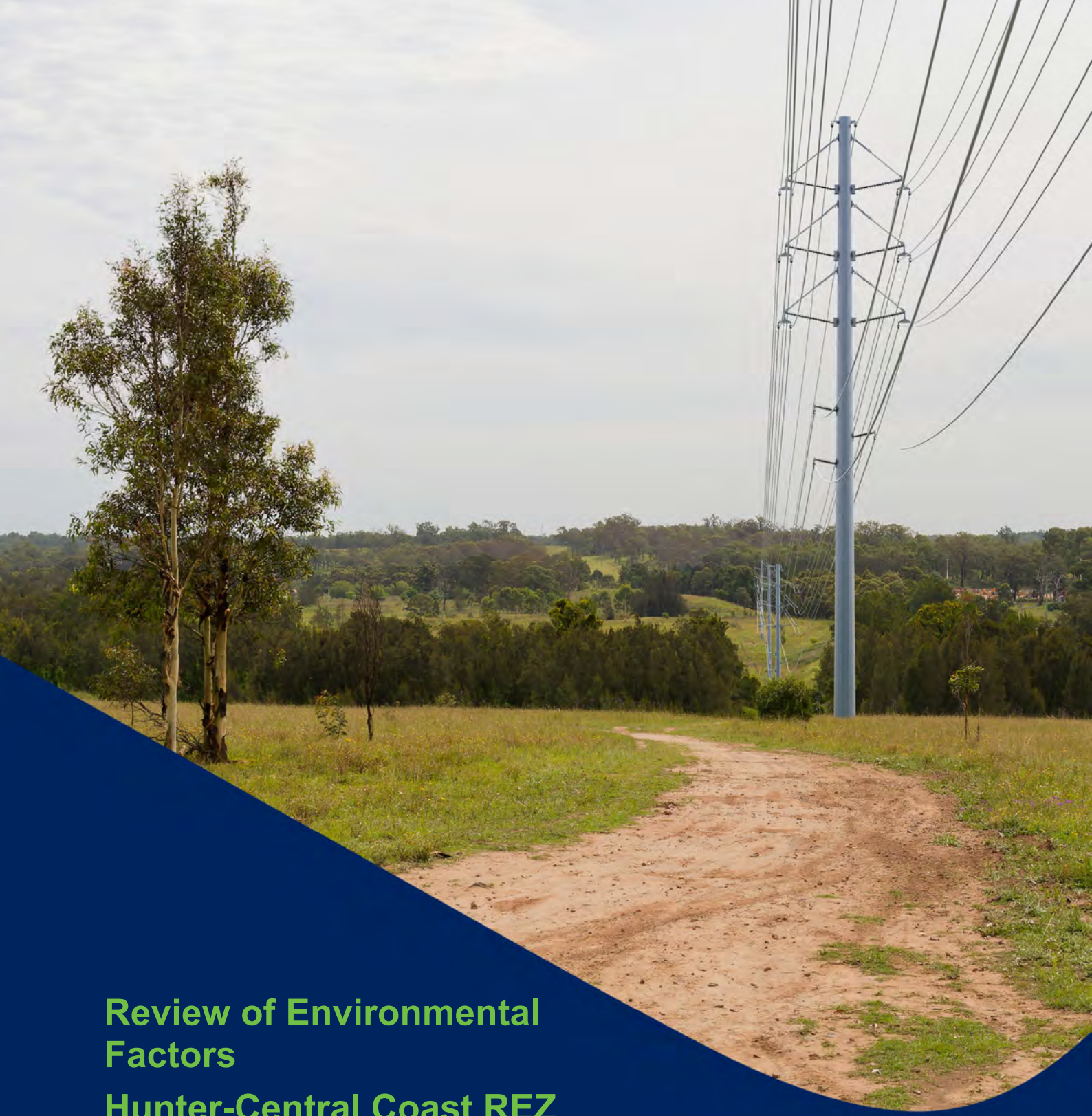

Review of Environmental Factors

Hunter-Central Coast REZ Network Infrastructure

Appendix I – Flora and Fauna

Wired for good.™

Ausgrid

Ecological Assessment Report
for

Ausgrids
HUNTER REZ PROJECT
NSW

Prepared by: WILDTHING Environmental Consultants

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For: **Ausgrid**
145 Newcastle Rd,
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Job No: 12875

April 2025

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Project Name	Ecological Assessment Report for Ausgrids Hunter REZ Project, NSW.	
Project Number	12875	
Prepared By	Daryl Harman Senior Ecologist BEnvSc BAAS17074	
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Date	13 November 2024	
Version Number	1	

Disclaimer

This report has been prepared in accordance with the proposal provided by the Client and outlined within this report. All findings, conclusions or recommendations contained within this report are based upon the data and results collected under the times and conditions specified in the report and are only applicable for the proposal considered within this report. This report has been prepared for use exclusively by the Client. No responsibility for its use by any other party is accepted by WILDTHING Environmental Consultants.

Summary

Wildthing Environmental Consultants have been commissioned by Ausgrid to undertake an ecological assessment as part of Hunter-Central Coast Renewable Energy Project (REZ) to upgrade the existing electricity network between Kurri Kurri and Muswellbrook. The upgrade will allow new renewable generation to connect to the grid.

The REZ proposal will be completed in Stages:

Stage 1: A proposed dual circuit high capacity 132kV subtransmission lines ~60km between the existing Singleton and Kurri Sub-Transmission Substations (STS's). This will include pole replacements, access track works and vegetation clearing. This stage also includes upgrades at Singleton and Kurri STSs. The 132kV subtransmission line will be almost entirely located within Ausgrids existing maintained easement. Depending on the width of the required easement (either 20 or 45m) some areas of native vegetation along the edge of the easement will be impacted. In most cases only minor branch trimming will be required. Less frequently tree removal will be required.

Stage 2:
A proposed dual circuit high capacity 132kV subtransmission line (~25km) between the proposed Eastern Hub 132kV Switching Station located on the northern side of Lake Liddell to the existing Singleton STS.

Rearrangement of Ausgrid's existing Upper Hunter subtransmission network to provide connection between an existing subtransmission line known as 95U, which ultimately will connect to Eastern Hub SS and Ausgrid's existing Muswellbrook STS. The subtransmission line (~5km) will be almost entirely located within Ausgrids existing maintained easement. Some branch trimming and the removal of a small number of trees will likely be required.

Vegetation
Vegetation within the REZ Project area ranged from highly disturbed land that had been historically cleared and subject to prolonged grazing and coal mining impacts to areas of woodland and open forest that were relatively intact. Most of the vegetation within the required 132kV subtransmission line easement was contained within the existing Ausgrid easement and had been keep low to the ground by routine maintenance. Other areas impacted by the Muswellbrook STS upgrade and new sections of easement such as an area between the Kurri STS and Hunter Expressway will also require removal of native vegetation.

The vegetation assemblages along the REZ were stratified where possible by assigning the vegetation to Plant Community Types (PCTs) detailed in the NSW Vegetation Information System (VIS) classification database. A total of 11 Plant Community Types were identified: these were:

- PCT 3630 Kurri Sand Heathy Woodland
- PCT 3433 Hunter Coast Foothills Spotted Gum-Ironbark Forest
- PCT 3634 Quorrobolong Sand Flats Forest
- PCT 3444 Lower Hunter Spotted Gum-Ironbark Forest
- PCT 3446 Lower North Foothills Spotted Gum-Ironbark Grassy Forest
- PCT 4023 Coastal Valleys Riparian Forest
- PCT 3315 Central Hunter Ironbark-Spotted Gum Forest
- PCT 4015 Central Hunter Swamp Oak Riparian Forest
- PCT 4073 Lower North Hinterland River Oak Forest
- PCT 3431 Central Hunter Ironbark Grassy Woodland
- PCT 3525 Upper Hunter Box-Blakely's Red Gum Grassy Forest

Threatened Ecological Communities listed under the state BC Act 2016
Seven TEC's listed under the BC Act were identified within the REZ or in close proximity. These TEC's were:

- Kurri Sand Swamp Woodland in the Sydney Basin Bioregion
- Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions
- Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions
- Central Hunter Ironbark – Spotted Gum – Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions
- Central Hunter Grey Box – Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions
- Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grasslands

The proposal will result in an incremental reduction in each of these threatened ecological communities, however it is considered unlikely to have a significant impact which might lead to extinction locally.

Threatened flora species listed under the state BC Act 2016
Four threatened flora species were recorded during fieldwork, these were

- *Eucalyptus glaucina* (Slaty Red Gum)
- *Eucalyptus parramattensis* subsp. *decadens* (Drooping Red Gum)
- *Grevillea parviflora* subsp. *parviflora* (Small-flowered Grevillea)
- *Diuris tricolor* (Pine Donkey Orchid)

The proposal will directly impact a small number of specimens of Slaty Red Gum) and Drooping Red Gum. Specimens of Small-flowered Grevillea and Pine Donkey Orchid were recorded within the existing easement and are not required to be impacted by the proposal. However, these flora species may potentially be inadvertently impacted during the construction of the subtransmission line. Considerations under Section 7.3 of the BC Act (2016) found the REZ is unlikely to significantly affect the life cycle of any of these flora species or place any viable local populations of these species at risk of extinction.

Threatened fauna species listed under the state BC Act 2016
Three threatened fauna species were recorded during fieldwork. These species were:

- *Pomatostomus temporalis* subsp. *temporalis* (Grey-crowned Babbler);
- *Climacteris picumnus victoriae* (Brown Treecreeper);
- *Haliaeetus leucogaster* (White-bellied Sea-Eagle).

The proposal will impact suitable habitat for the Grey-crowned Babbler and Brown Treecreeper. A small number of Grey-crowned Babbler nests/roosts may also be impacted. No suitable habitat is likely to be impacted for *Haliaeetus leucogaster* (White-bellied Sea-Eagle). *Delma vescolineata* (Hunter Valley Delma) has been recorded in 2024 within the neighbouring property to the west of the Muswellbrook proposed STS within similar habitat (Wildthing Environmental Consultants, 2024). According to the BioNet Atlas records (DPE, 2024), *D. vescolineata* has also been found within close proximity to the Muswellbrook STS. Taking this into consideration it is highly likely that *D. vescolineata* would utilise habitat within the impact area of the Muswellbrook STS. Considerations under Section 7.3 of the BC Act (2016) found the REZ is unlikely to significantly affect the life cycle of any of these fauna species or place any viable local populations of these species at risk of extinction.

Commonwealth Environment Protection and Biodiversity Conservation Act 1999 & Matters of National Environmental Significance
Three Nationally Listed Threatened Ecological Communities were identified within the REZ:

- Kurri sand swamp woodland of the Sydney Basin bioregion;
- Central Hunter Valley eucalypt forest and woodland;

- Swamp Oak Floodplain Forest;
- White Box – Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland

Three Nationally threatened flora species were recorded during fieldwork:
Eucalyptus glaucina (Slaty Red Gum)
Eucalyptus parramattensis subsp. *decadens* (Drooping Red Gum)
Grevillea parviflora subsp. *parviflora* (Small-flowered Grevillea)

One Nationally threatened fauna species *Climacteris picumnus victoriae* (Brown Treecreeper) was recorded within the REZ land.

It was determined the REZ is unlikely to have a significant impact on any of these nationally listed threatened communities or species therefore a referral is unlikely to be required.

Impacts of the proposed REZ
The proposal will result in the following direct and potential impacts/losses:

- Impact to areas of native vegetation along the 132kV subtransmission line largely in the form of branch trimming and less frequent tree removal within 11 Plant Community Types (PCT's):
  - PCT 3630 Kurri Sand Heathy Woodland
  - PCT 3433 Hunter Coast Foothills Spotted Gum-Ironbark Forest
  - PCT 3634 Quorrobolong Sand Flats Forest
  - PCT 3444 Lower Hunter Spotted Gum-Ironbark Forest
  - PCT 3446 Lower North Foothills Spotted Gum-Ironbark Grassy Forest
  - PCT 4023 Coastal Valleys Riparian Forest
  - PCT 3315 Central Hunter Ironbark-Spotted Gum Forest
  - PCT 4015 Central Hunter Swamp Oak Riparian Forest
  - PCT 4073 Lower North Hinterland River Oak Forest
  - PCT 3431 Central Hunter Ironbark Grassy Woodland
  - PCT 3525 Upper Hunter Box-Blakely's Red Gum Grassy Forest
- Impact to 0.2ha of PCT 3630 Kurri Sand Heathy Woodland for approximately 150m new section of easement between the Kurri STS and Hunter Expressway;
- Impact to 2.7ha of PCT 3431 Central Hunter Ironbark Grassy Woodland for the upgrade of the Muswellbrook STS. The 2.7ha of PCT 3431 is composed of 1.55ha of woodland with 1.22ha of derived native grassland.
- Impact to 7 Ecological Communities listed under the BC Act 2016:
  - Kurri Sand Swamp Woodland in the Sydney Basin Bioregion;
  - Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW;
  - Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions;
  - Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions;
  - Central Hunter Grey Box – Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions
  - Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East;
  - White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland
- Impact to 3 Nationally Listed Threatened Ecological Communities:
  - Kurri sand swamp woodland of the Sydney Basin bioregion;
  - Central Hunter Valley eucalypt forest and woodland;
  - Swamp Oak Floodplain Forest;
  - White Box – Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland
- Impact up to 32 specimens of the state and nationally threatened *Eucalyptus parramattensis* subsp. *decadens* (Drooping Red Gum);
- Impact to a small number of specimens of *Eucalyptus glaucina* (Slaty Red Gum), a state and nationally threatened species;

- Impact to up 24 significant (larger trees) including up to 24 hollow-bearing trees;
- Impacts to habitat for the BC Act listed species threatened fauna species *Pomatostomus temporalis* subsp. *temporalis* (Grey-crowned Babbler);
- Impacts to habitat for the BC Act listed species threatened fauna species *Haliaeetus leucogaster* (White-bellied Sea-Eagle);
- Impacts to the BC Act 2026 & national EPBC Act 1999 listed species *Climacteris picumnus victoriae* (Brown Treecreeper);
- Removal/modification of a suitable habitat for a number of the addressed threatened flora and fauna species;

A number of mitigation measures have been specified to minimise the impact of the proposal and to protect biodiversity values.

In conclusion, the proposal will result in a small incremental impact to native vegetation and habitat for a number of threatened species. Given the mitigation measures the proposal is unlikely to disrupt the life cycle of any addressed threatened species, endangered population or endangered ecological community such that local extinction would occur.

CONTENTS

LIST OF APPENDICES

Acronyms and Abbreviations used in this report

AOBV	Area of outstanding Biodiversity Value
BAAS	Biodiversity Assessors Accreditation System
BAM	Biodiversity Assessment Method
BAMC	Biodiversity Assessment Method Calculator
BAR	Biodiversity Assessment Report
BC Act	Biodiversity Conservation Act 2016
BDAR	Biodiversity Development Assessment Report
BOAMS	Biodiversity Offsets and Agreement Management System
BOS	Biodiversity Offset Scheme
BOSET	Biodiversity Offsets Scheme Entry Tool
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DPE	Department of Planning and Environment (NSW)
EEC	Endangered Ecological Community
EPBC Act	Environmental Protection & Biodiversity Conservation Act 1999
EP&A Act	Environmental Planning & Assessment Act 1979
IBRA	Interim Biogeographic Regionalisation for Australia
LGA	Local Government Area
LLS Act	Local Land Services Act 2013
NES	Matters of National Significance under the EPBC Act
NPW Act	National Parks & Wildlife Act 1974
OEH	Office of Environment & Heritage (now DPE)
PCT	Plant Community Type
PMST	Protected Matters Search Tool
SAII	Serious and Irreversible Impacts
SEPP	State Environmental Planning Policy
REZ	Renewable Energy Zone
SP	Single Pole
TEC	Threatened Ecological Community

1.0 INTRODUCTION

Flora, fauna and habitat studies have been undertaken for Ausgrids Hunter REZ Project. The investigations were in accordance with the requirements of the *Environmental Planning and Assessment Amendment Act 2017* (EP&A Act 2017), the *Biodiversity Conservation Act 2016* (BC Act 2016) and the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999). The results are presented here in the form of an Ecological Assessment.

1.1 THE PROPOSAL

The NSW energy system is undergoing a major transformation to transition its reliance on coal-fired power to renewable energy. By 2040, the remaining four of NSW's coal-fired generators will have been retired, while increasingly higher demand for electricity will be required.

The construction of new and upgraded network infrastructure is required to ensure energy can be transferred from Renewable Energy Zones (REZs) to major load centres in NSW. The Hunter and Central Coast REZ (HCC REZ) was formally declared on 9 December 2022 and comprises a specified geographical area which lies within the Ausgrid distribution network. EnergyCo as the infrastructure planner has nominated that planned, new and existing network infrastructure with the geographical area is specified as REZ infrastructure.

The HCC REZ is expected to accommodate renewable energy generation and storage projects, and become a hub for low-emission industrial development in the region. EnergyCo conducted an initial engagement process with industry regarding the potential investment in renewable generation and storage projects in the HCC REZ. From this, an intended network capacity of 1GW has been identified for HCC REZ.

The REZ proposal will be completed in Stages:

Stage 1: A proposed dual circuit high capacity 132kV subtransmission lines ~60km between the existing Singleton and Kurri Sub-Transmission Substations (STS's). This will include pole replacements, access track works and vegetation clearing. This stage also includes upgrades at Singleton and Kurri STSs. The 132kV subtransmission line will be almost entirely located within Ausgrids existing maintained easement. Depending on the width of the required easement (either 20 or 45m) some areas of native vegetation along the edge of the easement will be impacted. In most cases only minor branch trimming will be required. Less frequently tree removal will be required.

Stage 2:

A proposed dual circuit high capacity 132kV subtransmission line (~25km) between the proposed Eastern Hub 132kV Switching Station located on the northern side of Lake Liddell to the existing Singleton STS.

Rearrangement of Ausgrid's existing Upper Hunter subtransmission network to provide connection between an existing subtransmission line known as 95U, which ultimately will connect to Eastern Hub SS and Ausgrid's existing Muswellbrook STS. The subtransmission line (~5km) will be almost entirely located within Ausgrids existing maintained easement. Some branch trimming and the removal of a small number of trees will likely be required.

The location of the Hunter REZ Project is shown in Figure 1.1.

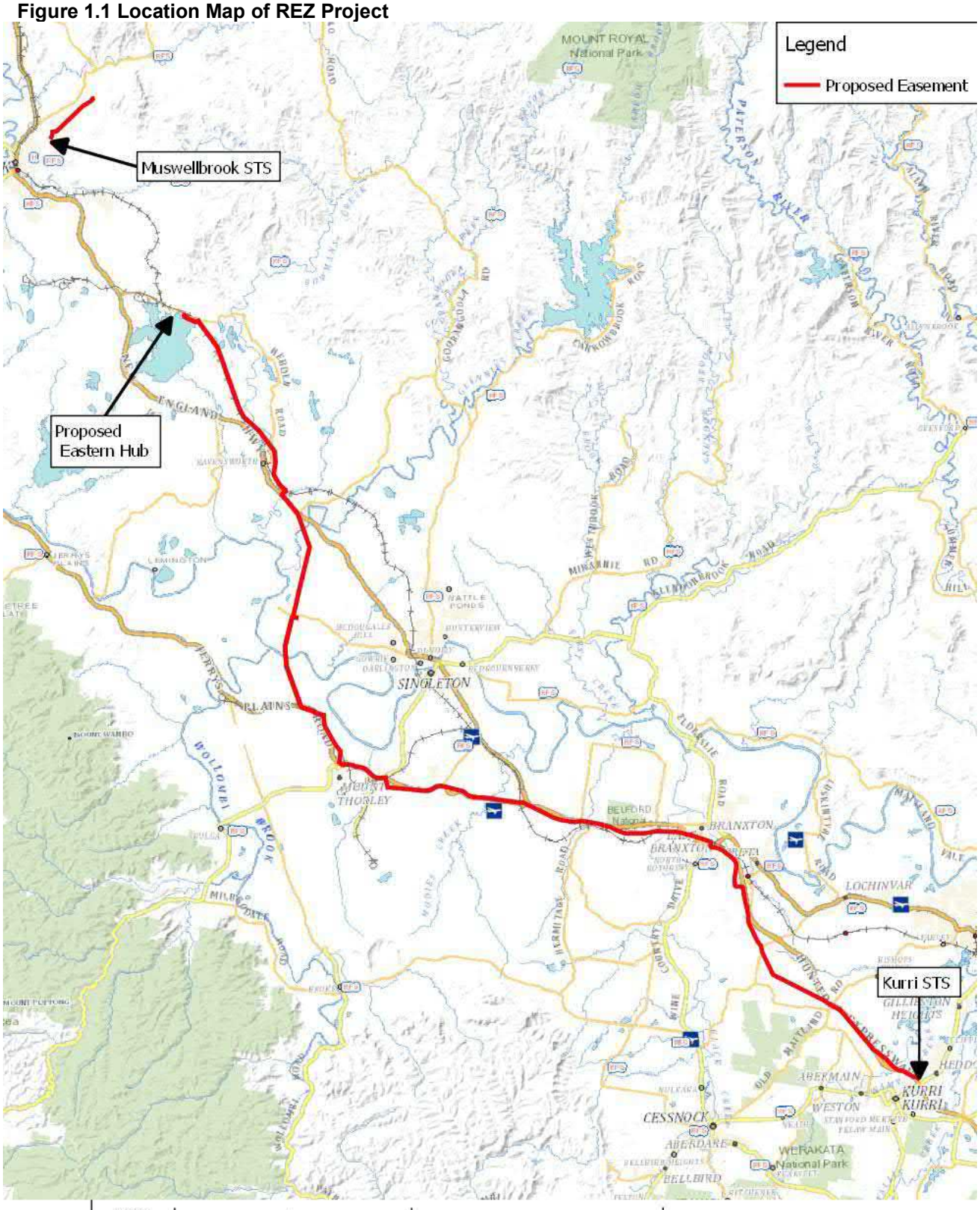
2.0 SUBJECT LAND CONTEXT

The REZ project is located entirely within the Sydney Basin Bioregion and Hunter Sub-bioregion (regions gazetted by the Minister, or an Interim Biogeographical Regionalisation of Australia (IBRA Bioregion). Mitchell Landscapes located within the REZ project are Newcastle Coastal Ramp, Central Hunter Foothills, Central Hunter Alluvial Plains. The REZ project is located within the Cessnock, Singleton and Muswellbrook Local Government Areas (LGA's).

2.1 HYDROGEOGRAPHY

The entire REZ project is located entirely within the greater Hunter River Catchment. The easement crosses a number of minor and major streams including the Hunter River, Gennies and Bowmans Creeks.

Figure 1.1 Location Map of REZ Project



3.0 LEGISLATIVE CONTEXT

The following sections detail the legislative frameworks relevant to this report.

3.1 NSW ENVIRONMENTAL PLANNING AND ASSESSMENT AMENDMENT ACT 2017

The assessment of development applications in NSW are regulated under Part 4 or Part 5 of the EP&A Act. Under Section 110B(1)(a) of the EP&A Act, Ausgrid is both the proponent and determining authority and, as such, acts under Part 5 of the EP&A Act. Section 1.7 of the EP&A Act links proponents to Part 7 of the BC Act for the operation of the EP&A Act in connection with the terrestrial environment. The EP&A Act is also supported by other statutory environmental planning instruments, including State Environmental Planning Policies (SEPPs). The following SEPPs and acts are relevant to this report:

- State Environmental Planning Policy (Biodiversity and Conservation) 2021 (Biodiversity and Conservation SEPP)
- State Environmental Planning Policy (Resilience and Hazards)

3.2 NSW BIODIVERSITY CONSERVATION ACT 2016

The Biodiversity Offsets Scheme (BOS) Entry Test (BOSET) does not apply to Part 5 developments as it does for Part 4. The BOS only applies to Part 5 in the circumstances outlined below:

1. Is the proposed activity to be carried out in an Area of Outstanding Biodiversity Value (AOBV)?
2. Is the proposed activity likely to significantly affect threatened species?

The Review of Environmental Factors (REF), is prescribed by Part 5 of the Environmental Planning and Assessment Act 1979 and Part 8 of the Environmental Planning and Assessment Regulation 2021. As part of the REF, a Test of Significance is undertaken to determine if the activity is likely to harm a threatened species. If the answer is yes to either there are two options as follows:

- Option 1 - Prepare a Species Impact Statement (SIS) in consultation with Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW);

  or

- Option 2 - Opt in to the Biodiversity Offset Scheme (BOS)

The BOS criteria as it applies to Part 5 for the proposal is shown in Table 3.1. A Biodiversity Values Map and Threshold Tool (BMAT) map for the site is shown in Figure 3.1.

3.2.1 SERIOUS AND IRREVERSIBLE IMPACTS

The BC Act imposes various obligations on determining authorities in relation to impacts on biodiversity values that are at risk of a serious and irreversible impact. Under the BC Act, a determination of whether an impact is serious and irreversible must be made in accordance with the principles prescribed in section 6.7 of the BC Regulation 2017. Species and ecological communities (SAII entities) that are likely to be the subject of serious and irreversible impacts are listed on the NSW DCCEEW website (NSW DCCEEW 2025f). No candidate SAII entities were found to be present within the site.

Table 3.1: Criteria for entry into the Biodiversity Offsets Scheme in relation to the proposed development.

CRITERIA FOR ENTRY INTO THE BIODIVERSITY OFFSETS SCHEME (BOS)	SECTION CRITERIA ADDRESSED	ASSESSMENT OF CRITERIA
Development activities that have the potential to impact Areas of Outstanding Biodiversity Value (AOBV) as listed under Part 3 of the BC Act.	Section 7.0	No declared areas of outstanding biodiversity value were located within or in proximity to the site.
Development activities that have the potential to cause a significant impact on a threatened species, population or ecological community, listed under Schedules 1 and 2 of the BC Act, as determined by application of a five-part-test of significance in accordance with Section 7.3 of the BC Act;	Section 7.0	The five-part test found no significant impact on threatened species, populations or ecological communities listed under Schedules 1 and 2 of the BC Act.

3.3 STATE ENVIRONMENTAL PLANNING POLICY (BIODIVERSITY AND CONSERVATION) 2021

The State Environmental Planning Policy (Biodiversity and Conservation) 2021 (Biodiversity and Conservation SEPP) consolidates, transfers and repeals provisions of the following 11 SEPPs (or deemed SEPPs):

1. SEPP (Vegetation in Non-Rural Areas) 2017 (Vegetation SEPP)
2. SEPP (Koala Habitat Protection) 2020 (Koala SEPP 2020)
3. SEPP (Koala Habitat Protection) 2021 (Koala SEPP 2021)
4. Murray Regional Environmental Plan No 2—Riverine Land (Murray REP)
5. SEPP No 19—Bushland in Urban Areas (SEPP 19)
6. SEPP No 50—Canal Estate Development (SEPP 50)
7. SEPP (Sydney Drinking Water Catchment) 2011 (Sydney Drinking Water SEPP)
8. Sydney Regional Environmental Plan No 20 – Hawkesbury – Nepean River (No 2 – 1997) (Hawkesbury–Nepean River SREP)
9. Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (Sydney Harbour Catchment SREP)
10. Greater Metropolitan Regional Environmental Plan No 2 – Georges River Catchment (Georges River REP)
11. Willandra Lakes Regional Environmental Plan No 1 – World Heritage Property (Willandra Lakes REP).

Each consolidated SEPP now makes up a chapter in the SEPP (Biodiversity and Conservation) 2021. The subject land is located within the Mid-Western Regional LGA and is zoned as RU1 and C1. Therefore, the subject land falls under 'Chapter 3 Koala habitat protection' 2020 and 'Chapter 4 Koala habitat protection' 2021 of the SEPP (Biodiversity and Conservation) 2021.

3.3.1 CHAPTER 3 KOALA HABITAT PROTECTION 2020

This Chapter aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline—

- by requiring the preparation of plans of management before development consent can be granted in relation to areas of core koala habitat, and
- by encouraging the identification of areas of core koala habitat, and
- by encouraging the inclusion of areas of core koala habitat in environment protection zones.

This Chapter applies to land use zones RU1, RU2 and RU3 (or an equivalent land use zone) in LGAs specified in the SEPP (Biodiversity and Conservation) 2021, which includes the Mid-Western Regional LGA. This Chapter has been addressed in Section 8.1 of this report.

3.3.2 CHAPTER 4 KOALA HABITAT PROTECTION 2021

This Chapter aims to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current trend of koala population decline.

Land to which Chapter applies

1. This Chapter applies to each local government area listed in Schedule 2.
2. The whole of each local government area is—
    a. in the koala management area specified in Schedule 2 opposite the local government area, or
    b. if more than 1 koala management area is specified, in each of those koala management areas.
3. Despite subsection (1), this Chapter does not apply to—
    a. land dedicated or reserved under the National Parks and Wildlife Act 1974, or acquired under Part 11 of that Act, or
    b. land dedicated under the Forestry Act 2012 as a state forest or a flora reserve, or
    c. land on which biodiversity certification has been conferred, and is in force, under Part 8 of the Biodiversity Conservation Act 2016, or
    d. land in the following land use zones, or an equivalent land use zone, unless the zone is in a local government area marked with an * in Schedule 2:
        i. Zone RU1 Primary Production,
        ii. Zone RU2 Rural Landscape,
        iii. Zone RU3 Forestry.

This Chapter applies to areas of more than one hectare or an area, which has together with any adjoining land in the same ownership an area of more than 1 hectare, whether or not the development application applies to the whole, or only part of the land. The study area constitutes an area over 1ha therefore Chapter 4 applies and has been addressed in Section 8.2 of this report.

3.4 BIOSECURITY ACT 2015

The NSW Biosecurity Act 2015 provides regulatory controls and powers to manage priority weeds in NSW. For weed management this Act divides NSW into regions based on combined LGAs and priority weeds for a region are listed. Some weeds are managed at a state level as they form part of a broader containment strategy. The legislation compliments listed Weeds of National Significance (WoNS).

3.5 COMMONWEALTH ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

The purpose of the EPBC Act is to ensure that actions likely to cause a significant impact on Matters of National Environmental Significance (MNES) undergo a process of assessment. Under the EPBC Act, an action includes a project, undertaking, development or activity that may impact MNES. An action that 'has, will have or is likely to have a significant impact on a MNES' is deemed to be a 'controlled action' and may

not be undertaken without prior approval from the commonwealth minister for the Department of Climate Change, Energy, the Environment and Water (DCCEEW).

MNES categories listed under the EPBC Act are:

- World heritage properties;
- National heritage places;
- Wetlands of international importance (Ramsar wetlands);
- Threatened species and ecological communities (Section 18 and 18A);
- Migratory species;
- Commonwealth marine areas;
- Nuclear actions (including uranium mining); and
- A water resource, in relation to coal seam gas development and large coal mining development.

Initially MNES protected under the EPBC Act are assessed in accordance with the Significant Impact Guidelines 1.1 - Matters of National Environmental Significance (DoE 2013). This is performed to determine if there is likelihood for an action to have a significant impact on MNES. An action will require referral to, and may require the approval of, the commonwealth minister for the Environment (in addition to any local or state government consent or approval) if that action will have, or is likely to have, a significant impact on the environment or on a MNES.

3.6 LICENSING

Fieldwork undertaken by Wildthing Environmental Consultants was carried out under NPWS Scientific Investigation Licence SL100345 and under Animal Care and Ethics Approval: Animal Research Authority Issue by the Department of Primary Industries (Trim File No. 13/251) for Fauna Survey for Biodiversity and Impact Assessment.

4.0 METHODOLOGY

4.1 DESKTOP ASSESSMENT

A site-specific literature and database review was undertaken prior to conducting the field survey and the preparation of this report. A list of the resources reviewed, the date they were accessed and the spatial extent of the search conducted, where relevant, is provided in Table 4.1.

Table 4.1: Desktop Resources

RESOURCE	LAST ACCESS DATE	SPATIAL EXTENT
Biodiversity Values and Landscape Maps		
BioNet Atlas of NSW Wildlife (BioNet) (DPE 2024a)	28 May 2024 5 June 2024 5 November 2024	10x10km radius of subject land
Commonwealth Protected Matters Search Tool (PMST) (DCCEEW 2024a)	5 June 2024	10x10km radius of subject land
NSW Biodiversity Values Map (DPE 2024b)	28 May 2024	Entire subject land
SIX Maps -Base Map - LPI 1:25,000 digital topographic databases (DTDB) (LPI 2024) -Cadastral data LPI digital cadastral database (DCDB) (LPI 2024)	Various dates	Entire subject land
NSW Government SEED Mapping (NSW Government 2024)	Various dates	Entire subject land
BioNet NSW (Mitchell) Landscapes – Version 3.1 (OEH 2016a)	5 November 2024	
NSW Interim Biogeographic Regions of Australia (IBRA region and sub-regions) – Version 7 (DAWE 2016).	5 November 2024	Entire subject land
Threatened Species and Vegetation Databases		
Commonwealth species profiles and threats database (SPRAT) (DCCEEW 2024a)	Various dates	-
DPE Profiles of threatened species, population, and ecological communities (DPE 2024d)	Various dates	-
DPE BioNet vegetation classification database (DPE 2024c)	Various dates	

4.2 FIELD ASSESSMENT

A summary of the time spent on site during fieldwork and the prevailing weather conditions at the time is contained in Table 4.2.

4.2.1 VEGETATION ASSESSMENT

The initial determination of the basic vegetation community boundaries was undertaken through the review of an orthophoto covering the site. Following this, a detailed ground survey was conducted in accordance with the Department of Environment and Conservation's (NSW) Threatened Biodiversity Survey and Assessment Guidelines – Working Draft (Department of Environment and Conservation, 2004). Flora searches were undertaken in the manner described by Cropper (1993) as the 'Random Meander Technique'. This involved walking in a random manner throughout the easement route, particularly within areas of impacted native vegetation.

A list of all flora species identified on site has been provided in Appendix A. Field survey tracks are shown in Figure 4.1.

4.2.2 DIURNAL FAUNA SURVEY

Opportunistic sightings of species and secondary indications (scats, scratches, diggings, tracks etc.) of resident fauna were noted and included:

- Surveys for avifauna;
- Surveys for herpetofauna;
- checks for obvious nests of raptors;
- checking trees (particularly smooth-barked species) for scratches consistent with arboreal mammals.

4.2.3 GENERAL HABITAT FOR NATIVE SPECIES

From the vegetation appraisal, diurnal fauna survey and a general inspection of the site and surrounding areas, a subjective assessment of the general habitat value of this site was made. Considered in this assessment were:

- occurrence of that habitat type in the general vicinity;
- degree of disturbance and degradation;
- area occupied by that habitat on site;
- continuity with similar habitat adjacent to the site, or connection with similar habitat off site by way of corridors; and
- structural and floral diversity.

4.2.4 HABITAT FOR SIGNIFICANT SPECIES

The subject land area was evaluated as potential habitat for each of the threatened species reported on the BioNet (DPE, 2024a) and PMST (DCCEEW, 2024a) databases from within 10km of the site. This evaluation was based on home range, feeding, roosting, breeding, movement patterns and corridor requirements for fauna and hydrology, soil types, aspect and structural formation for flora species. The list of threatened species recorded within these databases is provided within Table 4.3 and an assessment of the likelihood of occurrence of these threatened species within the subject land is provided in Table 5.4.

Table 4.2: Survey Dates, Times and Weather Conditions

DATE	TIME	LOCATIONS	WEATHER
Wednesday 29 May 2024	0800 - 1530	Kurri Kurri STS, Scales Road, Hart Road, Bishops Bridge, Majors Lane	0/8 Cloud, 6.7°C, 700% relative humidity, Wind 6km//hr WNW
Thursday 30 May 2024	8:00 - 1500	Lovedale Road	0/8 Cloud, 9.7°C, 100% relative humidity, Wind 2km//hr ESE
Monday 3 June 2024	0830 - 1630	Vegetation surveys.	0/8 Cloud, 10.6°C, 82% relative humidity, Wind 19km//hr WNW
Tuesday 4 June 2024	0830 - 1630	Lower Belford	7/8 Cloud, 9.7°C, 71% relative humidity, Wind 17km//hr NW
Thursday 6 June 2024	0800 - 1630	From intersection of Golden Highway & New England Highway. Mining buffer land, Long Point	1/8 Cloud, 10.5°C, 93% relative humidity, Wind 4km//hr WSW
Tuesday 11 June 2024	0830 - 1400	Singleton STS, Maison Dieu	2/8 Cloud, 6.7°C, 100% relative humidity, Wind 7km//hr W
Thursday 13 June 2024	0930 - 1500	Singleton Military Base, Bulga Coal Offset	0/8 Cloud, 8.8°C, 60% relative humidity, Wind 19km//hr SSW
Monday 1 July 2024	0830 - 1500	Camberwell, Glennies Creek, Eastern Hub (Muswellbrook)	3/8 Cloud, 10.6°C, 63% relative humidity, Wind 11km//hr SSW
Thursday 22 August 2024	1030 - 1200	Kurri Kurri STS, Hart Road Mapping new easement alignment, Bushfire Assessor also on site.	6/8 Cloud, 17.6°C, 75% relative humidity, Wind 13km//hr NW
Thursday 29 August 2024	0900 - 1430	Muswellbrook STS area & existing easement to the NE.	8/8 Cloud, 15°C, 80% relative humidity, Wind 13km//hr SW
Friday 4 April 2025	1000 - 1130	Western side of Hunter Expressway over from Kurri STS.	0/8 Cloud, 20.5°C, 69% relative humidity, Wind 15km//hr WNW

A detailed methodology for the surveys listed within Table 4.2 above have been described in the following Sections 4.2.1 – 4.2.5:

4.2.5 TREE SURVEY

During the fieldwork, a survey was undertaken to identify significant trees (larger trees and/or those containing hollows or other habitat attributes) which may be impacted by the proposal. Hollow-bearing trees are a habitat resource utilised by a variety of native avifaunal and mammalian species. This resource is usually a limiting factor in the occurrence of hollow-dependent species on a site, due to the time taken for hollows to form in trees. It must be noted that observations made from ground level may fail to record a small number of hollows that are obscured. Some entrances may also not lead to a cavity. The internal dimensions of the hollows are also impossible in many cases to determine from the ground.

4.3 SIGNIFICANT SPECIES

The following threatened species listed in Table 4.3 have been recorded on the BioNet (DPE, 2024a) and PMST (DCCEEW, 2024a) Databases as occurring within 10km of the subject land. Species marked with an asterisk (*) are listed on the DCCEEW Database as having habitat likely to occur within 10km of the subject land.

Table 4.3: Threatened species, endangered populations and ecological communities considered

Scientific Name	Common Name	BC Act 2016	EPBC Act 1999
Flora Species			
**Wollemia nobilis*	Wollemi Pine	E4A	CE
**Caladenia tessellata*	Thick-lipped Spider-orchid	V	V
Corybas dowlingii	Red Helmet Orchid	E1	
**Cryptostylis hunteriana*	Leafless Tongue Orchid	V	V
Diuris pedunculata	Small Snake Orchid	E1	E
Diuris tricolor	Pine Donkey Orchid	V	
Prasophyllum petilum	Tarengo Leek Orchid	E1	E
**Prasophyllum* sp. *Wybong*	A Leek Orchid		CE
Pterostylis chaetophora	Tall Rustyhood	V	
**Pterostylis gibbosa*	Illawarra Greenhood	E1	E
**Rhizanthella slateri*	Eastern Underground Orchid	V	E
**Thelymitra adorata*	Wyong Sun-orchid	E4A	CE
**Dichanthium setosum*	Bluegrass	V	V
**Cynanchum elegans*	White-flowered Wax Plant	E1	E
**Brachyscome brownii*	Brachyscome brownii		CE
**Ozothamnus tesselatus*	Ozothamnus tesselatus	V	V
**Picris evae*	Hawkweed	V	V
**Rutidosis heterogama*	Heath Wrinklewort	V	V
**Lepidium aschersonii*	Spiny Peppercress	V	V
**Tetratheca juncea*	Black-eyed Susan	V	V
**Tylophora linearis (Vincetoxicum forsteri)*		V	E
**Acacia bynoeana*	Bynoe's Wattle	E1	V
Dillwynia tenuifolia		V	
**Swainsona murrayana*	Slender Darling-pea	V	V
**Prostanthera cineolifera*	Singleton Mint Bush	V	V
**Angophora inopina*	Charmhaven Apple	V	V
Callistemon linearifolius	Netted Bottle Brush	V	
Eucalyptus castrensis	Singleton Mallee	E1	
Eucalyptus fracta	Broken Back Ironbark	E1	
**Eucalyptus glaucina*	Slaty Red Gum	V	V
Eucalyptus largeana	Craven Grey Box	E1	E
**Eucalyptus parramattensis* subsp. *decadens*	Drooping Red Gum	V	V
**Eucalyptus pumila*	Pokolbin Mallee	V	V
**Melaleuca biconvexa*	Biconvex Paperbark	V	V
Melaleuca groveana	Grove's Paperbark	V	
**Rhodamnia rubescens*	Scrub Turpentine	E4A	CE
**Rhodomyrtus psidioides*	Native Guava	E4A	CE
**Syzygium paniculatum*	Magenta Lilly Pilly	E1	V
**Euphrasia arguta*		E4A	CE
**Persicaria elatior*	Tall Knotweed	V	V
**Banksia penicillata*			E
**Grevillea parviflora* subsp. *parviflora*	Small-flowered Grevillea	V	V
**Olearia cordata*		V	V
**Persoonia hirsuta*	Hairy Geebung	E1	E
**Persoonia pauciflora*	North Rothbury Persoonia	E4A	CE
**Androcalva procumbens*			V
**Pomaderris brunnea*	Brown Pomaderris	E1	V
Pomaderris queenslandica	Scant Pomaderris	E1	
**Asperula asthenes*	Trailing Woodruff	V	V
**Homoranthus darwinioides*		V	V
**Leionema lamprophyllum* subsp. *fractum*		E4A	CE
**Thesium australe*	Austral Toadflax	V	V

Scientific Name	Common Name	BC Act 2016	EPBC Act 1999
Bertya mollissima	Bertya mollissima	E1	E
Maundia triglochinoides		V	
Zannichellia palustris		E1	
Amphibians			
**Heleioporus australiacus*	Giant Burrowing Frog	V	V
**Litoria aurea*	Green and Golden Bell Frog	E1	V
**Litoria booroolongensis*	Booroolong Frog	E1	E
Litoria brevipalmata	Green-thighed Frog	V	
Litoria littlejohni	Littlejohn's Tree Frog	E1	E
**Mixophyes balbus*	Stuttering Frog	E1	V
**Mixophyes iteratus*	Giant Barred Frog	V	V
Pseudophryne australis	Red-crowned Toadlet	V	
Reptiles			
**Aprasia parapulchella*	Pink-tailed Worm-lizard	V	V
Delma impar	Striped Legless Lizard	V	V
**Delma vescolineata*	Hunter Valley Delma	E1	E
Varanus rosenbergi	Rosenberg's Goanna	V	
**Hoplocephalus bungaroides*	Broad-headed Snake	E1	E
Birds			
**Calidris acuminata*	Sharp-tailed Sandpiper		V & M
**Calidris ferruginea*	Curlew Sandpiper	E4A	CE & M
**Tringa nebularia*	Common Greenshank		E & M
**Numenius madagascariensis*	Eastern Curlew		CE & M
**Charadrius leschenaultii*	Greater Sand-plover	V	V & M
**Gallinago hardwickii*	Latham's Snipe	V	V
**Rostratula australis*	Australian Painted Snipe	E1	E
**Botaurus poiciloptilus*	Australian Bittern	E1	E
Ixobrychus flavicollis	Black Bittern	V	
Ephippiorhynchus asiaticus	Black-necked Stork	E1	
Anseranas semipalmata	Magpie Goose	V	
Oxyura australis	Blue-billed Duck	V	
Stictonetta naevosa	Freckled Duck	V	
Irediparra gallinacea	Comb-crested Jacana	V	
Burhinus grallarius	Bush Stone-curlew	E1	
Turnix maculosus	Red-backed Button-quail	V	
Sternula albifrons	Little Tern	E1	M
Ptilinopus magnificus	Wompoo Fruit-Dove	V	
Ptilinopus regina	Rose-crowned Fruit-Dove	V	
Ptilinopus superbus	Superb Fruit-Dove	V	
**Calyptorhynchus lathami*	Glossy Black-Cockatoo	V	V
**Callocephalon fimbriatum*	Gang Gang Cockatoo	E1	E
**Lathamus discolor*	Swift Parrot	E1	CE
**Neophema chrysostoma*	Blue-winged Parrot	V	V
Neophema pulchella	Turquoise Parrot	V	
**Polytelis swainsonii*	Superb Parrot	V	V
Glossopsitta pusilla	Little Lorikeet	V	
**Aphelocephala leucopsis*	Southern Whiteface	V	V
**Hirundapus caudacutus*	White-throated Needletail	V	V & M
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	
**Pycnoptilus floccosus*	Pilotbird	V	V
Epthianura albifrons	White-fronted Chat	V	
**Melanodryas cucullata cucullata*	Hooded Robin	E1	E
Petroica boodang	Scarlet Robin	V	
Petroica phoenicea	Flame Robin	V	
**Climacteris picumnus victoriae*	Brown Treecreeper	V	V

Scientific Name	Common Name	BC Act 2016	EPBC Act 1999
**Stagonopleura guttata*	Diamond Firetail	V	V
Pomatostomus temporalis subsp. *temporalis*	Grey-crowned Babbler	V	
Chthonicola sagittata	Speckled Warbler	V	
**Anthochaera phrygia*	Regent Honeyeater	E4A	CE
Certhionyx variegatus	Pied Honeyeater	V	
**Grantiella picta*	Painted Honeyeater	V	V
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	V	
Daphoenositta chrysoptera	Varied Sittella	V	
Circus assimilis	Spotted Harrier	V	
Pandion cristatus	Eastern Osprey	V	
Lophoictinia isura	Square-tailed Kite	V	
**Erythrotriorchis radiatus*	Red Goshawk	E1	E
Hieraaetus morphnoides	Little Eagle	V	
Haliaeetus leucogaster	White-bellied Sea Eagle	V	M
Hamirostra melanosternon	Black-breasted Buzzard	V	
**Falco hypoleucos*	Grey Falcon	V	V
Falco subniger	Black Falcon	V	
Ninox connivens	Barking Owl	V	
Ninox strenua	Powerful Owl	V	
Tyto longimembris	Eastern Grass Owl	V	
Tyto novaehollandiae	Masked Owl	V	
Tyto tenebricosa	Sooty Owl	V	
Mammals			
**Dasyurus maculatus maculatus*	Spotted-tailed Quoll	V	E
Phascogale tapoatafa	Brush-tailed Phascogale	V	
**Phascolarctos cinereus*	Koala	E1	E
**Petrogale penicillata*	Brush-tailed Rock-wallaby	E1	V
**Notamacropus parma*	Parma Wallaby	V	V
**Potorous tridactylus tridactylus*	Long-nosed Potoroo		V
Cercartetus nanus	Eastern Pygmy-possum	V	
**Petaurus australis*	Yellow-bellied Glider	V	V
Petaurus norfolcensis	Squirrel Glider	V	
**Petauroides volans*	Greater Glider	E1	E
**Pseudomys novaehollandiae*	New Holland Mouse		V
Pseudomys oralis	Hastings River Mouse	E1	E
**Pteropus poliocephalus*	Grey-headed Flying-fox	V	V
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	
Micronomus norfolkensis	Eastern Freetail-bat	V	
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	
Miniopterus australis	Little Bentwing-bat	V	
Miniopterus orianae oceanensis	Large Bentwing-bat	V	
Myotis macropus	Southern Myotis	V	
**Nyctophilus corbeni*	Corben's Long-eared Bat	V	V
Scoteanax rueppellii	Greater Broad-nosed Bat	V	
**Chalinolobus dwyeri*	Large Pied Bat	E1	E
Vespadelus troughtoni	Eastern Cave Bat	V	
Endangered Populations			
Acacia pendula (Weeping Myall) – population in the Hunter Catchment		E2	
Cymbidium canaliculatum population in the Hunter Catchment		E2	
Diuris tricolor (Pine Donkey Orchid) population in the Muswellbrook local government area		E2	
Eucalyptus camaldulensis (River Red Gum) – population in the Hunter Catchment		E2	
Leionema lamprophyllum subsp. *obovatum* in the Hunter Catchment		E2	

Scientific Name	Common Name	BC Act 2016	EPBC Act 1999
Spyridium burragorang – in the Cessnock local government area		E2	
Endangered Ecological Communities			
Central Hunter Grey Box-Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions		E3	
Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions		E3	
Central Hunter Valley eucalypt forest and woodland			CE
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions			E
Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E3	
Hunter Floodplain Red Gum Woodland in the NSW North Coast and Sydney Basin Bioregions		E3	
Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions		E3	
Hunter Valley Footslopes Slaty Gum Woodland in the Sydney Basin Bioregion		V2	
Hunter Valley Vine Thicket in the NSW North Coast and Sydney Basin Bioregions		E3	
Hunter Valley Weeping Myall (Acacia pendula) Woodland			CE
Hunter Valley Weeping Myall Woodland in the Sydney Basin Bioregion		E4B	
Kurri Sand Swamp Woodland in the Sydney Basin Bioregion		E3	
Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions		E3	
Lower Hunter Valley Dry Rainforest in the Sydney Basin and NSW North Coast Bioregions		V2	
Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions		E3	
Lowland Rainforest of Subtropical Australia			CE
Lowland Rainforest on Floodplain in the New South Wales North Coast Bioregion		E3	
Quorrobolong Scribbly Gum Woodland in the Sydney Basin Bioregion		E3	
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria			CE
River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E3	
Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregion		E3	
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions			E
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E3	
Sydney Freshwater Wetlands in the Sydney Basin Bioregion		E3	
Warkworth Sands Woodland in the Sydney Basin Bioregion		E3	
Warkworth Sands Woodland of the Hunter Valley			CE
Weeping Myall Woodlands		E	
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and		E4B	
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland			CE

E1/E=Endangered Species E2=Endangered Population E3=Endangered Ecological Community
V=Vulnerable Species V2= Vulnerable Ecological Community E4A/E4B/CE=Critically Endangered
M=Migratory Species

5.0 RESULTS

5.1 FLORA ASSEMBLAGES

Vegetation within the REZ Project area ranged from highly disturbed land that had been historically cleared and subject to prolonged grazing and coal mining impacts to areas of woodland and open forest that were relatively intact. Most of the vegetation within the required 132kV transmission line easement was contained within the existing Ausgrid easement and had been keep low to the ground by routine maintenance. The required easement for the 132kV transmission line will require some additional impacts in certain areas. These impacts are mostly in the form of tree branch trimming to widen the easement; however, some tree removal will be required. Areas impacted by the Muswellbrook STS upgrade and new sections of easement such as an area between the Kurri STS and Hunter Expressway will require removal of native vegetation.

