Proposed Industrial Facility

600 Woodstock Avenue, Rooty Hill

Biodiversity Development Assessment Report

Charter Hall

21 February 2022

Final

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Report No. 21132RP1

The preparation of this report has been in accordance with the brief provided by the Client and has relied upon the data and results collected at or under the times and conditions specified in the report. All findings, conclusions or commendations contained within the report are based only on the aforementioned circumstances. The report has been prepared for use by the Client and no responsibility for its use by other parties is accepted by Cumberland Ecology.

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Approved by:	David Robertson
Position:	Director
Signed:	
Date:	21 February, 2022

Table of Contents

Table of Tables

Table of Photographs

Table of Appendices

Table of Figures

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Glossary

Term / Abbreviation	Definition
Assessment area	Area of land within a 1500 m buffer around the outer boundary of the subject land
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator
BC Act	*NSW Biodiversity Conservation Act 2016*
BC Regulation	*NSW Biodiversity Conservation Regulation 2017*
BDAR	Biodiversity Development Assessment Report
Biosecurity Act	NSW Biosecurity Act 2015
BOS	Biodiversity Offset Scheme
C	Celsius
CEEC	Critically Endangered Ecological Community
Council	Blacktown City Council
DA	Development Application
DAWE	Commonwealth Department of Agriculture, Water and the Environment
DBH	Diameter at Breast Height
DPIE	NSW Department of Planning, Industry and Environment
EES	Environment, Energy and Science Group
EP&A Act	*NSW Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
GIS	Geographic Information System
ha	Hectares
IBRA	Interim Biogeographic Regionalisation for Australia
LEP	Local Environment Plan
LGA	Local Government Area
NSW	New South Wales
OEH	NSW Office of Environment and Heritage
PCT	Plant Community Type
SAII	Serious and Irreversible Impact
SSD	State Significant Development
Subject land	Lot 67 DP804292, also known as 600 Woodstock Avenue, Rooty Hill
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened Ecological Community
the 'project'	Proposal to construct the proposed Materials Recycling Facility

1. Introduction

Cumberland Ecology was commissioned by Charter Hall (the 'client') to prepare a Biodiversity Development Assessment Report (BDAR) for the proposed Materials Recycling Facility (the 'project') at 600 Woodstock Avenue, Rooty Hill. The project involves the construction of a Materials Recycling Facility, including associated carpark, ancillary infrastructure, and landscaping. This BDAR will form part of the documentation to support a State Significant Development (SSD) application for Development Consent under Part 4 of the New South Wales (NSW) *Environmental Planning and Assessment Act 1979* (EP&A Act).

1.1. Requirement for BDAR

The project is classified as SSD under Clause 23 of Schedule 1 of State Environmental Planning Policy (State and Regional Development) 2011, as the proposal seeks consent for development for the purpose of resource recovery or recycling facilities that handle more than 100,000 tonnes per year of waste.

Section 7.9 of the NSW *Biodiversity Conservation Act 2016* (BC Act) requires all development applications for SSD to be accompanied by a BDAR unless both the Planning Agency Head and the Environment Agency Head determine that the proposed development is not likely to have any significant impact on biodiversity values.

Secretary's Environmental Assessment Requirements (SEARs) were issued for the project on 10 November 2021, which specified the requirement for a BDAR. The SEARs stated that the following requirement applied to biodiversity:

"Biodiversity – including an assessment of the proposal's biodiversity impacts in accordance with the Biodiversity Conservation Act 2016 (NSW) (BC Act), including the preparation of a Biodiversity Development Assessment Report (BDAR) where required under the BC Act."

A waiver has not been sought for the project, and therefore this BDAR has been prepared.

Under the BAM, a development can be assessed using the Streamlined Assessment Module - a small area development if it involves impacts to biodiversity below a prescribed area threshold, as set out in Table 12 of Appendix C of the BAM. The minimum lot size associated with the project is 0.15 ha (1500m^2); therefore, the maximum area clearing limit for the application of the small area development module is ≤1 ha. As the project will only result in the clearance of approximately 0.13 ha of native vegetation (including planted native vegetation), it qualifies for the small area development module. Therefore, the project is being assessed under the small area development module in accordance with Appendix C of the BAM.

Furthermore, parts of the site consist of native vegetation of planted origin as part of the landscaping. The impacts on the planted native vegetation within the site has therefore been assessed under the streamlined assessment module for planted native vegetation in accordance with Appendix D of the BAM.

This assessment has been prepared in accordance with BAM 2020. Any reference to the BAM in the following report refers to the BAM 2020, unless stated otherwise.

1.2. Purpose

The purpose of this BDAR is to document the findings of an assessment undertaken for the project in accordance with Stage 1 (Biodiversity Assessment) and Stage 2 (Impact Assessment) of the BAM. Specifically, the objectives of this BDAR are to:

- Identify the landscape features and site context (native vegetation cover) within the subject land and assessment area;
- Assess native vegetation extent, plant community types (PCTs), threatened ecological communities (TECs) and vegetation integrity (site condition) within the subject land;
- Provide a justification for the use of the streamlined module for planted native vegetation and evidence for the planted origin of the native vegetation within the subject
- Assess habitat suitability for threatened species that can be predicted by habitat surrogates (ecosystem credits) and for threatened species that cannot be predicted by habitat surrogates (species credit species);
- Assess habitat suitability of the planted native vegetation for use by threatened species;
- Identify potential prescribed biodiversity impacts on threatened species;
- Describe measures to avoid and minimise impacts on biodiversity values and prescribed biodiversity impacts during project planning;
- Describe impacts to biodiversity values and prescribed biodiversity impacts and the measures to mitigate and manage such impacts;
- Identify the thresholds for the assessment and offsetting of impacts, including:
    - Impact assessment of potential entities of serious and irreversible impacts (SAII);
    - Impacts for which an offset is required;
    - Impacts for which no further assessment is required; and
- Describe the application of the no net loss standard, including the calculation of the offset requirement.

1.3. Project Description

1.3.1. Location

The project is located at 600 Woodstock Avenue, Rooty Hill, also known as Lot 67 DP804292 (hereafter referred as the 'subject land'). The subject land is approximately 2 ha and occurs in the Blacktown Government Area (LGA). The subject land is zoned IN1 – General Industrial under the *Blacktown Local Environmental Plan 2015*. The subject land is generally surrounded by industrial properties, and is bounded by Woodstock Avenue to the north, Kellogg Road to the west and south, and an adjacent industrial complex to the east.

A site map and location map have been prepared in accordance with the BAM and are presented in **Figure 1** and **Figure 2**, respectively.

1.3.2. Project Overview

The project involves the redevelopment of the subject land and construction of a Materials Recycling Facility, new car park, landscaping and associated works. Specifically, the SSD application proposes the following:

- Demolition of existing structures and construction of a Materials Recycling Facility with capacity to process up to 120,000 tonnes per annum (TPA), ancillary office space and facilities, on-site parking and associated works including excavation and landscaping.

The proposal comprises the redevelopment of the site as summarised below:

- Demolition of existing structures;
- Construction and operation of a purpose-built Materials Recycling Facility comprising a total of 7,572m^2 gross floor area, including: – Maximum building height of RL 57.83m;
    - Warehouse space: 6,732m^2;
    - Office space (across two levels) and amenities: 840m^2;
    - Capacity to process up to 120,000 TPA;
- Car parking provided on-site: 40 car spaces;
- Hard and soft landscaping; and
- Building identification signage.

Details of the subject land are provided in **Table 1**.

Table 1 Details of the subject land

Descriptor	Details
Street Address	600 Woodstock Avenue, Rooty Hill
Legal Description	Lot 67 in Deposited Plan DP804292

1.3.3. Identification of the Development Site Footprint

The layout of the project is shown in **Figure 3**. The development site footprint comprises 2.00 ha of land directly impacted by the project and is referred to within this BDAR as the subject land. All temporary/ancillary construction facilities and infrastructure will be contained within the operational footprint. Therefore, for the purposes of this assessment, the subject land comprises both the construction footprint and the operational footprint of the project.

1.3.4. General Description of the Subject Land

The subject land has been highly modified as a result of previous land disturbance. Vegetation within the subject land mainly consists of pockets of remnant native vegetation, planted native trees and shrubs surrounded by small areas of exotic dominated lawns, as part of the landscaping of the existing industrial facility, as well as limited patches of remnant vegetation.

Historical aerial imagery held within the Historical Imagery Viewer (Spatial Services NSW Goverment 2021) indicates that almost the entirety of the subject land was iteratively cleared from prior to 1984 and until 1991 for industrial use, with only small areas of remnant trees remaining in the south and north of the subject land. Planting of new trees are evident into the 1990s, whilst the exotic dominated grassland and cleared areas within the subject land have been maintained as cleared since this time.

The subject land is relatively flat, gently sloping from the northern boundary (approximately 46 m Australian Height Datum) towards the southern boundary of the subject land with a topographic low of 42 m.

The entirety of the subject land falls within the Blacktown soil landscape, which is characterised by gently undulating rises on Winamatta Group shales and Hawkesbury shale (DPIE. 1990).

1.4. Information Sources

1.4.1. Databases

A number of databases were utilised during the preparation of this BDAR, including:

- Environment, Energy and Science (EES) BioNet Atlas (EES 2021a);
- EES Threatened Biodiversity Data Collection (TBDC);
- EES BioNet Vegetation Classification database (2021b);
- Commonwealth Department of Agriculture, Water and the Environment (DAWE) Species Profile and Threat Database (2021);
- DAWE Protected Matters Search Tool (2021b); and
- DAWE Directory of Important Wetlands in Australia (2021a).

1.4.2. Literature

This BDAR has utilised the results and/or spatial data from the following documents:

- Remnant vegetation of the western Cumberland subregion, 2013 Update. VIS_ID 4207 (OEH 2013); and
- NSW Critically Endangered Ecological Community Map. Version 6.0. February 2020 (DPIE 2020).

Other sources of information have been referenced throughout this BDAR.

1.4.3. Aerial Photography

The aerial imagery utilised in this BDAR is sourced from NearMap and is dated 26 January 2021. Additional aerial images available on NearMap and SixMaps were also consulted.

1.5. Authorship and Personnel

This document has been certified by David Robertson (BAM Accredited Assessor No: BAAS17027) as being prepared in accordance within the BAM as at 21 January 2022.

This BDAR, and associated field surveys and Geographic Information Systems (GIS) mapping, was prepared with the assistance of additional personnel as outlined in **Table 2**.

Table 2 Personnel

Name	Tasks	Relevant Qualifications / Training	BAM Accredited Assessor No.
David Robertson	Document preparation, document review	Doctor of Philosophy. Ecology, University of Melbourne, 1986 Bachelor of Science (Honours) in Ecology, University of Melbourne, 1980 BAM Accredited Assessor Training. Muddy Boots, 2017 BAM Re-accreditation Training, Muddy Boots, 2021	BAAS17027
Cecilia Eriksson Pinatacan	Project management, document preparation, credit calculations, field surveys, GIS mapping	Master of Science (Major in Marine Science and Management). University of Technology, Sydney, 2013 Bachelor of Science (Honours) in Marine Biology. University of Technology, Sydney, 2008 BAM Accredited Assessor Training. Muddy Boots, 2017	BAAS19052
Michael Davis	Project management, document preparation, credit calculations, GIS mapping	Bachelor of Biodiversity and Conservation. Macquarie University, 2015 BAM Accredited Assessor Training. Muddy Boots, 2017	-
Jesse Luscombe	GIS mapping	Bachelor of Marine Science. Macquarie University, 2013 Certificate III in Conservation and Land Management. TAFE NSW, 2016 BAM Accredited Assessor Training. Muddy Boots, 2018	-

Name	Tasks	Relevant Qualifications / Training	BAM Accredited Assessor No.
Dr Rohan Mellick	Field surveys	Doctor of Philosophy, Evolutionary Ecology. The University of Adelaide, 2012 Bachelor of Applied Science (Honours) in Natural Resource Management, Southern Cross University, 2000. BAM Accredited Assessor Training. Muddy Boots, 2017	BAAS18075
John Foster	Field surveys	Bachelor of Science - Biology, Macquarie University, 2019. BAM Accredited Assessor Training. Muddy Boots, 2021	-

2. Methodology

2.1. Review of Existing Data

Existing information on biodiversity values within the assessment area was reviewed, which includes:

- Species data that is held in the BioNet Atlas; and
- Vegetation mapping contained within the Remnant vegetation of the western Cumberland subregion, 2013 Update. VIS_ID 4207 (OEH 2013).

This existing information was considered and included, where appropriate, into survey design, vegetation mapping and reporting.

2.2. Landscape Features

2.2.1. Landscape Features

Landscape features requiring consideration were initially determined via desktop assessment. Field surveys undertaken on 5 August 2021 sought to verify the following landscape features:

- Rivers, streams and estuaries;
- Important and local wetlands;
- Karsts, caves, crevices, cliffs and areas of geological significance; and
- NSW BioNet Landscapes.

No amendments were required to be made to any of these landscape features following field surveys.

2.2.2. Native Vegetation Cover

The native vegetation cover within the assessment area was determined through the use of existing vegetation mapping data, review of recent aerial imagery and field surveys within the subject land. The existing vegetation mapping data utilised was the *Remnant vegetation of the western Cumberland subregion, 2013 Update. VIS_ID 4207* (OEH 2013). The polygons of native vegetation within this dataset were revised following review of aerial imagery from NearMap dated 26 January 2021. Amendments were also made within the subject land following field surveys undertaken on 5 August 2021 (see ***Section 2.3.1***).

2.3. Native Vegetation Survey

2.3.1. Vegetation Mapping

Broad scale vegetation mapping prepared by OEH (2013) exists for the subject land and surrounds and was reviewed prior to field surveys. Cumberland Ecology conducted vegetation surveys on 5 August 2021 to verify and update the vegetation extent and existing broad-scale PCT mapping. The vegetation within the subject land was ground-truthed to examine and verify the mapping of the condition and extent of the different plant communities. Mapping of plant communities within the subject land was undertaken by random meander surveys through patches of vegetation, noting key characteristics of areas in similar broad condition states such as similar tree cover, shrub cover, ground cover, weediness or combinations of these. Vegetation within the

subject land was assessed as native vegetation for the purpose of this assessment if it contained any native vegetation.

Records of plant community boundaries were made using a hand-held Global Positioning System and mark-up of aerial photographs. The resultant information was synthesised using GIS to create a spatial database that was used to interpret and interpolate the data to produce a vegetation map of the subject land.

