

15 March 2021

Mr Stephen O'Donoghue
Director, Resource Assessments
NSW Department of Planning, Industry and Environment
Locked Bag 5022
Parramatta NSW 2124

Dear Stephen

RE: Charbon Coal Mine MOD 2 and Clarence Colliery MOD 6 Response to Request for Additional Information No. 2

I refer to the Department's second request for additional information dated 19 February 2021 regarding advice from the Biodiversity Conservation and Science Directorate (BCS).

Our response to the residual issues outlined regarding the biodiversity assessment are addressed in the revised Biodiversity Development Assessment Report (BDAR). A copy of the revised BDAR is attached to this letter.

Table 1-2 in Section 1 of the revised BDAR provides a direct response to the recommendations presented by BCS and outlines how they have been addressed.

We trust this satisfies Request for Additional Information #2. If required I am available to discuss further by phone (02) 4935 8901 or email iain.hornshaw@centennialcoal.com.au.

Yours sincerely



Iain Hornshaw
Approvals Manager

Attachments:

- Charbon Colliery: Road Widening Streamlined Biodiversity Assessment Report: Small Area

CHARBON COLLIERY: ROAD WIDENING

Streamlined Biodiversity Development Assessment Report: Small Area



146693
V2
15 March 2021

REPORT

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
V0	Client review	Hayden Beck and Shelomi Doyle	Mark Aitkens	Mark Aitkens	27/01/2021
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V2	Final (RTS)	Hayden Beck and Shelomi Doyle	Mark Aitkens	Mark Aitkens	14/03/2021

This Biodiversity Development Assessment Report has been certified by the following accredited assessor

Mark Aitkens
BAAS 17034



15 March 2021

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1 INTRODUCTION

1.1 The Project

Charbon Coal Pty Limited is proposing to modify the approved State Significant Development (SSD) 08_0211 under Section 4.55(2) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to import coarse coal reject (CCR) material from Clarence Colliery for backfilling and rehabilitating historical mining areas (hereafter referred to as the 'Project'). If approved, this modification (MOD 2), will authorise:

- Importation of CCR from Clarence Colliery to Charbon by rail. This will involve one fully laden train per day;
- Minimal disturbance to establish a level train unloading area adjacent to the existing rail loop;
- Establish and upgrade haul roads within existing disturbed areas;
- Construction of a link road to facilitate vehicle movements between the proposed hardstand and Charbon's existing haul roads;
- Construction of powerline poles and an additional 11-kV transmission line for Charbon's existing pump shed; and
- Use of CCR for ongoing rehabilitation of Charbon.

The upgrading of the haul road to support the Project construction and operation will require some native vegetation removal where existing approvals make no allowance for such works. In this respect, vegetation located within the approved 'Expanded Reject Emplacement Area' is excluded from this assessment as this vegetation can be lawfully removed under this existing consent.

As the Project is a modification to an SSD, application of the Biodiversity Assessment Methodology (BAM) is mandatory (State of NSW 2020).

1.2 Identification of Subject Land

The Subject Land is at Charbon Road, Charbon NSW 2848 Australia. The Lot/Section/Plan numbers relevant to the Project are:

- Lot 76 DP755765;
- Lot 12 DP1179184;
- Lot 6 DP259893;
- Lot 146 DP755765;
- Lot 11 DP731484;
- Lot 86 DP755765;
- Lot 102 DP879293;
- Lot 5 DP1179184;
- Lot 8 DP1179184;
- Lot 3 DP1179184;
- Lot 1 DP46452;
- Lot 1 DP593624; and
- Lot 160 DP755765.

The Subject Land is within Mid-Western Regional Local Government Area (LGA). The location of the Subject Land and Project are shown in **Figure 1-1**. Lands within the approved Reject Emplacement Area are excluded from the Project Area as the existing approval allows for the clearing of vegetation and habitat for approved SSD 08_0211.

1.3 Sources of information used in assessment

Sources of information used in this assessment include:

- Centennial Coal (2009). *Environmental Assessment Continued Operation of the Charbon Colliery. Project Application No: 08_0211*. Report prepared by R.W. Corkery & Co. Pty. Limited in conjunction with Centennial Coal;
- Proposal layers and concept designs provided by Centennial;
- Department of Agriculture, Water and Environment (DAWE) Australian Government's Species Profiles and Threats (SPRAT) database (<http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>) (DAWE 2021a);
- DAWEs EPBC Act Protected Matters Search Tool (<http://www.environment.gov.au/epbc/protected-matters-search-tool>; DAWE 2021b);
- Department of Planning, Industry and Environment (DPIE) Threatened Species Profiles (<http://www.environment.nsw.gov.au/threatenedspeciesapp/>; DPI 2020a);
- Interim Biogeographical Regionalisation for Australia (IBRA) and IBRA sub-regions (<http://www.environment.gov.au/land/nrs/science/ibra>);
- DPIEs profiles of threatened species, populations and ecological communities;
- DPIEs VIS Mapping (<http://www.environment.nsw.gov.au/research/VISmap.htm>);
- NSW Biodiversity Values Map (<https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BVMap>; Accessed January 2021); and
- State of NSW (2020). Biodiversity Assessment Method.

1.4 Identification of assessment method applied

A streamlined assessment module for small area developments was used since the extent of clearing required for the Project fell below the area clearing threshold shown in Table 12 of BAM 2020 (State of NSW). That is, the minimum lot size for the Subject Land is 40 ha (Zoning AB4 under the Mid-Western Regional Local Environmental Plan 2012). Hence, the extent of clearing of ~0.06 ha is required for the Project falls below the ≤3 ha maximum clearing area limit.

Moreover, in accordance with Appendix C of BAM 2020, the streamlined assessment module for small area developments may be used to assess the biodiversity values of land that is located within an area on the Biodiversity Values Map, except where the biodiversity value included on the Biodiversity Values Map is core koala habitat identified in a plan of management under the State Environmental Planning Policy (Koala Habitat Protection) 2019. However, the Project Area lies outside mapped core Koala Habitat, as per the Biodiversity Offset Scheme (BOS) Entry Threshold Map (**Appendix A**). As such, the streamlined assessment module for small area developments may be applied in this case.

1.5 Staff Qualifications

This report was written by Hayden Beck and Shelomi Doyle. It was reviewed and issued for approval by Mark Aitkens (Accredited BAM Assessor - BAAS17034). Historical flora and fauna surveys were undertaken by Mark Aitkens (2015-2017). Recent surveys were undertaken by Shelomi Doyle, Joe Gibbs, Joe May and Giorginna Xu.

1.6 Definitions

Terms and definitions adopted in this report are listed in **Table 1-1**.

Table 1-1 Terms and definitions

Term	Definition
BAM	Biodiversity Assessment Method
BDAR	Biodiversity Development Assessment Report
BOS	Biodiversity Offset Scheme
Buffer Area	Land within 500 m of Project Area ¹
CAA	Charbon Application Area
CCR	Coarse Coal Reject
LGA	Local Government Area
Local Area	Land within 10km radius of the Project Area
MIA	Mining Infrastructure Area
Project	Modification 2 to Charbon Colliery SSD 08_0211
Project Area	Land to which the Project applies (i.e. where ground disturbance is proposed)
SAII	Serious and Irreversible Impact
Subject Land	Land Parcels where Project is located
SSD	State Significant Development
TECs	Threatened Ecological Communities

1. A 500 m buffer is applied since the Project is linear development.

1.7 Response to Submission

The Biodiversity Conservation Directorate (BCS) provided, in a letter dated 18 February 2021, recommendations including detailed comments on the BDAR (V1) dated 28/01/2021. A response to recommendations requiring an action is provided in this revised version and is summarised in **Table 1-2**.

Table 1-2 BCS Recommendations

BCS Recommendation	Response
1.1 The BDAR should be certified by the assessor within 14 days of the relevant submission date of the EIS. The BAM-C credit case and BAM-C generated credit report should be finalised within 14 days of certifying the BDAR.	Page 2 of the BDAR has been updated to include words that certify the BDAR. This report and the BAM-C Credit case will be submitted within 14 days of each other to comply with regulation.
2.1 Provide additional justification supporting the PCT that has been selected	See Section 3.4
3.1 The BDAR should outline the method used to determine areas that are absent of vegetation or consistent with non-native vegetation and provide relevant evidence to support this determination.	The BDAR is not required to assess parts of the Project Area where existing approvals make allowance for vegetation and habitat removal (i.e. Link Road, as identified in Figure 1-1 , within the REA approved under SSD 08_0211). This area is treated as cleared and, for the purposes of this assessment, does not comprise native vegetation or habitat. The northern part of the Project Area is confirmed to be non-native vegetation. Plot data obtained from that part of the Project Area has been used to show this as non-native vegetation (see Section 3.4).
4.1 Provide further justification that that the targeted survey undertaken for <i>Grevillea divaricata</i> and <i>Grevillea obtusiflora</i> was adequate to determine the absence of these species from the subject site.	Survey in the prescribed period for these two species has not been performed. Such survey requirements have the purpose of enabling an investigator to distinguish between closely related species. A seasonal survey is not warranted as no unidentified woody perennial shrub species belonging to the Proteaceae family occur within the Project Area, which may otherwise be assigned to either of these species. These two species are absent from the Project Area. See Section 4.3.2 for further details.

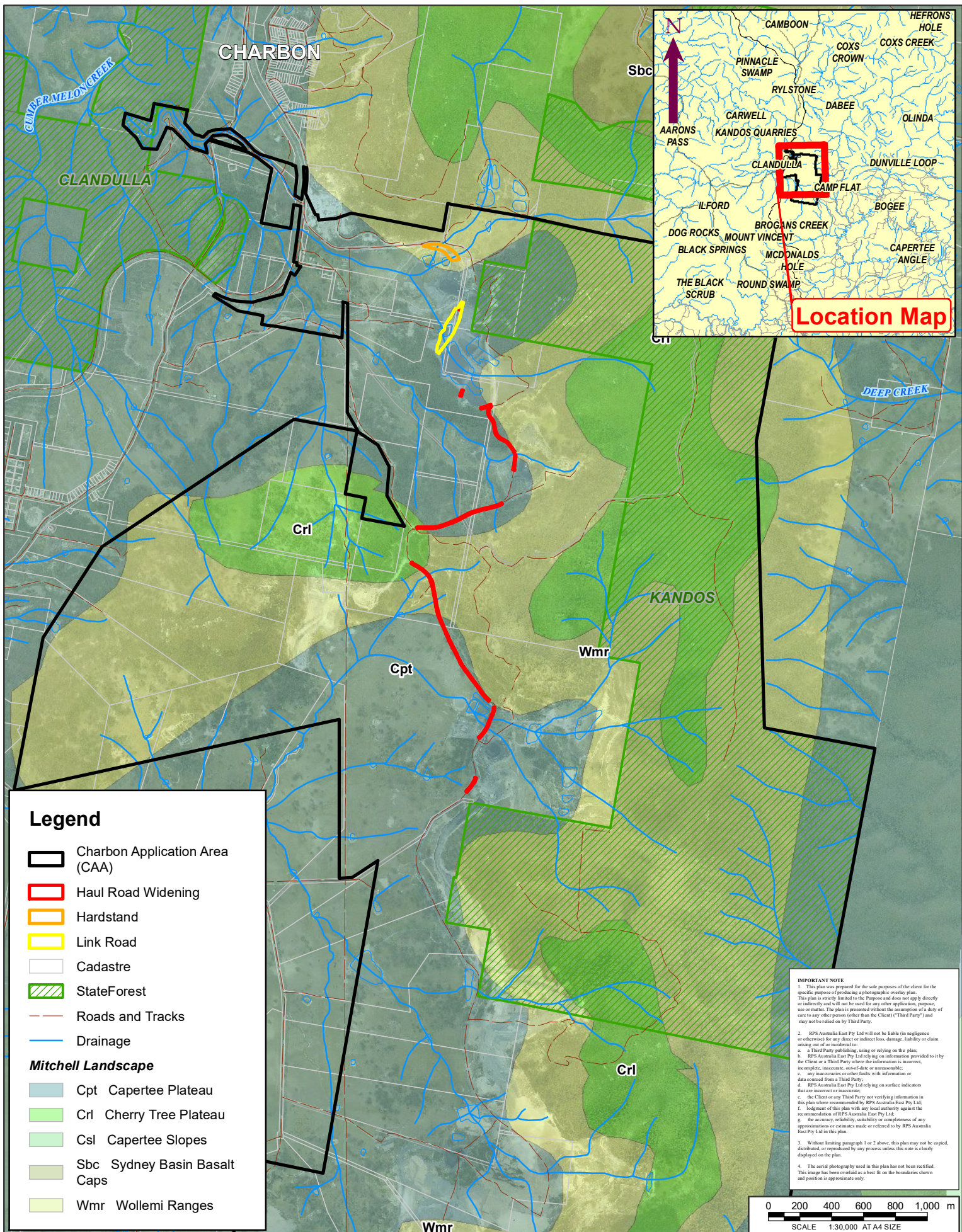


FIGURE 1-1: LOCATION OF SUBJECT LAND AND PROJECT

LOCATION: CHARBON

DATUM: GDA2020

JOB NO.: PR 146693

PROJECTION: GDA2020 MGA Zone 55

PURPOSE: BDAR

Data Sources:
RPS_Client
mga56_Charbon_2015

Technician: Natalie Wood

Date: 25/01/2021

CLIENT: CENTENNIAL

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2 LANDSCAPE CONTEXT

2.1 IBRA Bioregions and subregions

The Project Area is located just within the South Eastern Highlands Interim Biogeographic Regionalisation for Australia (IBRA) region and Capertee Uplands subregion. However, for the purposes of vegetation mapping, the best fitting plant community type (PCT) allocated was for the immediately adjacent NSW South Western Slopes IBRA region and Capertee Valley Sub Region (i.e. the boundary between the two regions is only ~0.5 km from the Project Area).