The vegetation assemblages along the HEZ were stratified where possible by assigning the vegetation to Plant Community Types (PCTs) detailed in the NSW Vegetation Information System (VIS) classification database. A total of 11 Plant Community Types were identified: these were:

- 01. PCT 3630 Kurri Sand Heathy Woodland
- 02. PCT 3433 Hunter Coast Foothills Spotted Gum-Ironbark Forest
- 03. PCT 3634 Quorrobolong Sand Flats Forest
- 04. PCT 3444 Lower Hunter Spotted Gum-Ironbark Forest
- 05. PCT 3446 Lower North Foothills Spotted Gum-Ironbark Grassy Forest
- 06. PCT 4023 Coastal Valleys Riparian Forest
- 07. PCT 3315 Central Hunter Ironbark-Spotted Gum Forest
- 08. PCT 4015 Central Hunter Swamp Oak Riparian Forest
- 09. PCT 4073 Lower North Hinterland River Oak Forest
- 10. PCT 3431 Central Hunter Ironbark Grassy Woodland
- 11. PCT 3525 Upper Hunter Box-Blakely's Red Gum Grassy Forest

These PCT's within the REZ varying conditions from derived grassland to open forest. A description of each PCT has been given in Tables 5.1 – 5.11. The vegetation assemblages have been mapped and are shown in Appendix B. A full list of the flora species recorded during the fieldwork is listed in Appendix C.

Table 5.1 PCT 3630 Kurri Sand Heathy Woodland

PCT 3630 Kurri Sand Heathy Woodland	
PCT ID	PCT 3630
PCT name	Kurri Sand Heathy Woodland
Vegetation Formation	Dry Sclerophyll Forests (Shrubby sub-formation)
Vegetation Class	Sydney Sand Flats Dry Sclerophyll Forests
Per cent cleared value (%)	58.04
Extent of PCT within REZ	This community was present between the Kurri Kurri STS and the Hunter Expressway and North-west from Hart Road.
Description of PCT 3631 within the subject land	Common canopy species were *Eucalyptus parramattensis* subsp. *decadens* (Drooping Red Gum) and *Angophora bakeri* (Narrow-leaved Apple). Common shrub species were *Melaleuca nodosa* (Ball-Honeymyrtle), *Daviesia ulicifolia*, *Acacia longifolia* (Sydney Golden Wattle), *Lissanthe strigosa*, *Grevillea montana* and *Grevillea parviflora* subsp. *parviflora*.
Condition States	Between the Kurri STS and the Hunter Expressway there is no existing easement. This area of Kurri Sand Heathy Woodland has been subject to previous disturbance with areas of this EEC highly modified to relatively intact. Between Hart Road and the Hunter Expressway this EEC occurs within an existing easement and is composed of low maintained grown covers with a moderate diversity. Better quality areas of Kurri Sand Heathy Woodland occur either side of the easement.

PCT 3630 Kurri Sand Heathy Woodland	
BC Act Status	Kurri Sand Swamp Woodland in the Sydney Basin Bioregion
EPBC Act Status	Kurri sand swamp woodland of the Sydney Basin bioregion

Plate 01: PCT 3630 Kurri Sand Heathy Woodland between Kurri STS and the Hunter Expressway.

Plate 02: PCT 3630 Kurri Sand Heathy Woodland (West of Hart Road)

PCT 3630 Kurri Sand Heathy Woodland

Plate 03: PCT 3630 Kurri Sand Heathy Woodland (West of Hart Road)

Table 5.2 PCT 3433 Hunter Coast Foothills Spotted Gum-Ironbark Forest

PCT 3433 Hunter Coast Foothills Spotted Gum-Ironbark Forest	
PCT ID	PCT 3433
PCT name	Hunter Coast Foothills Spotted Gum-Ironbark Forest
Vegetation Formation	Dry Sclerophyll Forests (Shrubby sub-formation)
Vegetation Class	Hunter-Macleay Dry Sclerophyll Forest
Per cent cleared value (%)	68.60
Extent of PCT within REZ	Sections of PCT 3433 were present along the Hunter Expressway near Kurri Kurri, NW of Harts Road.
Description of PCT 3433 within the REZ	The dominant canopy species were *Corymbia maculata* (Spotted Gum) and *Eucalyptus fibrosa* (Broad-leaved Ironbark). Common shrub species were *Melaleuca nodosa* (Ball-Honeymyrtle), *Daviesia ulicifolia*, *Acacia longifolia* (Sydney Golden Wattle), *Bursaria spinosa* (Blackthorn) and *Dillwynia retorta* (Heathy Parrot Pea).
Condition States	PCT 3433 was found in a variety of condition states. Areas of PCT are largely located along the existing easement with canopy species present along the edge of the easement and derived native low groundcovers within the easement.
BC Act Status	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions
EPBC Act Status	

PCT 3433 Hunter Coast Foothills Spotted Gum-Ironbark Forest

Plate 04: PCT 3433 Hunter Coast Foothills Spotted Gum-Ironbark Forest just NW of Hart Road.

Plate 05: PCT 3433 Hunter Coast Foothills Spotted Gum-Ironbark Forest just NW of Hart Road.

Table 5.3 PCT 3634 Quorrobolong Sand Flats Forest

PCT 3634 Quorrobolong Sand Flats Forest	
PCT ID	PCT 3634
PCT name	Quorrobolong Sand Flats Forest
Vegetation Formation	Dry Sclerophyll Forests (Shrubby sub-formation)
Vegetation Class	Sydney Sand Flats Dry Sclerophyll Forests
Per cent cleared value (%)	78.12
Extent of PCT within REZ	PCT 3634 Quorrobolong Sand Flats Forest was present along Scales Road at Loxford. **Points 6-13.**
Description of PCT 3634 within the REZ	Common canopy species were *Angophora floribunda* (Rough-barked Apple), *Eucalyptus punctata* (Grey Gum) and *Eucalyptus tereticornis* (Forest Red Gum). Native shrub species present were *Melaleuca nodosa*, *Acacia parvipinnula, Acacia longifolia, Acacia ulicifolia, Breynia oblongifolia Persoonia linearis* and *Bursaria spinosa*. Common native ground covers were *Imperata cylindrica* (Blady Grass), *Microlaena stipoides* (Weeping Meadow Grass), *Lomandra longifolia*, *Pteridium esculentum* (Bracken) and Cheilanthes sieberi (Mulga Fern). Common introduced species were *Lantana camara* (Lantana), *Anthoxanthum odoratum* (Sweet Vernal Grass), *Hyparrhenia hirta* (Coolatai Grass), Coreopsis lanceolata (Coreopsis) and *Ambrosia artemisiifolia* (Annual Ragweed).
Condition States	PCT within the REZ varying conditions from derived grassland to open forest.
BC Act Status	Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions
EPBC Act Status	NA

Plate 06: PCT 3634 Quorrobolong Sand Flats Forest along Scales Road, Loxford.

PCT 3634 Quorrobolong Sand Flats Forest

Plate 07: PCT 3634 Quorrobolong Sand Flats Forest along Scales Road, Loxford.

Table 5.4 PCT 3444 Lower Hunter Spotted Gum-Ironbark Forest

PCT 3444 Lower Hunter Spotted Gum-Ironbark Forest	
PCT ID	PCT 3444
PCT name	Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest
Vegetation Formation	Dry Sclerophyll Forests (Shrubby sub-formation)
Vegetation Class	Hunter-Macleay Dry Sclerophyll Forest
Per cent cleared value (%)	62.33
Extent of PCT within REZ	East of Old Maitland Road.
Description of PCT 3631 within the subject land	The dominant canopy species were *Corymbia maculata* (Spotted Gum) and *Eucalyptus fibrosa* (Broad-leaved Ironbark). Common shrub species were *Melaleuca nodosa* (Ball-Honeymyrtle), *Melaleuca nodosa*, *Melaleuca stypheloides*, *Acacia parvipinnula, Acacia longifolia, Acacia ulicifolia, Bursaria spinosa, Breynia oblongifolia* and *Persoonia linearis.* Groundcovers Aristida vagans, Entolasia stricta,
Condition States	
BC Act Status	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions
EPBC Act Status	NA

PCT 3444 Lower Hunter Spotted Gum-Ironbark Forest

Plate 08: PCT 3444 Lower Hunter Spotted Gum-Ironbark Forest (east of Old Maitland Road) (Point 16).

Table 5.5 PCT 3446 Lower North Foothills Ironbark-Box-Gum Grassy Forest

PCT 3446 Lower North Foothills Ironbark-Box-Gum Grassy Forest	
PCT ID	PCT 3446
PCT name	Lower North Foothills Ironbark-Box-Gum Grassy Forest
Vegetation Formation	Dry Sclerophyll Forests (Shrubby sub-formation)
Vegetation Class	Hunter-Macleay Dry Sclerophyll Forest
Per cent cleared value (%)	74.93
Extent of PCT within REZ	Point 26
Description of PCT 3631 within the subject land	The dominant canopy species were *Corymbia maculata* (Spotted Gum), *Eucalyptus crebra* (Narrow-leaved Ironbark), *Eucalyptus moluccana* (Grey Box) and *Eucalyptus tereticornis* (Forest Red Gum). Shrub species were *Acacia falcata, Acacia implexa, Breynia oblongifolia, Leucopogon juniperinus* and *Persoonia linearis.* Common native ground covers were *Cymbopogon refractus, Lobelia purpurascens, Cheilanthes sieberi subsp. sieberi Themeda triandra, Microlaena stipoides, Dichondra repens* and *Lomandra multiflora subsp. multiflora*
Condition States	
BC Act Status	Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions
EPBC Act Status	Central Hunter Valley eucalypt forest and woodland

PCT 3446 Lower North Foothills Ironbark-Box-Gum Grassy Forest

Plate 09: PCT 3446 Lower North Foothills Ironbark-Box-Gum Grassy Forest (Point 26).

Table 5.6 PCT 4023 Coastal Valley Riparian Forest

PCT 4023 Coastal Valley Riparian Forest	
PCT ID	PCT 4023
PCT name	Coastal Valley Riparian Forest
Vegetation Formation	Forested Wetlands
Vegetation Class	Coastal Floodplain Wetlands
Per cent cleared value (%)	78.22
Extent of PCT within REZ	Found adjacent to drainage lines such as Black Creek & Jump up Creek at Belford.
Description of PCT 4023 within the subject land	*Casuarina glauca* (Swamp Oak) was the dominant canopy species. Included other canopy species *Eucalyptus tereticornis* (Forest Red Gum) and *Eucalyptus moluccana* (Grey Box). Common native ground covers were *Microlaena stipoides* (Weeping Meadow Grass), *Cynodon dactylon* (Couch), *Austrostipa verticillata*, *Dichondra repens* (Kidney Weed) *Lomandra longifolia* and *Lobelia purpurescens*. Common introduced species were *Cardiospermum grandiflorum* (Balloon Vine), *Tradescantia fluminensis* (Trad).
Condition States	
BC Act Status	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
EPBC Act Status	Swamp Oak Floodplain Forest

PCT 4023 Coastal Valley Riparian Forest

Plate 10: PCT 4023 Coastal Valley Riparian Forest (Black Creek crossing) (Point 90).

Plate 11: PCT 4023 Coastal Valley Riparian Forest (Jump up Creek crossing) (Point 118).

Table 5.6 PCT 4023 Coastal Valley Riparian Forest

PCT 4039 Hunter Range Creekflat Apple-Red Gum Forest	
PCT ID	PCT 4023
PCT name	Coastal Valley Riparian Forest
Vegetation Formation	Forested Wetlands
Vegetation Class	Coastal Floodplain Wetlands
Per cent cleared value (%)	78.22
Extent of PCT within REZ	Found adjacent to drainage lines such as Black Creek & Jump up Creek at Belford.
Description of PCT 4023 within the subject land	*Casuarina glauca* (Swamp Oak) was the dominant canopy species. Included other canopy species *Eucalyptus tereticornis* (Forest Red Gum) and *Eucalyptus moluccana* (Grey Box). Common native ground covers were *Microlaena stipoides* (Weeping Meadow Grass), *Cynodon dactylon* (Couch), *Austrostipa verticillata*, *Dichondra repens* (Kidney Weed) *Lomandra longifolia* and *Lobelia purpurescens*. Common introduced species were *Cardiospermum grandiflorum* (Balloon Vine), *Tradescantia fluminensis* (Trad).
Condition States	
BC Act Status	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
EPBC Act Status	Swamp Oak Floodplain Forest

Plate 10: PCT 4023 Coastal Valley Riparian Forest (Black Creek crossing) (Point 90).

PCT 4039 Hunter Range Creekflat Apple-Red Gum Forest

Plate 11: PCT 4023 Coastal Valley Riparian Forest (Jump up Creek crossing) (Point 118).

Table 5.7 PCT 3315 Central Hunter Ironbark-Spotted Gum Forest

PCT 3315 Central Hunter Ironbark-Spotted Gum Forest	
PCT ID	PCT 3315
PCT name	Central Hunter Ironbark-Spotted Gum Forest
Vegetation Formation	Grassy Woodlands
Vegetation Class	Coastal Valley Grassy Woodlands
Per cent cleared value (%)	77.70
Extent of PCT within REZ	Lower Belford
Description of PCT 3315 within the subject land	Canopy species were *Corymbia maculata* (Spotted Gum) *Eucalyptus crebra* (Narrow-leaved Ironbark), Eucalyptus moluccana (Grey Box) and *Eucalyptus fibrosa* (Broad-leaved Ironbark), *Eucalyptus tereticornis* (Forest Red Gum) *Allocasuarina luehmannii* (Bulloak) was a common mid storey species. Common shrub species were *Acacia parvipinnula, Acacia falcata, Melaleuca decora, Melaleuca nodosa, Persoonia linearis, Grevillea montana, Lissanthe strigosa, Daviesia ulicifolia, Breynia oblongifolia, Melichrus urceolatus, Hibbertia pedunculata, Phylanthus hirtellus* Common groundcovers were *Cymbopogon refractus, Aristida racemosa, Aristida vagans, Lomandra multiflora subsp. multiflora, Cheilanthes sieberi subsp. sieberi and Dianella revoluta.*
Condition States	
BC Act Status	Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions
EPBC Act Status	Central Hunter Valley Eucalypt Forest and Woodland

PCT 3315 Central Hunter Ironbark-Spotted Gum Forest

Plate 12: PCT 3315 Central Hunter Ironbark-Spotted Gum Forest (Point 69)

Plate 13: PCT 3315 Central Hunter Ironbark-Spotted Gum Forest (Point 44)

PCT 3315 Central Hunter Ironbark-Spotted Gum Forest

Plate 14: PCT 3315 Central Hunter Ironbark-Spotted Gum Forest (Point 85)

Table 5.8 PCT 4015 Central Hunter Riparian Forest

PCT 4015 Central Hunter Riparian Forest	
PCT ID	PCT 4015
PCT name	Coastal Valley Riparian Forest
Vegetation Formation	Forested Wetlands
Vegetation Class	Coastal Floodplain Wetlands
Per cent cleared value (%)	87.87
Extent of PCT within REZ	Found adjacent to drainage lines near the Singleton Army Base. Points 145, 146 Muds Creek Crossing.
Description of PCT 4015 within the subject land	*Casuarina glauca* (Swamp Oak) was the dominant canopy species. Very little mid stratum was present. Native ground covers were *Austrostipa verticillata*, *Microlaena stipoides* (Weeping Meadow Grass), *Cynodon dactylon* (Couch) and *Lobelia purpurascens* (White Root). The invasive climber *Anredera cordifolia* (Madeira Vine) was very common at the Muds Creek crossing.
Condition States	
BC Act Status	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
EPBC Act Status	Swamp Oak Floodplain Forest

PCT 4015 Central Hunter Riparian Forest


Plate 15: PCT 4015 Central Hunter Riparian Forest (Muds Creek Golden Highway) (Point 145)

Table 5.9 PCT 4073 Lower North Hinterland River Oak Forest

PCT 4015 Central Hunter Riparian Forest	
PCT ID	PCT 4073
PCT name	Coastal Valley Riparian Forest
Vegetation Formation	Forested Wetlands
Vegetation Class	Eastern Riverine Forests
Per cent cleared value (%)	80.40
Extent of PCT within REZ	Found along Bowmans and Glennies Creek crossings.
Description of PCT 4073 within the subject land	*Casuarina cunninghamiana subsp. cunninghamiana* (River Oak) was the dominant canopy species. Other native tree species included Casuarina glauca (Swamp Oak), *Melia azedarach* (White Cedar), *Angophora floribunda* (Rough-barked Apple). Native ground covers were *Austrostipa verticillata*, *Microlaena stipoides* (Weeping Meadow Grass) and *Cynodon dactylon* (Couch), *Lomandra longifolia* and Lobelia purpurascens (White Root). Common introduced flora species were *Cestrum parqui* (Green Cestrum), *Ricinus communis* (Castor Oil Plant), *Lycium ferocissimum* (African Boxthorn), *Galium aparine* (Clevers), *Bidens pilosa* (Bidens).
Condition States	
BC Act Status	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
EPBC Act Status	Swamp Oak Floodplain Forest

PCT 4015 Central Hunter Riparian Forest

Plate 16: PCT 4073 Lower North Hinterland River Oak Forest Glennies Creek crossing (Point 190)

Plate 17: PCT 4073 Lower North Hinterland River Oak Forest (Point 194)

PCT 4015 Central Hunter Riparian Forest

Plate 18: PCT 4073 Lower North Hinterland River Oak Forest (Bowmans Creek) (Point 223)

Plate 19: PCT 4073 Lower North Hinterland River Oak Forest (Bowmans Creek) (Point 225)

Table 5.10 PCT 3431 Central Hunter Ironbark Grassy Woodland

PCT 3431Central Hunter Ironbark Grassy Woodland	
PCT ID	PCT 3431
PCT name	Central Hunter Ironbark Grassy Woodland
Vegetation Formation	Dry Sclerophyll Forests (Shrub/grass sub-formation)
Vegetation Class	Hunter-Macleay Dry Sclerophyll Forests
Per cent cleared value (%)	86.47
Extent of PCT within REZ	In and around the Muswellbrook STS and existing easement to the NE.
Description of PCT 3431 within the subject land	Areas of native vegetation within and around the proposed Muswellbrook STS and along the existing easement east to the north-east were consistent with PCT 3431 Central Hunter Ironbark Grassy Woodland. Areas of this PCT have been subject to historic native vegetation clearance and past agricultural practices particularly cattle grazing and the construction of the existing easement. A large portion of PCT 3431 within the existing easement and parts of the proposed STS was composed of a derived grassland variation of this PCT. Other areas were composed of more concentrated remnant trees and regrowth trees. *Eucalyptus crebra* (Narrow-leaved Ironbark) was the dominant canopy species. A small number of specimens of *Eucalyptus moluccana* (Grey Box) were also noted outside the impact areas. Mid-storey species were largely absent. A small number of specimens of *Allocasuarina luehmannii* (Bulloak) were present. Native shrub species were uncommon within the impact areas. Species recorded were *Notelaea microcarpa* var. *microcarpa* (Native Olive), *Acacia paradoxa* (Kangaroo Wattle), *Acacia decora* (Western Silver Wattle), *Solanum cinereum* (Narrawa Burr) and *Maireana microphylla* (Eastern Cottonbush). Native grasses were common groundcovers over the subject land within derived and treed areas. Common native grasses were *Aristida ramosa* (Three-awn Grass), *Sporobolus creber* (Rats Tail Grass), *Bothriochloa decipiens* var. *decipiens* (Red Leg Grass), *Cymbopogon refractus* (Barbed Wire Grass), *Chloris ventricosa* (Tall Windmill Grass), *Austrostipa verticillata* (Slender Bamboo Grass), *Digitaria divaricatissima* (Umbrella Grass), *Eriochloa pseudoacrotricha* (Early Spring Grass), *Rytidosperma fulvum* (Wallaby Grass), *Cynodon dactylon* (Couch), *Eragrostis leptostachya* (Paddock Lovegrass) and *Microlaena stipoides* (Weeping Meadow Grass). Other common native ground included *Chrysocephalum apiculatum* (Common Everlasting), *Sida corrugata* (Corrugated Sida), *Sida hackettiana* (Golden Rod), *Glycine tabacina*, *Dichondra repens* (Kidneyweed), *Einadia hastata* (Berry Saltbush), *Eremophila debilis* (Amulla), *Vittadinia cuneata* (Fuzzweed), *Commelina cyanea* (Scurvy Weed), *Stackhousia viminea* (Slender Stackhousia), *Rumex brownii* (Slender Dock), *Dianella revoluta* (Blueberry Lily), *Erodium crinitum* (Blue Storksbill) and *Cheilanthes sieberi* subsp. *sieberi* (Mulga Fern). Common introduced species included *Paspalum dilatatum* (Paspalum), *Lolium perenne* (Perennial Ryegrass), *Senecio madagascariensis* (Fireweed), *Sida rhombifolia* (Paddy's Lucerne), *Plantago lanceolata* (Plantago), *Gomphocarpus fruticosus* (Narrow-leaved Cottonbush), *Galenia pubescens* (Galenia), *Bidens pilosa* (Cobblers Pegs), *Verbena bonariensis* (Purple-top Verbena) and *Lycium ferocissimum* (African Boxthorn). *Galenia pubescens* was particularly invasive in some areas.
Condition States	
BC Act Status	Central Hunter Grey Box-Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions
EPBC Act Status	Central Hunter Grey Box-Ironbark Woodland where a patch satisfies condition thresholds as per Section 1.5.3 of the Conservation Advice.

PCT 3431Central Hunter Ironbark Grassy Woodland

Plate 20: PCT 3431Central Hunter Ironbark Grassy Woodland within impact area of the proposed new Muswellbrook STS.

Plate 21: PCT 3431Central Hunter Ironbark Grassy Woodland within impact area of the proposed new Muswellbrook STS.

PCT 3431Central Hunter Ironbark Grassy Woodland

Plate 22: PCT 3431Central Hunter Ironbark Grassy Woodland within impact area of the proposed new Muswellbrook STS.

Plate 23: PCT 3431Central Hunter Ironbark Grassy Woodland within impact area of the proposed new Muswellbrook STS.

PCT 3431Central Hunter Ironbark Grassy Woodland

Plate 24: PCT 3431Central Hunter Ironbark Grassy Woodland within impact area of the proposed new Muswellbrook STS.

Plate 25: PCT 3431Central Hunter Ironbark Grassy Woodland within NW impact area of the proposed new Muswellbrook STS (Note: Tree is a *Lophostemon confertus* (Brush box) which is not endemic to the area.

Table 5.11 PCT 3525 Upper Hunter Box-Blakely's Red Gum Grassy Forest

PCT 3525 Upper Hunter Box-Blakelys Red Gum Grassy Forest	
PCT ID	PCT 3525
PCT name	Upper Hunter Box-Blakely's Red Gum Grassy Forest
Vegetation Formation	Dry Sclerophyll Forests (Shrub/grass sub-formation)
Vegetation Class	North-west Slopes Dry Sclerophyll Woodlands
Per cent cleared value (%)	58.34
Extent of PCT within REZ	Areas of PCT 3525 were only recorded north-east of the Muswellbrook STS. Points 250,251,252.
Description of PCT 3525 within the subject land	Common canopy species were *Eucalyptus blakelyi* (Blakley's Red Gum), *Eucalyptus moluccana* (Grey Box). Shrub species included *Breynia oblongifolia* (Breynia), *Notelaea microcarpa*, and *Pittosporum undulatum* (Sweet Pittosporum). Common grasses were *Microlaena stipoides* (Weeping Meadow Grass), Aristida racemosa, *Cymbopogon refractus* (Barbed Wire Grass) and *Dichondra repens* (Kidney Weed).
Condition States	
BC Act Status	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grasslands (Critically Endangered under BC Act)
EPBC Act Status	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grasslands

Plate 26: PCT 3525 Upper Hunter Box-Blakely's Red Gum Grassy Forest north-west of Muswellbrook STS. Note tree on right No. 23 may require removal.

5.1.1 THREATENED ECOLOGICAL COMMUNITIES

Twenty-one threatened ecological communities (TECs) have been recorded within the locally of the REZ the region according to both the BioNet (DPE, 2024a) and PMST databases. Results of the database search conducted for TECs are shown within Table 4.3.

Seven TEC's listed under the BC Act were identified within the REZ or in close proximity. These TEC's were:

- Kurri Sand Swamp Woodland in the Sydney Basin Bioregion
- Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions
- Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions
- Central Hunter Ironbark – Spotted Gum – Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions
- Central Hunter Grey Box – Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions
- Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grasslands

Table 5.12 below shows the PCT's which are consistent within the threatened Ecological Communities listed under the BC Act 2016 and National EPBC Act 1999.

The impact of the proposed REZ on threatened Ecological Communities listed under the BC Act 2016 and National EPBC Act 1999 has been undertaken in Sections 7 & 10.

Table 5.12 PCT's WITHIN REZ ALIGNED WITH STATE AND NATIONALLY LISTED THREATENED ECOLOGICAL COMMUNITIES.

Plant Community Type (PCT)	Threatened Ecological Community BC Act 2016	Threatened Ecological Community EPBC Act 1999 (provided criteria are met)
PCT 3630 Kurri Sand Heathy Woodland	Kurri Sand Swamp Woodland in the Sydney Basin Bioregion	Kurri sand swamp woodland of the Sydney Basin bioregion
PCT 3433 Hunter Coast Foothills Spotted Gum-Ironbark Forest	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	
PCT 3444 Lower Hunter Spotted Gum-Ironbark Forest		
PCT 3634 Quorrobolong Sand Flats Forest	Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions	
PCT 3446 Lower North Foothills Spotted Gum-Ironbark Grassy Forest		
PCT 3315 Central Hunter Ironbark-Spotted Gum Forest	Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions	Central Hunter Valley eucalypt forest and woodland
PCT 3431Central Hunter Ironbark Grassy Woodland	Central Hunter Grey Box-Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions	
PCT 4023 Coastal Valley Riparian Forest	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	Swamp Oak Floodplain Forest
PCT 4015 Central Hunter Riparian Forest		

Plant Community Type (PCT)	Threatened Ecological Community BC Act 2016	Threatened Ecological Community EPBC Act 1999 (provided criteria are met)
PCT 3525 Upper Hunter Box-Blakely's Red Gum Grassy Forest	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland

5.1.2 ENDANGERED POPULATIONS

Two Endangered Populations are listed in the local area:

- *Acacia pendula* (Weeping Myall) – population in the Hunter Catchment.
- *Diuris tricolor,* the Pine Donkey Orchid population in the Muswellbrook local government area
- *Cymbidium canaliculatum* population in the Hunter Catchment.
- *Eucalyptus camaldulensis* in the Hunter Catchment

A small number of specimens of *Acacia pendula* (Weeping Myall) were found along the REZ route. Specimens we recorded at Lower Belford and within the vicinity of the Liddell STS. Specimens near the proposed Liddell STS have been likely planted (Plate 27). No specimens of *Acacia pendula* are likely to be impacted by the REZ.

A small number of specimens of *Diuris tricolor* (Pine Donkey Orchid) (approximately 4 specimens) were present in the REZ within the existing easement north-east of the Muswellbrook STS (Plate 28).

Plate 27: Planted line of Acacia pendula (Weeping Myall) below area of proposed Eastern Hub.

Plate 28: Photo of *Diuris tricolor* (Pine Donkey Orchid) North-east of the Muswellbrook STS.

Whist suitable habitat for *Cymbidium canaliculatum* was present, no specimens were recorded during fieldwork.

Specimens of *Eucalyptus camaldulensis* (River Red Gum) are known to occur within the vicinity of the transmission crossing of the Hunter River at the transmission crossing at Maison Dieu. As the transmission lines will be well above the canopy no specimens of *E. camaldulensis* will likely be impacted.

5.1.3 THREATENED AND RARE FLORA SPECIES

Fifty-five (55) flora species have been recorded within 10km of the subject land according to the BioNet database (DPE, 2024) or are considered to have suitable habitat on the PMST database. The results of the database search conducted for threatened flora species is shown within Table 4.3.

Threatened flora species recorded during fieldwork were:

- *Eucalyptus glaucina* (Slaty Gum)
- *Eucalyptus parramattensis* subsp. *decadens* (Drooping Red Gum)
- *Grevillea parviflora* subsp. *parviflora* (Small-flowered Grevillea)
- *Diuris tricolor* (Pine Donkey Orchid)

A number of specimens of *Eucalyptus glaucina* (Slaty Gum) were present within the area around Belford and the Singleton Military Base (Plate 29).

Specimens of *Eucalyptus parramattensis* subsp. *decadens* (Drooping Red Gum) were common within areas mapped as Kurri Sand Swamp Forest. Several specimens occurring between the Kurri STS (Plate 30) and the Hunter Expressway will likely require removal for the creation of a new easement. The locations of *E. parramattensis* subsp. *decadens* are shown in the mapping in Appendix B. Details of each tree are contained in Table 5.13.

Grevillea parviflora subsp. *parviflora* (Small-flowered Grevillea) were found to be common within areas of existing easement containing low maintained derived Kurri Sand Swamp Forest (Plate 31).

As previously stated approximately 4 specimens of *Diuris tricolor* (Pine Donkey Orchid) were present in the REZ within the existing easement north-east of the Muswellbrook STS (Plate 28).

Plate 29: Photo of *Eucalyptus glaucina (Slaty Red Gum)* occurring along the New England Highway at Belford below Point 118.

Plate 30: Photo of *Eucalyptus parramattensis* subsp. *decadens* (Drooping Red Gum) occurring between the Kurri STS and Hunter Expressway.

Plate 31: Photo of *Grevillea parviflora* subsp. *parviflora* (Small-flowered Grevillea) west of Hart Road.

Table 5.13 *Eucalyptus parramattensis* subsp. *decadens* (Drooping Red Gum) recorded within REZ.

Tree No.	Species	COORDINATES GDA – 2020 Easting	COORDINATES GDA – 2020 Northing	*DBH (M)	*Height (M)	Comments	Removal Required?
1.	*Eucalyptus parramattensis* subsp. *decadens*	359430	6369215	0.14	5		**Possible Removal**
2.	*E. parramattensis* subsp. *decadens*	359392	6369239	0.36	9		**Possible Removal**
3.	*E. parramattensis* subsp. *decadens*	359382	6369248	0.19	5		**Possible Removal**
4.	*E. parramattensis* subsp. *decadens*	359373	6369253	0.52	7	1 x class 2 hollow 1 x class 3 hollow 1 x class 4 hollow	**Possible Removal**
5.	*E. parramattensis* subsp. *decadens*	359373	6369253	0.13	4		Possible Removal
6.	*E. parramattensis* subsp. *decadens*	359369	6369253	0.12	4		**Possible Removal**
7.	*E. parramattensis* subsp. *decadens*	359374	6369270	0.2	5		**Possible Removal**
8.	*E. parramattensis* subsp. *decadens*	359374	6369273	0.28	8		**Possible Removal**
9.	*E. parramattensis* subsp. *decadens*	359361	6369279	0.36	9		Possible Removal

5.1.4 PRIORITY WEEDS AND WEEDS OF STATE AND NATIONAL SIGNIFICANCE

Four priority weed species listed under the Biosecurity Act 2015 were identified on site and are listed below in Table 5.14. The site lies within the Hunter Regional Weed Committee (HRWC).

Table 5.14: Priority Weeds recorded within the REZ.

WEED SPECIES	LEGAL REQUIREMENTS	ADDITIONAL SIGNIFICANCE
Echium plantagineum Paterson's Curse	General Biosecurity Duty Regional Recommended Measure (Hunter)	
Asparagus aethiopicus Ground Asparagus	General Biosecurity Duty Prohibition on dealings Regional Recommended Measure	
Asparagus asparagoides Bridal Creeper	General Biosecurity Duty Prohibition on dealings Regional Recommended Measure (Hunter)	T
Juncus acutus Spiny Rush	General Biosecurity Duty Regional Recommended Measure (Hunter)	
Arundo donax Giant Reed	General Biosecurity Duty Regional Recommended Measure (Hunter)	
Cortaderia selloana Pampas Grass	General Biosecurity Duty Prohibition on dealings Regional Recommended Measure (Hunter)	T
Eragrostis curvula *African Lovegrass*	General Biosecurity Duty Regional Recommended Measure (Hunter)	T
Hyparrhenia hirta Coolatai Grass	General Biosecurity Duty Regional Recommended Measure	T
Ageratina adenophora Crofton Weed	General Biosecurity Duty Regional Recommended Measure (Hunter)	
Carthamus lanatus Saffron Thistle	General Biosecurity Duty	
Senecio madagascariensis Fireweed	General Biosecurity Duty Regional Recommended Measure	N
Xanthium spinosum *Bathurst Burr*	General Biosecurity Duty	
Ailanthus altissima Tree-of-heaven	General Biosecurity Duty Regional Recommended Measure (Hunter)	
Dolichandra unguis-cati Cat's claw creeper	General Biosecurity Duty Prohibition on dealings Regional Recommended Measure (Hunter)	T
Erythrina crista-galli Cockspur Coral Tree	General Biosecurity Duty Prohibition on dealings Regional Recommended Measure (Hunter)	
Gleditsia triacanthos Honey Locust	General Biosecurity Duty Regional Recommended Measure (Hunter)	
Hypericum perforatum St. John's Wort	General Biosecurity Duty Regional Recommended Measure (Hunter)	
Galenia pubescens Galenia	General Biosecurity Duty Regional Recommended Measure (Hunter)	
Lycium ferocissimum African Boxthorn	General Biosecurity Duty Regional Recommended Measure	N

WEED SPECIES	LEGAL REQUIREMENTS	ADDITIONAL SIGNIFICANCE
Opuntia stricta Prickly Pear	General Biosecurity Duty Prohibition on dealings Regional Recommended Measure	
Lantana camara Lantana	General Biosecurity Duty Prohibition on dealings Regional Recommended Measure (Hunter)	N, T
Bryophyllum species Mother-of-millions	General Biosecurity Duty Regional Recommended Measure	
Rubus fruticosus species aggregate Blackberry	General Biosecurity Duty Prohibition on dealings Regional Recommended Measure	
Heliotropium amplexicaule Blue Heliotrope	General Biosecurity Duty Regional Recommended Measure (Hunter)	
Cinnamomum camphora Camphor Laurel	General Biosecurity Duty Regional Recommended Measure	
Olea europaea subsp. *cuspidata* African Olive	General Biosecurity Duty Regional Recommended Measure	T
Cotoneaster glaucophyllus Cotoneaster	General Biosecurity Duty Regional Recommended Measure*	
Cestrum parqui Green Cestrum	General Biosecurity Duty Regional Recommended Measure (Hunter)	

T – Listed as a Threatening Process under the NSW BC Act 2016.
N –Weed of National Significance.
***Priorities under the Biosecurity Act 2015**
General Biosecurity Duty - any person dealing with plant matter must take measures to prevent, minimise or eliminate the biosecurity risk (as far as is reasonably practicable).
Prohibition on dealings - Must not be imported into the State or sold.
Regional Recommended Measure - Land managers mitigate the risk of the plant being introduced to their land. Land managers reduce impacts from the plant on priority assets. Land managers prevent spread from their land where feasible. The plant or parts of the plant are not traded, carried, grown or released into the environment.

5.2 HABITAT APPRASIAL

5.2.1 HABITAT DESCRIPTION AND DISTRIBUTION IN THE VICINITY

The vegetation and landforms present along the REZ offer a variety of habitats for native fauna species. The broad habitat types included Open Forest, Woodland Grassland and Aquatic.

Sclerophyll Forest/Woodland

Sclerophyll Forest/Woodland occurring along the REZ route would provide suitable habitat opportunities for a variety of species. Frugivorous, nectivorous, granivorous and insectivorous birds and microchiropteran bat species would all find potential foraging resources within this complex. Hollow-bearing trees were would provide nesting and roosting sites for a variety of fauna species such as arboreal mammals, microchiropteran bats, reptile and avifauna species. Hunting opportunities exist for birds of prey, given that the variable tree coverage and understorey vegetation has created a myriad of ecotones and habitat densities. Such habitat is suitable for terrestrial species including small and medium sized mammals, macropods, reptiles and potentially for some frog species adapted to drier areas.

Disturbed Grassland

Disturbed Grassland provides habitat for a number of avifauna species, including predominantly terrestrial species preferring open spaces, seed eating birds and several birds of prey, which may hunt over this area

in search of potential prey species. Macropods may also frequent such areas whilst grazing. Some species of bats may also forage over this cleared area for insects. The scarcity of trees and shrubs along with the often limits the value of such areas for many vulnerable species, particularly some reptiles, small mammals and birds.

Aquatic Habitat Dam

Rivers, streams, dams and wetlands would provide suitable habitat for a range of fish, frog, reptile, waterbird and mammal species. This area would also act as a water source for other native animals such as macropods and offer potential hunting habitat for microchiropteran bats such as *Myotis macropus* (Southern Myotis) that prefer to hunt above or around water bodies.

5.2.2 HABITAT CORRIDORS

The REZ crossing a number of habitat corridors of various sizes and functionality. As a result of the relatively small size and narrow nature of the REZ the proposal is unlikely to have any significant impact on the movement of any threatened fauna species.

5.2.3 TREE SURVEY

A total of 24 significant (larger trees and/or those containing hollows) trees were recorded along the proposed REZ and may be impacted by the proposal. Fourteen (14) of these trees were found to contain habitat in the form of hollows. A number of these trees will likely require removal or branch trimming.

It is recommended that tree removal be avoided wherever possible. Details of each of the 24 trees including height, diameter at breast height (DBH), coordinates and fauna habitat attributes such as hollows and are contained Appendix D.

5.3 HABITAT FOR SIGNIFICANT SPECIES

An assessment of habitat attributes on site has been undertaken for the significant species listed in Table 4.3. The results of the assessment using definitions shown in Table 5.15 are displayed in Table 5.16. Threatened species identified in this assessment as having potential habitat available on site have been considered further in Section 7.0 of this report.

Table 5.15: Definitions of likelihood of occurrence criteria.

Likelihood of Occurrence	Threatened Fauna	Threatened Flora
Unlikely	Suitable habitat is absent from the subject land and/or the subject land is outside of the species known distribution	
Low	• The species has not been recorded in the locality (10km) within the last five years; and/or • Although suitable habitat is present in the subject land the suitable habitat is in a highly modified, limited or degraded state; and/or • This species may be an occasional visitor, but habitat similar or of higher quality is widely distributed in the local area.	• The species has not been recorded in the locality (10km) within the last five years, and/or • Although suitable habitat is present in the subject land the suitable habitat is in a highly modified or degraded state
Moderate	• The species has been recorded in the locality (10km) within the last five years; and/or • It is unlikely to be dependent on habitat within the subject land (i.e., for breeding or important life cycle periods) or to maintain a permanent resident population. However, the species may seasonally, opportunistically or occasionally use resources within the subject land; and/or • Although suitable habitat is present in the subject land the suitable habitat is in a moderately modified, limited or degraded state This category includes fauna species that were targeted by seasonal surveys and were not recorded, wide ranging species which may fly-over' the site, regardless of the habitat types present and generalist species with non-specific habitat requirements	• The species has been recorded in the locality (10km) within the last five years; and/or. • Although potential habitat is present in the subject land the suitable habitat is in a moderately modified or degraded state. This category includes flora species that were targeted by seasonal surveys and were not recorded.
High	• The species has been recorded in the locality (10km) within the last five years; and/or • It is highly likely that the species inhabits the subject land and is dependent on identified suitable habitat (i.e., for breeding or important life cycle periods) and is likely to maintain a resident population. This includes species that are known to visit the subject land during regular seasonal movements or migration.	• The species has been recorded in the locality (10km) within the last five years; and/or • It is highly likely to inhabit the subject land and is dependent on identified suitable habitat.
Known	The species was observed in the subject land during the current survey and/or was recorded during a survey conducted on the site during the last 5 years.	

