



Project Pluto Data Centre
SSD-69223466

Biodiversity Development Assessment
Report

prepared for

Goodman Property Services (Aust.) Pty Ltd

Project Pluto Data Centre (SSD-69223466) – Biodiversity Development Assessment Report

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Statement of Authorship

The author of the report is Kat Duchatel with 30 years' experience and the following relevant qualifications:

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Revision Schedule

Rev No	Date	Description	Issued to
0	16/12/2024	DRAFT Biodiversity Development Assessment Report (BDAR)	Goodman
1	07/02/2025	Biodiversity Development Assessment Report (BDAR)	Goodman
2	21/02/2025	Amended Biodiversity Development Assessment Report (BDAR)	Goodman

Summary

This Biodiversity Development Assessment Report (BDAR) has been prepared by écologique to accompany a State Significant Development Application (SSDA) for the construction and ongoing operation of a data centre facility at 132 McCredie Road, Guildford West NSW 2161 (the proposal), in the Cumberland Council Local Government Area (LGA). The subject land is legally described as Lot 1 in DP596315.

This BDAR has been prepared to address the Secretary’s Environmental Assessment Requirements (SEARs) issued for the Project Pluto Data Centre (SSD-69223466) dated 4 April 2024, which requires that any biodiversity impacts associated with the development be assessed in accordance with the *Biodiversity Conservation Act 2016* (BC Act) and the Biodiversity Assessment Method 2020 (BAM), including the preparation of a BDAR.

Native vegetation on the subject land is predominantly of planted origins. Approximately 0.72 ha has been allocated to Plant Community Type (PCT) of Cumberland Blue Box Riverflat Forest (PCT 4024), which has been assessed under Appendix C of the BAM – streamlined module for small development areas.

The remaining 0.15 ha of native vegetation has been assessed under Appendix D of the BAM – streamlined module for planted native vegetation.

In accordance with the NSW Biodiversity Offset Scheme’s hierarchy of avoidance and minimising before offsetting as a mitigation measure, the proposal has avoided over 70% of the subject land’s native vegetation.

The proposal will clear approximately 0.21 ha of PCT 4024 and 0.15 ha of planted native vegetation (not allocated to a PCT). The total 0.36 ha of proposed native vegetation clearing is significantly less than that currently approved on the subject land under a previous development application (DA2022/0759) and later modification (MOD2024/0047) i.e., up to 0.51 ha of PCT 4024 and 0.15 ha of planted native vegetation.

PCT 4024 is a listed threatened ecological community (TEC) in NSW under the BC Act and is a listed matter of national environmental significance (MNES) under the Commonwealth EPBC Act. The community on the subject land, does not meet the diagnostic and condition criteria to be considered a MNES under the EPBC Act.

While PCT 4024 on the subject land is comprised of planted native species, it has been maintained as the TEC in the BAM calculator. Impacts on PCT 4024 that require an offset (as per BAM Subsection 9.2.2(2.)) are outlined in Table E1. No species credit species are required to be offset.

Table E1 Impacts that require an offset – ecosystem credits

PCT	TEC/EC	Impact area (ha)	Number of ecosystem credits required
PCT 4024	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions.	0.21	2

This BDAR has determined the following:

- + The subject land does not provide threatened species (candidate species) habitat requirements.
- + No evidence, incidental sightings or past records of any threatened species on the subject land were found.
- + The activities associated with the proposal are considered unlikely to result in a prescribed impact
- + The proposal will not directly or indirectly impact on a serious and irreversible impact entity
- + The risk of any indirect impacts (including prescribed impacts) will be minimised and managed through a range of mitigation measures, including but not limited to:
 - Implementation of erosion and sediment controls, including monitoring and maintenance of all controls throughout construction
 - Suppression of dust generated during construction
 - Protection of vegetation to be retained in accordance with the arborists tree management recommendations or other directives provided by the project's ecologist
 - Preclearance and clearance surveys to detect and, if necessary, relocate any resident or visiting fauna in vegetation and other areas that will be cleared
 - Implementation of hygiene measures to prevent the introduction and/or spread of weeds, pathogens or disease in soils and vegetation.
 - Installation of stormwater management measures to prevent and minimise any polluted water discharging from the operational development
 - Installation of lights and other illuminations that minimise potential adverse effects on nocturnal fauna

This BDAR concludes that the proposed data centre will not adversely impact on any biodiversity values subject to the implementation of the mitigation measures recommended above.

Declarations

i. Certification under clause 6.15 Biodiversity Conservation Act 2016

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

Name: Kat Duchatel



Date: 21 February 2025

BAM Assessor Accreditation no: BAAS17054

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

ii. Details and experience of author/s and contributors

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iii. Conflict of Interest

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

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

Signature:



Date: 21 February 2025

BAM Assessor Accreditation no: BAAS17054

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Shortened form

BAM	NSW Biodiversity Assessment Method
BAM-C	BAM calculator
BC Act	NSW <i>Biodiversity Conservation Act 2016</i>
BDAR	Biodiversity Development Assessment Report
Biosecurity Act	NSW <i>Biodiversity Security Act 2015</i>
BOAMS	Biodiversity Offsets and Agreement Management System
CEEC	Critically Endangered Ecological Community
CEMP	Construction Environmental Management Plan
DBH	Diameter at breast height
DCP	Development Control Plan
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DPE	NSW Department of Planning and Environment
EP&A Act	<i>Environmental Planning and Assessment Act 1979 (NSW)</i>
EPBC Act	Commonwealth <i>Environment Protection Biodiversity and Conservation Act 1999</i>
FM Act	NSW <i>Fisheries Management Act 1994</i>
IBRA	Interim Biogeographic Regionalisation of Australia
LEP	Local Environment Plan
LGA	Local Government Area
MNES	Matters of National Environmental Significance
PCT	Plant Community Type
SAII	Serious and Irreversible Impact
SEARs	Secretary's Environmental Assessment Requirements
SEPP	NSW State Environment Protection Policy
SSD	State Significant Development
TEC	Threatened Ecological Community
TBDC	Threatened Biodiversity Data Collection

1. Introduction

1.1 Proposed development

1.1.1 Development overview

Goodman Property Services (Aust.) Pty Ltd (the Applicant) proposes to construct and operate a data centre facility at 132 McCredie Road, Guildford West NSW 2161 (the subject land).

The proposal is being assessed as a state significant development (SSD-69223466) by the Department of Planning Housing and Infrastructure (DPHI). Industry Specific Secretary's Environmental Assessment Requirements (SEARs) for Data Storage Centres were issued on 4 April 2024 (SSD-69223466). Relevant to this Biodiversity Development Assessment Report, the following requirements have been addressed:

9. Biodiversity

- + Assess any biodiversity impacts associated with the development in accordance with the Biodiversity Conservation Act 2016 and the Biodiversity Assessment Method 2020, including the preparation of a Biodiversity Development Assessment Report (BDAR), unless a waiver is granted, or the site is on biodiversity certified land.

Additionally, DPHI requires that any development application that is required to be submitted with a BDAR must use the template available at: <https://www.environment.nsw.gov.au/research-and-publications/publications-search/guidance-for-the-biodiversity-development-assessment-report-template>. This BDAR follows the template format as required.

1.1.2 Location

Key site details are provided in Table 1 and the subject site's location and context is shown in Figure 1.

Table 1. Subject site details

Legal description	Lot 1 in DP596315
Local Government Area (LGA)	Cumberland Council Local Government Area
Area	7.17 ha (71,710 m ²)
Local Environmental Plan (LEP)	Cumberland LEP 2021 (CLEP)
Zoning	General Industrial (E4) under the CLEP
Development Control Plan (DCP)	Cumberland DCP 2021

1.1.3 Proposed development and the subject land

1.1.3.1 Proposed development

The proposed development comprises:

- + Site preparation works including bulk excavation and removal of existing hard standing and structures on the site, tree and vegetation clearing, and bulk earthworks;
- + Construction, fit out and operation of a data centre with an approximate building height of 25.77m and total gross floor area of approximately 29,444 m² comprising:

- At-grade parking for 53 car parking spaces and 2 accessible car parking spaces
- Two (2) loading dock spaces.
- Two (2) levels of technical data hall floor space with incorporating a total of nine (9) data halls
- Ancillary office space
- + Provision of required utilities, including:
 - Fuel storage
 - Two (2) Switch-rooms
 - Four (4) industrial water storage tanks
- + Vehicle entry and egress driveways located along McCredie Road
- + Internal access road
- + Associated landscaping and site servicing
- + Installation of services and drainage infrastructure.

The proposal layout is shown in Figure 2.

1.1.3.2 Subject land

The subject land is located on Gandangara Land and is in the Smithfield Industrial Area within the Cumberland Local Government Area (LGA). It is bounded by McCredie Road to the north.

The front part of the subject land adjoins the Guildford Transmission Substation, which is located immediately to the east and fronts onto McCredie Road. Other industrial uses are located further east, with residential properties beyond.

The Guildford West Sports Ground, which comprises several playing fields, is located to the south of the Guildford Transmission Substation. The playing fields bound the southern part of the subject land to the east. The playing fields / public recreation area also abut the southern boundary of the subject land.

Prospect Creek is located to the south of the public recreation area and is zoned C2 Environmental Protection. The area to the south of Prospect Creek is predominately characterised by low density single storey residential housing.

The subject land is located in the south eastern corner of the Smithfield Industrial Estate and is within close proximity of the Cumberland Highway (A28) and M4 and M7 motorways, which provide access to Sydney CBD, western Sydney and the south. A range of large format industrial uses are located to the west and north west of the site. The Smithfield Industrial Estate extends across the A28 to Gipps Road (approximately 3km west of the site). It forms part of the broader Smithfield Wetherill Park industrial area, which is one of the largest of its kind in the Southern Hemisphere and makes a significant contribution to the New South Wales and Australian economies.

The subject land has a net developable area of 71,710 m² and is currently vacant. It previously operated as a Castrol Lubricants facility. However, the majority of the subject land has now been cleared and subject to category 1 remediation works. A single storey office building is located on the northern portion of the site fronting McCredie Road. The building is vacant.

1.2 Biodiversity Offsets Scheme entry

The proposal is being assessed as state significant development (SSD-19618251). Secretary's Environmental Assessment Requirements (SEARs) were issued on the 4 April 2024 (refer Section 1.1.1).

The Biodiversity Offsets Scheme applies to a range of developments, land clearing and activities that meet certain thresholds. This includes all state significant development projects (unless the Environment Agency Head and Secretary of the Planning Agency Head determine that the project is not likely to have any significant impact on biodiversity values).

1.3 Excluded impacts

No impacts have been excluded.

1.4 Matters of national environmental significance

Potential Matters of national environmental significance (MNES) considered in this BDAR have been assessed against relevant significant impact guidelines, diagnostic and condition thresholds.

This assessment has determined that there are no MNES likely to occur within the subject land and the proposal is unlikely to indirectly impact on any offsite MNES. A referral under the EPBC Act is not required.

1.5 Information sources

The following information sources were used in the preparation of this report:

- + Aerial Imagery: NearMap 3 September 2024
- + Australian Government Department of Climate Change, Energy, the Environment and Water
 - Interim Biogeographic Regionalisation for Australia (IBRA) version 7.0
 - Protected Matters Search Tool <http://www.environment.gov.au/epbc/pmst/index.html>
 - Species Profiles and Threats Database (SPRAT) <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>
 - Significant Impact Guidelines 1.1 – Matters of National Environmental Significance (Department of the Environment, Water, Heritage, and the Arts, 2013 EPBC Act Policy Statement)
- + NSW Department of Climate Change, Energy, the Environment and Water
 - Biodiversity Values Map Edition BV174_Web.gdb (DPE 2024)
 - BioNet Vegetation Classification Database (VCD) and Threatened Biodiversity Data Collection (TBDC)
 - NSW (Mitchell) Landscapes Version 3.1 (2017)
 - State Vegetation Type Mapping - SVTM_NSW_Extant_PCT_vC2_0_M2_0_106 (DPE 2023)
- + NSW Spatial Services: Historical Imagery Viewer
- + NSW Department of Planning, Housing and Industry
 - EPI Land Zoning (2024)
- + Soil Landscapes of the Penrith 1:100 000 Sheet Map (Bannerman & Hazelton PA 1990)

1.5.1 Other documents

- + Arboricultural Impact Assessment, prepared for Goodman Property Services (Aust) Pty Ltd. Civica Pty Limited (28 November 2024)
- + DA2022/0759 | PPSSCC-430 – 132 McCredie Road Guildford BDAR for submission on behalf of Goodman (13/12/2022) deferred commencement approval granted 19 September 2023
- + DA2022/0759 | PPSSCC-430 – Modification 132 McCredie Road Guildford BDAR for submission on behalf of Goodman (01/07/2024) approval granted 11 September 2024

2. Methods

2.1 Biodiversity Assessment Method (BAM)

The proposal has been assessed under the following streamlined assessment modules in the BAM:

- a) Appendix C: Streamlined assessment module – small area, which may be used as:
 - The proposal only clears 0.36 ha which is below the clearing threshold provided in Table 12 of the BAM (which in this case is both a lot size and clearing of <1ha); and
 - The subject land is not located within an area on the BV map, which is also core koala habitat.
- b) Appendix D: Streamlined assessment module – Planted native vegetation:
 - Where only part of the subject land contains planted native vegetation, this module may be used to assess that part of the development proposal. The standard BAM is then used to assess the remaining areas.

2.2 Site context methods

2.2.1 Landscape features

Under the small area development assessment module, the site context must be established by identifying the following:

- + IBRA subregion in which the development takes place, and
- + Relevant landscape features listed in Section 3.1 of the BAM

The site context has been established using ESRI ArcMap v8 as follows:

- + Creating a 1500m buffer zone (the BDAR assessment area) around the subject land using the Data Analysis - proximity and buffer tools
- + Clipping the extent of the relevant landscape feature layers within the BDAR assessment area
- + Exporting each landscape feature layer and creating new shapefiles

2.2.2 Native vegetation cover

In accordance with the with Section 3.2 and Subsection 4.3.2 of the BAM, the native vegetation cover and patch size must be determined.

Native vegetation cover was determined by:

- + Clipping the extent of NSW State Vegetation Type Map (SVTM) (DPE 2023) within the BDAR assessment area
- + Creating a new 'Native vegetation cover' shapefile
- + In edit mode, deleting or decreasing areas of vegetation cleared or increasing areas of vegetation that have expanded in extent (since mapping undertaken)
- + Exporting data and removing non-native vegetation data and calculating the native vegetation cover in excel

2.3 Native vegetation, threatened ecological communities and vegetation integrity methods

2.3.1 Existing information

Previous assessments conducted for the subject land were used for this assessment, which included:

- + DA2022/0759 | PPSSCC-430 – 132 McCredie Road Guildford BDAR for submission on behalf of Goodman (13/12/2022) deferred commencement approval granted 19 September 2023
- + DA2022/0759 | PPSSCC-430 – Modification 132 McCredie Road Guildford BDAR for submission on behalf of Goodman (01/07/2024) approval granted 11 September 2024

The above and current BDARs reviewed and considered the NSW State Vegetation Type Mapping (SVTM, DPE 2023) and the Bionet Vegetation Classification Database and data collected by écologique on 20 November 2020.