2.3.2. Plot-based Vegetation Survey and Vegetation Integrity Assessment

A plot-based vegetation survey and vegetation integrity assessment was undertaken concurrently within the subject land in accordance with the BAM (hereafter referred to as 'BAM plots'). This BAM plot were undertaken in accordance with Section 4.2.1 and Section 4.3.2 of the BAM.

A total of one BAM plot (P1) was undertaken within the subject land on 5 August 2021, and its location is shown in **Figure 4**. The BAM plots required the establishment of a 20 x 50 m plot with an internal 20 m x 20 m plot. The following data was collected within the plot:

- Composition for each growth form group by counting the number of native plant species recorded for each growth form group within a 20 m x 20 m floristic plot;
- Structure of each growth form group as the sum of all the individual projected foliage cover estimates of all native plant species recorded within each growth form group within a 20 m x 20 m floristic plot;
- Cover of 'High Threat Exotic' weed species within a 20 m x 20 m floristic plot;
- Assessment of function attributes within a 20 x 50 m plot, including:
    - Count of number of large trees;
    - Tree stem size classes, measured as 'diameter at breast height over bark' (DBH);
    - Regeneration based on the presence of living trees with stems <5 cm DBH;
    - The total length in metres of fallen logs over 10 cm in diameter;
- Assessment of litter cover within five 1 m x 1 m plots evenly spread within the 20 x 50 m plot; and
- Number of trees with hollows that are visible from the ground within the 20 x 50 m plot.

Table 3 summarises the plot requirements based on the size and number of vegetation zones in the subject land. As shown in this table, the minimum number of plots has been completed for the single vegetation zone. One additional random meander survey was performed for the purpose of supplementary information only, to verify the exotic species dominance of the grassland/lawn areas.

Table 3 BAM plot survey requirements

Vegetation Zone	PCT	Condition Name	Area (ha)	Minimum Number of Plots Required	Number of Plots Completed	Plot Name
1	849	Moderate	0.12	1	1	P1

2.4. Threatened Flora Species Survey

2.4.1. Habitat Constraints

Desktop assessments and field surveys within the subject land included assessment of habitat constraints and microhabitats for predicted species credit flora species.

2.4.2. Targeted Species Survey

No species credit flora species have been assessed as candidate species credit species for further assessment (see ***Section 5.3***). Based on the nature of the subject land, with a highly modified and degraded understory that is regularly managed as part of the industrial use of the land, it is highly unlikely that any threatened flora species would be present within the subject land based on the degraded or absent microhabitats. Nonetheless, threatened flora surveys were still undertaken within the site as a precautionary measure, through the completion of random meander surveys and plot-based surveys. The locations of the targeted flora species surveys are shown in **Figure 4**.

A random meander survey and plot survey was undertaken within the subject land on 5 August 2021. Due to the small area of potential habitat within the subject land, a random meander was deemed appropriate for the survey, and was supplemented with the required plot survey. Nevertheless, it should be noted that no species credit species have been assessed as candidate species credits for further assessment within this BDAR.

2.5. Threatened Fauna Species Survey

2.5.1. Habitat Constraints

Desktop assessments and field surveys within the subject land included assessment of habitat constraints and microhabitats for predicted species credit fauna species. This included desktop assessment of proximity of the subject land to features such as caves and waterways, and field inspection of microhabitats including leaf litter, rocky outcrops, hollow-bearing trees and man-made structures (if present).

2.5.2. Threatened Fauna Species Survey

No predicted threatened fauna species were assessed as candidate species credit species requiring further assessment (see ***Section 5.3***), therefore no targeted threatened fauna surveys were required to be undertaken within the subject land.

2.6. Weather Conditions

Weather conditions during the field survey was appropriate for detection of a range of flora and fauna species. A summary of weather conditions in the wider locality of the subject land (BOM Weather Station 067026) leading up to and during the field survey is provided in **Table 4**.

Table 4 Weather conditions leading up to and during field surveys

Date	Mean Temperature Minimum (ºC)	Mean Temperature Maximum (ºC)	Mean Rainfall (mm)
Preceding Months			
May 2021	8.3	20.0	65.4
June 2021	6.3	17.5	79.9
July 2021	4.5	17.4	43.2
During Surveys			
5 August 2021	5.7	18.7	2.4

2.7. BAM-C

Due to the limitations in the BAM Calculator (BAM-C) in relation to completing an assessment using the small area streamlined assessment module for a major project, the decision was made to select the Part 4 option for a small area assessment in the BAM-C instead of the Major Projects option.

Furthermore, it should also be noted that for the purpose of the calculations in the BAM-C, it has been assumed that all vegetation within the subject land will be cleared. However, as reflected in **Chapter 7** of this BDAR and within the project's Arboricultural Impact Assessment, a number of trees adjacent to the subject land will be retained and incorporated into the proposed landscaping for the project (Bradshaw Consulting Arborists 2022).

3. Landscape Features

3.1. Assessment Area

The subject land is approximately 2 ha in size and is shown in **Figure 1**. As the project is being assessed as a site-based project, the assessment area comprises the area of land within a 1,500 m buffer around the outer boundary of the subject land. The assessment area is approximately 800 ha in size and is shown in **Figure 2**.

3.2. Landscape Features

Landscape features identified within the subject land and assessment area are outlined below. The extent of these features within the subject land is shown in **Figure 1** and the extent within the assessment area is shown in **Figure 2**.

3.2.1. IBRA Bioregions and IBRA Subregions

The subject land and assessment area occur within the Sydney Basin Interim Biogeographic Regionalisation for Australia (IBRA) Bioregion and within the Cumberland Subregion.

3.2.2. Rivers, Streams and Estuaries

The subject land and assessment area occur within the Hawkesbury River catchment. No mapped watercourses occur within the subject land. Several streams occur within the assessment area ranging from first to third order streams, including Eastern Creek (3rd Order), Angus Creek (1st Order), Kitchen Creek (1st Order) and Bells Creek (1st Order). In accordance with Appendix 3 of the BAM, a riparian corridor of 10 m and 30 m either side of the waterway applies to first and third order streams within the assessment area, respectively.

3.2.3. Important and Local Wetlands

No important wetlands listed in the Directory of Important Wetlands in Australia or wetlands mapped under the *State Environmental Planning Policy (Coastal Management) 2018* are present in the subject land and/or assessment area. However, several artificial dams are located in the assessment area, mainly in association with Eastern Creek to the east of the subject land and the Blacktown International Sportspark Athletics Centre which occurs to the south of the subject land.

3.2.4. Habitat Connectivity

The subject land does not form part of a regional biodiversity corridor, flyway for migratory species, riparian buffer or estuary, or a local corridor.

The subject land occurs within a highly industrialised area, surrounded by industrial developments and roads. The existing small remnant and planted areas of trees and shrubs within the subject land are likely to mainly function as stepping-stone habitat that provides connectivity between larger habitat corridors and bushland areas in the wider landscape, including the riparian corridor and reserves surrounding Eastern Creek approximately 500 m to the east of the subject land.

3.2.5. Karsts, Caves, Crevices, Cliffs and Areas of Geological Significance

No karsts, caves, crevices, cliffs or areas of geological significance have been identified within the assessment area based on searches of available aerial imagery from NearMap, or topographic data available from SixMaps.

3.2.6. Areas of Outstanding Biodiversity Value

No Areas of Outstanding Biodiversity Value have been mapped within the subject land and assessment area.

3.2.7. NSW (Mitchell) Landscapes

The subject land is located entirely within the 'Cumberland Plain' NSW (Mitchell) Landscape, whilst the assessment area is located predominantly within the 'Cumberland Plain ' landscape with a strip of 'Hawkesbury – Nepean Channels and Floodplains' running along the extent of Eastern Creek.

3.2.8. Soil Hazard Features

Soil hazard features have not been identified as the project does not comprise a vegetation clearing proposal.

3.3. Native Vegetation Cover

The native vegetation cover was determined through the use of GIS. To map native vegetation cover within the subject land and assessment area, this assessment utilised the detailed vegetation mapping prepared by Cumberland Ecology in conjunction with broadscale mapping by OEH (2013). The native vegetation cover within the assessment area is shown in **Figure 2**. The assessment area is approximately 800 ha in size, of which approximately 137 ha comprises native vegetation cover, which represents 17% of the assessment area. Therefore, the native vegetation cover value is assigned to the cover class of >10-30%.

The remaining land within the assessment area comprises cleared land, exotic vegetation and dams. No significant differences between the aerial photographs used in this assessment and the native vegetation cover shown in **Figure 2** have been identified.

4. Native Vegetation

4.1. Native Vegetation Extent

The subject land has been subject to detailed surveys by Cumberland Ecology for the purpose of this BDAR. The native vegetation extent within the subject land was determined through a combination of aerial photograph interpretation and field surveys. The native vegetation extent is shown in **Figure 5** and occupies approximately 0.16 ha, which represents 8% of the subject land. This includes approximately 0.14 ha of remnant native vegetation and 0.02 ha of planted native vegetation.

The remaining land within the subject land comprises cleared land (1.75 ha) and exotic vegetation (0.08 ha), totalling an area of approximately 1.84 ha.

No differences between the aerial photographs used in this assessment and the native vegetation extent shown in **Figure 5** have been identified.

4.2. Plant Community Types

4.2.1. Overview

The analysis determined that the remnant native vegetation within the subject land aligned with one PCT held within the BioNet Vegetation Classification database. **Table 5** provides a summary of the PCT identified within the subject land, whilst the distribution of this PCT is shown in **Figure 6**. Details of the vegetation within the subject land are outlined below, including justification for PCT selection.

Table 5 Plant community types within the subject land

PCT #	PCT Name	Subject Land (ha)
849	Cumberland Shale Plains Woodland	0.12

4.2.2. PCT 849 - Cumberland Shale Plains Woodland

Vegetation Formation: Grassy Woodlands

Vegetation Class**:** Coastal Valley Grassy Woodlands

Percent Cleared Value: 93

4.2.2.1. General Description

This community within the subject land consists of small stands of remnant *Eucalyptus moluccana* (Grey Box) and smaller *Allocasuarina littoralis* (Black She-Oak) trees throughout the subject land, primarily in the south-west and north-east corners. A shrub layer is largely absent from the community, with the trees occurring over a very sparse ground layer comprised of a combination of native and exotic species and plant litter. However, native shrubs occur in very low numbers with a scattered distribution including *Bursaria spinosa* (Native Blackthorn), *Daviesia acicularis* and *Pultenaea microphylla*. Exotic small trees and shrubs are also present throughout the community, including species such as *Olea europaea* subsp. *cuspidata* (African Olive) and *Phoenix canariensis* (Canary Island Date Palm).

The ground layer is dominated by a combination of native and exotic species with a sparse distribution amongst the dense litter. The most dominant native species in the ground layer is *Eriochloa pseudoacrotricha* (Early Spring Grass), followed by *Asperula conferta* (Common Woodruff) and *Polymeria calycina*. The ground layer also contains numerous exotic species including *Ehrharta erecta* (Panic Veldtgrass), *Sonchus oleraceus* (Common Sowthistle), *Cirsium vulgare* (Spear Thistle), *Conyza bonariensis* (Flaxleaf Fleabane) and exotic climbers such as *Araujia sericifera* (Moth Vine) and *Asparagus asparagoides* (Bridal Creeper).

Examples of PCT 849 in the subject land are shown in **Photographs 1-2**.

Photograph 1 PCT 849 within the southern corner of the subject land

Photograph 2 PCT 849 within the southern corner of the subject land

4.2.2.2. Justification of PCT Selection

Identification of this PCT within the subject land was guided by review of existing data, and the results of the surveys undertaken by Cumberland Ecology. The data collected during surveys of the subject land was analysed in conjunction with a review of the PCTs held within the BioNet Vegetation Classification database. In selecting searching for suitable PCT, consideration was initially given to the following:

- IBRA subregion: Cumberland;
- Vegetation formation: Grassy Woodlands;
- Alignment with TEC: Cumberland Plain Woodland; and
- Canopy species: *Eucalyptus moluccana*.

PCTs that were associated with these aforementioned parameters include PCT 830, PCT 849 and PCT 850. Review of the landscape position of these PCTs ruled out both PCT 830 and PCT 850 as both occurs on higher elevations of hills and rises, whilst the subject land occurs on relatively flat land on a lower elevation. Furthermore, the *Remnant vegetation of the western Cumberland subregion* maps 'Cumberland Shale Plains

Woodland' (PCT 849) in areas surrounding the subject land on similar topographies (OEH 2013). Cumberland Plain Woodland is described as occurring on Wianamatta Shale derived soils (OEH 2011), which matches the soil landscape matching of the subject land as containing the Blacktown soil landscape, which is comprised of Wianamatta Group shales.

Within the subject land, the vegetation exists in a highly degraded form, consisting mostly of trees only over an exotic dominated understorey with occasional native elements. However, the tree species present (*Eucalyptus moluccana)* is consistent with assigning PCT 849 to the vegetation. The location in Western Sydney on the Cumberland Plain is also consistent with the description of this PCT (OEH 2011).

Species recorded within the subject land that align with the description of PCT 849 within the BioNet Vegetation Classification database include: *Eucalyptus moluccana, Daviesia acicularis, Bursaria spinosa* and *Eriochloa pseudoacrotricha*. Therefore, based on the existing available information of the subject land and surrounds, it was determined that the vegetation within this community aligns with PCT 849.

4.2.2.3. Alignment with Threatened Ecological Communities

Within the BioNet Vegetation Classification, PCT 849 is associated with the following TEC:

- Cumberland Plain Woodland in the Sydney Basin Bioregion.

The entire occurrence of PCT 849 within the subject land is considered to be consistent with the Cumberland Plain Woodland TEC as described in the final determination (OEH 2011) for the community as listed under the BC Act, due to the presence of the characteristic species *Eucalyptus moluccana* and the appropriate landform.

The occurrence of PCT 849 within the subject land does not conform to the EPBC Act listed community as it does not meet the condition thresholds described in the Conservation Advice (Threatened Species Scientific Committee 2008)for the community. The PCT 849 vegetation within the subject land was recorded as having a native perennial understorey vegetation cover of 5%. This is well below the minimum 30% native vegetation cover for patches with connectivity to other large vegetation remnants in the landscape.