Table 5.16: Habitat Assessment for Significant Species (Oceanic Birds have been removed from assessment)

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE REZ SITE
	BC Act 2016	EPBC Act 1999	SAII		
FLORA					
Wollemia nobilis Wollemi Pine	E4A	CE	Yes	Restricted to remote canyons in the Wollemi National Park, north-west of Sydney. Occurs in warm temperate rainforest and rainforest margins in remote sandstone canyons.	**Unlikely** No suitable habitat was present. Outside known distribution.
Caladenia tessellata Thick-lipped Spider-orchid	V	V	Yes	Generally found in grassy sclerophyll woodland on clay loam or sandy soils, though the population near Braidwood is in low woodland with stony soil. Is known from the Sydney area (old records), Wyong, Ulladulla and Braidwood in NSW.	**Unlikely** Only marginal habitat present. Outside known distribution.
Corybas dowlingii Red Helmet Orchid	E1		No	Forms colonies and typically grows in gullies in tall open forest on well-drained gravelly soil at elevations of 10-200m. Is restricted to New South Wales where it is currently known from 4 localities including Port Stephens (2 localities), Bulahdelah and Freemans Waterhole south of Newcastle. A population is known from Stoney Ridge Reserve on Soldiers Point on the southern shore of Port Stephens.	**Low** Marginal habitat confined to the far east of the REZ.
Cryptostylis hunteriana Leafless Tongue Orchid	V	V	No	Grows in swamp-heath on sandy soils, chiefly in coastal districts, south from the Gibraltar Range. It is known historically from several localities on the NSW south coast and has been observed in recent years at many sites between Batemans Bay and Nowra (although it is uncommon at all sites). Also recorded at Munmorah State Conservation Area, Nelson Bay, Wyee, Washpool National Park, Nowendoc State Forest, Ku-Ring-Gai Chase National Park and Ben Boyd National Park.	**Unlikely** Only marginal habitat present. Outside known distribution.
Diuris pedunculata Small Snake Orchid	E1	E	No	Confined to northeast NSW. It was originally found scattered from Tenterfield south to the Hawkesbury River. Mainly found on the New England Tablelands, around Armidale, Uralla, Guyra and Ebor. Grows on grassy slopes or flats, often on peaty soils in moist areas. Also occurs on shale and trap soils, on fine granite, and among boulders. It flowers during August-October.	**Unlikely** Only marginal habitat present. Outside known distribution.
Diuris tricolor Pine Donkey Orchid	V		No	Sporadically distributed on the western slopes of NSW, extending from south of Narrandera all the way to the north of NSW. Localities in the south include several sites west of Wagga Wagga, Dubbo in the Central West and Pilliga National in the north. The population in the Muswellbrook LGA is at the eastern limit of the geographic range of the species. Grows in sclerophyll forest among grass with native Cypress Pine (*Callitris* spp.). It is found in sandy soils, either on flats or small rises. Flowers from September to November.	**Known** Recorded within easement to the NE of the Muswellbrook STS. Suitable habitat confined to western half of REZ. More likely to be present around Muswellbrook.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE REZ SITE
	BC Act 2016	EPBC Act 1999	SAII		
Prasophyllum petilum Tarengo Leek Orchid	E1	E	No	In NSW natural populations are known in a total of five sites. These are near Boorowa, Queanbeyan area, Ilford, Delegate and west of Muswellbrook. Grows in open sites within Natural Temperate Grassland.	**Low** Suitable habitat confined to western half of REZ. More likely to be present around Muswellbrook.
Prasophyllum sp. Wybong A Leek Orchid		CE	Yes	Leek orchids are generally found in shrubby and grassy habitats in dry to wet soil (Jones 2006). Known to occur in open eucalypt woodland and grassland.	**Low** Suitable habitat confined to western half of REZ. More likely to be present around Muswellbrook.
Pterostylis chaetophora Tall Rustyhood	V		No	In NSW it is currently known from 18 scattered locations in a relatively small area between Taree and Kurri Kurri, extending to the south-east towards Tea Gardens and west into the Upper Hunter, with additional records near Denman and Wingen. The preferred habitat is seasonally moist, dry sclerophyll forest with a grass and shrub understorey.	**Low** Suitable habitat confined to the far east of the REZ.
Pterostylis gibbosa Illawarra Greenhood	E1	E	No	All known sub-populations occur in open forest and woodland on flat or gently sloping land with poorly drained soils. Within the Hunter Valley this orchid species is confined to the Milbrodale area.	**Unlikely** Only marginal habitat present. Outside known distribution.
Rhizanthella slateri Eastern Underground Orchid	V	E1	Yes	Occurs from south-east Queensland to south-east NSW. In NSW, currently known from fewer than 10 locations, including near Bulahdelah, the Watagan Mountains, the Blue Mountains, Wiseman's Ferry area, Agnes Banks and near Nowra. Grows in sclerophyll forest in shallow to deep loams.	**Low** Marginal habitat was present within better quality areas of native vegetation. No known local records.
Thelymitra adorata Wyong Sun Orchid	E4A	CE	Yes	Currently known from several local government areas (LGA) within the Central Coast Council region of New South Wales. These include but are not limited to the LGAs of Wyong, Warnervale and Wyongah. Also recorded in the southern portion of Lake Macquarie City Council area. Occurs in grassy woodland or occasionally derived grassland in well-drained clay loam or shale derived soils. The vegetation type in which the majority of populations occur (including the largest colony) is a Spotted Gum - Ironbark Forest with a diverse grassy understorey and occasional scattered shrubs.	**Unlikely** Outside known distribution.
Dichanthium setosum Blue Grass	V	V	No	Occurs on the New England Tablelands, Northwest Slopes and Plains and the Central Western Slopes of NSW, extending to northern Queensland. Associated with heavy basaltic black soils and red-brown loams with clay subsoil.	**Low** Suitable habitat confined to the far west of the REZ.
Cynanchum elegans White-flowered Wax Plant	E1	E	No	This species occurs in scattered coastal localities from the QLD-NSW border south to Wollongong. Found in dry, littoral or subtropical rainforest, and occasionally in scrub and woodland from sea level to about 600m ASL.	**Unlikely** No likely suitable habitat.
Brachyscome brownii		CE	No	Endemic to New South Wales (NSW).Associated with riparian zones and sandy soils in dry sclerophyll forest.	**Low** Suitable habitat was present.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE REZ SITE
	BC Act 2016	EPBC Act 1999	SAII		
Ozothamnus tesselatus	V	V	No	East-west zone south of Bunnan and between west Bylong and east Ravensworth. Grows in eucalypt woodland.	**Low-Moderate** Suitable habitat present west of Singleton. Known records around Ravensworth.
Picris evae Hawkweed	V	V	No	Found in NSW north from the Inverell area, in the north-western slopes and plains regions. Main habitat is open Eucalypt Forest.	**Unlikely** No likely suitable habitat.
Rutidosis heterogama Heath Wrinklewort	V	V	No	Grows in heath on sandy soils and moist areas in open forest and has been recorded along disturbed roadsides. Recorded from near Cessnock to Kurri Kurri with an outlying occurrence at Howes Valley. On the Central Coast it is located north from Wyong to Newcastle.	**Low-Moderate** Suitable habitat confined to the east of the REZ.
Lepidium aschersonii Spiny Peppercress	V	V	No	Endemic to mainland southern Australia, north-eastern New South Wales to Western Australia. Occurs in the marginal central-western slopes and north-western plains regions of NSW. Associated with periodically wet sites such as gilgai depressions and the margins of freshwater and saline marshes and shallow lakes, usually on heavy clay soil (Harris & Smith 2000).	**Unlikely** No likely suitable habitat.
Tetratheca juncea Black-eyed Susan	V	V	No	Confined to the northern portion of the Sydney Basin bioregion and the southern portion of the North Coast bioregion in the local government areas of Wyong, Lake Macquarie, Newcastle, Port Stephens, Great Lakes and Cessnock. Found in low open forest/woodland with a mixed shrub understorey and grassy groundcover. However, it has also been recorded in heathland and moist forest.	**Unlikely** No likely suitable habitat. REZ outside known distribution.
Tylophora linearis (Vincetoxicum forsteri)	V	E	No	Occurs from southern Queensland into central NSW. Grows in dry scrub and open forest.	**Unlikely** No likely suitable habitat.
Acacia bynoeana Bynoe's Wattle	E1	V	No	Found in heath, woodland and dry sclerophyll forests on sandy soils derived from Hawkesbury Sandstone. Associated overstorey species include Red Bloodwood, Scribbly Gum, Parramatta Red Gum, Saw Banksia and Narrow-leafed Apple but has also been recorded within Spotted Gum – Ironbark Forest at its most northerly extent in North Rothbury in the Hunter Valley. Found in central eastern NSW, from the Hunter District (Morisset, Kurri Kurri & North Rothbury) south to the Southern Highlands and west to the Blue Mountains.	**Low-Moderate** Suitable habitat confined to the east of the REZ.
Dillwynia tenuifolia	V		No	Core distribution is the Cumberland Plain from Windsor and Penrith east to Dean Park near Colebee. Other populations in western Sydney recorded from Voyager Point and Kemps Creek in the Liverpool LGA, Luddenham in the Penrith LGA and South Maroota in the Baulkham Hills Shire. Disjunct localities outside the Cumberland Plain include the Bulga Mountains at Yengo in the north, Kurrajong	**Unlikely** No likely suitable habitat.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE REZ SITE
	BC Act 2016	EPBC Act 1999	SAII		
				Heights, and Woodford in the Lower Blue Mountains. Occurs in dry sclerophyll woodland on sandstone, shale or laterite	
Swainsona murrayana Slender Darling-pea	V	V	No	Found throughout NSW , recorded in the Jerilderie and Deniliquin areas of the southern riverine plain, the Hay plain as far north as Willandra National Park, near Broken Hill and in various localities between Dubbo and Moree. Grows in vegetation types including bladder saltbush, black box and grassland communities. Plants have been found in remnant native grasslands or grassy woodlands that have been intermittently grazed or cultivated	**Low** Marginal habitat confined to the far west of the REZ.
Prostanthera cineolifera Singleton Mint Bush	V	V	No	Grows in open woodlands on exposed sandstone ridges. Usually found in association with shallow or skeletal soils. Localities include Apseley Falls, east of Walcha; St Albans and the western side of Mangrove Creek Dam, near Bucketty; a site west of North Rothbury; Pokolbin State Forest (NSW Government, 2005) and Bellbird in the Hunter Valley (DECC NSW, 2008).	**Unlikely** No likely suitable habitat.
Angophora inopina Charmhaven Apple	V	V	No	Endemic to the Central Coast region of NSW. The known northern limit is near Karuah where a disjunct population occurs; to the south populations extend from Toronto to Charmhaven with the main population occurring between Charmhaven and Morisset. There is an unconfirmed record of the species near Bulahdelah. Approximately 1250 ha of occupied habitat has been mapped in the Wyong–southern Lake Macquarie area. Grows in open woodland with a dense shrub understorey on deep white sandy soils over sandstone.	**Unlikely** No likely suitable habitat.
Callistemon linearifolius Netted Bottle Brush	V		No	Grows in dry sclerophyll forest on the coast and adjacent ranges. From the Georges River to the Hawkesbury River in the Sydney area, and north to Nelson Bay. Known to occur within Stony Ridge Reserve on Soldiers Point.	**Moderate-High** Suitable habitat within the eastern section of the REZ. Known records close to REZ.
Eucalyptus castrensis Singleton Mallee	E1		Yes	Occurs on a low broad ridgetop on loam over sandstone. The understorey consists of grasses and scattered shrubs, with bare ground and litter. Known only from a single dense stand within the Singleton Military Area. Here it is locally dominant stand over about ten hectares with a number of smaller outlying stands over a 2.5 km range.	**Unlikely** No suitable habitat was present.
Eucalyptus fracta Broken Back Ironbark	E1		Yes	Occurs in dry eucalypt woodland in shallow soils. Associated species in slightly deeper soils include *Eucalyptus sparsifolia, E. punctata,* Corymbia maculata and *Angophora euryphylla*. Confined largely to State Forest. Locally common but restricted to the northern Broken Back Range near Cessnock, NSW. The dominant tree in a narrow band along the upper edge of a sandstone escarpment.	**Unlikely** No suitable habitat was present.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE REZ SITE
	BC Act 2016	EPBC Act 1999	SAII		
Eucalyptus glaucina Slaty Red Gum	V	V	No	Grows in grassy woodland and dry eucalypt forest, usually on deep, moderately fertile and well-watered soils. This species has only been recorded on the north coast of NSW and in small populations from Taree to Broke and west of Maitland.	**Known** Tree recorded at several locations within or in close proximity to the REZ.
Eucalyptus largeana Craven Grey Box	E1	E	No	Confined to Gloucester-Craven district and near Pokolbin, although a number of unsubstantiated records exist from outside the currently accepted range. Populations are known from Copeland Tops State Conservation Area and Berrico Nature Reserve, with unconfirmed records from Talawahl and Glen Nature Reserves and Willi Willi National Park. The majority of remaining populations occur on private lands and roadsides, often as single trees or small clumps interspersed with other tree species. Occurs in wet forest on sloping sites in subcoastal ranges.	**Unlikely** No suitable habitat was present. Outside known distribution.
Eucalyptus parramattensis subsp. *decadens* Drooping Red Gum	V	V	No	Generally, occupies deep, low-nutrient sands, often those subject to periodic inundation or where water tables are relatively high. It occurs in dry sclerophyll woodland with dry heath understorey. It also occurs as an emergent in dry or wet heathland. Often where this species occurs, it is a community dominant. In the Kurri Kurri area, *E. parramattensis* subsp. *decadens* is a characteristic species of 'Kurri Sand Swamp Woodland and in the Tomago Sandbeds area, the species is usually associated with the 'Tomago Swamp Woodland'.	**Known** Tree species recorded at several locations within or in close proximity to the REZ. Found within areas of Kurri Sand Heathy Woodland.
Eucalyptus pumila Pokolbin Mallee	V	V	Yes	Present as a mid-canopy species to a height of 6 m within dry sclerophyll woodland which has a canopy comprising Eucalyptus fibrosa, Callitris endlicheri and, to a lesser extent, Corymbia maculata. Very restricted distribution. Occupies a north-west facing slope of the Broken Back Range west of Pokolbin.	**Unlikely** No suitable habitat was present.
Melaleuca biconvexa Biconvex Paperbark	V	V	No	Only found in NSW, with scattered and dispersed populations found in the Jervis Bay area in the south and the Gosford-Wyong area in the north. Grows in damp places, often near streams; coastal districts and adjacent tablelands from Jervis Bay north to the Port Macquarie district.	**Low** Only marginal habitat was present around low drainage areas in the far east of the REZ.
Melaleuca groveana Grove's Paperbark	V		No	Widespread, scattered populations in coastal districts north of Yengo National Park to southeast Queensland. Grows in heath and shrubland, often in exposed sites, in low coastal hills, escarpment ranges and tablelands on outcropping granite, rhyolite and sandstone on rocky outcrops and cliffs. It also occurs in dry shrubby open forest and woodlands	**Unlikely** No suitable habitat was present. Outside known distribution.
Rhodamnia rubescens Scrub Turpentine	E4A	CE	Yes	Occurs in coastal districts north from Batemans Bay in New South Wales, approximately 280 km south of Sydney, to areas inland of Bundaberg in Queensland. Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	**Unlikely** No suitable habitat was present.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE REZ SITE
	BC Act 2016	EPBC Act 1999	SAII		
Rhodomyrtus psidioides Native Guava	E4A	CE	Yes	Occurs from Broken Bay New South Wales to Maryborough in Queensland. Pioneer species found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest often near creeks and drainage lines.	**Unlikely** No suitable habitat was present.
Syzygium paniculatum Magenta Lilly Pilly	E1	V	No	Occurs in a narrow coastal distribution in rainforests on sandy soils or stabilised coastal dunes from Jervis Bay to Bulahdelah in NSW.	**Unlikely** No suitable habitat was present.
Euphrasia arguta Eyebright	E4A	CE	Yes	Found within the Nundle area reported from eucalypt forest with a mixed grass and shrub understorey; here, plants were most dense in an open disturbed area and along the roadside, indicating the species had regenerated following disturbance.	**Unlikely** No suitable habitat was present.
Persicaria elatior Tall Knotweed	V	V	No	Recorded in south-eastern NSW (Mt Dromedary (an old record), Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertsocaleyin, Bermagui, and Picton Lakes. In northern NSW it is known from Raymond Terrace (near Newcastle) and the Grafton area (Cherry Tree and Gibberagee State Forests). grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance.	**Low** Only marginal habitat was present around low drainage areas in the far east of the REZ.
Banksia penicillata		E	No	Endemic to NSW, found on sandstone-derived soils along ridges, among rocks or near cliffs, and occasionally on lower slopes and in plateau valleys, in the northern Blue Mountains. Occurs in sclerophyll forest or woodland (occasionally heaths) on sandstone soils.	**Unlikely** No suitable habitat was present.
Grevillea parviflora subsp. *parviflora* Small-flower Grevillea	V	V	No	Grows in sandy or light clay soils usually over thin shales. Occurs in a range of vegetation types from heath and shrubby woodland to open forest and is found over a range of altitudes from flat, low-lying areas to upper slopes and ridge crests. Common canopy species vary greatly with community type but generally are species that favour soils with a strong lateritic influence including *Eucalyptus fibrosa*, *E. parramattensis, Angophora bakeri* and *Eucalyptus sclerophylla*.	**Known** Tree species recorded at several locations within or in close proximity to the REZ. Found within areas of Kurri Sand Heathy Woodland.
Olearia cordata	V	V	No	Scattered distribution generally restricted to the south-western Hunter Plateau, eastern Colo Plateau, and the far north-west of the Hornsby Plateau near Wisemans Ferry east of Maroota. Grows in dry open sclerophyll forest and open shrubland, on sandstone ridges.	**Unlikely** No suitable habitat was present.
Persoonia hirsuta Hairy Geebung	E1	E	Yes	Has a scattered distribution around Sydney. The species is distributed from Singleton in the north, along the east coast to Bargo in the south and the Blue Mountains to the west. Found in sandy soils in dry sclerophyll open forest, woodland and heath on sandstone.	**Unlikely** No suitable habitat was present. Outside known distribution.
Persoonia pauciflora North Rothbury Persoonia	E4A	CE	Yes	Found only in small area near North Rothbury in the Hunter Valley. Occurs in open forests and woodlands with a shrubby understorey on clay soils derived from silty sandstones.	**Low-Moderate** Suitable habitat was present within the vicinity of Rothbury.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE REZ SITE
	BC Act 2016	EPBC Act 1999	SAII		
Androcalva procumbens		V	No	In sandy sites mainly confined to the Dubbo;-Mendooran;-and Gilgandra region.	**Unlikely** No suitable habitat was present. Outside known distribution.
Pomaderris brunnea Brown Pomaderris	E1	V	No	Found in a very limited area around the Colo, Nepean and Hawkesbury Rivers, including the Bargo area and near Camden. It also occurs near Walcha on the New England tablelands and in far eastern Gippsland in Victoria. Grows in moist woodland or forest on clay and alluvial soils of flood plains and creek lines.	**Unlikely** No suitable habitat was present. Outside known distribution.
Pomaderris queenslandica Scant Pomaderris	E1		No	Known from several locations on the NSW north coast and a few locations on the New England Tablelands and North West Slopes, including near Torrington and Coolata. Found in moist eucalypt forest or sheltered woodlands with a shrubby understorey, and occasionally along creeks.	**Unlikely** No suitable habitat was present. Outside known distribution.
Asperula asthenes Trailing Woodruff	V	V	No	Occurs only in NSW. It is found in scattered locations from Bulahdelah north to near Kempsey, with several records from the Port Stephens/Wallis Lakes area/Forster (including Myall Lakes NP, New England NP, Wallingat NP and Darawnk NR). Occurs in damp sites, often along riverbanks.	**Unlikely** No suitable habitat was present. Outside known distribution.
Homoranthus darwinioides	V	V	No	Rare in the central tablelands and western slopes of NSW, occurring from Putty to the Dubbo district. It is found west of Muswellbrook between Merriwa and Bylong, and north of Muswellbrook to Goonoo SCA. Grows in shrubby woodland, usually in deep sandy soils over sandstone.	**Unlikely** No suitable habitat was present. Outside known distribution.
Leionema lamprophyllum subsp. *fractum*	E4A	CE	Yes	Currently known only from the Broken Back Range near Cessnock, with a historical collection from Munghorn Gap Nature Reserve near Wollar.	**Unlikely** No suitable habitat was present. Outside known distribution.
Thesium australe Austral Toadflax	V	V	No	Grows in grassland or woodland, often in damp sites.	**Low** Marginal habitat was present.
Bertya mollissima	E1	E	No	Endemic to north-eastern New South Wales (NSW), known to occur historically from Mount Kaputar, Warrumbungle and Liverpool Ranges to the Scone and Singleton districts. Occurs on steep hillsides and mountain summits in shallow sandy or gravelly soil in rock cracks and among boulders. Within heath or open woodland communities surrounded by Eucalyptus spp. between 500 to 1500 m above sea level.	**Unlikely** No suitable habitat was present.
Maundia triglochinoides	V		No	Restricted to coastal NSW and extending into southern Queensland. The current southern limit is Wyong. Grows in swamps or shallow freshwater in heavy clay.	**Unlikely** No suitable habitat was present.
Zannichellia palustris	E1		No	In NSW, known from the lower Hunter and in Sydney Olympic Park. Grows in fresh or slightly saline stationary or slowly flowing water.	**Low** Suitable habitat was confined to areas of aquatic habitat in the far east of the REZ site such as within Swamp Creek.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE REZ SITE
	BC Act 2016	EPBC Act 1999	SAII		
FAUNA - AMPHIBIANS					
Heleioporus australiacus Giant Burrowing Frog	V	V	No	Banks of semi-permanent to ephemeral sand or rock-based streams and has also been identified in dams, drainage ditches and roadside culverts.	**Unlikely** No suitable habitat was present. Outside known distribution.
Litoria aurea Green and Golden Bell Frog	E1	V	No	Inhabits swamps, lagoons, streams and ponds as well as dams, drains and storm water basins.	**Low** Suitable habitat was present within dams, drainage lines and wetlands along the REZ route. Few recent records. Most recent records are around Ravensworth
Litoria booroolongensis Booroolong Frog	E1	E	No	Restricted to NSW and north-eastern Victoria, predominantly along the western-flowing streams of the Great Dividing Range. Lives along permanent streams with some fringing vegetation cover such as ferns, sedges, or grasses. Adults occur on or near cobble banks and other rock structures within stream margins.	**Unlikely** No suitable habitat was present. Outside known distribution.
Litoria brevipalmata Green-thighed Frog	V		No	Occurs in isolated localities along the coast and ranges from just north of Wollongong to south-east Queensland. Occurs in a range of habitats from rainforest and moist eucalypt forest to dry eucalypt forest and heath, typically in areas where surface water gathers after rain. It prefers wetter forests in the south of its range but extends into drier forests in northern NSW and southern Queensland.	**Low** Marginal habitat confined to aquatic areas in the far east of the REZ route.
Litoria littlejohni Littlejohn's Tree Frog	E1	E	No	Habitats include wet and dry sclerophyll forest, coastal woodland and heath. Associated characteristics include rocky streams and sandstone outcrops, semi-permanent dams and slow flowing streams. The water quality required for breeding is usually tannic (pH 6.2) and contains detritus which is used as anchors for egg clusters.	**Low** Marginal habitat confined to aquatic areas in the far east of the REZ route.
Mixophyes balbus Stuttering Frog	E1	V	Yes	Occurs in wet forest regions of south-eastern Queensland, Eastern NSW and Victoria. In late spring, eggs are deposited among leaf litter on the banks of streams and subsequently are washed into the water during heavy rain.	**Unlikely** No suitable habitat was present. Outside known distribution.
Mixophyes iteratus Giant Barred Frog	V	V	No	Distributed from Doongul Creek, Wongi State Forest, near Maryborough in south-eastern Queensland (Hines 2003), south to Warrimoo in the Blue Mountains, New South Wales. Occurs in rainforests and wet sclerophyll forests in upper to lower catchment areas (Ingram & McDonald 1993).	**Unlikely** No suitable habitat was present. Outside known distribution.
Pseudophryne australis Red-crowned Toadlet	V		No	Distribution within sandstone of the Sydney Basin. This frog species may utilise areas below the first cliff line for breeding and the adjacent ridge tops and escarpments for foraging and refuge. Usually found along “feeder creeks” which feed run-off water from ridges into perennial creeks.	**Unlikely** No suitable habitat was present. Outside known distribution.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE REZ SITE
	BC Act 2016	EPBC Act 1999	SAII		
FAUNA - REPTILES					
Aprasia parapulchella Pink-tailed Worm-lizard	V	V	No	Is distributed along the western foothills of the Great Dividing Range between Bendigo in Victoria and Gunnedah in northern New South Wales. Generally, occupies sites with a grassy ground layer particularly those dominated by Kangaroo Grass with little or no leaf litter, and relatively low tree and shrub cover. Sites are typically well-drained, with rocky outcrops or scattered, partially buried rocks.	**Low** Marginal habitat was present.
Delma vescolineata Hunter Valley Delma	E1	E	No	Is known almost entirely from a 25 km wide corridor in the Hunter Valley NSW, between Maitland and Muswellbrook. The sites where the species has been detected include rehabilitated mine sites and pastoral land used for cattle grazing.	**High** Known records within proximity to the Muswellbrook STS site and easement to the NE. Less likely to be recorded in the eastern portion of the REZ.
Varanus rosenbergi Rosenberg's Goanna	V		No	Occurs on the Sydney Sandstone in Wollemi National Park to the north-west of Sydney, in the Goulburn and ACT regions and near Cooma in the south. Found in heath, open forest and woodland. Associated with termites, the mounds of which this species nests in; termite mounds are a critical habitat component.	**Low** Suitable habitat was present. No known local records.
Hoplocephalus bungaroides Broad-headed Snake	E1	E	Yes	Found under large slabs of rock or crevices on sandstone outcrops. Is largely confined to Triassic and Permian sandstones, including the Hawkesbury, Narrabeen and Shoalhaven groups, within the coast and ranges in an area within approximately 250 km of Sydney.	**Unlikely** No suitable habitat was present. Outside known distribution.
FAUNA - BIRDS					
Calidris acuminata Sharp-tailed Sandpiper		V & M	No	Widespread in both inland and coastal locations and in both freshwater and saline habitats.	**Low** Suitable habitat was present.
Calidris ferruginea Curlew Sandpiper	E4A	CE	Yes	Tidal mudflats; saltmarsh; fresh, brackish or saline wetlands; sewage ponds.	**Unlikely** No suitable habitat was present.
Tringa nebularia Common Greenshank	E1	E & M	No	Inhabits a wide variety of inland permanent and temporary wetlands and sheltered coastal habitats of varying salinity.	**Low** Suitable habitat was present.
Numenius madagascariensis Eastern Curlew	E4A	CE M	No	Estuaries, tidal mudflats, sandspits, saltmarshes, mangroves; occasionally fresh or brackish lakes.	**Unlikely** No suitable habitat was present.
Charadrius leschenaultii Greater Sand-plover	V		No	In NSW, the species has been recorded between the northern rivers and the Illawarra, with most records coming from the Clarence and Richmond estuaries. Almost entirely restricted to coastal areas in NSW, occurring mainly on sheltered sandy, shelly or muddy beaches or estuaries with large intertidal mudflats or sandbanks.	**Unlikely** No suitable habitat was present.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE REZ SITE
	BC Act 2016	EPBC Act 1999	SAII		
Gallinago hardwickii Latham's Snipe	V	V & M	No	Utilises a variety of habitat, such as soft wet ground or shallow water with tussock and other green and dead vegetation, and scrub or open wetland from sea-level to alpine bogs.	**Moderate** Suitable areas of aquatic habitat were present along the REZ route.
Rostratula australis Australian Painted snipe	E1	E	No	Margins of swamps and streams, chiefly those covered with low and stunted vegetation.	**Low** Suitable areas of aquatic habitat were present along the REZ route.
Botaurus poiciloptilus Australasian Bittern	E1	E	No	The Australasian Bittern lives alone or in loose groups and favours permanent fresh waters dominated by sedges, rushes, reeds or cutting grasses (e.g. Phragmites, Scirpus, Eleocharis, Juncus, Typha, Baumea and Gahnia) and feeds on insects, small fish, eels, frogs and other aquatic life, sometimes in rice fields.	**Low** Suitable areas of aquatic habitat were present along the REZ route.
Ixobrychus flavicollis Black Bittern	V		No	Inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves.	**Low** Suitable areas of aquatic habitat were present along the REZ route.
Ephippiorhynchus asiaticus Black-necked Stork	E1		No	Widespread in coastal and subcoastal northern and eastern Australia, as far south as central NSW. Breeding has been recorded as far south as Tomago NSW.	**Low** Suitable larger areas of aquatic habitat were present along the REZ route.
Anseranas semipalmata Magpie Goose	V		No	Relatively common in the Australian northern tropics. Records in central and northern NSW. Vagrants can follow food sources to south-eastern NSW. Mainly found in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges.	**Low** Suitable areas of aquatic habitat were present along the REZ route.
Oxyura australis Blue-billed Duck	V		No	Endemic to south-eastern and south-western Australia. It is widespread in NSW. Most common in the southern Murray-Darling Basin area. Prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation.	**Low** Suitable areas of aquatic habitat were present along the REZ route.
Stictonetta naevosa Freckled Duck	V		No	Found primarily in south-eastern and south-western Australia, occurring as a vagrant elsewhere. It breeds in large temporary swamps created by floods in the Bulloo and Lake Eyre basins and the Murray-Darling system. The species may also occur as far as coastal NSW and Victoria during extensive inland droughts.	**Low** Suitable areas of aquatic habitat were present along the REZ route.
Irediparra gallinacea Comb-crested Jacana	V		No	Occurs in northern and eastern Australia, mainly in coastal and subcoastal regions, from the north-eastern Kimberley Division of Western Australia to Cape York Peninsula then south along the east coast to the Hunter region of NSW. Inhabits permanent freshwater wetlands, either still or slow-flowing, with a good surface cover of floating vegetation, especially waterlilies, or fringing and aquatic vegetation.	**Unlikely** No suitable habitat was present.
Burhinus grallarius Bush Stone Curlew	E1		No	Found throughout Austrnovaalia except for the central southern coast and inland, the far south-east corner, and Tasmania. Inhabits open forests and woodlands with a sparse grassy ground layer and fallen timber.	**Low** Suitable areas of habitat were present along the REZ route.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE REZ SITE
	BC Act 2016	EPBC Act 1999	SAII		
Turnix maculosus Red-backed Button-quail	V		No	Recorded only infrequently in NSW, with most records from the North Coast Bioregion. In NSW, said to occur in grasslands, heath and crops. Said to prefer sites close to water, especially when breeding.	**Low** Suitable areas of habitat were present along the REZ route. Few local records.
Sternula albifrons Little Tern	E1		No	Migrating from eastern Asia, the Little Tern is found on the north, east and south-east Australian coasts. Exclusively coastal, nests in small, scattered colonies in low dunes or on sandy beaches just above high tide mark near estuary mouths or adjacent to coastal lakes and islands.	**Unlikely** No suitable habitat was present.
Ptilinopus magnificus Wompoo Fruit-Dove	V		No	Occurs along the coast and coastal ranges from the Hunter River in NSW to Cape York Peninsula. It is rare south of Coffs Harbour. Found in, or near rainforest, low elevation moist eucalypt forest and brush box forests.	**Unlikely** No suitable habitat was present.
Ptilinopus regina Rose-crowned Fruit-Dove	V		No	Coast and ranges of eastern NSW and Queensland, from Newcastle to Cape York. Occur mainly in sub-tropical and dry rainforest and occasionally in moist eucalypt forest and swamp forest, where fruit is plentiful.	**Unlikely** No suitable habitat was present.
Calyptorhynchus lathami Glossy Black-Cockatoo	V	V	No	Lowland coastal forests, dense mountain forests, semi-arid woodland and trees bordering watercourses, with (Allo)Casuarina trees for foraging.	**Low** Suitable habitat was present.
Callocephalon fimbriatum Gang Gang Cockatoo	E1	E	No	Tall montane forests and woodlands in mature wet sclerophyll forests. Requires hollows in which to breed between October and January.	**Low** Suitable habitat was present.
Lathamus discolor Swift Parrot	E1	CE	Yes	Open Forest to Woodland, also street trees and in parks and gardens, winter flowering eucalypts for feeding. This species nests in Tasmania during the summer months.	**Moderate** Seasonal foraging habitat was present.
Neophema chrysostoma Blue-winged Parrot	V	V	No	Found in western NSW. They favour grasslands and grassy woodlands. They are often found near wetlands both near the coast and in semi-arid zones. Blue-winged Parrots can also be seen in altered environments such as airfields, golf-courses and paddocks.	**Low** Suitable habitat areas were present.
Neophema pulchella Turquoise Parrot	V		No	Lives on the edges of Eucalypt woodland adjoining clearings and on timbered ridges and creeks in farmland. It has also been recorded utilising roadside verges and orchards. Nests in small hollow branches of Eucalypts.	**Low** Suitable habitat areas were present.
Polytelis swainsonii Superb Parrot	V	V	No	Found throughout eastern inland NSW. They inhabit Box-Gum, Box-Cypress-pine and Boree woodlands and River Red Gum Forest.	**Low**

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE REZ SITE
	BC Act 2016	EPBC Act 1999	SAII		
					Marginal habitat areas were present in the far west of the REZ.
Glossopsitta pusilla Little Lorikeet	V		No	Tall Open Forests, woodlands, orchards, parks and street trees.	**High** Suitable habitat areas were present along the REZ route.
Aphelocephala leucopsis Southern Whiteface	V	V	No	Open woodlands and shrublands with understorey of grasses or shrubs, or both.	**Low** Suitable habitat areas were present along the REZ route.
Hirundapus caudacutus White-throated Needletail	V	V & M	No	Inhabits the airspace above forests, woodlands, farmlands, plains, lakes, coasts and towns.	**Moderate** Due to the non-specific habitat requirements of this species habitat was considered to be present.
Artamus cyanopterus cyanopterus Dusky Woodswallow	V		No	The Dusky Woodswallow is found in open forests and woodlands and may be seen along roadsides and on golf courses.	**Moderate–High** Suitable habitat areas were present along the REZ route.
Pycnoptilus floccosus Pilotbird	V	V		Found in wet forested areas and heathland in eastern Victoria and south-eastern New South Wales	**Unlikely** No suitable habitat was present.
Epthianura albifrons White-fronted Chat	V		No	In NSW, it occurs mostly in the southern half of the state, in damp open habitats along the coast, and near waterways in the western part of the state. Along the coastline, it is found predominantly in saltmarsh vegetation but also in open grasslands and sometimes in low shrubs bordering wetland areas. Gregarious species usually found foraging on bare or grassy ground in wetland areas, singly or in pairs. They are insectivorous, feeding mainly on flies and beetles caught from or close to the ground.	**Unlikely** No suitable habitat was present.
Melanodryas cucullata cucullata Hooded Robin (south-eastern form)	E1	E	No	Eucalypt woodlands, Acacia scrublands, Banksia dominated coastal scrubs and open forests.	**Low-Moderate** Suitable habitat areas were present along the REZ route.
Petroica boodang Scarlet Robin	V		No	Primarily a resident in forests and woodlands, but some adults and young birds disperse to more open habitats after breeding. This species lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. Habitat usually contains abundant logs and fallen timber and these are important components of its habitat.	**Low-Moderate** Suitable habitat areas were present along the REZ route.
Petroica phoenicea Flame Robin	V		No	Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Endemic to south-eastern Australia, and ranges from near the Queensland border to southeast South Australia and also in Tasmania.	**Low-Moderate** Suitable habitat areas were present along the REZ route.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE REZ SITE
	BC Act 2016	EPBC Act 1999	SAII		
Climacteris picumnus victoriae Brown Treecreeper	V	V	No	This species is a medium sized insectivorous bird that occupies Eucalypt woodlands, particularly open woodlands lacking a dense understorey, River Red Gums on watercourses and around lakeshores. It is sedentary and nests in tree hollows within permanent territories.	**Known** Recorded within proximity to easement NE of Muswellbrook STS. Suitable habitat areas were also present along the entire REZ route.
Stagonopleura guttata Diamond Firetail	V	V	No	Inhabits areas with a grassy, shrubby understorey including Eucalypt woodlands, forests, Acacia scrubs and mallee.	**Moderate** Suitable habitat areas were present along the REZ route.
Pomatostomus temporalis subsp. *temporalis* Grey-crowned Babbler	V		No	Open forest, woodland, scrubland, farmland and outer suburbs. Prefers woodlands with regenerating trees, tall shrubs, and an intact ground cover of grass and forbs.	**Known** Recorded along a number of locations along the REZ route.
Chthonicola sagittata Speckled Warbler	V		No	Speckled Warblers live in a wide range of eucalypt-dominated vegetation that has a grassy understorey, often on rocky ridges or in gullies. It builds a domed nest of grass, bark shreds and moss, lined with fur on the ground.	**Moderate-High** Suitable habitat areas were present along the REZ route.
Anthochaera phrygia Regent Honeyeater	E4A	CE	Yes	Temperate woodlands and open forest, including forest edges, preferring to forage on large-flowered Eucalypts.	**Low** Suitable habitat areas were present along the REZ route.
Certhionyx variegatus Pied Honeyeater	V			Occasionally occurs on the slopes and plains and the Hunter Valley, typically during periods of drought. Inhabits wattle shrub mallee, spinifex and eucalypt woodlands, usually when shrubs are flowering.	**Low** Suitable habitat areas were present along the REZ route.
Grantiella picta Painted Honeyeater	V	V	No	Nomadic, within a range of generally drier forested areas with mistletoes.	**Low** Suitable habitat areas were present along the REZ route.
Melithreptus gularis gularis Black-chinned Honeyeater (eastern subspecies)	V		No	Usually found on the western side of the Great Dividing Range in dry sclerophyll forests and woodlands containing box-ironbark associations and River Red Gum. In the Hunter Valley this species is known to utilise drier coastal woodlands. Usually found in open woodlands.	**Low-Moderate** Suitable habitat areas were present along the REZ route.
Daphoenositta chrysoptera Varied Sittella	V		No	Open eucalypt woodland/forest, mallee, inland acacia, coastal tea-tree scrubs, golf courses, orchards and parks.	**Moderate** Suitable habitat areas were present along the REZ route.
Circus assimilis Spotted Harrier	V		No	Occurs throughout the Australian mainland, except in densely forested or wooded habitats of the coast, escarpment and ranges, and rarely in Tasmania. Found in grassy	**Low-Moderate**

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE REZ SITE
	BC Act 2016	EPBC Act 1999	SAII		
				open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land.	Suitable habitat areas were present along the REZ route.
Pandion cristatus Eastern Osprey	V		No	Found right around the Australian coastline. Favour coastal areas, especially the mouths of large rivers, lagoons and lakes. Feeds on fish over open waters.	**Unlikely** No suitable habitat was present.
Lophoictinia isura Square-tailed Kite	V		No	Inhabits open forests and woodlands, particularly those on fertile soils with abundant passerines.	**Low-Moderate** Suitable habitat areas were present along the REZ route.
Erythrotriorchis radiatus Red Goshawk	E1	E	Yes	The species is very rare in NSW, extending south to about 30°S, with most records north of this, in the Clarence River Catchment, and a few around the lower Richmond and Tweed Rivers. Formerly, it was at least occasionally reported as far south as Port Stephens. In NSW, preferred habitats include mixed subtropical rainforest, Melaleuca swamp forest and riparian Eucalyptus Forest of coastal rivers.	**Unlikely** No suitable habitat was present.
Hieraaetus morphnoides Little Eagle	V		No	Is found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW. Occupies open eucalypt forest, woodland or open woodland. Sheoak or acacia woodlands and riparian woodlands of interior NSW are also used.	**Moderate** Suitable habitat areas were present along the REZ route.
Haliaeetus leucogaster White-bellied Sea-Eagle	V	M	No	Occupies habitat characterised by the presence of large areas of open water and feeds opportunistically on a variety of fish, birds, reptiles, mammals and crustaceans. The nests are built in a variety of sites including tall trees, bushes, mangroves, cliffs, rocky outcrops, caves, crevices, on the ground or even in artificial structures.	**Low-Moderate** Suitable habitat areas were present along the REZ route.
Hamirostra melanosternon Black-breasted Buzzard	V		No	Found sparsely in areas of less than 500mm rainfall, from north-western NSW and north-eastern South Australia to the east coast at about Rockhampton. Lives in a range of inland habitats, especially along timbered watercourses which is the preferred breeding habitat. Hunts over grasslands and sparsely timbered woodlands.	**Low-Moderate** Suitable habitat areas were present along the REZ route.
Falco hypoleucos Grey Falcon	V	V	No	Sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. Generally restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast.	**Low** Suitable habitat areas were present along the REZ route.
Falco subniger Black Falcon	V		No	Widely, but sparsely, distributed in New South Wales, mostly occurring in inland regions.	**Low-Moderate** Suitable habitat areas were present along the REZ route.
Ninox connivens Barking Owl	V		No	Is found in forest and woodland, encountered most commonly in savanna and paperbark woodlands. It sometimes roosts in rainforests, but it requires the more open country for hunting and hollow Eucalypts for breeding.	**Low-Moderate** Suitable habitat areas were present along the REZ route.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE REZ SITE
	BC Act 2016	EPBC Act 1999	SAII		
Ninox strenua Powerful Owl	V		No	Inhabits a wide range of vegetation types from wet Eucalypt forests with a Rainforest understorey to Dry Open Forests and Woodlands. The species has been recorded utilising disturbed habitats such as exotic pine plantations and large trees in parks and gardens. Powerful Owls nest in a slight depression in the wood-mould on the base of a cavity in a large old tree, sometimes in excess of 25 metres above the ground.	**Low-Moderate** Suitable habitat areas were present along the REZ route.
Tyto longimembris Eastern Grass Owl	V		No	Recorded occasionally in all mainland states of Australia but are most common in northern and north-eastern Australia. Found in areas of tall grass, including grass tussocks, in swampy areas, grassy plains, swampy heath, and in cane grass or sedges on flood plains.	**Unlikely** No suitable habitat was present.
Tyto novaehollandiae Masked Owl	V		No	A range of wooded habitats that contain mature trees with large hollows for roosting and nesting, and more open areas for hunting.	**Low** Suitable habitat areas were present along the REZ route.
Tyto tenebricosa Sooty Owl	V		Yes	Prefers dense dimly lit forests, inhabiting pockets of rainforest and wet sclerophyll forest mainly in mountainous areas, often in south-east facing gullies.	**Unlikely** No suitable habitat was present.
FAUNA – MAMMALS					
Dasyurus maculatus ssp. *maculatus* Spotted-tailed Quoll	V	E	No	Inhabits sclerophyll forests, rainforests and coastal woodlands. Nests are made in rock caves and hollow logs or trees, and basking sites are usually found nearby.	**Unlikely** No suitable habitat was present.
Phascogale tapoatafa Brush-tailed Phascogale	V		No	Prefer dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter.	**Low** Suitable habitat areas containing open forest and woodland were present along the REZ route.
Phascolarctos cinereus Koala	E1	E	No	Coastal woodland and open forest containing suitable food trees.	**Low** Areas containing habitat were present along the REZ route.
Petrogale penicillata Brush-tailed Rock-wallaby	E1	V	Yes	Found in steep rocky sites in sclerophyll forests with a grassy understorey.	**Unlikely** No suitable habitat was present.
Notamacropus parma Parma Wallaby	V	V	No	Range is now confined to the coast and ranges of central and northern NSW from the Gosford district to south of the Bruxner Highway between Tenterfield and Casino. Preferred habitat is moist eucalypt forest with thick, shrubby understorey, often with nearby grassy areas, rainforest margins and occasionally drier eucalypt forest.	**Unlikely** No suitable habitat was likely present.
Potorous tridactylus sp. *tridactylus* Long-nosed Potoroo	V	V	No	This species is known from a variety of habitats, including Rainforest, Open Forests and Woodlands with dense groundcover, and dense, wet coastal heathlands. Soft (often sandy) substrates are preferred by this species.	**Low** A small number of areas containing marginal were present along the REZ route.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE REZ SITE
	BC Act 2016	EPBC Act 1999	SAII		
Cercartetus nanus Eastern Pygmy-possum	V		No	In NSW it extends from the coast inland as far as the Pilliga, Dubbo, Parkes and Wagga Wagga on the western slopes. Found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred, except in north-eastern NSW where they are most frequently encountered in rainforest.	**Low** A small number of areas containing marginal were present along the REZ route.
Petaurus australis Yellow-bellied Glider	V	V	No	Occurs in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south. Is found along the eastern coast to the western slopes of the Great Dividing Range, from southern Queensland to Victoria.	**Low** A small number of areas containing marginal were present along the REZ route.
Petaurus norfolcensis Squirrel Glider	V		No	Dry sclerophyll forests and woodlands with exudates for foraging and hollows for nesting.	**High** Suitable habitat areas containing open forest and woodland were present along the REZ route. Has been recorded within a number of locations within proximity to the REZ according to BioNet records (NSW DCCEEW, 2024).
Petauroides volans Greater Glider	E1	E	No	Eucalypt-dominated low open forests on the coast to tall forests in the ranges and low woodland west of Great Dividing Range. Not found within rainforests.	**Low** A small number of areas containing marginal habitat were present along the REZ route. No known records.
Pseudomys novaehollandiae New Holland Mouse		V	No	Known to inhabit open heathlands, open woodlands with a heathland understorey and vegetated sand dunes.	**Low** A small number of areas containing suitable habitat were present along the REZ route.
Pseudomys oralis Hastings River Mouse	E1	E	No	A patchy distribution spanning the Great Dividing Range from the Hunter Valley, south of Mt Royal, north to the Bunya Mountains near Kingaroy in south-east Queensland, at elevations between 300 m and 1100 m. Found in in a variety of dry open forest types with dense, low ground cover and a diverse mixture of ferns, grass, sedges and herbs. Access to seepage zones, creeks and gullies is important, as is permanent shelter such as rocky outcrops and fallen logs.	**Unlikely** No suitable habitat was likely present.
Pteropus poliocephalus Grey-headed Flying-Fox	V	V	No	Wet and Dry Sclerophyll Forests, Rainforest, Mangroves and Paperbark swamps and Banksia Woodlands.	**High** Suitable seasonal foraging habitat was present along the entire length of the REZ.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE REZ SITE
	BC Act 2016	EPBC Act 1999	SAII		
Saccolaimus flaviventris Yellow-bellied Sheathtail-bat	V		No	Has been reported from a wide variety of habitats. Roosts in tree hollows, animal burrows, dry clay cracks, under rock slabs and in abandoned Sugar Glider nests.	**Moderate** Suitable habitat areas containing hunting and roosting habitat were present along the REZ route.
Micronomus norfolkensis Eastern Freetail-bat	V		No	Appears to live in sclerophyll forests and woodland. Roosts in tree hollows or under loose bark.	**Moderate - High** Suitable habitat areas containing hunting and roosting habitat were present along the REZ route.
Falsistrellus tasmaniensis Eastern False Pipistrelle	V		No	Inhabits sclerophyll forests and has been observed roosting in holes and hollow trunks of Eucalypts.	**Moderate** Suitable habitat areas containing hunting and roosting habitat were present along the REZ route.
Miniopterus australis Little Bentwing-bat	V		Yes	Tropical rainforest to warm-temperate wet and dry sclerophyll forest; caves or similar structures for roosting.	**Moderate - High** Suitable habitat areas containing hunting habitat were present along the REZ route. No preferred roosting habitat was present.
Miniopterus orianae oceanensis Large Bentwing-bat	V		Yes	Wet and dry tall open forest, rainforest, monsoon forest, open woodland, paperbark forests and open grasslands, caves or similar structures for roosting. It occasionally uses tree hollows.	**Moderate - High** Suitable habitat areas containing hunting habitat were present along the REZ route. No preferred roosting habitat was present.
Myotis macropus Southern Myotis	V		No	Various habitats of the coast and adjacent ranges with suitable waterbodies for hunting; caves or similar structures for roosting. It occasionally uses tree hollows.	**Moderate - High** Suitable habitat areas containing hunting and roosting habitat were present along the REZ route.
Nyctophilus corbeni Corben's Long-eared Bat	V	V	No	Inhabits a variety of vegetation types, including mallee, bull oak Allocasuarina leuhmanni and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland. Roosts in tree hollows, crevices, and under loose bark.	**Low - Moderate** Suitable habitat areas containing hunting and roosting habitat were present along the REZ route.
Scoteanax rueppellii Greater Broad-nosed Bat	V		No	Tree-lined creeks, woodland/clearing ecotones and rainforest creeks, roosting mainly in tree hollows.	**Moderate - High** Suitable habitat areas containing hunting and roosting habitat were present along the REZ route.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE REZ SITE
	BC Act 2016	EPBC Act 1999	SAII		
Chalinolobus dwyeri Large Pied Bat	E1	E	Yes	Occupies dry sclerophyll forest and woodland. Roosts in caves, abandoned mud-nests of Fairy Martins and mine tunnels.	**Low** Suitable habitat areas containing hunting habitat were present along the REZ route. No preferred roosting habitat was present.
Vespadelus troughtoni Eastern Cave Bat	V		Yes	The Eastern Cave Bat is found in a broad band on both sides of the Great Dividing Range from Cape York to Kempsey, with records from the New England Tablelands and the upper north coast of NSW. The western limit appears to be the Warrumbungle Range, and there is a single record from southern NSW, east of the ACT. A cave-roosting species that is usually found in dry open forest and woodland, near cliffs or rocky overhangs; has been recorded roosting in disused mine workings, occasionally in colonies of up to 500 individuals.	**Low - Moderate** Suitable habitat areas containing hunting habitat were present along the REZ route. No preferred roosting habitat was present.

5.4 FAUNA APPRASIAL RESULTS

5.4.1 DIURNAL SURVEYS

Amphibians

Suitable habitat was found to be present for a number of species of amphibian species in the form of drainage lines, creeks, rivers, dams and wetlands. Species recorded during fieldwork were *Crinia signifera* (Common Eastern Froglet), *Limnodynastes tasmaniensis* (Spotted Grass Frog) and *Litoria fallax* (Dwarf Green Tree Frog).

No threatened amphibian species listed as threatened under either the NSW BC Act 2016 and National EPBC Act 1999 were recorded.

Reptiles

Suitable habitat was found to be present for a number of species of reptile within the REZ site. Reptile species recorded during fieldwork included *Lampropholis delicata* (Grass Skink), *Ctenotus robustus* (Striped Skink), *Carlia tetradactyla* (Rainbow Skink), *Anomalopus leuckartii* (Two-clawed worm-skink), *Cryptoblepharus pulcher* (Fence Skink), *Pogona barbata* (Eastern Bearded Dragon) and *Varanus varius* (Lace Monitor).

No threatened reptile species listed as threatened under either the NSW BC Act 2016 and National EPBC Act 1999 were recorded. One newly described threatened reptile species *Delma vescolineata* (Hunter Valley Delma), listed as Endangered under both the BC Act 2026 and National EPBC Act 1999 has been recorded within the vicinity of the Muswellbrook STS (Wildthing Environmental Consultants, 2024 & WPS, 2021) within similar habitat in the form of woodland/derived grassland.

Avifauna

An array of avifauna species was present within the REZ impact area. Common species recorded were *Gymnorhina tibicen* (Australian Magpie), *Trichoglossus moluccanus* (Rainbow Lorikeet), *Caligavis chrysops* (Yellow-faced Honeyeater), *Malurus cyaneus* (Superb Blue Wren); *Philemon corniculatus* (Noisy Friarbird), *Manorina melanocephala* (Noisy Miner), *Grallina cyanoleuca* (Magpie Lark), *Platycercus eximius* (Eastern Rosella) and *Corvus coronoides* (Australian Raven).

Three threatened avifauna species *Pomatostomus temporalis temporalis* (Grey-crowned Babbler), *Climacteris picumnus victoriae* (Brown Treecreeper) and *Haliaeetus leucogaster* (White-bellied Sea-Eagle) were recorded during fieldwork. Groups of *P. temporalis temporalis* were recorded at a number of locations together with their distinct spherical nests/roosts. *Climacteris picumnus victoriae* was recorded along the easement to the north-east of the Muswellbrook STS. One specimen of *H. leucogaster* was observed flying over the proposed site for the Eastern Hub near the northern shore of Lake Liddell.

These three species have been further assessed under the BC Act 2016 in Section 7.0. As *C. picumnus victoriae* is also listed as a threatened species under the EPBC Act 1999 the impact on this species has also been assessed in Section 9.0.

Mammals

Native mammals recorded during fieldwork were *Macropus giganteus* (Eastern Grey Kangaroo) and *Notamacropus rufogriseus* (Red-necked Wallaby). Scats and digging of *Vombatus ursinus* (Common Wombat) were also noted.