2.3.2 Mapping native vegetation extent

Native vegetation cover mapping (prepared to establish site context in Section 2.2.2) was ground truthed and the extent of native vegetation cover on the subject land mapped.

2.3.3 Vegetation integrity survey

Vegetation integrity of the plant community types (PCTs) on the subject site were assessed quantitatively by collecting field data for the condition attributes at a plot in accordance with Subsection 4.3.4 of the BAM

Planted native vegetation was assessed qualitatively and reviewed against the arboricultural assessment finding (Civica, 2024), refer to Section 2.4.2.

2.4 Assessing the habitat suitability for threatened species

2.4.1 Streamlined assessment methods

The BAM streamlined assessment module for planted native vegetation does not require survey strictly in accordance with the BAM.

Instead, a reasonable understanding of habitat suitability for threatened species is expected and a commensurate assessment be undertaken to determine if the planted native vegetation has the potential to provide habitat for threatened species.

The BAM streamlined assessment module for small areas requires the assessor determine the suite of threatened species likely to occur according to Step 1 and Step 2 in BAM Section 5.2.

This includes the predicted species assessed for ecosystem credits and the candidate species assessed for species credits.

In addition to ecosystem and species credit species generated by the BAM-C for the proposal, threatened species records from within a ten kilometre search radius of the subject land were obtained from the BioNet Atlas database.

Candidate species credit species at risk of serious and irreversible impacts (SAILs) have been considered further. Candidate species credit species not at risk of SAILs and not incidentally recorded on the subject land do not require further assessment.

2.4.2 Arborist assessment

All tree species within the site have been the subject of a detailed arboricultural assessment (Civica, 2024). This has provided an additional layer of assessment (into the range of planted and naturally occurring tree species within the subject land, which has been considered in this BDAR.

Tree surveys were conducted on 19 and 20 September 2022, which included visual tree assessment, and the following measurements taken: tree height; crown width; trunk diameter at breast height (DBH); trunk diameter at the root crown (DRC).

Tree protection zones (TPZ) and structural root zones (SRZ) were calculated in accordance with the Australian Standard AS 4970–2009: Protection of Trees on Development Sites.

2.4.3 Site surveys

2.4.3.1 Flora

The subject land was inspected by one ecologist on 20 November 2020 over approximately four hours. As the area is highly modified and predominantly comprises plantings in garden beds surrounded by hardstand, all vegetated areas were able to be investigated without applying random meander or transect methods. Data was collected from BAM two plot / transects as shown in Figure 5 and plot data is provided in Appendix B.

Table 2. Environmental conditions during surveys

Date	Temperature (min. & max.)	General	Rainfall (mm)	
20.11.2020	17°C - 26.7°C	Calm, 80% cloud cover	nil	44mm in the preceding 3 weeks (36mm, 2mm, and 6mm in the weeks 1 to 3 respectively)

2.4.3.2 Habitat assessment

The subject site was assessed for habitat features that may support threatened species identified as candidate species credit species and those recorded within the search area in the TBDC.

Habitat searches focused on the presence of tree hollows, dreys, nests, scratchings, exudation, bark decortication, faecal stains/droppings, scats and any incidental sightings.

2.4.3.3 Microbat roosting habitat

A targeted microbat roost habitat search of the building to be demolished was undertaken on 23 May 2024 by Lauren Crofts (B.Sc Grad Cert Env.Sc M.EnvSc.Mngt) and Harry Engel (B.Mar.Sc).

The inspection focused on:

- + Conducting foot traverses around the outside of the building to determine if any suitable roosting sites (such as crevices, overhangs and the like), or openings that permit access into the roof space, were present
- + Conducting foot surveys internally within each part of the building, particularly any sites that are ‘dark’.

The methods employed to targeted any microbats and their potential breeding/roosting habitat is based on the Roost Search method described in the:

- + OEH 2016 publication titled ‘Threatened Bat Survey Guidelines for NSW: NSW guide for the survey of threatened bats and their habitats for offset methodologies’

- + OEH 2018 publication titled 'Species credit' threatened bats and their habitats: NSW survey guide for the Biodiversity Assessment Method'.

To assist with the inspections, hand-held torches and echolocation detectors were employed. Whilst conducting the surveys, a hand-held echolocation detection device (a Titley Scientific Anabat Express™) connected to a microphone extension cable was used. Where potential cavities, overhangs or crevice's were seen, the unit's microphone was directed (or lowered/inserted) into these. The microphone was left in place within these features for a period of about 10 minutes per site.

In conducting the inspections within, and external to, the building, guano accumulations, characteristic staining and/or deceased microbats were searched for.

During the course of the inspection, no limitations such as adverse weather conditions (e.g. rain or low/cold temperatures) or restricted access/site visibility were encountered.

3. Site context

3.1 General description

The subject land slopes gently toward the south and Prospect Creek (located 120m to the south). The highest elevation is along the northern boundary at approximately 20 m AHD, with the lowest point located in the southeastern corner at approximately 16 m AHD.

Some sections of the site are grassed with landscaping, particularly in the south where historical filling has reportedly occurred (JBS&G 2022).

3.1.1 Soil landscapes

The subject land is mapped as overlying Berkshire Park soil landscape. Table 3 provides a summary of the soil landscape characteristics. These characteristics are important contributors in identifying the plant community types and potential threatened species habitat present within the subject land.

Table 3. Subject land soil landscapes

Landscape	Alluvial plain on Londonderry Tertiary Alluvium (alluvium, clay, silt and sand) in the Cumberland Plain. Local relief 0-20 m; altitude 10-54 m; slopes 0-3%; rock outcrop nil. Partially cleared woodland
Soils	Brown and Yellow Sodosols (Soloths) and Brown and Yellow Kurosols (Yellow and Brown Podzolic Soils).
Vegetation	Partially cleared Castlereagh Scribbly Gum Woodland and Swamp Woodland. Dominated by <i>Eucalyptus sclerophylla</i> and <i>Angophora bakeri</i> . Common shrub species include <i>Banksia spinulosa</i> , <i>Grevillea</i> spp., <i>Hakea sericea</i> , <i>Leptospermum trinervium</i> and <i>Melaleuca nodosa</i> . The Swamp Woodland is dominated by <i>E. parramattensis</i> subsp. <i>parramattensis</i> and <i>Melaleuca decora</i> with some <i>E. sclerophylla</i> (hard-leaved scribbly gum).
Land degradation	Sheet, rill and gully erosion occur where surface soils are sandy and have been disturbed, e.g., along tracks and creek lines.
Hazards	Localised salinity, low fertility, foundation movement hazards and sheet and gully erosion hazards

3.2 Landscape features

The BAM stream-lined module requires the identification of landscape features in accordance with BAM Section 3.1. Landscape features relevant to the proposal have been assessed from within a 1500m buffer zone (the BDAR assessment area) around the subject land. Table 4 and Figure 3 identify the landscape features identified.

Table 4. Landscape features

Landscape features	
IBRA bioregion/subregion	Sydney Basin/Cumberland
NSW (Mitchell) landscapes	BDAR assessment area: Cumberland Plain (49%); Georges River Alluvial Plain (30%); Ashfield Plains (21%) Subject land: Cumberland Plain (80%); Georges River Alluvial Plain (20%)
Rivers and streams classified according to stream order	No watercourses occur within the subject land. Prospect Creek occurs as a 2 nd order stream in the BDAR assessment. A smaller 1 st order stream (Blind Gully Creek) feeds into Prospect Creek to the west of the subject land,
Wetlands within, adjacent to and downstream of the site	No wetlands of local, regional, national or international significance are located within the subject land or BDAR assessment area
Connectivity of different areas of habitat	The subject land does not contain any regionally important biodiversity corridors but provides connectivity from south to north towards the Prospect Creek riparian corridor, which is identified as a Cumberland subregional corridor (see Figure 5)
Geological features such as karst, caves, crevices, cliffs, rocks, and other geological features of significance and for vegetation clearing proposals, soil hazard features	No karsts, caves, crevices, cliffs or areas of geological significance have been identified within the BDAR assessment area.
Areas of outstanding biodiversity value occurring on the subject site and assessment area	No outstanding biodiversity values occur within the BDAR assessment area.

3.3 Native vegetation cover

Table 5 summarises the extent of native vegetation cover within the BDAR assessment area. Figure 4 shows native vegetation cover within the assessment area.

The BDAR assessment area including the subject land is 894 ha. The total of native vegetation cover within the BDAR assessment area is estimated at 60 ha, which equates to 6.7% and an assignment to the <10% cover class (in accordance with the BAM Section 3.2).

Table 5. Native vegetation cover in the BDAR assessment area

BDAR assessment area (ha)	894 ha
Total area of native vegetation cover (ha)	60 ha
Percentage of native vegetation cover (%)	6.7%
Class (0-10, >10-30, >30-70 or >70%)	0-10%

4. Native vegetation, threatened ecological communities and vegetation integrity

4.1 Assessment overview

Native vegetation within the subject land extends over approximately 0.89 ha, which comprises predominantly planted native tree species overlying mown grass or in garden beds (see photo plates provided at the end of this section).

Unless eligible to be assessed in accordance with Appendix D of the BAM (refer Section 3.2) all planted native vegetation must be allocated to the most likely plant community type (PCT).

Identification of plant community types (PCTs) within the subject land was undertaken with reference to the following resources:

- + Native vegetation mapping (Section 4.1.1);
- + Arboricultural assessment (Section 4.1.2);
- + Historical imagery (Section 4.1.3);
- + Site survey/floristic data collection (Section 4.3); and
- + The BioNet Vegetation Classification database (Section 4.3).

4.1.1 Vegetation mapping

Cumberland Blue Box Riverflat Forest (PCT 4024) is mapped on the State Vegetation Type Map (SVTM) (DPE 2023) as occurring along Prospect Creek approximately 120m to the south of the subject land.

The subject land is mapped as 'Urban Exotic/Native' by OEH (2016) and 'Not native vegetation' by DPE (2023).

4.1.2 Arboricultural assessment

Civica (2024) identified twenty-seven (27) species (including exotic species) with the most prevalent being *Eucalyptus tereticornis* (forest red gum), *Casuarina glauca* (swamp oak) and *Corymbia maculata* (spotted gum) and the following descriptors provided:

- + Predominantly planted stock, with some possibly self-sown;
- + No significant remnant trees identified;
- + A relatively young treescape with the following ratings:
 - 46 trees (20%) mature specimens
 - 94 (42%) semi-mature
 - 82 trees (37%) juvenile
 - Two (1%) being senescent

Table 6 lists all native species identified by Civica (2024), whether they are local or non-local species and their habitat requirements.

Table 6. Tree species identified in subject land

Species name	Common name	Status
Local native		
<i>Callistemon salignus</i>	willow bottlebrush	Mostly grows in low-lying river flats and damp creeks, rarely in dry areas.
<i>Casuarina cunninghamiana</i>	river oak	Along permanent freshwater streams.
<i>Casuarina glauca</i>	swamp oak	In brackish situations along coastal streams, somewhat farther inland along major river valleys. Often forming pure stands.
<i>Corymbia maculata</i>	spotted gum	Community dominant, in open forest on somewhat infertile and drier sites on shales and slates.
<i>Eucalyptus fibrosa</i>	red ironbark	Locally frequent, in wet or dry sclerophyll forest on shallower and somewhat infertile soils.
<i>Eucalyptus tereticornis</i>	forest red gum	Community dominant, widespread in grassy, wet or dry forest or woodland on soils of medium to high fertility.
<i>Melaleuca decora</i>		Grows in swamps on heavy soils, chiefly in coastal sites.
<i>Melaleuca linariifolia</i>	flax-leaved paperbark	Grows in heath and dry sclerophyll forest in moist or swampy ground.
<i>Syncarpia glomulifera</i>	turpentine	Often grows as an emergent near the margins of rainforest or in wet sclerophyll forest, often on heavier soils.
<i>Syzygium paniculatum</i>	magenta lily pily	Grows in subtropical and littoral rainforest on sandy soils or stabilised dunes, often near the sea.
<i>Tristaniopsis laurina</i>	water gum, kanooka, kanuka	Grows in rainforest and sclerophyll forest; widespread on the coast and ranges, usually along banks of streams.
Non-local native		
<i>Callistemon viminalis</i>	weeping bottlebrush	Occurs north from the Gloucester area. Widely cultivated species.
<i>Leptospermum petersonii</i>	lemon-scented teatree	Occurs north from Port Macquarie often near wet sclerophyll forest or rainforest, on sandy soils or on rocky escarpments.
<i>Lophostemon confertus</i>	brush box	Occurs north from the Hunter Valley; sparingly naturalised around Sydney in some areas where the species is planted as a street tree.
<i>Melaleuca bracteata</i>	black tea-tree	Occurs north from the Macleay River where its widespread along watercourses or on heavier inland soils in depressions.
<i>Melaleuca leucadendra</i>	weeping paperbark/Cajuput	Occurs in Western Australia, the northern part of the Northern Territory, and East Timor.
<i>Melaleuca quinquenervia</i>	broad-leaved paperbark	Occurs north from Botany Bay, widespread in coastal swamps and around lake margins. Widely planted as street trees.

4.1.3 Historical imagery

Historical imagery from 1947 to current day provides insight into land-use changes over time. This method of assessment is particularly useful when an area of interest (such as the subject land) contains numerous non-local native and exotic planted species.

A summary of findings is provided in Table 8 and historical imagery is provided in Appendix C.

Table 7. Historical imagery summary

Year	Summary
1947-1960	Site cleared for agriculture, residential dwelling evident on the current southwest corner of subject land. Market gardens / crops extending all the way to Prospect Creek. Trees evident around dwelling, along eastern and western boundary and along an old fence line running from west to east.
1969	The Castrol facility and associated buildings and car park established (Dwelling and market gardens at southern end of subject land demolished. Remnant vegetation in the northern site portion and central area of site cleared.
1977	Planted vegetation associated with office building adjacent McCredie Road evident.
1985	Planted vegetation associated with car parks in northern site portion evident
1993	Planted vegetation along southern and southeastern boundary evident
2010	New car park to the south of tanks and clearing of one remnant tree evident. Remnant tree felled to south of subject land in Prospect Creek reserve also evident.