4.3. Other Vegetation Types

4.3.1. Planted Native Vegetation

4.3.1.1. General Description

This vegetation type consists of strips of planted native trees along the southern and western boundaries of the subject land, and as scattered trees elsewhere. Planted trees include species both indigenous and not indigenous to the Sydney Region, comprising the species *Eucalyptus sideroxylon* (Mugga Ironbark), and *Callistemon viminalis* (Weeping Bottlebrush). The ground layer is mostly absent in areas of planted native trees, limited to scattered weeds such as the grasses *Poa annua* (Winter grass), *Ehrharta erecta* (Panic Veldtgrass) and *Eragrostis curvula* (African Lovegrass). A small number of native species are present with a scattered distribution. These include *Imperata cylindrica* (Blady Grass), *Eriochloa pseudoacrotricha* (Early Spring Grass) and *Lachnagrostis filiformis*.

An example of this community is shown in **Photograph 3**.

Photograph 3 Planted native vegetation adjacent to the southern boundary of the the subject land

4.3.1.2. Justification of PCT Selection

BAM includes a streamlined assessment module for "planted native vegetation". This module simplifies the assessment of impacts on planted native vegetation within a development site. The decision-making key outlined in Section D.1 of Appendix D of the BAM provides a framework to determine whether the streamlined assessment module for planted native vegetation can be applied to a site.

An assessment against the decision-making key in Appendix D of the BAM was undertaken and it was determined that Planted Native Vegetation in the subject land did not need to be assigned to a PCT. **Table 6** provides an assessment against the decision-making key.

The planted origin of this vegetation community in the subject land is evident when reviewing historical aerial imagery, held within the Historical Imagery Viewer (Spatial Services NSW Goverment 2021). The historical imagery indicates that almost the entirety of the subject land was cleared prior to 1990 for industrial purposes, with only small areas of remnant trees remaining. Planting of new trees are evident between 1984 and into the 1990s, whilst the exotic dominated grassland and cleared areas within the subject land have been maintained as cleared since this time. Furthermore, the species composition of the trees and shrubs and the existing use

of the subject land as an industrial site also further supports the planted origin of the vegetation classified in this BDAR as Planted Native Vegetation.

Table 6 Decision-making key to determine the application of the streamlined assessment module for planted native vegetation

Decision-Making Key	Response
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?	No – the scattered planted native species do not form a mosaic with remnant native vegetation.
2. Is the planted native vegetation: *a. planted for the purpose of environmental rehabilitation or restoration under an existing conservation obligation listed in BAM Section 11.9(2.), and* *b. the primary objective was to replace or regenerate a plant community type or a threatened plant species population or its habitat?*	No – native species have not been planted for the purposes of environmental rehabilitation or restoration, or to replace or regenerate a PCT or threatened species population or habitat.
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: *a. a species recovery project* *b. Saving our Species project* *c. other types of government funded restoration project* *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* *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)* *f. ecological rehabilitation to re-establish a PCT or TEC that was, or is carried out under a mine operations plan, or* *g. approved vegetation management plan (e.g. as required as part of a Controlled Activity Approval for works on waterfront land under the NSW Water Management Act 2000)?*	No – the planted native species do not comprise threatened species or native species planted/translocated for any of the listed purposes or programs.
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?	No – planted native vegetation was not undertaken for the purposes of revegetation, rehabilitation or restoration.
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 teatree farms?	Yes – native species have been planted for aesthetic purposes as part of the streetscape landscaping within the subject land.

Decision-Making Key	Response
	Native vegetation has been considered for use by threatened species within Chapter 5 of this BDAR (The use of Chapters 4 and 5 of the BAM are not required to be applied).
6. Is the planted native vegetation a species listed as a widely cultivated native species on a list approved by the Secretary of the Department (or an officer authorised by the Secretary)?	N/A

4.3.2. Exotic Vegetation

The remaining vegetation within the subject land consists of exotic species, including some planted trees/shrubs, but predominately consisting of open areas of exotic dominated grassland. Trees include *Phoenix canariensis* (Canary Island Date Palm) and *Jacaranda mimosifolia* (Jacaranda). Shrubs present within these areas include *Opunita stricta* (Common Prickly Pear), *Nandina domestica* (Japanese Sacred Bamboo) and *Rhaphiolepsis indica* (Indian Hawthorn). Grassland areas are dominated mostly by *Stenotaphrum secundatum* (Buffalo Grass) in addition to *Poa annua* (Winter grass), *Ehrharta erecta* (Panic Veldtgrass), *Chloris gayana* (Rhodes Grass) and *Eragrostis curvula* (African Lovegrass).

An example of this community is provided in **Photograph 4** and **5.**

Photograph 4 Exotic vegetation within the subject land

Photograph 5 Grassy Exotic Vegetation within the subject land

4.4. Threatened Ecological Communities

The entire occurrence of PCT 849 identified within the subject land has been assessed as being associated with a TEC. No other vegetation within the subject land conforms to a TEC under the BC Act and/or EPBC Act. **Table 7** summarises the TEC identified within the subject land and its distribution is shown in **Figure 7**.

Table 7 Threatened ecological communities within the subject land

TEC Name	BC Act Status	EPCB Act Status	Associated PCT	Associated Vegetation Zone	Subject Land (ha)
Cumberland Plain Woodland in the Sydney Basin Bioregion	CEEC	Not listed	849 - Cumberland shale plains woodland	1_Moderate	0.12

4.5. Vegetation Integrity Assessment

The native vegetation identified within the subject land was assigned to one vegetation zone based on PCT and broad condition states. A patch size was subsequently assigned for the single vegetation zone. The extent of this vegetation zone and associated patch size class within the subject land are shown in **Figure 8**.

The vegetation zone was assessed using survey BAM plots (see ***Section 2.3.2***) to determine the vegetation integrity score. BAM plot data utilised within the BAM-C to determine the vegetation integrity score is provided in **Appendix A**. The vegetation integrity assessment utilised the benchmark data held within the BAM-C (as derived from the BioNet Vegetation Classification). Therefore, this assessment did not utilise local benchmarks.

Vegetation zones, patch sizes and vegetation integrity scores for the subject land are summarised in **Table 8**.

Table 8 Vegetation zones within the subject land

Vegetation Zone	PCT	Condition Name	Area (ha)	Patch Size Class	Vegetation Integrity Score	Hollow-bearing Trees Present?
1	849 - Cumberland shale plains woodland	Moderate	0.12	≥100	48.6 (Composition = 38.4, Structure = 33.9, Function = 80)	No

5. Threatened Species

5.1. Identifying Threatened Species for Assessment

The BAM-C generates a list of threatened species requiring assessment utilising a number of variables. The following criteria have been utilised to predict the threatened species requiring further assessment:

- IBRA subregion: Cumberland;
- Associated PCT: 849;
- Percent native vegetation cover in the assessment area: 17%;
- Patch size: ≥100 ha; and
- Credit type: Ecosystem and/or species.

Based on the above variables, the BAM-C generated a list of 30 ecosystem credit species and six species credit species. Ecosystem credit species and species credit species are assessed further in ***Section 5.2*** and ***Section 5.3***, respectively.

5.2. Ecosystem Credit Species

5.2.1. Overview

A total of 30 ecosystem credit species are predicted, including four dual credit species which are considered as ecosystem credit species for their foraging habitat. **Table 9** lists the predicted ecosystem credit species for the vegetation zones within the subject land, and whether they have been retained within the assessment following consideration of habitat constraints, geographic limitations, vagrancy and quality of microhabitats. All ecosystem species have been retained in the assessment.

5.2.2. Justification for Removal

No ecosystem credit species have been removed from the assessment, therefore no justification is provided.

Table 9 Predicted ecosystem credit species

Scientific Name	Common Name	Relevant PCT	Relevant Vegetation Zones	Sensitivity to Gain Class	Retained in Assessment?
Anthochaera phrygia	Regent Honeyeater (Foraging)	849	1	High	Yes
Artamus cyanopterus cyanopterus	Dusky Woodswallow	849	1	Moderate	Yes
Callocephalon fimbriatum	Gang-gang Cockatoo (Foraging)	849	1	Moderate	Yes
Chthonicola sagittata	Speckled Warbler	849	1	High	Yes
Circus assimilis	Spotted Harrier	849	1	Moderate	Yes
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	849	1	High	Yes
Daphoenositta chrysoptera	Varied Sittella	849	1	Moderate	Yes
Dasyurus maculatus	Spotted-tailed Quoll	849	1	High	Yes
Glossopsitta pusilla	Little Lorikeet	849	1	High	Yes
Grantiella picta	Painted Honeyeater	849	1	Moderate	Yes
Haliaeetus leucogaster	White-bellied Sea-Eagle (Foraging)	849	1	High	Yes
Hieraaetus morphnoides	Little Eagle (Foraging)	849	1	Moderate	Yes
Hirundapus caudacutus	White-throated Needletail	849	1	High	Yes
Lathamus discolor	Swift Parrot (Foraging)	849	1	Moderate	Yes
Lophoictinia isura	Square-tailed Kite (Foraging)	849	1	Moderate	Yes
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	849	1	Moderate	Yes

Scientific Name	Common Name	Relevant PCT	Relevant Vegetation Zones	Sensitivity to Gain Class	Retained in Assessment?
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	849	1	Moderate	Yes
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	849	1	High	Yes
Miniopterus australis	Little Bent-winged Bat (Foraging)	849	1	High	Yes
Miniopterus orianae oceanensis	Large Bent-winged Bat (Foraging)	849	1	High	Yes
Neophema pulchella	Turquoise Parrot	849	1	High	Yes
Ninox connivens	Barking Owl (Foraging)	849	1	High	Yes
Ninox strenua	Powerful Owl (Foraging)	849	1	High	Yes
Petroica boodang	Scarlet Robin	849	1	Moderate	Yes
Petroica phoenicea	Flame Robin	849	1	Moderate	Yes
Phascolarctos cinereus	Koala (Foraging)	849	1	High	Yes
Pteropus poliocephalus	Grey-headed Flying-fox (Foraging)	849	1	High	Yes
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	849	1	High	Yes
Stagonopleura guttata	Diamond Firetail	849	1	Moderate	Yes
Tyto novaehollandiae	Masked Owl (Foraging)	849	1	High	Yes

5.3. Species Credit Species

5.3.1. Overview

A total of six species credit species are predicted, including four dual credit species which are considered as species credit species for their breeding or important habitat. As the project is being assessed under the Streamlined Assessment Module – small area development, candidate species credit species that are not at risk of an SAII and are not incidentally recorded on the subject land do not require further assessment.

Table 10 lists the predicted species credit species for the one vegetation zone within the subject land, and whether they have been retained within the assessment following consideration of habitat constraints, geographic limitations, vagrancy and quality of microhabitats. Justification is provided below this table for species that have been removed from the assessment in accordance with Steps 1-3 of Section 5.2 of the BAM. All species not removed from consideration (i.e. retained in the assessment) are by default candidate species credit species that require further assessment.

Of the assessed predicted species, no species credit species have been retained for further assessment.

Table 10 Predicted species credit species

Scientific Name	Common Name	Relevant PCT	Relevant Vegetation Zones	Suitable Habitat within Planted Native Vegetation?	Sensitivity to Gain Class	Retained in Assessment?
Flora						
Caladenia tessellata	Thick Lip Spider Orchid	849	1	No	Moderate	No
Fauna						
Anthochaera phrygia	Regent Honeyeater (Breeding)	849	1	No	High	No
Chalinolobus dwyeri	Large-eared Pied Bat	849	1	No	Very High	No
Lathamus discolor	Swift Parrot (Breeding)	849	1	No	Moderate	No
Miniopterus australis	Little Bent-winged Bat (Breeding)	849	1	No	Very High	No
Miniopterus orianae oceanensis	Large Bent-winged Bat (Breeding)	849	1	No	Very High	No

5.3.2. Justification for Removal

5.3.2.1. Caladenia tessellata

Caladenia tessellata (Thick-lipped Spider-orchid) has been removed from the assessment due to the absence of microhabitats required by the species within the subject land. The species is known to favour low, dry sclerophyll woodland (for example open *Kunzea* woodland) with a heathy or sometimes grassy understorey on clay loams or sandy soils, occurring less commonly in heathland on sandy loam soils (Duncan 2010). Such habitats are not present within the subject land.

Furthermore, whilst acknowledged that this is not an accepted reason for removal of a species, it is noted that subject land is located outside of the limited known range of the species. Within NSW, *Caladenia tessellata* (Thick-lipped Spider-orchid) is known from two disjunct areas; one population near Braidwood on the Southern Tablelands and three populations in the Wyong area on the Central Coast (OEH 2018).

5.3.2.2. Regent Honeyeater

The Regent Honeyeater (*Anthochaera phrygia*) has been removed from the assessment as the subject land is not located within an area on the important habitat map for the species.

5.3.2.3. Large-eared Pied Bat

The Large-eared Pied Bat (*Chalinolobus dwyeri*) has been removed from the assessment as the habitat constraints for the species are absent from the subject land. The TBDC lists the following habitat constraints for the species: *Within two kilometres of rocky areas containing caves, overhangs, escarpments, outcrops, or crevices, or within two kilometres of old mines or tunnels.* The subject land does not occur within 2 km of rocky areas containing caves, overhands, escarpments, outcrops or crevices, or old mines or tunnels.

5.3.2.4. Swift Parrot

The Swift Parrot (*Lathamus discolor*) has been removed from the assessment as the subject land is not located within an area on the important habitat map for the species.

5.3.2.5. Little Bent-winged Bat

The Little Bent-winged Bat (*Miniopterus australis*) has been removed from the assessment as the habitat constraints for the species are absent from the subject land. The TBDC lists the following habitat constraint for the species: *Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records in BioNet with microhabitat code 'IC – in cave'; observation type code 'E nest-roost'; with numbers of individuals >500; or from the scientific literature*. Whilst the subject land contains large industrial structures, they are not suspected to be utilised for breeding due to their active use as industrial facilities and the high degree of associated disturbance. None of these habitat features, or records held within BioNet, are present within the subject land.

5.3.2.6. Large Bent-winged Bat

The Large Bent-winged Bat (*Miniopterus orianae oceanensis*) has been removed from the assessment as the habitat constraints for the species are absent from the subject land. The TBDC lists the following habitat

constraint for the species: *Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records with microhabitat code "IC - in cave;" observation type code "E nest-roost;" with numbers of individuals >500*. Whilst the subject land contains large industrial structures, they are not suspected to be utilised for breeding due to their active use as industrial facilities and the high degree of associated disturbance. None of these habitat features, or records held within BioNet, are present within the subject land.