A number of introduced mammals were observed within the REZ land and included *Oryctolagus cuniculus* (European Rabbit), *Lepus capensis* (European Hare) and *Mus musculus* (House Mouse). Secondary evidence such as diggings and foot prints also identified the presence of *Sus scrofa* (Feral Pig) and *Cervus elaphus* (Red Deer).

None of these mammal species are listed as threatened under either the NSW BC Act 2016 and National EPBC Act 1999.

5.5 SURVEY LIMITATIONS

As with all reports of this type the main survey limitation is considered to be the very short period of time in which the fieldwork was carried out. Limitations to the likelihood of detecting certain subject species were also encountered during this survey. Such limitations were generally related to the seasonal occurrence of species, be it as a result of known flowering periods for flora or migratory movements by fauna.

These limitations have been overcome by applying the precautionary principle in all cases where the survey methodology may have given a false negative result. This precautionary principle was achieved by recognising that most threatened species are rare and therefore unlikely to be encountered during a survey even if they may utilise the site at other times. These species have been assessed on the basis of the presence of their habitat and the likely significance of that habitat to a viable local population.

6.0 IMPACT ASSESSMENT

6.1 AVOIDANCE AND MINIMISATION OF IMPACTS

The majority of the 132kV transmission line will be contained within an existing easement which will avoid impacting large areas of native vegetation. As the easement is required to be widened in some sections, native vegetation occurring within these areas will be impacted. These impacts will be limited to tree branch trimming and some tree removal. Areas impacted by the Muswellbrook STS upgrade and new sections of easement particularly between the Kurri STS and Hunter Expressway will require removal of native vegetation. The area of the Eastern Hub near Lake Liddell will be situated within an already cleared grassy area.

6.2 DIRECT IMPACT

The proposal will result in the following direct and potential impacts/losses:

- Impact to areas of native vegetation along the 132kV transmission line largely in the form of branch trimming and less frequent tree removal within 11 Plant Community Types (PCT's):
  - PCT 3630 Kurri Sand Heathy Woodland
  - PCT 3433 Hunter Coast Foothills Spotted Gum-Ironbark Forest
  - PCT 3634 Quorrobolong Sand Flats Forest
  - PCT 3444 Lower Hunter Spotted Gum-Ironbark Forest
  - PCT 3446 Lower North Foothills Spotted Gum-Ironbark Grassy Forest
  - PCT 4023 Coastal Valleys Riparian Forest
  - PCT 3315 Central Hunter Ironbark-Spotted Gum Forest
  - PCT 4015 Central Hunter Swamp Oak Riparian Forest
  - PCT 4073 Lower North Hinterland River Oak Forest
  - PCT 3431 Central Hunter Ironbark Grassy Woodland
  - PCT 3525 Upper Hunter Box-Blakely's Red Gum Grassy Forest
- Impact to 0.2ha of PCT 3630 Kurri Sand Heathy Woodland for approximately 150m new section of easement between the Kurri STS and Hunter Expressway;
- Impact to 2.7ha of PCT 3431 Central Hunter Ironbark Grassy Woodland for the upgrade of the Muswellbrook STS. The 2.7ha of PCT 3431 is composed of 1.55ha of woodland with 1.22ha of derived native grassland.
- Impact to 7 Ecological Communities listed under the BC Act 2016:
  - Kurri Sand Swamp Woodland in the Sydney Basin Bioregion;
  - Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW;
  - Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions;
  - Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions;
  - Central Hunter Grey Box – Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions
  - Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East;

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

- Impact to 3 Nationally Listed Threatened Ecological Communities:
  Kurri sand swamp woodland of the Sydney Basin bioregion;
  Central Hunter Valley eucalypt forest and woodland;
  Swamp Oak Floodplain Forest;
  White Box – Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland
- Impact up to 32 specimens of the state and nationally threatened *Eucalyptus parramattensis* subsp. *decadens* (Drooping Red Gum);
- Impact to a small number of specimens of *Eucalyptus glaucina* (Slaty Red Gum), a state and nationally threatened species;
- Impact to up 24 significant (larger trees) including up to 24 hollow-bearing trees;
- Impacts to habitat for the BC Act listed species threatened fauna species *Pomatostomus temporalis* subsp. *temporalis* (Grey-crowned Babbler);
- Impacts to habitat for the BC Act listed species threatened fauna species *Haliaeetus leucogaster* (White-bellied Sea-Eagle);
- Impacts to the BC Act 2026 & national EPBC Act 1999 listed species *Climacteris picumnus victoriae* (Brown Treecreeper);
- Removal/modification of a suitable habitat for a number of the addressed threatened flora and fauna species;

6.3 INDIRECT IMPACTS

The proposal may result in the following indirect and potential impacts:

- Trees and other Native Vegetation
- Potential impact to a small number of specimens of *Diuris tricolor* (Pine Donkey Orchid) and *Grevillea parviflora* subsp. *parvifolia* (Small-flowered Grevillea) within the existing easement;
- Impact on native fauna during vegetation removal:
- Erosion and sedimentation particularly in relation to streambanks;
- Introduction of priority, other weed species into other areas.

6.4 MITIGATION MEASURES

Mitigation measures have been specified to minimise the impact of the vegetation clearance to protect biodiversity values. The measures will include:

<u>Trees and other Native Vegetation</u>

Trees and native vegetation within the subject land are to be avoided wherever possible within the scope of the proposal. Works should avoid any impact to native vegetation outside the impact area. Where unavoidable, works should minimise impacts to trees as follows:

- clearing limits will be clearly marked on the ground to prevent unnecessary clearing beyond the extent of the proposal;
- trees to be removed or trimmed are to be clearly marked to prevent any unintentional impact on trees that are to remain untouched;
- the clearing or trimming of any trees should be undertaken in a manner that avoids damaging adjacent vegetation;
- tree removal and branch trimming will be carried out in accordance with Ausgrid's Tree Safety Management Plan;
- all material stockpiles, vehicle parking and machinery storage will be located outside areas of native vegetation.

Threatened Flora species

Threatened flora species such as *Diuris tricolor* (Pine Donkey Orchid) and *Grevillea parviflora* subsp. *parvifolia* (Small-flowered Grevillea) occurring within the existing easement are to be avoided during the construction of the transmission lines. The locations of these species should be located and marked, allowing them to be avoided.

Erosion

Temporary erosion and sediment controls (e.g., silt fences) are to be installed to avoid disturbance and degradation of soils and nearby features. These controls should conform to the specifications in Soils and Construction 'Blue Book' (Landcom, 2004) and should be maintained throughout the construction process until soil is successfully stabilised.

Stumps of cut trees required to be removed along waterways such as Glennies and Bowmans Creek will be left *in-situ* to continue to hold the stream bank together.

Weeds & Pathogens

Before entering the impact areas:

- All movement is to stay within the impact area,
- Use routes as instructed by the manager in the plan for the works
- Ensure machinery, vehicles clothing and equipment have been cleaned and inspected prior to entering new areas to prevent the spread of new plant propagules (seeds and fragments of plants), – Areas to inspect and clean within vehicles include tyres, wheel arches, under carriages, radiator grills, floor mats, load areas, boots, socks or anywhere that seeds and soil can lodge.

Native Fauna

The removal of hollow-bearing trees is to be supervised by a suitably qualified ecologist from Ausgrid or contract ecologist to reduce the impact on any fauna which may be present.

In relation to the Grey-crowned Babbler the following is be undertaken:

- Pre-clearance searches are to be undertaken for Grey-crowned Babbler nests prior to vegetation removal;
- Removal of nests is to be avoided where possible within the scope of the proposal;
- Where the removal of nests is unavoidable, nests are to be assessed for usage. If nests are found to be active, nests are not to be removed until all young have fledged the nest;
- If removal of a nest is unavoidable then the nest is to be removed by a suitably qualified ecologist and relocated nearby within the site;

7.0 CONSIDERATIONS UNDER SECTION 7.3 OF THE BC ACT 2016

A summary of the impacts for the REZ under *Section 7.3* of the BC Act (2016) for the concerned threatened ecological communities and species is given below. The threatened communities and species dealt with are those identified during the fieldwork and those identified as having potential habitat available on site in Table 4.3. Individual assessments for threatened communities and species recorded within the REZ or close proximity under *Section 7.3* of the BC Act (2016) are contained in Appendix D.

Seven Threatened Ecological Communities were found to be present within the REZ. These were;

- Kurri Sand Swamp Woodland in the Sydney Basin Bioregion;
- Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW;
- Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions;
- Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions;
- Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East;
- Central Hunter Grey Box-Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions
- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland

The proposal will result in an incremental reduction in each of these threatened ecological communities, however it is considered unlikely to have a significant impact which might lead to extinction locally.

Four threatened flora species were recorded during fieldwork, these were

- *Eucalyptus glaucina* (Slaty Gum)
- *Eucalyptus parramattensis* subsp. *decadens* (Drooping Red Gum)
- *Grevillea parviflora* subsp. *parviflora* (Small-flowered Grevillea)
- *Diuris tricolor* (Pine Donkey Orchid)

The proposal will directly impact a small number of specimens of *Eucalyptus glaucina* (Slaty Gum) and *Eucalyptus parramattensis* subsp. *decadens* (Drooping Red Gum). Specimens of *Grevillea parviflora* subsp. *parviflora* (Small-flowered Grevillea) and *Diuris tricolor* (Pine Donkey Orchid) were recorded within the existing easement and are not required to be impacted by the proposal. However, there is a chance these flora species will be inadvertently impacted during the construction of the transmission line. Considerations under Section 7.3 of the BC Act (2016) (contained within Appendix D) found the REZ is unlikely to significantly affect the life cycle of any of these flora species or place any viable local populations of these species at risk of extinction.

No additional flora species were recorded within the survey area during fieldwork. Suitable habitat of varying quality was considered to be present for 14 of the 19 threatened flora species listed in Table 4.3. These flora species were:

- *Corybas dowlingii* (Red Helmet Orchid);
- *Prasophyllum* sp. Wybong (A Leek Orchid)
- *Pterostylis chaetophora* (Tall Rustyhood)

- *Rhizanthella slateri* (Eastern Underground Orchid);
- *Dichanthium setosum* (Blue Grass)
- *Brachyscome brownii*
- *Ozothamnus tesselatus*
- *Rutidosis heterogama* (Heath Wrinklewort)
- *Acacia bynoeana* (Bynoe's Wattle)
- *Callistemon linearifolius* (Netted Bottle Brush);
- *Persicaria elatior* (Tall Knotweed)
- *Persoonia pauciflora* (North Rothbury Persoonia)
- *Thesium australe* (Austral Toadflax)
- *Zannichellia palustris*

According to BioNet records (DPE, 2024) and presence of suitable habitat the most likely of these flora species to be present were *Rutidosis heterogama* (Heath Wrinklewort), *Callistemon linearifolius* (Netted Bottle Brush) and *Acacia bynoeana* (Bynoe's Wattle). The proposal will result in an incremental reduction in habitat, however considering the relatively small impact, the absence of these species during fieldwork and areas of similar surrounding habitat it is considered unlikely that it would significantly affect the life cycle of any of these flora species or place any viable local populations of these species at risk of extinction.

Threatened Fauna

Three threatened fauna species were recorded during fieldwork. These species were:

- *Pomatostomus temporalis* subsp. *temporalis* (Grey-crowned Babbler);
- *Climacteris picumnus victoriae* (Brown Treecreeper);
- *Haliaeetus leucogaster* (White-bellied Sea-Eagle).

The proposal will impact suitable habitat for *Pomatostomus temporalis* subsp. *temporalis* (Grey-crowned Babbler) and *Climacteris picumnus victoriae* (Brown Treecreeper). A small number of nests/roosts of *P. temporalis* subsp. *temporalis* may also be impacted. No suitable habitat is likely to be impacted for *Haliaeetus leucogaster* (White-bellied Sea-Eagle). Considerations under Section 7.3 of the BC Act (2016) (contained within Appendix D) found the REZ is unlikely to significantly affect the life cycle of any of these fauna species or place any viable local populations of these species at risk of extinction.

No additional threatened fauna species were recorded during fieldwork. Of the 90 addressed threatened fauna species, the REZ was considered to contain suitable habitat for 68 species:

- *Litoria aurea* (Green and Golden Bell Frog);
- *Litoria brevipalmata* (Green-thighed Frog);
- *Litoria littlejohni* (Littlejohn's Tree Frog);
- *Aprasia parapulchella* (Pink-tailed Worm-lizard);
- *Delma vescolineata* (Hunter Valley Delma)
- *Botaurus poiciloptilus* (Australasian Bittern);
- *Varanus rosenbergi* (Rosenberg's Goanna)
- *Calidris acuminata* (Sharp-tailed Sandpiper);
- *Tringa nebularia* (Common Greenshank)

- *Gallinago hardwickii* (Latham's Snipe)
- *Rostratula australis* (Australian Painted Snipe);
- *Botaurus poiciloptilus* (Australasian Bittern)
- *Ixobrychus flavicollis* (Black Bittern);
- *Ephippiorhynchus asiaticus* (Black-necked Stork)
- *Anseranas semipalmata* (Magpie Goose);
- *Oxyura australis* (Blue-billed Duck);
- *Stictonetta naevosa* (Freckled Duck)
- *Burhinus grallarius* (Bush Stone Curlew)
- *Turnix maculosus* (Red-backed Button-quail);
- *Calyptorhynchus lathami* (Glossy Black-Cockatoo)*;*
- *Callocephalon fimbriatum* (Gang Gang Cockatoo);
- *Lathamus discolor* (Swift Parrot);
- *Neophema chrysostoma* (Blue-winged Parrot)
- *Neophema pulchella* (Turquoise Parrot)
- *Polytelis swainsonii* (Superb Parrot)
- *Glossopsitta pusilla* (Little Lorikeet);
- *Aphelocephala leucopsis* (Southern Whiteface);
- *Hirundapus caudacutus* (White-throated Needletail);
- *Artamus cyanopterus cyanopterus* (Dusky Woodswallow)
- *Melanodryas cucullata cucullata* (Hooded Robin) (south-eastern form)
- *Petroica boodang* (Scarlet Robin);
- *Petroica phoenicea* (Flame Robin);
- *Stagonopleura guttata* (Diamond Firetail);
- *Chthonicola sagittata* (Speckled Warbler);
- *Anthochaera phrygia* (Regent Honeyeater);
- *Certhionyx variegatus* (Pied Honeyeater);
- *Grantiella picta* (Painted Honeyeater);
- *Melithreptus gularis gularis* (Black-chinned Honeyeater);
- *Daphoenositta chrysoptera* (Varied Sittella);
- *Circus assimilis* (Spotted Harrier);
- *Lophoictinia isura* (Square-tailed Kite);
- *Hieraaetus morphnoides* (Little Eagle);
- *Hamirostra melanosternon* (Black-breasted Buzzard);
- *Falco hypoleucos* (Grey Falcon);
- *Falco subniger* (Black Falcon);
- *Ninox connivens* (Barking Owl);
- *Ninox strenua* (Powerful Owl);
- *Tyto novaehollandiae* (Masked Owl);
- *Dasyurus maculatus* subsp. *maculatus* (Spotted-tailed Quoll);
- *Phascogale tapoatafa* (Brush-tailed Phascogale);
- *Phascolarctos cinereus* (Koala)
- *Potorous tridactylus* sp. *tridactylus* (Long-nosed Potoroo)
- *Cercartetus nanus* (Eastern Pygmy-possum);
- *Petaurus australis* (Yellow-bellied Glider);
- *Petaurus norfolcensis* (Squirrel Glider);
- *Petauroides volans* (Greater Glider);
- *Pseudomys novaehollandiae* (New Holland Mouse)
- *Pteropus poliocephalus* (Grey-headed Flying-Fox);

- *Saccolaimus flaviventris* (Yellow-bellied Sheathtail-bat);
- *Micronomus norfolkensis (Eastern Freetail-bat);*
- *Falsistrellus tasmaniensis* (Eastern False Pipistrelle);
- *Miniopterus australis* (Little Bentwing-bat);
- *Miniopterus schreibersii oceanensis* (Large Bentwing-bat);
- *Myotis macropus* (Southern Myotis)
- *Nyctophilus corbeni* (Corben's Long-eared Bat)
- *Scoteanax rueppellii* (Greater Broad-nosed Bat);
- *Chalinolobus dwyeri* (Large Pied Bat);
- *Vespadelus troughtoni* (Eastern Cave Bat).

According to the BioNet Atlas records (DPE, 2024) threatened fauna species found within proximity of the REZ included *Delma vescolineata* (Hunter Valley Delma), *Daphoenositta chrysoptera* (Varied Sittella), *Chthonicola sagittata* (Speckled Warbler), *Glossopsitta pusilla* (Little Lorikeet), *Artamus cyanopterus cyanopterus* (Dusky Woodswallow), *Petaurus norfolcensis* (Squirrel Glider), *Phascogale tapoatafa* (Brush-tailed Phascogale), *Pteropus poliocephalus* (Grey-headed Flying-fox) and addressed microchiropteran bats. The proposal will result in a small incremental reduction habitat for the above species. Given the relatively small impact and recommendations it is unlikely that the proposal will have a significant impact on these threatened fauna species such that a local extinction would occur.

9.0 ASSESSMENT OF SERIOUS AND IRREVERSIBLE IMPACTS

Under the BC Act 2016, a determination of whether an impact is serious and irreversible (SAII) must be made in accordance with the principles prescribed in section 6.7 of the BC Regulation.

The "*Guidance to assist a decision maker to determine a serious and irreversible impact*, 2017, sets out those potential SAII species and ecological communities (known as "potential SAII entities").

The principles for determining serious and irreversible impacts in the Biodiversity Conservation Regulation, 2017 are:

- *will cause a further decline of a species or ecological community that is currently observed, estimated, inferred or reasonably suspected to be in a rapid rate of decline, or*
- *will further reduce the population of a species or ecological community that is currently observed, estimated, inferred, or reasonably suspected to have a very small population size, or*
- *are impacts on the habitat of a species or area of ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very limited geographic distribution, or*
- *are impacts on a species or ecological community is unlikely to respond to measures to improve habitat and vegetation integrity and is therefore irreplaceable.*

9.1 POTENTIAL SAII ENTITIES

In this case all potential SAII entities are derived from Appendix 2 of the Guide, and are within the BioNet search area (DPE, 2023). The approval authority must take those impacts into consideration and determine whether there are any additional and appropriate measures that will minimise those impacts if approval is to be granted. An Impact evaluation is shown in Table 9.1. Entities include:

- Central Hunter Valley Eucalypt Forest and Woodland
- White Box Yellow Box Blakely's Red Gum Woodland
- *Rhizanthella slateri* (Eastern Underground Orchid);
- *Lathamus discolor* (Swift Parrot);
- *Anthochaera phrygia* (Regent Honeyeater);
- *Miniopterus australis* (Little Bentwing-bat);
- *Chalinolobus dwyeri* (Large Pied Bat);
- *Vespadelus troughtoni* (Eastern Cave Bat);

Table 8.1: SAII impact evaluation

Potential SAII Entities	Impact Evaluation	Impact Thresholds	Serious and Irreversible Impact?
Central Hunter Valley Eucalypt Forest and Woodland	Present within the subject land		No
White Box Yellow Box Blakely's Red Gum Woodland	Present within the subject land	No threshold identified.	No
Rhizanthella slateri Eastern Underground Orchid	Only marginal habitat was present.		No
Lathamus discolor Swift Parrot	Suitable habitat was present.	Not within a mapped BAM Important Area (DPE, 2023)	No

Potential SAII Entities	Impact Evaluation	Impact Thresholds	Serious and Irreversible Impact?
Anthochaera phrygia Regent Honeyeater	Seasonal foraging habitat was present.	Not within a mapped BAM Important Area (DPE, 2023)	No
Miniopterus australis Little Bentwing-bat	Suitable hunting habitat was present. Preferred roosting habitat was absent.		No
Chalinolobus dwyeri Large Pied Bat	Suitable hunting habitat was present. Preferred roosting habitat was absent.		No
Vespadelus troughtoni Eastern Cave Bat	Suitable hunting habitat was present. No preferred roosting habitat was available within the site.		No

Two SAII entities the TEC – Central Hunter Valley Eucalypt Forest and Woodland and White Box - Yellow Box - Blakely's Red Gum Woodland (Box Gum Woodland TEC) were identified within the REZ.

10.0 CONSIDERATIONS UNDER THE COMMONWEALTH ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

Considerations have been made to the Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act 1999. Assessments have been made to determine whether or not the proposal or activity has, will have, or is likely to have a significant impact on a matter of National Environmental Significance. The matters of National Environmental Significance and the appropriate responses are listed below:

- *World Heritage properties;*

The REZ is unlikely to impact any World Heritage Properties.

- *wetlands recognised under the Ramsar convention as having international significance;*

The subject land is located upstream from the Hunter Estuary. The proposed works are not likely to have a significant impact to any Ramsar Wetlands.

- *listed threatened species and communities;*

Four nationally threatened ecological communities were recorded on the DCCEEW database as having potential to occur within 10km of the site, these being:

- Kurri sand swamp woodland of the Sydney Basin bioregion;
- Central Hunter Valley eucalypt forest and woodland;
- Swamp Oak Floodplain Forest;
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

The assessment undertaken in Sections 10.1 found the proposal is unlikely to significantly impact any of these four communities.

A total of 52 nationally threatened species were recorded on the DCCEEW database as occurring or having potential habitat available within 10km of the site (excluding pelagic species), these being:

Anthochaera phrygia	Regent Honeyeater
Calidris ferruginea	Curlew Sandpiper
Lathamus discolor	Swift Parrot
Callocephalon fimbriatum	Gang-gang Cockatoo
Melanodryas cucullata cucullata	South-eastern Hooded Robin
Botaurus poiciloptilus	Australasian Bittern
Rostratula australis	Australian Painted Snipe
Stagonopleura guttata	Diamond Firetail
Pycnoptilus floccosus	Pilotbird
Polytelis swainsonii	Superb Parrot
Aphelocephala leucopsis	Southern Whiteface
Grantiella picta	Painted Honeyeater
Falco hypoleucos	Grey Falcon

Hirundapus caudacutus	White-throated Needletail
Calidris acuminata	Sharp-tailed Sandpiper
Gallinago hardwickii	Latham's Snipe
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo
Climacteris picumnus victoriae	Brown Treecreeper (south-eastern)
Neophema chrysostoma	Blue-winged Parrot
Litoria booroolongensis	Booroolong Frog
Heleioporus australiacus	Giant Burrowing Frog
Phascolarctos cinereus	Koala
Chalinolobus dwyeri	Large-eared Pied Bat
Dasyurus maculatus maculatus (SE mainland population)	Spot-tailed Quoll
Petauroides volans	Greater Glider (southern and central)
Petrogale penicillata	Brush-tailed Rock-wallaby
Pseudomys novaehollandiae	New Holland Mouse
Pteropus poliocephalus	Grey-headed Flying-fox
Petaurus australis australis	Yellow-bellied Glider (south-eastern)
Nyctophilus corbeni	Corben's Long-eared Bat
Euphrasia arguta	
Prasophyllum sp. Wybong (C.Phelps ORG 5269)	a leek-orchid
Wollemia nobilis	Wollemi Pine
Hibbertia acaulothrix	
Androcalva rosea	Sandy Hollow Commersonia
Persoonia hirsuta	Hairy Geebung
Pomaderris cotoneaster	Cotoneaster Pomaderris
Cynanchum elegans	White-flowered Wax Plant
Vincetoxicum forsteri	
Prostanthera discolor	
Lepidium aschersonii	Spiny Peppercress
Dichanthium setosum	bluegrass
Ozothamnus tesselatus	
Prostanthera cryptandroides subsp. cryptandroides	Wollemi Mint-bush
Pomaderris brunnea	Rufous Pomaderris
Homoranthus darwinioides	
Swainsona murrayana	Slender Darling-pea
Androcalva procumbens	
Thesium australe	Austral Toadflax
Hoplocephalus bungaroides	Broad-headed Snake
Delma vescolineata	Hunter Valley Delma
Aprasia parapulchella	Pink-tailed Worm-lizard

One nationally threatened species; *Climacteris picumnus victoriae* (Brown Treecreeper) was recorded during fieldwork. Of the listed national threatened species, those most likely to occur within the site and close proximity would include the flora species such as *Pteropus poliocephalus* (Grey-headed Flying-fox), listed woodland birds, and microchiropteran bats. Potential habitat for all of the listed nationally threatened species has been assessed in Table 5.5. The action will result in a small incremental loss/modification of habitat within the locality for these species, however it is not likely to have a significant impact on any of these addressed species.

- *migratory species protected under international agreements.*

Eleven nationally listed migratory species were recorded on the DCCEEW on-line database as occurring or having potential habitat available within 10km of the study area, these being:

Migratory Terrestrial Species:

- *Hirundapus caudacutus* (White-throated Needletail)

- *Monarcha melanopsis* (Black-faced Monarch)
- *Motacilla flava* (Yellow Wagtail)
- *Myiagra cyanoleuca* (Satin Flycatcher)
- *Rhipidura rufifrons* (Rufous Fantail)

Migratory Wetland Species:

- *Actitis hypoleucos* (Common Sandpiper)
- *Calidris ferruginea* (Curlew Sandpiper)
- *Calidris melanotos* (Pectoral Sandpiper)
- *Gallinago hardwickii* (Latham's Snipe)
- *Numenius madagascariensis* (Eastern Curlew)

Migratory Marine Birds

- *Apus pacificus* (Fork-tailed Swift)

Considering the relatively small impact on habitat in the locality it is unlikely that these species or any of the listed migratory species would be significantly affected by the proposal.

- *nuclear activities;*

The proposal does not involve any type of nuclear activity.

- *the Commonwealth marine environment;*

The proposal does not involve the modification of the Commonwealth marine environment

10.1 CENTRAL HUNTER VALLEY EUCALYPT FOREST AND WOODLAND

The vegetation must be consistent with the criteria outlined in the 'Approved Conservation Advice (including listing advice) for the Central Hunter Valley eucalypt forest and woodland ecological community' (DotE 2015) (Table 10.1).

In order to be considered a Matter of National Environmental Significance under the EPBC Act, areas of the ecological community must meet:

1. the key diagnostic characteristics (in Section 1.5.1; DotE 2015) (Table 10.1); AND

Areas of (PCT) 3431 - Central Hunter Ironbark Grassy Woodland and PCT 3315 Central Hunter Ironbark-Spotted Gum Forest met the key diagnostic characteristics of Central Hunter Valley eucalypt forest. An exception would be the areas of derived woodland which do not met the key diagnostic characteristics.

2. at least the minimum condition thresholds for species composition and patch sizes (DotE 2015).

Minimum Condition Thresholds

Minimum condition thresholds for species composition and patch sizes (DotE 2015).

(1) Is the patch at least 0.5 ha in size? -

Yes

↓

(2) Is at least 50% of the perennial understorey vegetative cover of the patch (due to) native plants?

Yes, for a number of areas.

↓

(3) Are there at least 12 native understorey species in the whole patch?

This would be true for a number of areas.

↓

The patch is part of the protected nationally listed ecological community

Areas of (PCT) 3431 - Central Hunter Ironbark Grassy Woodland and PCT 3315 Central Hunter Ironbark-Spotted Gum Forest would be consistent with the Critically Endangered Ecological Community Central Hunter Valley eucalypt forest and woodland. An assessment Central Hunter Valley eucalypt forest and woodland was conducted and found that the proposal is unlikely to have a significant impact.

Table 10.1: Assessment of EPBC Act Central Hunter Valley eucalypt forest and woodland. Key diagnostic characteristics against Plant Community Type (PCT)

Key diagnostic characteristics as described in in Section 1.5.1 of DotE 2015	Impacted Area (PCT) 3431 with canopy 1.55ha (PCT) 3315 with canopy	Impacted Area – 3ha (PCT) 3431 (Derived Grassland) 1.22ha (PCT) 3315 (Derived Grassland)
It occurs in the Hunter River catchment (typically called the Hunter Valley region)	Yes	Yes
It typically occurs on lower hillslopes and low ridges, or valley floors in undulating country; on soils derived from Permian sedimentary rocks	Yes	Yes
It does not occur on alluvial flats, river terraces, aeolian sands, Triassic sediments, or escarpments	Yes	Yes
The canopy of the ecological community is dominated by one or more of the following four eucalypt species: *Eucalyptus crebra* (narrow-leaved ironbark), *Corymbia aculata* (syn. E. maculata) (spotted gum), *E. dawsonii* (slaty gum) and E. moluccana (grey box) OR a fifth species, *Allocasuarina luehmannii* (bulloak, buloke) dominates in combination with one or more of the above four eucalypt species, in sites previously dominated by one or more of the above four eucalypt species	Dominated by *Eucalyptus crebra* (Narrow-leaved Ironbark). Some specimens of *Eucalyptus moluccana* (Grey Box)	Generally, no canopy present
Allocasuarina torulosa (forest oak/ she-oak, rose she-oak/oak), *Eucalyptus acmenoides* (white mahogany) and *E. fibrosa* (red/broad-leaved ironbark) are largely absent from the canopy of a patch.	Yes	Yes
A ground layer is present (although it may vary in development and composition), as a sparse to thick layer of native grasses and other native herbs and/or native shrubs	Yes	Yes
Does this PCT/condition zone meet the EPBC Act listing criterion	**Yes**	**No**

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:

- ***reduce the extent of an ecological community***

The proposal will result in a narrow impact to the road reserve, however is unlikely to significantly reduce the extent of this community.

- ***fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines***

The project involves the development of an easement for the overhead lines. As the relatively narrow proposal will not impact groundcovers and small shrubs it is unlikely to impede any genetic transfer between areas.

- ***adversely affect habitat critical to the survival of an ecological community***

The project is unlikely to adversely affect habitat considered to be critical to the survival of the community.

- ***modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns***

The project is unlikely to affect any abiotic processes necessary for the community's survival.

- ***cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting the following criteria:***

The proposal is unlikely to result in substantial change in the species composition of this community locally.

- **cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:**
  -assisting invasive species, that are harmful to the listed ecological community, to become established, or
  – causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or

Taking the mitigations measures into consideration the proposal is unlikely to assist any invasive species, nor cause any increased mobilisation of fertilisers which would kill or inhibit the growth of species in the ecological community.

- ***interfere with the recovery of an ecological community.***

The proposal is unlikely to interfere with any current recovery programs in the area.

Conclusion
The project is unlikely to significantly impact this community

10.2 WHITE BOX -YELLOW BOX- BLAKELYS RED GUM GRASSY WOODLAND AND DERIVED NATIVE GRASSLAND

To be considered consistent with the Critically Endangered listing under the EPBC Act, the vegetation must be consistent with the criteria outlined in the EPBC Act policy statement 3.5 – White box – Yellow box – Blakely's red gum grassy woodlands and derived native grasslands (Department of the Environment and Heritage, 2006) and as summarised in Table 10.2.

The assessment concluded that the vegetation did meet the condition criteria of the EPBC Act listing for White Box – Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grasslands. An assessment under the Significant Impact Criteria for this community has been undertaken below.

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:

- ***reduce the extent of an ecological community***

The proposal will result in a narrow impact to the road reserve, however is unlikely to significantly reduce the extent of this community.

- ***fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines***

The project involves the development of an easement for the overhead lines. As the relatively narrow proposal will not impact groundcovers and small shrubs it is unlikely to impede any genetic transfer between areas.

- ***adversely affect habitat critical to the survival of an ecological community***

The project is unlikely to adversely affect habitat considered to be critical to the survival of the community.

- ***modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns***

The project is unlikely to affect any abiotic processes necessary for the community's survival.

- ***cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting the following criteria:***

The proposal is unlikely to result in substantial change in the species composition of this community locally.

- **cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:**
  -assisting invasive species, that are harmful to the listed ecological community, to become established, or

– causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or

Taking the mitigations measures into consideration the proposal is unlikely to assist any invasive species, nor cause any increased mobilisation of fertilisers which would kill or inhibit the growth of species in the ecological community.

- ***interfere with the recovery of an ecological community.***

The proposal is unlikely to interfere with any current recovery programs in the area.

Conclusion
The project is unlikely to significantly impact this community

Table 10.2: Assessment of EPBC Act White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland. Key diagnostic characteristics against Plant Community Type (PCT)

Key diagnostic characteristics as described in in Section 1.5.1 of DotE 2015	Key Diagnostics Met
The ecological community occurs in the following bioregions (IBRA, DoE 2012): Brigalow Belt South, Murray Darling Depression, Nandewar, New England Tableland, Threatened Species Scientific Committee Page 14 of 121 White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland Conservation Advice NSW North Coast, NSW South Western Slopes, Riverina, South Eastern Queensland, South East Corner, South East Coastal Plain, South Eastern Highlands, Southern Volcanic Plain, Sydney Basin and Victorian Midlands (TSSC 2006; DECCW 2011; DCCEEW 2022).	Yes, occurs within the Sydney Basin IBRA Bioregion.
It has, or previously had, an overstorey dominated or co-dominated by: • *Eucalyptus albens* (white box) and/or *E. melliodora* (yellow box) and/or *E. blakelyi* (Blakely's red gum) (applicable across the entire range of the ecological community); or, • in the Nandewar bioregion (IBRA, DoE 2012), any of the above three species and/or E. *microcarpa* (western grey box) and/or *E. moluccana* (grey box, coastal grey box);	Yes, has an overstorey dominated by *Eucalyptus. blakelyi* (Blakely's Red Gum).
It has a predominantly native ground layer	Yes
Tussock grasses are conspicuous in the ground layer (except in some situations, such as under dense groves of shrubs or regenerating trees), usually with several native species from some the following genera: *Austrostipa, Bothriochloa, Chloris, Cymbopogon, Dichanthium, Microlaena, Poa, Themeda, Rytidosperma* or *Sorghum*.	Yes
Amongst the grass tussocks and sometimes in swathes, a range of broad-leaved forbs and petaloid monocots (e.g. lilies sens. lat.) may be a major component of the plant diversity.	Yes
While shrubs may be dominant locally within areas of the ecological community, areas of native vegetation with a more continuous shrub layer, in which the average shrub cover of the whole patch is greater than 30%, is considered to be a shrubby woodland and so is not part of the listed ecological community. In assessing this, the effects of disturbance need to be considered, for example where heavy grazing may result in high densities of shrubs during a recovery phase	Yes
Does this PCT meet the EPBC Act listing criterion	**Yes**

10.3 KURRI SAND SWAMP WOODLAND OF THE SYDNEY BASIN BIOREGION

To be considered consistent with the Endangered listing under the EPBC Act, the vegetation must be consistent with the criteria outlined in the Approved Conservation Advice for the Kurri sand swamp woodland of the Sydney Basin bioregion (DCCEEW, 2022) (Section 2.1) and as summarised in Table 10.3. The assessment concluded that the vegetation did meet the condition criteria of the EPBC Act listing for Kurri sand swamp woodland of the Sydney Basin bioregion. An assessment under the Significant Impact Criteria for this community has been undertaken below.

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:

- ***reduce the extent of an ecological community***

The proposal will result in a narrow impact to the road reserve, however is unlikely to significantly reduce the extent of this community.

- ***fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines***

The project involves the development of an easement for the overhead lines. As the relatively narrow proposal will not impact groundcovers and small shrubs it is unlikely to impede any genetic transfer between areas.

- ***adversely affect habitat critical to the survival of an ecological community***

The project is unlikely to adversely affect habitat considered to be critical to the survival of the community.

- ***modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns***

The project is unlikely to affect any abiotic processes necessary for the community's survival.

- ***cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting the following criteria:***

The proposal is unlikely to result in substantial change in the species composition of this community locally.

- **cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:**
  -assisting invasive species, that are harmful to the listed ecological community, to become established, or
  – causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or

Taking the mitigations measures into consideration the proposal is unlikely to assist any invasive species, nor cause any increased mobilisation of fertilisers which would kill or inhibit the growth of species in the ecological community.

- ***interfere with the recovery of an ecological community.***

The proposal is unlikely to interfere with any current recovery programs in the area.

Conclusion
The project is unlikely to significantly impact this community

Table 10.3: Assessment of EPBC Act Kurri sand swamp woodland of the Sydney Basin bioregion. Key diagnostic characteristics against Plant Community Type (PCT)

Key diagnostic characteristics as described in in Section 2.1 Approved Conservation Advice for the Kurri sand swamp woodland of the Sydney Basin bioregion (DCCEEW, 2022).	Key Diagnostics Met
Mainly occurs within the Hunter subregion of the Sydney Basin Bioregion, with some patches extending into the Wyong subregion (DoE 2013).	Yes
The vegetation structure is typically a heathland to low sclerophyll woodland.	Yes
Where a eucalypt canopy layer is evident, *Angophora bakeri, Eucalyptus parramattensis* subsp. *decadens and/or Eucalyptus* sp. aff. *agglomerata* are the typical dominant to codominant tree species of the canopy. Other eucalypts, for example E. fibrosa, may also be present and be locally dominant, but not as dominant canopy species throughout a patch. This also applies to hybrids of these trees. In areas where the eucalypt canopy is sparse, *Melaleuca nodosa* can dominate the mid-storey to tree canopy layers.	Yes
The mid-layer, where present, is typically characterised by a mid-dense to dense shrub layer of sclerophyllous species, commonly; *Acacia elongata, A. longifolia, Banksia collina, Bossiaea spp. Callistemon linearis, Dillwynia retorta, Hakea sericea, Isopogon anemonifolius, Lambertia formosa, Leptospermum spp. Leucopogon virgatus, Melaleuca nodosa, M. thymifolia* (thyme honey-myrtle), *Monotoca scoparia* and *Xanthorrhoea glauca* (grasstree).	Yes
The ground layer is typically a patchy sparse to mid-dense cover of low shrubs and/or grasses, sedges, and forbs, including *Anisopogon avenaceus, Aristida spp., Entolasia stricta, and Lomandra* spp.	Yes
Does this PCT meet the EPBC Act listing criterion	**Yes**

10.4 BROWN TREECREEPER

An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:

- **lead to a long-term decrease in the size of a population**

The proposal resulting in the modification of a relatively narrow area of suitable habitat for the Brown Treecreeper which is connected to substantial areas of habitat is unlikely to lead to any long-term decrease in the size of a population.

- **reduce the area of occupancy of the species**

The removal/modification of habitat is unlikely to reduce the area of occupancy of the mobile Brown Treecreeper.

- **fragment an existing population into two or more populations**

The project will not fragment an existing population of this mobile bird species.

- **adversely affect habitat critical to the survival of a species**

No area critical to the survival of the Brown Treecreeper will be adversely impacted.

- **disrupt the breeding cycle of a population**

The project is unlikely to disrupt any breeding.

- **modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline**

The proposal is unlikely to remove or modify habitat such that the Brown Treecreeper is likely to decline.

- **result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat**

The proposal is unlikely to result in the introduction of any invasive species.

- **introduce disease that may cause the species to decline, or**

The proposal is unlikely to result in the introduction of any disease that may affect the Brown Treecreeper.

- **interfere with the recovery of the species.**

The project will not interfere with the recovery of the species.

Conclusion
The proposal is unlikely to have a significant impact on the Brown Treecreeper as a result of the relatively small area impacted and presence of extensive adjoining habitat.

11.0 CONCLUSION

It is believed that the ecological assessment has been undertaken in accordance with the requirements of the Environmental Planning and Assessment Amendment Act 2017 (EP&A Act 2017), the Biodiversity Conservation Act 2016 (BC Act 2016) and the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act 1999).

The ecological assessment found the proposed REZ Project will result in an incremental reduction/modification of habitat, however taking into consideration the mitigation measures the proposal is unlikely to have a significant impact on any addressed threatened species, endangered population or threatened ecological community.

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APPENDIX A

SURVEY POINTS ALONG REZ ROUTE

Table A1 Survey Point Details

Point No.	Location		Point Description & Impact	Date	Photo and/or Photo No.
	Easting	Northing			
1	359498	6369179	From Kurru Kurri STS Maintained lawn around Kurri Kurri STS *Cynodon dactylon* (Couch), *Hypochaeris radicata* (Flatweed), *Richardia humistrata* (White Eye)	22/08/2024	#9121
2	359435	6369207	No existing easement PCT 3631 Kurri Sand-Clay Woodland *Melaleuca decora* (White-feathered Honey-myrtle), *Melaleuca nodosa* (Ball Honeymyrtle), *Acacia longifolia* (Sydney Golden Wattle), *Grevillea montana*. Deer prints on ground.	22/08/2024	#9135 #9134
3	359411	6369233	No existing easement, within drainage line. PCT 3631 Kurri Sand-Clay Woodland *Eucalyptus parramattensis subsp. decadens* (Drooping Red Gum), *Melaleuca decora* (White-feathered Honey-myrtle), *Melaleuca decora* (White-feathered Honey-myrtle), Ground: *Carex appressa* (Saw Sedge), *Hypolepis muelleri* (Harsh Ground Fern).	22/08/2024	#9142 #9141
4	359324	6369289	Ground*: Imperata cylindrica* (Blady Grass), *Eragrostis curvula* (African Lovegrass).	22/08/2024	#9179 #9180 #9181
5	385748	6369533	PCT ? No new clearing along this section. The new line will be within an already maintained easement.	29/05/2024	#8120 #8119
6	357765	6370033	*Angophora floribunda* (Rough-barked Apple), *Acacia parvipinnula, Pteridium esculentum* (Bracken Fern).*Leptospermum polygalifolium* (Tantoon), Weeds: *Ehrharta erecta* (Panic Veldtgrass). *Anthoxanthum odoratum* (Sweet Vernal Grass),	29/05/2024	
7	357734	6370068	*Acacia parvipinnula, Acacia ulicifolia* (Prickly Moses), *Pteridium esculentum* (Bracken Fern).	29/05/2024	
8	357701	6370106	Water crossing *Typha orientalis* (Cumbungi), *Melaleuca sieberi* (Sebers Paperback). *Hypolepis muelleri* (Harsh Ground Fern). *Melaleuca nodosa* (Ball Honeymyrtle), *Imperata cylindrica* (Blady Grass), Weeds: *Hyparrhenia hirta* (Coolatai Grass), *Coreopsis lanceolata* (Coreopsis).	29/05/2024	#8136
9	357688	6870134	Scales Road Overhanging branches require removal. *Angophora floribunda* (Rough-barked Apple), *Eucalyptus punctata* (Grey Gum). *Melaleuca nodosa* (Ball Honeymyrtle), *Acacia parvipinnula, Angophora bakeri* (Narrow-leaved Apple), *Bursaria spinosa (Blackthorn).* Weeds: *Lantana camara* (Lantana), *Cestrum parqui* (Green Cestrum), *Asparagus asparagoides* (Bridal Creeper).	29/05/2024	#8140 #8141
10	357630	6370185	Grassy open area. *Lomandra longifolia* (Spiny Mat Rush), Weeds: *Anthoxanthum odoratum* (Sweet Vernal Grass), *Andropogon virginicus* (Whiskey Grass), *Sida rhombifolia* (Paddys Lucerne), *Coreopsis lanceolata* (Coreopsis), *Ambrosia artemisiifolia* (Annual Ragweed),	29/05/2024	#8147
11	357536	6370307	Scales Road Introduced grassy west side of road. Small number of specimens of *Eucalyptus tereticornis* (Forest Red Gum) may require branch trimming.	29/05/2024	
12	357496	6370355	Over Hart Road 20m of existing easement already present. Couple of large trees in south may require branch trimming.	29/05/2024	#8165
13	357788	6370024	Outside corner Scales Road. *Acacia parvipinnula* regrowth. Weeds *Lantana camara* (Lantana), *Cenchrus clandestinus* (Kikuyu), *Ehrharta erecta* (Panic Veldtgrass).	29/05/2024	#8166
14	357834	6369979	Existing easement off bend on Scale Road	29/05/2024	#8168

Point No.	Location		Point Description & Impact	Date	Photo and/or Photo No.
	Easting	Northing			
			Cynodon dactylon (Couch), *Microlaena stipoides* (Weeping Meadow Grass), *Cheilanthes sieberi* (Mulga Fern), Weeds: *Anthoxanthum odoratum* (Sweet Vernal Grass). Either side of easement PCT 4039 Hunter Range Creekflat Apple-Red Gum Forest *Eucalyptus amplifolia* (Cabbage Gum), *Pteridium esculentum* (Bracken Fern).		
15	357906	6369919	Next to Swamp Creek. *Eucalyptus amplifolia* (Cabbage Gum), *Angophora floribunda* (Rough-barked Apple), *Lomandra longifolia* (Spiny Mat Rush), *Phragmites australis* (Australian Reed) on edge of creek. Introduced species *Ligustrum sinense* (Small-leaved Privet), *Megathyrsus maximus* (Guinea Grass). Only need to remove *Acacia parvipinnula* on the edge of the easement (likely two trees) Possible branch trimming of *Angophora floribunda*.	29/05/2024	#8173
16	334160	6373	Bishops Bridge off Old Maitland Road Approximately 3m of additional clearing on edge of clearing. *Corymbia maculata* (Spotted Gum), *Eucalyptus fibrosa* (Broad-leaved Ironbark), *Eucalyptus moluccana* (Grey Box), *Melaleuca styphelioides* (Prickly-leaved Paperbark). In easement *Dodonaea triquetra* (Common Hop Bush), *Notelaea longifolia* (Mock Olive), *Breynia oblongifolia* (Breynia), *Leucopogon juniperinus* (Prickly Bearded Heath). *Bursaria spinosa* (Blackthorn), *Macrozamia flexuosa*, *Cymbopogon refractus* (Barbed Wire Grass), Lobelia purpurescens (Whiteroot). Gahnia aspera.	29/05/2024	#8180 to #8185
17	353908	6373909	Three (3) *Eucalyptus moluccana* (Grey Box) require likely removal. Introduced *Chloris gayana* (Rhodes Grass) around base of trees.	29/05/2024	#8196
18	353837	6373944	*Eucalyptus moluccana* (Grey Box), *Dianella caerulea* var. *caerulea* (Blue Flax Lily). *Chloris gayana* (Rhodes Grass), Bidens pilosa (Bidens).	29/05/2024	#8202
19	353780	6373978	*Eucalyptus moluccana* (Grey Box), *Corymbia maculata* (Spotted Gum).	29/05/2024	#8207 #8208
20	353655	6374041	*Eucalyptus moluccana* (Grey Box), *Corymbia maculata* (Spotted Gum).	29/05/2024	#8213
21	353503	6374172	*Acacia parvipinnula, Pultenaea spinosa, Dichondra repens* (Kidneyweed). Weeds: *Paspalum urviillei* (Vasey Grass).	29/05/2024	#8223 #8224
22	353398	6374211	Drainage Crossing: *Melaleuca styphelioides* (Prickly-leaved Paperbark), *Acacia fimbriata*, *Adiantum aethiopicum* (Maidenhair Fern).	29/05/2024	#8229 #8230
23	353222	6374317	Existing Easement. Complies, only minor branch trimming. *Eucalyptus moluccana* (Grey Box).	29/05/2024	#8246
24	351636	6375102	Private Property, Existing creek crossing will need some work, area approx. 5x5m for access for cranes and EWP (heavy vehicle access) Mostly branch removal of up to 2 trees.. PCT 4023 Coastal Valley Riparian Forest – *Casuarina glauca* (Swamp Oak), *Melaleuca styphelioides* (Prickly-leaved Paperbark), *Alectryon tomentosus* (Hairy Bird's Eye), *Juncus usitatus* (Common Rush), *Gahnia aspera*, *Dichondra repens* (Kidneyweed). Fauna Brown Thornbill. *Crinia signifera*.(Common Eastern Froglet)	28/05/2024	#8253 #8254 #8263
25	351632	6375115	Area of tree to the side of the existing easement require removal. *Casuarina glauca* (Swamp Oak), *Melaleuca styphelioides* (Prickly-leaved Paperbark), *Bursaria spinosa* (Blackthorn). Weeds: *Cenchrus clandestinus* (Kikuyu).	28/05/2024	#8256 #8257
26	351453	6375216	Existing 20m easement, only minor branch trimming. PCT 3446 Lower North Foothills Ironbark-Box-Gum Grassy Forest *Eucalyptus crebra* (Narrow-leaved Ironbark), *Angophora floribunda* (Rough-barked Apple), *Pultenaea spinosa, Bursaria spinosa* (Blackthorn).	28/05/2024	#8267
27	351324	6375282	Open Grassland. NNW distance, existing easement largely conforms. Only minor branch trimming if required.	28/05/2024	#8268 #8269
28	349981	6376096	Creek crossing- PCT 4023 Coastal Valley Riparian Forest *Casuarina glauca* (Swamp Oak), *Melaleuca styphelioides* (Prickly-leaved Paperbark), *Gahnia aspera*, *Juncus usitatus* (Common Rush), *Microlaena stipoides* (Weeping Meadow Grass). Weeds *Ehrharta erecta* (Panic Veldtgrass). *Cheilanthes sieberi* (Mulga Fern),	28/05/2024	#8275 #8276
29	349965	6376149		28/05/2024	#8281