4.2 Planted native vegetation

Based on the information provided in Section 3.1, planted native vegetation located within the northern site portion is eligible to be assessed under Appendix D of the BAM.

The remaining areas occur as a mosaic of planted and native vegetation and must be allocated to the best-fit PCT and assessed under Chapters 4 and 5 of the BAM (refer Section 4.3).

4.2.1 D.1 Decision-making key

Table 7 outlines the BAM’s Appendix D decision-making key (D1) with relevance to the planted native vegetation located in the northern site portion of the subject land, which covers approximately 0.17 ha. Photographic plates 1 to 6 illustrate areas of planted native vegetation within the subject land.

Table 8. D.1 Decision-making key

Key	If yes	If no
1. Does the planted native vegetation occur within an area that contains a mosaic of planted and remnant native vegetation and which can be reasonably assigned to a PCT known to occur in the same IBRA subregion as the proposal?	The planted native vegetation must be allocated to the best fit PCT, and the BAM must be applied.	No, the area does not occur in a mosaic with remnant native vegetation

Key	If yes	If no
		Go to 2.
<p>2. Is the planted native vegetation:</p> <p>a. planted for the purpose of environmental rehabilitation or restoration under an existing conservation obligation listed in BAM Section 11.9(2.), and</p> <p>b. the primary objective was to replace or regenerate a plant community type or a threatened plant species population or its habitat?</p>	<p>The planted native vegetation must be assessed in accordance with Chapters 4 and 5 of the BAM.</p>	<p>No, it was not planted for these purposes</p> <p>Go to 3.</p>
<p>3. Is the planted/translocated native vegetation individuals of a threatened species or other native species planted/translocated for the purpose of providing threatened species habitat under one of the following:</p> <p>a. a species recovery project</p> <p>b. Saving our Species project</p> <p>c. other types of government funded restoration project</p> <p>d. condition of consent for a development approval that required those species to be planted or translocated for the purpose of providing threatened species habitat</p> <p>e. legal obligation as part of a condition or ruling of court. This includes regulatory directed or ordered remedial plantings (e.g., Remediation Order for clearing without consent issued under the BC Act or the Native Vegetation Act)</p> <p>f. ecological rehabilitation to re-establish a PCT or TEC that was, or is carried out under a mine operations plan, or</p> <p>g. approved vegetation management plan (e.g., as required as part of a Controlled Activity Approval for works on waterfront land under the <i>NSW Water Management Act 2000</i>)?</p>	<p>The planted native vegetation must be assessed in accordance with Chapters 4 and 5 of the BAM.</p>	<p>No, it was not planted for the purpose of providing threatened species habitat</p> <p>Or</p> <p>Under an approved vegetation management plan.</p> <p>Go to 4.</p>
<p>4. Was the planted native vegetation (including individuals of a threatened flora species) undertaken voluntarily for revegetation, environmental rehabilitation or restoration without a legal obligation to secure or provide for management of the native vegetation?</p>	<p>Go to D:2 Assessment of planted native vegetation for threatened species habitat (the use of Chapters 4 and 5 of the BAM are not required to be applied).</p>	<p>No</p> <p>Go to 5.</p>

Key	If yes	If no
<p>5. Is the native vegetation (including individuals of a threatened flora species) planted for functional, aesthetic, horticultural or plantation forestry purposes? This includes examples such as: windbreaks in agricultural landscapes, roadside plantings (including street trees, median strips, roadside batters), landscaping in parks, gardens and sport fields/complexes, macadamia plantations or tea tree farms?</p>	<p>Go to D.2 Assessment of planted native vegetation for threatened species habitat (the use of Chapters 4 and 5 of the BAM are not required to be applied).</p>	



Photo 1. Northern boundary (McCredie Road) planted natives

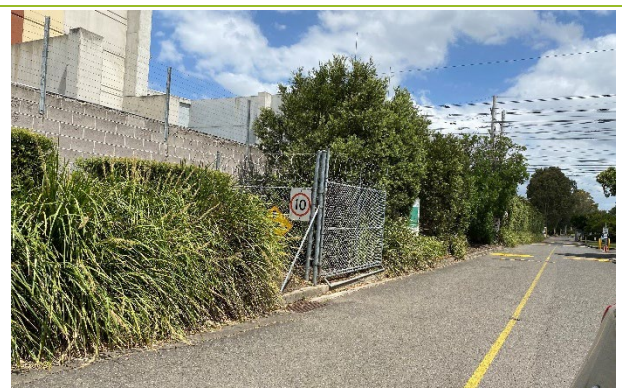


Photo 2. Site entrance native and exotic landscaping



Photo 3. Eastern boundary (and access road) landscaping



Photo 4. Car park area in northern site portion (planted exotics in forefront and planted non-local natives in background)



Photo 5. Car park landscaping (western end of northern site portion)



Photo 6. Car park landscaping (western end of northern site portion)

4.2.2 D.2 Assessment of planted native vegetation for threatened species habitat

In accordance with Appendix D of the BAM (2020) – Part (D2) an assessment of the suitability of the planted native vegetation for use by threatened species must be undertaken.

This assessment has concluded that the planted native vegetation does not provide habitat for threatened species, due to the following:

- + Lack of microhabitat features that would support threatened species credit species;
- + Highly degraded nature of the subject land and surrounding industrial /urban environs; and
- + A lack of incidental sightings or evidence (e.g., dreys, nests, scratchings, exudation, bark decortication, faecal stains/droppings, scats).

Refer to Section 5 for description of habitat for threatened species assessment.

4.3 Plant community types

4.3.1 Overview

Vegetation within the subject land has been assessed as aligning with the BioNet Vegetation Classification PCTs identified within Table 9 and their extent is shown in Figure 5.

Table 9. PCTs identified in the subject land

PCT ID	PCT name	Subject land (ha)
PCT 4024	Cumberland Blue Gum Riverflat forest	0.72
Total extent in subject land		0.72

4.3.2 PCT 4024 Cumberland Blue Gum Riverflat forest

4.3.2.1 PCT overview

Table 10 outlines data contained within the BioNet Vegetation Classification for PCT 4024.

Table 10. PCT 4024 Cumberland Blue Gum Riverflat forest

PCT ID	PCT 4024
PCT name	Cumberland Blue Gum Riverflat forest
Vegetation formation	Forested Wetlands
Vegetation class	Coastal Floodplain Wetlands
Percent cleared value (%)	98.88
Extent within subject land	Cumberland Blue Gum Riverflat forest

4.3.2.2 Condition states

PCT 4024 within the subject land has been assessed as being in the one broad ‘poor’ condition. Photographic plates 7 to 18 illustrate the highly modified condition of the PCT within the subject land.



Photo 7. Western boundary southern site portion



Photo 8. Western boundary southern site portion



Photo 9. Western boundary looking north



Photo 10. Western boundary looking south



Photo 11. Isolated swamp oak to be removed



Photo 12. Modified soils/substrate and dominant introduced ground layer



Photo 13. Vegetation to be cleared along southeastern boundary



Photo 14. Vegetation to be cleared along southeastern boundary



Photo 15. Example of weed infestations along southern boundary



Photo 16. Example of weed infestations along southern boundary



4.3.2.3 Justification of PCT selection

Potential PCTs were filtered through the BioNet Vegetation Classification database based on the Sydney Basin region and Cumberland subregion criteria and presence of species identified during site surveys. The most closely matched PCTs included:

- + Coastal Valleys Swamp Oak Riparian Forest (PCT 4023)
- + Cumberland Blue Gum Riverflat forest (PCT 4024)
- + Cumberland Red Gum Riverflat Forest (PCT 4025)

Table 11 compares the above four PCTs against the subject land’s native tree species (which are listed in order of abundance) and the median cover score (MCS)[#].

[#] The Eastern NSW PCT Classification cover and abundance schema used is 1 to 6 cover abundance score where:

- Score 1 = Up to 5% projected foliage cover and uncommon
- Score 2 = Up to 5% projected foliage cover and common
- Score 3 = 6-20% projected foliage cover
- Score 4 = 21-50% projected foliage cover
- Score 5 = 51-75% projected foliage cover
- Score 6 = Over 75% projected foliage cover

Table 11. Bionet Vegetation Classification database results

Species name	PCT 4023		PCT 4024		PCT 4025		PCT 3320	
	MCS	Freq.	MCS	Freq.	MCS	Freq.	MCS	Freq.
Casuarina glauca ^{##}	4	88	2	50	2	9	2	2
Eucalyptus tereticornis ^{##}	1	17	2	50	3	69	3	72
Corymbia maculata	1	4			3	5	3	10

Species name	PCT 4023		PCT 4024		PCT 4025		PCT 3320	
	MCS	Freq.	MCS	Freq.	MCS	Freq.	MCS	Freq.
Melaleuca decora ^{##}	3	13	4	17	1	15		
Melaleuca linariifolia	1	4			3	10	2	1
Casuarina cunninghamiana	2	4			2	4		
Eucalyptus fibrosa					3	4	2	14

^{##} Remnant native species based on historical and existing location and age of trees

In the absence of remnant subshrub and groundcover species it is impossible to confidently ascertain which PCT is most appropriate. i.e., dominant tree species are not always a useful diagnostic of the PCT. While they may be among the species with highest cover-abundance values, they still represent a relatively small proportion of the total species richness present at a site.

The PCTs shown in Table 12 are all found on the Cumberland Plain and all have considerable floristic overlaps. The elevation, soil and Mitchell landscapes (refer Sections 3.1 and 3.2) are more suited to PCTs 4023 (swamp oak forest), 4024 and 4025 (riverflat forests) in comparison to PCT 3320 (shale plains woodland).

On broader floodplains of the Cumberland Plain, swamp oak forest grades into riverflat forests and riverflat forest often grades into shale plains woodland.

PCT 4023 is associated with the South Creek catchment, whereas PCT 4024 is associated with the Georges River and PCT 4025 is situated on the alluvial flats alongside streams that drain the Cumberland Plain or more rarely the broad alluvial flats of the Hawkesbury and Nepean river systems to the west of Sydney.

As shown in Table 12, PCT 4024 appears more closely matched when considering additional aspects and PCT 4024 is the most commonly mapped PCT in proximity to the subject land.

Table 12. Comparison of PCTs

Aspects considered	PCT 4023	PCT 4024	PCT 4025	PCT 3320
Elevation	✓	✓	✓	
Soil landscape	✓	✓	✓	
Mitchell landscape	✓	✓	✓	✓
Catchment		✓	✓	✓
Median Elevation (m)		✓		
Median Annual Rainfall (mm)		✓		
Remnant species match	3	3	3	2

4.3.2.4 Alignment with TECs

PCT 4024 relates to the NSW threatened ecological community (TEC) River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions.

4.3.2.5 Alignment with EPBC Act listed ECs

PCT 4024 relates to the Commonwealth River-flat Eucalypt Forest on Coastal Floodplains TEC where it satisfies condition thresholds as per section 5.2 of the Conservation Advice.

Section 5.2 identifies that areas of the National listed ecological community focuses legal protection on patches of the ecological community that are the most functional, relatively natural and in comparatively good condition. In order to be protected as a matter of national environmental significance (MNES), areas of the ecological community must meet both:

- + The key diagnostic characteristics, AND
- + At least the minimum condition thresholds.

Native vegetation allocated to PCT 4024 in the subject land does not satisfy the diagnostic AND condition thresholds as summarised in Table 13 and Table 14.

Table 13. Key diagnostic characteristics

Characteristic	Relevance to subject land
Occurs in the South East Corner and Sydney Basin IBRA7 Bioregions, in eastern Victoria and south eastern New South Wales.	Characteristic present
Occurs within catchments of the eastern and southern watershed of the Great Dividing Range	Characteristic present
Occurs at elevations up to 250 metres above sea-level (ASL), but most typically below 50 metres ASL	Characteristic present
Occurs on alluvial landforms related to coastal river floodplains and associated sites where transient water accumulates, including floodplains, riverbanks, riparian zones, lake foreshores, creek lines (including the floors of tributary gullies), floodplain pockets, depressions, alluvial flats, fans, terraces, and localised colluvial fans.	Soils have been substantially modified from original Berkshire soil landscape
Occurs on alluvial soils of various textures including silts, clay loams, sandy loams, gravel and cobbles. Does not occur on soils that are primarily marine sands, or aeolian sands.	As above
Occurs as a tall closed-forest, tall open-forest, closed forest, open forest, tall woodland, or woodland	Characteristic present

Characteristic	Relevance to subject land
The canopy has a crown cover of at least 20 percent	Characteristic present
Has a canopy dominated by one or a combination of the following species: <i>Angophora floribunda</i> , <i>A. subvelutina</i> , <i>Eucalyptus amplifolia</i> , <i>E. baueriana</i> , <i>E. benthamii</i> , <i>E. bosistoana</i> , <i>E. botryoides</i> , <i>E. botryoides x E. saligna</i> , <i>E. elata</i> , <i>E. grandis</i> , <i>E. viminalis</i>	Condition not strictly met, although <i>E. tereticornis</i> and <i>C. glauca</i> are identified in Appendix A. Species lists as occurring in the NSW communities.

Table 14. Condition classes and thresholds

Patch size thresholds →	Large patch Patch size ≥ 2 ha	Small contiguous ⁷ patch Patch size ≥ 0.5 ha within a larger area of native vegetation ≥ 5 ha	Small patch Patch size ≥ 0.5 ha
Biotic thresholds ↓			
High condition ≥ 80% of its total perennial understorey vegetation cover ¹ is comprised of native species AND Ground cover richness ² ≥ 10 native species per sample plot AND ≥ 20 large trees ³ per ha	CLASS A1 Large or contiguous patch in high condition		CLASS B1 Small patch in high condition
Good condition with arboreal mammals ≥ 50% of its total perennial understorey vegetation cover ¹ is comprised of native species AND Ground cover richness ² ≥ 6 native species per sample plot AND At least 10 large trees ³ per ha AND Evidence of 4 or more species of arboreal mammals ⁴ detected ⁵ in the patch	CLASS A2 Large or contiguous patch in good condition with arboreal mammals		CLASS B2 Small patch in good condition with arboreal mammals
Good condition ≥ 50% of its total perennial understorey vegetation cover ¹ is comprised of native species AND Ground cover richness ² ≥ 6 native species per sample plot AND At least 10 large trees ³ per ha	CLASS B3 Large or contiguous patch in good condition		CLASS C1 Small patch in good condition
Moderate condition ≥ 30% of its total perennial understorey vegetation cover ¹ is comprised of native species AND Ground cover richness ≥ 4 native species per sample plot ²	CLASS C2 Large or contiguous patch in moderate condition		Does not meet biotic
<p>¹ Perennial understorey vegetation cover includes vascular plant species of all layers below the canopy with a life-cycle of more than two growing seasons. It includes herbs (graminoids and forbs), grasses, shrubs and juvenile plants of canopy species, but does not include annual plants, cryptogams, plant litter or exposed soil.</p> <p>² Ground cover richness includes combined species richness of native grasses, forbs, ferns and sedges per 0.04 ha (20 x 20 m sample plot).</p> <p>³ Large eucalypt trees are greater than 45 cm [diameter at breast height (dbh)]. This is used as a surrogate for tree hollows and habitat values.</p> <p>⁴ Excluding micro-bats (Microchiroptera).</p> <p>⁵ Survey guidelines (DSEWPC 2011).</p> <p>⁷ Contiguous means the patch is connected to, or in close proximity to (i.e. within 30 m of), another area of native vegetation (i.e. an area where the total perennial vegetation cover is dominated (50 percent or more) by native plant species).</p>			

Source: Table 4 - River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria Conservation Advice, Page 24 of 82 (6 December 2020)

4.4 Patch size

A patch is an area of native vegetation that occurs on the subject land and includes native vegetation that has a gap of less than 100 m from the next area of native vegetation (or ≤ 30 m for non-woody ecosystems). A patch may extend onto adjoining land. The patch size in hectares must be assigned for each vegetation zone, to one of the following classes:

- (a) <5 ha, or (b) 5–<25 ha, or (c) 25–<100 ha, or (d) ≥100 ha.

