populations typically occur in woodland dominated by Scribbly Gum (*Eucalyptus sclerophylla*), Silvertop Ash (*E. sieberi*), Red Bloodwood (*Corymbia gummifera*) and Black Sheoak (*Allocasuarina littoralis*); appears to prefer open areas in the understorey of this community and is often found in association with the Large Tongue Orchid (*C. subulata*) and the Tartan Tongue Orchid (*C. erecta).*	Low – No suitable habitat present within the subject land.
Cynanchum elegans	White-flowered Wax Plant	E	E	Bionet – 1 (1993) PMST	The White-flowered Wax Plant usually occurs on the edge of dry rainforest vegetation. Other associated vegetation types include littoral rainforest; Coastal Tea-tree Leptospermum laevigatum – Coastal Banksia *Banksia integrifolia subsp. integrifolia* coastal scrub; Forest Red Gum *Eucalyptus tereticornis* aligned open forest and woodland; Spotted Gum *Corymbia maculata* aligned open forest and woodland; and Bracelet Honeymyrtle *Melaleuca armillaris* scrub to open scrub. Flowering occurs between August and May, with a peak in November.	Species assessed in Section 6.1.2 as part of BAM-C species assessment.
Darwinia biflora		V	V	PMST	Occurs on the edges of weathered shale-capped ridges. Associated overstorey species include *E. haemastoma*, *Corymbia gummifera* and *E. squamosa*. Fire is important for germination with areas with the chances of detection reduced at sites where fire has been absent.	Low – no suitable habitat

Scientific name	Common name	BC Act status	EPBC Act status	Database records	Habitat requirements	Likelihood of occurrence
Dillwynia tenuifolia	Dillwynia tenuifolia, Kemps Creek	V	Not Listed	Bionet – 805(2020)	In western Sydney, may be locally abundant particularly within scrubby/dry heath areas within Castlereagh Ironbark Forest and Shale Gravel Transition Forest on tertiary alluvium or laterised clays. May also be common in transitional areas where these communities adjoin Castlereagh Scribbly Gum Woodland. At Yengo, is reported to occur in disturbed escarpment woodland on Narrabeen sandstone. *Eucalyptus fibrosa* is usually the dominant canopy species. *Eucalyptus globoidea, E. longifolia, E. parramattensis, E. sclerophylla* and *E. sideroxylon* may also be present or codominant, with Melaleuca decora frequently forming a secondary canopy layer. Associated species may include *Allocasuarina littoralis, Angophora bakeri, Aristida spp. Banksia spinulosa, Cryptandra* spp. *Daviesia ulicifolia, Entolasia stricta, Hakea sericea, Lissanthe strigosa, Melaleuca nodosa, Ozothamnus diosmifolius* and *Themeda australis*. *D. tenuifolia* is often found in association with other threatened species such as *Dodonaea falcata, Grevillea juniperina, Micromyrtus minutiflora, Pultenaea parviflora* and *Styphelia laeta.*	Species assessed in Section 6.1.2 as part of BAM-C species assessment.
Genoplesium baueri	Yellow Gnat-orchid	E	E	PMST	Grows in dry sclerophyll forest and moss gardens over sandstone. Flowers February to March.	Low – No suitable habitat present within the subject land.
Grevillea juniperina subsp. juniperina	Juniper-leaved Grevillea	V	Not Listed	Bionet – 2819 (2021)	Grows on reddish clay to sandy soils derived from Wianamatta Shale and Tertiary alluvium (often with shale influence), typically containing lateritic gravels. Recorded from Cumberland Plain Woodland, Castlereagh Ironbark Woodland, Castlereagh Scribbly Gum Woodland and Shale/Gravel Transition Forest. Associated canopy species within Cumberland Plain Woodland and Shale/Gravel Transition Forest include *Eucalyptus tereticornis, E. moluccana, E. crebra, E. fibrosa* and *E. eugenioides*. Understorey species *include Bursaria spinosa, Dillwynia sieberi, Ozothamnus diosmifolius, Daviesia ulicifolia, Acacia falcata, Acacia parramattensis, Themeda australis,*	Species assessed in Section 6.1.2 as part of BAM-C species assessment.

Scientific name	Common name	BC Act status	EPBC Act status	Database records	Habitat requirements	Likelihood of occurrence
					Aristida ramosa, Cymbopogon refractus, Eragrostis brownii, Cheilanthes sieberi, Dianella revoluta and *Goodenia hederacea*.	
Grevillea parviflora subsp. parviflora	Small-flower Grevillea	V	V	Bionet – 3 (2015) PMST	Grows in dry sclerophyll forest on the coast and adjacent ranges. Flowers spring – summer.	Low – No suitable habitat present within the subject land.
Haloragis exalata subsp. Exalata	Wingless Raspwort	V	V	PMST	Square Raspwort appears to require protected and shaded damp situations in riparian habitats. Flowering specimens in NSW are recorded from November to January.	Low – No suitable habitat present within the subject land.
Hibbertia puberula		E	Not Listed	Bionet – 3 (2018)	Flowering time is October to December, sometimes into January. Occurs on sandy soil often associated with sandstone, or on clay. Habitats are typically dry sclerophyll woodland communities, although heaths are also occupied. One of the recently (2012) described subspecies also favours upland swamps.	Low – No suitable habitat present within the subject land.
Macadamia integrifolia	Macadamia Nut	Not Listed	V	Bionet – 3 (2017)	Not known to occur naturally in the wild in NSW.	Low - Not known to occur naturally in the wild in NSW.
Marsdenia viridiflora subsp. viridiflora	Marsdenia viridiflora R. Br. subsp. viridiflora population in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool and Penrith local	EP	Not Listed	Bionet – 66 (2018)	Grows in vine thickets and open shale woodland. Recent records are from Prospect, Bankstown, Smithfield, Cabramatta Creek and St Marys. Previously known north from Razorback Range.	Species assessed in Section 6.1.2 as part of BAM-C species assessment.