Point No.	Location		Point Description & Impact	Date	Photo and/or Photo No.
	Easting	Northing			
30	349586	6376906	Lovedale Possible removal of three (3) trees. *Eucalyptus tereticornis* (Forest Red Gum).	28/05/2024	#8282 #8284
31	349332	6377525	Lovedale Road, Lovedale. PCT 3315 Central Hunter Ironbark-Spotted Gum Forest Possible removal of three (3) specimens of *Eucalyptus moluccana* (Grey Box), 1 Eucalyptus fibrosa (Broad-leaved Ironbark). Trees are located in the neighbouring property. Highly altered groundcover. Weeds *Hyparrhenia hirta* (Coolatai Grass).	30/05/2024	#8288
32	349329	6377547	Lovedale Road Possible removal of three (3) smaller specimens of *Angophora floribunda* (Rough-barked Apple). Weeds: *Chloris gayana* (Rhodes Grass),	30/05/2024	#8289
33	349342	6377481	Lovedale Road Trim overhanging branches. Stringybark.	30/05/2024	#8290
34	349342	6377481	Lovedale Road (Branch Trimming) PCT 3315 Central Hunter Ironbark-Spotted Gum Forest *Eucalyptus moluccana* (Grey Box), *Acacia parvipinnula,* Weeds: *Olea europaea* subsp. *cuspidata* (African Olive), *Melinis repens* (Red Natal Grass), *Hyparrhenia hirta* (Coolatai Grass). Threatened Grey-crowned Babblers	30/05/2024	#8291
35	349146	6377962	Existing easement largely compliant. Some overhanging branches likely require removal. PCT 3315 Central Hunter Ironbark-Spotted Gum Forest *Corymbia maculata* (Spotted Gum), *Eucalyptus moluccana* (Grey Box), *Eucalyptus tereticornis* (Forest Red Gum), *Cymbopogon refractus* (Barbed Wire Grass), *Lomandra multiflora, Eremophila debilis* (Amulla). Weeds in easement: *Eragrostis curvula* (African Lovegrass), *Senecio madagascariensis* (Fireweed), *Bryophyllum delagoense* (Mother of Millions).	30/05/2024	#8314 #8315
36	349105	6378007	Existing easement largely compliant. Branches on eastern side require some trimming. PCT 3315 Central Hunter Ironbark-Spotted Gum Forest *Corymbia maculata* (Spotted Gum), *Pultenaea spinosa, Leucopogon juniperinus* (Bearded Heath), *Ozothamnus diosmifolius* (Dogwood), *Daviesia ulicifolia* (Gorse Bitter Pea), *Cymbopogon refractus* (Barbed Wire Grass), *Lomandra multiflora,*	30/05/2024	#3315
37	348936	6378331	PCT 3315 Central Hunter Ironbark-Spotted Gum Forest – Mainly Derived Grassland. *Corymbia maculata* (Spotted Gum), *Eucalyptus moluccana* (Grey Box). *Daviesia ulicifolia* (Gorse Bitter Pea), *Cymbopogon refractus* (Barbed Wire Grass), *Themeda triandra* (Kangaroo Grass).	30/05/2024	#8326 #8237 #8238
38	348888	6378428	PCT 3315 Central Hunter Ironbark-Spotted Gum Forest – Derived Grassland. *Cymbopogon refractus* (Barbed Wire Grass), *Lomandra multiflora, Chrysocephalum apiculatum* (Common Everlasting), *Themeda triandra* (Kangaroo Grass).	30/05/2024	#8330 #8331
39	348781	6378655	PCT 3315 Central Hunter Ironbark-Spotted Gum Forest Derived Grassland within existing easement. Side of easement. Minor branch trimming. *Eucalyptus moluccana* (Grey Box), *Acacia implexa* (Hickory Wattle), *Pultenaea spinosa, Daviesia ulicifolia* (Gorse Bitter Pea), *Ozothamnus diosmifolius* (Dogwood), *Leucopogon juniperinus* (Prickly Bearded Heath), *Calotis cuneifolia* (Purple Burr-daisy).	30/05/2024	#8335 #8336
40	348834	6378547	Dam within easement. *Crinia signifera* (Common Eastern Froglet) calling.	30/05/2024	#8341
41	348703	6378833	Gate. Some minor branch trimming is required. *Eucalyptus moluccana* (Grey Box), *Eucalyptus tereticornis* (Forest Red Gum), *Goodenia rotundifolia*, *Panicum effusum*, *Aristida vagans*.	30/05/2024	#8349 #8350
42	348613	6379021	Existing easement largely compliant. Minor branch trimming. *Eucalyptus moluccana* (Grey Box), *Pultenaea spinosa, Chrysocephalum apiculatum* (Common Everlasting), *Rytidosperma* sp. (Wallaby Grass), *Hardenbergia violacea* (Purple Coral Pea), *Hypericum gramineum* (Native St John's Wort).	30/05/2024	#8352 #8353
43	348524	6379212	*Eucalyptus moluccana* (Grey Box),	30/05/2024	#8354 #8355

Point No.	Location		Point Description & Impact	Date	Photo and/or Photo No.
	Easting	Northing			
44	348475	6379458	*Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus crebra* (Narrow-leaved Ironbark), *Ozothamnus diosmifolius* (Dogwood), *Cymbopogon refractus* (Barbed Wire Grass), *Cynodon dactylon* (Couch). Weeds: *Bryophyllum delagoense* (Mother of Millions), *Paspalum dilatatum* (Paspalum).	30/05/2024	#8365 #8366
45	348470	6379591	Near Camp Road Smaller Specimens of *Eucalyptus crebra* (Narrow-leaved Ironbark), *Angophora floribunda* (Rough-barked Apple), *Melaleuca styphelioides* (Prickly-leaved Paperbark), *Cynodon dactylon* (Couch). Weeds: *Senecio madagascariensis* (Fireweed).	30/05/2024	#8368 #8369
46	348483	6379695	Near Camp Road PCT 3315 Central Hunter Ironbark-Spotted Gum Forest Small tree regrowth in easement. *Eucalyptus crebra* (Narrow-leaved Ironbark), *Eucalyptus tereticornis* (Forest Red Gum), *Casuarina glauca* (Swamp Oak), *Cynodon dactylon* (Couch). Weeds *Lantana camara* (Lantana), *Verbena bonariensis* (Purple Top Verbena).	30/05/2024	#8372 #8373
47	348472	6379739	Disturbed area – thick *Lantana camara* (Lantana). *Acacia implexa* (Hickory Wattle).	30/05/2024	#8381
48	348470	6379824	Easement cuts back over Camp Road. Highly disturbed area. *Acacia implexa* (Hickory Wattle). Weeds: Lantana camara (Lantana), *Verbena bonariensis* (Purple Top Verbena), *Paspalum dilatatum* (Paspalum), *Gomphocarpus fruticosus* (Narrow-leaved Cottonbush).	30/05/2024	#8379
49	348419	6379950	*Eucalyptus crebra* (Narrow-leaved Ironbark), *Pultenaea spinosa, Acacia longifolia* (Sydney Golden Wattle), *Cymbopogon refractus* (Barbed Wire Grass), *Calotis lappulacea* (Yellow Burr-daisy).	30/05/2024	#8383 #8384
50	348404	6380122	Minor branch trimming. *Corymbia maculata* (Spotted Gum), *Eucalyptus crebra* (Narrow-leaved Ironbark), *Pultenaea spinosa, Cymbopogon refractus* (Barbed Wire Grass), *Glycine tabacina*. Weeds: *Senecio madagascariensis* (Fireweed).	30/05/2024	#8385 #8386
51	348363	6380354	Branch Trimming. Smaller trees may require removal Minor branch trimming. *Eucalyptus crebra* (Narrow-leaved Ironbark), *Corymbia maculata* (Spotted Gum), *Eucalyptus moluccana* (Grey Box), *Daviesia ulicifolia* (Gorse Bitter Pea), *Pultenaea spinosa, Ozothamnus diosmifolius* (Dogwood), *Acacia elongata*. Weeds: *Bryophyllum delagoense* (Mother of Millions), *Senecio madagascariensis* (Fireweed).	30/05/2024	#8389 #8390
52	348290	6380600	*Minor branch trimming.* Possible removal of small trees. *Eucalyptus moluccana* (Grey Box), *Eucalyptus crebra* (Narrow-leaved Ironbark), *Breynia oblongifolia* (Breynia), *Pultenaea spinosa, Cymbopogon refractus* (Barbed Wire Grass), *Gahnia aspera*, *Aristida racemosa* (Three-awn Grass). Weeds : *Bryophyllum delagoense* (Mother of Millions), *Senecio madagascariensis* (Fireweed), *Lantana camara* (Lantana), *Axonopus fissifolius* (Narrow-leafed Carpet Grass).	30/05/2024	#8393 #8394
53	348220	6380938	Possible removal of smaller trees. Minor branch trimming. *Corymbia maculata* (Spotted Gum), *Eucalyptus fibrosa* (Broad-leaved Ironbark), *Pultenaea spinosa, Acacia parvipinnula, Aristida racemosa, Lomandra multiflora.*	30/05/2024	#8397 #8398
54	348177	6381150	*Corymbia maculata* (Spotted Gum), *Eucalyptus fibrosa* (Broad-leaved Ironbark), *Pultenaea spinosa, Acacia parvipinnula, Bursaria spinosa* (Blackthorn), *Aristida racemosa, Goodenia rotundiflora, Lomandra multiflora.* Grape vines in vineyard to the east.	30/05/2024	#8400 #8401
55	348124	6381592	Derived grassland between fence and highway. Trees *Eucalyptus tereticornis* (Forest Red Gum), *Lomandra longifolia*, *Cymbopogon refractus* (Barbed Wire Grass), *Lomandra multiflora. Chrysocephalum apiculatum.* Weeds: *Senecio madagascariensis* (Fireweed), *Setaria parviflora* (Slender Pigeon Grass).	30/05/2024	#8402 #8403
56	348048	6381594	Maintained Lawn, Paddock.	30/05/2024	#8403 #8404
57	347617	6381634	Tuckers Lane. Branch trimming on the corner. *Corymbia maculata* (Spotted Gum), Young *Eucalyptus fibrosa* off tuckers road to the north. *Acacia podalyriifolia* (Qld Silver Wattle), *Melinus repens* (Red Natal Grass).	30/05/2024	#8406 #8407
58	347603	6381823	Young regrowth, *Eucalyptus fibrosa. Acacia podalyriifolia* (Qld Silver Wattle) not much on the ground.	30/05/2024	#8412 #84

Point No.	Location		Point Description & Impact	Date	Photo and/or Photo No.
	Easting	Northing			
59	347582	638198763	Next to dam. *Acacia parvipinnula, Hakea sericea* (Needlebush), *Acacia falcata* (Falcate Wattle). *Crinia signifera* (Common Eastern Froglet) call from dam. Birds Jacky Winter, Willy Wagtail.	30/05/2024	#8429 #8430 #8431
60	347583	6382141	*Acacia longifolia* (Sydney Golden Wattle) – dense area next to drainage line. Brown Thornbill, Fuscus Honeyeater, Grey Fantail.	30/05/2024	#8433
61	347594	6382214	Highly disturbed area. *Acacia parvipinnula, Breynia oblongifolia, Cynodon dactylon* (Couch), *Lantana camara* (Lantana). *Carlia tetradactyla* (Southern Rainbow Skink).	30/05/2024	#8440 #8441
62	347622	6382392	PCT 3315 Central Hunter Ironbark-Spotted Gum Forest, *Eucalyptus crebra* (Narrow-leaved Ironbark), *Eucalyptus punctata* (Grey Gum), *Eucalyptus tereticornis* (Forest Red Gum), *Melaleuca nodosa* (Ball Honeymyrtle), *Acacia ulicifolia*, *Persoonia linearis* (Narrow-leaved Geebung), *Breynia oblongifolia, Acacia parvipinnula, Grevillea montana, Dianella revoluta, Chrysocephalum apiculatum. Aristida racemosa, Pultenaea spinosa,*	30/05/2024	#8445 #8446
63	347662	6382656	PCT 3315 Central Hunter Ironbark-Spotted Gum Forest, Top of hill, Road off to the side. *Eucalyptus crebra* (Narrow-leaved Ironbark), *Corymbia maculata* (Spotted Gum), *Melaleuca nodosa* (Ball Honeymyrtle), *Persoonia linearis* (Narrow-leaved Geebung), *Breynia oblongifolia, Hakea sericea* (Needlebush), *Acacia longifolia* (Sydney Golden Wattle), *Grevillea montana*, *Lepidosperma laterale*, *Acacia parvipinnula, Lomandra multiflora, Phyllanthus hirtellus, Aristida vagans, Dianella revoluta, Chrysocephalum apiculatum. Cymbopogon refractus* (Barbed Wire Grass). Rainbow Lorikeet, Yellow-faced Honeyeater,.	03/06/2024	#8448 #8449
64	347693	6382875	PCT 3315 Central Hunter Ironbark-Spotted Gum Forest, Similar vegetation to P63. *Eucalyptus crebra* (Narrow-leaved Ironbark), *Corymbia maculata* (Spotted Gum), *Stypandra glauca*, *Melichrus urceolatus*	03/06/2024	#8457 #8458
65	347676	6383125	PCT 3315 Central Hunter Ironbark-Spotted Gum Forest, *Eucalyptus crebra* (Narrow-leaved Ironbark), *Corymbia maculata* (Spotted Gum), *Eucalyptus fibrosa, Melaleuca nodosa* (Ball Honeymyrtle), *Melaleuca decora*, *Persoonia linearis* (Narrow-leaved Geebung), *Acacia longifolia* (Sydney Golden Wattle), *Grevillea montana.*	03/06/2024	#8461 #8462
66	347614	6383258	*Eucalyptus fibrosa, Corymbia maculata* (Spotted Gum), *Persoonia linearis* (Narrow-leaved Geebung), *Grevillea montana*, *Phyllanthus hirtellus, Daviesia ulicifolia* (Gorse Bitter Pea), *Acacia falcata*, *Aristida racemosa.*	03/06/2024	#8465 #8466
67	347458	6383449	*Eucalyptus fibrosa* (Dominant), Some *Eucalyptus tereticornis* (Forest Red Gum), *Breynia oblongifolia, Aristida racemosa, Cymbopogon refractus* (Barbed Wire Grass). Intact Grey-crowned Babbler Nest in skinny Spotted Gum.	03/06/2024	#8476 #8477
68	347458	6383449	PCT 3328 Lower Hunter Red Gum-Paperbark Riverflat Forest - Creek Crossing, *Eucalyptus tereticornis* (Forest Red Gum), *Melaleuca decora*,	03/06/2024	#8488
69	347188	6383662	Possible removal of smaller trees and branch trimming of larger trees. *Corymbia maculata* (Spotted Gum), *Eucalyptus crebra* (Narrow-leaved Ironbark), *Eucalyptus punctata* (Grey Gum), *Melaleuca decora*, *Persoonia linearis* (Narrow-leaved Geebung), *Phyllanthus hirtellus, Entolasia stricta* (Wiry Panic), *Lomandra multiflora, Lobelia purpurescens, Breynia oblongifolia, Dianella revoluta.*	03/06/2024	#8489 #8490 #8491
70	346965	6383829	Creek crossing- PCT 4023 Coastal Valley Riparian Forest Casuarina glauca (Swamp Oak), *Eucalyptus tereticornis* (Forest Red Gum), *Melaleuca linariifolia*, *Microlaena stipoides* (Weeping Meadow Grass), Weeds: *Olea europaea* subsp. *cuspidata* (African Olive), *Asparagus asparagoides* (Bridal Creeper), *Juncus acutus*. Satin Bowerbird.	03/06/2024	#8496 #8497
71	346649	6384037	*Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus punctata* (Grey Gum), *Melaleuca decora*, *Breynia oblongifolia, Persoonia linearis* (Narrow-leaved Geebung), *Acacia falcata.* Weeds: *Olea europaea* subsp. *cuspidata* (African Olive), *Grevillea montana*,	03/06/2024	#8514 #8515 #8516
72	346649	6384037	*Eucalyptus tereticornis* (Forest Red Gum) to east *Eucalyptus punctata* (Grey Gum).	03/06/2024	#8519 #8520

Point No.	Location		Point Description & Impact	Date	Photo and/or Photo No.
	Easting	Northing			
73	346488	6384103	Easement is relatively wide – only minor branch trimming. *Corymbia maculata* (Spotted Gum), *Eucalyptus crebra* (Narrow-leaved Ironbark), *Acacia parvipinnula, Melaleuca nodosa* (Ball Honeymyrtle).	03/06/2024	#8523 #8524
74	346323	6384150	*Corymbia maculata* (Spotted Gum), *Eucalyptus crebra* (Narrow-leaved Ironbark), *Acacia parvipinnula, Melaleuca nodosa* (Ball Honeymyrtle), *Aristida racemosa, Pultenaea spinosa, Grevillea montana*, *Microlaena stipoides* (Weeping Meadow Grass), *Cheilanthes sieberi* (Mulga Fern), *Cymbopogon refractus* (Barbed Wire Grass), *Bursaria spinosa* (Blackthorn), *Goodenia rotundifolia*.	03/06/2024	#8525 #8526 #8527
75	346172	6384150	Thick *Melaleuca nodosa* (Ball Honeymyrtle), *Eucalyptus fibrosa, Grevillea montana*, *Aristida racemosa.*	03/06/2024	#8531 #8532
76	346030	6384197	Disturbed cleared area *Cynodon dactylon* (Couch), Weeds *Ambrosia artemisiifolia* (Annual Ragweed), *Bidens pilosa* (Bidens), *Eragrostis curvula* (African Lovegrass), *Sida rhombifolia* (Paddys Lucerne)	03/06/2024	#8536 #8537
77	346040	6384285	Area between Road and Expressway – Disturbed easement. Only minor branch trimming. *Eucalyptus fibrosa, Eucalyptus moluccana* (Grey Box), *Acacia parvipinnula, Acacia falcata, Cymbopogon refractus* (Barbed Wire Grass), *Dichodra repens* (Kidneyweed), *Cynodon dactylon*. Weeds: *Lycium ferocissimum* (African Boxthorn), *Chloris gayana* (Rhodes Grass).	03/06/2024	
78	346070	6384505	Corner bend in powerline. Sides of existing easement *Corymbia maculata* (Spotted Gum), *Eucalyptus fibrosa, Melaleuca decora, Grevillea montana*, *Cynodon dactylon, Cymbopogon refractus* (Barbed Wire Grass), *Microlaena stipoides* (Weeping Meadow Grass). Weeds common within easement. *Paspalum urvillei* (Vasey Grass), *Melinus repens* (Red Natal Grass), *Bryophyllum delagoense* (Mother-of-millions), *Opuntia stricta* (Prickly Pear).	03/06/2024	#8547 #8548
79	345778	6384607	Drainage line 15m to west. Weedy grasses within easement, *Cynodon dactylon, Capillipedium parviflorum* (Scented Top Grass). Casuarina glauca (Swamp Oak) either side of easement. Mistletoe Bird.	03/06/2024	#8566 #8567
80	345601	6384666	Highly disturbed easement. *Eucalyptus fibrosa* to side. Only minor branch trimming required. Weeds *Verbena bonariensis* (Purple Top Verbena), *Setaria parviflora*.	03/06/2024	#8568 #8569 #8570
81	345305	6384761	On northern side of easement, slightly west likely removal of some trees either side *Corymbia maculata* (Spotted Gum), *Eucalyptus fibrosa, Acacia parvipinnula, Leucopogon juniperinus.* Weeds *Melinus repens* (Red Natal Grass), *Eragrostis curvula* (African Lovegrass).	03/06/2024	#8573 #8574
82	345010	6384850	Some tree removal to the east. Disturbed introduced grassy easement. *Eucalyptus fibrosa, Corymbia maculata* (Spotted Gum), *Acacia parvipinnula, Acacia falcata, Olea europaea* subsp. *cuspidata* (African Olive). Grey-crowned Babbler Nest	03/06/2024	#8579 #8580
83	344729	6384944	Near Branxton Railway Station Highly disturbed easement. *Corymbia maculata* (Spotted Gum), *Eucalyptus crebra* (Narrow-leaved Ironbark) small number of trees require removal approx. 50m to the west.	03/06/2024	#8591 #8592
84	344429	6384981	*Corymbia maculata* (Spotted Gum), *Eucalyptus crebra* (Narrow-leaved Ironbark), *Acacia falcata*. Small number of smaller trees require removal & some branch trimming. *Olea europaea* subsp. *cuspidata* (African Olive), *Melaleuca decora*, *Dianella revoluta*.	03/06/2024	#8597 #8598
85	344227	6385061	*Corymbia maculata* (Spotted Gum), *Eucalyptus moluccana* (Grey Box), *Melaleuca decora*, *Eucalyptus crebra* (Narrow-leaved Ironbark). *Lomandra longifolia*, *Grevillea montana*, *Aristida vagans*, *Lomandra multiflora*, *Breynia oblongifolia*. Two Grey-crowned Babbler Nests.	03/06/2024	#8603 #8604
86	343968	6385126	Branch trimming along section. *Corymbia maculata* (Spotted Gum), *Eucalyptus moluccana* (Grey Box), *Acacia falcata*, *Cymbopogon refractus* (Barbed Wire Grass), *Cynodon dactylon, Lomandra multiflora*, *Aristida racemosa*, *Lomandra longifolia*	03/06/2024	#8607 #8608

Point No.	Location		Point Description & Impact	Date	Photo and/or Photo No.
	Easting	Northing			
88	343848	6385150	*Corymbia maculata* (Spotted Gum), *Acacia falcata*, *Grevillea montana.*	03/06/2024	#8614 #8615
89	343787	6385148	Old railway to west (cuts through). *Corymbia maculata* (Spotted Gum), *Eucalyptus crebra* (Narrow-leaved Ironbark), *Acacia falcata,* Minor branch trimming.	03/06/2024	#8617 #8618
90	343484	6385160	Cleared Grassy Area, *Aristida racemosa, Cynodon dactylon, Cymbopogon refractus* (Barbed Wire Grass). Weeds: *Olea europaea* subsp. *cuspidata* (African Olive),	03/06/2024	#8619 #8620
91	343268	6385169	*Casuarina glauca* (Swamp Oak), *Carex appressa*, *Cynodon dactylon, Weeds: Cardiospermum grandiflorum* (Balloon Vine). Welcome Swallow, Eastern Grey Kangaroos.	03/06/2024	#8624 #8625
92	342656	6385192	*Eucalyptus tereticornis* (Forest Red Gum) and *Corymbia maculata* (Spotted Gum), nearby require removal Weeds*: Melinus repens* (Red Natal Grass), *Sorghum halepense* (Johnson Grass).	03/06/2024	#8336 #8337
93	342459	6385180	*Olea europaea* subsp. *cuspidata* (African Olive) along fenceline. Road opposite Standen Drive. End of road to the south.	04/06/2024	#8644 #8645
94	342342	6385161	Lower grassed paddock (grasses). Area of *Eucalyptus tereticornis* (Forest Red Gum) to NE. *Cynodon dactylon, Senecio madagascariensis* (Fireweed).	4/06/2024	#8652 #8653
95	342065	6385108	Low Paddock Grasses. Trees to north, *Eucalyptus crebra* (Narrow-leaved Ironbark), *Eucalyptus moluccana* (Grey Box). Black-faced Cuckoo Shrike, Noisy Miner.	4/06/2024	#8659 #8660
96	341882	6385075	Grassy Paddock. *Eucalyptus crebra* (Narrow-leaved Ironbark), *Eucalyptus moluccana* (Grey Box). *Cynodon dactylon.* Minor Branch trimming.	4/06/2024	#8662 #8663
97	341787	6385057	New Green Tank to North. *Eucalyptus crebra* (Narrow-leaved Ironbark) near tank. Noisy Miner	4/06/2024	#8668 #8669
98	341520	6385056	Grassy Paddock low grasses- *Cynodon dactylon, Mentha satureioides* (Native Mint), *Senecio madagascariensis* (Fireweed). Two smaller trees to NW both *Eucalyptus fibrosa*.	4/06/2024	#8668 #8669
99	341224	6385052	Grassy Paddock low grasses- *Cynodon dactylon, Senecio madagascariensis* (Fireweed). Two smaller trees to NW both *Eucalyptus fibrosa* likely to require trimming. *Allocasuarina luehmannii* (Bulloak) nearby.	4/06/2024	#8673 #8674
100	340926	6385051	Grassy Paddock low grasses-Some branch trimming of *Eucalyptus fibrosa* to NE.	4/06/2024	#8684 #8685
101	340722	6385052	Grassy Paddock low grasses- 1 specimen of *Eucalyptus moluccana* (Grey Box) possible removal. *Eucalyptus fibrosa* – Branch trimming.	4/06/2024	#8687 #8688 #8689
102	340626	6385050	Dam to east. Possible branch trimming on northern side. PCT 3315 Central Hunter Ironbark-Spotted Gum Forest, *Corymbia maculata* (Spotted Gum), *Eucalyptus fibrosa Eucalyptus crebra* (Narrow-leaved Ironbark), *Bursaria spinosa* (Blackthorn), *Pultenaea spinosa, Breynia oblongifolia, Allocasuarina luehmannii* (Bulloak). Two Grey-crowned Babbler nests/roosts to south of the dam.	4/06/2024	#8700 #8701
103	340481	6385055	Potential removal of small specimens of *Eucalyptus moluccana* (Grey Box). Branch trimming *Eucalyptus crebra* (Narrow-leaved Ironbark) and the introduced *Jacaranda mimosifolia* (Jacaranda). Australian Raven, King Parrot, Noisy Miner.	4/06/2024	#8709 #8710
104	340409	6385082	Small Jacarandas lining driveway. Ground *Lomandra multiflora, Aristida vagans, Bothriochloa decipiens* (Redleg Grass).	4/06/2024	#8716 #8717

Point No.	Location		Point Description & Impact	Date	Photo and/or Photo No.
	Easting	Northing			
105	340309	6385117	Possible branch trimming - *Corymbia maculata* (Spotted Gum), *Eucalyptus moluccana* (Grey Box), *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus crebra* (Narrow-leaved Ironbark). *Bursaria spinosa* (Blackthorn), *Pultenaea spinosa, Daviesia ulicifolia* (Gorse Bitter Pea), *Cymbopogon refractus* (Barbed Wire Grass), *Dianella revoluta, Lomandra multiflora, Aristida vagans.*	4/06/2024	#8718 #8719
106	340090	6385206	Grassy paddock near houses.	4/06/2024	#8726 #8727
107	340014	6385239	Just east of Porantha Road, Lower Belford. Trees near road *Corymbia maculata* (Spotted Gum), *Eucalyptus fibrosa.* Minor branch trimming.	4/06/2024	#8729 #8730
108	339857	6385297	Near old road, Lower Belford. *Acacia falcata*, Weeds *Hyparrhenia hirta* (Coolatai Grass), *Verbena bonariensis* (Purple Top). Possible removal of one specimen of *Corymbia maculata* (Spotted Gum) approximately 70m to the west.	4/06/2024	#8736 #8737
109	339565	6385444	One Old Highway	4/06/2024	#8742 #8743
110	339359	6385499	*Corymbia maculata* (Spotted Gum), *Eucalyptus crebra* (Narrow-leaved Ironbark), *Eucalyptus tereticornis* (Forest Red Gum), *Acacia parvipinnula*, *Allocasuarina luehmannii* (Bulloak): Weeds: *Olea europaea* subsp. *cuspidata* (African Olive), *Hyparrhenia hirta* (Coolatai Grass). Likely small specimen of the threatened species *Eucalyptus glaucina* (Slaty Red Gum) to NE. Likely outside of impact area.	4/06/2024	#8746 #8747
111	339230	6385522	*Corymbia maculata* (Spotted Gum). Branch trimming. Possible removal of small trees. Grey Fantail	4/06/2024	#8755 #8756
112	338992	6385606	*Eucalyptus tereticornis* (Forest Red Gum) either side of easement.	4/06/2024	#8767 #8768
113	338837	6385659	*Corymbia maculata* (Spotted Gum), *Eucalyptus crebra* (Narrow-leaved Ironbark), *Eucalyptus sideroxolyn* (Mugga Ironbark) (this Ironbark species may not be endemic to the area).	4/06/2024	#8770 #8771
114	338771	6385680	Along New England Highway, Belford. *Eucalyptus moluccana* (Grey Box), *Corymbia maculata* (Spotted Gum), *Eucalyptus tereticornis* (Forest Red Gum). Quite weedy within easement – Introduced grasses *Megathyrsus maximus* (Panic). Potential branch trimming.	4/06/2024	#8774 #8775
115	338464	6385724	Along New England Highway, Belford. *Eucalyptus punctata* (Grey Gum), *Corymbia maculata* (Spotted Gum). Introduced grasses in easement *Chloris gayana* (Rhodes Grass), *Hyparrhenia hirta* (Coolatai Grass), *Gomphocarpus fruticosus*.	4/06/2024	#8785 #8786
116	338250	6385759	Next to intersection of New England Highway and Hermitage Road. *Corymbia maculata* (Spotted Gum). Introduced ground covers *Chloris gayana* (Rhodes Grass), *Galium aparine*.	4/06/2024	#8792 #8793
117	338149	6385776	Minor drainage line. Native: *Phragmites australis* (Australian Reed). Weeds *Chloris gayana* (Rhodes Grass). *Crinia signifera* (Common Eastern Froglet) heard calling.	4/06/2024	#8799 #8800
118	338021	6385801	Along New England Highway, Belford just east of Jump up Creek. PCT 4023 Coastal Valley Riparian Forest. *Casuarina glauca* (Swamp Oak), *Phragmites australis* (Australian Reed) in creek. Specimen of *Eucalyptus glaucina* (Slaty Red Gum) to south outside easement.	4/06/2024	#8005 #8007 #8008
119	337776	6385838	Along New England Highway, Belford. Weeds - *Megathyrsus maximus* (Panic) and *Cenchrus clandestinus* (Kikuyu).	4/06/2024	#8815 #8816
120	337581	6385838	Along Belford Road. *Capillipedium spicigerum* (Scented Top Grass).	4/06/2024	#8822 #8823
121	337322	6385799	Three *Eucalyptus sideroxylon* (Mugga) trees. Likely require branch trimming. Pied Currawong.	4/06/2024	#8828 #8829

Point No.	Location		Point Description & Impact	Date	Photo and/or Photo No.
	Easting	Northing			
122	337220	6385788	Pole to be move slightly north will result in the removal of three specimens of *Eucalyptus crebra* (Narrow-leaved Ironbark) (two of these trees are small).	4/06/2024	#8836 #8837
123	336909	6385821	Natives: *Bothriochloa decipiens* (Red Grass), *Cynodon dactylon* (Couch). Weeds	4/06/2024	#8844 #8845
124	336705	6385855		4/06/2024	
125	336377	6385912		4/06/2024	
126	336087	6386003		4/06/2024	
127	335859	6386076		4/06/2024	
128	335680	6386164		4/06/2024	
129	335460	6386276		4/06/2024	
130	335282	6386367		4/06/2024	
131	334982	6386514		4/06/2024	
132	334564	6386720		4/06/2024	
133	334303	6386848	Near Golden Highway Intersection with New England Highway.	4/06/2024	
134	334066	6386963	Near Golden Highway Intersection with New England Highway. *Eucalyptus crebra* trees to the west. Largely disturbed introduced grasses; *Chloris gayana* (Rhodes Grass), *Axonopus fissifolius* (Narrow-leaved Carpet Grass).	6/06/2024	#9077 #9078
135	333957	6387037	Some native regrowth; *Eucalyptus crebra* (Narrow-leaved Ironbark). Introduced: *Chloris gayana* (Rhodes Grass), *Gomphocarpus fruticosus*.	6/06/2024	#9079 #9080
136	333749	6387045	Near railway line. *Chloris gayana* (Rhodes Grass), *Ambrosia artemisiifolia.*	6/06/2024	#9081 #9082
137	333675	6387034	Line of specimens of *Eucalyptus sideroxolyn* (Mugga Ironbark) over fence to the north on private property. Trees may require trimming, possible removal. Natives: *Asperula conferta*. Introduced species: *Chloris gayana* (Rhodes Grass), *Senecio madagascariensis* (Fireweed).	6/06/2024	#9083 #9084
138	333429	6387071	Entry to private property. Row of planted *Corymbia maculata* (Spotted Gum),Planted native trees just inside boundary to the north. *Eucalyptus tereticornis* (Forest Red Gum) to SW in road reserve. : *Chloris gayana* (Rhodes Grass),	6/06/2024	#9087 #9088
139	333224	6387102	Old Mill Gate. Eucalyptus cut back, appearing to lean to the north. Likely specimen of *Eucalyptus glaucina* (Slaty Red Gum) in paddock to the NW.	6/06/2024	#9091 #9092
140	333152	6387111	*Eucalyptus crebra* & *E. moluccana* within property to the north. Branch trimming maybe required.	6/06/2024	#9093 #9094
141	332986	6387135	*Allocasuarina luehmannii* (Bulloak) just over fence & *Angophora floribunda* may require removal or trimming.	6/06/2024	#9095 #9096
142	332746	6387161	*Crinia signifera* (Common Eastern Froglet) heard calling from the creek.	6/06/2024	#9098 #9099
143	332362	6387213	No impact disturbed grassland.	6/06/2024	#9100 #9101
144	332074	6387259	Horse head on gate. Introduced species: *Chloris gayana* (Rhodes Grass), *Rumex crispus* (Curled Dock), *Galium aparine* (Clevers).	6/06/2024	#9102 #9103
145	331967	6387284	Just East of Muds Creek. *Casuarina glauca* (Swamp Oak), *Clematis* sp. *Austrostipa* sp.. *Phragmites australis* in creek. PCT 4015. Introduced: *Anredera cordifolia* (Madeira Vine) quite invasive.	6/06/2024	#9105 #9106 #9107

Point No.	Location		Point Description & Impact	Date	Photo and/or Photo No.
	Easting	Northing			
146	331909	6387293	*Phragmites australis*: Introduced *Galium aparine* (Clevers).	6/06/2024	#9112 #9113
147	331801	6387306	Few *Casuarina glauca* (Swamp Oaks) to east. Disturbed roadside grasses to the west.	6/06/2024	
148	331068	6387375	At gate-ED lodge. Tree 100m to east may require trimming. Planted trees to west in private property including *Grevillea robusta, Callistemon salignus* and *Melaleuca styphelioides.*	6/06/2024	#9116 #9117
149	330865	6387385	Planed trees back to east. Disturbed roadside grasses to west - *Chloris gayana* (Rhodes Grass).	6/06/2024	#9118 #9119 #9120
150	330370	6387498	Thick area of *Allocasuarina luehmannii* (Bulloak) over fence. *Hyparrhenia hirta* (Coolatai Grass) in easement.	6/06/2024	#9125 #9126 #9127 #9128
151	330313	6387548	*End of Allocasuarina luehmannii* to the west.	6/06/2024	#9129 #9130
152	330239	6387608	Disturbed, natives *Acacia parvipinnula*, *Allocasuarina luehmannii.* Introduced*: Hyparrhenia hirta* (Coolatai Grass) & *Chloris gayana* (Rhodes Grass), *Gomphocarpus fruticosus*.	6/06/2024	#9131 #9132
153	330105	6387721	Area of *Allocasuarina luehmannii* (Bulloak) to ENE.	6/06/2024	#9133 #9134
154	329957	6387795		6/06/2024	#9135 #9136
155	329714	6387848	In road reserve, Military land to north. Highly disturbed introduced species.	6/06/2024	#9139 #9140
156	329022	6388038	Native tree either side of the easement. *Eucalyptus crebra. Weeds Tiger Pear.*	6/06/2024	#9142 #9143 #9144 #9145
157	328860	6388068	Front of Singleton Army Base. Dead Red-necked Wallaby on side of the road.	6/06/2024	#9153 #9152
158	328523	6388137		6/06/2024	#9157 #9158
159	328277	6388052		6/06/2024	
160	328102	6387966		6/06/2024	
161	328014	6387910		6/06/2024	
162	327961	6387882		6/06/2024	
163	327881	6387841		6/06/2024	
164	327771	6387830		6/06/2024	
165	327461	6387818		6/06/2024	
166	327379	6387824		6/06/2024	
167	326509	6387905		6/06/2024	
168	326440	6387910		6/06/2024	
169	319230	6394107		6/06/2024	
170	319086	6394492		6/06/2024	
171	318917	6394969		6/06/2024	
172	318674	6395647		6/06/2024	

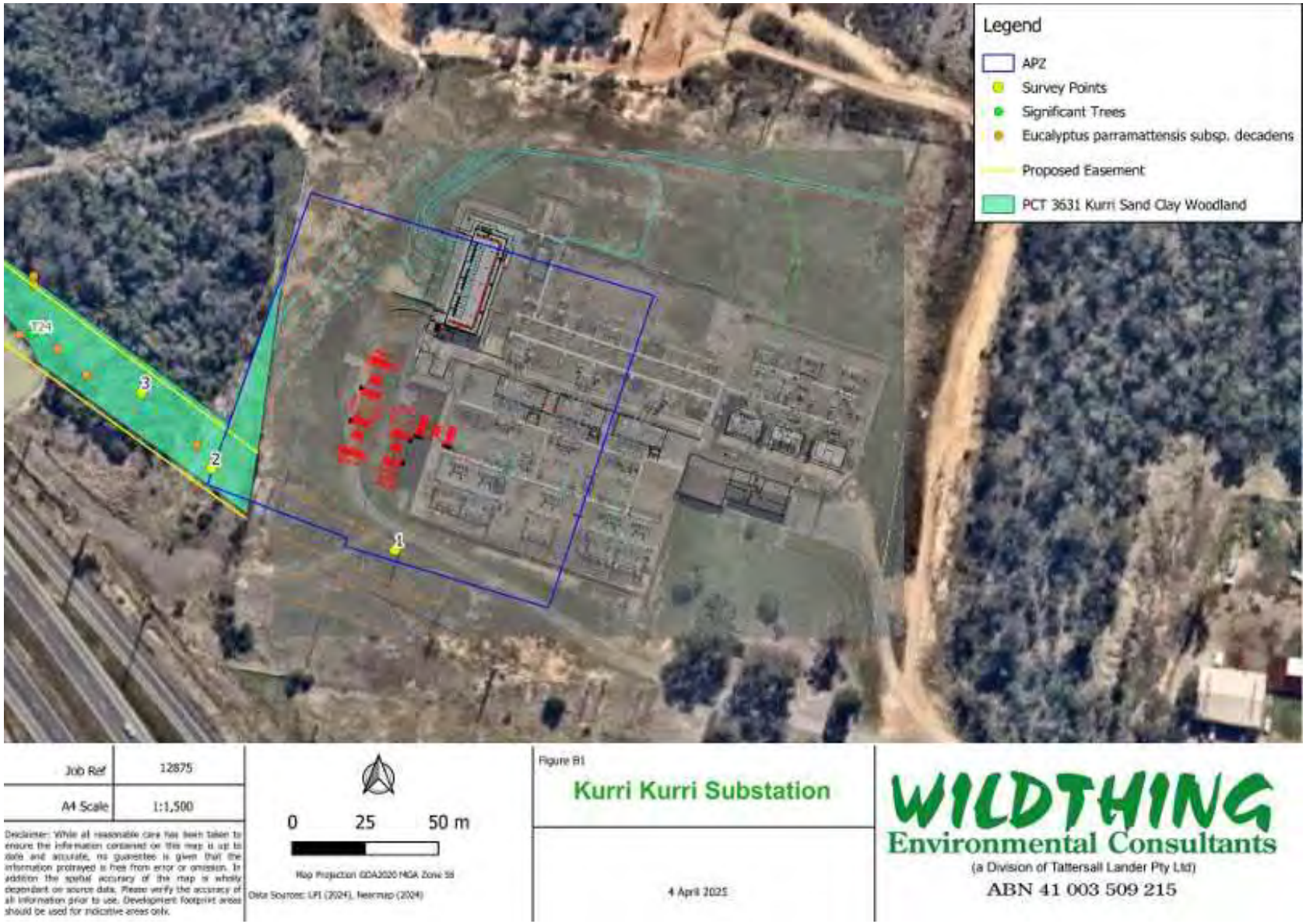
Point No.	Location		Point Description & Impact	Date	Photo and/or Photo No.
	Easting	Northing			
173	318564	6396239		6/06/2024	
174				6/06/2024	
175	319352	6393766		6/06/2024	
176	319459	6393452		6/06/2024	
177	319484	6393383		6/06/2024	
178	319217	6399017		11/06/2024	
179	318907	6398832		11/06/2024	
180	319023	6399115		11/06/2024	
181	319052	6399187		11/06/2024	
182	319059	6399220		11/06/2024	
183	319236	6399959		11/06/2024	
184	319281	6400160		11/06/2024	
185	319289	6400224		11/06/2024	
186	319326	6400387		11/06/2024	
187	319350	6400514		11/06/2024	
188	319512	6400117		11/06/2024	
189	319530	6401253		11/06/2024	
190	319676	6404754		11/06/2024	
191	319561	6405081		11/06/2024	
192	319397	6405543		11/06/2024	
193	318686	6406500		11/06/2024	
194	318566	6406632		11/06/2024	
195	326408	6387926		13/06/2024	
196	326328	6387921		13/06/2024	
197	326277	6387924		13/06/2024	
198	326231	6387931		13/06/2024	
199	326103	6387941		13/06/2024	
200	325947	6387955		13/06/2024	
201	325812	6387968		13/06/2024	
202	325709	6387979		13/06/2024	
203	325486	6387998		13/06/2024	
204	325425	6388005		13/06/2024	
205	325352	6388009		13/06/2024	
206	325305	6388014		13/06/2024	
207	325162	6388026		13/06/2024	
208	327330	6387829		13/06/2024	
209	327271	6387835		13/06/2024	
210	327180	6387844		13/06/2024	
211	326902	6387868		13/06/2024	
212	326789	6387878		13/06/2024	
213	325139	6388111		13/06/2024	
214	325107	6388228		13/06/2024	
215	325066	6388381		13/06/2024	

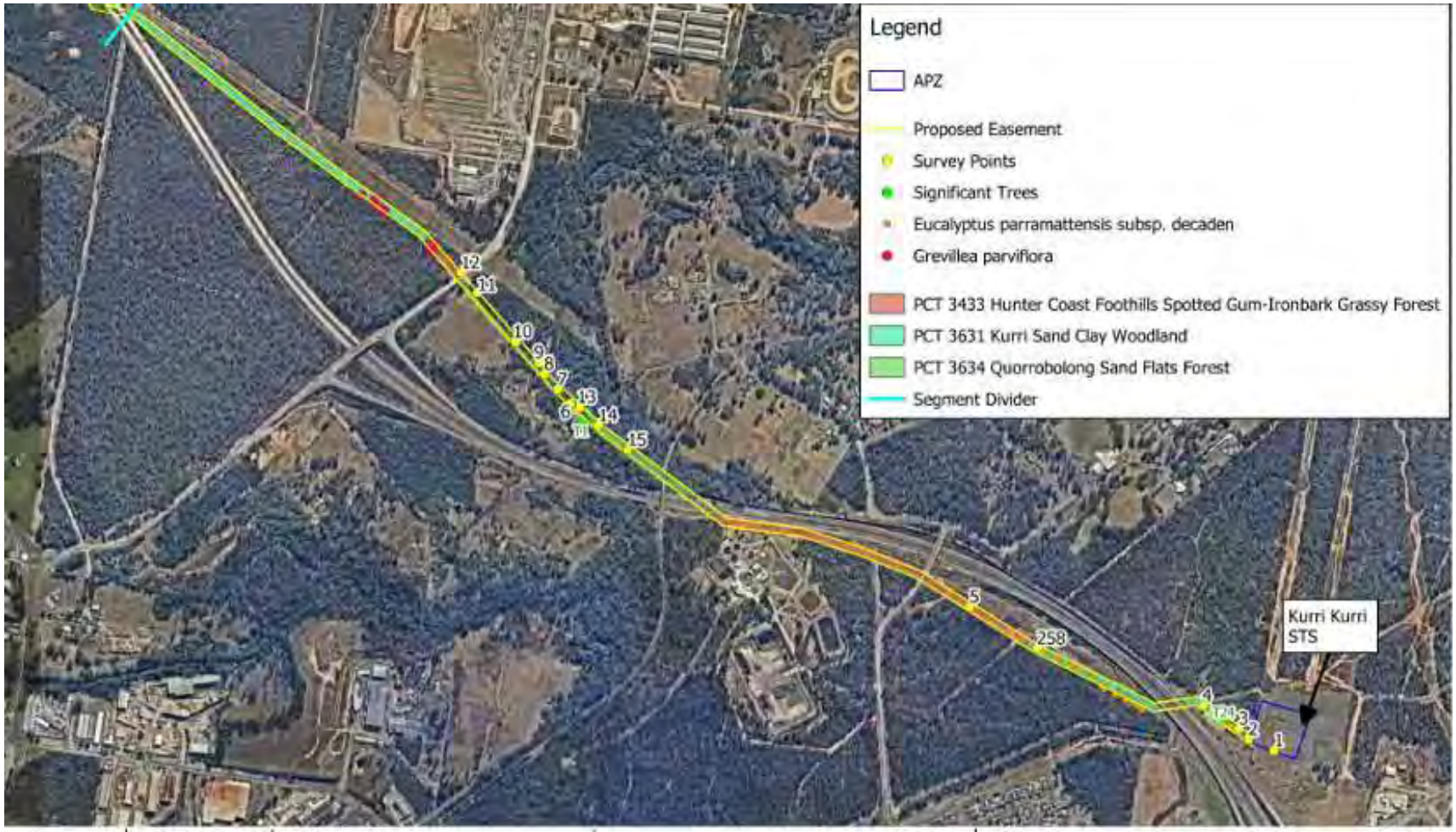
Point No.	Location		Point Description & Impact	Date	Photo and/or Photo No.
	Easting	Northing			
216	325025	6388544		13/06/2024	
217	325007	6388618		13/06/2024	
218				1/07/2024	
219				1/07/2024	
220	317870	6409290		1/07/2024	
221	317860	6409410		1/07/2024	
222	318324	6409410		1/07/2024	
223	318448	6407119		1/07/2024	
224	317507	6410192		1/07/2024	
225	317413	6410316		1/07/2024	
226	314327	6415962		1/07/2024	
227	314268	6416133		1/07/2024	
228	314207	6416293		1/07/2024	
229	314153	6416441		1/07/2024	
230	314128	6416494		1/07/2024	
231	314742	6417030		1/07/2024	
232	312862	6418187		1/07/2024	
233	312723	6418138		1/07/2024	
234	312425	6418278		1/07/2024	
235				1/07/2024	
236	312065	6418523	Location of proposed Eastern Hub near the northern shore of Lake Liddell. Entire area of Eastern Hub composed of very low grasses such as *Cynodon dactylon* (Couch).	1/07/2024	#0401 #0402 #0403
237	311992	6418679		1/07/2024	
238	312002	6418702		1/07/2024	
239	303405	6430146		4/06/2024	
240	303464	6430384		4/06/2024	
241	303471	6430427		4/06/2024	
242	303649	6430461		4/06/2024	
243	303717	6430471		4/06/2024	
244	303847	6430593		4/06/2024	
245	303937	6430679		4/06/2024	
246	304089	6430810		4/06/2024	
247	304152	6430869		4/06/2024	
248	304257	6430987		4/06/2024	
249	304415	6431134		4/06/2024	
250	304728	6431439		4/06/2024	
251	304933	6431635		4/06/2024	
252	304975	6431668		4/06/2024	
253	305032	6431720		4/06/2024	
254	305138	6431825		4/06/2024	
255	305498	6432141		4/06/2024	
256	305692	6432267		4/06/2024	