Native vegetation within the subject land is proximal to the Prospect Creek riparian corridor, which is a continuous vegetated corridor connecting to Prospect Reservoir where .

Therefore, a patch size of ≥100 ha has been assigned.

4.5 Vegetation integrity (vegetation condition)

4.5.1 Vegetation integrity survey plots

BAM data was collected from two vegetation integrity plot/transects in vegetation allocated to PCT 4024, which is compliant with the minimum number of plots required being one (1). The location of each plot is shown in Figure 5.

4.5.2 Scores

Vegetation integrity scores calculated from data collected in the BAM calculator (BAM C) is presented in Table 15.

Table 15. Vegetation integrity scores

Vegetation zone ID	Composition condition score	Structure condition score	Function condition score (where relevant)	Vegetation integrity score	Hollow bearing trees present?
PCT 4025-low	7.6	18.5	55.7	19.1	No

5. Threatened species

5.1 Assessing habitat suitability for threatened species

The Threatened Biodiversity Data Collection (TBDC) identifies the threatened species that are likely to occur on or use the subject land and thereby predicts the species that require assessment. This is automatically populated in the BAM-C based on the information collected from assessing the subject land.

Threatened species are categorised in the BAM-C as ecosystem, species, or dual, credit species.

5.1.1 Ecosystem credit species

Ecosystem credit species are those threatened species where the likelihood of occurrence of a species or elements of the species' habitat can be predicted by vegetation surrogates and landscape features, or for which targeted survey has a low probability of detection.

The TBDC identifies the threatened species assessed for ecosystem credits. A targeted survey is not required to identify or confirm the presence of ecosystem credit species.

The list of ecosystem credit species (predicted species) is provided Appendix D. The following three ecosystem credit species were not maintained in the BAM C due to the lack of wetland habitat within the subject land.

- + *Botaurus poiciloptilus* Australasian Bittern
- + *Ephippiorhynchus asiaticus* Black-necked Stork
- + *Rostratula australis* Australian Painted Snipe

5.1.2 Species credit species

Species credit species are threatened species for which vegetation surrogates and/or landscape features cannot reliably predict the likelihood of their occurrence or components of their habitat.

Under the stream-lined BAM module, only candidate species credit species at risk of a Serious and Irreversible Impacts (SAIs) must be further assessed. Candidate species credit species that are not at risk of an SAI and are not incidentally recorded on the subject land do not require further assessment. The list of species credit species (candidate species) is provided **Appendix D**.

5.1.3 Dual credit species

Dual credit species are threatened species that the TBDC identifies as both ecosystem credits and species credit species. Dual credit species are generally highly mobile species that rely on particular habitat components for breeding or require particular areas in the landscape important for their survival. For dual credit species, part of the habitat is assessed as a species credit. The remaining habitat components for the species are assessed as an ecosystem credit (e.g., foraging habitat).

5.1.4 Species at risk of an SAI

No candidate species credit species have been incidentally recorded on the subject land.

Candidate species credit species that are at risk of an SAI are listed in Table 15, which identifies the following:

- + The species credit type, i.e., species (breeding) indicates the species is a dual species and already considered as an ecosystem credit species;
- + Whether they have been retained within the assessment (yes or no); and

- + Justification for the species not being retained within the assessment (i.e., following consideration of any habitat constraints, absence of habitat, geographic limitations, and habitat quality).

Table 16. Species credit species at risk of an SAI

Species name	Credit type	Maintained in BAM-C	Justification in BAM C if not retained
Bats			
<i>Miniopterus australis</i>	SAII Species (breeding)	NO	Habitat constraint: i.e., absence of cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species and records with microhabitat code "IC - in cave" observation type code "E nest-roost " with numbers of individuals >500
<i>Miniopterus orianae oceanensis</i>	SAII Species (breeding)		
Birds			
<i>Anthochaera phrygia</i>	SAII Species (breeding)	NO	Habitat constraint: i.e., site is not within BAM Regent Honeyeater Important Habitat Areas mapping
<i>Lathamus discolor</i>	SAII Species (breeding)	NO	Habitat constraint: i.e., site is not within BAM Swift Parrot Important Habitat Areas mapping
Flora			
<i>Hibbertia</i> sp. Bankstown	SAII	YES	
<i>Persoonia hirsuta</i>	SAII	YES	
<i>Rhodamnia rubescens</i>	SAII	NO	Not known to occur naturally in the wild in NSW

5.2 Listed SAI entities

Threatened flora species (listed SAI entities) that required further consideration are *Hibbertia* sp. Bankstown and *Persoonia hirsuta* (hairy geebung).

Syzygium paniculatum (magenta lilly pilly) is an additional threatened species, which has been considered further. Historical imagery (provided in Appendix C) shows that the specimens of magenta lilly pilly were planted in the northern site portion sometime in the 1970s. Prior to this the land was cleared prior to 1947 (as evident in historical imagery).

- + The species grows in subtropical and littoral rainforest on sandy soils or stabilised dunes, often near the sea, which is not representative of the subject land and the species' distribution is between the Taree area and Conjola in NSW.
- + The species has been widely planted as a municipal and domestic ornamental tree.

On this basis it is concluded that these specimens are not representative of the naturally occurring threatened *S.paniculatum* and further consideration of this species unnecessary

5.2.1 *Hibbertia* sp. Bankstown

This species is endemic to New South Wales and is currently known to occur in only one population at Bankstown Airport in Sydney’s southern suburbs, in the Bankstown local government area.

Known only from tertiary alluvial soil along Airport Creek on Bankstown Airport and not from areas where subsequent fill has been deposited in between. The plant assemblage where found at the airport is attributable to Castlereagh Ironbark Forest in the Sydney Basin Bioregion.

The TBDC’s optimal survey times and conditions for this species advises that identification is by the flower with flowering from October to December. Thus, the survey timing was appropriate in which the species was not detected.

5.2.2 *Persoonia hirsuta* (hairy geebung)

The NSW Scientific Committee’s final determination describes the species as occurring in woodlands and dry sclerophyll forest on sandstone or very rarely on shale, with the TBDC stating it is found in clayey and sandy soils in dry sclerophyll open forest, woodland and heath, primarily on the Mittagong Formation and on the upper Hawkesbury Sandstone.

The subject land is located on the Tertiary alluvial/colluvial Berkshire soil landscape and not on the Mittagong Formation or the upper Hawkesbury Sandstone.

Regardless, no *Persoonia* species were detected within the subject land.

The hairy geebung is a spreading to decumbent shrub, distinguished by its hairiness, that can be surveyed all year round. Thus, the survey timing was appropriate in which the species was not detected.

5.3 Matters of NES

Further to the consideration of PCT 835 in Section 4.3, Table 16 identifies nationally threatened and migratory species recorded within a ten (10) kilometre radius from the subject land.

Table 17. Threatened and migratory species recorded from locality

Species name	Common name	Justification
Flora		
<i>Acacia pubescens</i>	Downy Wattle	Not found during surveys
<i>Pimelea spicata</i>	Spiked Rice-flower	Not identified in the BAM C as a candidate species. Habitat absent: In the Cumberland Plain (western Sydney (<i>P. spicata</i> occurs on an undulating topography of well structured clay soils, derived from Wianamatta shale, which is not present in the subject land.
Avifauna		
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	Habitat absent, maintained as ecosystem credit in BAM-C

Species name	Common name	Justification
Lathamus discolor	Swift Parrot	Habitat degraded / breeding habitat absent, maintained as ecosystem credit in BAM-C
Mammals		
Dasyurus maculatus	Spotted-tailed Quoll	Habitat absent, species not identified in the BAM-C as a ecosystem credit species.
Phascolarctos cinereus	Koala	Habitat absent, species not identified in the BAM-C as a ecosystem credit species.
Pteropus poliocephalus	Grey-headed Flying-fox	Habitat degraded / breeding habitat absent, maintained as ecosystem credit in BAM-C.
Migratory		
Apus pacificus	Fork-tailed Swift	<p>Non-breeding visitor, which is almost exclusively aerial. 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. They are said to search along edges of low-pressure systems, which assist flight.</p> <p>Recorded from Prospect Reservoir (5kms to west). Unlikely to forage over subject land or be affected by the proposed development.</p>
Hirundapus caudacutus	White-throated Needletail	<p>Non-breeding visitor, which almost always forage aerially, at heights up to 'cloud level', above a wide variety of habitats ranging from heavily treed forests to open habitats, such as farmland, heathland or mudflats. They sometimes forage over recently disturbed areas, such as forest that has been recently cleared or burnt, or above paddocks as they are being ploughed or slashed. They often forage in areas of updraughts, such as ridges, cliffs or sand-dunes, or in the smoke of bushfires or in whirlwinds. They often forage along the edges of low pressure systems, which both lift their food sources and assist with their flight, and it is said that they follow these systems across Australia.</p> <p>Recorded from Prospect Reservoir (5kms to west). Unlikely to forage over subject land</p>

Species name	Common name	Justification
		or be affected by the proposed development.
Hydroprogne caspia	Caspian Tern	<p>Mostly found in sheltered coastal embayments (harbours, lagoons, inlets, bays, estuaries and river deltas) and those with sandy or muddy margins are preferred.</p> <p>Recorded from Chipping Norton Lake (>5kms to the south). Unlikely to forage over subject land or be affected by the proposed development.</p>

6. Prescribed Impact Identification

Prescribed additional biodiversity impacts (prescribed impacts) must be assessed as part of the Scheme, as per clause 6.1 of the BC Regulation. Prescribed impacts include those impacts on the habitat of threatened species or ecological communities from development that is not directly caused as a result of vegetation clearing.

Table 17 lists the prescribed impacts, which are identified in Clause 6.1 of the *Biodiversity Conservation Regulation 2017* and the relevance of each prescribed impact in relation to the proposal.

Table 18. Prescribed and Uncertain Impacts

Will there be impacts on any of the following	Yes/No	If yes, address the assessment questions from section 9.2.1 of the BAM
(a) Development on the habitat of threatened species or ecological communities associated with: <ul style="list-style-type: none"> i. karst, caves, crevices, cliffs, rock outcrops and other geological features of significance; ii. human-made structures; iii. non-native vegetation; 	NO	<ul style="list-style-type: none"> i. no karst, caves, crevices, cliffs and other features of geological significance occur on or near the subject land. ii. human-made structures within the subject land do not provide habitat for threatened species (see Appendix E). iii. non-native vegetation within the subject land does not provide habitat for threatened species or ecological communities.
(b) on areas connecting threatened species habitat, such as movement corridors	NO	<p>The subject land does not contain threatened species habitat and the proposal will not significantly impact on potential local movement corridors.</p> <p>The proposal has avoided areas of native vegetation that provide habitat stepping stones to proximal vegetation to the east and west.</p>
(c) that affect water quality, water bodies and hydrological processes that sustain threatened entities (including from subsidence or upsidence from underground mining)	YES	<p>The subject land does not contain any drainage lines. Prospect Creek is located approximately 100m from the southern boundary of the subject land.</p> <p>The proposal does not involve excavation that will intercept groundwater.</p> <p>The potential for the proposal to affect water quality, water bodies and hydrological processes that sustain threatened entities, is considered a low risk.</p> <p>Refer to Section 7 (avoidance and minimisation of indirect impacts) and Section 9 (mitigating and managing impacts).</p>
(d) on threatened and protected animals from turbine strikes from a wind farm	NO	No wind turbines are proposed.

Will there be impacts on any of the following	Yes/No	If yes, address the assessment questions from section 9.2.1 of the BAM
(e) on threatened species or fauna that are part of a TEC from vehicle strikes	NO	<p>The proposal is not anticipated to impact on any threatened or other fauna as a result of vehicle strikes, above any potential risk that already exists.</p> <p>The subject land is located adjacent to an existing highly trafficked road within an industrial area.</p>

7. Avoid or Minimise Impacts

7.1 Avoiding or minimising impacts on biodiversity values

Knowledge of biodiversity values has informed the location and design of the proposal. This has been an iterative process since the subject land was first proposed for a local development (DA2022/0759) and later modification DA (MOD2024/0047).

The final location of the proposed built environment avoids direct impacts on a total of 0.53 ha of native vegetation and will unavoidably impact (clear) 0.36 ha of native vegetation (see Table 18).

This is an additional 0.30 ha of PCT 4024 avoided compared to the approved DA clearing (see Table 18).

Table 19. Avoidance of DA approved clearing

Vegetation type	Existing vegetation (ha)	Approved DA clearing (ha)	Proposed SSD clearing (ha)	Proposed SSD avoidance (ha)
PCT 4024	0.72	0.51	0.21	0.51
Planted native	0.17	0.15	0.15	0.02
TOTAL	0.89	0.66	0.36	0.53

The proposal avoids impacts on biodiversity values along the southern boundary of the site and areas of mature trees along the eastern and western boundaries (see Figure 6). This demonstrating how the proposal has avoided and minimised impacts on biodiversity values and represents a significant betterment compared to the approved DA (as modified).

7.2 Avoid or minimise prescribed impacts when planning the proposal

The subject land overlies perched groundwater at approximately 0.2-0.4m below ground level (bgl) and approximately 4.0-6.0 m bgl.

Previous DA design iterations sought to excavate the subject land for basement carparking. The current proposal accommodates all carparking at ground level, which avoids the potential for the following prescribed impact:

- + Indirect impacts that affect water quality, water bodies and hydrological processes that sustain threatened entities.