2.2 NSW Landscape regions

The Project is to occur primarily on Capertee Plateau Mitchell Landscape (NPWS 2003; **Figure 2-1**). Small sections of the Project occur on Cherry Tree Plateau and Wollemi Ranges Mitchell Landscape (NPWS 2003).

2.3 Area

The Project Area footprint is approximately 4.67 ha. Approximately 0.06 ha of native vegetation will be removed for the Project.

2.4 Native vegetation

Approximately 258.02 ha of vegetation occurs within the 500 m Buffer (~50.25%). Native vegetation within this Buffer Area is shown in **Figure 2-2**.

Vegetation mapping and inspection of recent aerial photography indicates a limited amount of vegetation clearing within the locality, resulting in a large continuous native vegetation patch, which includes immediately adjacent to the Subject Land, Clandulla State Forest (1,400 ha) and Kandos State Forest (1,600 ha) (**Figure 2-1**).

2.5 Cleared Areas

Approximately 49.75% (255.41 of 513.43 ha) of the 500 m Buffer is cleared (**Figure 2-2**). Past clearing of native vegetation has occurred due to:

- Public roads;
- Haul roads;
- Unsealed access tracks;
- Rail lines;
- Open cut and underground mines and associated facilities;
- Clearing by past forestry;
- Livestock farming;
- Rural housing; and
- Transmission line easements.

2.6 Rivers and Streams

First and second order tributaries of Cumber Mellon Creek and Rileys Creek are located within or downslope of the Project Area, which discharge into Cudgegong River. The ephemeral nature of these creeks is reflected in small flows during wet periods and cease to flow during drought periods. A number of small

dams have been constructed along these drainage lines, which has altered flow levels somewhat. Cumber Mellon Creek and Rileys Creek are mapped as Key Fish Habitats by DPI (2007).

2.7 Wetlands

Within the Project Area there are several constructed sediment dams. These are mine-related infrastructure and offer little in the way of vegetation or habitat value.

2.8 Connectivity Features

The Project Area provides a variety of habitat linkages along creeks, gullies and ridgelines. Vegetation mapping and inspection of recent aerial photography indicates vegetation clearing within the locality has fragmented the landscape. Nevertheless, vegetation at the Project Area is connected to a large and continuous native vegetation, including several conservation areas, which include Clandulla State Forest, Kandos State Forest and Capertee National Park. More broadly, the bushland within the Project Area is connected to a vast tract of vegetation to the east, which includes the Wollemi and Yengo National Parks.

2.9 Areas of Geological Significance and Soil Hazard Features

There are several sandstone crevices and cliffs within and adjacent to the Subject Land. Geological features and Soil Landscape Units present within the Project Area are provided in Figure 2-3, **Figure 2-4** and **Table 2-1**.

Table 2-1 Soil Landscape Units

Soil Landscape	Formative Process	Composition	Hazards
Collingwood	Colluvial-alluvial	Red Podzolic Soils	Minor sheet erosion.
Capertee	Colluvial-alluvial	Yellow Podzolic Soils	High erosion hazard when uncovered.
Three Sisters	Predominantly colluvial	Shallow soils	Minor sheet erosion. Landslides on steep slopes.

2.10 Areas of Outstanding Biodiversity Value

No areas of outstanding Biodiversity Value are known to occur within the Project Area.

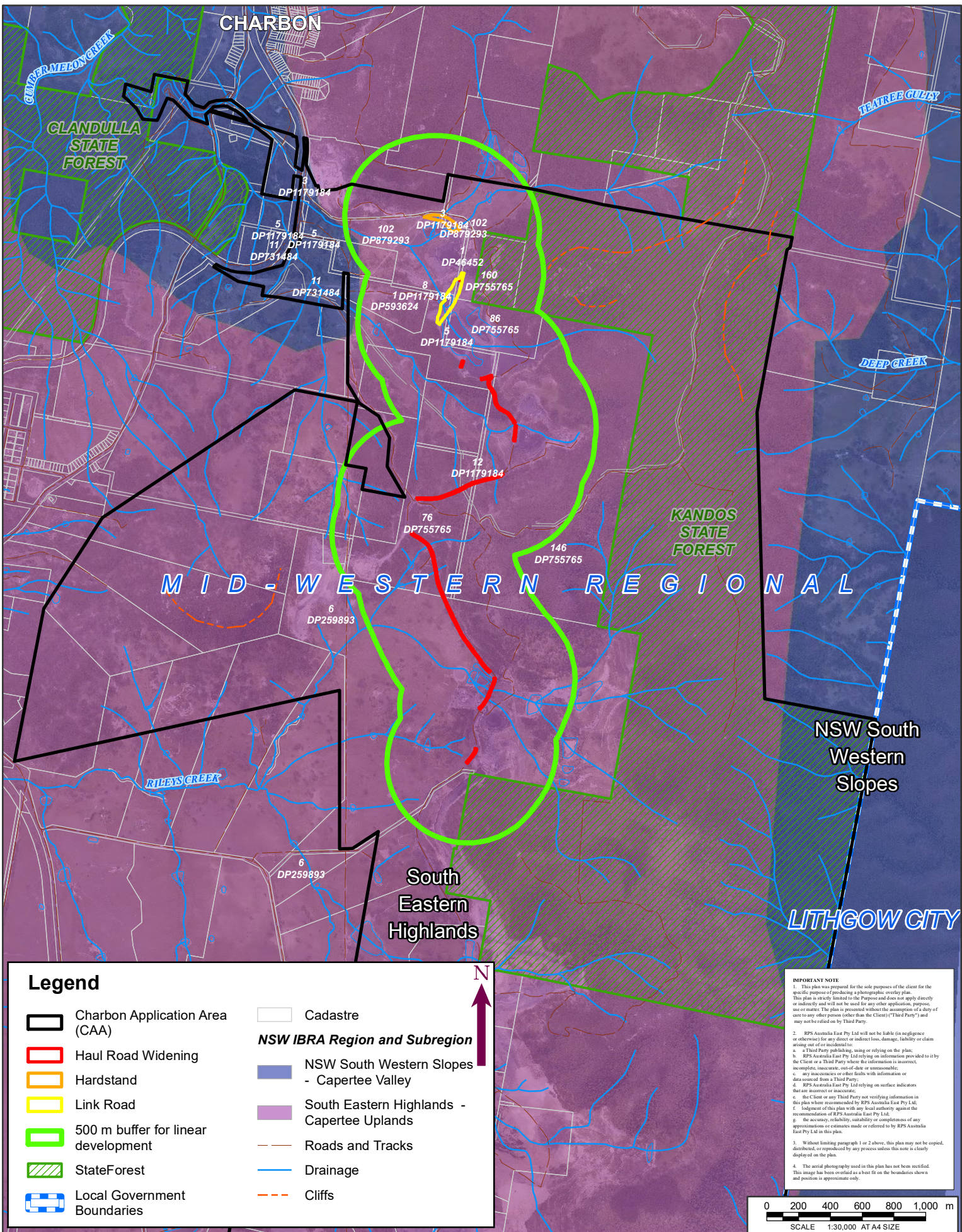


FIGURE 2-1: SITE CONTEXT AND LANDSCAPE FEATURES

LOCATION: CHARBON

DATUM: GDA2020

JOB NO.: PR 146693

PROJECTION: GDA2020 MGA Zone 55

PURPOSE: BDAR

Data Sources:
RPS_Client
mga56_Charbon_2015

Technician: Natalie Wood

Date: 27/01/2021

CLIENT: CENTENNIAL

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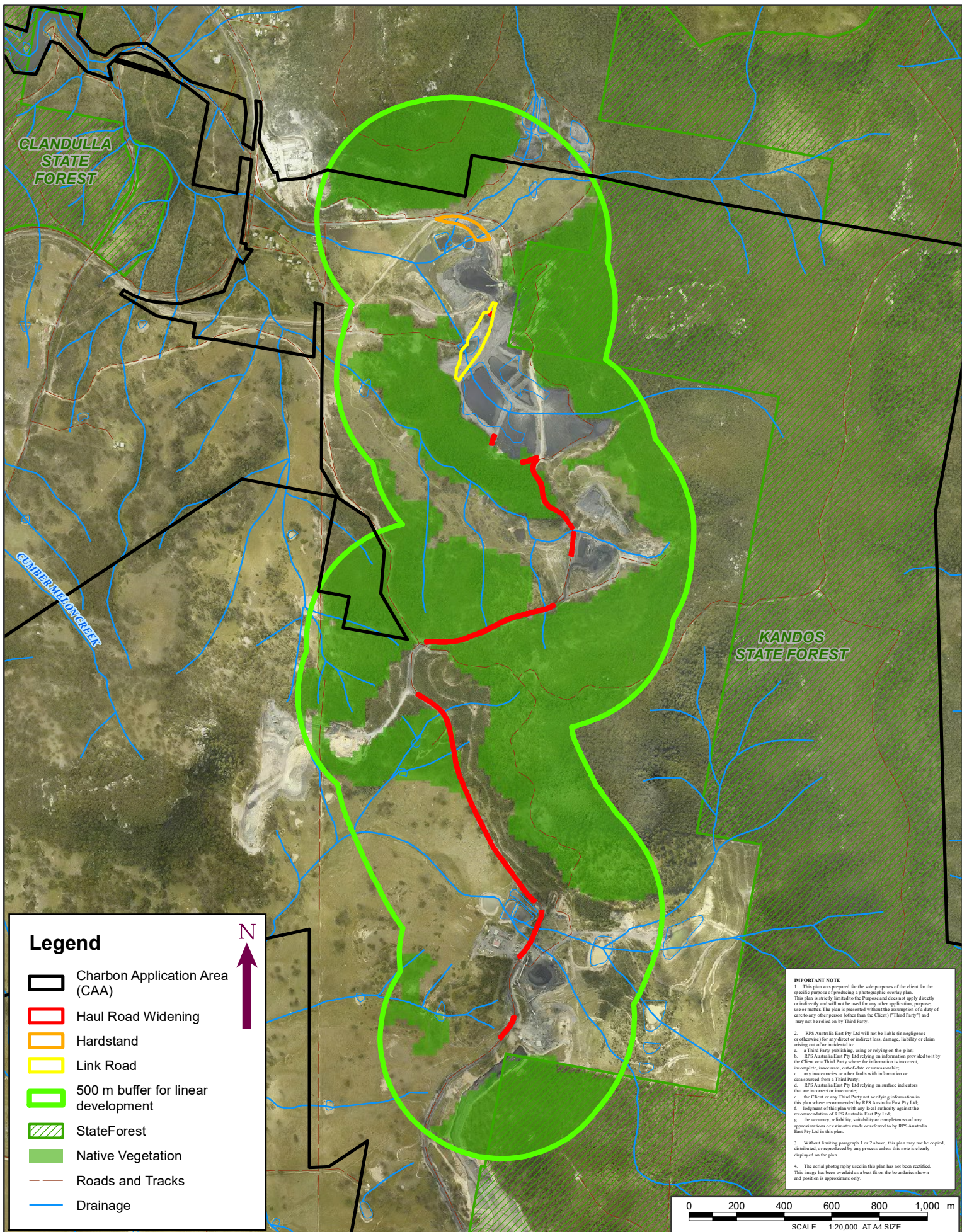


FIGURE 2-2: NATIVE VEGETATION WITHIN BUFFER AREA

LOCATION: CHARBON	DATUM: GDA2020
JOB NO.: PR 146693	PROJECTION: GDA2020 MGA Zone 55
PURPOSE: BDAR	Data Sources: RPS_Client mga56_Charbon_2015
Technician: Natalie Wood	Date: 25/01/2021

CLIENT: CENTENNIAL

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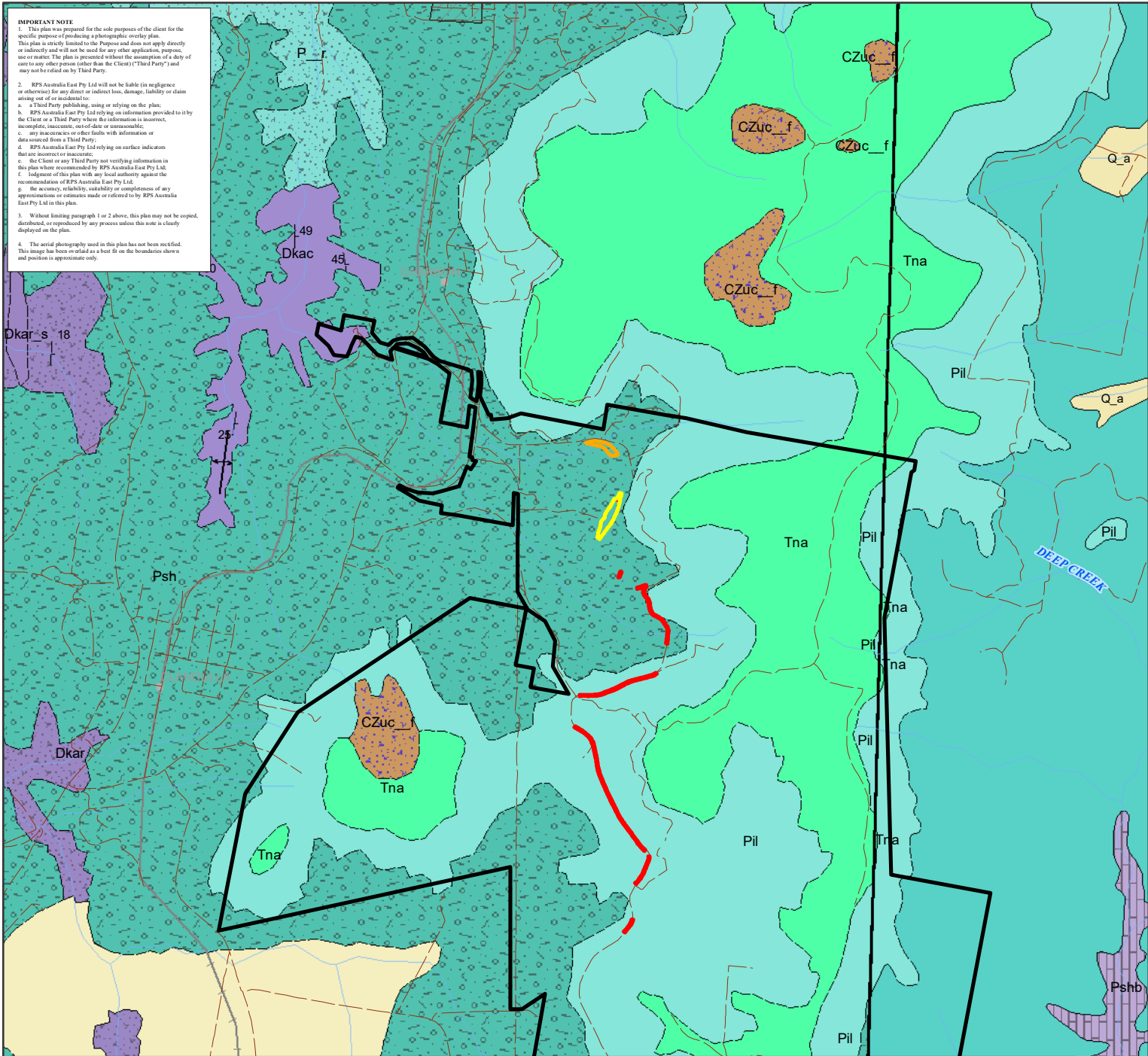
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f. Judgment of this plan with any local authority against the recommendation of RPS Australia East Pty Ltd;

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Legend

- Charbon Application Area (CAA)
- Haul Road Widening
- Hardstand
- Link Road
- BuiltUpAreas
- Railways
- Roads and Tracks
- Watercourse

RockUnits_LachlanOro...