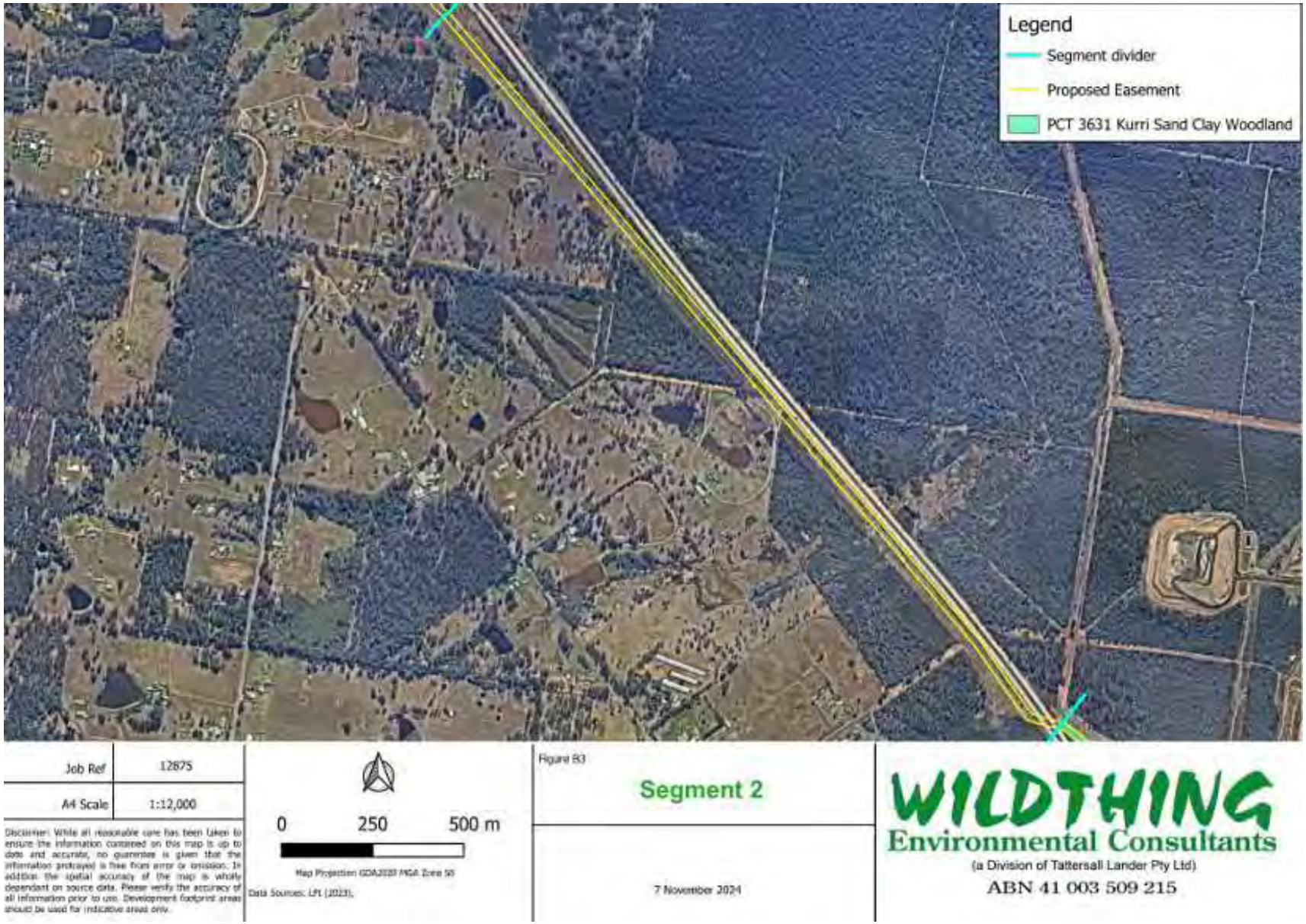
Point No.	Location		Point Description & Impact	Date	Photo and/or Photo No.
	Easting	Northing			
257	306043	6432585		4/06/2024	
258	358914	6369420		4/04/2025	#3084 #3085

APPENDIX B

DETAILED MAPS OF REZ


Legend
APZ
Survey Points
Significant Trees
Eucalyptus parramattensis subsp. decadens
Proposed Easement
PCT 3631 Kurri Sand Clay Woodland
T24
1
2
3
Job Ref
12875
A4 Scale
1:1,500
0
25
50 m
Map Projection GDA2020 MGA Zone 56
Data Sources: LPI (2024), Nearmap (2024)
Figure B1
Kurri Kurri Substation
4 April 2025
WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215


Legend
APZ
Proposed Easement
Survey Points
Significant Trees
Eucalyptus parramattensis subsp. decaden
Grevillea parviflora
PCT 3433 Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest
PCT 3631 Kurri Sand Clay Woodland
PCT 3634 Quorrobolong Sand Flats Forest
Segment Divider
Kurri Kurri STS
Job Ref 12875
A4 Scale 1:12,000
0 250 500 m
Figure B2
Segment 1
4 April 2025
WILDTHING Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215


Legend
Segment divider
Proposed Easement
PCT 3631 Kurri Sand Clay Woodland
Job Ref
12875
A4 Scale
1:12,000
Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.
0
250
500 m
Map Projection GDA2020 MGA Zone 56
Data Sources: LPI (2023),
Figure B3
Segment 2
7 November 2024
WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215

Job Ref	12875
A4 Scale	1:12,000

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

0 250 500 m

Map Projection GDA2020 MGA Zone 56

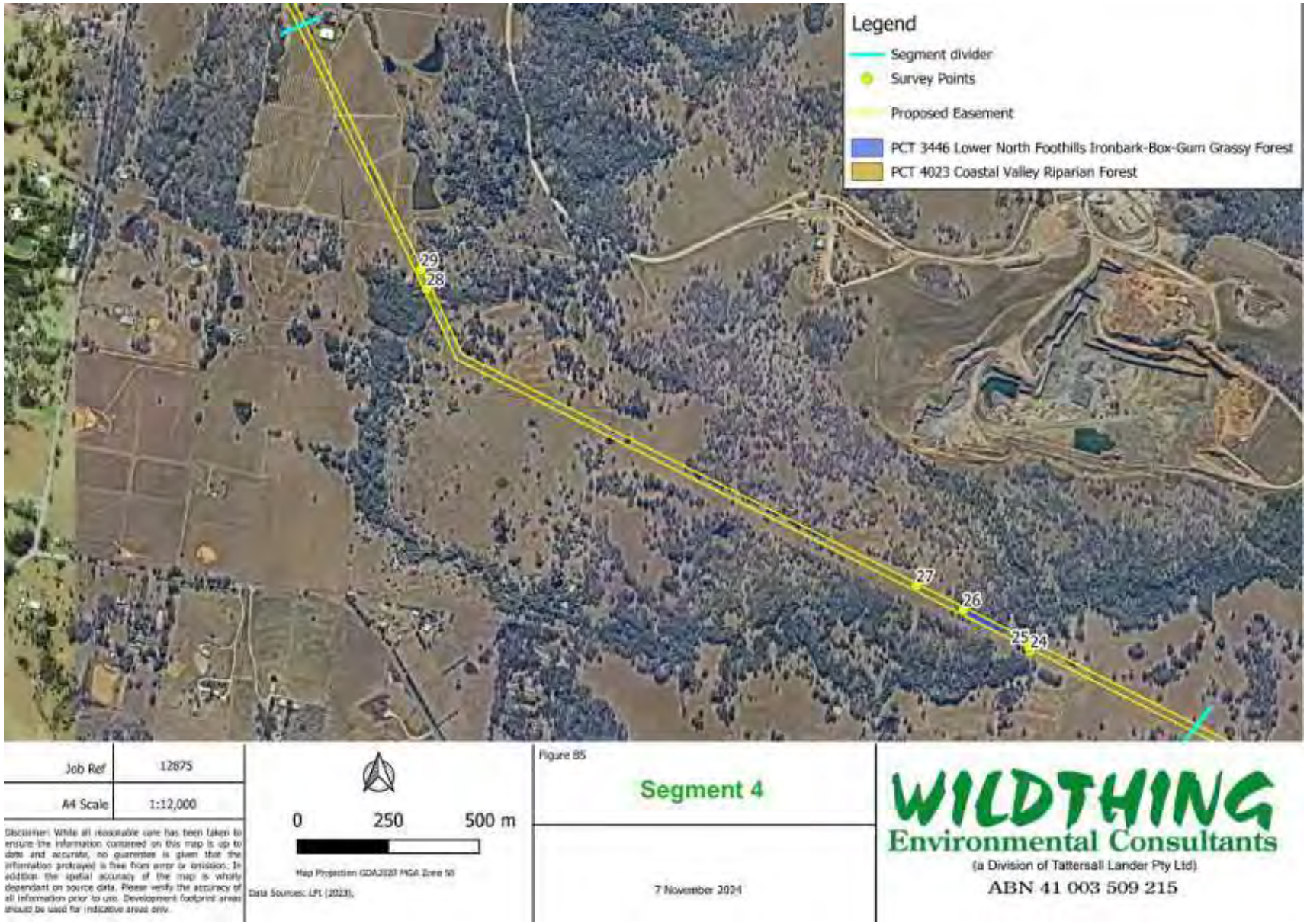
Data Sources: LPI (2023),

Figure 84

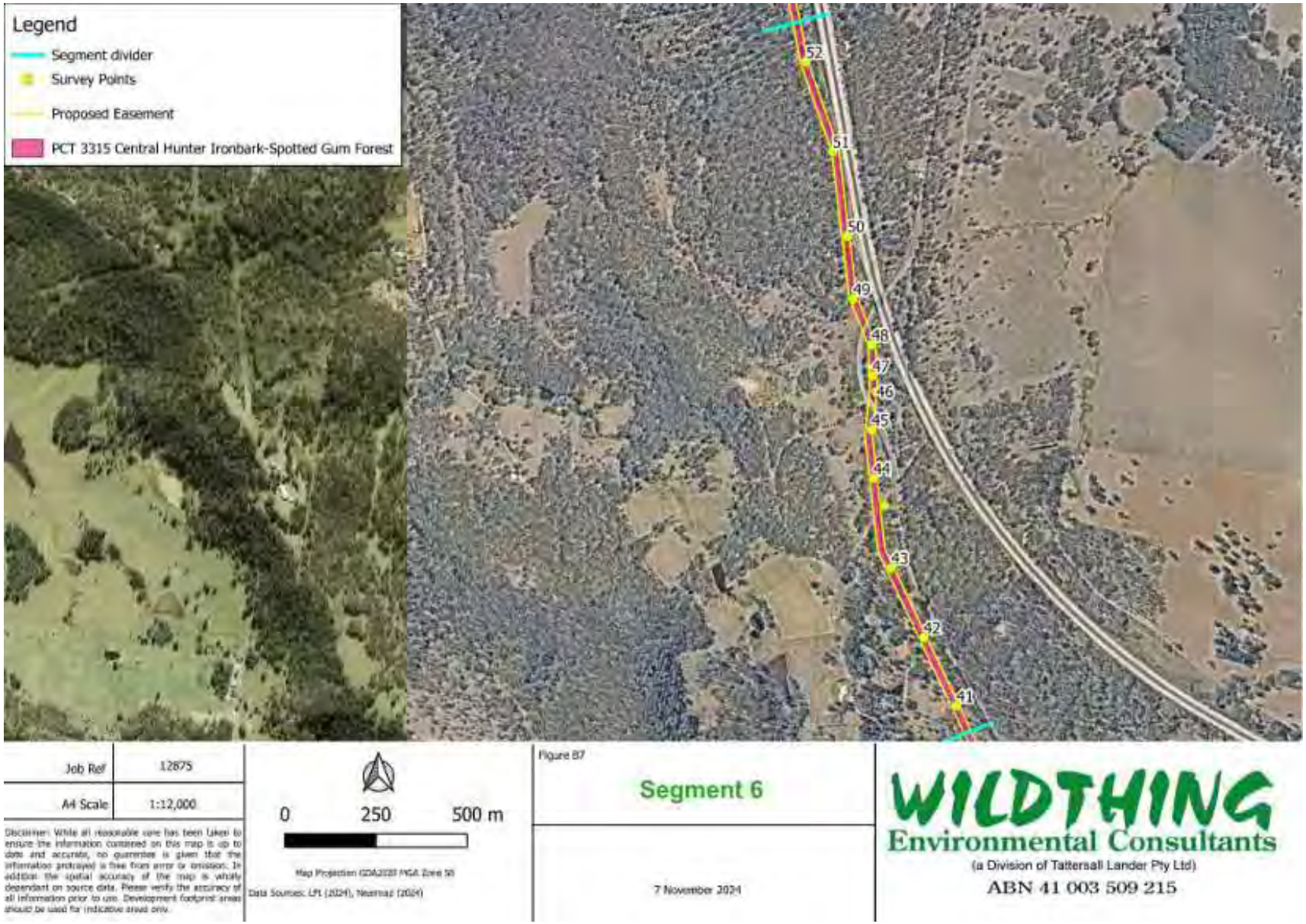
Segment 3

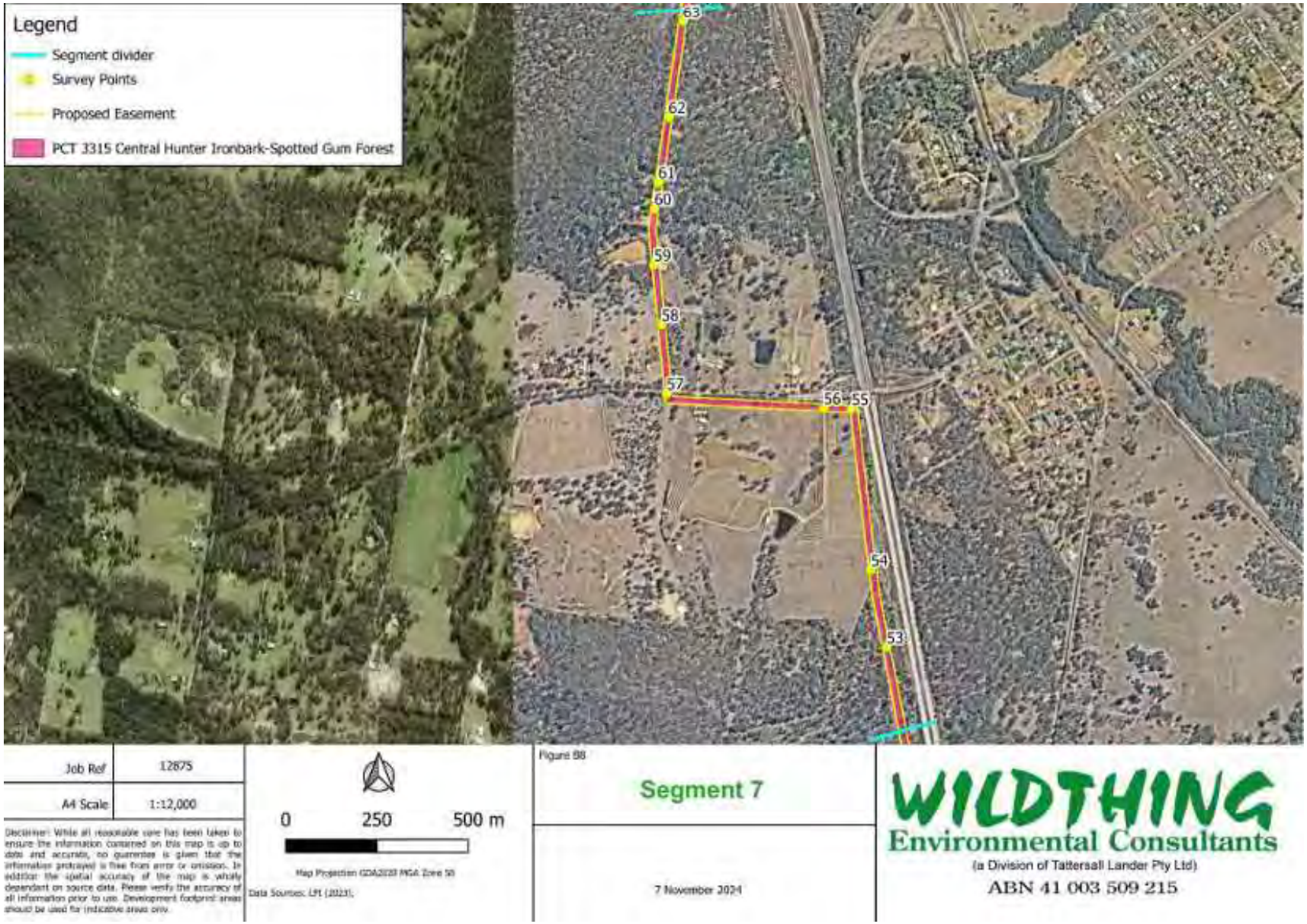
7 November 2024

WILDTHING Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215

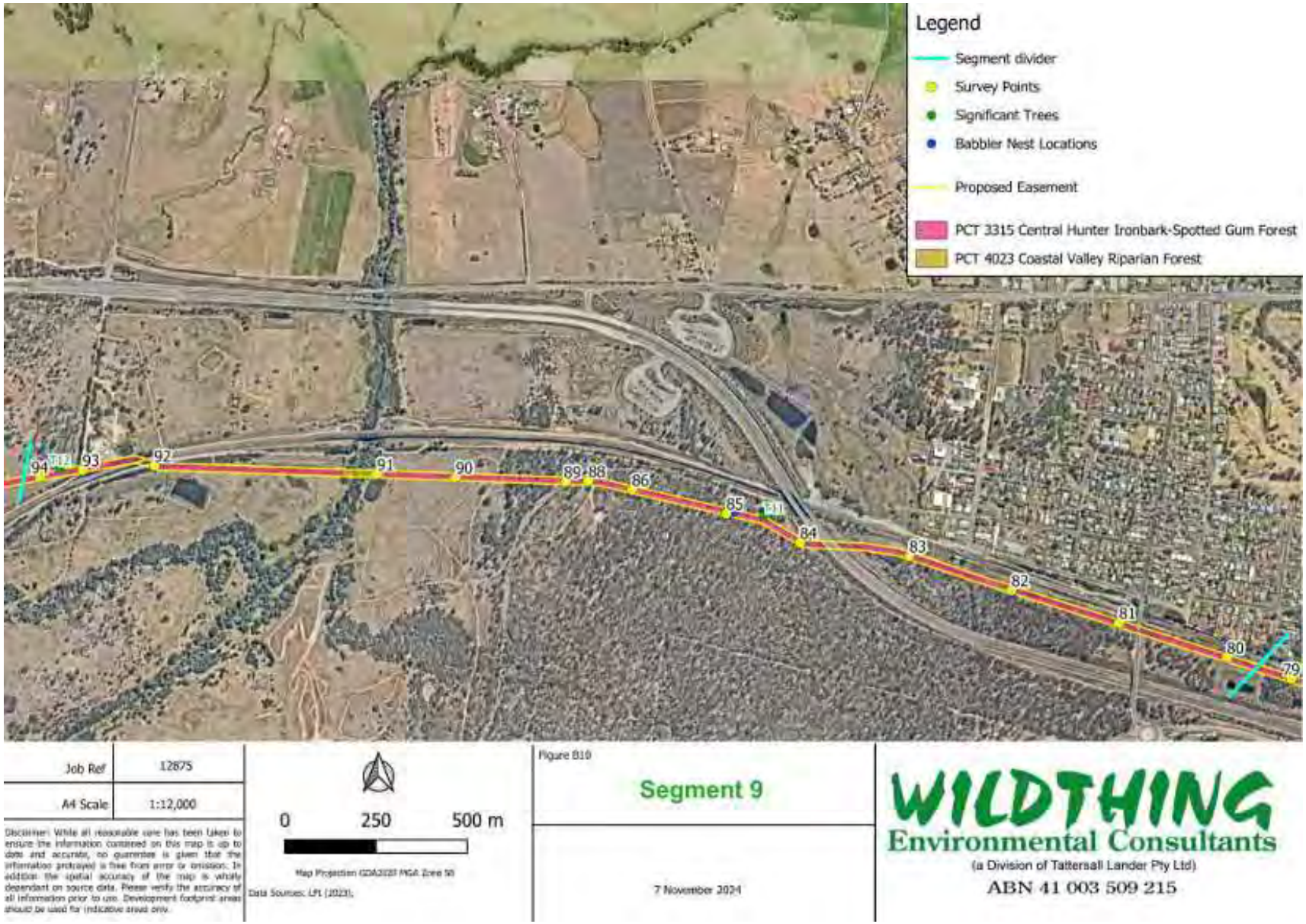

Legend
Segment divider
Survey Points
Proposed Easement
PCT 3446 Lower North Foothills Ironbark-Box-Gum Grassy Forest
PCT 4023 Coastal Valley Riparian Forest
29
28
27
26
25
24
Job Ref
12875
A4 Scale
1:12,000
Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.
0
250
500 m
Map Projection GDA2020 MGA Zone 56
Data Sources: LPI (2023),
Figure 85
Segment 4
7 November 2024
WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215

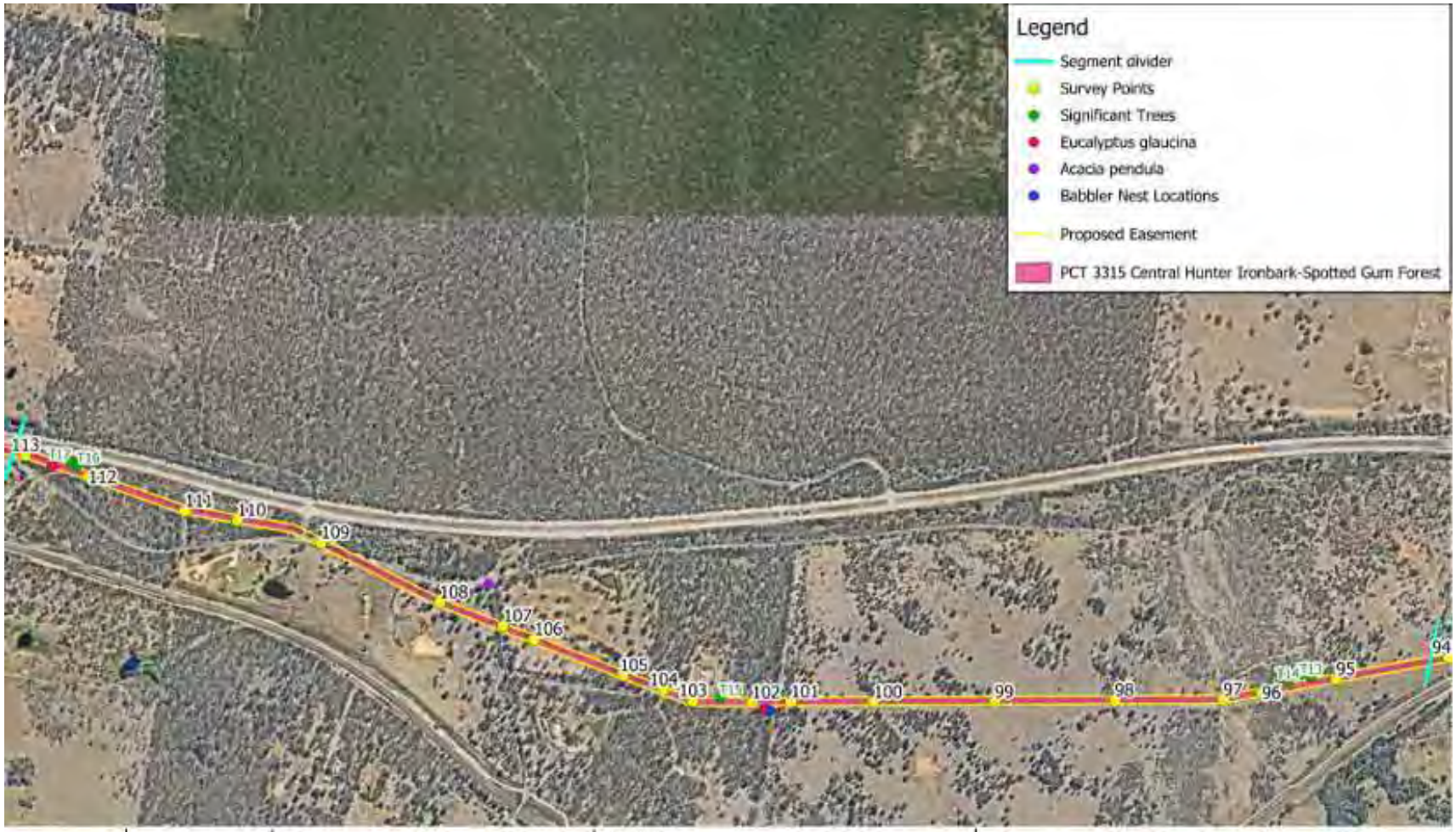

Legend
Segment divider
Survey Points
Significant Trees
Babbler Nest Locations
Proposed Easement
PCT 3315 Central Hunter Ironbark-Spotted Gum Forest
PCT 3444 Lower Hunter Spotted Gum-Ironbark Forest
39
40
38
37
36
35
32
31
33
34
30
Job Ref 12875
A4 Scale 1:12,000
0 250 500 m
Figure B6
Segment 5
7 November 2024
WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215


Legend
Segment divider
Survey Points
Proposed Easement
PCT 3315 Central Hunter Ironbark-Spotted Gum Forest
52
51
50
49
48
47
46
45
44
43
42
41
Job Ref
12875
A4 Scale
1:12,000
Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.
0
250
500 m
Map Projection GDA2020 MGA Zone 56
Data Sources: LPI (2024), Nearmap (2024)
Figure B7
Segment 6
7 November 2024
WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215


Legend
Segment divider
Survey Points
Proposed Easement
PCT 3315 Central Hunter Ironbark-Spotted Gum Forest
63
62
61
60
59
58
57
56
55
54
53
Job Ref
12875
A4 Scale
1:12,000
0
250
500 m
Figure 88
Segment 7
7 November 2024
WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215


80
79
78
77
76
75
74
73
72
71
70
69
68
66
65
64
Legend
Segment divider
Survey Points
Significant Trees
Babbler Nest Locations
Proposed Easement
PCT 3315 Central Hunter Ironbark-Spotted Gum Forest
PCT 3328 Lower Hunter Red Gum-Paperbark Riverflat Forest
PCT 4023 Coastal Valley Riparian Forest
Job Ref 12875
A4 Scale 1:12,000
0 250 500 m
Map Projection GDA2020 MGA Zone 56
Data Sources: LPI (2024), Nearmap (2024)
Figure 89
Segment 8
7 November 2024
WILDTHING Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215


Legend
Segment divider
Survey Points
Significant Trees
Babbler Nest Locations
Proposed Easement
PCT 3315 Central Hunter Ironbark-Spotted Gum Forest
PCT 4023 Coastal Valley Riparian Forest
94
93
92
91
90
89
88
86
85
84
83
82
81
80
79
Job Ref
12875
A4 Scale
1:12,000
0
250
500 m
Figure B10
Segment 9
7 November 2024
WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215



Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.


Legend
Segment divider
Survey Points
Significant Trees
Eucalyptus glaucina
Proposed Easement
PCT 3315 Central Hunter Ironbark-Spotted Gum Forest
PCT 4023 Coastal Valley Riparian Forest
130
129
128
127
126
125
124
123
122
121
120
119
118
117
116
115
114
113
Job Ref
12875
A4 Scale
1:12,000
0
250
500 m
Figure B12
Segment 11
7 November 2024
WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215

Job Ref	12875
A4 Scale	1:12,000

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0 250 500 m

Map Projection GDA2020 MGA Zone 56

Data Sources: LPI (2024), Nearmap (2024)

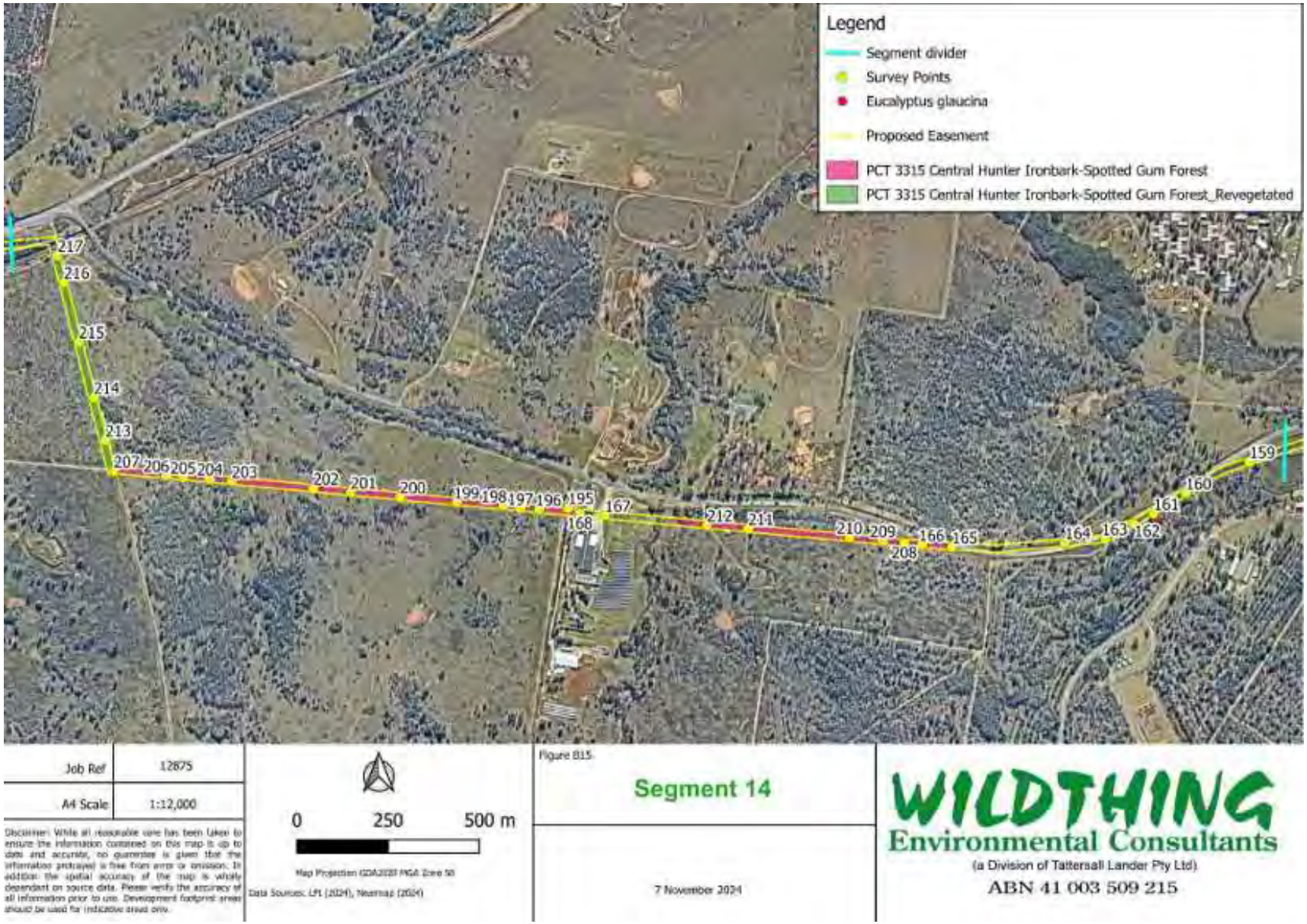
Figure B13

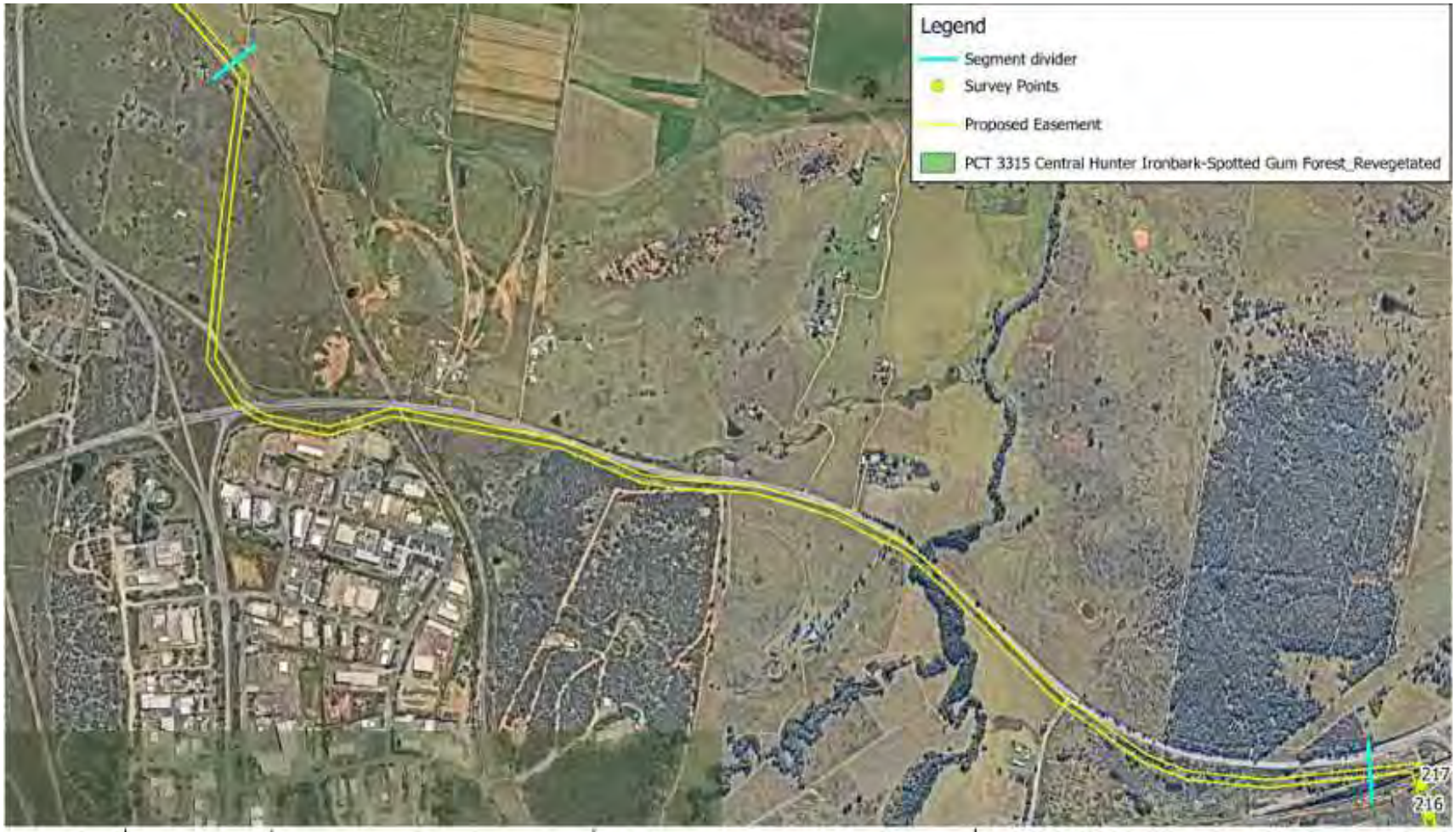
Segment 12

7 November 2024

WILDTHING Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215


Legend
Segment divider
Survey Points
Proposed Easement
PCT 3315 Central Hunter Ironbark-Spotted Gum Forest
PCT 4015 Central Hunter Swamp Oak Riparian Forest
Planted native trees
158
157
156
155
154
153
152
151
150
149
148
147
Job Ref
12875
A4 Scale
1:12,000
Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.
0
250
500 m
Map Projection GDA2020 MGA Zone 56
Data Sources: LPI (2024), Nearmap (2024)
Figure B14
Segment 13
7 November 2024
WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215


Legend
Segment divider
Survey Points
Eucalyptus glaucina
Proposed Easement
PCT 3315 Central Hunter Ironbark-Spotted Gum Forest
PCT 3315 Central Hunter Ironbark-Spotted Gum Forest_Revegetated
217
216
215
214
213
207
206
205
204
203
202
201
200
199
198
197
196
195
167
168
212
211
210
209
208
166
165
164
163
162
161
160
159
Job Ref
12875
A4 Scale
1:12,000
0
250
500 m
Figure 815
Segment 14
7 November 2024
WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215



Job Ref	12875
A4 Scale	1:12,000

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

0 250 500 m

Map Projection GDA2020 MGA Zone 56

Data Sources: LPI (2024), Nearmap (2024)

Figure B16

Segment 15

7 November 2024

WILDTHING Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215

Job Ref	12875
A4 Scale	1:12,000

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarentee is given that the information protrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

0 250 500 m

Map Projection GDA2020 MGA Zone 56

Data Sources: LPI (2024), Nearmap (2024)

Figure B17

Segment 16

7 November 2024

WILDTHING Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215

Job Ref	12875
A4 Scale	1:12,000

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

0 250 500 m

Map Projection: GDA2020 MGA Zone 56

Data Sources: LPI (2024), Nearmap (2024)

Figure B18

Segment 17

7 November 2024

WILDTHING Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215

Job Ref	12875
A4 Scale	1:12,000

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0 250 500 m

Map Projection: GDA2020 MGA Zone 56

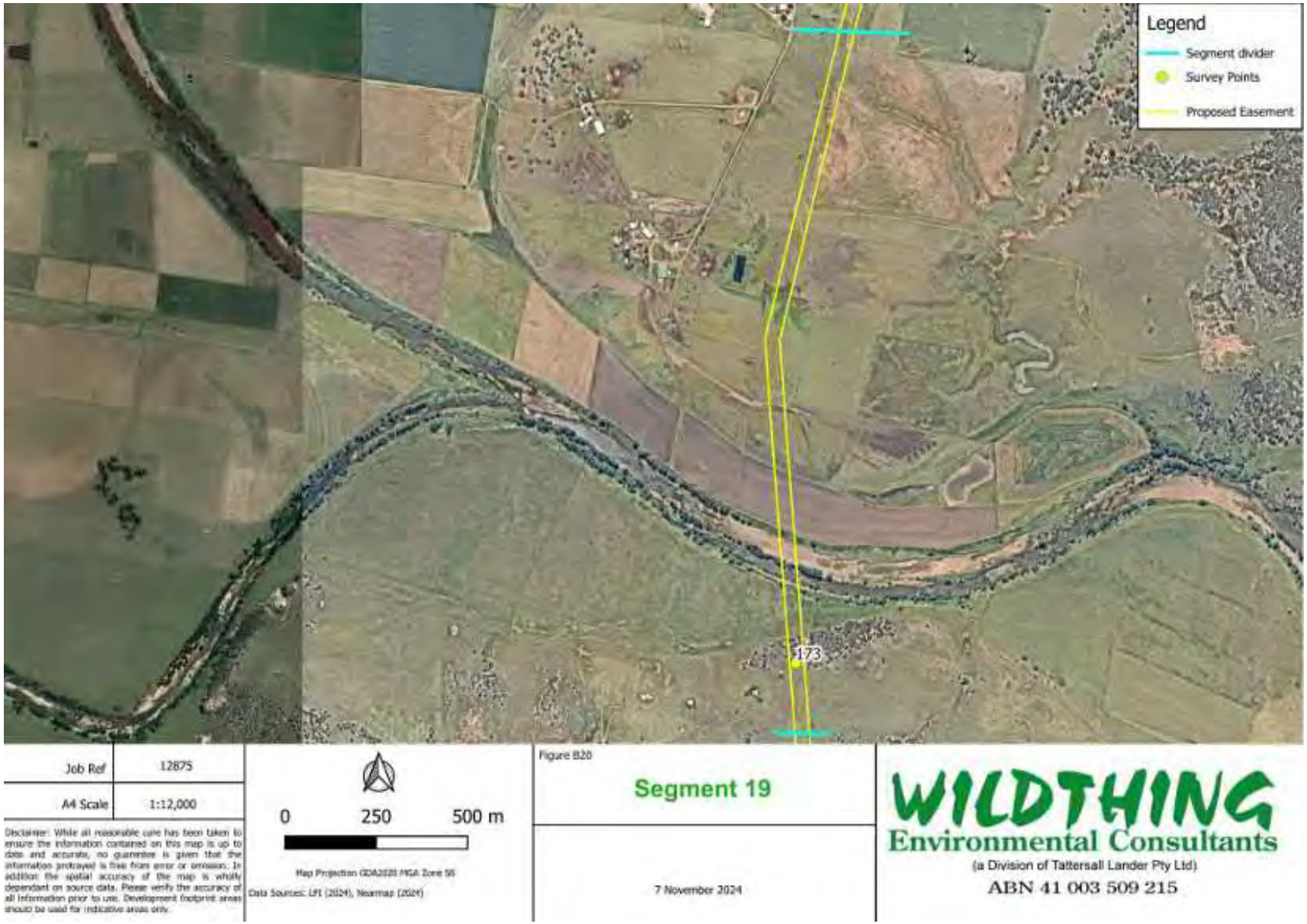
Data Sources: LPI (2024), Nearmap (2024)