The proposal has also reduced the extent of DA approved native vegetation clearing, thereby maintaining habitat linkages (albeit disconnected) along the southern and eastern boundaries of the subject land. This avoids the potential for the following prescribed impact:

- + Indirect impacts on areas connecting threatened species habitat, such as movement corridors.

8. Assessing the impacts of the proposal on biodiversity values

8.1 Direct impacts

8.1.1 Residual direct impacts

The proposed modification will unavoidably impact on approximately 0.37 ha of native vegetation that comprises:

- + 0.21 ha of native vegetation allocated to PCT 4024 that will be offset under the Scheme; and
- + 0.15 ha of landscaping (which includes planted non-local native species / assessed under the BAM planted native vegetation module).

Table 19 provides a summary of the residual direct impacts on vegetation allocated to PCT 4024.

8.1.2 Change in vegetation integrity score

The vegetation integrity score is the quantitative measure of vegetation condition calculated in accordance with Equation 23 of the BAM:

The change (loss) in vegetation integrity is the difference between the current vegetation integrity score determined before the development takes place and the future vegetation integrity score considering the impacts of development.

In this instance, the current vegetation integrity score is 21.8, and future vegetation integrity score is zero (see Table 20).

8.2 Indirect impacts

Indirect impacts are generally those that affect areas outside of the development footprint but occur due to the development, and which impact on native vegetation, threatened ecological communities, threatened species and their habitat. The BAM requires that the following aspects be assessed:

- a. the nature, extent, frequency, duration and timing of indirect impacts of the proposal, inclusive of the following:
 - i. during construction
 - ii. during operation
 - iii. arising from a change in land-use patterns
- b. the consequences of indirect impacts on biodiversity values;
- c. any limitations to data, assumptions and predictions about impacts on biodiversity; and
- d. reduced viability of adjacent habitat due to noise, dust or light spill.

Table 21 provides a summary of indirect impacts identified in the BAM that must be considered:

Table 20. Summary of residual direct impacts

Direct impact	BC Act status	EPBC status	Act	SAIL entity	Project phase/timing of impact	Extent (ha)
PCT 4024– Cumberland Blue Gum Riverflat forest	Endangered	N/A		No	Construction	0.21

Table 21. Impacts to vegetation integrity

PCT ID / Species ID	Area (ha)	Before development			After development			Change		
		Composition	Structure	Function	VI score	Composition	Structure	Function	VI score	Change in VI score
PCT 4024– Cumberland Blue Gum Riverflat forest	0.21	10	18.5	55.7	21.8	0	0	0	0	-21.8

Table 22. Assessment of indirect impacts

Indirect impact	Duration	Biodiversity values impacted	Consequence
Inadvertent impacts on adjacent habitat or vegetation, such as:			
Increased sedimentation	Short term during construction	Downslope retained vegetation and Prospect Creek system	Vegetation clearing and earthworks can expose soils and subsoils, which following rainfall may erode and mobilise soils in runoff, potentially smothering ground layer vegetation (in turn affecting health through a decrease in photosynthesis) or impact on water quality in downstream aquatic ecosystems (in turn affecting aquatic organisms that may provide a food resource for native fauna). Providing that best practices in erosion and sedimentation management are implemented in accordance with the project’s ESCP the consequence of this impact is considered to be a low risk.
Introduction of weeds and pathogens	Short term during construction	Retained vegetation and general environment	Construction activities have the potential to both spread existing weed infestations, introduce new weed species, and introduce or spread soil borne pathogens on machinery and equipment.

Indirect impact	Duration	Biodiversity values impacted	Consequence
			As a consequence, the condition (e.g., site integrity values) of retained and neighbouring vegetation could be decreased. Providing that the mitigation measures recommended in Section 9 are implemented the consequence of this impact is considered to be a low risk.
Trampling or other damage to remnant vegetation, including threatened species	Short term during construction	Retained vegetation	<p>Allowance for construction impacts outside of the design footprint have been included in the total area of clearing being offset under the Scheme.</p> <p>Retained vegetation will be protected in accordance with the project arborist’s recommendations (Civica 2024) and/or fencing that delineates no go zones (i.e., such as the vegetation along the southern boundary, which is being retained).</p>
Fertiliser drift	N/A	N/A	Only slow-release fertiliser in pellet form would be used, fertiliser drift will not occur.
Rubbish dumping, wood collection, removal and disturbance of rocks, including bush rock	N/A	N/A	The subject land does not contain any rocks, including bush rock. Rubbish dumping is not anticipated to occur within the developed site as it will be a fenced and a secure working environment.
Reduced viability of adjacent habitat due to:			
Dust	Short term during construction	Prospect Creek riparian corridor	<p>Dust generation during construction activities will be managed through the following measures:</p> <ul style="list-style-type: none"> + Construction staging, + Minimising material stockpiles, + Cleaning (water suppression) of construction haul roads, + Speed restrictions, and + Implementation of the project’s ESCP, and + Implementation of mitigations measures prescribed within the Construction Environmental Management Plan (CEMP).

Indirect impact	Duration	Biodiversity values impacted	Consequence
			The proposal is considered unlikely to reduce viability of vegetation and habitat within the riparian corridor due to dust generation.
Light spill	Long term during operation	Retained native vegetation	<p>The proposal will result in an increase in light levels above that which already exists. However, the retained native vegetation does not provide habitat of importance to any nocturnal fauna and the consequence of increased light impacts is considered a low risk.</p> <p>Mitigation of light spill shall be incorporated into the detailed lighting design (see Table 22 for recommended mitigation measures).</p>
Noise	Short term during construction and long-term during operation	Retained native vegetation	<p>All construction works are proposed to be undertaken during standard construction hours:</p> <ul style="list-style-type: none"> + Monday to Friday, 7am to 6pm; + Saturday 8am to 1pm; and + No work on Sundays or public holidays. <p>The proposed construction will be temporary in nature and the risk of consequence is considered low.</p> <p>Long term operation:</p> <ul style="list-style-type: none"> + The proposal will not result in an increase in noise levels above that which already exists; + Resident fauna within the vicinity of the proposed development would already be accustomed to a relatively high level of noise from existing development and busy roads. <p>The consequence of increased noise impacts is considered a low risk.</p>
Increased risk of starvation, exposure, loss of shade or shelter	N/A	N/A	<p>The proposal would not result in any significant changes to existing food resources, shade or shelter.</p> <p>Existing vegetation within the subject land does not provide any important habitat (in terms of foraging, shade and shelter) and higher quality vegetation and fauna habitat is available within the Prospect Creek riparian corridor.</p>

Indirect impact	Duration	Biodiversity values impacted	Consequence
			The likelihood of an increased risk of starvation, exposure, loss of shade or shelter is considered unlikely.
Loss of breeding habitat	N/A	N/A	Breeding habitat for threatened species is absent from subject land.
Habitat connectivity			
Habitat connectivity	N/A	N/A	Existing habitat connectivity will not be impacted by the proposed development. As shown in Figure 6 the proposal has avoided vegetation along the southern and eastern boundaries, which provide potential stepping stone habitat to other proximal vegetation and the riparian corridor of Prospect Creek.
Water bodies, water quality and hydrological processes			
Water bodies, water quality and hydrological processes	Short and long term	Prospect Creek, groundwater	<p>The subject land does not contain waterbodies or drainage lines.</p> <p>During construction, water quality control will be achieved by deposition and trapping of silts and clays which often have nutrients such as phosphorus and nitrogen attached to their surfaces.</p> <p>Silt fences will be erected prior to construction to control sediment runoff. This will reduce and isolate sediments and particulate matter and potential offsite impacts to Prospect Creek. These measures will be specified in Erosion and Sediment Control Plan in accordance with Landcom’s “Managing Urban Stormwater – Soils and Construction (2004)”. This will ensure that a significant portion of sediments and attached nutrients can be contained on site during construction.</p> <p>Operational stormwater runoff generated from the proposal is anticipated to have a low-risk consequence with design complying with Section G4 of the Cumberland DCP (2021), which requires:</p> <ul style="list-style-type: none"> + 85% reduction in the mean annual load of Total Suspended Solids (TSS) + 60% reduction in the mean annual load of Total Phosphorus (TP) + 60% reduction in the mean annual load of Total Nitrogen (TN)

Indirect impact	Duration	Biodiversity values impacted	Consequence
			<ul style="list-style-type: none"> + 90% reduction in the mean annual load of gross pollutants + 90% reduction in the mean annual load of hydrocarbons <p>The proposed design does not require excavations for basement car parks and therefore interference to perched groundwater is not a risk.</p>

9. Mitigating and managing impacts

9.1 Overview

The application of the BAM streamlined modules does not preclude the requirement to identify measures to mitigate or manage impacts in accordance with the BAM.

9.1.1 Construction impacts

Mitigation of construction impacts will be specified within a project Construction and Environmental Management Plan (CEMP). The following general areas are included in a CEMP but will vary depending on a site's environment and as required by consent conditions:

- + Air quality (i.e., dust production);
- + Noise and vibration;
- + Erosion and sediment controls;
- + Preclearance surveys and clearance supervision; and
- + Biosecurity management

All construction mitigation measures are summarised in Table 22 and Section 9.2 provides additional detail relating to flora and fauna management prior to and during the construction stage.

9.1.2 Operational impacts

Operational impacts are those impacts that are considered during the design phase of the proposal. Relevant to the proposal's operational impacts considered in this BDAR are the following:

- + Noise;
- + Light spill; and
- + Stormwater

Operational mitigation measures are also addressed in Table 22.

9.2 Flora and fauna management

Potential inadvertent and/or indirect impacts on retained vegetation and resident fauna will be mitigated through a range of measures, including but not limited to, the following:

- + Tree and retained vegetation protection,
- + Pre-clearance and clearance management,
- + Fauna rescue and relocation protocol,
- + General biosecurity duty (GBD) compliance,
- + Unexpected finds protocol, and
- + Monitoring and reporting strategies

9.2.1 Pre-clearance

The pre-clearing process provides a final check for the presence of flora and fauna species and habitat on a site immediately before clearing begins. Pre-clearing surveys are required to:

- + Delineate the extent of clearing permitted and prepare site map(s) identifying exclusion zones;
- + Identify and record the details of all habitat features (including where applicable: GPS location; species or type of habitat feature) for inclusion on site map(s);
- + Mark habitat features that will be cleared, using suitable methods; and

- + Locate nearby habitat suitable for the release of fauna that may be encountered during the pre-clearing or clearing stages.

9.2.2 Clearing

Where habitat features are identified in pre-clearing surveys, a two-staged clearance process shall be undertaken and an experienced ecologist present to supervise the process, act as a fauna spotter and relocate any fauna captured.

This shall include sufficient notification to proximal veterinarian surgeons and wildlife carers of the intent to commence clearance works and determining nearby locations where any injured or otherwise immature and susceptible fauna may be released.

- + Mark any habitat features that will be cleared, using suitable methods; and
- + Locate nearby habitat suitable for the release of fauna that may be encountered during the pre-clearing or clearing stages;
- + Locate suitable areas for relocation of habitat features if any (e.g., large woody debris).

Table 23. Summary of mitigation measures for impacts to native vegetation and habitat

Mitigation measure	Proposed technique	Timing	Frequency	Responsibility	Risk of Failure	Risk and consequences of residual impacts
Construction						
Erosion and sediment controls	Implementation of Erosion and Sediment Control Plan (ESCP) measures	Pre-construction	Ongoing	Contractor	High	Sedimentation of native vegetation and downstream aquatic environment.
Pre-clearance surveys	Refer Section 9.2.1	Pre-construction	Once	Contractor / Project Ecologist	Moderate	Habitat features not identified Harm / death of fauna Woody weeds inadvertently chipped and reused on site as mulch
Clearance	Refer Section 9.2.2	Pre-construction	Once	Contractor / Project Ecologist	Moderate	Harm / death of fauna
Biosecurity management	Implementation of hygiene measures to prevent the introduction and / or spread of introduced flora and fauna species, pathogens and / or disease.	Throughout	Ongoing	Contractor / Principal /	Moderate	Introduction and/or spread of pest species, pathogens, disease, and in turn harm death of adjacent flora and fauna
Operation						
Stormwater management	Compliance with Section G4 of the Cumberland DCP (2021), which requires: + 85% reduction in the mean annual load of Total Suspended Solids (TSS)	Planning	Once	Principal	High	Decreased water quality in downstream aquatic ecosystem of Prospect Creek.

Mitigation measure	Proposed technique	Timing	Frequency	Responsibility	Risk of Failure	Risk and consequences of residual impacts
	<ul style="list-style-type: none"> + 60% reduction in the mean annual load of Total Phosphorus (TP) + 60% reduction in the mean annual load of Total Nitrogen (TN) + 90% reduction in the mean annual load of gross pollutants + 90% reduction in the mean annual load of hydrocarbons 					
Lighting design	<p>Lighting should be designed in accordance with available standards and guidelines for mitigating impacts on fauna habitat, which include but may not be limited to the following:</p> <ul style="list-style-type: none"> + Commonwealth of Australia (2020) National Light Pollution Guidelines for Wildlife Including Marine Turtles, Seabirds and Migratory Shorebirds; and + AS/NZS 4282:2019 Control of the obtrusive effects of outdoor lighting recognises the impact of artificial light on biota. T <p>The above guidelines provide a range of measures to minimise light spill impacts on fauna and fauna habitat. Examples include:</p> <ul style="list-style-type: none"> + The use of recent advances in smart control technology options 	Planning	Once	Principal	Low	<p>SSD-69223466 seeks approval for 24hour operation. Therefore, the operational phase has the potential to impact on nocturnal fauna behaviour.</p> <p>Providing the design of lighting installations incorporates the recommended and current best practice measures, the likelihood of light spill impacts on fauna and fauna habitat will be minimised as far as practical.</p>

Mitigation measure	Proposed technique	Timing	Frequency	Responsibility	Risk of Failure	Risk and consequences of residual impacts
	<p>for better controlled and targeted artificial light management;</p> <ul style="list-style-type: none"> + Ensuring that lighting is shielded and directed only to the intended object or area; + Ensuring that light intensity is appropriate for the target area using only the minimum number and intensity of lights needed to provide safe and secure illumination for the area at the time required to meet the lighting objectives; and + Consideration of the following lighting aspects: <ul style="list-style-type: none"> ○ high quality, low glare lighting, which enhances visibility for the user at night, reduces eye fatigue, improves night vision and delivers light where it is needed, ○ non-reflective, dark coloured surfaces, ○ reduced or filtered out blue, violet and ultraviolet wavelengths, which wildlife are sensitive to. 					

10. Thresholds for Assessment

Section 9 of the BAM sets out the impact thresholds that must be applied, which include:

1. Impacts on an entity that is at risk of a serious and irreversible impact;
2. Impacts for which the assessor is required to determine an offset requirement;
3. Impacts for which the assessor is not required to determine an offset requirement; and
4. Impacts that do not require further assessment by the assessor.