5.3.3. Presence of Candidate Species Credit Species

No candidate species credit species were retained for further assessment.

6. Prescribed Impacts

Prescribed impacts are identified in Clause 6.1 of the *Biodiversity Conservation Regulation 2017* (BC Regulation). Prescribed impacts are those that are additional to the clearing of native vegetation and associated habitat. These include:

- Development on the habitat of threatened species or ecological communities associated with:
  - karst, caves, crevices, cliffs, rock outcrops and other geological features of significance;
  - human-made structures;
  - non-native vegetation;
- Development on areas connecting threatened species habitat, such as movement corridors;
- Development on water quality, water bodies and hydrological processes that sustain threatened species and TECs (including from subsidence or upsidence from underground mining);
- Wind turbine strikes on protected animals; and
- Vehicle strikes on threatened species or on animals that are part of a TEC.

An assessment of the relevance of these prescribed impacts to the project is provided in **Table 11**. The location of prescribed impacts is shown in **Figure 9**.

Table 11 Relevance of prescribed impacts

Prescribed Impact	Relevance to Project	Associated Threatened Entities
Karst, caves, crevices, cliffs, rock outcrops and other geological features of significance	Not relevant. Features are not present within the subject land.	-
Human-made structures	This feature is present in the form of the existing industrial structures that dominated the subject land. Nevertheless, as the buildings are reasonably well-maintained and have been subject to high levels of disturbance associated with active industrial use, they are unlikely to provide suitable breeding habitat for threatened species. However, they may be utilised as non-breeding habitat by threatened microbats on an occasional or opportunistic basis.	Little Bent-winged Bat, Large Bent-winged Bat
Non-native vegetation	Non-native vegetation occurring within the subject land comprises areas of managed lawns and limited scattered occurrences of	Ecosystem credit fauna species which may utilise the habitat as part of a larger foraging range.

Prescribed Impact	Relevance to Project	Associated Threatened Entities
	trees and shrubs. This vegetation may provide some low-value habitat for native fauna species, including threatened birds and bats, on occasion. Impacts to non-native vegetation would occur during the construction phase of the project and result in a long-term impact.	
Habitat connectivity	The subject land occurs in a highly industrialised environment and is not part of an established habitat corridor. Nonetheless, the treed areas of the subject land are likely to function as stepping-stone habitat for highly mobile fauna species between larger tracts of bushland. Minor direct impacts to habitat connectivity may occur as a result of the reduction of trees along the boundaries of the subject land.	Ecosystem credit fauna species which may utilise the habitat as part of a larger foraging range and as stepping-stone habitat.
Waterbodies, water quality and hydrological processes	Not relevant. Waterbody features are not present within the subject land. The subject land is dominated by hardstand and other impervious surfaces. The project may result in a marginal change to impervious surfaces, resulting in minor and insignificant changes to surface hydrology. The project aims to achieve a post-development stormwater peak event discharge from the subject land which does not exceed the pre-development stormwater peak event discharge (Northrop 2022).	-
Wind turbine strikes	Not relevant. The project does not comprise a wind farm development.	-
Vehicle strikes	Not relevant. The operational and construction phases of the project will involve the movement of vehicles. However, the anticipated	-

Prescribed Impact	Relevance to Project	Associated Threatened Entities
	vehicle movement is not anticipated to be significantly greater than current conditions and no impacts to threatened species are predicted.	

7. Avoid and Minimise Impacts

This section includes demonstration of efforts to avoid and minimise impacts on biodiversity values identified within the subject land, which includes assessment of direct, indirect and prescribed impacts. Any mentioning of the development footprint within this chapter is synonymous with the subject land. A summary table of options considered for the project to avoid and minimise impacts on biodiversity is provided in **Table 12**.

7.1. Avoid and Minimise Direct and Indirect Impacts on Native Vegetation and Habitat

Under the BAM, measures taken to avoid and minimise impacts on biodiversity values from the development need to be documented. As described in previous chapters of this BDAR, the subject land contains an area of approximately 0.12 ha of Cumberland Plain Woodland CEEC comprised of two small patches in the south and north of the subject land. The remainder of the site comprises a mix of planted native and exotic vegetation that is generally considered to be of low biodiversity value.

From a biodiversity perspective, most of the subject land has already been subject to historical clearing, with the majority of the site now comprising cleared land with small patches of remnant native vegetation, planted native vegetation and exotic vegetation over exotic lawns or mulched areas. Hence, the impacts on biodiversity associated with a redevelopment of the subject land are considered to be relatively low considering the already modified nature of the site.

When considering the specific requirements of the project, including the size of the development and the site selection, in combination with the scattered nature of the existing vegetation, opportunities to avoid all impacts on Cumberland Plain Woodland are limited. The specific requirements of the project that had to be considered are outlined below. Nevertheless, as outlined in ***Section 7.1.1,*** a number of measures have been implemented for the project to minimise the impacts on native vegetation and habitat.

7.1.1. Site Selection Considerations

i. Site Selection Criteria

The project commenced with Cleanaway's tender for the contract to collect yellow lidded recycling bins from the Blacktown LGA. Cleanaway was awarded the contract in November 2020 requiring the Materials Recycling Facility to be developed within the Blacktown LGA and operational in Q1 2022.

During the site selection process for the project, numerous unique requirements and limitations had to be considered to facilitate a permissible and operational Materials Recycling Facility development. Unique requirements that apply to the site selection for the project are listed below:

- The project requires an IN 1 – General Industrial zoning to be permissible under the LEP;
- The project has unique building requirements in order to operate the proposed facility;
- The operational phase of the project has a strict requirement for a variety of inbound and outbound traffic movements with differing types of vehicles requires a unique hardstand configuration with full drive around and access on all sides;

- The type of industry and activities is often seen as negative to adjacent tenants, and institutional investors do not necessarily want this use in multi-tenant buildings and estates; and
- The proximity to residential development and potential acoustic impacts also dictates the suitability of site options.

Subsequently, the site selection process for a standalone facility with the relevant attributes was challenging. This was further complicated by a substantial increase in industrial facility investment which has stimulated a rise in property values.

a. Consideration of alternative project sites

During the site selection process, a total of 22 additional properties were thoroughly investigated as to whether they could support the project, comprising 18 sites from within the Blacktown LGA and four sites from outside the Blacktown LGA. Out of these sites, 14 did not have a site configuration that could support the project, whilst eight had a site configuration that was either ideal for the project or could be reconfigured to accommodate the project. Ultimately, the project was not able to proceed on any of the eight potentially viable alternative sites, as the owners were either not willing to accommodate the project within their estates or were not prepared to sell or finance the extensive works required to accommodate the project.

b. Suitability of the Subject Land for the project

The subject land was selected for the project due to being located within the Blacktown LGA and within an area of IN1 – General Industrial zoning. The subject land can accommodate the unique building and hardstand configuration, with full drive around and access on all sides to allow the necessary inbound and outbound traffic movements of the operational phase of the project. The subject land was deemed to be the most viable site for the project whilst adhering to the geographical and timing constraints of the Cleanaway contract.

ii. Zoning of the Land

The land proposed for development is zoned IN1 - General Industrial. The objectives of the IN1 - General Industrial zone do not strictly include biodiversity conservation measures, as set out below:

- *To provide a wide range of industrial and warehouse land uses.*
- *To encourage employment opportunities.*
- *To minimise any adverse effect of industry on other land uses.*
- *To support and protect industrial land for industrial uses.*
- *To enable other land uses that provide facilities or services to meet the day to day needs of workers in the area.*
- *To minimise adverse impacts on the natural environment.*

Within the zone, a range of intensive industrial land uses, and developments are permissible. Notwithstanding the objectives of the zone, consideration has been made to design a development that maximises the available

land for landscaping, including species characteristic of PCT 849 while still allowing for a feasible, functional development appropriate to the zone.

iii. Potential reduction of scale of Development

The development cannot be reduced in scale for the purpose of vegetation retention due to the highly specific design requirements of the project. The operational phase of the project requires a unique building and hardstand configuration allowing full drive around and access on all sides to facilitate the necessary inbound and outbound traffic movements of the operational phase of the project. Subsequently, there is no scope of a reduction in the scale of the development to allow retention of the extant vegetation of the subject land.

iv. The current design

The current design of the project involves the construction and operation of a purpose-built Materials Recycling Facility comprising a total of 7,572m^2 gross floor area. The design is comprised of warehouse space, office space (across two levels) and amenities, on-site car parking with 40 spaces, hard and soft landscaping and building identification signage.

The current design and resulting impact footprint are dictated by the highly specialised processing equipment being used within the facility. The process equipment is being supplied by a specialist supplier of sorting equipment, and the layout of the equipment is of a fixed design within the facility. Subsequently there is no scope for a reduction in the size of the current design to facilitate the retention of extant vegetation. It is noted that there are stands of existing trees that are located directly adjacent to areas subject to earthworks. These trees are not anticipated to be viably retained and will be replaced with native plantings as described in ***Section 8.5.7***.

7.1.2. Project Location and Design Avoidance Considerations

In determining the location and design of the final development footprint, the project has sought to minimise impacts on native vegetation and habitat by:

- Locating the project predominantly within areas containing previously cleared land;
- Configuring the driveways and site access in areas that allows for the retention of Planted Native trees adjacent to the subject land along the street verge;
- Incorporating a detailed landscape design as part of the project, to facilitate an overall increase in canopy cover within the subject land in the longer term;
- Designing the project's landscaping to incorporate replacement plantings of the TEC Cumberland Plain Woodland;
- Implementation of a suite of mitigation measures as part of the project (***Section 8.5***), to minimise the impacts on biodiversity, including:
    - Weed management;
    - Pre-clearance surveys and clearance supervision;

- Tree protection measures;
- Sedimentation control measures; and
- Staging of clearing.

7.2. Avoid and Minimise Prescribed Impacts

7.2.1. Non-native Vegetation

Areas of non-native vegetation within the subject land are predominantly in the form of managed lawns, with some smaller scattered areas of woody vegetation.

Although the non-native vegetation may provide some habitat value for native fauna in terms of shelter and foraging resources, these areas are unlikely to be favoured over the woodland habitats outside of the subject land within the assessment area of the project. Hence, impacts to the areas of non-native vegetation are not able to be avoided as part of the project.

7.2.2. Human-made Structures

Two existing industrial structures that are proposed to be demolished as part of the project, could potentially provide non-breeding roosting habitat for threatened microbats that may be utilised on an occasional or opportunistic basis. Given the scope and design requirements of the project, impacts to these structures are not able to be avoided as part of the development.

Nevertheless, the human made structures planned to be demolished and removed are not considered to be essential for survival for any of the potentially impacted species, and adequate mitigation measures (as discussed in ***Section 8.5-8.6***) will be implemented to minimise the impact to fauna (if any) that may utilise the existing human-made structures for roosting.

7.2.3. Habitat Connectivity

The subject land occurs in a highly industrialised environment and is not part of an established habitat corridor. Nonetheless, the treed areas of the subject land are likely to function as stepping-stone habitat for highly mobile fauna species between larger tracts of bushland. Minor direct impacts to habitat connectivity may occur as a result of the removal of trees within the subject land.

As explained in previous sections, when considering the requirements associated the project in combination with the scattered nature of the existing vegetation, there are limited opportunities to avoid impacts on native vegetation and associated habitat connectivity. Nevertheless, the project has focused on retaining a degree of canopy cover adjacent to the subject land within the southern street verge whilst still achieving a highly functional development. Furthermore, habitat connectivity will be enhanced in the longer term with the establishment of landscape plantings as discussed in ***Section 8.5.*** Therefore, although there will be some minor reduction in the overall habitat connectivity supported by the subject land, the overall subject land will continue to function as stepping-stone habitat between larger patches of woodland in the wider landscape in the long-term.

Table 12 Summary table of options considered for the project to avoid and minimise impacts on biodiversity

Action	Adopted (Yes/No/In part)	Justification	Timing (if adopted)	Responsibility (if adopted)	Outcome (if adopted)
Implementation of a suite of mitigation measures	Yes	To minimise the impacts on biodiversity, a suite of mitigation measures will be implemented such as weed management, tree protection measures, pre-clearance surveys, and landscaping and replacement plantings.	Pre and post construction and during operation phase	Proponent and consultant team	Minimise impacts on biodiversity
Locating the project predominantly within areas containing exotic-dominated vegetation which has previously been cleared	In part	The project has been located in an area where the majority of vegetation to be impacted comprises previously cleared land, exotic vegetation and small areas of remnant and planted native vegetation.	Project planning	Proponent and consultant team	Impacts predominantly occur in areas of low biodiversity value.
Partial development of the study area to avoid/minimise impacts on biodiversity and achieve greater tree retention	No	The development cannot be reduced in scale to avoid/minimise impacts on biodiversity or to achieve greater tree retention due to the highly specific design requirements of the project. The project requires a unique building and hardstand configuration allowing full drive around and access on all sides to facilitate the necessary inbound and outbound traffic movements of the operational phase of the project.	-	-	-

Action	Adopted (Yes/No/In part)	Justification	Timing (if adopted)	Responsibility (if adopted)	Outcome (if adopted)
'Do-nothing' option to avoid all impacts on biodiversity	No	The do-nothing option for the project would maintain current tree cover on site but would not enable redevelopment of the study area to meet the demand for a materials recycling facility in the LGA. Under a do-nothing option, extant trees would remain and continue to grow and age, potentially to form hollows. However, there would be no requirement to replant or maintain native plant species on the site. Furthermore, if a tree dies or is damaged in a storm there would be no requirement for the tree to be replaced. Therefore, over time, there is potential for the existing canopy area to be reduced and for the native vegetation to be degraded further by edge-effects.	-	-	-
Consideration of alternative sites and layouts for the project within the study area	No	There is no scope for the relocation of the current design or alternative layouts for the project due to the highly specific design requirements of the project. The current design and resulting impact footprint are dictated by the highly specialised processing equipment being used within the facility. The process equipment is being supplied by a specialist supplier of sorting equipment, and	-	-	-

Action	Adopted (Yes/No/In part)	Justification	Timing (if adopted)	Responsibility (if adopted)	Outcome (if adopted)
		the layout of the equipment is of a fixed design within the facility.			

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8. Assessment of Impacts

8.1. Direct Impacts

8.1.1. Native Vegetation

The direct impact resulting from the proposed development is the loss of vegetation and associated habitat within the subject land. **Table 13** identifies the extent of impacts to vegetation within the subject land.