Scientific name	Common name	BC Act status	EPBC Act status	Database records	Habitat requirements	Likelihood of occurrence
	government areas					
Melaleuca deanei	Deane's Melaleuca	V	V	PMST	The species occurs mostly in ridgetop woodland, with only 5% of sites in heath on sandstone. Flowers appear in summer but seed production appears to be small and consequently the species exhibits a limited capacity to regenerate.	Low – No suitable habitat present within the subject land.
Micromyrtus minutiflora		E	V	Bionet – 6 (2004) PMST	Grows in Castlereagh Scribbly Gum Woodland, Ironbark Forest, Shale/Gravel Transition Forest, open forest on tertiary alluvium and consolidated river sediments. Sporadic flowering, June to March Response to fire and mechanical disturbance is uncertain. Regeneration may be due to resprouting or germination of soil-stored seed.	Low – No suitable habitat present within the subject land.
Persicaria elatior	Knotweed	V	V	PMST	This species normally grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance.	Low – No suitable habitat present within the subject land.
Persoonia hirsuta	Hairy Geebung	E	E	PMST	The Hairy Geebung is found in sandy soils in dry sclerophyll open forest, woodland and heath on sandstone. It is usually present as isolated individuals or very small populations. It is probably killed by fire (as other Persoonia species are) but will regenerate from seed.	Low – No suitable habitat present within the subject land.
Persoonia nutans	Nodding Geebung	E	E	Bionet – 22 (2021) PMST	Northern populations are confined to aeolian and alluvial sediments and occur in a range of sclerophyll forest and woodland vegetation communities, with the majority of individuals occurring within Agnes Banks Woodland or Castlereagh Scribbly Gum Woodland and some in Cooks River / Castlereagh Ironbark Forests. Southern populations also occupy tertiary alluvium, but extend onto shale sandstone transition communities and into Cooks River / Castlereagh Ironbark Forest.;1|Peak flowering is from November to March with sporadic flowering all year round.	Low – No suitable habitat present within the subject land.

Scientific name	Common name	BC Act status	EPBC Act status	Database records	Habitat requirements	Likelihood of occurrence
Pilularia novae-hollandiae	Austral Pillwort	E	Not Listed	Bionet – 1 (1966)	Austral Pillwort grows in shallow swamps and waterways, often among grasses and sedges. It is most often recorded in drying mud as this is when it is most conspicuous. Most of the records in the Albury-Urana area were from table drains on the sides of roads. The ACT record was from a subalpine grassy plain. This species is probably ephemeral (especially in the drier parts of its range), appearing when soils are moistened by rain.	Low – No suitable habitat present within the subject land.
Pimelea curviflora var. curviflora		V	V	Bionet – 3 (2018) PMST	Occurs on shaley/lateritic soils over sandstone and shale/sandstone transition soils on ridgetops and upper slopes amongst woodlands. Also recorded in Illawarra Lowalnd Grassy Woodland habitat at Albion Park on the Illawaraa coastal plain. Flowers October to May. Has an inconspicuous cryptic habit as it is fine and scraggly and often grows amongst dense grasses and sedges. It may not always be visible at a site as it appears to survive for some time without any foliage after fire or grazing, relying on energy reserves in its tuberous roots.	Low – No suitable habitat present within the subject land.
Pimelea spicata	Spiked Rice-flower	E	E	PMST Bionet – 281 (2023)	In both the Cumberland Plain and Illawarra environments this species is found on well-structured clay soils. On the Cumberland Plain sites it is associated with Grey Box communities (particularly Cumberland Plain Woodland variants and Moist Shale Woodland) and in areas of ironbark. The co-occurring species in the Cumberland Plain sites are grey box (*Eucalyptus moluccana*), forest red gum (*E. tereticornis*) and narrow-leaved ironbark (*E. crebra*). Blackthorn (*Bursaria spinosa*) is often present at sites (and may be important in protection from grazing) and kangaroo grass (*Themeda australis*) is usually present in the groundcover (also indicative of a less intense grazing history).	Species assessed in Section 6.1.2 as part of BAM-C species assessment.
Pomaderris brunnea	Rufous Pomaderris	E	V	PMST	Brown Pomaderris grows in moist woodland or forest on clay and alluvial soils of flood plains and creek lines. Flowers appear in September and October. The species is expected to live for 10 - 20 years, while the minimum time to produce seed is	Low – No suitable habitat present within the subject land.