10.1 Impacts on serious and irreversible impacts

No serious and irreversible impact (SAII) entities occur on the subject land (see Table 15).

10.2 Offset requirements

The clearing of PCT 4024 from within the subject land has been calculated as requiring two (2) ecosystem credits as shown in Figure 6 and Table 24 (refer also BAM credit summary reporting in Appendix B).

Table 24. Ecosystem credits required to be offset

Zone	Area (ha)	Vegetation integrity loss	Biodiversity risk weighting	Potential SAI	Ecosystem credits
4024_low	0.21	-21.8	2	NO	2
					2

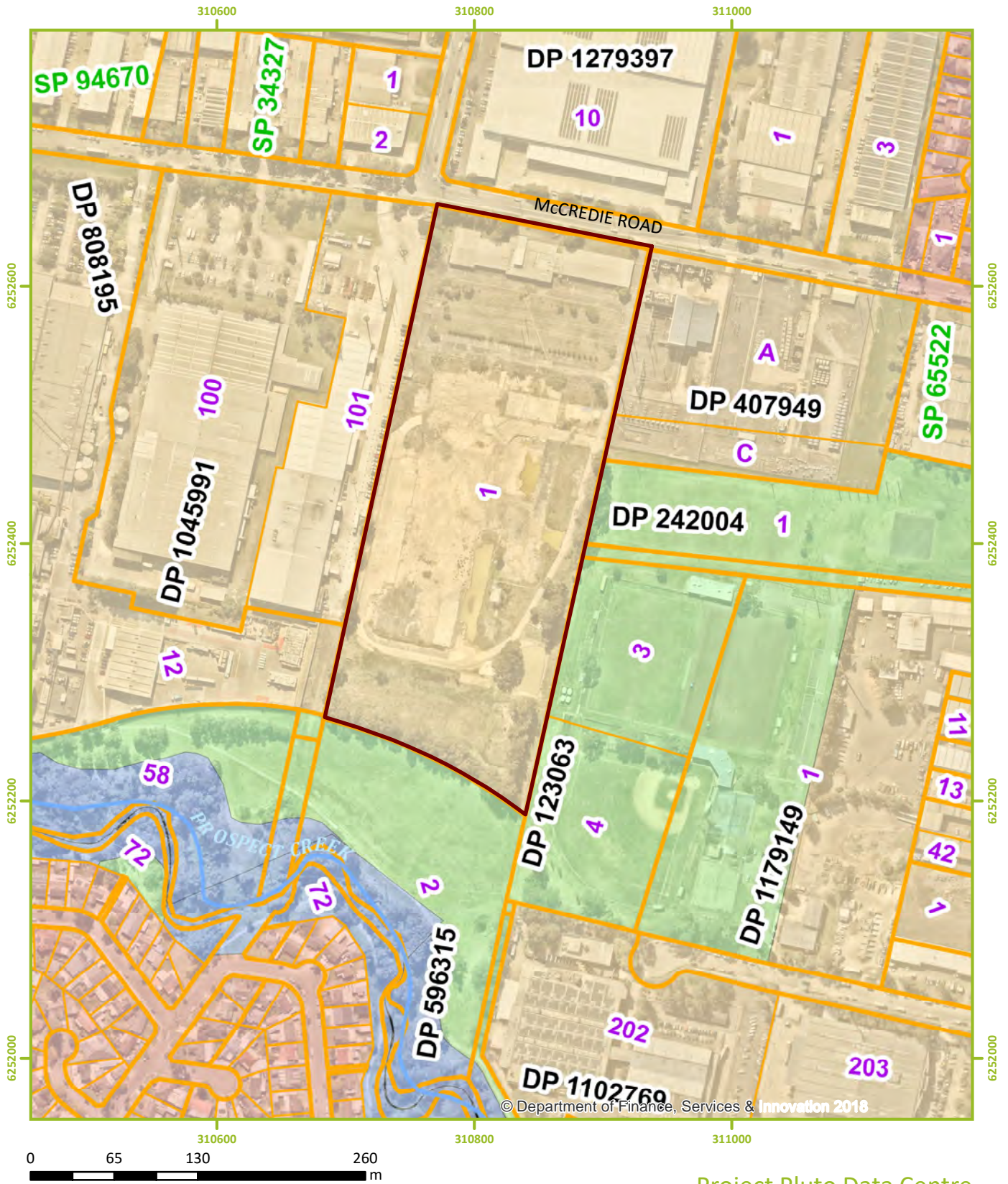
10.3 Impacts that do not require an offset

Approximately 0.15 ha comprises native planted native vegetation and 0.06 ha of exotic vegetation does not require an offset (see Table 24).

Table 25. Impacts that do not require an offset

Clearing impact	Area (ha)
Native planted vegetation not allocated to a PCT	0.15
Exotic planted	0.07

11. Figures



Project Pluto Data Centre
(SSD-69223466)

Figure 1. Site context

Legend

- Subject_site
- Low density residential R2
- Environmental conservation C2
- Public recreation RE1
- General industrial E4



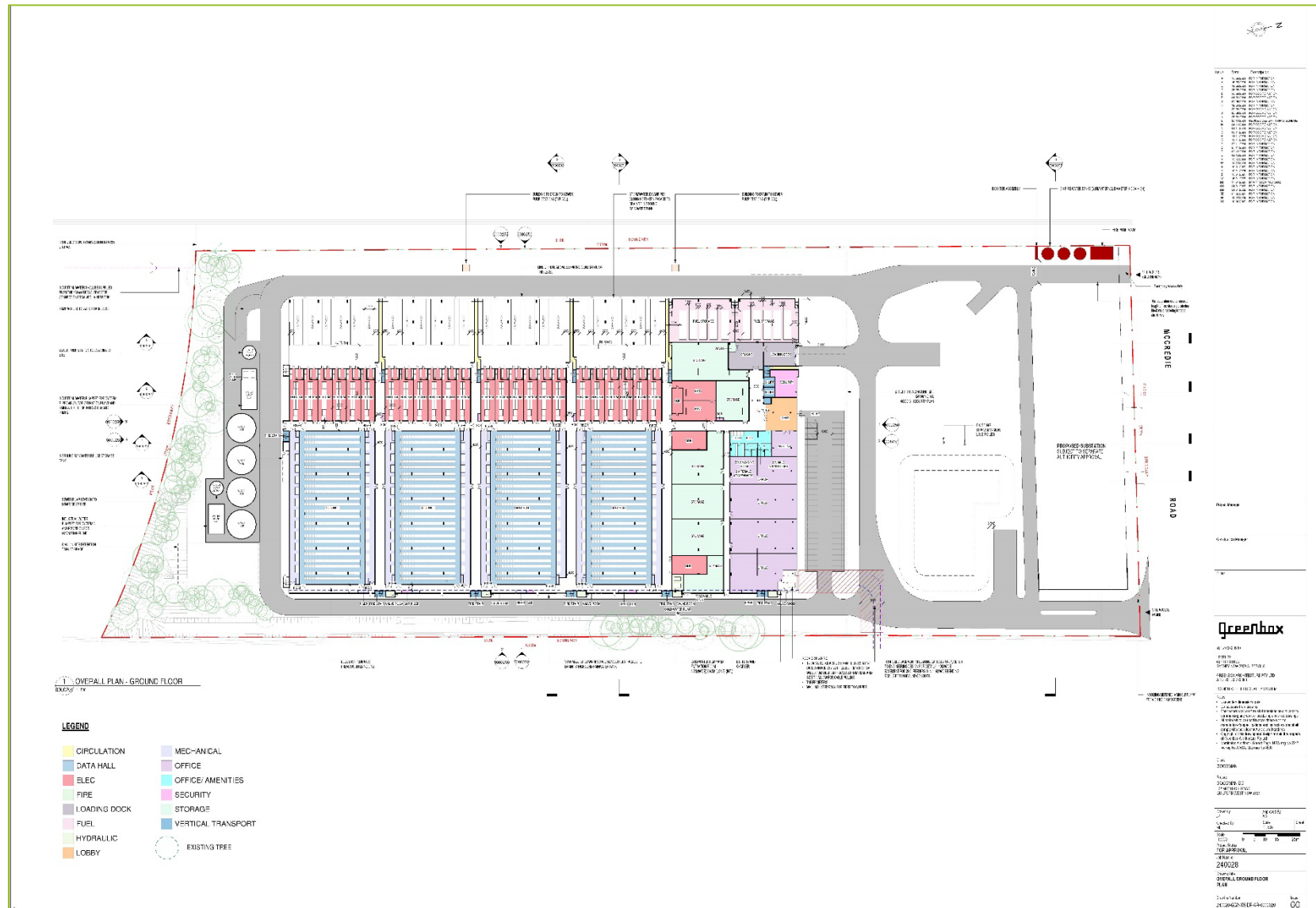
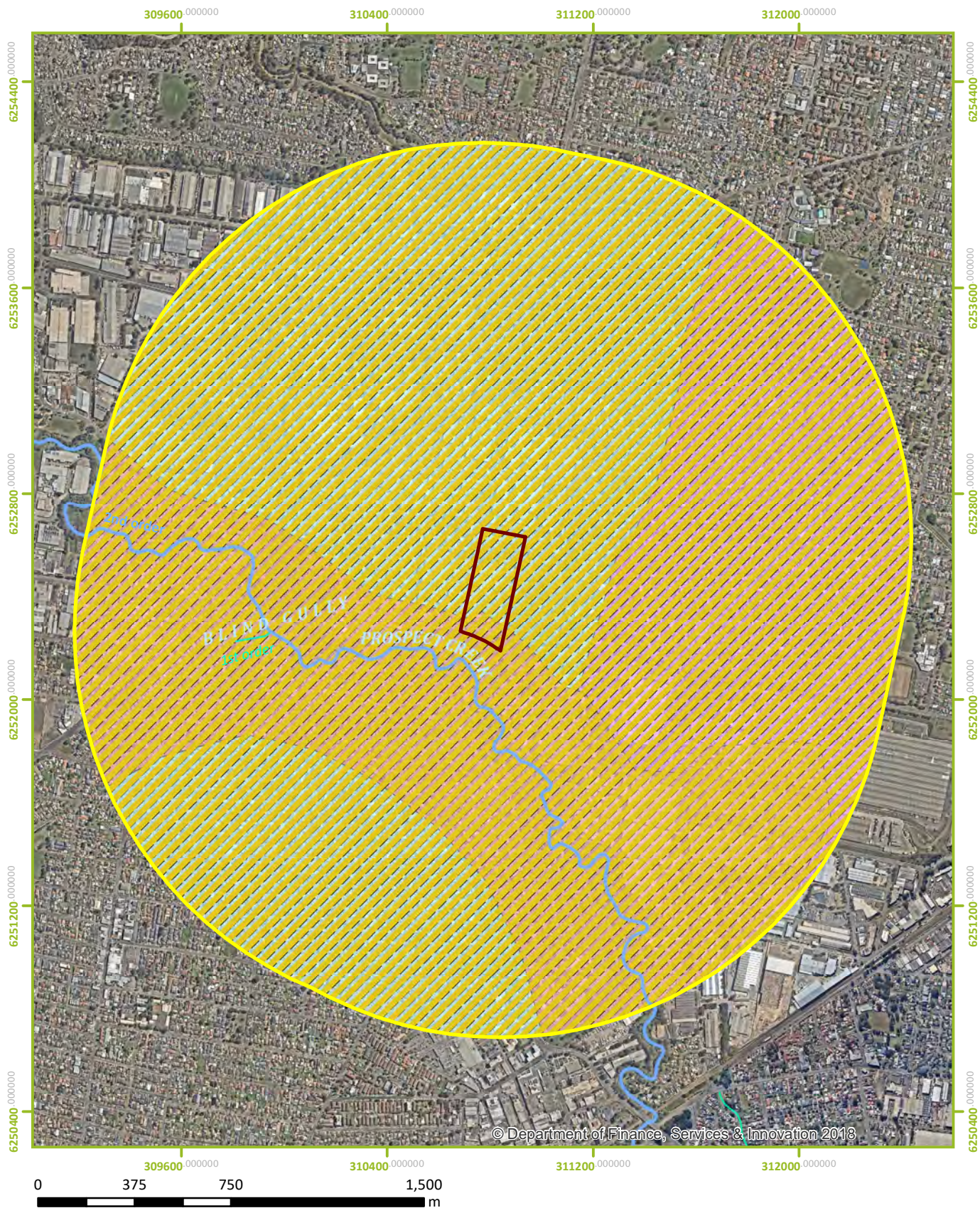








Figure 2. Proposal layout



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(SSD-69223466)

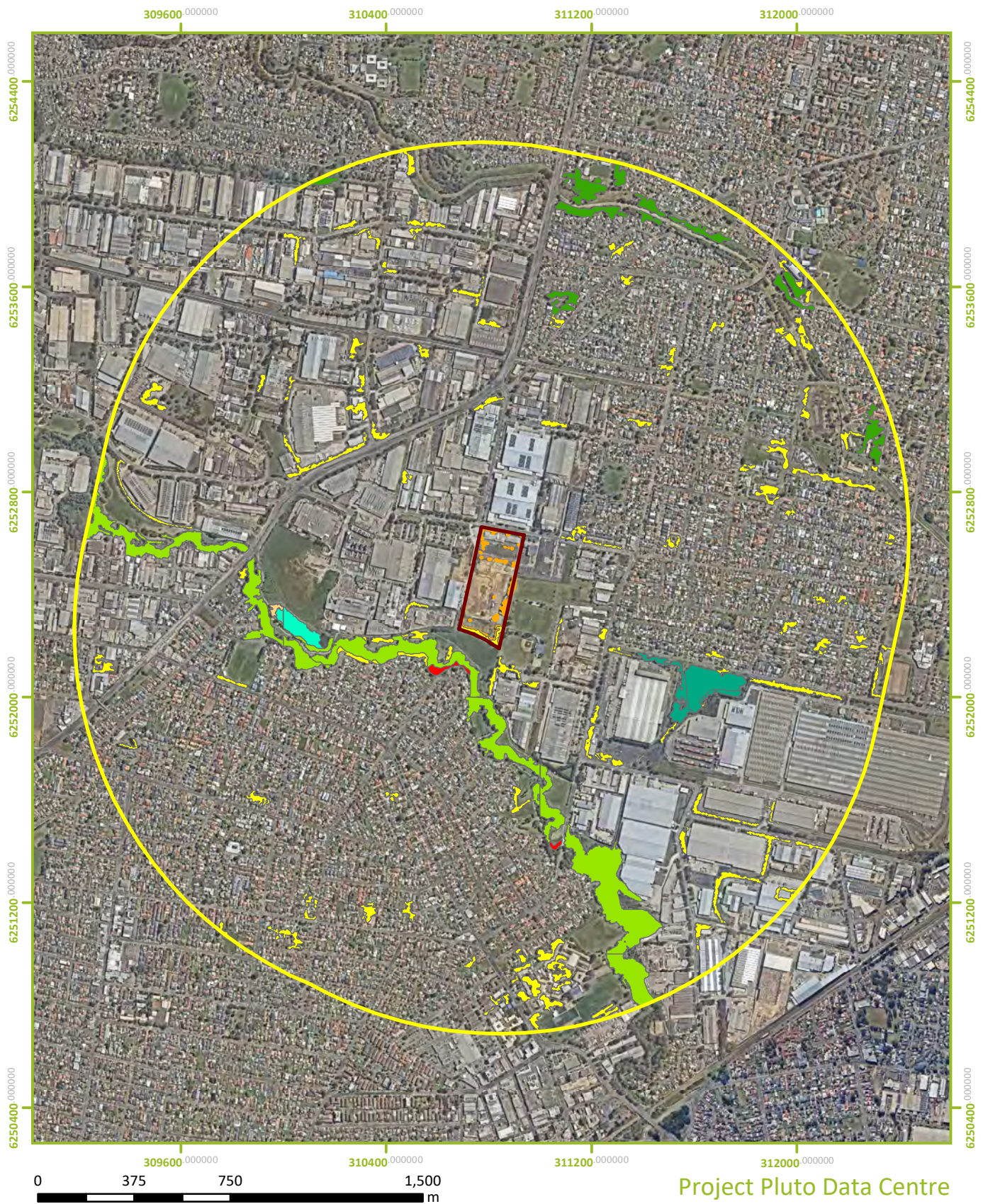
Figure 3. Landscape assessment

Legend

	BDAR assessment area	Landscape name
	Subject_site	 Ashfield Plains
	Cumberland subregion	 Cumberland Plain
		 Georges River Alluvial Plain