Table 13 Extent of vegetation impacts within the subject land

Vegetation Zone	PCT #	PCT Name	BC Act Status	Subject Land (ha)
1	849	Cumberland Shale Plains Woodland	CEEC	0.12
-	-	Planted native vegetation	-	0.02
-	-	Exotic vegetation	-	0.08
Total				**0.22**

CEEC = Critically endangered ecological community

8.1.2. Threatened Species

No species credit species will be impacted by the proposed development.

8.2. Change in Vegetation Integrity Score

Table 14 details the change in vegetation integrity score for the one vegetation zone within the subject land.

For the purpose of this assessment, it has been assumed that all vegetation within the subject land will be cleared within the BAM-C, as described in ***Section 2.7.***

Table 14 Change in vegetation integrity score

Zone	PCT Name	BC Act Status	BRW	Area (ha)	VI Score			
					Current	Future	Change	Total Change
1	849 – Cumberland Shale Plains Woodland	CEEC	2.5	0.12	48.6	0	-48.6	-48.6

BRW = Biodiversity Risk Weighting

VI Score = Vegetation Integrity Score

8.3. Indirect Impacts

Table 15 outlines the indirect impacts to native vegetation and habitat. No limitations to the assessment of indirect impacts have been identified.

Due to the existing highly modified nature of the vegetation both within and adjacent to the subject land, the indirect impacts of the project are not considered to be significant. No indirect impact zones have been identified for the purpose of this assessment.

Table 15 Indirect impacts of the project

Indirect Impact	Nature	Extent	Duration	Threatened Entities Likely Affected	Consequences
Inadvertent impacts on adjacent habitat or vegetation	Impact possible. Construction and operational activities may result in inadvertent impacts on retained vegetation surrounding the subject land.	Planted and potentially remnant native vegetation surrounding the subject land.	Short term (during construction) and potential long term	Cumberland Plain Woodland	Further reduced condition of the adjacent areas of Cumberland Plain Woodland.
Reduced viability of adjacent habitat due to edge effects	Impact unlikely. The subject land is not directly adjacent to any areas of native vegetation other than existing stands of trees already subject to high degrees of edge effects	-	-	-	-
Reduced viability of adjacent habitat due to noise, dust or light spill	Impact possible. The construction activities associated with the project are likely to increase the noise, dust and light above current levels within and immediately adjacent the subject land. Some impacts such as noise or light may persist during the operational phase.	Planted and potentially remnant native vegetation surrounding the subject land.	Short term (during construction) and potential long term	Ecosystem credit species	Short term disruption of fauna habitat usage during construction, with potential for ongoing occupation impacts.
Transport of weeds and pathogens from the site to adjacent vegetation	Impact possible. A number of high threat exotic weeds are known to occur within the subject land and may be inadvertently spread to surrounding vegetation.	Planted and potentially remnant native vegetation surrounding the subject land.	Potential long-term	Cumberland Plain Woodland	Further reduced condition of the adjacent areas of Cumberland Plain Woodland.

Indirect Impact	Nature	Extent	Duration	Threatened Entities Likely Affected	Consequences
Increased risk of starvation, exposure and loss of shade or shelter	Impact unlikely. The project is predominantly in cleared land, and unlikely to cause displacement of fauna such that it increases the risk of starvation, exposure and loss of shade or shelter.	-	-	-	-
Loss of breeding habitats	Impact possible. The subject land contains three hollow-bearing trees that are proposed to be removed as a result of the project. Fauna breeding habitat occurs in adjacent vegetation and includes hollow-bearing trees. The project is unlikely to result in the loss of breeding habitat within adjacent areas.	Three hollow-bearing trees.	Long-term	Ecosystem credit species and/or native species that may utilise tree-hollows for breeding such as small birds.	Loss of breeding habitat features and potential loss of breeding opportunities.
Trampling of threatened flora species	Impact unlikely. No threatened flora species known or likely to occur.	-	-	-	-
Inhibition of nitrogen fixation and increased soil salinity	Impact unlikely. The project is not considered to result in the inhibition of nitrogen fixation and increased soil salinity.	-	-	-	-
Fertiliser drift	Impact unlikely. The project does not involve fertiliser application, therefore the project is not considered to result in this indirect impact.	-	-	-	-
Rubbish dumping	Impact unlikely to occur beyond current conditions, considering the nature of the subject land and the project, and industrial land use of surrounding areas.	-	-	-	-

Indirect Impact	Nature	Extent	Duration	Threatened Entities Likely Affected	Consequences
Wood collection	Impact unlikely to occur, considering the nature of the subject land and the project, and industrial land use of surrounding areas.	-	-	-	-
Bush rock removal and disturbance	Impact unlikely. No bush rock has been identified within the subject land or immediate vicinity, therefore the project is not considered to result in this indirect impact.	-	-	-	-
Increase in predatory species populations	Impact unlikely. Considering the modified nature and the existing industrial usage of the subject land in combination with the nature of the project and the highly industrialised surrounding areas, the project is considered unlikely to result in an increase in predatory species populations.	-	-	-	-
Increase in pest animal populations	Impact unlikely. Considering the modified nature and the existing industrial usage of the subject in combination with the nature of the project and the highly industrialised surrounding areas, the project is considered unlikely to result in an increase in pest animal populations.	-	-	-	-
Increased risk of fire	Impact unlikely. The project is unlikely to increase the risk of bushfire and does not occur on a bushfire zone as mapped by Blacktown City council.	-	-	-	-
Disturbance to specialist breeding and foraging habitat	Impact unlikely. Considering the modified nature and the existing industrial usage of the subject in combination with the nature of the project and the highly industrialised surrounding areas, the project is considered unlikely to result in disturbance to specialist breeding and foraging habitat.	-	-	-	-

8.4. Prescribed Impacts

The project has been assessed as resulting in three prescribed impacts (see ***Chapter 6***). An assessment of these prescribed impacts is provided below in accordance with Section 8.3 of the BAM.

8.4.1. Non-native Vegetation

8.4.1.1. Nature

Non-native vegetation to be impacted by the project occurs mainly as small open areas of managed lawns within the subject land, and some smaller scattered areas of woody exotic vegetation.

8.4.1.2. Extent

The project will clear a total of approximately 0.08 ha of non-native vegetation. The majority of this comprises exotic dominated grasslands in the form of managed lawns and garden beds of the subject land, which are of low habitat value.

8.4.1.3. Duration

Impacts to non-native vegetation would occur during the construction phase of the project. The removal of the non-native vegetation is a long-term impact.

8.4.1.4. Threatened Entities Affected

The habitat provided by non-native vegetation may provide some marginal foraging habitat for ecosystem species, such as microchiropteran bats and birds, mainly within the small occurrences of woody exotic shrubs. The non-native vegetation is not considered suitable breeding/nest habitat due to lack of hollows.

8.4.1.5. Consequences

The project will result in a reduction in non-native vegetation by approximately 0.08 ha. The reduction of this small area of habitat is not considered to significantly impact upon the potentially affected threatened entities as other areas of more suitable habitat will remain within wider assessment area. Furthermore, the majority of the non-native vegetation to be removed comprises exotic dominated lawns that are considered to be of low habitat value.

8.4.2. Human-made Structures

8.4.2.1. Nature

Human-made structures to be impacted by the project include the two large industrial structures that dominate the subject land.

8.4.2.2. Extent

The impacts will be limited to the two industrial structures within the subject land.

8.4.2.3. Duration

Impacts to the human-made structures would occur during the construction phase of the project. The removal of these structures is a long-term impact.

8.4.2.4. Threatened Entities Affected

The habitat provided by the human-made structures may provide potential non-breeding roosting habitat for a number of threatened microbats, including the Eastern False Pipistrelle, Eastern Coastal Free-tailed Bat, Little Bent-winged Bat, Large Bent-winged Bat, Yellow-bellied Sheathtail-bat, and Greater Broad-nosed Bat

8.4.2.5. Consequences

The project will result in the loss of two human-made structures in the form of two industrial buildings, which may provide potential non-breeding roosting habitat for a number of threatened microbats. Nevertheless, the human made structures to be removed for the proposed development are not considered to form significant roosting habitat for these species and therefore not considered to be dependent on for survival for the Little Bent-winged Bat and the Large Bent-winged Bat. Hence, no significant impacts to these species are expected from the removal of the human made structures on the subject land.

8.4.3. Habitat Connectivity

8.4.3.1. Nature

The native vegetation within the subject land has the potential to function as stepping-stone habitat that connects larger areas of woody vegetation within the assessment area (see **Figure 2**). The woody vegetation proposed to be removed from within the subject land occurs as small patches and scattered individual trees within a predominantly cleared site.

8.4.3.2. Extent

Habitat connectivity will be marginally reduced by the removal of 0.13 ha of woody native vegetation comprising Cumberland Plain Woodland and Planted Native Vegetation. Removal of the woody vegetation within the subject land will not result in further fragmentation of habitat in the locality, as it is only a very small decrease in total area. The majority of the subject land has previously been cleared of treed vegetation and the trees adjoining the subject land and will continue to function as stepping-stone habitat in the landscape.

8.4.3.3. Duration

Direct impacts to habitat connectivity would occur during the construction and operational phase of the project. The reduction of habitat connectivity is considered to be a long-term impact.

8.4.3.4. Threatened Entities Affected

The habitat provided by woody vegetation may provide foraging habitat for ecosystem species, such as the Grey-headed Flying-fox, microchiropteran bats and birds.

8.4.3.5. Consequences

The project will result in the reduction of woody vegetation by 0.13 ha, comprising PCT 849 (0.12 ha) and Planted Native Vegetation (0.02 ha). This woody vegetation would function as stepping-stone habitat between larger areas of habitat. The reduction of this small area of habitat is not considered to significantly impact the movement of mobile fauna species as extensive areas of similar vegetation and habitat, including better connected and larger areas of remnant vegetation, is located in the adjacent native vegetation in the immediate surrounding area. For example, the Grey-headed Flying-fox forages opportunistically, often at distances up to

30 km from camps, and occasionally up to 60-70 km per night, in response to patchy food resources (NSW Scientific Committee 2004). It is considered unlikely that native fauna would be solely reliant on the habitat within the subject land for movement between different areas of habitat.

8.5. Mitigation of Impacts to Native Vegetation and Habitat

A range of mitigation measures have been developed for the project to mitigate the impacts to native vegetation and habitat that are unable to be avoided. These include a range of measures to be undertaken before and during construction to limit the impact of the project. Each mitigation measure is discussed in detail below, and a summary is provided in **Table 16**.

8.5.1. Weed Management

In order to minimise the spread of weeds throughout the subject land and adjoining areas, appropriate weed control activities will be undertaken prior to vegetation clearing in accordance with the *Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022* (LLS: Greater Sydney 2019) under the NSW *Biosecurity Act 2015*.

The *Biosecurity Act 2015* and regulations provide specific legal requirements for state level priority weeds and high risk activities, as provided in the Appendices of the *Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022* (LLS: Greater Sydney 2019). In order to comply with the objectives of the plan, it is recommended the following measures be implemented as part of weed management for the subject land.

i. Prevention

Appropriate construction site hygiene measures will be implemented to prevent entry of new weeds to the area such as the cleaning of equipment prior to entering the subject land.

ii. Eradication

Initial weed management will be carried out within the subject land according to best-practice methods. The targeted species will be those listed under Appendices 1 and 2 of the *Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022* (LLS: Greater Sydney 2019). Initial weed treatment will include eliminating woody species and targeting large dominant infestations of exotic herbs. This may be achieved via a combination of manual weed removal and herbicide use.

Weed management measures should avoid adverse impacts to retained vegetation within the subject land, including not over clearing (remove only targeted species), employment of minimal disturbance techniques to avoid soil and surrounding vegetation disturbance.

iii. Containment

Follow-up monitoring and maintenance should be undertaken in the subject land following vegetation clearing activities, to contain any re-emergence of weed species.

8.5.2. Delineation of Clearing Limits

The current limits of clearing will be marked either by high visibility tape on trees or metal/wooden pickets, fencing or an equivalent boundary marker that will be installed prior to clearing. To avoid unnecessary or inadvertent vegetation and habitat removal or impacts on fauna, disturbance must be restricted to the

delineated area and no stockpiling of equipment, machinery, soil or vegetation will occur beyond this boundary.

8.5.3. Tree Protection Measures

As outlined in the Arboricultural Impact Assessment prepared by Bradshaw Consulting Arborists (Bradshaw Consulting Arborists 2022), several tree protection measures are recommended to be implemented to avoid inadvertent impacts to trees that are marked for retention located adjacent to the southern boundary of the subject land. These measures include the implementation of tree protection fencing of retained trees, relevant signage, as well as specific measures for demolition and excavation works within Tree Protection Zones. Further details on tree protection measures are outlined in the Arboricultural Impact Assessment (Bradshaw Consulting Arborists 2022).

8.5.4. Pre-clearance Surveys

In order to minimise impacts to fauna species during the construction of the project, pre-clearance surveys will be conducted in all areas of woody vegetation that are required to be cleared or modified. Pre-clearing surveys will be undertaken within one week of clearing activities by a qualified ecologist.

Although some were not recorded during the current assessment, the pre-clearance survey will seek to identify the following habitat features within the APZ:

- Hollow-bearing trees;
- Hollow-bearing logs; and
- Nests within tree canopy or shrubs.

Such features have the potential to contain native species. All habitat features will be identified, recorded and flagged with fluorescent marking tape and trees will have an "H" spray painted with marking paint on two sides of the tree.

As part of the pre-clearing surveys, all built structures to be demolished will also be inspected to identify any habitat features that have a high potential to support native fauna species, in particular, microbats. The surveys will include visual roost searches for crevices that a microbat may be able to access and roost in, with the aid of a torch where required, and the use of a hand-held ultrasonic bat detector. If any suitable roost sites are identified, additional surveys comprising roost watches and the deployment of ultrasonic bat detectors will be completed over a period of two nights to detect bats using the buildings. Any roost watches and ultrasonic bat detector surveys should be undertaken during spring/summer when microbats are more likely to leave their roost (and subsequently be detected) and not be carried out during periods of heavy rain. All targeted microbat surveys should be carried out by a qualified ecologist with a minimum of three years' experiences in surveying microbats.