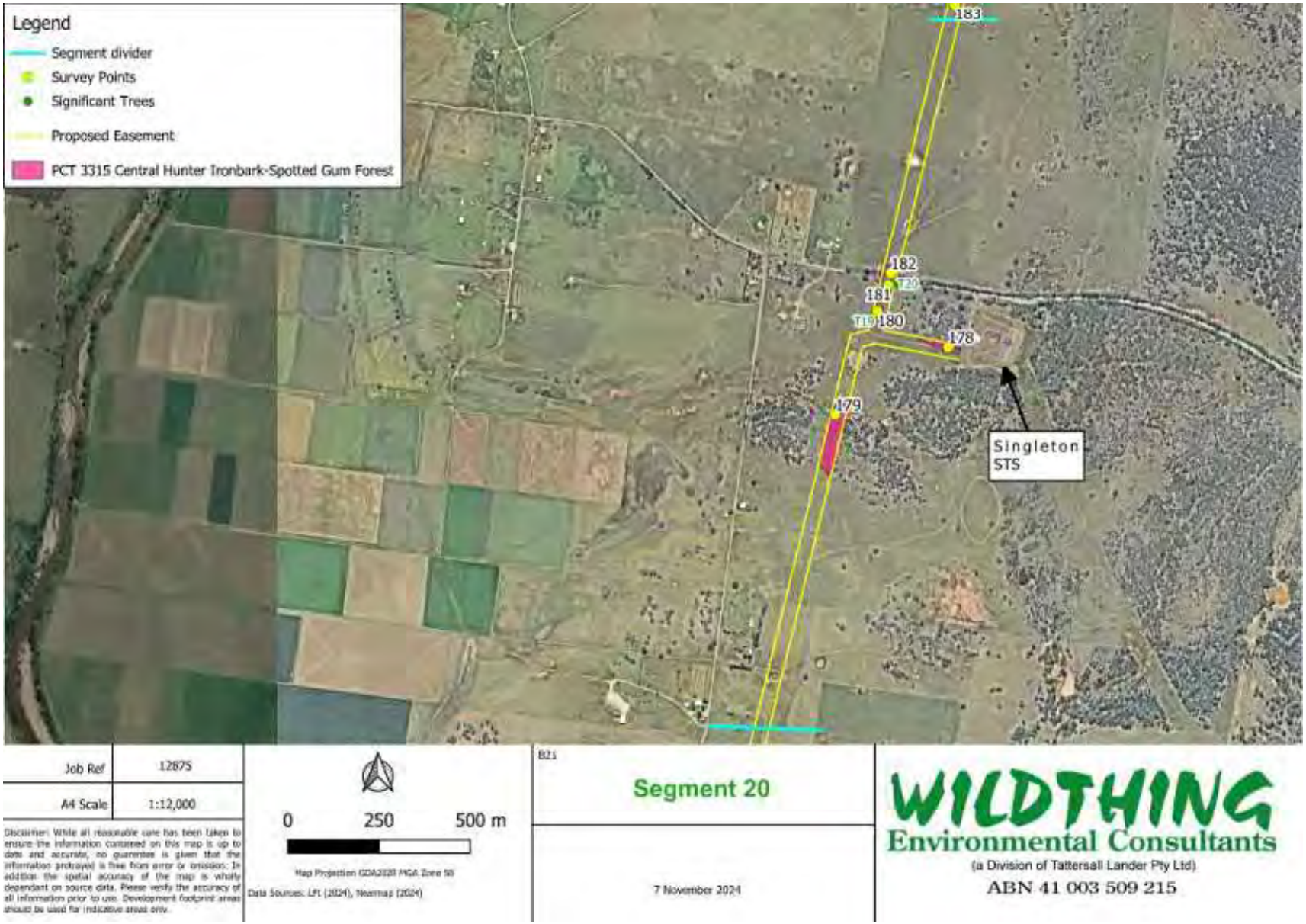
Figure 819

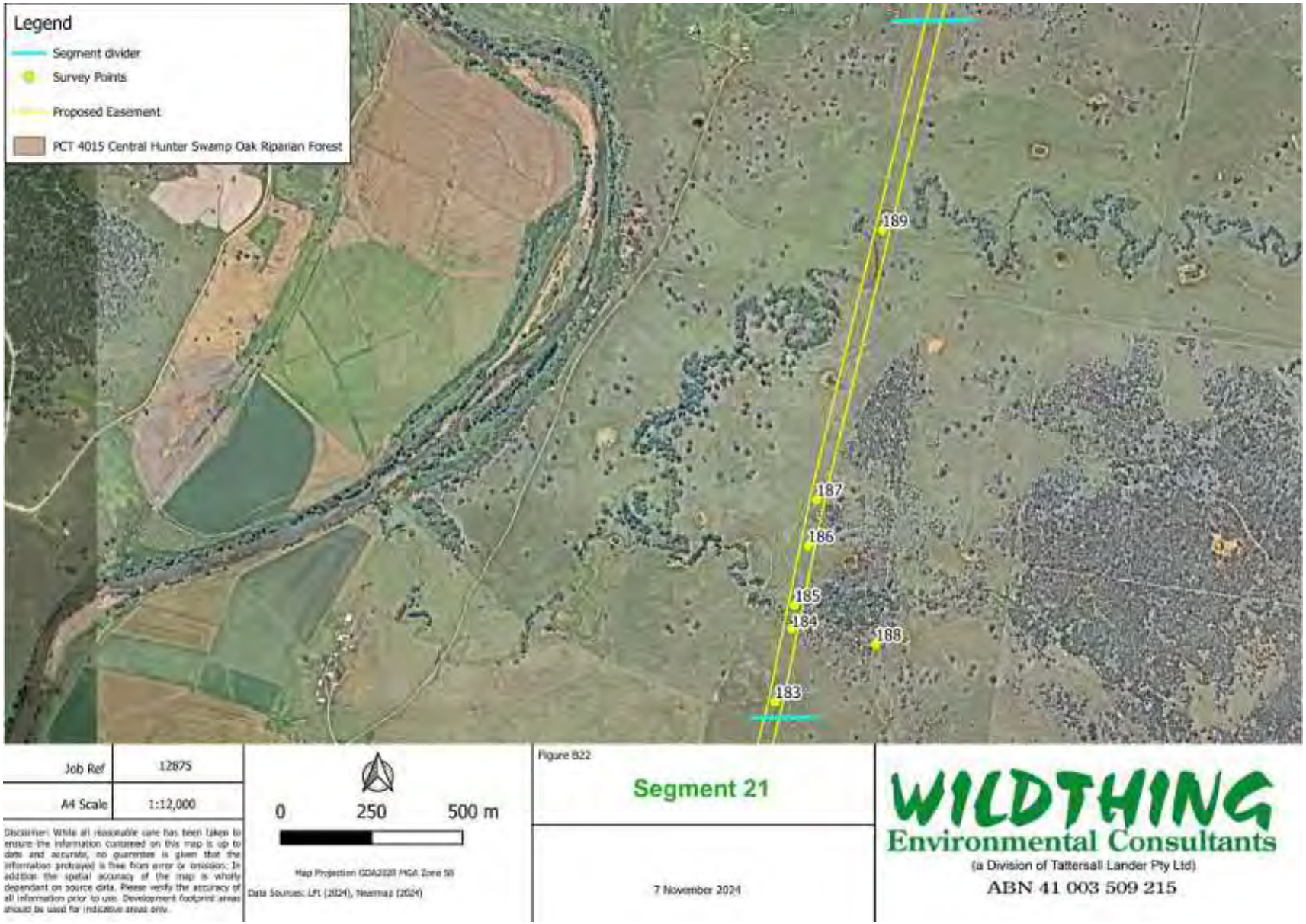
Segment 18

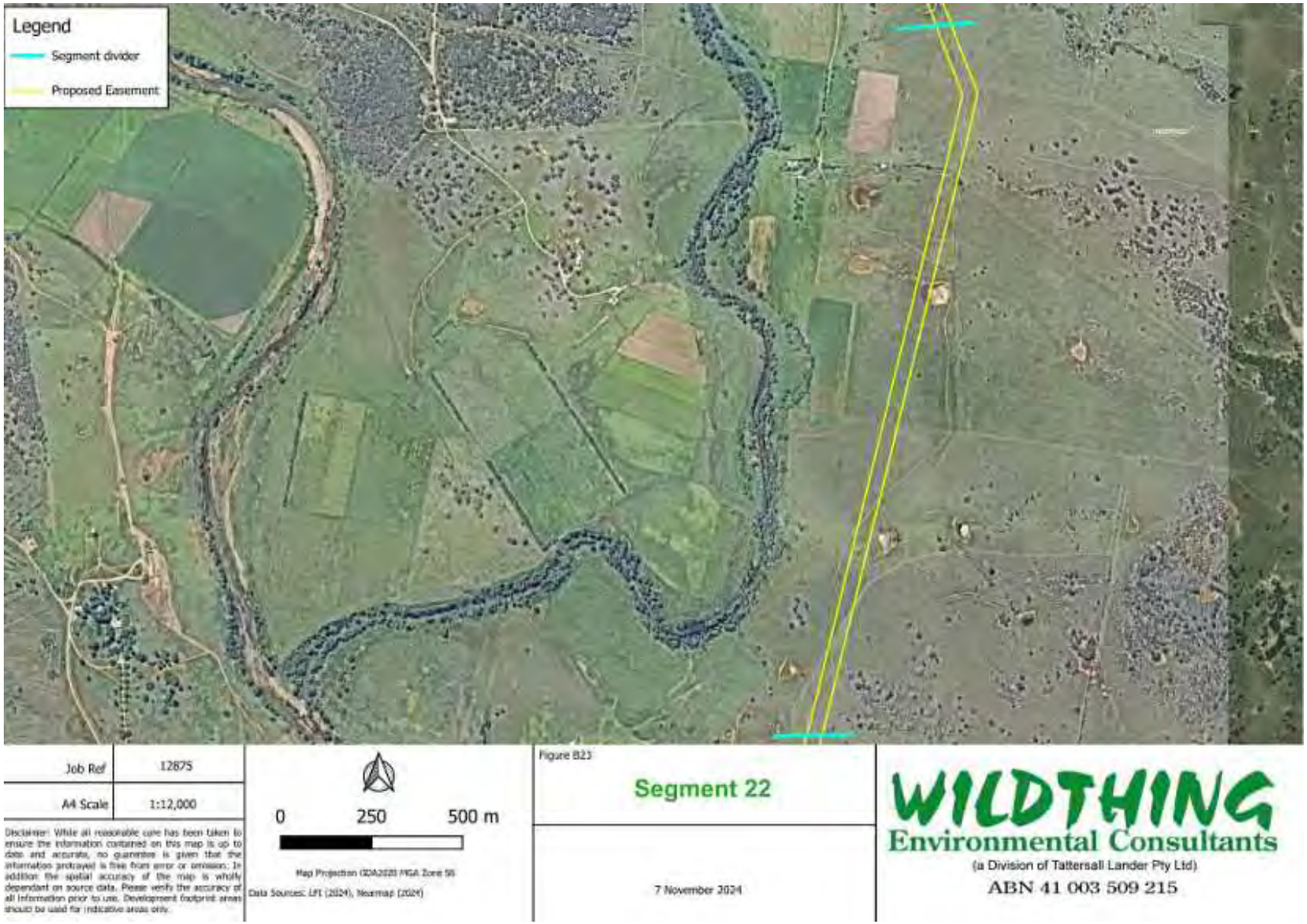
7 November 2024

WILDTHING Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215

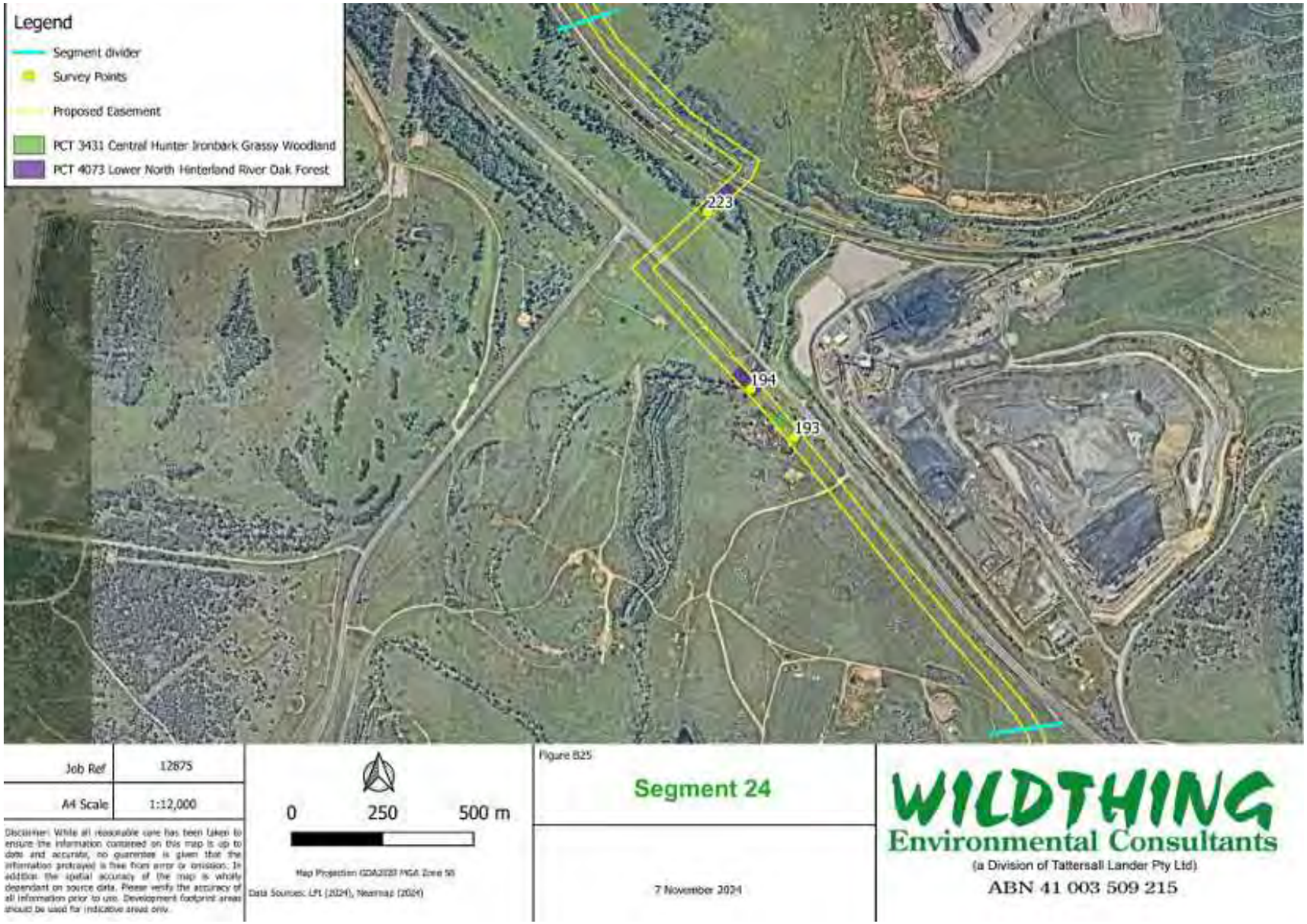

Legend
Segment divider
Survey Points
Proposed Easement
173
Job Ref
12875
A4 Scale
1:12,000
Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.
0
250
500 m
Map Projection GDA2020 MGA Zone 56
Data Sources: LPI (2024), Nearmap (2024)
Figure B20
Segment 19
7 November 2024
WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215


Legend
Segment divider
Survey Points
Significant Trees
Proposed Easement
PCT 3315 Central Hunter Ironbark-Spotted Gum Forest
183
182
T20
181
T19
180
178
179
Singleton STS
Job Ref
12875
A4 Scale
1:12,000
Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.
0
250
500 m
Map Projection GDA2020 MGA Zone 56
Data Sources: LPI (2024), Nearmap (2024)
B21
Segment 20
7 November 2024
WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215


Legend
Segment divider
Survey Points
Proposed Easement
PCT 4015 Central Hunter Swamp Oak Riparian Forest
189
187
186
185
184
188
183
Job Ref
12875
A4 Scale
1:12,000
Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.
0
250
500 m
Map Projection GDA2020 MGA Zone 56
Data Sources: LPI (2024), Nearmap (2024)
Figure B22
Segment 21
7 November 2024
WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215


Legend
Segment divider
Proposed Easement
Job Ref
12875
A4 Scale
1:12,000
Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.
0
250
500 m
Map Projection GDA2020 MGA Zone 56
Data Sources: LPI (2024), Nearmap (2024)
Figure B23
Segment 22
7 November 2024
WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215


Legend
Segment divider
Survey Points
Proposed Easement
PCT 4073 Lower North Hinterland River Oak Forest
192
191
190
Job Ref
12875
A4 Scale
1:12,000
0
250
500 m
Map Projection GDA2020 MGA Zone 56
Data Sources: LPI (2024), Nearmap (2024)
Figure B24
Segment 23
7 November 2024
WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215


Legend
Segment divider
Survey Points
Proposed Easement
PCT 3431 Central Hunter Ironbark Grassy Woodland
PCT 4073 Lower North Hinterland River Oak Forest
223
194
193
Job Ref
12875
A4 Scale
1:12,000
0
250
500 m
Figure B25
Segment 24
7 November 2024
WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215


Legend
Segment divider
Survey Points
Proposed Easement
PCT 3431 Central Hunter Ironbark Grassy Woodland
PCT 4073 Lower North Hinterland River Oak Forest
221
222
220
Job Ref
12875
A4 Scale
1:12,000
Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.
0
250
500 m
Map Projection GDA2020 MGA Zone 56
Data Sources: LPI (2024), Nearmap (2024)
Figure B26
Segment 25
7 November 2024
WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215

Job Ref	12875
A4 Scale	1:12,000

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

0 250 500 m

Map Projection GDA2020 MGA Zone 56

Data Sources: LPI (2024), Nearmap (2024)

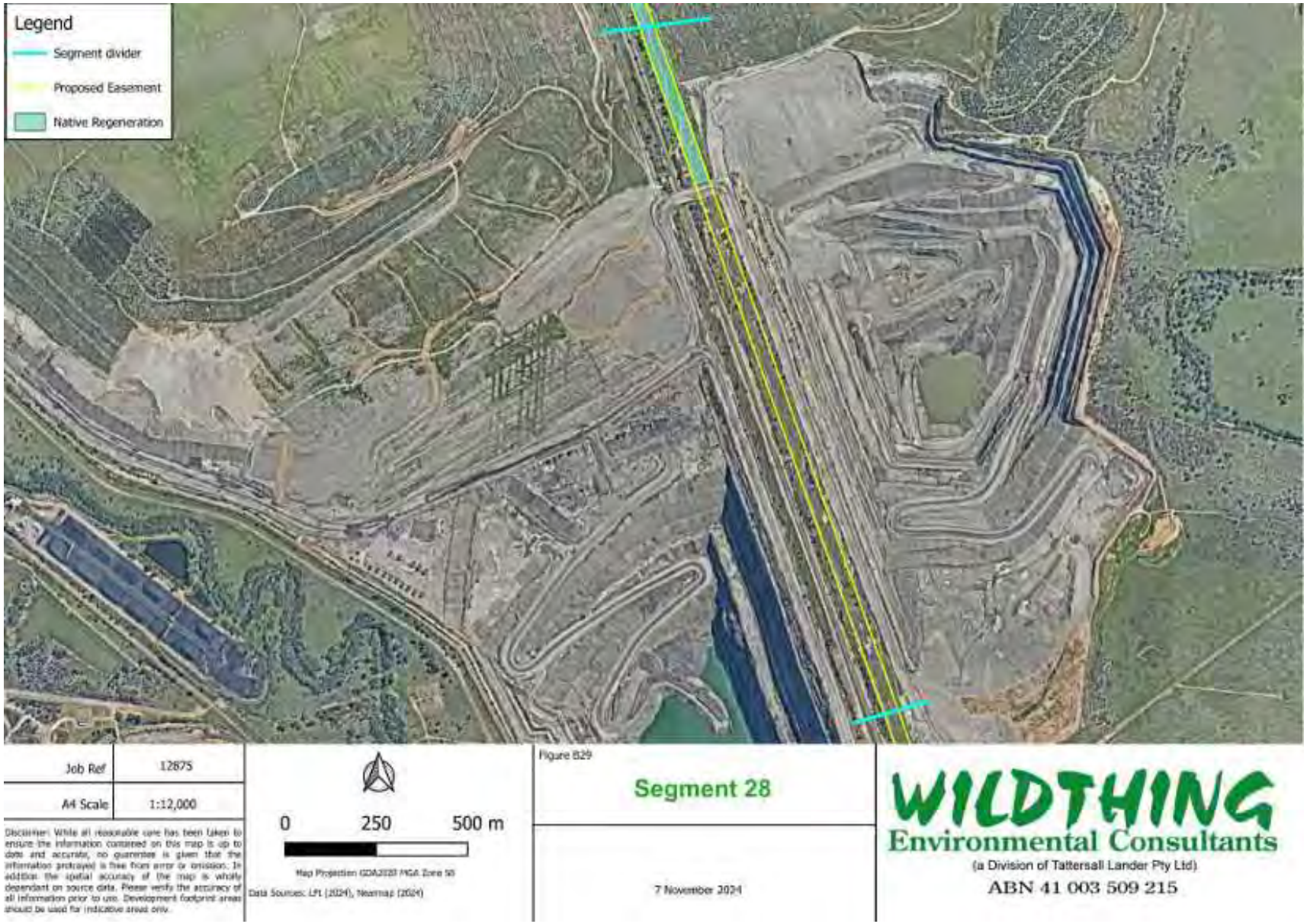
Figure B27

Segment 26

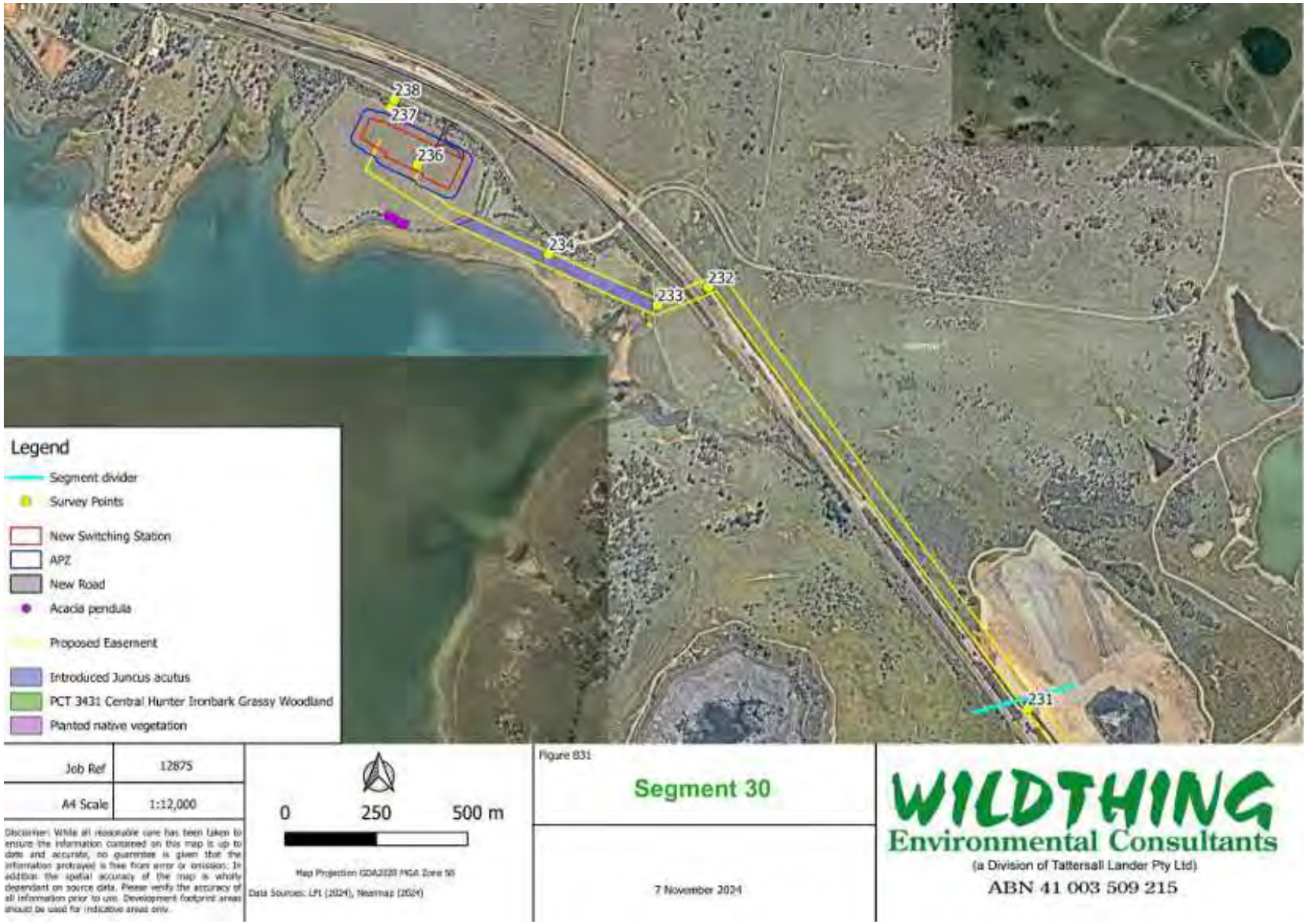
7 November 2024

WILDTHING Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215

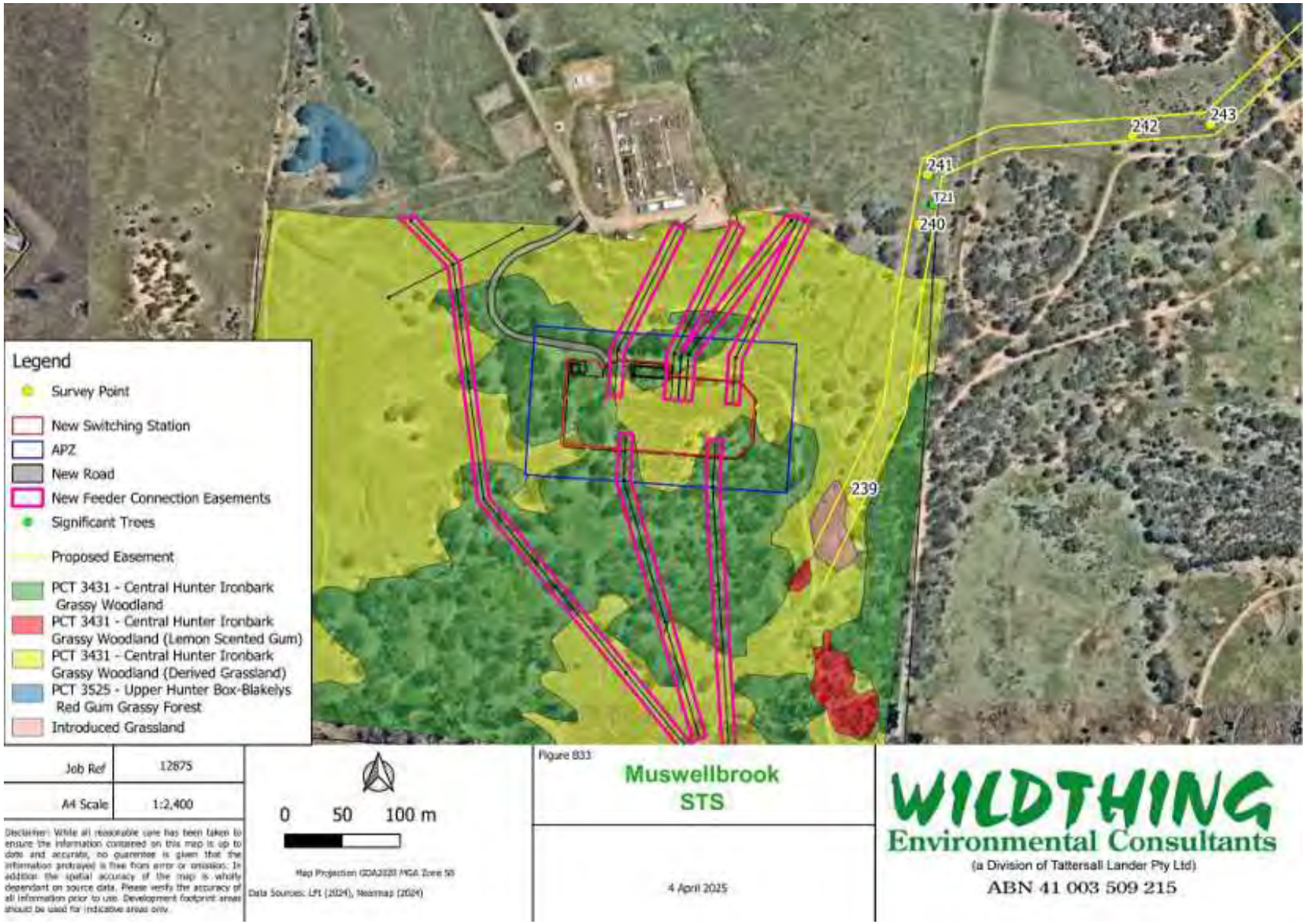

Legend
Segment divider
Proposed Easement
Job Ref
12875
A4 Scale
1:12,000
Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.
0
250
500 m
Map Projection GDA2020 MGA Zone 56
Data Sources: LPI (2024), Nearmap (2024)
Figure B28
Segment 27
7 November 2024
WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215

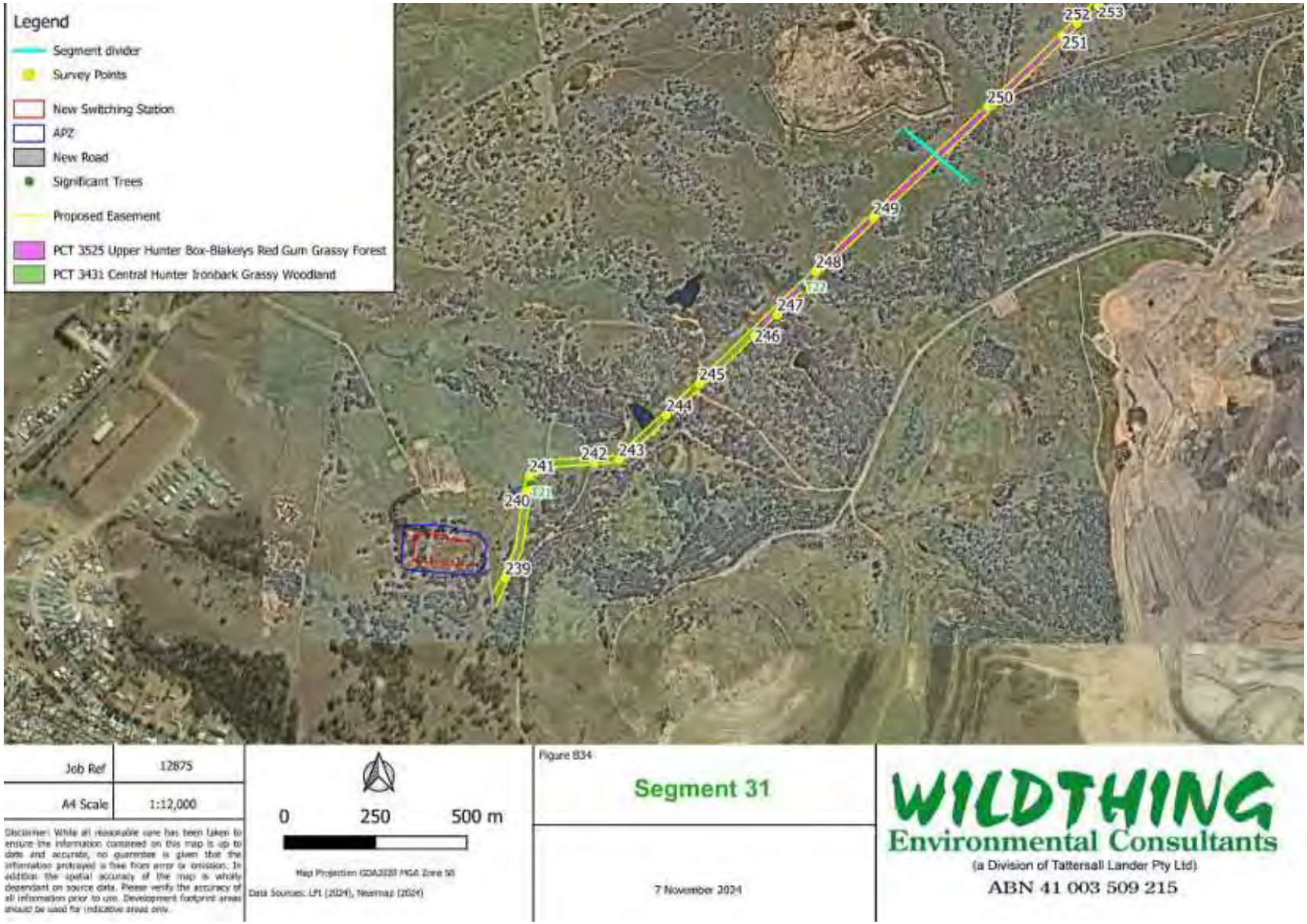

Legend
Segment divider
Proposed Easement
Native Regeneration
Job Ref
12875
A4 Scale
1:12,000
Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.
0
250
500 m
Map Projection GDA2020 MGA Zone 56
Data Sources: LPI (2024), Nearmap (2024)
Figure B29
Segment 28
7 November 2024
WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215


Legend
Segment divider
Survey Points
Proposed Easement
Native Regeneration
231
230
229
228
227
226
Job Ref
12875
A4 Scale
1:12,000
0
250
500 m
Map Projection GDA2020 MGA Zone 56
Data Sources: LPI (2024), Nearmap (2024)
Figure 830
Segment 29
7 November 2024
WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215


238
237
236
234
233
232
231
Legend
Segment divider
Survey Points
New Switching Station
APZ
New Road
Acacia pendula
Proposed Easement
Introduced Juncus acutus
PCT 3431 Central Hunter Ironbark Grassy Woodland
Planted native vegetation
Job Ref
12875
A4 Scale
1:12,000
0
250
500 m
Map Projection GDA2020 MGA Zone 56
Data Sources: LPI (2024), Nearmap (2024)
Figure 831
Segment 30
7 November 2024
WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215


238
237
236
Legend
Survey Points
New Switching Station
APZ
New Road
Acacia pendula
Proposed Easement
Introduced Juncus acutus
Planted native vegetation
Job Ref
12875
A4 Scale
1:2,400
0
50
100 m
Map Projection GDA2020 MGA Zone 56
Data Sources: LPI (2024), Nearmap (2024)
Figure B32
Liddel Switching Station
7 November 2024
WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215


243
242
241
121
240
239
Legend
Survey Point
New Switching Station
APZ
New Road
New Feeder Connection Easements
Significant Trees
Proposed Easement
PCT 3431 - Central Hunter Ironbark Grassy Woodland
PCT 3431 - Central Hunter Ironbark Grassy Woodland (Lemon Scented Gum)
PCT 3431 - Central Hunter Ironbark Grassy Woodland (Derived Grassland)
PCT 3525 - Upper Hunter Box-Blakelys Red Gum Grassy Forest
Introduced Grassland
Job Ref 12875
A4 Scale 1:2,400
0 50 100 m
Map Projection GDA2020 MGA Zone 56
Data Sources: LPI (2024), Nearmap (2024)
Figure B33
Muswellbrook STS
4 April 2025
WILDTHING Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215


Legend
Segment divider
Survey Points
New Switching Station
APZ
New Road
Significant Trees
Proposed Easement
PCT 3525 Upper Hunter Box-Blakelys Red Gum Grassy Forest
PCT 3431 Central Hunter Ironbark Grassy Woodland
252
253
251
250
249
248
247
246
245
244
243
242
241
240
239
Job Ref
12875
A4 Scale
1:12,000
Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.
0
250
500 m
Map Projection GDA2020 MGA Zone 56
Data Sources: LPI (2024), Nearmap (2024)
Figure 834
Segment 31
7 November 2024
WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215


Legend
Survey Points
Significant Trees
Diuris tricolor
Proposed Easement
PCT 3525 Upper Hunter Box-Blakelys Red Gum Grassy Forest
PCT 3431 Central Hunter Ironbark Grassy Woodland
Segment divider
257
256
255
254
253
252
251
250
249
Job Ref
12875
A4 Scale
1:12,000
0
250
500 m
Figure 835
Segment 32
4 April 2025
WILDTHING
Environmental Consultants
(a Division of Tattersall Lander Pty Ltd)
ABN 41 003 509 215

APPENDIX C

SECTION 7.3 OF THE BC ACT 2016

TEST OF SIGNIFICANCE

C1.0 SECTION 7.3 OF THE BC ACT 2016 TEST OF SIGNIFICANCE (THREATENED ECOLOGICAL COMMUNITIES)

C1.1 KURRI SAND WOODLAND IN THE SYDNEY BASIN BIOREGION

Kurri Sand Swamp Woodland in the Sydney Basin Bioregion	
Description	Kurri Sand Swamp Woodland is a low woodland or heathland, generally with a low open canopy rarely exceeding 15 m in height and a shrubby understorey. The overstorey is usually dominated by *Eucalyptus parramattensis* subsp. *decadens* (Parramatta Red Gum) and *Angophora bakeri* (Narrow-leaved Apple).
Habitat Requirements and Ecology	Occurs on soils developed on poorly drained Tertiary sand deposits that blanket Permian sediments.
Distribution	Known to occur in the Kurri Kurri–Cessnock area of the Cessnock LGA in the lower Hunter Valley.
BC Act 2016	Endangered Ecological Community
EPBC Act 1999	Endangered Ecological Community

Five Part Test of Significance

The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

a. *have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,*

   NA

b. *in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*
   i. *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
   ii. *is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

Areas mapped as PCT 3630 Kurri Sand Heathy Woodland occur west of the Kurri Kurri STS and west of Hart Road were found to be consistent with the Endangered Ecological Community; Kurri Sand Woodland in the Sydney Basin Bioregion. Between the Kurri STS and the Hunter Expressway and a section west of the Hunter Expressway across from the Kurri STS there was no existing easement. These areas had been subject to previous disturbance with areas highly disturbed to relatively intact. Between Hart Road and the Hunter Expressway this EEC occurs within an existing easement and is composed of low maintained grown covers with a moderate diversity. Better quality areas of Kurri Sand Heathy Woodland occur either side of the easement. The proposal will result in the removal/modification of a relatively small amount of Kurri Sand Swamp Woodland. Both areas of Kurri Sand Swamp Woodland are connected to much larger significant areas of this EEC. The proposal will result in an incremental reduction in Kurri Sand Swamp Woodland; however, it is considered unlikely to have a significant impact which might lead to extinction locally.

c. *in relation to the habitat of a threatened species or ecological community:*
   i. *the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
   ii. *whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and*
   iii. *the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,*

The REZ will impact 0.60ha Kurri Sand Swamp Woodland for approximately 150m of a new section of easement between the Kurri STS and Hunter Expressway (0.2a) and another section on the other side of

the Hunter Expressway (0.40ha). The REZ is will only have a small impact on Kurri Sand Swamp Woodland within the existing easement west of Hart Road. Areas of impacted Kurri Sand Swamp Woodland were connected to much larger areas of this EEC. No areas are likely to become fragmented or isolated from other areas that are important to the long-term survival of Kurri Sand Swamp Woodland in the locality.

d. *whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),*

No areas declared areas of outstanding biodiversity value were present within proximity to the REZ proposal.

e. *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the proposal have been addressed below:

Clearing of Native Vegetation.
The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. The action is unlikely to be responsible for the significant loss of this EEC provided that recommendations for impact minimisation as listed within Section 6.4 are undertaken.

Invasion of native plant communities by exotic perennial grasses.
Specimens of exotic perennial grasses such as *Chloris gayana* (Rhodes Grass), *Eragrostis curvula* (African Love Grass), *Andropogon virginicus* (Whisky Grass) and *Hyparrhenia hirta* (Coolatai Grass) were present. These exotic grasses compete with species within this EEC for space, light, and other resources and may threaten its persistence at several sites. The action is unlikely to be responsible for the significant loss of this EEC provided recommendations for impact minimisation as listed within Section 6.4 are undertaken.

High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition
It is unknown what impact fire has had within areas of this EEC. The proposal is unlikely to increase

Competition and grazing by the feral European rabbit, Oryctolagus cuniculus
Observations and secondary indications of the European Rabbit such as scats and diggings were noted along parts of the REZ. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Herbivory and environmental degradation caused by feral deer
Tracks of Feral Deer were recorded within several sections of the REZ. Feral Deer would be considered to have an impact on native flora in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Infection of native plants by Phytophthora cinnamomi
No evidence of *Phytophthora cinnamomi* was observed during site visits. The proposal is unlikely to cause the spread of this fungus.

Invasion, establishment and spread of Lantana (Lantana camara)
Lantana was recorded within parts of the REZ proposal. The proposal is unlikely to cause the spread of this weed species.

Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae.
No evidence of the fungi was observed during site visits. The proposal is unlikely to cause the spread of this fungus.

Invasion of native plant communities by African Olive *Olea europaea* subsp. *cuspidata*
The African Olive was recorded along parts of the REZ route. The proposal is unlikely to cause further spread of this introduced tree.

Kurri Sand Swamp Woodland in the Sydney Basin Bioregion

Removal of dead wood and dead trees
Dead wood and trees were recorded along small sections of the REZ route. Dead wood and trees such be avoided wherever possible.

Predation, habitat degradation, competition and disease transmission by *Sus scrofa* (Feral Pigs)
Signs of Feral Pigs were noted along parts of the REZ route. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Conclusion
The proposal will result in an incremental reduction in Kurri Sand Swamp Woodland; however, it is considered unlikely to have a significant impact on this EEC.

Bibliography:
Bell, S. and Driscoll, C. (2007) Vegetation of the Cessnock-Kurri region, Cessnock LGA, New South Wales: Survey, Classification & Mapping. Report to Department of Environment & Climate Change, Newcastle.

NSW Scientific Committee (2001) Kurri sand swamp woodland in the Sydney Basin Bioregion- Endangered ecological community determination - final. DEC (NSW), Sydney.

C1.2 LOWER HUNTER SPOTTED GUM-IRONBARK FOREST

Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	
Description	This community is dominated by *Corymbia maculata* (Spotted Gum) and *Eucalyptus fibrosa* (Broad-leaved Ironbark) while *E. punctata* (Grey Gum) and *E. crebra* (Narrow-leaved Ironbark) occur occasionally. The understorey is marked by the tall shrub, *Acacia parvipinnula*, and by the prickly shrubs, *Daviesia ulicifolia, Bursaria spinosa, Melaleuca nodosa* and *Lissanthe strigosa.* The ground layer is diverse; frequent species include *Cheilanthes sieberi, Cymbopogon refractus, Dianella revoluta, Entolasia stricta, Glycine clandestina, Lepidosperma laterale, Lomandra multiflora, Microlaena stipoides, Pomax umbellata, Pratia purpurascens, Themeda australis* and *Phyllanthus hirtellus.*
Habitat Requirements and Ecology	Occurs principally on Permian geology in the central to lower Hunter Valley. The Permian substrates most commonly supporting the community belong to the Dalwood Group, the Maitland Group and the Greta and Tomago Coal Measures, although smaller areas of the community may also occur on the Permian Singleton and Newcastle Coal Measures and the Triassic Narrabeen Group.
Distribution	Restricted to a range of approximately 65 km by 35 km centred on the Cessnock - Beresfield area in the Central and Lower Hunter Valley.
BC Act 2016	Endangered Ecological Community
EPBC Act 1999	Not listed

Five Part Test of Significance

The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

a. *have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,*

   NA

b. *in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*
   i. *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
   ii. *is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

Areas mapped as PCT 3433 Hunter Coast Foothills Spotted Gum-Ironbark Forest and PCT 3444 Lower Hunter Spotted Gum-Ironbark Forest were found to be consistent with the EEC; Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions. Sections of this EEC were present along the Hunter Expressway near Kurri Kurri, NW of Harts Road and East of Old Maitland Road. This EEC largely occurred within areas of existing easement, composed of low maintained grown covers with a varying diversity. Better quality areas of Lower Hunter Spotted Gum Ironbark Forest were generally present on the edges of the existing easement. The proposal will result in the removal/modification of a relatively small amount of generally disturbed Lower Hunter Spotted Gum Ironbark Forest resulting in an incremental reduction in the local area, however, it is considered unlikely to have a significant impact which might lead to extinction locally.

c. *in relation to the habitat of a threatened species or ecological community:*
   i. *the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
   ii. *whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and*
   iii. *the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,*

The REZ is will only have a relatively small impact on Lower Hunter Spotted Gum Ironbark Forest within areas of existing easement and parts of the easement edge. No areas are likely to become fragmented or

Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions

isolated from other areas that are important to the long-term survival of Lower Hunter Spotted Gum Ironbark Forest in the locality.

d. whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

No areas declared areas of outstanding biodiversity value were present within proximity to the REZ proposal.

e. whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the proposal have been addressed below:

Clearing of Native Vegetation.
The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. The action is unlikely to be responsible for the significant loss of this EEC provided that recommendations for impact minimisation as listed within Section 6.4 are undertaken.

Invasion of native plant communities by exotic perennial grasses.
Specimens of exotic perennial grasses such as *Chloris gayana* (Rhodes Grass), *Eragrostis curvula* (African Love Grass), *Andropogon virginicus* (Whisky Grass) and *Hyparrhenia hirta* (Coolatai Grass) were present. These exotic grasses compete with species within this EEC for space, light, and other resources and may threaten its persistence at several sites. The action is unlikely to be responsible for the significant loss of this EEC provided recommendations for impact minimisation as listed within Section 6.4 are undertaken.

High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition
It is unknown what impact fire has had within areas of this EEC. The proposal is unlikely to increase

Competition and grazing by the feral European rabbit, Oryctolagus cuniculus
Observations and secondary indications of the European Rabbit such as scats and diggings were noted along parts of the REZ. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Herbivory and environmental degradation caused by feral deer
Tracks of Feral Deer were recorded within several sections of the REZ. Feral Deer would be considered to have an impact on native flora in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Infection of native plants by Phytophthora cinnamomi
No evidence of *Phytophthora cinnamomi* was observed during site visits. The proposal is unlikely to cause the spread of this fungus.

Invasion, establishment and spread of Lantana (Lantana camara)
Lantana was recorded within parts of the REZ proposal. The proposal is unlikely to cause the spread of this weed species.

Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae.
No evidence of the fungi was observed during site visits. The proposal is unlikely to cause the spread of this fungus.

Invasion of native plant communities by African Olive *Olea europaea* subsp. *cuspidata*
The African Olive was recorded along parts of the REZ route. The proposal is unlikely to cause further spread of this introduced tree.

Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions

Removal of dead wood and dead trees

Dead wood and trees were recorded along small sections of the REZ route. Dead wood and trees such be avoided wherever possible.

Predation, habitat degradation, competition and disease transmission by *Sus scrofa* (Feral Pigs)

Signs of Feral Pigs were noted along parts of the REZ route. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Conclusion

The proposal will result in a small incremental reduction in Lower Hunter Spotted Gum Ironbark Forest; however, it is considered unlikely to have a significant impact on this EEC.

Bibliography:

Bell, S. and Driscoll, C. (2007) Vegetation of the Cessnock-Kurri region, Cessnock LGA, New South Wales: Survey, Classification & Mapping. Report to Department of Environment & Climate Change, Newcastle.

NSW Scientific Committee (2005) Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin Bioregion - Endangered ecological community determination - final. DEC (NSW), Sydney.

C1.3 HUNTER LOWLAND REDGUM FOREST IN THE SYDNEY BASIN AND NSW NORTH COAST BIOREGIONS

Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions	
Description	Hunter Lowland Redgum Forest is an open forest where the most common canopy tree species are *Eucalyptus tereticornis* (Forest Red Gum) and *E. punctata* (Grey Gum). Other frequently occurring canopy species are *Angophora floribunda* (Rough-barked Apple), *E. crebra* (Narrow-leaved Ironbark), *E. moluccana* (Grey Box) and *Corymbia maculata* (Spotted Gum). The shrub layer is open and common shrub species include *Breynia oblongifolia* (Coffee Bush), *Leucopogon juniperinus* (Prickly Beard-heath) and *Daviesia ulicifolia* (Gorse Bitter Pea). The ground cover typically comprises grasses and herbs with common species being *Microlaena stipoides* var. *stipoides* (Weeping Meadow Grass), *Pratia purpurascens* (Whiteroot), *Lomandra multiflora* (Many-flowered Mat-rush), *Cymbopogon refractus* (Barbed Wire Grass), *Cheilanthes sieberi* (Poison Rock Fern) and *Dichondra repens* (Kidney Weed).
Habitat Requirements and Ecology	Permian sediments of the Hunter Valley floor on gentle slopes of depressions and drainage flats.
Distribution	Occurs between Muswellbrook, Beresfield, Mulbring and Cessnock in the Lower Hunter in the Sydney Basin and North Coast bioregions. It has been recorded from the Maitland, Cessnock, Port Stephens, Muswellbrook and Singleton LGAs.
BC Act 2016	Endangered Ecological Community
EPBC Act 1999	Not listed

Five Part Test of Significance

The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

a. *have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,*

   NA

b. *in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*
   i. *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
   ii. *is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

Areas mapped as PCT 3446 Lower North Foothills Ironbark-Box-Gum Grassy Forest and PCT 3634 Quorrobolong Sand Flats Forest were found to be consistent with the EEC; Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions. Sections of this EEC were present along present along Scales Road at Loxford and Majors Lane Sawyers Gully. This EEC largely occurred within areas of existing easement, composed of low maintained grown covers with a varying diversity. Better quality areas of Hunter Lowland Redgum Forest were generally present on parts of the Scales Road reserve. The proposal will result in the removal/modification of a relatively small amount of generally disturbed Lower Hunter Spotted Gum Ironbark Forest resulting in an incremental reduction in the local area, however, it is considered unlikely to have a significant impact which might lead to extinction locally.

c. *in relation to the habitat of a threatened species or ecological community:*
   i. *the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
   ii. *whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and*
   iii. *the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,*

Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions

The REZ is will only have a relatively small impact on Hunter Lowland Redgum Forest within areas of existing easement and parts of the easement edge. No areas are likely to become fragmented or isolated from other areas that are important to the long-term survival of Hunter Lowland Redgum Forest in the local area.

d. *whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),*

No areas declared areas of outstanding biodiversity value were present within proximity to the REZ proposal.

e. *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the proposal have been addressed below:

Clearing of Native Vegetation.
The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. The action is unlikely to be responsible for the significant loss of this EEC provided that recommendations for impact minimisation as listed within Section 6.4 are undertaken.

Invasion of native plant communities by exotic perennial grasses.
Specimens of exotic perennial grasses such as *Chloris gayana* (Rhodes Grass), *Eragrostis curvula* (African Love Grass), *Andropogon virginicus* (Whisky Grass) and *Hyparrhenia hirta* (Coolatai Grass) were present. These exotic grasses compete with species within this EEC for space, light, and other resources and may threaten its persistence at several sites. The action is unlikely to be responsible for the significant loss of this EEC provided recommendations for impact minimisation as listed within Section 6.4 are undertaken.

High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition
It is unknown what impact fire has had within areas of this EEC. The proposal is unlikely to increase

Competition and grazing by the feral European rabbit, Oryctolagus cuniculus
Observations and secondary indications of the European Rabbit such as scats and diggings were noted along parts of the REZ. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Herbivory and environmental degradation caused by feral deer
Tracks of Feral Deer were recorded within several sections of the REZ. Feral Deer would be considered to have an impact on native flora in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Infection of native plants by Phytophthora cinnamomi
No evidence of *Phytophthora cinnamomi* was observed during site visits. The proposal is unlikely to cause the spread of this fungus.

Invasion, establishment and spread of Lantana (Lantana camara)
Lantana was recorded within parts of the REZ proposal. The proposal is unlikely to cause the spread of this weed species.

Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae.
No evidence of the fungi was observed during site visits. The proposal is unlikely to cause the spread of this fungus.

Invasion of native plant communities by African Olive *Olea europaea* subsp. *cuspidata*
The African Olive was recorded along parts of the REZ route. The proposal is unlikely to cause further spread of this introduced tree.

Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions

Removal of dead wood and dead trees
Dead wood and trees were recorded along small sections of the REZ route. Dead wood and trees such be avoided wherever possible.

Predation, habitat degradation, competition and disease transmission by *Sus scrofa* (Feral Pigs)
Signs of Feral Pigs were noted along parts of the REZ route. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Conclusion

The proposal will result in a small incremental reduction in Hunter Lowland Redgum Forest; however, it is considered unlikely to have a significant impact on this EEC.

Bibliography:
Bell, S. and Driscoll, C. (2007) Vegetation of the Cessnock-Kurri region, Cessnock LGA, New South Wales: Survey, Classification & Mapping. Report to Department of Environment & Climate Change, Newcastle.