Scientific name	Common name	BC Act status	EPBC Act status	Database records	Habitat requirements	Likelihood of occurrence
					estimated to be 4 - 6 years. The species has been found in association with *Eucalyptus amplifolia, Angophora floribunda, Acacia parramattensis, Bursaria spinosa* and *Kunzea ambigua.*	
Pterostylis gibbosa	Illawarra Greenhood	E	E	PMST	All known populations grow in open forest or woodland, on flat or gently sloping land with poor drainage. In the Illawarra region, the species grows in woodland dominated by Forest Red Gum *Eucalyptus tereticornis*, Woollybutt *E. longifolia* and White Feather Honey-myrtle Melaleuca decora. Near Nowra, the species grows in an open forest of Spotted Gum *Corymbia maculata*, Forest Red Gum and Grey Ironbark *E. paniculat*. In the Hunter region, the species grows in open woodland dominated by Narrow-leaved Ironbark *E. crebra*, Forest Red Gum and Black Cypress Pine *Callitris endlicheri*. The Illawarra Greenhood is a deciduous orchid that is only visible above the ground between late summer and spring, and only when soil moisture levels can sustain its growth.	Low – No suitable habitat present within the subject land.
Pterostylis saxicola	Sydney Plains Greenhood	E	E	Bionet – 1 (no date) PMST	Most commonly found growing in small pockets of shallow soil in depressions on sandstone rock shelves above cliff lines. The vegetation communities above the shelves where *Pterostylis saxicola* occurs are sclerophyll forest or woodland on shale/sandstone transition soils or shale soils. All species of Pterostylis are deciduous and die back to fleshy, rounded underground tuberoids. The time of emergence and withering has not been recorded for this species, however flowering occurs from October to December and may vary due to climatic conditions. The above ground parts of the plant wither and die following seed dispersal and the plant persists as a tuberoid until the next year. Typically occurs as scattered individuals or in small groups.	Low – No suitable habitat present within the subject land.
Pultenaea parviflora		E	V	Bionet – 503 (2019)	May be locally abundant, particularly within scrubby/dry heath areas within Castlereagh Ironbark Forest and Shale Gravel Transition Forest on tertiary alluvium or laterised clays. May	Low – No suitable habitat present within the subject land.

Scientific name	Common name	BC Act status	EPBC Act status	Database records	Habitat requirements	Likelihood of occurrence
				PMST	also be common in transitional areas where these communities adjoin Castlereagh Scribbly Gum Woodland. *Eucalyptus fibrosa* is usually the dominant canopy species. *Eucalyptus globoidea, E. longifolia, E. parramattensis, E. sclerophylla* and *E. sideroxylon* may also be present or co-dominant, with *Melaleuca decora* frequently forming a secondary canopy layer. Associated species may include *Allocasuarina littoralis, Angophora bakeri, Aristida spp. Banksia spinulosa, Cryptandra spp., Daviesia ulicifolia, Dodonaea falcata, Entolasia stricta, Hakea sericea, Lissanthe strigosa, Melaleuca nodosa, Ozothamnus diosmifolius, Styphelia laeta* and *Themeda australis*. Often found in association with other threatened species such as *Dillwynia tenuifolia, Grevillea juniperina, Micromyrtus minutiflora* and *Persoonia nutans*.	
Rhizanthella slateri	Eastern Underground Orchid	V	E	PMST	Habitat requirements are poorly understood and no particular vegetation type has been associated with the species, although it is known to occur in sclerophyll forest. Highly cryptic given that it grows almost completely below the soil surface, with flowers being the only part of the plant that can occur above ground. Therefore, usually located only when the soil is disturbed. Flowers September to November.	Low – No suitable habitat present within the subject land.
Rhodamnia rubescens	Scrub Turpentine	CE	Not Listed	PMST	Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils. This species is characterised as highly to extremely susceptible to infection by Myrtle Rust. Myrtle Rust affects all plant parts.	Low – No suitable habitat present within the subject land.
Rhodomyrtus psidiodes	Native Guava	CE	Not Listed	PMST	Pioneer species found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest often near creeks and drainage lines. This species is characterised being extremely susceptible to infection by Myrtle Rust. Myrtle Rust affects all plant parts.	Low – No suitable habitat present within the subject land.

Scientific name	Common name	BC Act status	EPBC Act status	Database records	Habitat requirements	Likelihood of occurrence
Syzygium paniculatum	Magenta Lilly Pilly	E	V	PMST	On the south coast the Magenta Lilly Pilly occurs on grey soils over sandstone, restricted mainly to remnant stands of littoral (coastal) rainforest. On the central coast Magenta Lilly Pilly occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities.	Low – No suitable habitat present within the subject land.
Thesium australe	Austral Toadflax	V	V	PMST	Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. Often found in association with Kangaroo Grass (*Themeda australis*). A root parasite that takes water and some nutrient from other plants, especially Kangaroo Grass.	Species assessed in Section 6.1.2 as part of BAM-C species assessment.

V – Vulnerable, E – Endangered CE – Critically endangered, EP – Endangered population, X - Extinct

APPENDIX E: DATABASE SEARCH RESULTS – FAUNA

Descriptions from Environment, Energy and Science www.environment.nsw.gov.au. Excludes migratory only species which are shown below.