Limestone

RockUnits_LachlanOrogen_Pol...

- Devonian to Devonian, Ungrouped Eastern Lachlan Devonian units - limestone, Dul_
- Early Devonian to Early Devonian, Winding Pinch Formation, D_w
- Pragian to Emsian, Carwell Creek Formation, Dkac

Rock Unit Polygons - CSP - colours

Q_a

Rock Unit Polygons - CIP - pattern fills

- Basalt
- CZuc_f
- P_r
- Pil
- Psh
- Tna

- Strike and dip of bedding
- Anticline, position accurate

Rock Unit Polygons - LAO - pattern fills

- Pyroclastic rock
- Sandstone

Rock Unit Polygons - LAO - colours

- Dkac
- Dkar
- Dkar_s

FIGURE 2-3: AREAS OF GEOLOGICAL SIGNIFICANCE

LOCATION: CHARBON

DATUM: GDA2020

PROJECTION: GDA2020 MGA Zone 55

JOB NO.: PR 146693

Data Sources:
RPS_Client
mga56_Charbon_2015

PURPOSE: BDAR

Technician: Natalie Wood

Date: 25/01/2021

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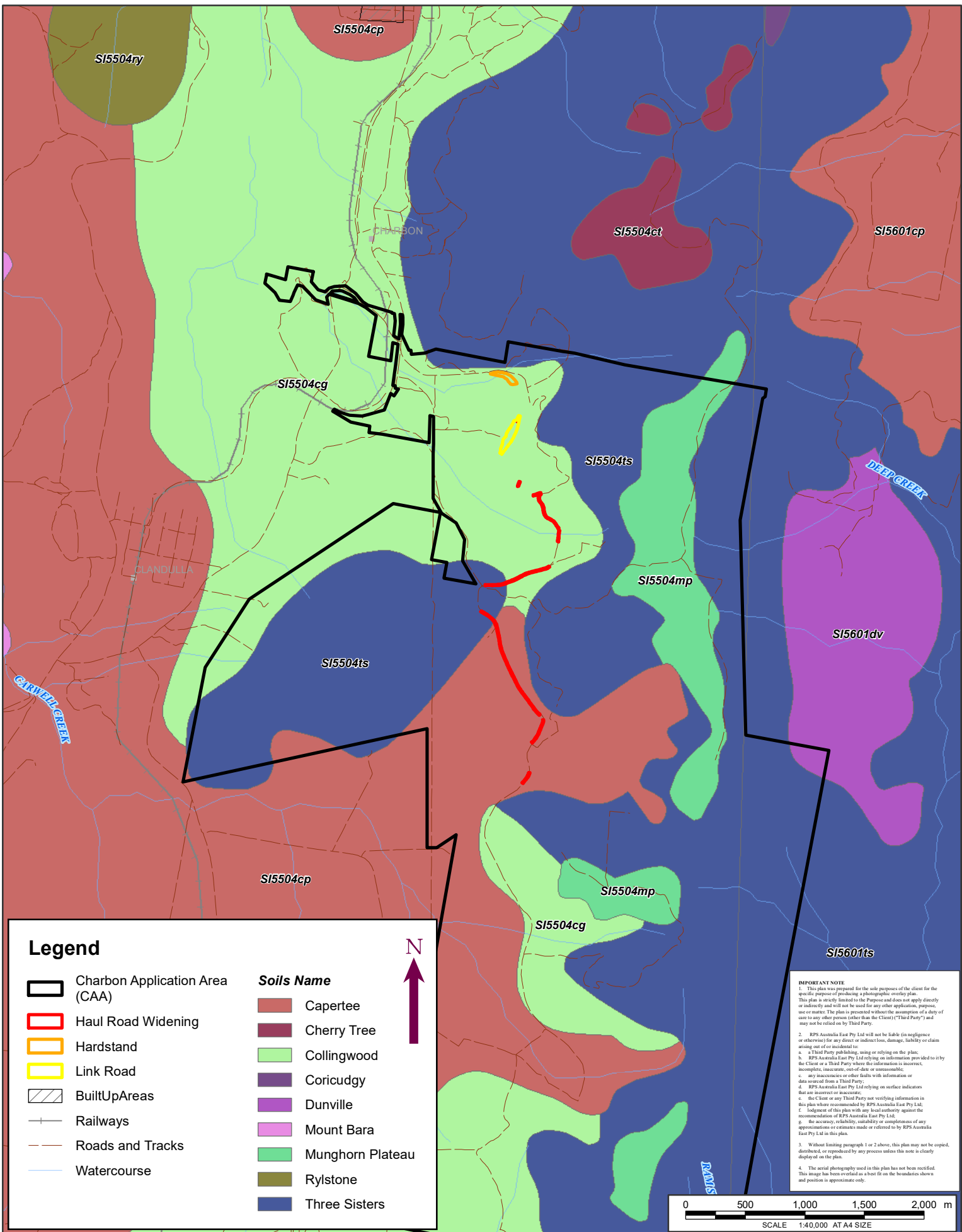


FIGURE 2-4: SOIL LANDSCAPE

LOCATION: CHARBON

DATUM: GDA2020

JOB NO.: PR 146693

PROJECTION: GDA2020 MGA Zone 55

PURPOSE: BDAR

Data Sources:
RPS_Client
mga56_Charbon_2015

Technician: Natalie Wood

Date: 25/01/2021

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3 NATIVE VEGETATION, TECS AND VEGETATION INTEGRITY

3.1 Native Plant Species

A total of 54 flora species were detected during site investigations including 35 native and 19 weed species. For a full list of species see **Appendix B**. None of the species observed within the Project Area where vegetation removal is required comprised any unidentified taxa. None of the species observed belong to the Proteaceae family including taxa associated with the *Grevillea* genus. Broader floristic studies included targeted threatened species surveys of the CAA have not identified any taxa belonging to the *Grevillea* genus (Mark Aitkens *pers obs*).

3.2 High Threat Weeds

Three high threat weeds species were detected in the BAM plot and include:

- *Asparagus aethiopicus*;
- *Hypericum perforatum*; and
- *Senecio jacobaea*.

3.3 Patch size

The native vegetation to be cleared is part of a large continuous patch, which includes immediately adjacent to the Subject Land, Clandulla State Forest (1,400 ha) and Kandos State Forest (1,600 ha). In accordance with the BAM, patch size area was assigned a class, being <5ha, 5–24 ha, 25–100 ha or ≥ 100. This determines the allocation of patch size with ≥100 ha.

3.4 Plant Community Type (PCT)

3.4.1 Method of assessing PCTs

3.4.1.1 Review of Existing Information

Unpublished vegetation mapping produced by Mark Aitkens of RPS in 2017, which extends throughout the CAA, consisting of 37 floristic BBAM plots and 115 rapid data points (RDPs). This was reviewed and supported quantitatively in 2020 by Shelomi Doyle and Joe Gibbs in undertaking RDPs and collecting BAM plot data within the Project Area in accordance with the BAM. A previous survey was also undertaken in the proposed hardstand area on 28/05/2019 by Shelomi Doyle, with one BAM plot and RDPs conducted, confirming that the area contains non-native vegetation.

3.4.1.2 Floristic Survey

One flora plot was carried out on 14/12/2020 in accordance with the BAM to assess the composition, structure and function components of vegetation integrity (**Appendix C**). The location of this BAM plot was situated to achieve maximum coverage of the small amount of vegetation within the site, and best represent the vegetation to be cleared. The following attributes were measured in each plot:

- One standard 20 x 20 m plot, to assess the composition and structure attributes, including trees, shrubs, grasses, forbs, ferns and other growth forms;
- One standard 20 x 50 m plot (1,000 m²) to assess the function attributes: number of large trees (i.e. > 50 cm DBH), stem size class, tree regeneration, length of fallen logs, high threat exotic vegetation cover and hollow-bearing trees; and
- Five 1 m² sub-plots to assess average litter cover for the plots.

3.4.2 PCTs identified within the Project Area

The vegetation within the plot was found to be highly disturbed by previous clearing activities, as indicated by high weed species cover. The remaining upper and mid storey species appear modified by comparison to adjacent vegetation, which may be a function of past land clearing and roadside management activity.

Following field surveys, three potential PCTs were identified for consideration, including the following:

- PCT 1088 – Red Box - Grey Gum - stringybark woodland on talus slopes of the western Blue Mountains, Sydney Basin Bioregion;
- PCT 863 – Grey Gum - Narrow-leaved Stringybark - Inland Scribbly Gum shrubby open forest of the western Capertee Valley, Sydney Basin Bioregion; and
- PCT 703 – Blakely's Red Gum - Yellow Box - Rough-barked Apple grassy woodland of the Capertee Valley, Sydney Basin Bioregion.

A review of existing information included extensive flora data for the surrounding area, and assisted in understanding the dominant species of this community on a broader scale, in areas of similar topography and sandstone soil type. This added consideration of species such as *Eucalyptus sparsifolia*, *Eucalyptus melliodora* and *Eucalyptus polyanthemos*. The Bionet Vegetation Classification tool was consulted in conjunction with the Vegetation of the Western Blue Mountains (DEC 2006).

The vegetation is not consistent with nearby PCT 703 as indicated by the absence of any diagnostic species in the upper stratum, such as *Eucalyptus blakelyi*, *Eucalyptus melliodora* and *Angophora floribunda*. One diagnostic mid storey species was present, namely *Solanum prinophyllum*. Three diagnostic ground species were present, namely *Cheilanthes sieberi*, *Desmodium varians* and *Hydrocotyle laxiflora*. While this community is present within the broader CAA, it generally occurs on finer soil types in depressions and on gently rises.

The vegetation to be cleared is not consistent with PCT 863 as indicated by the presence of only one diagnostic species in the upper stratum, namely *Eucalyptus punctata*, which occurred adjacent to the plot. Other diagnostic species present included *Astroloma humifusum*, *Lomandra glauca* and *Microlaena stipoides* in the ground layer. All other diagnostic species were absent. This community is generally located on moderate to steep slopes and crests, which contrasts with gentle slope of the Project Area.

One PCT was selected which best reflects the vegetation within the Project Area:

- PCT 1088 - Red Box - Grey Gum - stringybark woodland on talus slopes of the western Blue Mountains, Sydney Basin Bioregion.

This PCT was selected due to consistency with dominant species in all stratum, and its position in the landscape on slopes below cliff lines of the Capertee Valley. Survey effort and clearing extents of this PCT are outlined in **Table 3-1**.

Table 3-1 Vegetation Cover within the Project Area

Vegetation Cover Type	Condition	Clearing (ha)	No. BAM plots required	No. BAM plots undertaken
1088 - Red Box - Grey Gum - stringybark woodland on talus slopes of the western Blue Mountains, Sydney Basin Bioregion	Moderate/Poor	~0.06	1	1
Non-native vegetation	Poor	NA	1	1

Further information including a description of this PCT and justification for its selection is shown in **Table 3-2**. **Figure 3-1** shows the extent of native vegetation subject to this assessment.