8.5.5. Staging of Clearing

The clearing will be conducted using a two-stage clearing process as follows:

Stage 1: Clearing will commence following the identification of potential habitat features by a qualified ecologist. If found, hollow-bearing trees marked during pre-clearing will not be cleared during the first stage; however all vegetation around these trees will be cleared to enable isolation of the feature. Other habitat features, such as hollow-bearing logs (if present at time of clearing), can be removed during Stage 1 done under supervision by a qualified ecologist. Identified hollow-bearing trees will be left at a minimum overnight after Stage 1 clearing to allow resident fauna to voluntarily move from the area.

Stage 2: After hollow-bearing trees have been left overnight, the trees will be cleared using the following protocols:

- Trees marked as containing hollows will be shaken by machinery prior to clearing to encourage any animals remaining to leave the hollows and move on;
- Use a bulldozer or excavator to start pushing the tree over. Move the bulldozer over the roots and continue gently pushing the tree over;
- Remove branches with hollows and sections of trunk and set aside for immediate transfer to a storage area for placement within retained vegetation; and
- All hollows will be investigated by an ecologist for the presence of fauna following felling of the tree.

The felled habitat tree will be left overnight to allow any remaining fauna time to leave the hollows and move on.

The two-stage clearing process enables fauna a chance to self-relocate upon nightfall, when foraging typically occurs.

The demolition of built structures will be guided by the results of the pre-clearing surveys. Where suitable bat roost sites and evidence of bat usage is recorded, the relevant built structures should be demolished under supervision of an ecologist. Staging of the built structures may also be required to provide opportunity for any roosting bats to self-relocate. Depending on the location of potential suitable roosting sites, the method for demolition of the existing buildings may involve an initial removal of the roof structures, with the buildings left overnight without roofing. Demolition of the remaining portion of the buildings would then occur on the following day. The specific details of the recommended demolition process will be included in the pre-clearance letter, as required.

Provisions will be made to protect any native fauna during clearing activities by the following means:

- All staff working on the vegetation clearing will be briefed about the possible fauna present and should avoid injuring any present;
- Animals disturbed or dislodged during the clearance but not injured will be assisted to move to adjacent bushland or other specified locations; and
- If animals are injured during the vegetation clearance, appropriate steps will be taken to humanely treat the animal (either taken to the nearest veterinary clinic for treatment, or if the animal is unlikely to survive, it will be humanely euthanised).

Provision of a report following the completion of clearing works will be provided detailing the total number and species of individuals recorded and details of their release/health.

8.5.6. Sedimentation Control Measures

The project may result in erosion and transport of sediments as a result of soil disturbance during construction. In order to prevent this impact, construction activities will be undertaken in accordance with "The Blue Book" (Landcom 2004). These include implementation of the following measures:

- Installation of sediment control fences;
- Covering soil stockpiles; and
- Avoiding soil disturbance prior to heavy rainfall.

8.5.7. Landscaping and Replacement Plantings

Landscaping works will be undertaken within the subject land in accordance with the Landscape Architecture Report prepared by Habit8 (Habit8 2022). The landscaping for the subject land involves consideration of increased future canopy coverage, and includes provisions for replacement plantings of substantial areas dominated by species associated with the TEC Cumberland Plain Woodland. The area identified for the replacement planting will ensure that the canopy coverage within the subject land will increase as a result of the project in the longer term. Replacement tree plantings are proposed to be established with advanced specimens ranging from 2 to 2.5 m in height, supplied in 100L pots. These plantings will restore a degree of foraging habitat to within the subject land within a relatively short timeframe following clearing of native vegetation and subsequent establishment of landscape plantings. The landscape plan additionally lists a number of maintenance measures to ensure optimal viability of landscape plantings in the long-term including mulching, watering, rubbish removal, pest and disease control and replacement of any missing unhealthy or dead plants throughout the life of the development (Habit8 2022).

Future landscape plantings will contain 31 trees that are listed as being characteristic or associated with the Cumberland Plain Woodland TEC as follows:

- 12 *Corymbia maculata* (Spotted Gum);
- 9 *Eucalyptus tereticornis* (Forest Red Gum); and
- 10 *Eucalyptus moluccana* (Grey-Box).

Further details of the landscaping and replacement plantings are provided in the Landscape Plan prepared by Habit8 (Habit8 2022).

8.5.7.1. Nickel Contamination within the subject land

A site contamination assessment was undertaken within the subject land as part of the project. This assessment has identified concentrations of nickel above the adopted ecological investigation criteria for commercial/industrial land use (WSP 2022). Nonetheless, the contamination consultant has concluded that the

present nickel concentrations are not considered to present a risk to current vegetation and proposed landscape plantings within the subject land (WSP 2022).

The area of nickel contamination is located within the centre of the subject land under the current buildings and within the footprint of proposed buildings. The nickel contamination occurs down to a depth of approximately 1m (WSP 2022). Whilst there have been no nickel testing locations within the proposed landscaping areas, testing locations closer to the proposed landscaping areas have returned results below the adopted assessment criteria (WSP 2022). The proposed landscape plantings, including the Cumberland Plain Woodland Characteristic trees are located along the outer boundary of the subject land and do not occur within areas of identified nickel contamination. Additionally, the nickel contaminated soil is proposed to be removed via earthwork during the construction phase of the project.

Subsequently, the identified nickel contamination is considered unlikely to result in negative impacts to the proposed landscape plantings within the subject site, including the Cumberland Plain Woodland characteristic trees. Nevertheless, it is recommended that further testing be undertaken throughout the proposed landscaping areas as part of future proposed staged contamination testing following demolition (WSP 2022). At the time of planting, soil within the landscaping area must have nickel concentrations below the adopted ecological investigation criteria. If nickel concentrations exceed the adopted ecological investigation criteria, appropriate ameliorative measures must be implemented under the guidance of a qualified contamination consultant. Additionally, the project landscape plan recommends monitoring of landscape plantings with replacement of any missing unhealthy or dead plants throughout the life of the development which must be undertaken with consideration of the results of future nickel testing undertaken following demolition (Habit8 2022).

Table 16 Summary of mitigation measures

Mitigation Measure	Impact Addressed	Proposed Techniques	Timing	Frequency	Responsibility	Risk of Failure	Consequences of Residual Impacts
Weed management	Direct, indirect	Appropriate weed control activities will be undertaken in accordance with the *Greater Sydney Regional Strategic Weed Management Plan 2017 – 2022* (LLS: Greater Sydney 2019).	Construction	Prior to construction, following vegetation clearing	Contractor	Moderate	Further Spread of weeds throughout the surrounding land.
Delineation of clearing limits	Indirect, prescribed	Clearing limits marked either by high visibility tape on trees of metal/wooden pickets, fencing or an equivalent boundary marker. Disturbance, including stockpiling, restricted to clearing limits.	Construction	Once	Contractor	High	Unnecessary damage to retained trees in adjoining vegetation.
Tree Protection Measures	Indirect, prescribed	Implementation of tree protection measures in accordance with Arboricultural Impact Assessment.	Construction	Prior to construction and vegetation clearing	Contractor	High	Unnecessary damage to retained trees adjacent to the subject land.
Pre-clearance survey	Direct, prescribed	Pre-clearance surveys will be conducted in all areas of vegetation that are required to be cleared. Pre-clearing surveys will be undertaken within one week of clearing.	Construction	Once	Contractor	Moderate	Increased and unnecessary mortality of native fauna.

Mitigation Measure	Impact Addressed	Proposed Techniques	Timing	Frequency	Responsibility	Risk of Failure	Consequences of Residual Impacts
		Habitat features will be marked during the pre-clearing survey.					
Staging of clearing	Direct, prescribed	Vegetation clearing will be conducted using a two-stage clearing process. Animals disturbed or dislodged during the clearance but not injured will be assisted to move to adjacent bushland or other specified locations If animals are injured during the vegetation clearance, appropriate steps will be taken to humanely treat the animal (either taken to the nearest veterinary clinic for treatment, or if the animal is unlikely to survive, it will be humanely euthanized)	Construction	Once	Contractor	High	Increased and unnecessary mortality of native fauna.
Sedimentation control	Indirect, prescribed	Construction activities will be undertaken in accordance with "The Blue Book" (Landcom 2004). These include implementation of the following measures: Installation of sediment control fences;	Construction	Throughout construction period	Contractor	Moderate	Sedimentation into adjoining vegetation.

Mitigation Measure	Impact Addressed	Proposed Techniques	Timing	Frequency	Responsibility	Risk of Failure	Consequences of Residual Impacts
		Covering soil stockpiles; and Avoiding soil disturbance prior to heavy rainfall					
Landscaping maintenance and Replacement Plantings	Direct, prescribed	Landscaping and replacement plantings will be undertaken within the subject land using species associated with the TEC Cumberland Plain Woodland.	Operation	Post construction and for the life of the development	Contractor	Moderate	Short to medium term loss of canopy cover and connectivity
Nickel Testing and potential ameliorative measures	N/A	Removal of nickel contaminated soil during the construction phase of the project and future nickel testing within the proposed landscaping area.	Construction	Nickel testing throughout the construction period and prior to landscape plantings.	Contractor	Moderate	Reduced landscape planting viability.

8.6. Mitigation of Prescribed Impacts

The following mitigation measures, described in ***Section 8.5***, are relevant to the prescribed impacts relevant to the project:

- Delineation of clearing limits;
- Tree protection measures;
- Pre-clearance survey;
- Staging of clearing; and
- Landscaping and replacement plantings.

No additional mitigation measures are proposed for prescribed impacts as none are deemed necessary.

8.7. Adaptive Management for Uncertain Impacts

The project is considered unlikely to result in any uncertain impacts that require adaptive management.

8.8. Use of Biodiversity Credits to Mitigate or Offset Indirect or Prescribed Impacts

Due to the small scale of indirect and prescribed impacts, the project does not propose to use biodiversity credits to mitigate or offset these type of impacts.

9. Thresholds of Assessment

9.1. Introduction

The assessment thresholds that must be considered include the following:

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

The following sections outline these assessment thresholds and their relevance to the project.

9.2. Impacts on Serious and Irreversible Impact Entities

One candidate SAII entity have been considered as relevant to the project, being Cumberland Plain Woodland. Further consideration of this entity is provided below.

9.2.1. Cumberland Plain Woodland

Cumberland Plain Woodland is confirmed as occurring within the subject land and will be impacted by the project. Approximately 0.12 ha of Cumberland Plain Woodland has been assessed as proposed to be removed within the subject land for the purpose of this assessment. The area that has been assessed for removal comprises native canopy trees with a highly degraded understorey. The location of the Cumberland Plain Woodland within the subject land is shown in **Figure 11**.

Section 9.1.1 of the BAM requires the provision of additional information regarding SAII entities that are TECs. The additional information is required to assist the consent authority to evaluate the nature of an impact on a potential entity at risk of a serious and irreversible impact. The additional information requirements are provided in **Table 17**.

Table 17 Additional impact assessment provisions for Cumberland Plain Woodland

Criteria	Additional Impact Assessment Provisions	Response
1	The assessor is required to provide further information in the BDAR or BCAR regarding the impacts on each TEC at risk of an SAII. This must include the action and measures taken to avoid the direct and indirect impact on the TEC at risk of an SAII. Where these have been addressed elsewhere the assessor can refer to the relevant sections of the BDAR and BCAR.	The suitability of avoidance of impacts to Cumberland Plain Woodland is addressed in **Chapter 7**.
2	The assessor must consult the TBDC and/or other sources to report on the current status of the TEC including:	-
(a)	Evidence of reduction in geographic distribution (Principle 1, clause 6.7(2)(a) BC Regulation) as the current total geographic extent of the TEC in NSW and the estimated reduction in geographic extent of the TEC since 1970 (not including impacts of the proposal)	The current total geographic extent of Cumberland Plain Woodland varies depending on the source interrogated. The current extent of Cumberland Plain Woodland in the TBDC is described as only less than 9% of the original extent remaining and does not include a conclusive total area for the community. BioNet Vegetation Classification Database estimates the current area of occupancy of the community based on the two PCTs (849 and 850) conforming to Cumberland Plain Woodland with available data as approximately 11,200 ha of the original 'Pre-European Extent' published on the database of 71,200 ha. It is noted however, that BioNet Vegetation Classification Database documents two further PCTs as potentially conforming to the BC Act listing of Cumberland Plain Woodland. These PCTs however, do not contain published total areas for the communities. Therefore, the BioNet total current and Pre-European Extent areas of the community cannot be accurately estimated.

Criteria	Additional Impact Assessment Provisions	Response
		Cumberland Plain Woodland is also associated with a targeted recovery plan for the Cumberland Plain that was prepared by the Department of Environment, Climate Change and Water in 2011 (DECCW 2011). This document is the currently accepted standard for the retention and recovery of TECs in the Cumberland Plain. Table 2 of the recovery plan displays an estimated current total of Cumberland Plain Woodland of 24,530 ha, however, it is reported that a small portion of this total does not meet the listing criteria for the TEC. The same table also estimates the 'Pre-1750 (ha)' total of the community at 125,449 ha being a reduction in area to current levels of approximately 20%. Of the current total area, the recovery plan reports approximately 967 ha identified as occurring within reserves. The Final Determination for Cumberland Plain Woodland (NSW Scientific Committee 2009) identifies that the TEC is restricted in geographic distribution to the Sydney Basin Bioregion and was estimated to have an extant area of approximately 11,054 ha (±1,564 ha) according to mapping by Tozer (2003), which covered the Cumberland Plain. This is reported by the final determination as being a reduction from the 'Pre-European distribution' by 8.8% (±1.2%) suggesting the Pre-European distribution of the community to cover approximately 125,613 ha. According to the Map of Critically Endangered Ecological Communities NSW Version 6 dated 25/02/2020 (DPIE 2020) the current extent of Cumberland Plain Woodland in NSW is approximately 23,020.75 ha. This mapping is the most recent and comprehensive published mapping available and could be considered to be most accurate of the sources reviewed.