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**Project Pluto Data Centre
(SSD-69223466)**

Figure 4. Native vegetation cover

Legend

- | | | | |
|---|--|---|---|
|  | BDAR assessment area |  | Sydney Creekflat Wetland PCT 3972 |
|  | Subject_site |  | Cumberland Shale Plains Woodland PCT 3320 |
|  | Castlereagh Ironbark Forest PCT 3448 |  | Urban_E/N: Urban Exotic/Native |
|  | Cumberland Blue Box Riverflat Forest PCT 4024 |  | Weed_Ex: Weeds and Exotics |
|  | Coastal Valleys Swamp Oak Riparian Forest PCT 4023 |  | Subject land vegetation |



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Project Pluto Data Centre
(SSD-69223466)

Figure 5. Site vegetation

Legend

- Subject_site
- Local native
- Non-local native
- Exotic



Project Pluto Data Centre (SSD-69223466)

Figure 6. Vegetation avoided

Legend

- Subject_site
- Retained
- To be removed

Coordinate system: MGA Zone 56 (GDA 2020)
Image source: Nearmap 3 September 2024



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Project Pluto Data Centre
(SSD-69223466)

Figure 7. Offset requirements

Legend

- Subject_site
- Planted offset Not required
- Exotic offset Not required
- PCT 4024 Offset required

Coordinate system: MGA Zone 56 (GDA 2020)
Image source: Nearmap 3 September 2024



Appendix A. BAM summary reports

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00051903/BAAS17054/24/00051904	Project Pluto Data Centre	28/10/2024
Assessor Name	Report Created	BAM Data version *
Kat Duchatel	21/02/2025	Current classification (live - default) (80)
Assessor Number	BAM Case Status	Date Finalised
BAAS17054	Finalised	21/02/2025
Assessment Revision		Assessment Type
0		Major Projects

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

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

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAI	Ecosystem credits
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Cumberland Blue Box Riverflat Forest												
1	4024_Low	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	19.9	19.9	0.21	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		2
										Subtotal	2	
										Total	2	

Species credits for threatened species

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



BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00051903/BAAS17054/24/00051904	Project Pluto Data Centre	28/10/2024
Assessor Name	Assessor Number	BAM Data version *
Kat Duchatel	BAAS17054	Current classification (live - default) (80)
Proponent Names	Report Created	BAM Case Status
	21/02/2025	Finalised
Assessment Revision		Assessment Type
0		Major Projects
Date Finalised		
21/02/2025		

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

Potential Serious and Irreversible Impacts

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

Additional Information for Approval

Assessment Id	Proposal Name
00051903/BAAS17054/24/00051904	Project Pluto Data Centre



BAM Biodiversity Credit Report (Like for like)

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT

No Changes

Predicted Threatened Species Not On Site

Name

Botaurus poiciloptilus / Australasian Bittern

Ephippiorhynchus asiaticus / Black-necked Stork

Rostratula australis / Australian Painted Snipe

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

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
4024-Cumberland Blue Box Riverflat Forest	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	0.2	0	2	2



BAM Biodiversity Credit Report (Like for like)

4024-Cumberland Blue Box Riverflat Forest	Like-for-like credit retirement options					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions This includes PCT's: 3145, 3181, 3185, 3188, 3192, 3258, 3328, 4024, 4025, 4039, 4041, 4058, 4138	-	4024_Low	No	2	Cumberland, Burragorang, Pittwater, Sydney Cataract, Wollemi and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

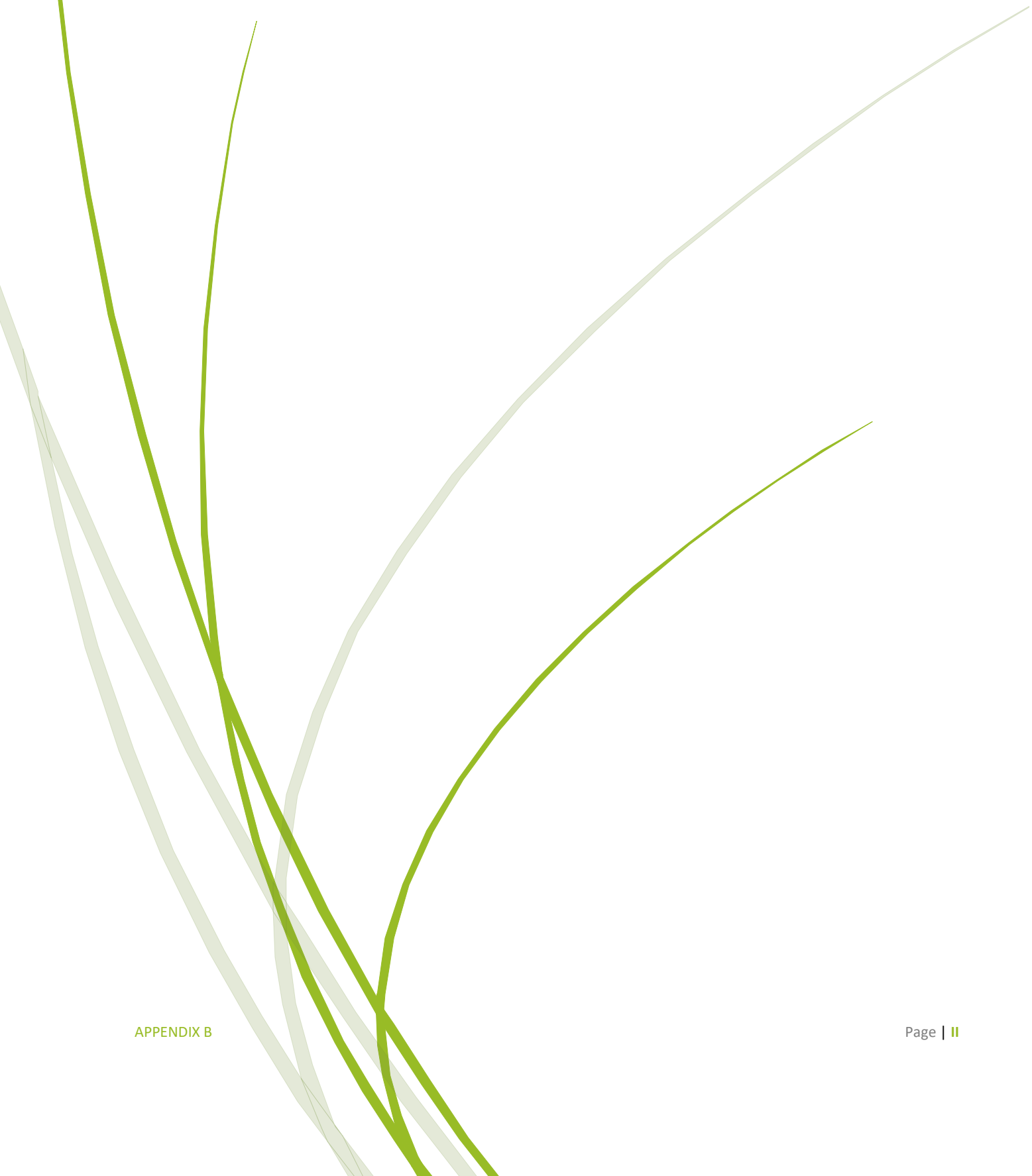
Species Credit Summary

No Species Credit Data

Credit Retirement Options

Like-for-like credit retirement options

Appendix B. BAM plot data



Survey Name: McCredie Rd, Smithfield

Date: 18/11/2020

Zone ID: 1

Plot no: 1

Location:	Zone	Easting	Northing	Bearing
	56H	310745	6252255	55

Vegetation formation:	Vegetation class:	PCT (if known)
UNKNOWN	UNKNOWN	PCT 835/4024 assigned

CONDITION (400m² plot)

Composition:	Tree	Shrub	Grass grasslike	Forb	Fern	Other
Native Richness count:	2	0	0	0	0	0

Structure:	Tree	Shrub	Grass grasslike	Forb	Fern	Other
Cover of each group:	35	0	0	0	0	0

High Threat Weed cover: 66

FUNCTION (1,000m² plot)

Tree regeneration (<5cm)		Stem classes	
Present		5-9	0
		10-19	7
Absent	✓	20-29	4
		30-49	8

No large trees (>50cm DBH)	No. of HBTs	Length of LWD (m):
2	0	0

FUNCTION (50m transect)

Litter cover	5m	15m	25m	35m	45m	Average
	25	15	45	60	5	30

Survey Name: McCredie Rd, Smithfield

Plot no: 1

GF code	Scientific Name	Common Name	N, E or HTW	Cover	Abund	Stratum
TG	<i>Eucalyptus tereticornis</i>	Forest red gum	N	35	5	OS
TG	<i>Casuarina glauca</i>	Swamp oak	N	2	1	OS
				37		
SG	<i>Ailanthus altissima</i>	Tree of heaven	HTW	5	4	MS
SG	<i>Cestrum parquii</i>	Green cestrum	HTW	10	10	MS
SG	<i>Cestrum parquii</i>	Green cestrum	HTW	5	>50	US
SG	<i>Olea europaea</i> subsp. <i>cupidata</i>	African olive	HTW	15	13	MS
GG	<i>Cenchrus clandestinum</i>	Kikuyu	HTW	1.25	5m ²	US
GG	<i>Ehrharta erecta</i>	Panic veldt grass	HTW	0.5	>10	US
GG	<i>Eragrostis curvula</i>	African lovegrass	HTW			US
FG	<i>Bidens pilosa</i>	Cobblers pegs	HTW	3.75	15m ²	US
OG	<i>Anredera cordifolia</i>	Madeira vine	HTW	0.5	2	Aerial
OG	<i>Cardiospermum grandiflorum</i>	Balloon vine	HTW	25	>10	Aerial
				66		
GG	<i>Avena barbata</i>	Wild oats	E	25	100m ²	US
FG	<i>Foeniculum vulgare</i>	Fennel	E	1.25	5m ²	US
FG	<i>Nothoscordum gracile</i>	Onion weed	E	0.25	>10	US
FG	<i>Plantago lanceolata</i>	Lambs tongue	E			US
FG	<i>Rumex crispus</i>	Curly-leaf dock	E			US
FG	<i>Sida rhombifolia</i>	Paddy's lucerne	E			US
FG	<i>Taraxacum officinale</i>	Dandelion	E			US
FG	<i>Trifolium repens</i>	White clover	E			US
OG	<i>Araujia sericifera</i>	Moth vine	E			Aerial
				26.5		

GF Code: Growth Form | N: native, E: exotic, HTE: high threat exotic

Cover: 0.1, 0.2, 0.3, ..., 1, 2, 3, ..., 10, 15, 20, 25, ...100% (foliage cover); **Note:** 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately 1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m

Abundance: 1, 2, 3, ..., 10, 20, 30, ... 100, 200, ..., 1000, ...