Table 3-2 Description of PCT 1088 within the Project Area

PCT 1088 – Red Box - Grey Gum - stringybark woodland on talus slopes of the western Blue Mountains, Sydney Basin Bioregion	
Description:	Open forest or woodland with an open understorey of shrubs and ground layer of forbs and grasses. Occurs on talus slopes below the major cliff lines of the Wolgan and Capertee Valleys in the western Blue Mountains.
BAM Plot Number:	1
Diagnostic upper stratum species:	<i>Eucalyptus blaxlandii</i> (<i>Eucalyptus punctata</i> adjacent to plot)
Diagnostic middle stratum species:	<i>Acacia falciformis</i> , <i>Solanum prinophyllum</i> ,
Diagnostic ground stratum species:	<i>Dichondra repens</i> , <i>Plantago debilis</i> , <i>Cheilanthes sieberi</i> , <i>Desmodium varians</i> , <i>Hydrocotyle laxiflora</i> , <i>Lomandra multiflora</i> , <i>Microlaena stipoides</i> , <i>Poa sieberiana</i> ,
Justification:	Dominant species support previous extensive mapping survey effort (i.e. <i>Eucalyptus blaxlandii</i> with <i>Eucalyptus punctata</i> and <i>Acacia falciformis</i>) in the area surrounding. For the purposes of vegetation mapping, the best fitting Plant Community Type allocated was for the immediately adjacent NSW South Western Slopes IBRA region and Capertee Valley Sub Region (i.e. the boundary between the two regions is only ~0.5 km from the Project Area).
Classification:	Not associated with a TEC.
Condition:	Moderate/Poor - Vegetation is impacted by edge effects associated with roads and a constructed sediment dam immediately adjacent. Few remnant eucalypts were present. The mid and ground storey had moderate weed presence.
Estimate of percent cleared value of dominant PCT:	50%



Plate 1 **Area of road to be widened in PCT 1088**

Non-native Vegetation

Description:	Highly disturbed area, previously cleared and devoid of upper storey. High weed cover.
BAM Plot Number:	2 (28/05/2019)
Diagnostic upper stratum species:	N/A
Diagnostic middle stratum species:	N/A
Diagnostic ground stratum species:	N/A – Dominant groundcover consisted of exotic Scabiosa species.
Justification:	Upper storey absent. Mid and ground stratum predominantly exotic.
Classification:	Not associated with a TEC.
Condition:	Poor - Vegetation is impacted by clearing, mining activities and edge effects associated with both a road and a rail line immediately adjacent. No remnant upper storey was present. The mid and ground storey had high weed presence.
Estimate of percent cleared value of dominant PCT:	N/A



Plate 2 Proposed hardstand in Non-native Vegetation

3.5 Vegetation Integrity Score

The Vegetation Integrity Score for PCT 1088 as calculated by the BAM-C (Version 36; last updated 21/12/20) is provided in **Table 3-3**.

Table 3-3 Vegetation Integrity Score

Composition condition score	Structure condition score	Function condition score	Current vegetation integrity score
89.9	30.4	74.2	58.7

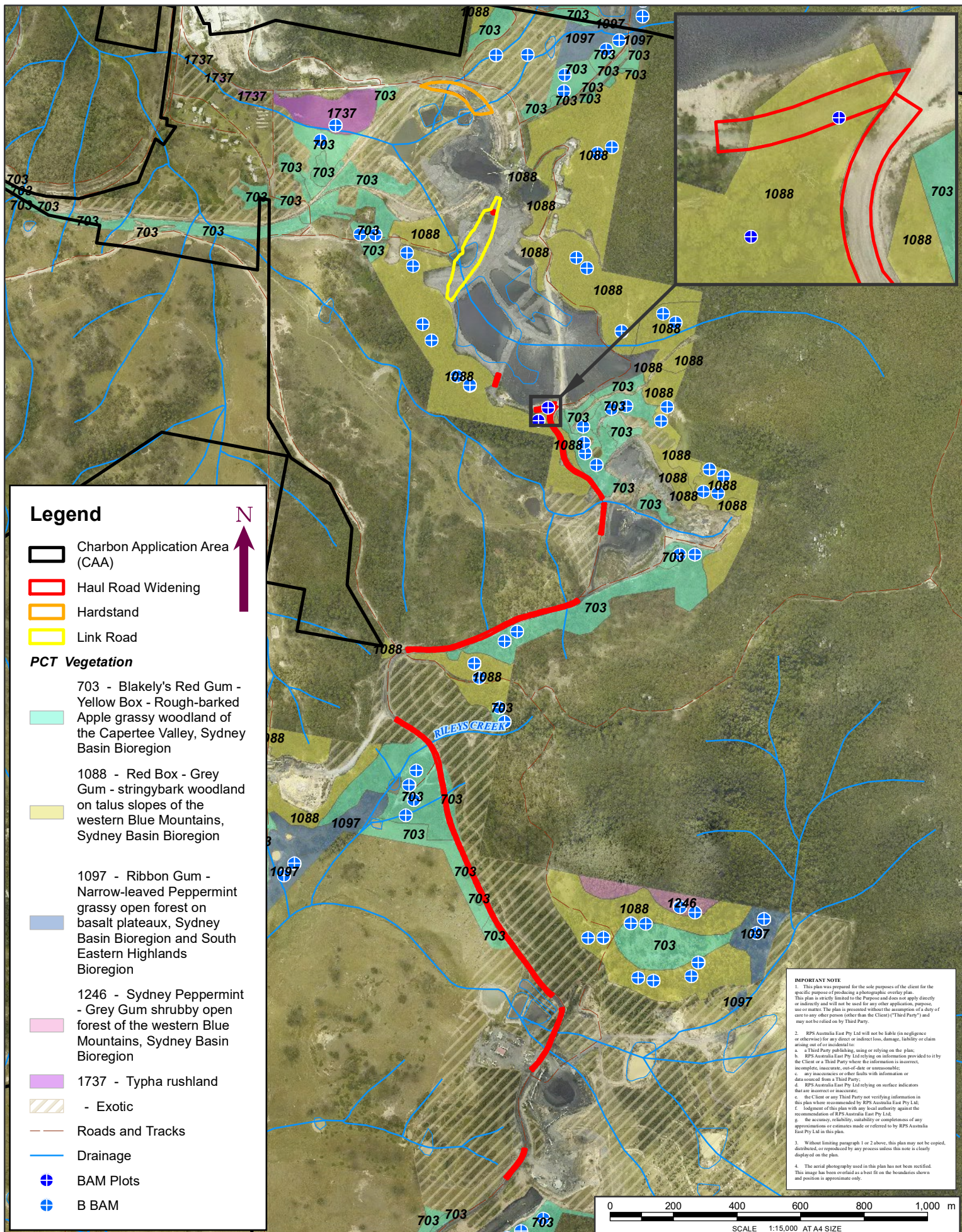


FIGURE 3-1: PLANT COMMUNITY TYPES AND VEGETATION PLOT

LOCATION: CHARBON	DATUM: GDA2020
JOB NO.: PR 146693	PROJECTION: GDA2020 MGA Zone 55
PURPOSE: BDAR	Data Sources: RPS_Client mgs56_Charbon_2015
Technician: Natalie Wood	Date: 27/01/2021

CLIENT: CENTENNIAL

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4 HABITAT SUITABILITY FOR THREATENED SPECIES

4.1 Survey Effort

Site inspections were carried out by RPS Ecologists on 7 to 9 and 25 to 28 August 2015, 7 to 11 October 2015, 1 to 5 February 2016, 19 March 2020 and 14 December 2020. **Table 4-1** and **Appendix D** summarise the survey effort undertaken within the CAA.

Table 4-1 Survey effort

Date	Survey effort
25 to 28 August 2015; 7 to 9 August 2015	BBAM plots and RDPs
7 to 10 October 2015	Bird surveys; Call Playback; Spotlighting; Harp trapping
9 to 11 February 2016	Bird surveys
1 to 5 February 2016	Arboreal Elliot trapping (Elliott A; 18 traps over four nights); Terrestrial Elliot trapping (Elliott B; 10 traps over four nights); Call playback (four nights); Spotlighting (four nights)
19 March 2020	RDPs and vegetation mapping confirmation
14 December 2020	BAM plot and threatened flora survey

4.1.1 Flora

4.1.1.1 Vegetation mapping

Preliminary plant community types (PCTs) were assigned to areas of relatively homogenous land cover (i.e. vegetation zones). Additional revisions were performed following collection of Rapid Data Points (RDPs) and completion of targeted field surveys (i.e. revision of boundaries and condition classes). PCT extent was calculated using Geographic Information System (GIS) to determine the number of BAM plots required. Data collected from RDPs was used to assist vegetation classification and refine the boundaries and distribution of PCTs. Data collected at each RDP include:

- Dominant canopy species;
- Main associated species;
- Landscape position;
- Characteristic mid-storey species;
- Characteristic groundcover species; and
- Other diagnostic features.

4.1.1.2 BAM plots

One BAM plot was undertaken on 14 December 2020 in accordance with Section 4.2 of BAM (State of NSW 2020). The species list from this plot is provided in **Appendix B** and data sheets are provided in **Appendix C** (**Figure 6**). More broadly, 49 BBAM plots were undertaken within the CAA for a previous assessment by RPS (unpublished data) in 2015 (**Figure 6**).

4.1.1.3 Threatened flora survey

Targeted flora searches were conducted with the aim of locating threatened flora species identified as Species Credit Species (BC Act) or those having a moderate or greater likelihood of occurrence within the Project Area. Searches were made within potential habitat occurring within the Project Area, guided by OEH (2020). Plant specimens of unknown or significant status were collected for later identification or lodgement with the National Herbarium in Sydney.

4.1.1.4 Fauna

Fauna survey efforts were undertaken by RPS (2015 to 2016; unpublished data). These survey methods are described below and are shown in **Appendix D**.

4.1.1.4.1 Spotlighting

Spotlighting was undertaken with the use of a 75-Watt hand-held spotlight and head torch whilst walking and driving over the Project Area. Areas of dense bush were targeted; however, tracks were also spotlighted whilst entering and exiting the Project Area.

4.1.1.4.2 Nocturnal Call Playback

Pre-recorded calls of Koala, owls and threatened gliders with the potential to occur within the Project Area were broadcast to elicit vocal responses or to attract these species to the Project Area. The calls were broadcast through an amplification system (loud hailer) designed to project the sound for at least 1 km under still night conditions.

4.1.1.4.3 Anabat census

Microbat echolocation calls were recorded using Anabat Detector units set to remotely record for the entire night (6pm to 6am). Survey locations had emphasis placed on areas deemed likely to provide potential foraging and flyway sites for microbats. Bat call analysis was undertaken by Echo Ecology. Each call sequence ('pass') was assigned to one of three categories, according to the confidence with which identification could be made, being:

- Definite - Pass identified to species level and could not be confused with another species;
- Probable - Pass identified to species level and there is a low chance of confusion with another species; and
- Or Possible - Pass identified to species level but short duration or poor quality of the pass increases the chance of confusion with another species.

4.1.1.4.4 Avifauna Census

Point/area bird census sites were surveyed on each investigation day. Each survey comprised of point-based, 20-minute count of 0.79 ha (50 m radius) circular plots. During the 20 min period, the observer stayed at the point, watching and listening for bird activity in the surrounding 50 m. This allowed the observer to safely keep track of individual birds within the reduced area, recording the numbers of each species and the closest distance that they approached the point during the 20 min period. The data was recorded in four distance categories around each point: 0-10, 10-20, 20-30 and 30-50 m. Birds beyond this search perimeter were also recorded during this time and indicated as "outside". Surveys were conducted within 3 hours of sunrise to improve the consistency of sampling conditions across the Project Area (i.e. period of highest bird activity).

During the bird survey, any cryptic bird species that may have been missed during the point count period were noted. Birds flying through the area were not recorded unless they were regarded as making some use of that vegetation type, for example, foraging in the airspace above.

4.1.1.4.5 Herpetofauna Census

Herpetofauna (frog and reptile) searches were carried out across the Project Area, targeting areas of appropriate habitat. Some suitable reptile habitat was scattered throughout the Project Area, including areas of rock assemblages, logs and leaf litter.

4.1.1.4.6 Harp Trapping

Harp traps were deployed overnight for two consecutive nights to census local microbat populations.

4.2 Ecosystem credit species

Ecosystem credits species are listed in **Table 4-2**.

Table 4-2 Ecosystem credit species

Species (Common name)	BC Act
<i>Artamus cyanopterus cyanopterus</i> Dusky Woodswallow	Vulnerable
<i>Callocephalon fimbriatum</i> Gang-gang Cockatoo (Foraging)	Vulnerable
<i>Climacteris picumnus victoriae</i> Brown Treecreeper (eastern subspecies)	Vulnerable
<i>Daphoenositta chrysoptera</i> Varied Sittella	Vulnerable
<i>Dasyurus maculatus</i> Spotted-tailed Quoll	Vulnerable
<i>Falsistrellus tasmaniensis</i> Eastern False Pipistrelle	Vulnerable
<i>Hieraaetus morphnoides</i> Little Eagle (Foraging)	Vulnerable
<i>Hoplocephalus bungaroides</i> Broad-headed Snake (Foraging)	Endangered
<i>Lathamus discolor</i> Swift Parrot (Foraging)	Endangered
<i>Lophoictinia isura</i> Square-tailed Kite (Foraging)	Vulnerable
<i>Melithreptus gularis gularis</i> Black-chinned Honeyeater (eastern subspecies)	Vulnerable
<i>Miniopterus orianae oceanensis</i> Large Bent-winged Bat (Foraging)	Vulnerable
<i>Neophema pulchella</i> Turquoise Parrot	Vulnerable
<i>Ninox connivens</i> Barking Owl (Foraging)	Vulnerable
<i>Petroica boodang</i> Scarlet Robin	Vulnerable
<i>Petroica phoenicea</i> Flame Robin	Vulnerable
<i>Phascolarctos cinereus</i> Koala (Foraging)	Vulnerable
<i>Pteropus poliocephalus</i> Grey-headed Flying-fox (Foraging)	Vulnerable
<i>Saccolaimus flaviventris</i> Yellow-bellied Sheath-tail-bat	Vulnerable
<i>Varanus rosenbergi</i> Rosenberg's Goanna	Vulnerable

4.2.1 Exclusions

Calyptorhynchus lathamii (Glossy Black-Cockatoo) was excluded since there was no presence of *Allocausuarina* or *Casuarina* species. *Grantiella picta* (Painted Honeyeater) was also removed due to an absence of mistletoes present at a density of greater than five mistletoes per hectare.

4.3 Candidate Species Likely to Occur

The suite of threatened species likely to occur on or use the proposed site according to Steps 1 and 2 in BAM Section 5.2, to be assessed for species credits, are provided in **Table 4-3**. Note that these species were assumed present due to no habitat constraints, whilst survey effort could not rule their presence out.