Scientific name	Common name	BC Act status	EPBC Act status	Database records	Habitat requirements	Likelihood of occurrence?
BIRDS						
Hirundapus caudacutus	White-throated Needletail	Not Listed	V, Mi	BioNet – 2 (2018) PMST	Migratory and usually seen in eastern Australia from October to April. Breeds in forests in south-eastern Siberia, Mongolia, the Korean Peninsula and northern Japan June-August. Most often seen in eastern Australia before storms, low pressure troughs and approaching cold fronts and occasionally bushfire. These conditions are often used by insects to swarm (e.g., termites and ants) or tend to lift insects away from the surface which favours sighting of White-throated Needletails as they feed. More common in coastal areas, less so inland.	Low. May occasionally fly over but roosting habitat does not occur.
Ephippiorhynchus asiaticus	Black-necked Stork	E	Not Listed	BioNet – 1 (2006)	Floodplain wetlands (swamps, billabongs, watercourses and dams) of the major coastal rivers are the key habitat in NSW for the Black-necked Stork. Secondary habitat includes minor floodplains, coastal sandplain wetlands and estuaries. Storks usually forage in water 5-30cm deep for vertebrate and invertebrate prey. Black-necked Storks build large nests high in tall trees close to water. Trees usually provide clear observation of the surroundings and are at low elevation (reflecting the floodplain habitat). In NSW, breeding activity occurs May - January; incubation May - October; nestlings July - January; fledging from September.	Low. Suitable habitat does not occur.
Ixobrychus flavicollis	Black Bittern	V	Not Listed	BioNet – 1 (2016)	Inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves. Feeds on frogs, reptiles, fish and invertebrates, including snails, dragonflies, shrimps and crayfish, with most feeding done at dusk and at night. During the day, roosts in trees or on the ground amongst dense reeds. Generally solitary, but occurs in pairs during the breeding season, from December to March.	Low. Suitable habitat does not occur.

Scientific name	Common name	BC Act status	EPBC Act status	Database records	Habitat requirements	Likelihood of occurrence?
Haliaeetus leucogaster	White-bellied Sea-Eagle	V	Not Listed	BioNet – 9 (2021)	Habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. Occurs at sites near the sea or sea-shore, such as around bays and inlets, beaches, reefs, lagoons, estuaries and mangroves; and at, or in the vicinity of freshwater swamps, lakes, reservoirs, billabongs and saltmarsh. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, and forest (including rainforest). Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat.	Low. Suitable habitat does not occur.
Hieraaetus morphnoides	Little Eagle	V	Not Listed	BioNet – 25 (2019)	Occupies open eucalypt forest, woodland or open woodland. Sheoak or Acacia woodlands and riparian woodlands of interior NSW are also used. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter. Lays two or three eggs during spring, and young fledge in early summer. Preys on birds, reptiles and mammals, occasionally adding large insects and carrion.	Low. May flyover occasionally but breeding habitat does not occur and foraging habitat is minimal.
Lophoictinia isura	Square-tailed Kite	V	Not Listed	BioNet – 3 (2021)	Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses. In arid north-western NSW, has been observed in stony country with a ground cover of chenopods and grasses, open acacia scrub and patches of low open eucalypt woodland. Breeding is from July to February, with nest sites generally located along or near watercourses, in a fork or on large horizontal limbs.	Low. Suitable habitat does not occur.
Falco subniger	Black Falcon	V	Not Listed	BioNet – 1 (1991)	The Black Falcon is widely, but sparsely, distributed in New South Wales, mostly occurring in inland regions. Some reports of 'Black Falcons' on the tablelands and coast of New South Wales are likely to be referable to the Brown Falcon. In New South Wales there is assumed to be a single population that is continuous with a broader continental population, given that falcons are highly mobile, commonly travelling hundreds of kilometres (Marchant & Higgins 1993). The Black Falcon occurs as solitary individuals, in pairs, or in family groups of parents and offspring.	Low. Outside of favoured range and minimal habitat is available on the subject land.

Scientific name	Common name	BC Act status	EPBC Act status	Database records	Habitat requirements	Likelihood of occurrence?
Burhinus grallarius	Bush Stone-curlew	E	Not Listed	BioNet – 1 (1996)	Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber. Largely nocturnal, being especially active on moonlit nights. Feed on insects and small vertebrates, such as frogs, lizards and snakes. Nest on the ground in a scrape or small bare patch. Two eggs are laid in spring and early summer.	Low. Suitable habitat is not available.
Rostratula australis	Australian Painted Snipe	E	E	BioNet – 1 (2015) PMST	Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds. The nest consists of a scrape in the ground, lined with grasses and leaves. Breeding is often in response to local conditions; generally occurs from September to December. Incubation and care of young is all undertaken by the male only. Forages nocturnally on mud-flats and in shallow water.	Low. Suitable habitat is not available.
Callocephalon fimbriatum	Gang-gang Cockatoo	V	E	BioNet – 1 (2007)	In spring and summer, generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas. May also occur in sub-alpine Snow Gum (*Eucalyptus pauciflora*) woodland and occasionally in temperate rainforests. Favours old growth forest and woodland attributes for nesting and roosting. Nests are located in hollows that are 9 cm in diameter or larger and at least 9 m above the ground in eucalypts.	Low. Minimal habitat occurs within or surrounding the subject land.
Calyptorhynchus lathami	Glossy Black-Cockatoo	V	Not Listed	BioNet – 1 (2001)	Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak (*Allocasuarina littoralis)* and Forest Sheoak (*A. torulosa*) are important foods. Inland populations feed on a wide range of sheoaks, including Drooping Sheoak, *A.diminuta*, and *A. gymnathera*. Belah is also utilised and may be a critical food source for some populations. In the Riverina, birds are associated with hills and rocky rises supporting Drooping Sheoak, but also recorded in open woodlands dominated by Belah (*Casuarina cristata*). Feeds almost exclusively on the seeds of several species of	Low. No foraging or breeding habitat occurs.