Survey Name: McCredie Rd, Smithfield Date: 18/11/2020

Zone ID: 1 Plot no: 2

Location:	Zone	Easting	Northing	Bearing
	56H	310864.7	6252368.7	180

Vegetation formation:	Vegetation class:	PCT (if known)
UNKNOWN	UNKNOWN	PCT 835/4024 assigned

CONDITION (400m² plot)

Composition:	Tree	Shrub	Grass grasslike	Forb	Fern	Other
Native Richness count:	2	2	0	0	0	0

Structure:	Tree	Shrub	Grass grasslike	Forb	Fern	Other
Cover of each group:	40	5	0	0	0	0

FUNCTION (1,000m² plot)

Tree regeneration (<5cm)		Stem classes	
Present		5-9	0
		10-19	0
Absent	✓	20-29	3
		30-49	8

No large trees (>50cm DBH)	No. of HBTs	Length of LWD (m):
4	0	0

Litter cover	5m	15m	25m	35m	45m	Average
	25	15	5	0	5	10

CONDITION (400m² plot data)

GF code	Scientific Name	Common Name	N, E or HTW	Cover	Abund	Stratum
TG	<i>Corymbia maculata</i>	Spotted gum	N	30	6	OS
TG	<i>Eucalyptus tereticornis</i>	Forest red gum	N	10	3	OS
TG	<i>Casuarina glauca</i>	Swamp oak	N	2	1	OS
				42		
SG	<i>Callistemon salignus</i>	Willow bottlebrush	N	2.5	1	MS
SG	<i>Melaleuca linariifolia</i>	Snow in summer	N	2.5	1	MS
				5		

Appendix C. Historical imagery





1950



1960



1969



1977



1985



1993



1998



2002



2010

Appendix D. BAM predicted & candidate species

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00051903/BAAS17054/24/00051904	Project Pluto Data Centre	28/10/2024
Assessor Name	Report Created	BAM Data version *
Kat Duchatel	21/02/2025	Current classification (live - default) (80)
Assessor Number	Assessment Type	BAM Case Status
BAAS17054	Major Projects	Finalised
Assessment Revision		Date Finalised
0		21/02/2025

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

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

Common Name	Scientific Name	Vegetation Types(s)
Black Falcon	Falco subniger	4024-Cumberland Blue Box Riverflat Forest
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	4024-Cumberland Blue Box Riverflat Forest
Diamond Firetail	Stagonopleura guttata	4024-Cumberland Blue Box Riverflat Forest
Dusky Woodswallow	Artamus cyanopterus cyanopterus	4024-Cumberland Blue Box Riverflat Forest
Eastern Coastal Free-tailed Bat	Micronomus norfolkensis	4024-Cumberland Blue Box Riverflat Forest
Eastern False Pipistrelle	Falsistrellus tasmaniensis	4024-Cumberland Blue Box Riverflat Forest
Eastern Osprey	Pandion cristatus	4024-Cumberland Blue Box Riverflat Forest
Gang-gang Cockatoo	Callocephalon fimbriatum	4024-Cumberland Blue Box Riverflat Forest
Greater Broad-nosed Bat	Scoteanax rueppellii	4024-Cumberland Blue Box Riverflat Forest
Grey-headed Flying-fox	Pteropus poliocephalus	4024-Cumberland Blue Box Riverflat Forest

Little Bent-winged Bat	<i>Miniopterus australis</i>	4024-Cumberland Blue Box Riverflat Forest
Little Eagle	<i>Hieraetus morphnoides</i>	4024-Cumberland Blue Box Riverflat Forest
Little Lorikeet	<i>Glossopsitta pusilla</i>	4024-Cumberland Blue Box Riverflat Forest
Regent Honeyeater	<i>Anthochaera phrygia</i>	4024-Cumberland Blue Box Riverflat Forest
Rosenberg's Goanna	<i>Varanus rosenbergi</i>	4024-Cumberland Blue Box Riverflat Forest
South-eastern Glossy Black-Cockatoo	<i>Calyptorhynchus lathami lathami</i>	4024-Cumberland Blue Box Riverflat Forest
Speckled Warbler	<i>Chthonicola sagittata</i>	4024-Cumberland Blue Box Riverflat Forest
Spotted Harrier	<i>Circus assimilis</i>	4024-Cumberland Blue Box Riverflat Forest
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	4024-Cumberland Blue Box Riverflat Forest
Square-tailed Kite	<i>Lophoictinia isura</i>	4024-Cumberland Blue Box Riverflat Forest
Swift Parrot	<i>Lathamus discolor</i>	4024-Cumberland Blue Box Riverflat Forest
Turquoise Parrot	<i>Neophema pulchella</i>	4024-Cumberland Blue Box Riverflat Forest
Varied Sittella	<i>Daphoenositta chrysoptera</i>	4024-Cumberland Blue Box Riverflat Forest
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	4024-Cumberland Blue Box Riverflat Forest
White-throated Needletail	<i>Hirundapus caudacutus</i>	4024-Cumberland Blue Box Riverflat Forest
Yellow-bellied Sheath-tail-bat	<i>Saccolaimus flaviventris</i>	4024-Cumberland Blue Box Riverflat Forest

Threatened species Manually Added

None added

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

Common Name	Scientific Name	Plant Community Type(s)
Australasian Bittern	<i>Botaurus poiciloptilus</i>	4024-Cumberland Blue Box Riverflat Forest
Australian Painted Snipe	<i>Rostratula australis</i>	4024-Cumberland Blue Box Riverflat Forest
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	4024-Cumberland Blue Box Riverflat Forest

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

Refer to BAR for detailed justification

Common Name	Scientific Name	Justification in the BAM-C
Australasian Bittern	<i>Botaurus poiciloptilus</i>	Habitat constraints
Australian Painted Snipe	<i>Rostratula australis</i>	Refer to BAR
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	Habitat constraints

Proposal Details

Assessment Id 00051903/BAAS17054/24/00051904	Proposal Name Project Pluto Data Centre	BAM data last updated * 28/10/2024
Assessor Name Kat Duchatel	Report Created 21/02/2025	BAM Data version * Current classification (live - default) (80)
Assessor Number BAAS17054	Assessment Type Major Projects	BAM Case Status Finalised
Assessment Revision 0		Date Finalised 21/02/2025

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

List of Species Requiring Survey

Name	Presence	Survey Months
<i>Eucalyptus benthamii</i> Camden White Gum	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<i>Hibbertia sp. Bankstown</i> Hibbertia sp. Bankstown	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?

BAM Candidate Species Report

<p><i>Marsdenia viridiflora</i> subsp. <i>viridiflora</i> - endangered population Marsdenia viridiflora R. Br. subsp. viridiflora population in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool and Penrith local government areas</p>	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<p><i>Meridolum corneovirens</i> Cumberland Plain Land Snail</p>	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<p><i>Persoonia nutans</i> Nodding Geebung</p>	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?
<p><i>Wahlenbergia multicaulis</i> - endangered population Tadgell's Bluebell in the local government areas of Auburn, Bankstown, Baulkham Hills, Canterbury, Hornsby, Parramatta and Strathfield</p>	No (surveyed)	<input type="checkbox"/> Jan <input type="checkbox"/> Feb <input type="checkbox"/> Mar <input type="checkbox"/> Apr <input type="checkbox"/> May <input type="checkbox"/> Jun <input type="checkbox"/> Jul <input type="checkbox"/> Aug <input type="checkbox"/> Sep <input type="checkbox"/> Oct <input checked="" type="checkbox"/> Nov <input type="checkbox"/> Dec <input type="checkbox"/> Survey month outside the specified months?

Threatened species Manually Added

None added

Threatened species assessed as not on site

Refer to BAR for detailed justification

Common name	Scientific name	Justification in the BAM-C
Barking Owl	Ninox connivens	Habitat constraints
Brown Pomaderris	Pomaderris brunnea	Refer to BAR

BAM Candidate Species Report

Bush Stone-curlew	<i>Burhinus grallarius</i>	Habitat degraded Habitat constraints
Eastern Osprey	<i>Pandion cristatus</i>	Habitat constraints
Eastern Pygmy-possum	<i>Cercartetus nanus</i>	Habitat degraded
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	Habitat constraints
Giant Burrowing Frog	<i>Heleioporus australiacus</i>	Refer to BAR
Green and Golden Bell Frog	<i>Litoria aurea</i>	Habitat constraints
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	Habitat constraints
Gyrostemon thesioides	<i>Gyrostemon thesioides</i>	Habitat constraints
Koala	<i>Phascolarctos cinereus</i>	Habitat degraded
Little Bent-winged Bat	<i>Miniopterus australis</i>	Habitat constraints
Little Eagle	<i>Hieraaetus morphnoides</i>	Habitat constraints
Masked Owl	<i>Tyto novaehollandiae</i>	Habitat constraints
Powerful Owl	<i>Ninox strenua</i>	Habitat constraints
Regent Honeyeater	<i>Anthochaera phrygia</i>	Habitat constraints
South-eastern Glossy Black-Cockatoo	<i>Calyptorhynchus lathami lathami</i>	Habitat constraints
Southern Greater Glider	<i>Petauroides volans</i>	Habitat degraded
Southern Myotis	<i>Myotis macropus</i>	Habitat constraints
Square-tailed Kite	<i>Lophoictinia isura</i>	Habitat constraints
Squirrel Glider	<i>Petaurus norfolcensis</i>	Habitat degraded
Swift Parrot	<i>Lathamus discolor</i>	Habitat constraints
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	Habitat constraints

Appendix E. Targeted microbat investigation

Ecological Statement – Targeted microbat investigation, 132 McCredie Road, Smithfield

1. Introduction and project understanding

At the request of Ecologique, Lesryk Environmental Pty Ltd (Lesryk) has been engaged to conduct a targeted Yangochiroptera (insectivorous bats, hereafter referred to as 'microbat') inspection at the above address.

As there is the potential for cave-dependent microbats that are tolerant of occupying human-built structures (i.e. cave-substitutes such as wall and roof spaces) to utilise components of the buildings present, a targeted inspection for this group of animals was conducted. The inspection considered both the internal portions of the accessible upper floor apartments, and their exteriors (particularly in relation to determining the presence of any suitable entrance/exit cavities that would permit microbats opportunities to access and roost/breed within the structures present).

132 McCredie Road, Smithfield is a complex of abandoned offices that was once occupied by Castrol Limited. The building is comprised of a mixture of corrugated galvanised metal sheets and brick, and appears to be rendered. The complex is located approximately 500 m north of Prospect Creek. The building is not currently being utilised and has been in disuse for some time. Generally, the ceilings within the building are approximately 2.5 metres (m) high and encased with ceiling tiles. Additionally, the walls were noted as bare brick or lined with plaster board.

The roofs are sheet metal (corrugated iron). All roofs are intact from the top, no obvious cavities/possible accesses present. The building was well sealed and any external vents into the air conditioning ducts were lined with a mesh, this preventing access into any dark recesses which could be occupied by microbats.

A large cavity/opening was noted where a sheet of compressed fibro had been broken, this seen at the back entrance to the building near the parking lot (Plate 1: Attachment 1). All other cavities, openings or 'holes' from the outside of the building, which could provide access for microbats were checked with no signs of use (Plate 5: Attachment 1).

Atop of Number 132 McCredie Road, the guttering channel appears to be clean and regularly flushed (during rainfall events). Access from the guttering to the roof space is not possible.

The inside of the building was well lit and do not support any 'dark places' that would be suitable for the roosting requirements of microbats.

In regards to those sites that supported gaps and crevices, inspections of these using a stepladder and hand torch noted that most exhibited spider webs (the built-up dust covering on a number of these indicating their age). The presence of spiderwebs over and within suitable gaps/crevice's indicates that these are not being used by microbats (if microbats were accessing these sites, the movements of their bodies/wings would preclude the development/permanency of spiderwebs).



2. Methodology

The building present at 132 McCredie Road, Smithfield (these hereafter being referred to as the subject site), was investigated on 23 May 2024 by Lauren Crofts (B.Sc Grad Cert Env.Sc M.EnvSc.Mngt) and Harry Engel (B.Mar.Sc) between the hours of 10:00 am and 10:45 am.

The inspection focused on:

- 1) Conducting foot traverses around the outside of the buildings to determine if any suitable roosting sites (such as crevices, overhangs and the like), or openings that permit access into the roof space, were present
- 2) Conducting foot surveys internally within each building, particularly any sites that are 'dark'.

The methods employed to targeted any microbats and their potential breeding/roosting habitat is based on the Roost Search method described in the:

- OEH 2016 publication titled '*Threatened Bat Survey Guidelines for NSW: NSW guide for the survey of threatened bats and their habitats for offset methodologies*'
- OEH 2018 publication titled '*Species credit' threatened bats and their habitats: NSW survey guide for the Biodiversity Assessment Method*'.

To assist with the inspections, hand-held torches and echolocation detectors were employed. Whilst conducting the surveys, a hand-held echolocation detection device (a Titley Scientific Anabat Express™) connected to a microphone extension cable was used. Where potential cavities, overhangs or crevice's were seen, the unit's microphone was directed (or lowered/inserted) into these. The microphone was left in place within these features for a period of about 10 minutes per site.

Any calls recorded were analysed in-house using Anabat 6.3 computer software.

In conducting the inspections within, and external to, the building, guano accumulations, characteristic staining and/or deceased microbats were searched for.

During the course of the inspection, no limitations such as adverse weather conditions (e.g. rain or low/cold temperatures) or restricted access/site visibility were encountered.

3. Results

During the site inspection, a number of cavities, crevices and 'holes' that could be used by microbats to access these structures were observed on the exterior and interior of the buildings. The openings were primarily crevices between sheets of metal and holes within the roof eaves. Any large external entrances such as the air vent system were deemed as inaccessible to any native fauna (including microbats) due to the small gauge mesh that covers these features.

There were no calls recorded during the duration of the hand-held echolocation detector employment to suggest the inhabitation of the building by microbats.

As mentioned, some of the areas inspected had dark recesses that could be used by microbats as roosting sites. That stated, inspections of these did not reveal any roosting individuals, and no staining, characteristic guano or deceased bats were recorded.

Inspections of the outer portions of the building surveyed, similarly, did not reveal any roosting microbats, or signs of their previous occupation.

A number of native and exotic vertebrate species were recorded or indicated as occupying the building, these identified in Table 1.

Table 1: Fauna species recorded and their detection method

Key - * - indicates introduced species

Species		Detection method
Common Name	Scientific Name	
Australian White Ibis	<i>Threskiornis molucca</i>	Observed
* Common Myna	<i>Sturnus tristis</i>	Observed
Australian Raven	<i>Corvus coronoides</i>	Observed
Rainbow Lorikeet	<i>Trichoglossus haematodus</i>	Observed
Australian Magpie	<i>Gymnorhina tibicen</i>	Observed

4. Conclusion

By the completion of the site inspection, no microbats were observed within the building surveyed at 132 McCredie Road, Smithfield. In addition, no evidence to suggest past use of the building, such as guano accumulations, characteristic staining or deceased animals, was obtained.

Based on the observations made at the time of the inspection, and the results of the hand-held echolocation detector, it is not considered that any species of threatened cave-dependent microbat are currently, or have previously occupied, the building present at 132 McCredie Road, Smithfield.

A number of native and one exotic species were recorded in proximity to the structure, none of which are listed, or currently being considered for listing, under the NSW *Biodiversity Conservation Act 2016* or Federal equivalent.

5. Bibliography

Churchill, S. 2008, *Australian bats - 2nd Edition*, Allen and Unwin, Crows Nest, NSW

Office of Environment and Heritage 2016, *Threatened Bat Survey Guidelines for NSW: NSW guide for the survey of threatened bats and their habitats for offset methodologies*. State of NSW and Office of Environment and Heritage, Sydney, NSW

- 2018, *Species credit' threatened bats and their habitats: NSW survey guide for the Biodiversity Assessment Method*. State of NSW and Office of Environment and Heritage, Sydney, NSW

- 2024, *Threatened biodiversity profile search*, viewed May 2024

Van Dyck, S. and Strahan, R. (Eds) 2008, *The Mammals of Australia (3rd edition)*, Reed New Holland, Sydney, NSW

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Version	Date	Prepared by	Reviewed	Approved for release
1	18/12/23	Deryk Engel (Director)	Harry Engel (Ecologist)	D.Engel 24/05/24

Attachment 1. Photographic record of several of the buildings inspected (photographs taken 23/05/24)



Plate 1: Character of large cavity into roof on the exterior of the building.



Plate 2: General character of the existing building. Photograph taken looking east.



Plate 3: Character of the grassland. Photograph taken looking south.



Plate 4: Character of the inside of the building.



Plate 5: Character of plant with opening to roof.



Plate 6: Roof cavity from large opening on outside of building.