Table 4-3 Candidate species likely to occur

Species (Common name)	BC Act	Serious and Irreversible Impact (SAIL)
<i>Callocephalon fimbriatum</i> Gang-gang Cockatoo	Vulnerable	No
<i>Chalinolobus dwyeri</i> Large-eared Pied Bat	Vulnerable	No SAIL threshold is potential breeding habitat and presence of breeding individuals. Potential breeding habitat is PCTs associated with the species within 100m of rocky areas containing caves, or overhangs or crevices, cliffs or escarpments, or old mines, tunnels, culverts, derelict concrete buildings. Surveys must be undertaken as per the Threatened Bat Survey Guide to confirm breeding habitat. Species mapping polygon for breeding habitat must use high resolution aerial imagery and topographic maps to identify features on the subject land (caves, scarps, cliffs etc). Polygon must be at least 100m wide (or 50m radius for point locations such as caves) with the breeding habitat features (may be multiple) as the centroid (see Threatened Bat Survey Guide). All breeding habitat on or within 100m of the subject land and the area immediately surrounding the feature must be identified. All habitat on the subject land should also be mapped if present. Use high resolution aerial imagery and topographic maps to identify potential roost habitat features on the subject land within 2km caves, scarps, cliffs etc. Species polygon boundary should align with PCTs on the subject land to which the species is associated that are within 2km of identified potential roost habitat feature

The Candidate Species found within or adjacent to the Project Area were:

- *Callocephalon fimbriatum* (Gang-gang Cockatoo); and
- *Chalinolobus dwyeri* (Large-eared Pied Bat).

A Species polygon for these species is provided in **Figure 4-1**. See **Appendix E** for threatened species detected by RPS 2015 (unpublished data) adjacent to the Project Area.

4.3.1 Potential Serious and Irreversible Impact (SAIL) species

Chalinolobus dwyeri (Large-eared Pied Bat) was the only potential serious and irreversible impact (SAIL) species detected or considered likely to occur in the Project Area. According to Step 3 of Section 5.2 of BAM, a candidate species may be removed from the list if “microhabitats” required by the species are absent. As the nearest sandstone cliffs/ ridgelines, which constitute potential breeding habitat for the species (i.e. caves, overhangs or escarpments; DPIE 2021b), was located ~700m from the Project Area it is considered unlikely that the Project will have an SAIL on *C. dwyeri* (Large-eared Pied Bat). Nevertheless, as the Project Area is located within 2km of this potential breeding habitat, hence a Species credit liability still applies.

4.3.2 Candidate Species Excluded

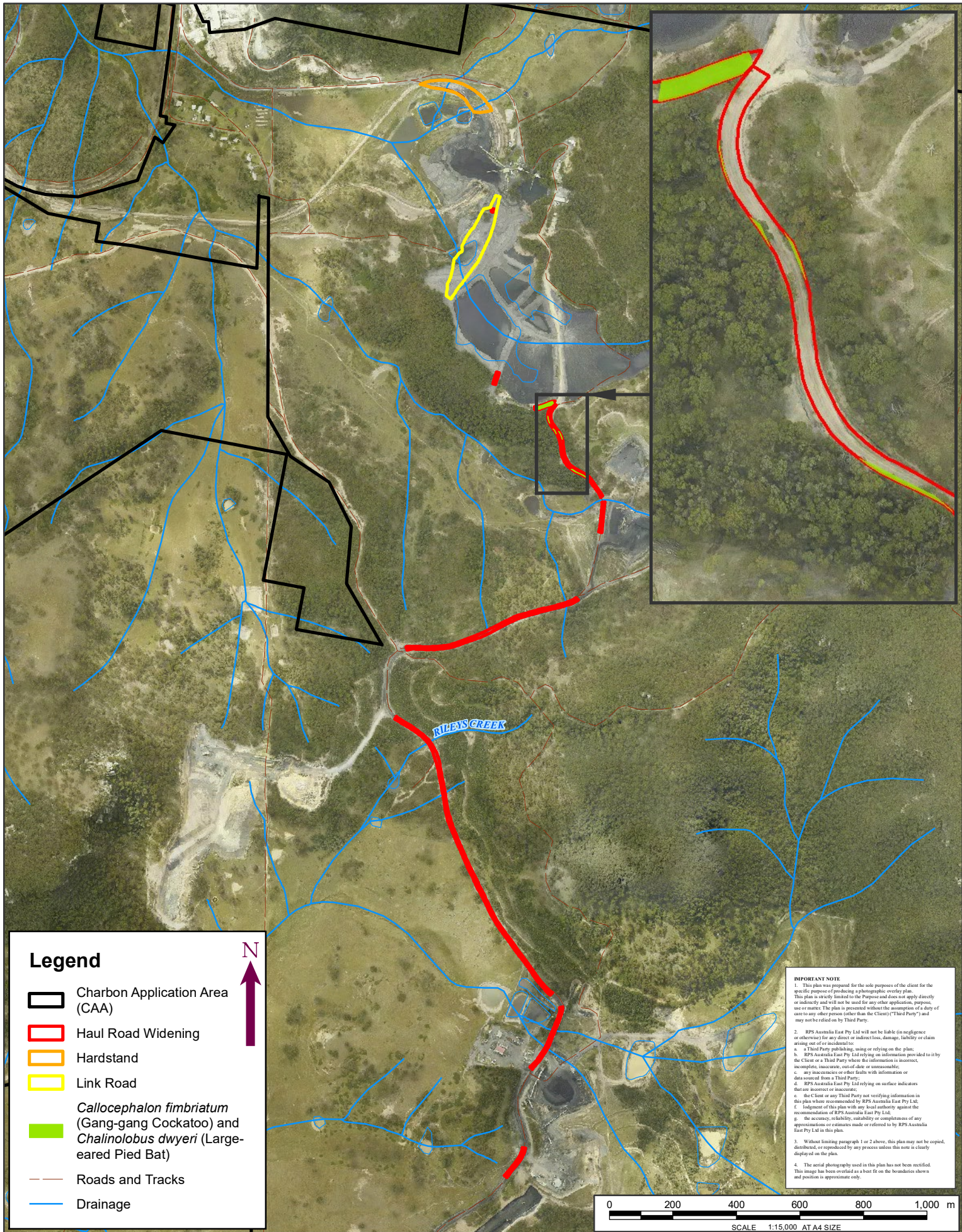
Candidate Species excluded based on habitat constraints or survey are listed in **Table 4-4**.

Table 4-4 Threatened species likely to occur

Species (Common name)	BC Act	Habitat constraint	Justification for removal
<i>Burhinus grallarius</i> Bush Stone-curlew	Endangered		Bird census found no individuals within Project Area.
<i>Calyptrorhynchus lathamii</i> Glossy Black-Cockatoo (Breeding)	Vulnerable	- Hollow bearing trees - Living or dead tree with hollows greater than 15cm diameter and greater than 5m above ground	Bird census found no individuals within Project Area. No hollow-bearing trees within Project Area.
<i>Eucalyptus cannonii</i> Capertee Stringybark	Vulnerable		Flora survey found no individuals within Project Area. Survey was undertaken during BAM survey timetable.
<i>Grevillea divaricata</i>	Endangered		No taxa belonging to the <i>Grevillea</i> genus were detected within the Project Area. There is no known occurrence of this species within the Charbon Colliery. See note.
<i>Grevillea obtusiflora</i>	Endangered		No taxa belonging to the <i>Grevillea</i> genus were detected within the Project Area. There is no known occurrence of this species within the Charbon Colliery. See note.
<i>Hieraaetus morphnoides</i> Little Eagle (Breeding)	Vulnerable	Nest trees - live (occasionally dead) large old trees within vegetation)	Bird census found no individuals within Project Area. Project Area lacks suitable nest trees to support breeding.
<i>Hoplocephalus bungaroides</i> Broad-headed Snake (Breeding)	Endangered	- Rocky areas - Including escarpments, outcrops and pogodas within the Sydney Sandstone geologies	Project Area lacks suitable rock structures to support breeding.
<i>Lathamus discolor</i> Swift Parrot (Breeding)	Endangered	As per mapped areas	Project Area is outside the mapped breeding area for this species.
<i>Lophoictinia isura</i> Square-tailed Kite (Breeding)	Vulnerable	Nest trees	Project Area lacks suitable nest trees.
<i>Miniopterus orianae oceanensis</i> Large Bent-winged Bat (Breeding)	Vulnerable	- Caves - 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	Project Area lacks caves, tunnels, mines, culverts or other structures known or suspected to be used for breeding.
<i>Mixophyes balbus</i> Stuttering Frog	Endangered		Survey found no habitat within Project Area.
<i>Ninox connivens</i> Barking Owl (Breeding)	Vulnerable	- Hollow bearing trees - Living or dead trees with hollows greater than 20 cm diameter and greater than 4m above the ground	No hollow-bearing trees within Project Area.

Species (Common name)	BC Act	Habitat constraint	Justification for removal
<i>Paralucia spinifera</i> Purple Copper Butterfly, Bathurst Copper Butterfly	Endangered	Bursaria spinosa or within 40m of Bursaria spinosa	Project Area lacks <i>Bursaria spinosa</i> subsp. <i>lasiophylla</i> .
<i>Petrogale penicillata</i> Brush-tailed Rock-wallaby	Endangered		Survey found no individuals within Project Area.
<i>Prostanthera cryptandroides</i> subsp. <i>cryptandroides</i> Wollemi Mint-bush	Vulnerable		No species belonging to the <i>Prostanthera</i> genus were detected within the Project Area. There is no known occurrence of this species within the Charbon Colliery.
<i>Prostanthera stricta</i> Mount Vincent Mint-bush	Vulnerable		No species belonging to the <i>Prostanthera</i> genus were detected within the Project Area. There is no known occurrence of this species within the Charbon Colliery.
<i>Pteropus poliocephalus</i> Grey-headed Flying-fox (Breeding)	Vulnerable	Breeding camps	Survey found no breeding camps in Project Area.
<i>Pultenaea</i> sp. <i>Olinda</i>	Endangered	- Rocky areas - Ledges and crevices associated with pagoda formations on Narrabeen sandstone or within 50 m	Project Area lacks rocky areas or pagoda formations.
<i>Veronica blakelyi</i>	Vulnerable		Survey found no individuals within Project Area. Survey was undertaken during BAM survey timetable.

Note: Seasonal targeted survey for *Grevillea divaricata* and/ or *Grevillea obtusiflora* is a requirement to ensure any species belonging to this genus are properly identified using appropriate vegetative material (i.e. flowers available during certain months of the year). In this study, all perennial woody shrub taxa observed within the Project Area was identified to species level. None of the taxa observed within the Project Area belong to the Proteaceae family or *Grevillea* genus. On this basis, seasonal survey requirements are not required to discern between taxa of the *Grevillea* genus. Both *Grevillea divaricata* and *Grevillea obtusiflora* are absent from the Project Area, a finding consistent with broader investigations of the CAA (Mark Aitkens pers obs).



Legend

 Charbon Application Area (CAA)

 Haul Road Widening

 Hardstand

 Link Road

 *Callocephalon fimbriatum* (Gang-gang Cockatoo) and *Chalinolobus dwyeri* (Large-eared Pied Bat)

 Roads and Tracks

 Drainage



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FIGURE 4-1: CALLOCEPHALON FIMBRIATUM (GANG-GANG COCKATOO) AND CHALINOLOBUS DWYERI (LARGE-EARED PIED BAT)

LOCATION: CHARBON

DATUM: GDA2020

JOB NO.: PR 146693

PROJECTION: GDA2020 MGA Zone 55

PURPOSE: BDAR

Data Sources:
RPS_Client
mga56_Charbon_2015

Technician: Natalie Wood

Date: 27/01/2021

CLIENT: CENTENNIAL

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5 PRESCRIBED IMPACTS

5.1 Impacts of development on water quality, water bodies and hydrological processes that sustain threatened species

The proposal will avoid directly impacting any water bodies or hydrological processes. Nevertheless, surface runoff arising from the Project Area may flow into Cumber Mellon Creek and Rileys Creek. Candidate species that could associate with these downstream tributaries are threatened frogs such as *Mixophyes balbus* (Stuttering Frog). This species depends upon water of a suitable quality and quantity, supplied from such tributaries, to support their resource requirements, including breeding habitat.

Potential impacts on water quality from the proposal will be restricted primarily to the construction phase; when earthworks may expose and destabilise soil. It is not expected that the Project will significantly change the water balance within these tributaries as areas of hard substrate to be constructed is an incremental increase to that already present.

5.2 Impacts of vehicle strikes on threatened species of animals

Vehicles will require frequent access to the site during the construction and operational phases during daytime only, which may pose a risk to several threatened species. During operation, an increase in truck movements would occur over the proceeding hours to shift the CCR to the pits. The risk of vehicle strike on threatened species is assessed in **Table 5-1**.

Table 5-1 Assessment of impact of vehicle strike on threatened fauna

Species	Likelihood of strike	Predicted impacts
<i>Calyptorhynchus lathamii</i> Glossy Black-Cockatoo	Low – species generally flies near canopy.	Unlikely to be struck by vehicles
<i>Chalinolobus dwyeri</i> Large-eared Pied Bat	Low – species is nocturnal and generally flies near canopy.	Unlikely to be struck by vehicles
<i>Hoplocephalus bungaroides</i> Broad-headed Snake	Low – species is nocturnal and uses rocky outcrops that are away from Project.	Unlikely to be struck by vehicles
<i>Petrogale penicillata</i> Brush-tailed Rock-wallaby	Low – species is nocturnal and may be prone to strike when foraging.	Unlikely to be struck by vehicles
<i>Phascolarctos cinereus</i> Koala	Low – species is nocturnal and may be prone to strike when moving between trees.	Unlikely to be struck by vehicles
<i>Pteropus poliocephalus</i> Grey-headed Flying-fox	Low – species is nocturnal and generally flies near canopy.	Unlikely to be struck by vehicles
<i>Lathamus discolor</i> Swift Parrot	Low – species generally flies near canopy.	Unlikely to be struck by vehicles
<i>Lophoictinia isura</i> Square-tailed Kite	Low – species generally flies near canopy.	Unlikely to be struck by vehicles
<i>Miniopterus orianae oceanensis</i> Large Bent-winged Bat	Low – species is nocturnal and generally flies near canopy.	Unlikely to be struck by vehicles
<i>Ninox connivens</i> Barking Owl	Low – species is nocturnal and generally flies near canopy.	Unlikely to be struck by vehicles
<i>Callocephalon fimbriatum</i> Gang-gang Cockatoo	Low – species generally flies near canopy.	Unlikely to be struck by vehicles
<i>Hieraaetus morphnoides</i> Little Eagle	Low – species generally flies near canopy.	Unlikely to be struck by vehicles

6 AVOID AND MINIMISE IMPACTS

6.1 Avoiding and Minimising Impacts on Native Vegetation and Habitat

Centennial reduced impacts of the Project on biodiversity values by restricting it to pre-disturbed areas wherever possible. **Sections 6.1.1** and **6.1.2** detail how impacts to Biodiversity were avoided and or minimised.