Scientific name	Common name	BC Act status	EPBC Act status	Database records	Habitat requirements	Likelihood of occurrence?
					she-oak (Casuarina and Allocasuarina species), shredding the cones with the massive bill. Dependent on large hollow-bearing eucalypts for nest sites.	
Glossopsitta pusilla	Little Lorikeet	V	Not Listed	BioNet – 9 (2022)	Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophora, Melaleuca and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in open country, e.g., paddocks, roadside remnants and urban trees also help sustain viable populations of the species. Feeds mostly on nectar and pollen, occasionally on native fruits such as mistletoe, and only rarely in orchards.	Low. Minimal habitat occurs.
Lathamus discolor	Swift Parrot	E	CE	BioNet – 53 (2021) PMST	Migrates to the Australian south-east mainland between February and October. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany *Eucalyptus robusta*, Spotted Gum *Corymbia maculata*, Red Bloodwood *C. gummifera*, Forest Red Gum *E. tereticornis*, Mugga Ironbark *E. sideroxylon*, and White Box *E. albens*. Commonly used lerp infested trees include Inland Grey Box *E. microcarpa*, Grey Box *E. moluccana*, Blackbutt *E. pilularis*, and Yellow Box *E. melliodora*. Return to some foraging sites on a cyclic basis depending on food availability. Following winter, they return to Tasmania where they breed from September to January, nesting in old trees with hollows and feeding in forests dominated by Tasmanian Blue Gum Eucalyptus globulus.	Low. Minimal habitat occurs
Neophema pulchella	Turquoise Parrot	V	Not Listed	BioNet – 1 (2018)	Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland. Usually seen in pairs or small, possibly family, groups and have also been reported in flocks of up to thirty individuals. Prefers to feed in the shade of a tree and spends most of the day on the ground searching for the seeds or grasses and herbaceous plants or browsing on vegetable matter. Forages quietly and may be quite tolerant of disturbance. However, if flushed it will fly to a nearby tree and then return to the ground to browse as soon as the	Low. Minimal habitat occurs

Scientific name	Common name	BC Act status	EPBC Act status	Database records	Habitat requirements	Likelihood of occurrence?
					danger has passed. Nests in tree hollows, logs or posts, from August to December.	
Ninox connivens	Barking Owl	V	Not Listed	BioNet – 1 (1996)	Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g. western NSW) due to the higher density of prey found on these fertile riparian soils. Roost in shaded portions of tree canopies, including tall midstorey trees with dense foliage such as Acacia and Casuarina species.	Low. Minimal habitat occurs
Ninox strenua	Powerful Owl	V	Not Listed	BioNet – 12 (2018)	The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. The Powerful Owl requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. It roosts by day in dense vegetation comprising species such as Turpentine *Syncarpia glomulifera*, Black She-oak *Allocasuarina littoralis*, Blackwood Acacia melanoxylon, Rough-barked Apple *Angophora floribunda* Cherry Ballart *Exocarpus cupressiformis* and a number of eucalypt species. Powerful Owls nest in large tree hollows (at least 0.5 m deep), in large eucalypts (diameter at breast height of 80-240 cm) that are at least 150 years old. While the female and young are in the nest hollow the male Powerful Owl roosts nearby (10-200 m) guarding them, often choosing a dense "grove" of trees that provide concealment from other birds that harass him.	Low. Minimal habitat occurs
Tyto novaehollandiae	Masked Owl	V	Not Listed	BioNet – 3 (2018)	Lives in dry eucalypt forests and woodlands from sea level to 1100 m. A forest owl, but often hunts along the edges of forests, including roadsides. The typical diet consists of tree-dwelling and ground mammals, especially rats. Pairs have a large home-range of 500 to 1000 hectares. Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting.	Low. Minimal habitat occurs

Scientific name	Common name	BC Act status	EPBC Act status	Database records	Habitat requirements	Likelihood of occurrence?
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V	Not Listed	BioNet – 1 (2019)	Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (Eucalyptus camaldulensis) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains. Sedentary, considered to be resident in many locations throughout its range; present in all seasons or year-round at many sites; territorial year-round, though some birds may disperse locally after breeding.	Low. Minimal habitat occurs
Chthonicola sagittata	Speckled Warbler	V	Not Listed	BioNet – 9 (2006)	The Speckled Warbler lives in a wide range of eucalyptus dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy. Large, relatively undisturbed remnants are required for the species to persist in an area.	Low. Minimal habitat occurs
Anthochaera phrygia	Regent Honeyeater	CE	CE	BioNet – 19 (2019) PMST	The Regent Honeyeater is a flagship threatened woodland bird whose conservation will benefit a large suite of other threatened and declining woodland fauna. The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Regent Honeyeaters inhabit woodlands that support a significantly high abundance and species richness of bird species. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. Every few years non-breeding flocks are seen foraging in flowering coastal Swamp Mahogany and Spotted Gum forests, particularly on the central coast and occasionally on the upper north coast. Birds are occasionally seen on the south coast. In the last 10 years Regent Honeyeaters have been	Low. Minimal habitat occurs. Lacks large numbers of similar species that can produce prolific flowering that this bird prefers to forage on.