Criteria	Additional Impact Assessment Provisions	Response
		Following a review of the above information for the extent of Cumberland Plain Woodland, both current and prior to European settlement, it is clear there is some variation in area calculations. It is noted however, that it is unanimously accepted by all sources that the community has suffered extensive clearing to a level that the community requires significant external intervention to maintain and recover the community within the Sydney Basin Bioregion. The estimated reduction in the geographic extent of Cumberland Plain Woodland since 1970 is not available in the TBDC, BioNet Vegetation Classification Database, the final determination or the recovery plan, and was not identified from a search of available literature. Nonetheless, the pre-European extent of Cumberland Plain Woodland is listed as approximately 125,449 ha within the Cumberland Plain Recovery Plan (DECCW 2011). No published data was found in the literature on the 1970 extent of Cumberland Plain Woodland and an accurate estimate of the reduction in distribution between the current extent and the 1970 geographic extent cannot be provided.
(b)	The extent of reduction in ecological function for the TEC using evidence that describes the degree of environmental degradation or disruption to biotic processes (Principle 2, clause 6.7(2)(b) BC Regulation) indicated by: i. Change in community structure ii. Change in species composition iii. Disruption of ecological processes iv. Invasion and establishment of exotic species v. Degradation of habitat; and	According to the final determination for Cumberland Plain Woodland (NSW Scientific Committee 2011), there has been a very large reduction in the ecological function of the community through processes such as: • Extensive removal of large old trees; • Tree-felling for crops and pastures; • Fragmentation of habitat; • Grazing by livestock and rabbits; • Modification of understory, to be dominated by woody exotic species; • Soil chemical and structural modification associated with agricultural uses;

Criteria	Additional Impact Assessment Provisions	Response
	vi. Fragmentation of habitat	• Changes in frequency of fire regimes; • Prevention of recruitment of species, through continued under-scrubbing and mowing; and • Reduction of understorey complexity, through the reduction of native shrub cover, resulting in degradation of habitat.
(c)	Evidence of restricted geographic distribution (Principle 3, clause 6.7(2)(c) BC Regulation), based on the TEC's geographic range in NSW according to the: **i.** extent of occurrence **ii.** area of occupancy, and **iii.** number of threat defined locations	Paragraph 11 of the Final Determination for Cumberland Plain Woodland (NSW Scientific Committee 2009) identifies that the community is restricted in geographic distribution to the Sydney Basin Bioregion, however it is noted that this is based on an estimated extant area of 2,810 km^2, which was established from outdated mapping undertaken by Tozer (2003). Based on current available information it is estimated that the current area of occupancy is between approximately 11,000 ha and 25,000 ha according to resources reviewed for Criteria 2(a). No threat defined location are specifically identified in the TBDC, however the ecological community is critically endangered across its range. According to the Final Determination (NSW Scientific Committee 2009), small, protected areas of the community exist in reserves such as Kemps Creek, Mulgoa and Windsor Downs, Scheyville National Park, and Leacock, Rouse Hill and Western Sydney Regional Parks.
(d)	Evidence that the TEC is unlikely to respond to management (Principle 4, clause 6.7(2)(d) BC Regulation)	This principle is not identified as applicable to BDARs. It is noted that the TEC does respond to management, with several successful management measures outlined in the Best Practice Guidelines for Cumberland Plain Woodland (DEC (NSW) 2005).
3	Where the TBDC indicates that data is 'unknown' or 'data deficient' for a TEC for a criterion listed in Section 9.1.1(2), the assessor must record this in the BDAR.	Not applicable.

Criteria	Additional Impact Assessment Provisions	Response
4 (a)	The impact on the geographic extent of the TEC (Principles 1 and 3) by estimating the total area of the TEC to be impacted by the proposal: i. in hectares; and ii. as a percentage of the current geographic extent of the TEC in NSW	The proposal will remove approximately 0.12 ha of Cumberland Plain Woodland in the subject land. The extent of the TEC in NSW differs depending on the information source. Based on a review of vegetation mapping layers, the estimated geographic extent in NSW is between approximately 11,000 ha and 25,000 ha according to resources reviewed for Criteria 2(a). However, based on the existing literature, the lowest number quoted for the estimated geographic extent of Cumberland Plain Woodland is 11,054 ha (OEH 2011). Based on the lower of the numbers outlined above, the extent of Cumberland Plain Woodland to be impacted by the project accounts for approximately 0.001% of the current geographic extent of the TEC in NSW.
(b)	The extent that the proposed impacts are likely to contribute to further environmental degradation or the disruption of biotic processes (Principle 2) of the TEC by:	-
	Estimating the size of any remaining, but now isolated, areas of the TEC; including areas of the TEC within 500m of the development footprint or equivalent area for other types of proposals	The project is not likely to result in the isolation of an area of Cumberland Plain Woodland from other areas of the community, as the occurrence of the TEC in the subject land occurs as isolated patches within a mostly cleared site.
	Describing the impacts on connectivity and fragmentation of the remaining areas of the TEC measures by:	-
	Distance between isolated areas of the TEC, presented as the average distance if the remnant is retained AND the average distance if the remnant is removed as proposed, and	There are isolated patches of the TEC to the southwest and east of the subject land as shown in **Figure 10**. The average distance between isolated areas of the TEC if the remnant is retained is approximated 220 m. The average distance between isolated areas of the TEC if the remnant is removed as proposed is approximately 630 m.

Criteria	Additional Impact Assessment Provisions	Response
	Estimated maximum dispersal distance for native flora species characteristic of the TEC, and	The main dispersal mechanisms for flora species associated with Cumberland Plain Woodland include one or a combination of the following: • Animals, • Wind, • Water runoff, and • Gravity. Eucalypts within the community are likely to rely on animal assisted dispersal by highly mobile vertebrate pollinators (birds and bats) which disperse pollen over large areas when foraging (Southerton S.G. 2003). The maximum dispersal distance for native flora species characteristic of the community is estimated to be at least 100 m and potentially much further.
	Other information relevant to describing the impact on connectivity and fragmentation, such as the area to perimeter ratio for remaining areas of the TEC as a result of the development	The TEC proposed to be removed within the subject land is comprised of two small, isolated patches and a number of scattered trees. There are relatively larger patches to the southwest and east of the subject land with a small degree of connectivity provided by thin rows of street trees which may comprise species associated with the TEC as shown in **Figure 10**. However, the subject land is surrounded by roads to the north, south and west, reducing the degree of connectivity to surrounding patches of vegetation. Subsequently, the project is not considered to significantly affect the connectivity of the TEC, as the vegetation proposed for removal occurs as two small pockets of vegetation with very minor degree of connectivity to the TEC in the surrounding land.
	Describing the condition of the TEC according to the vegetation integrity score for the relevant vegetation zone (s) (Section 4.3). The assessor must also include the relevant composition,	The Cumberland Plain Woodland in the subject land corresponds to PCT 849/ Zone 1. The vegetation integrity score for the TEC is as follows: Vegetation Integrity Score: 48.6 Composition: 38.4

Criteria	Additional Impact Assessment Provisions	Response
	structure and function condition scores for each vegetation zone.	Structure: 33.9 Function: 80.0
5	The assessor may also provide new information that demonstrates that the principle identifying that the TEC is at risk of an SAII is not accurate.	Not applicable.

9.3. Impacts that Require an Offset

9.3.1. Native Vegetation

In accordance with the BAM, the project requires offsets for the clearing of native vegetation as the following criteria are met:

- A vegetation zone that has a vegetation integrity score ≥15 where the PCT is representative of an Endangered Ecological Community or CEEC.

The PCT and vegetation zone requiring offsets are documented in **Table 18**. These areas are mapped in **Figure 11**.

Table 18 Summary of impact to native vegetation requiring an offset

Vegetation Zone	PCT	Condition Name	Area (ha)	Patch Size Class	Vegetation Integrity Score
1	849 - Cumberland Shale Plains Woodland	Moderate	0.12	>100 ha	48.6

9.3.2. Threatened Species

No species credit species have been identified as requiring an offset.

9.4. Impacts that do not Require an Offset

In accordance with Appendix D of the BAM, impacts on planted native vegetation do not require an offset. The areas of planted native vegetation in the subject land comprise approximately 0.01 ha, as shown in **Figure 11**.

9.5. Impacts that do not Require Further Assessment

All areas identified as 'Cleared' or 'Exotic Vegetation and Grassland' that occur within the subject land do not require further assessment. These areas comprise approximately 1.84 ha, as shown on **Figure 11**.

9.6. Application of the No Net Loss Standard

The BAM sets a standard that will result in no net loss of biodiversity values where the impacts on biodiversity values are avoided, minimised and mitigation, and all residual impacts are offset by retirement of the required number of biodiversity credits.

The ecosystem credit requirement for the project is summarised in **Table 19**, whilst the 'like for like' offsetting options for the ecosystem credits are provided in **Table 20**.

A credit summary report from the BAMC has been included in **Appendix B**.

Table 19 Summary of ecosystem credit liability

PCT #	PCT Name	TEC	Area (ha)	Credits Required
849	Cumberland Shale Plains Woodland	Cumberland Plain Woodland in the Sydney Basin Bioregion	0.12	4

Table 20 Like for like offsetting options for PCT 849

Any PCT with the below TEC	Containing Hollow-bearing Trees?	In the below IBRA Subregions
Cumberland Plain Woodland in the Sydney Basin Bioregion This includes PCT's: 849, 850	No	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.

10. Conclusion

This BDAR has been prepared to assess the impacts of the proposed development on biodiversity values, in accordance with the BAM Streamlined Assessment Module - small area and the Streamlined Assessment Module - planted native vegetation. The project involves the construction of the proposed Materials Recycling Facility at 600 Woodstock Avenue, Rooty Hill.

Native vegetation occurring within the subject land includes a number of small patches of Cumberland Plain Woodland CEEC (approximately 0.12 ha), which occur as canopy trees over a sparse and degraded understorey. The remainder of the subject land comprises scattered small patches of planted native and exotic vegetation and lawns as part of the existing landscaping.

As the project includes the removal of a small area of remnant native vegetation, offsets are required in the form of ecosystem credits. This assessment indicates that the removal of the native vegetation within the subject land requires a total of four (4) PCT 849 ecosystem credits.

No threatened flora or fauna species that are considered as species credit species were recorded within the subject land and none are considered likely to occur. Therefore, no species credits species are required to be offset.

The BAM sets a standard that will result in no net loss of biodiversity values where the impacts on biodiversity values are avoided, minimised and mitigated, and all residual impacts are offset by retirement of the required number of biodiversity credits. Avoidance of impacts to extant native vegetation within the subject land is not feasible for the project and subsequently a suite of mitigation measures will be implemented for the project to minimise impacts on biodiversity including weed management, delineation of clearing limits, pre-clearance surveys, staging of clearing, sedimentation control measures, and landscaping and replacement plantings including 32 trees associated with Cumberland Plain Woodland. The total credit liability for the project comprises four PCT 849 ecosystem credits. The project will satisfy the credit obligation through the offset rules identified in the BC Regulation.

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APPENDIX A :
BAM Plot Data

1	**plot**
849	**pct**
0.12	**area**
101	**patchsize**
Moderate	**conditionclass**
56	**zone**
300830	**easting**
6262043	**northing**
15	**bearing**
2	**compTree**
3	**compShrub**
6	**compGrass**
6	**compForbs**
0	**compFerns**
2	**compOther**
40.4	**strucTree**
3.0	**strucShrub**
0.9	**strucGrass**
0.8	**strucForbs**
0.0	**strucFerns**
0.3	**strucOther**
5	**funLargeTrees**
0	**funHollowtrees**
83.6	**funLitterCover**
0.0	**funLenFallenLogs**
1	**funTreeStem5to9**
1	**funTreeStem10to19**
1	**funTreeStem20to29**
1	**funTreeStem30to49**
1	**funTreeStem50to79**
1	**funTreeRegen**
1.0	**funHighThreatExotic**

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APPENDIX B :
BAMC Credit Report

BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00029870/BAAS17027/21/00029871	600 Woodstock Ave	24/11/2021
Assessor Name	Report Created	BAM Data version *
David Robertson	21/02/2022	50
Assessor Number	BAM Case Status	Date Finalised
BAAS17027	Finalised	18/02/2022
Assessment Revision	Assessment Type	BOS entry trigger
1	Part 4 Developments (Small Area)	Test of significance

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

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

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

Cumberland shale plains woodland												
1	849_Moderate	Cumberland Plain Woodland in the Sydney Basin Bioregion	48.6	48.6	0.12	PCT Cleared - 93%	High Sensitivity to Potential Gain	Critically Endangered Ecological Community	Critically Endangered	2.50	TRUE	4
											Subtotal	**4**
											Total	**4**

Species credits for threatened species

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

FIGURES

Legend

- Subject Land
- Cadastre
- Native Vegetation Cover
- Patch Size

IBRA Region (Inset A)

- Sydney Basin

IBRA Subregion (Inset B)

- Cumberland

NSW (Mitchell) Landscape (Inset C)

- Cumberland Plain

Image Source:
Image © NearMap 2021
Dated: 26/1/2021

Data Source:
NSW Government Spatial Services
SIX Maps 'Clip and Ship'
Blacktown LGA

DECCW (2008). Landscapes (Mitchell) of NSW - Version 3.

DSEWPaC (2012). Interim Biogeographic Regionalisation for Australia (IBRA) - Version 7.