6.1.1 Train unloading area

All construction and operation of the level train unloading area was positioned within an area devoid of native vegetation. By doing so, impacts to biodiversity values were avoided for this Project component.

6.1.2 Haul road upgrade and link road construction

Centennial has prioritised the use of existing access and haul roads to facilitate construction and operation wherever possible. This allowed the impact on biodiversity values to be isolated to a limited extent of disturbed bushland (i.e. ~0.06 ha). This vegetation to be impacted by the Project is of depauperate state, as it is currently subject to edge effects, being located adjacent to existing roads. Areas to be impacted also lack hollow-bearing trees, a native understory or other habitat features that Candidate species typically associate with.

6.2 Avoiding and Minimising Prescribed Biodiversity Impacts

The BC Regulation (clause 6.1) identifies actions that are prescribed as impacts to be assessed under the Biodiversity Offsets Scheme. **Sections 6.2.1** to **6.2.2** detail how impacts to potential Prescribed Biodiversity Impacts were avoided or minimised. Mitigation measures to further reduce the potential to impact these Prescribed Biodiversity Impacts are provided in **Section 8**.

6.2.1 Impacts of development on water quality, water bodies and hydrological processes that sustain threatened species

To minimise any potential water quality issues arising from earthworks, such as sedimentation, sediment and erosion controls will be implemented during construction. Following construction, any disturbed areas will be stabilised to ensure that there are no ongoing risks to water quality that may result from erosion. Water quality risks may also arise from chemical and oil spills from construction equipment. In the case of a chemical or oil spill, spill containment and clean-up protocols will be followed to minimise potential for these substances from contaminating nearby waterways. Mitigation actions to reduce risks of water contamination arising from construction are detailed in **Section 8**. Through use of appropriate mitigation measures to minimise risks of runoff contamination, the Project is unlikely to impact the bioregional persistence of the suite of threatened species likely to use downstream areas of habitat.

6.2.2 Impacts of vehicle strikes on threatened species of animals

Risk of vehicle strike will be reduced during construction by ensuring all construction are to be undertaken during the day. To further mitigate risks of strikes on nature fauna, vehicle speed limits are to be strictly enforced during both construction and operation. Inductions to all personnel during construction and operation will also be undertaken to ensure drivers are aware of the potential for animal vehicle strike, and the hours where risk is greatest (i.e. dawn and dusk). These requirements are provided in **Section 8**.

7 ASSESSMENT OF IMPACTS

7.1 Direct Impacts

The direct impacts resulting from the Project are summarised in **Table 7-1**.

Table 7-1 Direct impacts

Project component	Area
Train unloading area	0.00 ha
Upgrade haul roads	0.00 ha
Construction of link road	~0.06 ha
Total	~0.06 ha

7.2 Indirect Impacts

Indirect impacts that need to be considered are listed in Section 8.2 of BAM. Those that are relevant to the Project are:

- Inadvertent impacts on adjacent habitat or vegetation;
- Reduced viability of adjacent habitat due to edge effects;
- Reduced viability of adjacent habitat due to noise, dust or light spill; and
- Transport of weeds and pathogens from the site to adjacent vegetation.

Given the nature of the Project, the following impacts were considered not applicable:

- Increased risk of starvation or exposure, and loss of shade or shelter;
- Loss of breeding habitat;
- Trampling of threatened flora species;
- Inhibition of nitrogen fixation and increased soil salinity;
- Fertiliser drift;
- Rubbish dumping;
- Wood collection;
- Increase in predatory species;
- Increase in pest animal populations;
- Change in fire regimes; and
- Disturbance to specialist breeding and foraging habitat (e.g. beach nesting for shorebirds).

Table 12 identifies the type, frequency, duration and consequence of the indirect impacts that may occur due to applicable indirect impacts, in accordance with Section 9.1.4.2 of BAM.

8 MITIGATION AND MANAGEMENT OF IMPACTS

Measures to mitigate or manage impacts to biodiversity values are detailed in **Table 8-1**.

Table 8-1 Mitigation measures to avoid and minimise impacts on native vegetation and habitat

Mitigation measure	Proposed management measure	Timing	Frequency	Responsibility	Risk of failure	Risk and consequence of residual impacts
Impacts on fauna and their habitat						
Fauna protection protocols	Pre-clearance surveys by qualified ecologist prior to tree; and Apply procedures to safely fell habitat trees and release areas for any rescued fauna.	Construction	One-off	Centennial / contractor	Medium	Some individuals may be impacted if not detected.
Retain other habitat attributes	Hollow logs and rock habitat within the clearance areas will be retained and carefully placed into the adjacent bushland.	Construction	One-off	Centennial / contractor	Low	Some fauna may be injured/die
Maintain upper catchment hydrology (maintain ephemerality)	Erosion and sediment controls will be designed to prevent permanent or semi-permanent ponding of water	Construction	One-off	Centennial / contractor	Low	Impacts on water quality to flora and fauna associated with downstream waterways
Indirect impacts on native vegetation and habitat						
Protect adjacent habitat or vegetation	Boundaries for vegetation removal clearly established prior to clearing using tape by a qualified ecologist; All vehicles and equipment accessing site must use established access sites only; and Restrict load/equipment set down areas to well within the designated impact area.	Construction	One-off	Centennial / contractor	Low	Some adjacent vegetation or habitat may be damaged
Minimise noise and light spill	Avoid night work; and Take measures to reduce noise (e.g. use of noise barriers).	Construction	One-off	Centennial / contractor	Low	Minor impacts of noise on fauna during day only
Dust management	Monitoring of dust generate during earthworks, suspending work if dust is blown into adjacent bushland and use of water carts.	Construction	Ongoing	Centennial / contractor	Low	None

REPORT

Mitigation measure	Proposed management measure	Timing	Frequency	Responsibility	Risk of failure	Risk and consequence of residual impacts
Weed and pathogen management	Good hygiene practices are to be used to reduce the risk of spreading weeds and pathogens, including ensuring that all machinery, materials and personnel are clean of any weed seed to entering the site. Priority Weeds listed under <i>Biosecurity Act</i> (2015) to be actively managed on site to limit the spread of weeds into the adjacent forested areas; and Weeds removed from the subject site are to be disposed of appropriately at an approved waste facility; and occurrences of pathogens (e.g. Myrtle Rust and Phytophthora) will be reported, treated and monitored.	Construction	Infrequent	Centennial / contractor	Medium	Introduction and spread of invasive species that may outcompete or exclude native fauna; and Reduction of habitat quality in adjacent bushland. Introduction of Chytrid disease, impacting local frog populations
Fire response measures	Fire extinguishers accessible on site.	Construction	Infrequent	Centennial / contractor	Low	Uncontrolled burn
Rubbish management	All waste generated during construction is to be collected and deposited offsite at a suitable waste facility.	Construction	One-off	Centennial / contractor	Low	None
Staff training and site briefing to educate contractors on biodiversity management measures	Contractors are made aware of biodiversity management measures through site induction and toolbox talks; and Contractors Construction Environmental Management Plan (CEMP) to include all biodiversity management measures.	Pre-construction and Construction	Ongoing	Centennial / contractor	Low	Impacts to adjacent bushland and waterways
Prescribed biodiversity impacts						
Sediment and erosion controls	Erosion and sediment control measures are to be implemented and maintained to prevent sediment moving offsite, and sediment laden water entering any watercourse; Erosion controls are to be regularly inspected for their functionality and cleared if required, especially after rainfall;	Construction	One-off	Centennial / contractor	Low	Sedimentation of downstream aquatic habitats

REPORT

Mitigation measure	Proposed management measure	Timing	Frequency	Responsibility	Risk of failure	Risk and consequence of residual impacts
	Excavated material should be stockpiled well away from areas where native vegetation is to be retained and waterways; and Work areas stabilised progressively during works.					
Prevent water pollution	No release of dirty water into drainage lines/waterways; All fuel/chemicals are to be stored in either self-bunded containers or in a bunded facility; An emergency spill kit is always to be kept on sites where equipment is being used; An emergency spill response plan developed; and Regular inspection of equipment and vehicles for fuel or oil leaks.	Construction	Infrequent	Centennial / contractor	Low	Water pollution
Avoid vehicle strike	Vehicles will adhere to a 40 km/hr speed limit. Site inductions are to include risks associated with vehicle strike. Strict adherence to construction and operational periods (i.e. daylight hours).	Construction and operation	Ongoing	Centennial / contractor	Medium	Fauna strike by vehicle

9 THRESHOLDS FOR ASSESSING AND OFFSETTING IMPACTS OF THE PROPOSAL

9.1 Impacts of the proposal on threatened species and/or threatened populations at risk of an SAI

The Project is removing habitat ~0.06 ha of habitat for *Chalinolobus dwyeri* (Large-eared Pied Bat). However, this is not considered an SAI as the habitat to be removed is not microhabitat of a kind necessary for breeding or within 100 m of breeding habitat. The habitat loss is foraging habitat only. No further assessment of an SAI is required.

9.2 Impacts requiring offset

The Project is required to provide an offset for the following matters (**Figure 9-1**):

- ~0.06 ha of PCT 1088 Red Box - Grey Gum - stringybark woodland on talus slopes of the western Blue Mountains, Sydney Basin Bioregion;
- ~0.06 ha of habitat for *Chalinolobus dwyeri* (Large-eared Pied Bat); and
- ~0.06 ha of habitat for *Callocephalon fimbriatum* (Gang-gang Cockatoo).

9.3 Impacts not requiring offset (or assessment)

The assessment of non-vegetated lands located within the Project area is ~4.61 ha (**Figure 9-2**). No further assessment (or offsetting provisions) is required for this area as there is no loss of native vegetation, associated habitat or any prescribed impacts.