Scientific name	Common name	BC Act status	EPBC Act status	Database records	Habitat requirements	Likelihood of occurrence?
					recorded in urban areas around Albury where woodlands tree species such as Mugga Ironbark and Yellow Box were planted 20 years ago.	
Aphelocephala leucopsis	Southern Whiteface		V	PMST	The Southern Whiteface has only recently been listed nationally under the EPBC act as Vulnerable to extinction. It inhabits dry woodlands and shrublands. It is often seen in small flocks where is spends much of it's time foraging. It builds a nest of grass in dense shrubs or tree hollows. The species has declined an estimated 30% to 50% due to habitat loss.	Low. Minimal habitat and no species records. Requires dense low shrubs for nesting.
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	V	Not Listed	BioNet – 1 (2007)	The Black-chinned Honeyeater has two subspecies, with only the nominated (*gularis)* occurring in NSW. The other subspecies (*laetior*) was formerly considered a separate species (Golden-backed Honeyeater) and is found in northern Australia between central Queensland west to the Pilbara in Western Australia. It is generally rare east of the Great Dividing Range, except for in parts of the north coast of NSW. It occupies the upper levels of drier open forests or woodlands that usually include box and ironbark eucalypts. Gregarious, usually in pairs or small groups.	Low. Outside of preferred range and minimal habitat occurs.
Daphoenositta chrysoptera	Varied Sittella	V	Not Listed	BioNet – 25 (2022)	Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. Feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy. Builds a cup-shaped nest of plant fibres and cobwebs in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years. Generation length is estimated to be 5 years.	Low. Minimal habitat occurs.
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	Not Listed	BioNet – 31 (2018)	Primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland. Depending on location and local climatic conditions (primarily temperature and rainfall), the dusky woodswallow can be resident year	Low. Minimal habitat occurs

Scientific name	Common name	BC Act status	EPBC Act status	Database records	Habitat requirements	Likelihood of occurrence?
					round or migratory. In NSW, after breeding, birds migrate to the north of the state and to southeastern Queensland, while Tasmanian birds migrate to southeastern NSW after breeding. Migrants generally depart between March and May, heading south to breed again in spring.	
Petroica boodang	Scarlet Robin	V	Not Listed	BioNet – 4 (2008)	The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. This species lives in both mature and regrowth vegetation. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps. Scarlet Robin habitat usually contains abundant logs and fallen timber: these are important components of its habitat. The Scarlet Robin breeds on ridges, hills and foothills of the western slopes, the Great Dividing Range and eastern coastal regions; this species is occasionally found up to 1000 metres in altitude. The Scarlet Robin is primarily a resident in forests and woodlands, but some adults and young birds disperse to more open habitats after breeding. In autumn and winter many Scarlet Robins live in open grassy woodlands, and grasslands or grazed paddocks with scattered trees.	Low. Minimal habitat occurs.
Petroica phoenicea	Flame Robin	V	Not Listed	BioNet – 1 (1996)	Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Prefers clearings or areas with open understoreys. The groundlayer of the breeding habitat is dominated by native grasses and the shrub layer may be either sparse or dense. Occasionally occurs in temperate rainforest, and also in herbfields, heathlands, shrublands and sedgelands at high altitudes. In winter, birds migrate to drier more open habitats in the lowlands (i.e. valleys below the ranges, and to the western slopes and plains). Often occurs in recently burnt areas; however, habitat becomes unsuitable as vegetation closes up following regeneration. In winter lives in dry forests, open woodlands and in pastures and native grasslands, with or without scattered trees. In winter, occasionally seen in heathland or other shrublands in coastal areas.	Low. Minimal habitat occurs
Stagonopleura guttata	Diamond Firetail	V	Not Listed	BioNet – 2 (2012)	Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum *Eucalyptus pauciflora* Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary	Low. Minimal habitat occurs

Scientific name	Common name	BC Act status	EPBC Act status	Database records	Habitat requirements	Likelihood of occurrence?
					grassland derived from other communities. Often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland.	
Botaurus phrygia	Australasian Bittern	E	E	PMST	Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (Typha spp.) and spikerushes (*Eleocharis spp.).* Hides during the day amongst dense reeds or rushes and feed mainly at night on frogs, fish, yabbies, spiders, insects and snails. Feeding platforms may be constructed over deeper water from reeds trampled by the bird; platforms are often littered with prey remains.	Very low. No habitat occurs
Calidris ferruginea	Curlew Sandpiper	E	CE, Mi	PMST	It generally occupies littoral and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats of sheltered coasts. It also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes inland. It forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed. It roosts on shingle, shell or sand beaches; spits or islets on the coast or in wetlands; or sometimes in salt marsh, among beach-cast seaweed, or on rocky shores.	Low. Minimal habitat occurs
Falco hypoleucos	Grey Falcon	E	V	PMST	Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey.	Low. Outside of favoured geographic area. Minimal habitat occurs.
Grantiella picta	Painted Honeyeater	V	V	PMST	Inhabits Boree/ Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*) and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus Amyema. Insects and nectar from mistletoe or eucalypts are occasionally eaten. Nest from spring to autumn in a small, delicate nest hanging within the outer canopy of drooping eucalypts, she-oak, paperbark or mistletoe branches.	Low. Minimal habitat occurs
Numenius madagascariensis	Eastern Curlew	Not Listed	CE, Mi	PMST	It generally occupies coastal lakes, inlets, bays and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats and sometimes saltmarsh of sheltered coasts. Occasionally, the species	Low. Minimal habitat occurs