Coordinate System: MGA Zone 56 (GDA 94)

cumberland ecology

0 40 m

I:\...\21132\Figures\RP1\20211202\Figure 1. Site map

Figure 1. Site map

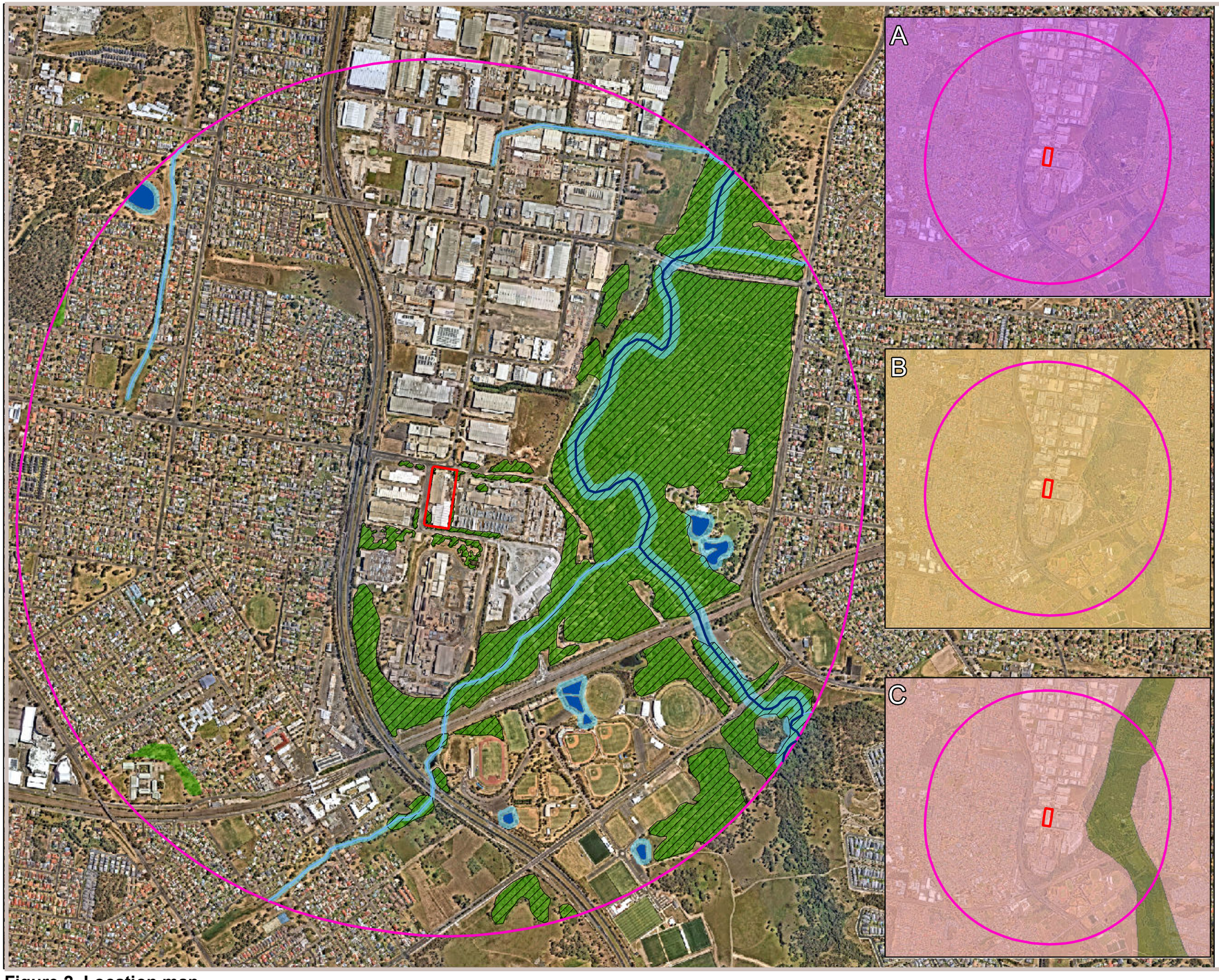


Figure 2. Location map

LANDSCAPE MASTERPLAN

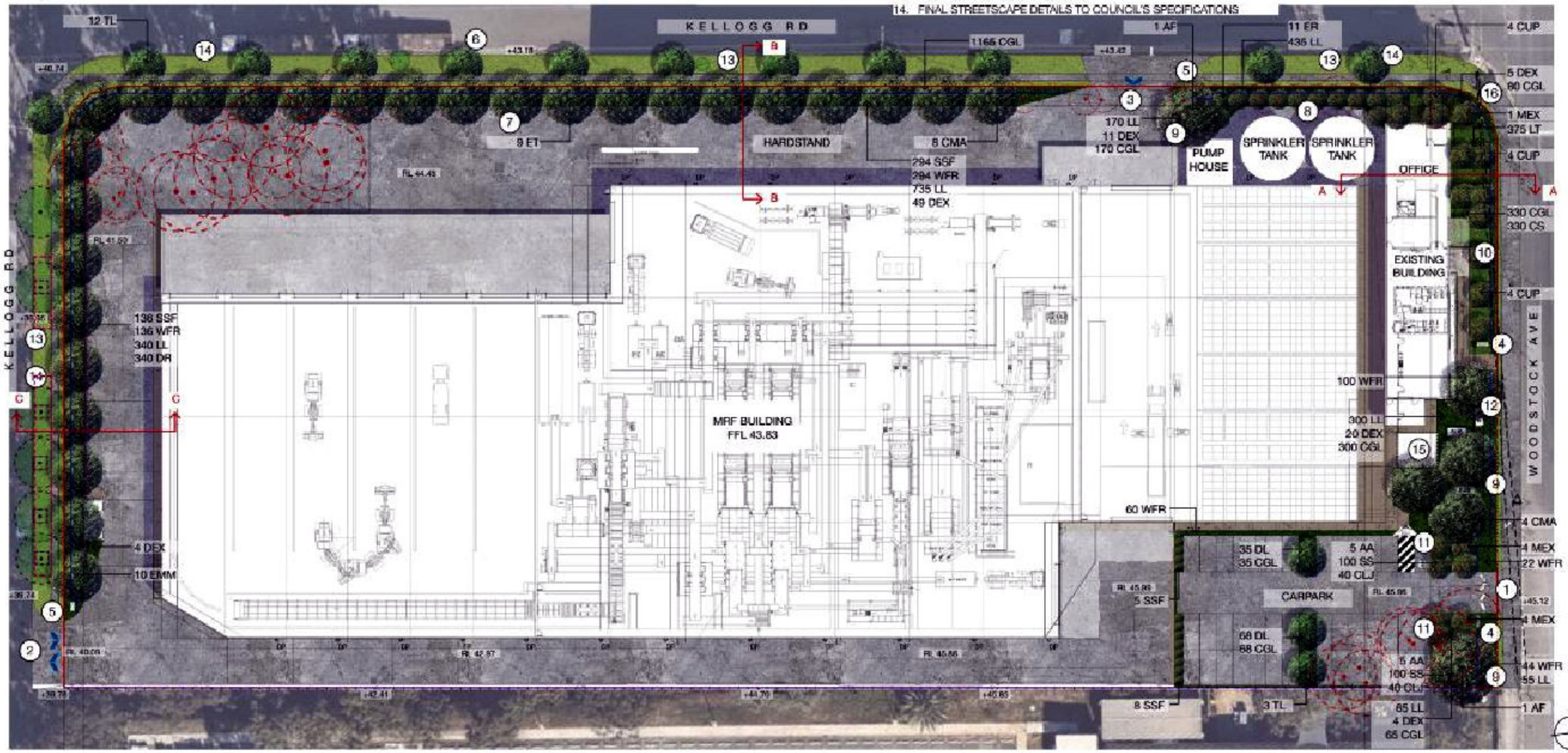
KEY

- SITE BOUNDARY
- SECURITY FENCE TO ARCHITECT'S DETAILS
- GARDEN EDGING
- EXISTING TREES TO BE RETAINED REFER TO ARBORIST'S REPORT
- EXISTING TREES TO BE REMOVED REFER TO ARBORIST'S REPORT
- TREE PROTECTION
- PROPOSED CANOPY TREE PLANTING REFER TO PLANT SCHEDULE
- MASS PLANTING BEDS
- EXISTING TURF TO BE RETAINED
- TREE PROTECTION FENCING
- CONCRETE SURFACE TO ENGINEER'S DETAILS
- PAVED SURFACE TO ARCHITECT'S DETAILS
- RETAINING WALL TO ENGINEER'S DETAILS
- (16) ELECTRICAL EASEMENT

DESIGN NOTES

1. CAR ENTRY / EXIT DRIVEWAY
2. TRUCK ENTRY / EXIT
3. PROPOSED TRUCK ENTRY
4. ENTRY STATEMENT B
5. ENTRY STATEMENT C
6. PROPOSED STREET TREES (E.G TRISTANIOPSIS LAURINA)
7. MEDIUM CANOPY TREES (10m HT)
8. SCREENING TREES
9. LARGE CANOPY TREES (E.g EUCALYPTUS, ANGOPHORA COSTATA)
10. FORMAL MOUND WITH BANDS OF SHRUBS, GRASSES AND GROUNDCOVERS
11. FORMAL BANDS OF PLANTING + MAGNOLIA TREES IN GRID
12. EXISTING SUBSTATION
13. EXISTING TURF TO BE RETAINED
14. FINAL STREETSCAPE DETAILS TO COUNCIL'S SPECIFICATIONS
15. EXISTING SUBSTATION TO BE DEMOLISHED
16. ELECTRICAL EASEMENT (OVERHEAD POWERLINES)

CONTEXT PLAN



PROJECT	DRAWING TITLE	PROJECT NO.	PURPOSE	SCALE	REVISION	DATE	DRAWN	CHECKED	PAGE	CLIENT
PROPOSED INDUSTRIAL FACILITY 600 WOODSTOCK AVE, ROOTY HILL, NSW 2766	ENTRY LANDSCAPE PLAN: SIGNAGE LOCATION	H8-21058	DA SUBMISSION	1:600@A3	D	10.01.2022	KM	DV	L02	Charter Hall

0 5 10 20 30m
SCALE 1:600 AT A3

HABIT8

I:\...\21132\Figures\RP1\20211202\Figure 3. Layout of the project

Figure 3. Layout of the project

Image Source: Habit8 (2022)

Legend

- Subject Land
- BAM Plot Locations
- Random Meander

Plant Community Type

- PCT 849 - Cumberland Shale Plains Woodland
- Planted Native Vegetation
- Exotic Vegetation
- Cleared Land

Image Source:
Image © NearMap 2021
Dated: 26/1/2021

Data Source:
NSW Government Spatial Services
SIX Maps 'Clip and Ship'
Blacktown LGA

Coordinate System: MGA Zone 56 (GDA 94)

cumberland ecology

0 40 m

I:\...\21132\Figures\RP1\20211202\Figure 4. Field survey locations

Figure 4. Field survey locations

Figure 5. Native vegetation extent

Figure 6. Plant community types

Figure 7. Threatened ecological communities

Figure 8. Vegetation zones

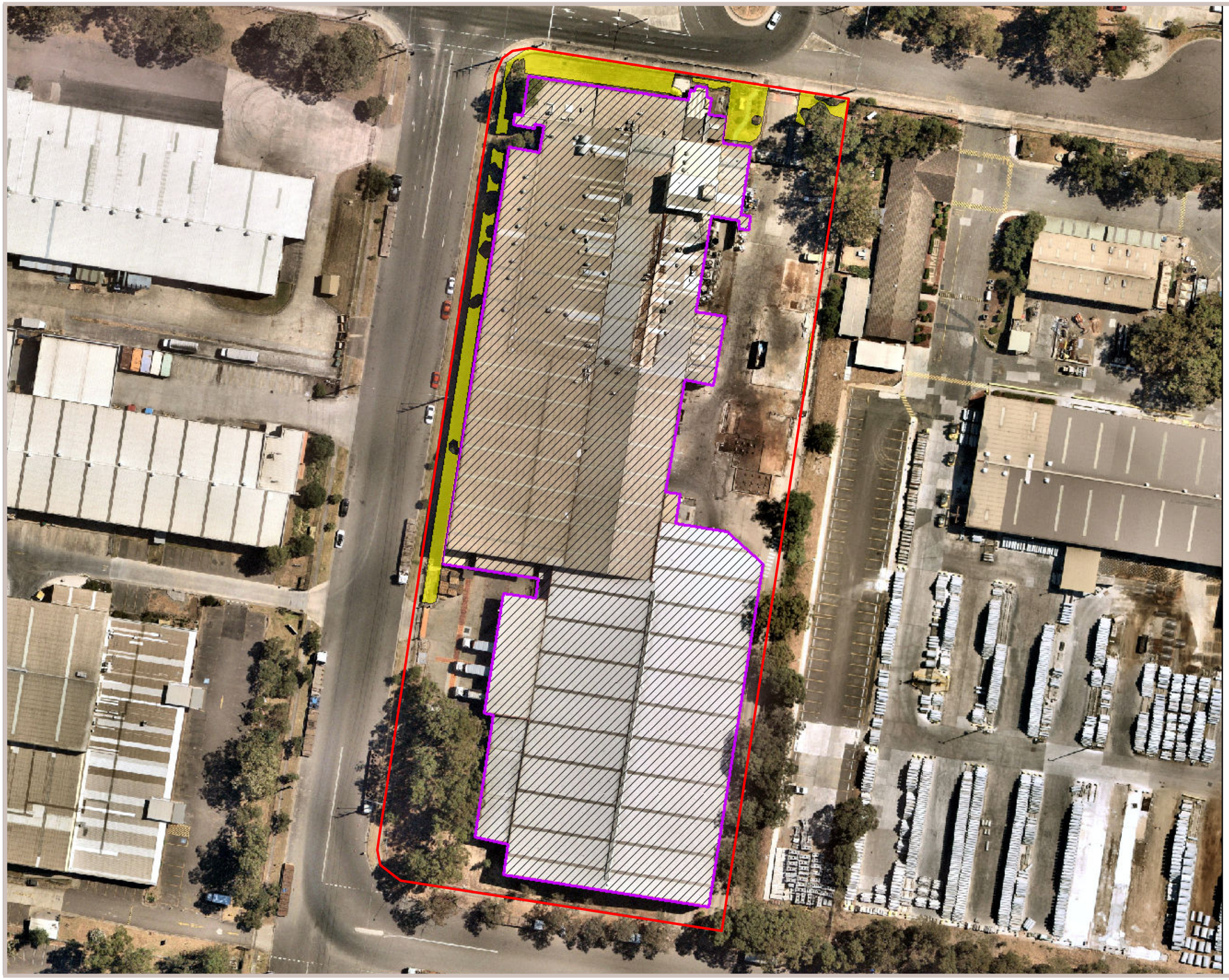


Figure 9. Extent of prescribed impacts

Legend

Subject Land

Serious and Irreversible Impact Entity

Cumberland Plain Woodland in the Sydney Basin Bioregion

Image Source:
Image © NearMap 2021
Dated: 26/1/2021

Data Source:
NSW Government Spatial Services
SIX Maps 'Clip and Ship'
Blacktown LGA

Coordinate System: MGA Zone 56 (GDA 94)

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0 50 100 150 200 m

I:\...\21132\Figures\RP1\20211202\Figure 10. Extent of CPW

Figure 10. Extent of Cumberland Plain Woodland surrounding the subject land

Legend

Subject Land

Impacts that require an offset

PCT 849 - Cumberland Shale Plains Woodland

Impacts that do not require an offset

Planted Native Vegetation

Exotic Vegetation

Human-made Structures

Image Source:
Image © NearMap 2021
Dated: 26/1/2021

Data Source:
NSW Government Spatial Services
SIX Maps 'Clip and Ship'
Blacktown LGA

Coordinate System: MGA Zone 56 (GDA 94)

cumberland ecology

0 40 m

I:\...\21132\Figures\RP1\20211202\Figure 11. Thresholds of assessment

Figure 11. Thresholds of assessment