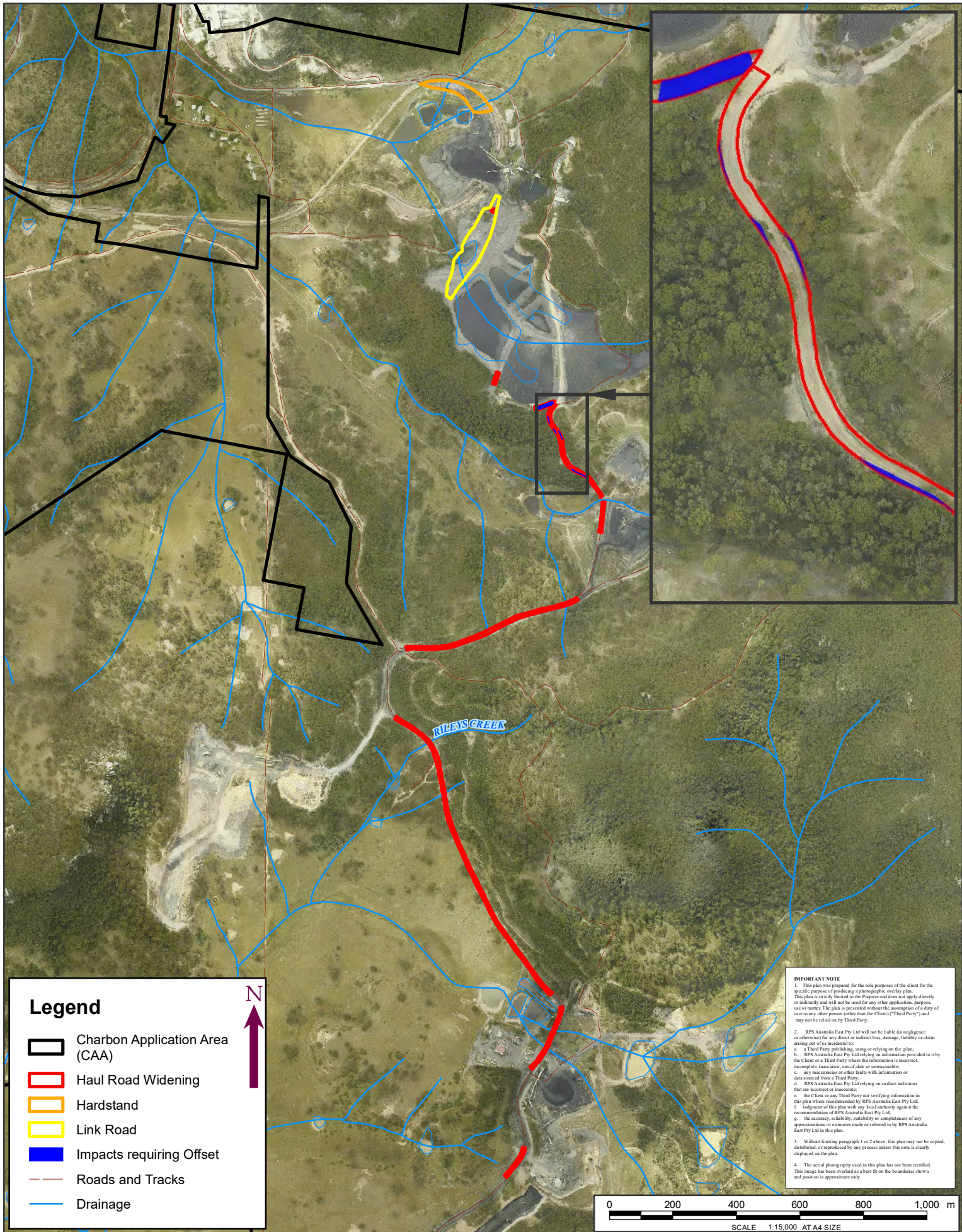


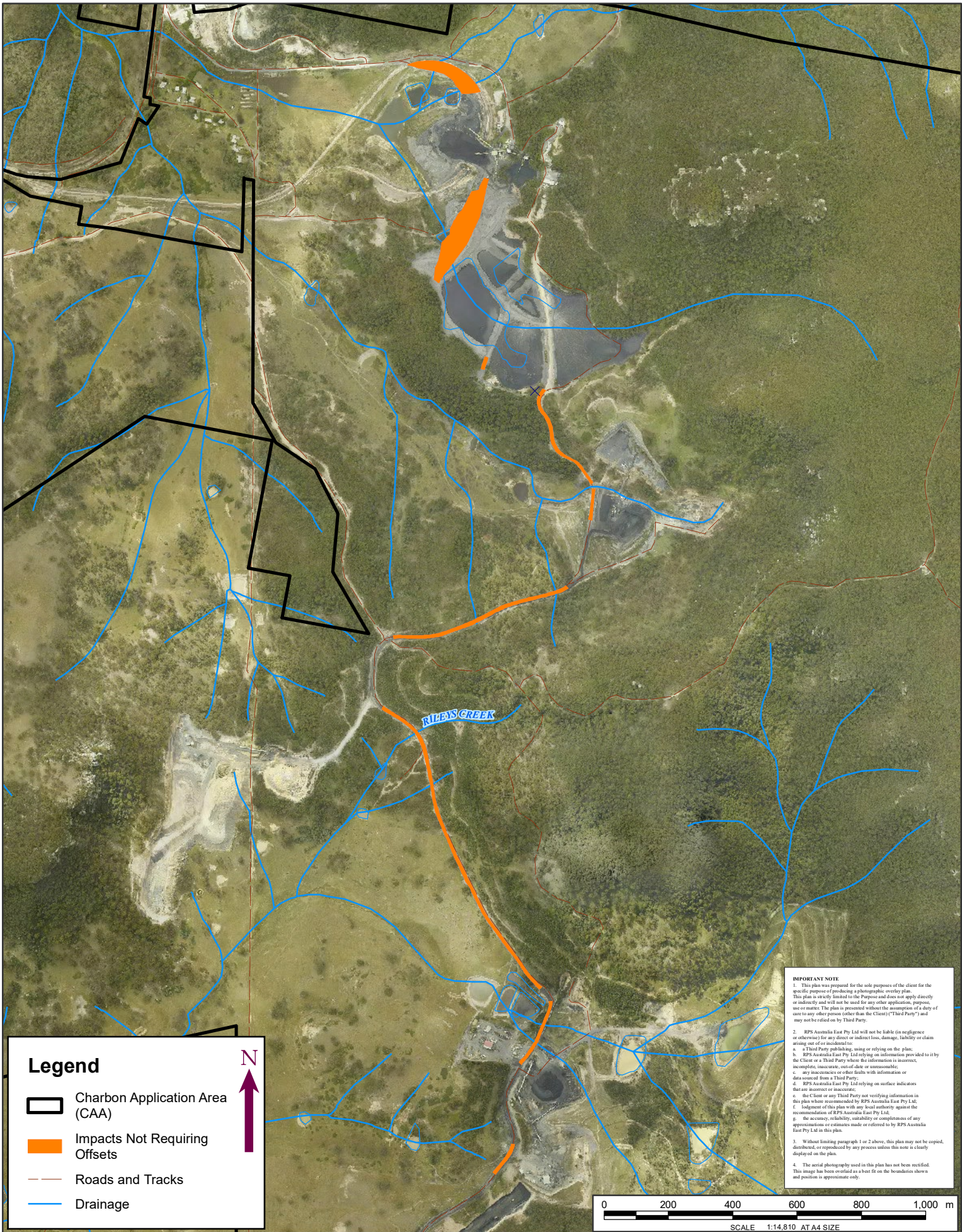
FIGURE 9-1: IMPACTS REQUIRING OFFSET

LOCATION: CHARBON	DATUM: GDA2020
JOB NO.: PR 146693	PROJECTION: GDA2020 MGA Zone 55
PURPOSE: BDAR	Data Sources: RPS_Client mga56_Charbon_2015
Technician: Natalie Wood	Date: 27/01/2021

CLIENT: CENTENNIAL

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)
Unit 2A, 45 Fitzroy Street, Carrington, NSW, Australia, 2294 PO Box 120, Carrington, NSW, 2294
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FIGURE 9-2: IMPACTS NOT REQUIRING OFFSET ASSESSMENT

LOCATION: CHARBON	DATUM: GDA2020
JOB NO.: PR 146693	PROJECTION: GDA2020 MGA Zone 55
PURPOSE: BDAR	Data Sources: RPS_Client mgs56_Charbon_2015
Technician: Natalie Wood	Date: 27/01/2021

CLIENT: CENTENNIAL

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10 APPLYING THE NO NET LOSS STANDARD

10.1 Impact on PCTs/TECs

The Project will impact ~0.06 ha of PCT 1088. This PCT is not consistent with any TEC.

10.2 Impact on threatened species at risk of an SAIL or incidentally observed via site visit

To be considered an SAIL, an impact is required to occur within 100 m of breeding habitat for *Chalinolobus dwyeri* (Large-eared Pied Bat). As impacts are outside of 100 m from potential breeding habitat for this species, it is considered impacts of the Project are unlikely to present a risk of an SAIL. Nevertheless, as the Project will impact native vegetation within 2 km of potential breeding habitat for this species, species credits are required to offset this impact.

10.3 Ecosystem credits required for impacts on biodiversity values

Two ecosystem credits are required for impacts on PCT 1088 Red Box - Grey Gum - stringybark woodland on talus slopes of the western Blue Mountains, Sydney Basin Bioregion. This PCT is not part of a TEC.

10.3.1 Ecosystem credit classes

Ecosystem credit classes are shown in **Table 10-1**.

Table 10-1 Credit class for ecosystem credits

PCT	Class	Trading group	HBT	Credits	IBRA region
PCT 1088 Red Box - Grey Gum - stringybark woodland on talus slopes of the western Blue Mountains, Sydney Basin Bioregion	Upper Riverina Dry Sclerophyll Forests This includes PCT's: 269, 285, 289, 290, 298, 302, 304, 314, 338, 340, 342, 353, 1088, 1094, 1095	Upper Riverina Dry Sclerophyll Forests - ≥ 50% - < 70% cleared group (including Tier 3 or higher threat status).	No	2	Capertee Valley , Capertee Uplands, Inland Slopes and Wollemi. or Any IBRA subregion that is within 100 km of the outer edge of the impacted site

10.4 Species credits required for impacts on biodiversity values

Species credits required for impacts are:

- 2 Species credits for *Callocephalon fimbriatum* (Gang-gang cockatoo); and
- 3 Species credits for *Chalinolobus dwyeri* (Large-eared Pied Bat).

Impacts on these species are not considered a risk of an SAIL.

10.4.1 Species credit classes

Species credit classes are shown in **Table 10-2**.

Table 10-2 Credit class

Species Credit Species	Credits	IBRA region
<i>Callocephalon fimbriatum</i> (Gang-gang cockatoo)	2	Any in NSW
<i>Chalinolobus dwyeri</i> (Large-eared Pied Bat)	3	Any in NSW

11 REFERENCES

- Department of Agriculture, Water and Environment [DAWE] (2021a). Australian Government's Species Profiles and Threats (SPRAT) database. Accessed January 2021. <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>
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- DEC (2006) *The Vegetation of the Western Blue Mountains*. Unpublished report funded by the Hawkesbury-Nepean Catchment Management Authority. Department of Environment and Conservation NSW, Hurstville.
- Department of Planning, Industry and Environment [DPIE] (2021a) Australian Government's Species Profiles and Threats (SPRAT) database. Accessed January 2021. <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>
- DPIE (2021b). BioNet Atlas of NSW Wildlife. Accessed January 2021. <http://www.bionet.nsw.gov.au/>
- DPIE (2021c). BioNet Vegetation Classification. Accessed January 2021. <https://www.environment.nsw.gov.au/research/Visclassification.htm>
- Department of Primary Industries [DPI] (2007). Key Fish Habitats. Accessed January 2021.
- National Parks and Wildlife Service (2003). Descriptions for NSW (Mitchell) Landscapes Version 2.
- Murphy B.W. and Lawrie J.M. (2010), Soil Landscapes of the Dubbo 1:250,000 Sheet map, Edition 1 reprint, Department of Environment, Climate Change and Water NSW, Sydney.
- Office of Environment and Heritage (2016). NSW Guide to Surveying Threatened Plants. Office of Environment and Heritage, Sydney.

Appendix A
Biodiversity Values Map

Biodiversity Offset Scheme (BOS) Entry Threshold Map



1: 56,832



2,887.1 0 1,443.53 2,887.1 Metres

WGS_1984_Web_Mercator_Auxiliary_Sphere

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

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Legend

- Biodiversity Values that have been mapped for more than 90 days
- Biodiversity Values added within last 90 days

Notes

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Biodiversity Values Map and Threshold Report

Results Summary

Date of Calculation	25/01/2021 6:38 PM	BDAR Required*
Total Digitised Area	313.87 ha	
Minimum Lot Size Method	LEP	
Minimum Lot Size	0.1 ha	
Area Clearing Threshold	0.25 ha	
Area clearing trigger Area of native vegetation cleared	Unknown [#]	Unknown [#]
Biodiversity values map trigger Impact on biodiversity values map(not including values added within the last 90 days)?	no	no
Date of the 90 day Expiry	N/A	

*If BDAR required has:

- at least one 'Yes': you have exceeded the BOS threshold. You are now required to submit a Biodiversity Development Assessment Report with your development application. Go to <https://customer.lmbc.nsw.gov.au/assessment/AccreditedAssessor> to access a list of assessors who are accredited to apply the Biodiversity Assessment Method and write a Biodiversity Development Assessment Report
- 'No': you have not exceeded the BOS threshold. You may still require a permit from local council. Review the development control plan and consult with council. You may still be required to assess whether the development is "likely to significantly affect threatened species' as determined under the test in s. 7.3 of the Biodiversity Conservation Act 2016. You may still be required to review the area where no vegetation mapping is available.

Where the area of impact occurs on land with no vegetation mapping available, the tool cannot determine the area of native vegetation cleared and if this exceeds the Area Threshold. You will need to work out the area of native vegetation cleared - refer to the BOSET user guide for how to do this.

On and after the 90 day expiry date a BDAR will be required.

Disclaimer

This results summary and map can be used as guidance material only. This results summary and map is not guaranteed to be free from error or omission. The State of NSW and Office of Environment and Heritage and its employees disclaim liability for any act done on the information in the results summary or map and any consequences of such acts or omissions. It remains the responsibility of the proponent to ensure that their development application complies with all aspects of the *Biodiversity Conservation Act 2016*.

The mapping provided in this tool has been done with the best available mapping and knowledge of species habitat requirements. This map is valid for a period of 30 days from the date of calculation (above).

Acknowledgement

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

Signature _____ Date: 25/01/2021 06:38 PM

Appendix B Species List

REPORT

Scientific Name	Common Name	Family	BC Act	EPBC Act	BAM 1 Cover	BAM 1 Abundance	BAM 2 Cover (Hardstand Area)	BAM 2 Abundance (Hardstand Area)
<i>Acacia falciformis</i>	Broad-leaved Hickory	Fabaceae (Mimosoideae)			1.0	4		
<i>Acacia longifolia</i>		Fabaceae (Mimosoideae)			0.1	1		
<i>Acaena novae-zelandiae</i>	Bidgee-widgee	Rosaceae			0.1	15		
<i>Asparagus aethiopicus</i>	Asparagus Fern	Asparagaceae			0.1	20		
<i>Astroloma humifusum</i>	Native Cranberry	Ericaceae			0.1	2		
<i>Austrostipa spp.</i>		Poaceae			0.1	15		
<i>Bothriochloa macra</i>	Red Grass	Poaceae					1	200
<i>Brachychiton populneus</i>	Kurrajong	Malvaceae			0.2	2		
<i>Brassica spp.</i>	Brassica	Brassicaceae			0.2	10		
<i>Brassicaceae indeterminate</i>	Mustards	Brassicaceae			0.1	20		
<i>Cassinia spp.</i>		Asteraceae			0.1	40		
<i>Centaurium erythraea</i>	Common Centaury	Gentianaceae			0.1	10		
<i>Cheilanthes sieberi</i>	Rock Fern	Pteridaceae			0.1	7		
<i>Cirsium vulgare</i>	Spear Thistle	Asteraceae			0.1	5		
<i>Clematis glycinoides</i>	Headache Vine	Ranunculaceae			0.1	2		
<i>Conyza spp.</i>		Asteraceae			0.1	20		
<i>Cotoneaster spp.</i>		Malaceae			0.2	3		
<i>Cynoglossum australe</i>		Boraginaceae			0.1	20		
<i>Desmodium varians</i>	Slender Tick-trefoil	Fabaceae (Faboideae)			0.1	1		
<i>Dichondra repens</i>	Kidney Weed	Convolvulaceae			0.1	5		
<i>Echium vulgare</i>	Viper's Bugloss	Boraginaceae			0.2	30		
<i>Eucalyptus blaxlandii</i>	Blaxland's Stringybark	Myrtaceae			30.0	6		
<i>Euchiton sphaericus</i>	Star Cudweed	Asteraceae			0.1	30		
<i>Geitonoplesium cymosum</i>	Scrambling Lily	Luzuriagaceae			0.1	3		