Scientific name	Common name	BC Act status	EPBC Act status	Database records	Habitat requirements	Likelihood of occurrence?
					occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets It forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed. It roosts on sandy spits and islets, especially on dry beach sand near the high-water mark, and among coastal vegetation including low saltmarsh or mangroves. May also roost on wooden oyster leases or other similar structures.	
Hirundapus caudactus	Black-faced Monarch	Not Listed	V, Mi	PMST	The Black-faced Monarch mainly occurs in rainforest ecosystems, including semi-deciduous vine-thickets, complex notophyll vine-forest, tropical (mesophyll) rainforest, subtropical (notophyll) rainforest, mesophyll (broadleaf) thicket/shrubland, warm temperate rainforest, dry (monsoon) rainforest and (occasionally) cool temperate rainforest. The species also occurs in selectively logged and 20—30 years old regrowth rainforest (Laurance et al. 1996). It is also sometimes found in nearby open eucalypt forests (mainly wet sclerophyll forests), especially in gullies with a dense, shrubby understorey as well as in dry sclerophyll forests and woodlands, often with a patchy understorey. The species especially occurs in 'marginal' habitats during winter or during passage (migration).	Low. Minimal habitat occurs
Pandion haliaetus	Eastern Osprey	V	Mi	PMST	Eastern Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia. They require extensive areas of open fresh, brackish or saline water for foraging. They frequent a variety of wetland habitats including inshore waters, reefs, bays, coastal cliffs, beaches, estuaries, mangrove swamps, broad rivers, reservoirs and large lakes and waterholes. They exhibit a preference for coastal cliffs and elevated islands in some parts of their range, but may also occur on low sandy, muddy or rocky shores and over coral cays. They may occur over atypical habitats such as heath, woodland or forest when travelling to and from foraging sites.	Low. Minimal habitat occurs
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Scientific name	Common name	BC Act status	EPBC Act status	Database records	Habitat requirements	Likelihood of occurrence?
Dasyurus maculatus	Spotted-tailed Quoll	V	E	BioNet – 7 (2005) PMST	Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Quolls use hollow-bearing trees, fallen logs, other animal burrows, small caves and rock outcrops as den sites. Mostly nocturnal, although will hunt during the day; spend most of the time on the ground, although also an excellent climber and will hunt possums and gliders in tree hollows and prey on roosting birds. Use communal 'latrine sites', often on flat rocks among boulder fields, rocky cliff-faces or along rocky stream beds or banks. Such sites may be visited by multiple individuals and can be recognised by the accumulation of the sometimes characteristic 'twisty-shaped' faeces deposited by animals.	Low. Minimal habitat occurs
Phascolarctos cinereus	Koala	V	V	BioNet – 4 (2018) PMST	Inhabit eucalypt woodlands and forests. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species. Inactive for most of the day, feeding and moving mostly at night. Spend most of their time in trees, but will descend and traverse open ground to move between trees. Home range size varies with quality of habitat, ranging from less than two ha to several hundred hectares in size.	Low. Minimal habitat occurs
Petaurus australis	Yellow-bellied Glider	V	Not Listed	BioNet – 1 (2018)	Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south. Feed primarily on plant and insect exudates, including nectar, sap, honeydew and manna with pollen and insects providing protein.	Low. Minimal habitat occurs
Petaurus norfolcensis	Squirrel Glider	V	Not Listed	BioNet – 1 (2011)	Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstorey. Live in family groups of a single adult male one or more adult females and offspring. Require abundant tree hollows for refuge and nest sites.	Low. Minimal habitat occurs

Scientific name	Common name	BC Act status	EPBC Act status	Database records	Habitat requirements	Likelihood of occurrence?
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	BioNet – 426 (2022) PMST	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. Individual camps may have tens of thousands of animals and are used for mating, and for giving birth and rearing young. Annual mating commences in January and conception occurs in April or May; a single young is born in October or November. Site fidelity to camps is high; some camps have been used for over a century. Can travel up to 50 km from the camp to forage; commuting distances are more often 20 km.	Low- moderate. May occasionally forage, but the removed vegetation is unlikely to be important to this species.
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	Not Listed	BioNet - 6 (2017)	Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory. Breeding has been recorded from December to mid-March, when a single young is born. Seasonal movements are unknown; there is speculation about a migration to southern Australia in late summer and autumn.	Low. Minimal habitat occurs
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	V	Not Listed	BioNet – 63 (2022)	Occur in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. Roost mainly in tree hollows but will also roost under bark or in man-made structures. Usually solitary but also recorded roosting communally, probably insectivorous.	May occur. Assessed further in Section 4.1.
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	BioNet – 2 (2003) PMST	Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (*Petrochelidon ariel*), frequenting low to mid-elevation dry open forest and woodland close to these features. Females have been recorded raising young in maternity roosts (c. 20-40 females) from November through to January in roof domes in sandstone caves and overhangs. They remain loyal to the same cave over many years. Found in well-timbered areas containing gullies.	Low. Minimal habitat occurs

Scientific name	Common name	BC Act status	EPBC Act status	Database records	Habitat requirements	Likelihood of occurrence?
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	Not Listed	BioNet – 23 (2021)	Prefers moist habitats, with trees taller than 20 m. Generally, roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings. Hunts beetles, moths, weevils and other flying insects above or just below the tree canopy. Hibernates in winter. Females are pregnant in late spring to early summer.	Low. Minimal habitat occurs
Myotis macropus	Southern Myotis	V	Not Listed	BioNet – 51 (2022)	Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forage over streams and pools catching insects and small fish by raking their feet across the water surface. In NSW females have one young each year usually in November or December.	Low. Minimal habitat occurs
Scoteanax rueppellii	Greater Broad-nosed Bat	V	Not Listed	BioNet – 26 (2022)	Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Although this species usually roosts in tree hollows, it has also been found in buildings. Forages after sunset, flying slowly and directly along creek and river corridors at an altitude of 3 - 6 m. Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects; this species has been known to eat other bat species. Little is known of its reproductive cycle, however a single young is born in January; prior to birth, females congregate at maternity sites located in suitable trees, where they appear to exclude males during the birth and raising of the single young.	Low. Minimal habitat occurs
Miniopterus australis	Little Bent-winged Bat	V	Not Listed	BioNet – 9 (2018)	Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub. Generally found in well-timbered areas. Little Bentwing-bats roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats. They often share roosting sites with the Common Bentwing-bat and, in winter, the two species may form mixed clusters. In NSW the largest maternity colony is in close association with a large maternity colony of Eastern Bentwing-bats (*Miniopterus schreibersii*) and appears	Low. Minimal habitat occurs