REPORT

Scientific Name	Common Name	Family	BC Act	EPBC Act	BAM 1 Cover	BAM 1 Abundance	BAM 2 Cover (Hardstand Area)	BAM 2 Abundance (Hardstand Area)
<i>Geranium spp.</i>		Geraniaceae			0.1	8		
<i>Hardenbergia violacea</i>	False Sarsaparilla	Fabaceae (Faboideae)			0.2	1		
<i>Hydrocotyle laxiflora</i>	Stinking Pennywort	Apiaceae			0.1	5		
<i>Hypericum perforatum</i>	St. Johns Wort	Clusiaceae			0.1	3	0.5	100
<i>Hypochoeris radicata</i>	Catsear	Asteraceae			0.1	3	0.1	15
<i>Linum trigynum</i>	French Flax	Linaceae			0.1	30		
<i>Lomandra glauca</i>	Pale Mat-rush	Lomandraceae			0.1	15		
<i>Lysimachia arvensis</i>	Scarlet Pimpernel	Primulaceae			0.1	3		
<i>Marrubium vulgare</i>	White Horehound	Lamiaceae			0.5	25		
<i>Microlaena stipoides</i>	Weeping Grass	Poaceae			0.2	30		
<i>Notelaea longifolia f. longifolia</i>		Oleaceae			0.2	1		
<i>Orobancha spp.</i>		Scrophulariaceae			0.1	3		
<i>Paspalum dilatatum</i>	Paspalum	Poaceae					0.1	5
<i>Petrorhagia nanteuilii</i>	Proliferous Pink	Caryophyllaceae			0.1	50		
<i>Phalaris minor</i>	Lesser Canary Grass	Poaceae					1	50
<i>Plantago debilis</i>	Shade Plantain	Plantaginaceae			0.1	15		
<i>Plantago lanceolata</i>	Lamb's Tongues	Plantaginaceae			0.1	5	0.1	20
<i>Poa sieberiana</i>	Snowgrass	Poaceae			0.1	20		
<i>Poaceae indeterminate</i>	Grasses, reeds and bamboos	Poaceae			0.1	5	0.1	5
<i>Pyracantha angustifolia</i>	Orange Firethorn	Malaceae					0.1	1
<i>Rubus fruticosus sp. agg.</i>	Blackberry complex	Rosaceae					0.1	2
<i>Rytidosperma caespitosum</i>	Ringed Wallaby Grass	Poaceae			0.2	50		
<i>Rytidosperma tenuius</i>		Poaceae			0.1	10		
<i>Scabiosa spp.</i>		Dipsacaceae			0.1	5	30	1000
<i>Senecio jacobaea</i>	Ragwort	Asteraceae			20.0	1,000		

REPORT

Scientific Name	Common Name	Family	BC Act	EPBC Act	BAM 1 Cover	BAM 1 Abundance	BAM 2 Cover (Hardstand Area)	BAM 2 Abundance (Hardstand Area)
<i>Senecio quadridentatus</i>	Cotton Fireweed	Asteraceae			0.1	7		
<i>Solanum nigrum</i>	Black-berry Nightshade	Solanaceae			0.1	10		
<i>Solanum prinophyllum</i>	Forest Nightshade	Solanaceae			0.1	4		
<i>Sonchus spp.</i>		Asteraceae					0.1	1
<i>Verbena spp.</i>		Verbenaceae					0.1	10
<i>Vittadinia cuneata</i>		Asteraceae			0.1	50		
<i>Wahlenbergia spp.</i>	Bluebell	Campanulaceae			0.1	40		

Appendix C
BAM Data

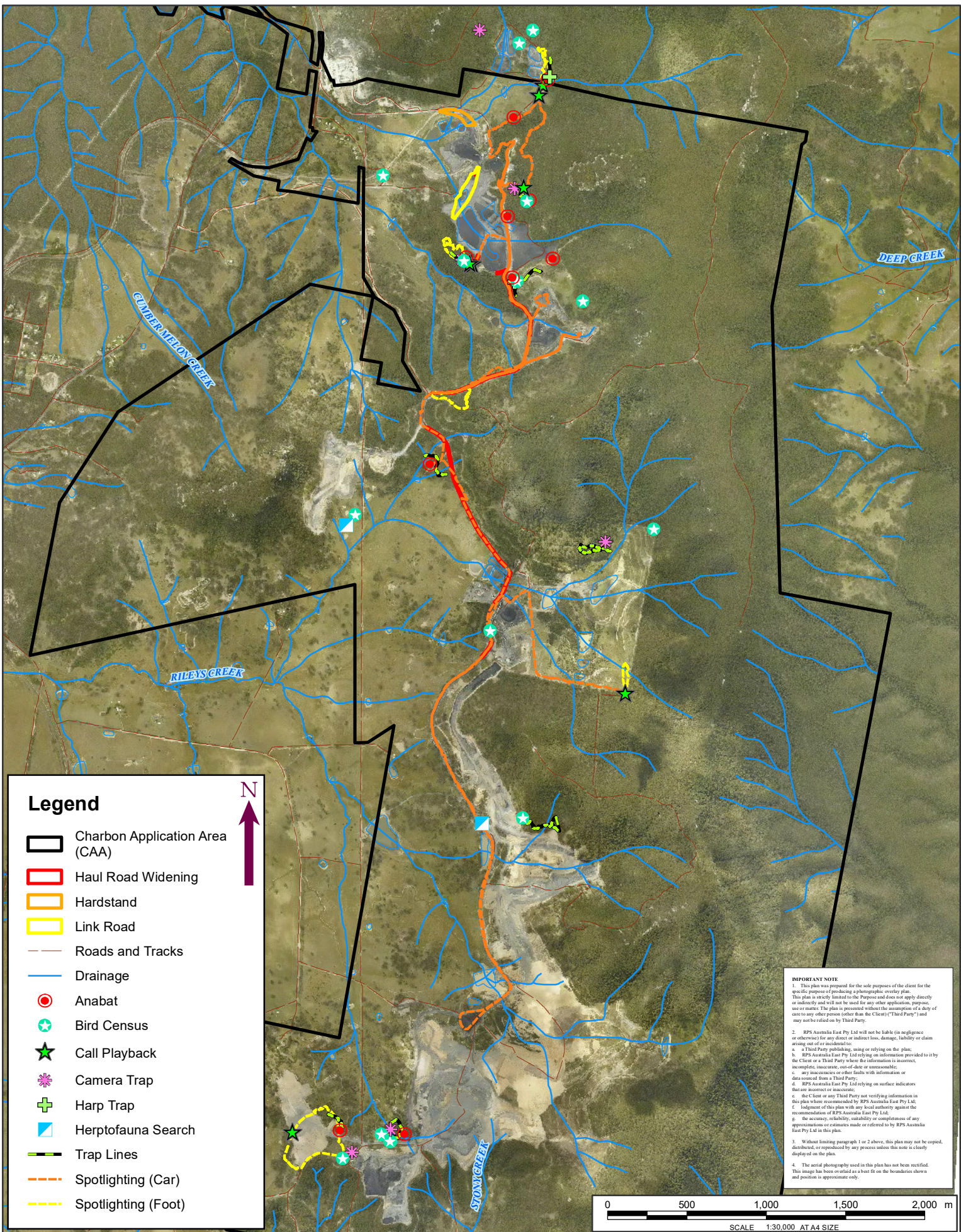
Table A1 BAM plot photographs

Plot no.	Photograph
BAM 1 Start	
BAM 1 End	

Plot no.	Photograph
BAM 2 Start	
BAM 2 End	

Appendix D

Fauna survey effort



APPENDIX A: SURVEY EFFORTS

LOCATION: CHARBON	DATUM: GDA2020
JOB NO.: PR 146693	PROJECTION: GDA2020 MGA Zone 55
PURPOSE: BDAR	Data Sources: RPS_Client mga56_Charbon_2015
Technician: Natalie Wood	Date: 27/01/2021

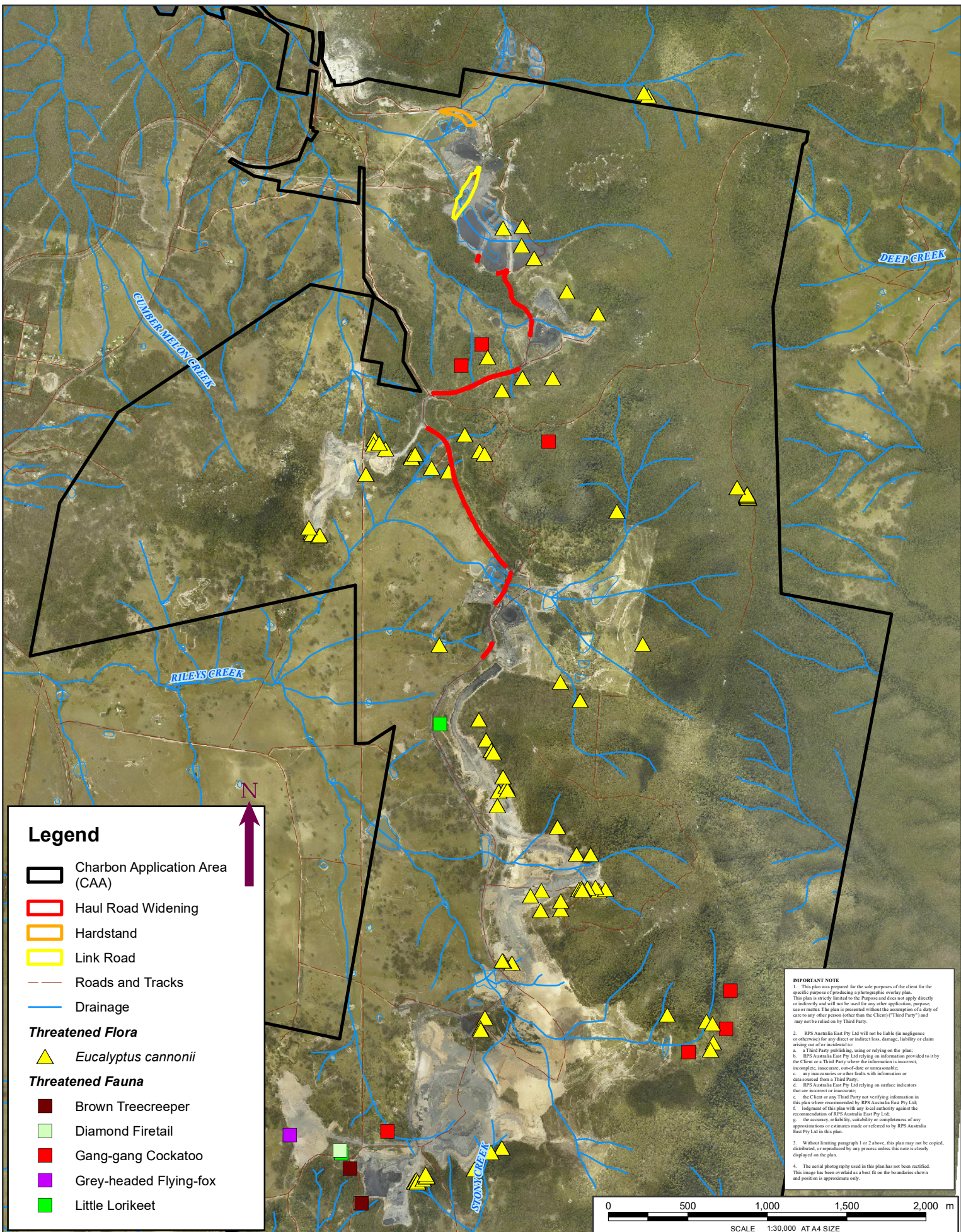
CLIENT: CENTENNIAL

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Appendix E

Threatened flora and fauna



APPENDIX B: THREATENED SPECIES

LOCATION: CHARBON

DATUM: GDA2020

JOB NO.: PR 146693

PROJECTION: GDA2020 MGA Zone 55

PURPOSE: BDAR

Data Sources:
RPS_Client
mga56_Charbon_2015

Technician: Natalie Wood

Date: 27/01/2021

CLIENT: CENTENNIAL

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)
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Appendix F
BAM-C credit report

BAM Candidate Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00023833/BAAS17034/21/00023834	Charbon Mod 2 BDAR Haul Road	21/12/2020
Assessor Name	Report Created	BAM Data version *
Mark Aitkens	29/01/2021	36
Assessor Number	Assessment Type	BAM Case Status
BAAS17034	Part 4 Developments (Small Area)	Open
Assessment Revision	Date Finalised	BOS entry trigger
0	To be finalised	BOS Threshold: Area clearing threshold

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

List of Species Requiring Survey

Name	Presence	Survey Months
<i>Callocephalon fimbriatum</i> Gang-gang Cockatoo	Yes (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☒ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Chalinolobus dwyeri</i> Large-eared Pied Bat	Yes (assumed present)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Grevillea divaricata</i> Grevillea divaricata	No (surveyed) *Survey months are outside of the months specified in Bionet.	☐ Jan ☒ Feb ☒ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☒ Oct ☐ Nov ☒ Dec ☒ Survey month outside the specified months?

BAM Candidate Species Report

<i>Grevillea obtusiflora</i> Grevillea obtusiflora	No (surveyed)	☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☒ Aug ☐ Sep ☒ Oct ☐ Nov ☐ Dec ☐ Survey month outside the specified months?
<i>Mixophyes balbus</i> Stuttering Frog	No (surveyed)	☐ Jan ☒ Feb ☒ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☒ Oct ☐ Nov ☒ Dec ☐ Survey month outside the specified months?
<i>Petrogale penicillata</i> Brush-tailed Rock-wallaby	No (surveyed)	☐ Jan ☒ Feb ☒ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☒ Aug ☐ Sep ☒ Oct ☐ Nov ☒ Dec ☐ Survey month outside the specified months?

Threatened species assessed as not on site

Refer to BAR for detailed justification

Common name	Scientific name	Justification in the BAM-C
Broad-headed Snake	Hoplocephalus bungaroides	Habitat constraints
Large Bent-winged Bat	Miniopterus orianae oceanensis	Habitat constraints
Swift Parrot	Lathamus discolor	Habitat constraints