Scientific name	Common name	BC Act status	EPBC Act status	Database records	Habitat requirements	Likelihood of occurrence?
					to depend on the large colony to provide the high temperatures needed to rear its young. Maternity colonies form in spring and birthing occurs in early summer. Males and juveniles disperse in summer. Only five nursery sites /maternity colonies are known in Australia.	
Miniopterus orianae oceanensis	Large Bent-winged Bat	V	Not Listed	BioNet (89 (2021)	Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young. Maternity caves have very specific temperature and humidity regimes. At other times of the year, populations disperse within about 300 km range of maternity caves. Cold caves are used for hibernation in southern Australia. Breeding or roosting colonies can number from 100 to 150,000 individuals. Hunt in forested areas, catching moths and other flying insects above the treetops.	May have been recorded. Further assessment is provided in Section 4.1.
Petauroides volans	Greater Glider	E	V	PMST	Greater Gliders are forest dependent and prefer older tree age classes in moist forest types. They are obligate users of hollow-bearing trees for shelter and nesting, with each family group using multiple den trees within its home range (Lindenmayer et al. 2004). Greater Glider density varies proportionally to the availability of hollow-bearing trees and do not persist in areas of forest where such trees are absent.	Very low. Habitat does not occur on subject land.
Petrogale penicillate	Brush-tailed Rock-wallaby	E	V	PMST	Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north. Shelter or bask during the day in rock crevices, caves and overhangs and are most active at night when foraging. Browse on vegetation in and adjacent to rocky areas eating grasses and forbs as well as the foliage and fruits of shrubs and trees.	Very low. Habitat does not occur on subject land.
Pseudomys novaehollandiae	New Holland Mouse	Not Listed	V	PMST	Known to inhabit open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes. It is a social animal, living predominantly in burrows shared with other individuals. Distribution is patchy in time and space, with peaks in abundance during early to mid stages of vegetation succession typically induced by fire.	Low. Minimal habitat occurs

Scientific name	Common name	BC Act status	EPBC Act status	Database records	Habitat requirements	Likelihood of occurrence?
AMPHIBIANS AND INVERTEBRATES						
Litoria aurea	Green and Golden Bell Frog	E	V	BioNet – 19 (2012) PMST	Inhabits marshes, dams and stream-sides, particularly those containing bullrushes (Typha spp.) or spikerushes (*Eleocharis spp.*). Optimum habitat includes water-bodies that are unshaded, free of predatory fish such as Plague Minnow (*Gambusia holbrooki*), have a grassy area nearby and diurnal sheltering sites available. Some sites, particularly in the Greater Sydney region occur in highly disturbed areas. The species is active by day and usually breeds in summer when conditions are warm and wet. Males call while floating in water and females produce a raft of eggs that initially float before settling to the bottom, often amongst vegetation.	Very low. Habitat does not occur on subject land.
Meridolum corneovirens	Cumberland Plain Land Snail	E	Not Listed	BioNet – 547 (2022)	Primarily inhabits Cumberland Plain Woodland (a CE ecological community). This community is a grassy, open woodland with occasional dense patches of shrubs. It is also known from Shale Gravel Transition Forests, Castlereagh Swamp Woodlands and the margins of River-flat Eucalypt Forest, which are also listed communities. Lives under litter of bark, leaves and logs, or shelters in loose soil around grass clumps. Occasionally shelters under rubbish. Can dig several centimetres into soil to escape drought. Is a fungus specialist.	Low. Minimal habitat occurs, searches were carried out and no snails were found.
Heleioporus australiacus	Giant Burrowing Frog	V	V	PMST	Found in heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based. Spends more than 95% of its time in non-breeding habitat in areas up to 300 m from breeding sites. Whilst in non-breeding habitat it burrows below the soil surface or in the leaf litter. Individual frogs occupy a series of burrow sites, some of which are used repeatedly. The home ranges of both sexes appear to be non-overlapping suggesting exclusivity of non-breeding habitat. Home ranges are approximately 0.04 ha in size.	Low. Minimal habitat occurs.
Litoria raniformis	Southern Bell Frog	E	V	PMST	Usually found in or around permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha swamps and River Red Gum swamps or billabongs along floodplains and river valleys. They are also found in irrigated rice crops, particularly where there is no available natural habitat. Breeding occurs during the warmer	Very low. Habitat does not occur on subject land.

Scientific name	Common name	BC Act status	EPBC Act status	Database records	Habitat requirements	Likelihood of occurrence?
					months and is triggered by flooding or a significant rise in water levels. The species has been known to breed anytime from early spring through to late summer/early autumn (Sept to April) following a rise in water levels. During the breeding season animals are found floating amongst aquatic vegetation (especially cumbungi or Common Reeds) within or at the edge of slow-moving streams, marshes, lagoons, lakes, farm dams and rice crops.	

V – Vulnerable, E – Endangered, CE – Critically endangered, EP – Endangered population, Mi - Migratory

APPENDIX F: BIODIVERSITY CREDIT REPORT