C1.4 CENTRAL HUNTER-IRONBARK-SPOTTED GUM GREY BOX FOREST IN THE NSW NORTH COAST AND SYDNEY BASIN BIOREGIONS

Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions	
Description	Typically forms an open forest or woodland dominated by *Eucalyptus crebra* (Narrow-leaved Ironbark), *Corymbia maculata* (Spotted Gum), *Eucalyptus moluccana* (Grey Box). Other tree species such as *Eucalyptus fibrosa* (Red Ironbark) and *Eucalyptus tereticornis* (Forest Red Gum) may be present, and occasionally dominate or co-dominate. A sparse layer of small trees including *Allocasuarina luehmannii* (Bulloak) or Acacia parvipinnula (Silver-stemmed Wattle) may be present in some areas. The shrub layer varies from sparse to moderately dense and includes shrub species include *Daviesia ulicifolia* subsp. *ulicifolia* (Gorse Bitter Pea), *Pultenaea spinosa* (Grey Bush-pea), Breynia oblongifolia (Breynia) and *Bursaria spinosa* subsp. *spinosa* (Blackthorn). Common species include *Cheilanthes sieberi* subsp. *sieberi* (Mulga Fern), *Cymbopogon refractus* (Barbed Wire Grass), *Pratia purpurascens* (Whiteroot), *Lomandra multiflora* subsp. *multiflora* (Many-flowered Mat-rush), *Pomax umbellata*, *Glycine tabacina, Dianella revol*uta (Blue Flax-lily), *Laxmannia gracilis* (Slender Wire Lily), *Vernonia cinerea* var. *cinerea, Desmodium varians* (Slender Tick-trefoil) and *Dichondra repens* (Kidney Weed).
Habitat Requirements and Ecology	Occupies undulating country including low rises and slopes, occurring on all aspects. It may also occur on alluvial and colluvial soils in valleys. It mostly occurs on clayey soils found on Permian sediments.
Distribution	Occurs in the central Hunter Valley mainly between Maitland and Muswellbrook. It has been recorded from Singleton, Cessnock and Muswellbrook LGAs.
BC Act 2016	Endangered Ecological Community
EPBC Act 1999	Not listed

Five Part Test of Significance

The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

a. *have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,*

   NA

b. *in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*
   i. *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
   ii. *is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

Areas mapped as PCT 3315 Central Hunter Ironbark-Spotted Gum Forest were found to be consistent with the EEC; Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions. This EEC was present along large sections of easement near Branxton and Belford and largely occurred within and either side of areas of existing easement, composed of low maintained grown covers with a varying diversity. Better quality areas of Central Hunter Ironbark-Spotted Gum-Grey Box Forest were generally present either side of the easement. The proposal will result in the removal/modification of a relatively small amount of generally disturbed Central Hunter Ironbark-Spotted Gum-Grey Box Forest resulting in an incremental reduction in the local area, however, it is considered unlikely to have a significant impact which might lead to extinction locally.

c. *in relation to the habitat of a threatened species or ecological community:*
   i. *the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
   ii. *whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and*

Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions

iii. the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

The REZ is will only have a relatively small impact on Central Hunter Ironbark-Spotted Gum-Grey Box Forest occurring largely within areas of existing easement and parts of the easement edge. No areas are likely to become fragmented or isolated from other areas that are important to the long-term survival of Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the local area.

d. whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

No areas declared areas of outstanding biodiversity value were present within proximity to the REZ proposal.

e. whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the proposal have been addressed below:

Clearing of Native Vegetation.
The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. The action is unlikely to be responsible for the significant loss of this EEC provided that recommendations for impact minimisation as listed within Section 6.4 are undertaken.

Invasion of native plant communities by exotic perennial grasses.
Specimens of exotic perennial grasses such as *Chloris gayana* (Rhodes Grass), *Eragrostis curvula* (African Love Grass), *Andropogon virginicus* (Whisky Grass) and *Hyparrhenia hirta* (Coolatai Grass) were present. These exotic grasses compete with species within this EEC for space, light, and other resources and may threaten its persistence at several sites. The action is unlikely to be responsible for the significant loss of this EEC provided recommendations for impact minimisation as listed within Section 6.4 are undertaken.

High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition
It is unknown what impact fire has had within areas of this EEC. The proposal is unlikely to increase

Competition and grazing by the feral European rabbit, Oryctolagus cuniculus
Observations and secondary indications of the European Rabbit such as scats and diggings were noted along parts of the REZ. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Herbivory and environmental degradation caused by feral deer
Tracks of Feral Deer were recorded within several sections of the REZ. Feral Deer would be considered to have an impact on native flora in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Infection of native plants by Phytophthora cinnamomi
No evidence of *Phytophthora cinnamomi* was observed during site visits. The proposal is unlikely to cause the spread of this fungus.

Invasion, establishment and spread of Lantana (Lantana camara)
Lantana was recorded within parts of the REZ proposal. The proposal is unlikely to cause the spread of this weed species.

Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae.
No evidence of the fungi was observed during site visits. The proposal is unlikely to cause the spread of this fungus.

Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions

Invasion of native plant communities by African Olive *Olea europaea* subsp. *cuspidata*
The African Olive was recorded along parts of the REZ route. The proposal is unlikely to cause further spread of this introduced tree.

Removal of dead wood and dead trees
Dead wood and trees were recorded along small sections of the REZ route. Dead wood and trees such be avoided wherever possible.

Predation, habitat degradation, competition and disease transmission by *Sus scrofa* (Feral Pigs)
Signs of Feral Pigs were noted along parts of the REZ route. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Conclusion

The proposal will result in a small incremental reduction in Central Hunter Ironbark-Spotted Gum-Grey Box Forest; however, it is considered unlikely to have a significant impact on this EEC.

Bibliography:
Bell, S. and Driscoll, C. (2007) Vegetation of the Cessnock-Kurri region, Cessnock LGA, New South Wales: Survey, Classification & Mapping. Report to Department of Environment & Climate Change, Newcastle.

C1.5 SWAMP OAK FLOODPLAIN FOREST OF THE NSW NORTH COAST, SYDNEY BASIN AND SOUTH EAST CORNER BIOREGIONS

Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	
Description	Swamp Oak Floodplain Forest is a community of plants that is generally dominated by the tree/s *Casuarina glauca* (Swamp Oak) and/or *Melaleuca ericifolia* (Swamp Paperbark). The understorey of this community is characterised by frequent occurrences of vines such as: *Parsonsia straminea* (Common Silkpod), *Geitonoplesium cymosum* (Scrambling Lily) and *Stephania japonica* (Snake Vine). There may be a sparse layer of shrubs and a number of small herbs such as *Centella asiatica* (Indian Pennywort), *Commelina cyanea* (Commelina), *Persicaria decipiens* (Slender Knotweed) and Viola spp..
Habitat Requirements and Ecology	Swamp Oak Floodplain Forest is associated with humic clay and sandy loam soils on waterlogged or periodically flooded areas. These soils are generally deposited during flood events and occur on the flats and drainage lines of the Coastal Floodplain. The community is usually found below 20m in elevation although sometimes up to 50 m elevation on small floodplains or where the larger floodplains adjoin lithic (rocky) substrates or coastal sand plains.
Distribution	Found in the NSW North Coast, Sydney Basin and South East Corner bioregions.
BC Act 2016	Endangered Ecological Community
EPBC Act 1999	Not listed

Five Part Test of Significance

The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

a. *have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,*

   NA

b. *in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*
   i. *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
   ii. *is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

Areas mapped as PCT 4015 Central Hunter Riparian Forest and PCT 4023 Coastal Valley Riparian Forest were found to be consistent with the EEC; Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions. This EEC was present alongside drainage crossings such as Black Creek at Belford and Muds Creek Crossing at Whittingham along the Golden Highway. Swamp Oak Floodplain Forest largely occurred within and either side of areas of existing easement, composed of low maintained grown covers with a varying diversity. Some smaller specimens of trees such as *Casuarina glauca* will likely require removal. The proposal will result in the removal/modification of a relatively small amount of generally disturbed Swamp Oak Floodplain Forest resulting in an incremental reduction in the local area, however, it is considered unlikely to have a significant impact which might lead to extinction locally.

c. *in relation to the habitat of a threatened species or ecological community:*
   i. *the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
   ii. *whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and*
   iii. *the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,*

Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions

The REZ is will only have a relatively small impact on Swamp Oak Floodplain Forest occurring largely within areas of existing easement and parts of the easement edge. No areas are likely to become fragmented or isolated from other areas that are important to the long-term survival of Swamp Oak Floodplain Forest in the local area.

d. *whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),*

No areas declared areas of outstanding biodiversity value were present within proximity to the REZ proposal.

e. *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the proposal have been addressed below:

Clearing of Native Vegetation.
The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. The action is unlikely to be responsible for the significant loss of this EEC provided that recommendations for impact minimisation as listed within Section 6.4 are undertaken.

Invasion of native plant communities by exotic perennial grasses.
Specimens of exotic perennial grasses such as *Chloris gayana* (Rhodes Grass), *Eragrostis curvula* (African Love Grass), *Andropogon virginicus* (Whisky Grass) and *Hyparrhenia hirta* (Coolatai Grass) were present. These exotic grasses compete with species within this EEC for space, light, and other resources and may threaten its persistence at several sites. The action is unlikely to be responsible for the significant loss of this EEC provided recommendations for impact minimisation as listed within Section 6.4 are undertaken.

High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition
It is unknown what impact fire has had within areas of this EEC. The proposal is unlikely to increase

Competition and grazing by the feral European rabbit, Oryctolagus cuniculus
Observations and secondary indications of the European Rabbit such as scats and diggings were noted along parts of the REZ. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Herbivory and environmental degradation caused by feral deer
Tracks of Feral Deer were recorded within several sections of the REZ. Feral Deer would be considered to have an impact on native flora in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Infection of native plants by Phytophthora cinnamomi
No evidence of *Phytophthora cinnamomi* was observed during site visits. The proposal is unlikely to cause the spread of this fungus.

Invasion, establishment and spread of Lantana (Lantana camara)
Lantana was recorded within parts of the REZ proposal. The proposal is unlikely to cause the spread of this weed species.

Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae.
No evidence of the fungi was observed during site visits. The proposal is unlikely to cause the spread of this fungus.

Invasion of native plant communities by African Olive *Olea europaea* subsp. *cuspidata*

Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
The African Olive was recorded along parts of the REZ route. The proposal is unlikely to cause further spread of this introduced tree. **Removal of dead wood and dead trees** Dead wood and trees were recorded along small sections of the REZ route. Dead wood and trees such be avoided wherever possible. **Predation, habitat degradation, competition and disease transmission by *Sus scrofa* (Feral Pigs)** Signs of Feral Pigs were noted along parts of the REZ route. The proposal is not likely to result in an increase in feral numbers of this introduced species. **Conclusion** The proposal will result in a small incremental reduction in Swamp Oak Floodplain Forest; however, it is considered unlikely to have a significant impact on this EEC.

Bibliography:

Bell, S. and Driscoll, C. (2007) Vegetation of the Cessnock-Kurri region, Cessnock LGA, New South Wales: Survey, Classification & Mapping. Report to Department of Environment & Climate Change, Newcastle.

C1.6 CENTRAL HUNTER GREY BOX-IRONBARK WOODLAND IN THE NSW NORTH COAST AND SYDNEY BASIN BIOREGIONS

Central Hunter Grey Box-Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions	
Description	Typically forms a woodland dominated by Eucalyptus crebra (Narrow-leaved Ironbark), *Brachychiton populneus* subsp. *populneus* (Kurrajong) and Eucalyptus moluccana (Grey Box). Other tree species such as *Angophora floribunda* (Rough-barked Apple) and *Callitris endlicheri* (Black Cypress Pine) may be present and occasionally dominate or co-dominate. A shrub layer is often present and common shrub species include *Notelaea microcarpa* var. *microcarpa* (Mock Olive), *Breynia oblongifolia* (Breynia), *Bursaria spinosa* subsp. *spinosa* (Blackthorn), *Cassinia quinquefaria* and *Dodonaea viscosa* (Sticky Hopbush). Subshrubs may also be common and include *Solanum cinereum* (Narrawa Burr), Phyllanthus virgatus and Maireana microphylla (Small-leaf Bluebush). Ground cover can be moderately dense to dense and consist of numerous forbs and grass species as well as a small number of ferns, sedges and twiners. The more common species include *Cymbopogon refractus* (Barbed Wire Grass), Aristida ramosa, Dichondra repens (Kidney Weed), Cheilanthes sieberi subsp. sieberi (Mulga Fern), Cheilanthes distans (Bristly Cloak Fern), *Chloris ventricosa* (Tall Windmill Grass), *Desmodium varians* (Slender Tick-trefoil), *Calotis lappulacea* (Yellow Burr-daisy), Lomandra multiflora subsp. multiflora (Many-flowered Mat-rush), *Brunoniella australis* (Blue Trumpet) and *Glycine tabacina*..
Habitat Requirements and Ecology	Occurs in areas of relatively low rainfall and high temperatures. It is associated mostly with Permian lithology, and is situated on gently undulating hills, slopes and valleys, or occasionally on rocky knolls.
Distribution	Occurs in the Central Hunter Valley between about Singleton and Muswellbrook. It is known to occur in the Cessnock, Singleton and Muswellbrook LGAs.
BC Act 2016	Endangered Ecological Community
EPBC Act 1999	Not listed

Five Part Test of Significance

The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

a. *have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,*

   NA

b. *in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*
   i. *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
   ii. *is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

Areas mapped as PCT 3431 Central Hunter Ironbark Grassy Woodland were found to be consistent with the EEC; Central Hunter Grey Box-Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions. This EEC was present within and around the Muswellbrook STS where it consisted of areas of woodland and derived grassland. The proposal will result in the removal/modification of Central Hunter Grey Box-Ironbark Woodland resulting in an incremental reduction in the local area, however, it is considered unlikely to have a significant impact which might lead to extinction locally.

c. *in relation to the habitat of a threatened species or ecological community:*
   i. *the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
   ii. *whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and*
   iii. *the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,*

Central Hunter Grey Box-Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions

The REZ will impact an area of Central Hunter Grey Box-Ironbark Woodland occurring within the proposed Muswellbrook STS site composed of woodland and derived grassland. No areas are likely to become fragmented or isolated from other areas that are important to the long-term survival of Central Hunter Grey Box-Ironbark Woodland in the local area.

d. *whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),*

No areas declared areas of outstanding biodiversity value were present within proximity to the REZ proposal.

e. *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the proposal have been addressed below:

Clearing of Native Vegetation.
The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. The action is unlikely to be responsible for the significant loss of this EEC provided that recommendations for impact minimisation as listed within Section 6.4 are undertaken.

Invasion of native plant communities by exotic perennial grasses.
Specimens of exotic perennial grasses such as *Chloris gayana* (Rhodes Grass), *Eragrostis curvula* (African Love Grass), *Andropogon virginicus* (Whisky Grass) and *Hyparrhenia hirta* (Coolatai Grass) were present. These exotic grasses compete with species within this CEEC for space, light, and other resources and may threaten its persistence at several sites. The action is unlikely to be responsible for the significant loss of this EEC provided recommendations for impact minimisation as listed within Section 6.4 are undertaken.

High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition
It is unknown what impact fire has had within areas of this EEC. The proposal is unlikely to increase

Competition and grazing by the feral European rabbit, Oryctolagus cuniculus
Observations and secondary indications of the European Rabbit such as scats and diggings were noted along parts of the REZ. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Herbivory and environmental degradation caused by feral deer
Tracks of Feral Deer were recorded within several sections of the REZ. Feral Deer would be considered to have an impact on native flora in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Infection of native plants by Phytophthora cinnamomi
No evidence of *Phytophthora cinnamomi* was observed during site visits. The proposal is unlikely to cause the spread of this fungus.

Invasion, establishment and spread of Lantana (Lantana camara)
Lantana was recorded within parts of the REZ proposal. The proposal is unlikely to cause the spread of this weed species.

Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae.
No evidence of the fungi was observed during site visits. The proposal is unlikely to cause the spread of this fungus.

Invasion of native plant communities by African Olive *Olea europaea* subsp. *cuspidata*

Central Hunter Grey Box-Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions

The African Olive was recorded along parts of the REZ route. The proposal is unlikely to cause further spread of this introduced tree.

Removal of dead wood and dead trees

Dead wood and trees were recorded along small sections of the REZ route. Dead wood and trees such be avoided wherever possible.

Predation, habitat degradation, competition and disease transmission by *Sus scrofa* (Feral Pigs)

Signs of Feral Pigs were noted along parts of the REZ route. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Conclusion

The proposal will result in a small incremental reduction in Central Hunter Grey Box-Ironbark Woodland, it is considered unlikely to have a significant impact on this EEC.

Bibliography:

Bell, S. and Driscoll, C. (2007) Vegetation of the Cessnock-Kurri region, Cessnock LGA, New South Wales: Survey, Classification & Mapping. Report to Department of Environment & Climate Change, Newcastle.

C1.7 WHITE BOX-YELLOW BOX-BLAKELY'S RED GUM GRASSY WOODLAND AND DERIVED NATIVE GRASSLAND

White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	
Description	Characterised by widely-spaced trees and projected foliage cover generally less than 30%. Conversely, the canopy may be completely absent in areas of derived native grassland where tree removal has occurred, and in such areas higher abundance of groundcover species may be present. Dominated by one or more of the species *Eucalyptus albens* (White Box), *E. melliodora* (Yellow Box) and *E. blakelyi* (Blakely's Red Gum). *Eucalyptus moluccana* (Grey Box) may be codominant in the Nandewar Bioregion and in the north-western corner of the Sydney Basin Bioregion in the upper Hunter Valley. Understorey shrubs are typically sparse or absent. The groundcover is dominated by perennial tussock grasses interspersed with a diverse range of forb species with the families Asteraceae and Fabaceae, and the orders Liliales and Asparagales well represented.
Habitat Requirements and Ecology	Occurs on hilly to undulating landscapes in areas with soils of moderate fertility derived from a range of lithologies, including alkaline and acid volcanics, granites, sediments, serpentinites and metamorphics.
Distribution	Occurs in an arc along the western slopes and tablelands of the Great Dividing Range from Southern Queensland through NSW to central Victoria. It occurs in the Brigalow Belt South, Nandewar, New England Tableland, South Eastern Queensland, Sydney Basin, NSW North Coast, South Eastern Highlands, South East Corner, NSW South Western Slopes, Victorian Midlands and Riverina Bioregions.
BC Act 2016	Critically Endangered Ecological Community
EPBC Act 1999	Critically Endangered Ecological Community

Five Part Test of Significance

The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

a. *have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,*

   NA

b. *in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*
   i. *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
   ii. *is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

Areas mapped as PCT 3525 Upper Hunter Box-Blakelys Red Gum Grassy Forest were found to be consistent with the CEEC; White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland. This CEEC was present along a section of existing easement to the north-east of the Muswellbrook STS. This CEEC largely occurred within areas of existing easement, composed of low maintained grown covers with a varying diversity (derived grassland). Better quality areas of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland were generally present on the edges of the existing easement. The proposal will result in the removal/modification of a relatively small amount of generally disturbed White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland resulting in an incremental reduction in the local area, however, it is considered unlikely to have a significant impact which might lead to extinction locally.

c. *in relation to the habitat of a threatened species or ecological community:*
   i. *the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
   ii. *whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and*

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

iii. the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

The REZ is will only have a relatively small impact on White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland occurring largely within areas of existing easement and parts of the easement edge. No areas are likely to become further fragmented or isolated from other areas that are important to the long-term survival of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the local area.

d. whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

No areas declared areas of outstanding biodiversity value were present within proximity to the REZ proposal.

e. whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the proposal have been addressed below:

Clearing of Native Vegetation.
The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. The action is unlikely to be responsible for the significant loss of this EEC provided that recommendations for impact minimisation as listed within Section 6.4 are undertaken.

Invasion of native plant communities by exotic perennial grasses.
Specimens of exotic perennial grasses such as *Chloris gayana* (Rhodes Grass), *Eragrostis curvula* (African Love Grass), *Andropogon virginicus* (Whisky Grass) and *Hyparrhenia hirta* (Coolatai Grass) were present. These exotic grasses compete with species within this CEEC for space, light, and other resources and may threaten its persistence at several sites. The action is unlikely to be responsible for the significant loss of this EEC provided recommendations for impact minimisation as listed within Section 6.4 are undertaken.

High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition
It is unknown what impact fire has had within areas of this EEC. The proposal is unlikely to increase

Competition and grazing by the feral European rabbit, Oryctolagus cuniculus
Observations and secondary indications of the European Rabbit such as scats and diggings were noted along parts of the REZ. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Herbivory and environmental degradation caused by feral deer
Tracks of Feral Deer were recorded within several sections of the REZ. Feral Deer would be considered to have an impact on native flora in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Infection of native plants by Phytophthora cinnamomi
No evidence of *Phytophthora cinnamomi* was observed during site visits. The proposal is unlikely to cause the spread of this fungus.

Invasion, establishment and spread of Lantana (Lantana camara)
Lantana was recorded within parts of the REZ proposal. The proposal is unlikely to cause the spread of this weed species.

Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae.
No evidence of the fungi was observed during site visits. The proposal is unlikely to cause the spread of this fungus.

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

Invasion of native plant communities by African Olive *Olea europaea* subsp. *cuspidata*
The African Olive was recorded along parts of the REZ route. The proposal is unlikely to cause further spread of this introduced tree.

Removal of dead wood and dead trees
Dead wood and trees were recorded along small sections of the REZ route. Dead wood and trees such be avoided wherever possible.

Predation, habitat degradation, competition and disease transmission by *Sus scrofa* (Feral Pigs)
Signs of Feral Pigs were noted along parts of the REZ route. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Conclusion

The proposal will result in a small incremental reduction in White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland; however, it is considered unlikely to have a significant impact on this EEC.

Bibliography:
Bell, S. and Driscoll, C. (2007) Vegetation of the Cessnock-Kurri region, Cessnock LGA, New South Wales: Survey, Classification & Mapping. Report to Department of Environment & Climate Change, Newcastle.

C2.0 SECTION 7.3 OF THE BC ACT 2016 TEST OF SIGNIFICANCE (THREATENED SPECIES)

C2.1 *DIURIS TRICOLOR* PINE DONKEY ORCHID

Diuris tricolor Pine Donkey Orchid	
Description	A tuberous, deciduous terrestrial orchid that has between one and three leaves, to 30 centimetres long and 4mm wide. The flower stalk is between 20-40cm high and has 2-6 flowers, which are bright yellow to orange, speckled with red to purple and white markings. The sepals (the down-pointing slender green segments) are very long and often crossed. The species is a tuberous, deciduous terrestrial orchid and the flowers have a pleasant, light sweet scent.
Habitat Requirements and Ecology	Grows in sclerophyll forest among grass, often with native Cypress Pine (Callitris spp.). It is found in sandy soils, either on flats or small rises. Also recorded from a red earth soil in a Bimble Box community in western NSW. Usually recorded as common and locally frequent in populations, however only one or two plants have also been observed at sites. The species has also been noted as growing in large colonies. Usually flowers between early September to late October.
Distribution	Sporadically distributed on the western slopes of NSW, extending from south of Narrandera all the way to the north of NSW. Localities in the south include several sites west of Wagga Wagga, Dubbo in the Central West and Pilliga National in the north. The population in the Muswellbrook LGA is at the eastern limit of the geographic range of the species. All other populations of the species are located west of the Great Dividing Range. The distance of the Muswellbrook LGA population to the nearest population of the species to the west is c. 100 km. Therefore the population in the Muswellbrook LGA is disjunct and at the limits of its geographic range.
BC Act 2016	Vulnerable
BC Act 2016	Endangered population listing - Diuris tricolor, the Pine Donkey Orchid population in the Muswellbrook local government area -
EPBC Act 1999	Not Listed

Five Part Test of Significance
The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

a. *have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,*

Approximately four specimens of *Diuris tricolor* (Pine Donkey Orchid) were recorded within the existing easement to the NE of the Muswellbrook STS during fieldwork. As these specimens of *D. tricolor* occur within the existing easement, they are not required to be impacted. It is recommended that these orchids be avoided during line works along the easement. Given the recommendation the proposal is unlikely to result in the extinction of any local population of this species.

b. *in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*
   i. *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
   ii. *is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

   NA

c. *in relation to the habitat of a threatened species or ecological community:*
   i. *the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
   ii. *whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and*

Diuris tricolor Pine Donkey Orchid

iii. the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

Given specimens of *D. tricolor* were found in an existing easement no areas are likely to become further fragmented or isolated from other areas that are important to the long-term survival of this threatened orchid species in the local area.

d. whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

No areas declared areas of outstanding biodiversity value were present within proximity to the REZ proposal.

e. whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the proposal have been addressed below:

Clearing of Native Vegetation.
The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. The action is unlikely to be responsible for the significant loss of this EEC provided that recommendations for impact minimisation as listed within Section 6.4 are undertaken.

Invasion of native plant communities by exotic perennial grasses.
Specimens of exotic perennial grasses such as *Chloris gayana* (Rhodes Grass), *Eragrostis curvula* (African Love Grass), *Andropogon virginicus* (Whisky Grass) and *Hyparrhenia hirta* (Coolatai Grass) were present. These exotic grasses compete with species within this CEEC for space, light, and other resources and may threaten its persistence at several sites. The action is unlikely to be responsible for the significant loss of this EEC provided recommendations for impact minimisation as listed within Section 6.4 are undertaken.

High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition
It is unknown what impact fire has had within areas of this EEC. The proposal is unlikely to increase

Competition and grazing by the feral European rabbit, Oryctolagus cuniculus
Observations and secondary indications of the European Rabbit such as scats and diggings were noted along parts of the REZ. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Herbivory and environmental degradation caused by feral deer
Tracks of Feral Deer were recorded within several sections of the REZ. Feral Deer would be considered to have an impact on native flora in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Infection of native plants by Phytophthora cinnamomi
No evidence of *Phytophthora cinnamomi* was observed during site visits. The proposal is unlikely to cause the spread of this fungus.

Invasion, establishment and spread of Lantana (Lantana camara)
Lantana was recorded within parts of the REZ proposal. The proposal is unlikely to cause the spread of this weed species.

Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae.
No evidence of the fungi was observed during site visits. The proposal is unlikely to cause the spread of this fungus.

Invasion of native plant communities by African Olive *Olea europaea* subsp. *cuspidata*

Diuris tricolor Pine Donkey Orchid
The African Olive was recorded along parts of the REZ route. The proposal is unlikely to cause further spread of this introduced tree. **Removal of dead wood and dead trees** Dead wood and trees were recorded along small sections of the REZ route. Dead wood and trees such be avoided wherever possible. **Predation, habitat degradation, competition and disease transmission by *Sus scrofa* (Feral Pigs)** Signs of Feral Pigs were noted along parts of the REZ route. The proposal is not likely to result in an increase in feral numbers of this introduced species. **Conclusion** The proposal will result in a small incremental modification of suitable habitat for *D. tricolor* however, it is considered unlikely to have a significant impact on this threatened orchid species.
Bibliography: Jones, D,.J. (2006). *A Complete Guide to Native Orchids of Australia including the Island Territories.* New Holland Publishers Australia Pty Ltd.

C2.2 *GREVILLEA PARVIFLORA* SUBSP. *PARVIFLORA* SMALL-FLOWERED GREVILLEA

***Grevillea parviflora* subsp. *parviflora* (Small-flowered Grevillea)**	
Description	Is a low spreading to erect shrub usually less than a metre high. Its erect narrow leaves are 2-3.5 mm long and less than 1.3mm wide with silky hairs on the underside and a short pointed tip. Leaf margins are curved back, or even rolled completely under. The small flowers are spider-like and clustered in groups of 6-12. Flowers are small and white or pinkish, with rusty-brown hairs that can become red with age. The fruiting capsule is 8–10 mm long and has 1–2 seeds (NSW NPWS 2002h, NSW OEH 2013o).
Habitat Requirements and Ecology	Grows in sandy or light clay soils usually over thin shales and occurs in a range of vegetation types from heath and shrubby woodland to open forest. It is found over a range of altitudes from flat, low-lying areas to upper slopes and ridge crests, and commonly occurs in open, slightly disturbed sites such as along tracks. Plants are capable of suckering from a rootstock and most populations demonstrate a degree of vegetative spread, particularly after disturbance such as fire. Flowering has been recorded between July to December as well as April-May. Flowers are insect-pollinated and seed dispersal is limited.
Distribution	Sporadically distributed throughout the Sydney Basin with the main occurrence centred around Picton, Appin and Bargo (and possibly further south to the Moss Vale area). Separate populations are also known further north from Putty to Wyong and Lake Macquarie on the Central Coast and Cessnock and Kurri Kurri in the Lower Hunter.
BC Act 2016	Vulnerable
EPBC Act 1999	Vulnerable

Five Part Test of Significance
The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

a. *have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,*

***Grevillea parviflora* subsp. *parviflora* (Small-flowered Grevillea)**

A small number of specimens of *Grevillea parviflora* subsp. *parviflora* were present within sections of existing easement west of the Kurri STS to Graham Road, Sawyers Gully. As these specimens of *G. parviflora* subsp. *parviflora* occur within the existing sections of easement, they are not required to be impacted. It is recommended that these grevilleas be avoided during upgrading works along the easement. Given the recommendation the proposal is unlikely to result in the extinction of any local population of this species.

b. in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

NA

c. in relation to the habitat of a threatened species or ecological community:

i. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

iii. the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

Given specimens of *G. parviflora* subsp. *parviflora* were found in an existing easement no areas are likely to become further fragmented or isolated from other areas that are important to the long-term survival of this threatened grevillea species in the local area.

d. whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

No areas declared areas of outstanding biodiversity value were present within proximity to the REZ proposal.

e. whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the proposal have been addressed below:

Clearing of Native Vegetation.

The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. The action is unlikely to be responsible for the significant loss of this EEC provided that recommendations for impact minimisation as listed within Section 6.4 are undertaken.

Invasion of native plant communities by exotic perennial grasses.

Specimens of exotic perennial grasses such as *Chloris gayana* (Rhodes Grass), *Eragrostis curvula* (African Love Grass), *Andropogon virginicus* (Whisky Grass) and *Hyparrhenia hirta* (Coolatai Grass) were present. These exotic grasses compete with species within this CEEC for space, light, and other resources and may threaten its persistence at several sites. The action is unlikely to be responsible for the significant loss of this EEC provided recommendations for impact minimisation as listed within Section 6.4 are undertaken.

High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition

It is unknown what impact fire has had within areas of this EEC. The proposal is unlikely to increase

Competition and grazing by the feral European rabbit, Oryctolagus cuniculus

Observations and secondary indications of the European Rabbit such as scats and diggings were noted along parts of the REZ. The proposal is not likely to result in an increase in feral numbers of this introduced species.

***Grevillea parviflora* subsp. *parviflora* (Small-flowered Grevillea)**

Herbivory and environmental degradation caused by feral deer
Tracks of Feral Deer were recorded within several sections of the REZ. Feral Deer would be considered to have an impact on native flora in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Infection of native plants by Phytophthora cinnamomi
No evidence of *Phytophthora cinnamomi* was observed during site visits. The proposal is unlikely to cause the spread of this fungus.

Invasion, establishment and spread of Lantana (Lantana camara)
Lantana was recorded within parts of the REZ proposal. The proposal is unlikely to cause the spread of this weed species.

Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae.
No evidence of the fungi was observed during site visits. The proposal is unlikely to cause the spread of this fungus.

Invasion of native plant communities by African Olive *Olea europaea* subsp. *cuspidata*
The African Olive was recorded along parts of the REZ route. The proposal is unlikely to cause further spread of this introduced tree.

Removal of dead wood and dead trees
Dead wood and trees were recorded along small sections of the REZ route. Dead wood and trees such be avoided wherever possible.

Predation, habitat degradation, competition and disease transmission by *Sus scrofa* (Feral Pigs)
Signs of Feral Pigs were noted along parts of the REZ route. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Conclusion

The proposal will result in a small incremental modification of suitable habitat for G. *parviflora* subsp. *parviflora* however, it is considered unlikely to have a significant impact on this threatened grevillea species.

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NSW Scientific Committee (1998) *Grevillea parviflora* subsp. *parviflora* (a shrub) - Vulnerable species determination - final. DEC (NSW), Sydney.

C2.3 *EUCALYPTUS GLAUCINA* (SLATY RED GUM)

***Eucalyptus glaucina* (Slaty Red Gum)**	
Description	A medium-sized tree to 30 m tall. The bark is smooth and mottled white to slaty grey. The juvenile leaves are oval in shape and blue-green with a whitish bloom, and the buds and fruit are similarly coloured. The flowers are white, or occasionally pink, and are produced between August and December. The fruits are oval-shaped and 7– 10 mm long. The three to five raised valves are surrounded by a domed disk raised above the fruit.
Habitat Requirements and Ecology	Grows in grassy woodland and dry eucalypt forest on deep, moderately fertile and well-watered soils.
Distribution	Found in separate districts along the eastern seaboard of NSW, from near Casino, to Taree, south to Broke, and recently discovered on the eastern side of the Blue Mountains National Park near Warragamba Dam.
BC Act 2016	Vulnerable
EPBC Act 1999	Vulnerable

Five Part Test of Significance

The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

a. *have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,*

A small number of specimens of *Eucalyptus glaucina* (Slaty Red Gum) were present within close proximity of the proposed and existing easement around Belford and Whittingham. The majority of these specimens will not be required to be impacted. It is recommended that specimens of *E. glaucina* be avoided wherever possible within the scope of the proposal. Given the recommendation the proposal is unlikely to result in the extinction of any local population of this eucalypt species.

b. *in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*
   i. *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
   ii. *is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

   NA

c. *in relation to the habitat of a threatened species or ecological community:*
   i. *the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
   ii. *whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and*
   iii. *the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,*

Specimens of *E. glaucina* are unlikely to become further fragmented or isolated from other areas that are important to the long-term survival of this threatened eucalypt species in the local area.

d. *whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),*

No areas declared areas of outstanding biodiversity value were present within proximity to the proposal.

e. *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

***Eucalyptus glaucina* (Slaty Red Gum)**

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the proposal have been addressed below:

Clearing of Native Vegetation.
The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. The action is unlikely to be responsible for the significant loss of this EEC provided that recommendations for impact minimisation as listed within Section 6.4 are undertaken.

Invasion of native plant communities by exotic perennial grasses.
Specimens of exotic perennial grasses such as *Chloris gayana* (Rhodes Grass), *Eragrostis curvula* (African Love Grass), *Andropogon virginicus* (Whisky Grass) and *Hyparrhenia hirta* (Coolatai Grass) were present. These exotic grasses compete with species within this CEEC for space, light, and other resources and may threaten its persistence at several sites. The action is unlikely to be responsible for the significant loss of this EEC provided recommendations for impact minimisation as listed within Section 6.4 are undertaken.

High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition
It is unknown what impact fire has had within areas of this EEC. The proposal is unlikely to increase

Competition and grazing by the feral European rabbit, Oryctolagus cuniculus
Observations and secondary indications of the European Rabbit such as scats and diggings were noted along parts of the REZ. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Herbivory and environmental degradation caused by feral deer
Tracks of Feral Deer were recorded within several sections of the REZ. Feral Deer would be considered to have an impact on native flora in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Infection of native plants by Phytophthora cinnamomi
No evidence of *Phytophthora cinnamomi* was observed during site visits. The proposal is unlikely to cause the spread of this fungus.

Invasion, establishment and spread of Lantana (Lantana camara)
Lantana was recorded within parts of the REZ proposal. The proposal is unlikely to cause the spread of this weed species.

Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae.
No evidence of the fungi was observed during site visits. The proposal is unlikely to cause the spread of this fungus.

Invasion of native plant communities by African Olive *Olea europaea* subsp. *cuspidata*
The African Olive was recorded along parts of the REZ route. The proposal is unlikely to cause further spread of this introduced tree.

Removal of dead wood and dead trees
Dead wood and trees were recorded along small sections of the REZ route. Dead wood and trees such be avoided wherever possible.

Predation, habitat degradation, competition and disease transmission by *Sus scrofa* (Feral Pigs)
Signs of Feral Pigs were noted along parts of the REZ route. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Conclusion

The proposal will result in a small incremental modification of suitable habitat for *E. glaucina* however, it is considered unlikely to have a significant impact on this threatened eucalypt species.

Eucalyptus glaucina (Slaty Red Gum)

Bibliography:

Harden, G.J. (ed.) (2002) Flora of New South Wales. Volume 2, Revised Edition. UNSW, Sydney.

C2.4 *EUCALYPTUS PARRAMATTENSIS* SUBSP. *DECADENS* (DROOPING RED GUM)

Eucalyptus parramattensis subsp. *decadens* (Drooping Red Gum)	
Description	A woodland tree, up to 15 m, but usually smaller. height. Buds are ovoid 4 – 10mm long, 4 – 6 mm in diameter with a scar present. Fruit is hemispherical or globose 4 – 9 mm long, 5 – 9 mm in diameter, with the disc flat or slightly raised, usually with four exserted valves.
Habitat Requirements and Ecology	Generally occupies deep, low-nutrient sands, often those subject to periodic inundation or where water tables are relatively high.
Distribution	There are two separate meta-populations; the Kurri Kurri meta-population is bordered by Cessnock—Kurri Kurri in the north and Mulbring—Abedare in the south. The Tomago Sandbeds meta-population is bounded by Salt Ash and Tanilba Bay in the north and Williamtown and Tomago in the south.
BC Act 2016	Vulnerable
BC Act 2016	Vulnerable
EPBC Act 1999	Not Listed

Five Part Test of Significance

The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

a. *have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,*

A number of specimens of *Eucalyptus parramattensis* subsp. *decadens* were present within two sections of proposed easement composed of Kurri Sand Woodland west of the Kurri STS to the Hunter Expressway and west over the expressway from the Kurri STS. The proposal will result in the removal of up to 32 specimens of *E. parramattensis* subsp. *decadens.* It is recommended that specimens of *E. parramattensis* subsp. *decadens* be avoided wherever possible. Given the presence of large numbers of *E. parramattensis* subsp. *decadens* within the local area, and given the recommendations, the proposal is unlikely to result in the extinction of any local population of this species.

b. *in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*
   i. *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
   ii. *is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

   NA

c. *in relation to the habitat of a threatened species or ecological community:*
   i. *the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*

Eucalyptus parramattensis subsp. _decadens_ (Drooping Red Gum)

ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

iii. the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

The proposal will result in the removal of up to 32 specimens of *E. parramattensis* subsp. *decadens* within two sections of proposed REZ easement composed of Kurri Sand Woodland, west of the Kurri STS to the Hunter Expressway and west over the expressway from the Kurri STS. No areas are likely to become further fragmented or isolated from other areas that are important to the long-term survival of this threatened eucalypt species in the local area.

d. whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

No areas declared areas of outstanding biodiversity value were present within proximity to the REZ proposal.

e. whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the proposal have been addressed below:

Clearing of Native Vegetation.
The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. The action is unlikely to be responsible for the significant loss of this EEC provided that recommendations for impact minimisation as listed within Section 6.4 are undertaken.

Invasion of native plant communities by exotic perennial grasses.
Specimens of exotic perennial grasses such as *Chloris gayana* (Rhodes Grass), *Eragrostis curvula* (African Love Grass), *Andropogon virginicus* (Whisky Grass) and *Hyparrhenia hirta* (Coolatai Grass) were present. These exotic grasses compete with species within this CEEC for space, light, and other resources and may threaten its persistence at several sites. The action is unlikely to be responsible for the significant loss of this EEC provided recommendations for impact minimisation as listed within Section 6.4 are undertaken.

High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition
It is unknown what impact fire has had within areas of this EEC. The proposal is unlikely to increase

Competition and grazing by the feral European rabbit, Oryctolagus cuniculus
Observations and secondary indications of the European Rabbit such as scats and diggings were noted along parts of the REZ. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Herbivory and environmental degradation caused by feral deer
Tracks of Feral Deer were recorded within several sections of the REZ. Feral Deer would be considered to have an impact on native flora in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Infection of native plants by Phytophthora cinnamomi
No evidence of *Phytophthora cinnamomi* was observed during site visits. The proposal is unlikely to cause the spread of this fungus.

Invasion, establishment and spread of Lantana (Lantana camara)
Lantana was recorded within parts of the REZ proposal. The proposal is unlikely to cause the spread of this weed species.

Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae.

***Eucalyptus parramattensis* subsp. *decadens* (Drooping Red Gum)**
No evidence of the fungi was observed during site visits. The proposal is unlikely to cause the spread of this fungus. **Invasion of native plant communities by African Olive *Olea europaea* subsp. *cuspidata*** The African Olive was recorded along parts of the REZ route. The proposal is unlikely to cause further spread of this introduced tree. **Removal of dead wood and dead trees** Dead wood and trees were recorded along small sections of the REZ route. Dead wood and trees such be avoided wherever possible. **Predation, habitat degradation, competition and disease transmission by *Sus scrofa* (Feral Pigs)** Signs of Feral Pigs were noted along parts of the REZ route. The proposal is not likely to result in an increase in feral numbers of this introduced species. **Conclusion** The proposal will result in a small incremental modification of suitable habitat for *E. parramattensis* subsp. *decadens* however, it is considered unlikely to have a significant impact on this threatened eucalypt species.

Bibliography:

Harden, G.J. (ed.) (2002) Flora of New South Wales. Volume 2, Revised Edition. UNSW, Sydney.

C2.5 DELMA VESCOLINEATA HUNTER VALLEY DELMA

***Delma vescolineata* Hunter Valley Delma**	
Description	*Delma vescolineata* (Hunter Valley Delma) is a legless or flap-footed lizard that grows to approximately 25 cm in total length, with a maximum snout-vent length (SVL) of 10 cm (Mahony et al. 2022). Lacks forelimbs and has very reduced hind limbs which are apparent as small flaps on either side of the vent. The top of the head is dark grey to light brown and uniform or with darker streaks or spots. There are scattered dark bars, spots or smudges on the scales bordering the mouth, the ear and sides toward the front of the body.
Habitat Requirements and Ecology	Has been recorded in secondary native grassland remaining after the removal or dieback of previous woody canopy vegetation (Benson 1996) in association with sparse box-gum or ironbark woodland (Mahony et al. 2022). The primary canopy species consists of Eucalyptus melliodora and E. crebra, with a diverse ground cover layer containing multiple grasses including Austrostipa spp., Bothriochloa spp., and Chloris spp. (Mahony et al. 2022).
Distribution	Known almost entirely from a 25 km wide corridor in the Hunter Valley, between Maitland and Muswellbrook, New South Wales (Mahony et al. 2022). A further specimen has been identified from just north of Parraweena on the Liverpool Plains, approximately 80 km north-west of Muswellbrook (Mahony et al. 2022). The primary canopy species consists of *Eucalyptus melliodora* and *E. crebra,* with a diverse ground cover layer containing multiple grasses including *Austrostipa* spp., *Bothriochloa* spp., and Chloris spp. (Mahony et al. 2022).
Photo Muswellbrook 25 March 2024 (just east of the Muswellbrook STS)	
BC Act 2016	Endangered
EPBC Act 1999	Endangered

Five Part Test of Significance

The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

a. *have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,*

Delma vescolineata (Hunter Valley Delma) has been recorded in 2024 within the neighbouring property to the west of the Muswellbrook proposed STS within similar habitat. According to the BioNet Atlas records (DPE, 2024) *D. vescolineata* has also been found within close proximity to the Muswellbrook STS. Taking this into consideration it is highly likely that *D. vescolineata* would utilise habitat within the impact area of the Muswellbrook STS. The proposal will likely result in a small incremental reduction of suitable habitat for *D. vescolineata.* Given the presence of large areas of similar adjoining woodland and derived grassland habitat the proposal is unlikely to result in the extinction of any local population of this reptile species.

***Delma vescolineata* Hunter Valley Delma**

b. *in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*
   i. *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
   ii. *is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

   NA

c. *in relation to the habitat of a threatened species or ecological community:*
   i. *the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
   ii. *whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and*
   iii. *the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,*

Given the presence of large areas of similar adjoining woodland and derived grassland habitat no areas are likely to become further fragmented or isolated from other areas that are important to the long-term survival of this threatened eucalypt species in the local area.

d. *whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),*

No areas declared areas of outstanding biodiversity value were present within proximity to the REZ proposal.

e. *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

The 'Key Threatening Processes' currently listed under Schedule 4 of the Biodiversity Conservation Act 2016 Act that are relevant to the site have been listed in bold below followed by an assessment of the applicability of the threatening process in regards to the proposal and the species considered.

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the proposal have been addressed below:

Clearing of Native Vegetation.
The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. The action is unlikely to be responsible for the significant loss of this EEC provided that recommendations for impact minimisation as listed within Section 6.4 are undertaken.

Invasion of native plant communities by exotic perennial grasses.
Specimens of exotic perennial grasses such as *Chloris gayana* (Rhodes Grass), *Eragrostis curvula* (African Love Grass), *Andropogon virginicus* (Whisky Grass) and *Hyparrhenia hirta* (Coolatai Grass) were present. These exotic grasses compete with species within this CEEC for space, light, and other resources and may threaten its persistence at several sites. The action is unlikely to be responsible for the significant loss of this EEC provided recommendations for impact minimisation as listed within Section 6.4 are undertaken.

High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition
It is unknown what impact fire has had within areas of this EEC. The proposal is unlikely to increase

Competition and grazing by the feral European rabbit, Oryctolagus cuniculus
Observations and secondary indications of the European Rabbit such as scats and diggings were noted along parts of the REZ. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Herbivory and environmental degradation caused by feral deer

***Delma vescolineata* Hunter Valley Delma**

Tracks of Feral Deer were recorded within several sections of the REZ. Feral Deer would be considered to have an impact on native flora in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Invasion, establishment and spread of Lantana (*Lantana camara*)
Lantana was recorded within parts of the REZ proposal. The proposal is unlikely to cause the spread of this weed species.

Invasion of native plant communities by African Olive *Olea europaea* subsp*. cuspidata*
The African Olive was recorded along parts of the REZ route. The proposal is unlikely to cause further spread of this introduced tree.

Removal of dead wood and dead trees
Dead wood and trees were recorded along small sections of the REZ route. Dead wood and trees such be avoided wherever possible.

Predation, habitat degradation, competition and disease transmission by *Sus scrofa* (Feral Pigs)
Signs of Feral Pigs were noted along parts of the REZ route. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Predation by the Vulpes vulpes (Red Fox)
The Red Fox was recorded along the REZ route a number of times and would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in numbers of this introduced species.

Predation by the *Felis catus* (Feral Cat)
The Feral Cat was not recorded along the REZ route during fieldwork; however, this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Conclusion

The proposal will result in a small incremental reduction of suitable habitat for *D. vescolineata* however, it is considered unlikely to have a significant impact on this threatened reptile species.

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C2.6 *CLIMACTERIS PICUMNUS VICTORIAE* BROWN TREECREEPER

Climacteris picumnus victoriae Brown Treecreeper	
Description	The Brown Treecreeper, Australia's largest treecreeper, is a grey-brown bird with black streaking on the lower breast and belly and black bars on the undertail.
Habitat Requirements and Ecology	This species is a medium sized insectivorous bird that occupies Eucalypt woodlands, particularly open woodlands lacking a dense understorey, River Red Gums on watercourses and around lake shores. It is sedentary and nests in tree hollows within permanent territories. They forage on tree trunks and on the ground amongst leaf litter and on fallen logs for ants, beetles and larvae. Breeding occurs from May to December.
Distribution	Distributed along the east coast of Australia from Spencer Gulf in South Australia, north to Townsville in Queensland and west to Channel Country. The eastern subspecies, Climacteris picumnus victoriae, is distributed through central NSW on the western side of the Great Dividing range and sparsely scattered to the east of the divide in drier areas such as the Cumberland Plain of Western Sydney, and in parts of the Hunter, Clarence, Richmond and Snowy River Valleys.
photo	
BC Act 2016	Vulnerable
EPBC Act 1999	Vulnerable

Five Part Test of Significance
The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

a. *have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,*

Climacteris picumnus victoriae (Brown Treecreeper) was observed just outside the existing easement within the REZ route NW of the Muswellbrook STS. As areas of suitable habitat for the Brown Treecreeper occur primarily outside the existing easement areas along the REZ route and only smaller area of suitable habitat will be impacted the proposal is unlikely to result in the extinction of any local population of this species.

b. *in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*
   i. *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
   ii. *is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

   NA

c. *in relation to the habitat of a threatened species or ecological community:*
   i. *the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
   ii. *whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and*
   iii. *the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,*

Given the presence of large areas of similar adjoining woodland and open forest habitat, no areas are likely to become further fragmented or isolated from other areas for the mobile Brown Treecreeper that are important to the long-term survival of this threatened bird species in the local area.

d. *whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),*

***Climacteris picumnus victoriae* Brown Treecreeper**

No areas declared areas of outstanding biodiversity value were present within proximity to the REZ proposal.

e. *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

The 'Key Threatening Processes' currently listed under Schedule 4 of the Biodiversity Conservation Act 2016 Act that are relevant to the site have been listed in bold below followed by an assessment of the applicability of the threatening process in regards to the proposal and the species considered.

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the proposal have been addressed below:

Clearing of Native Vegetation.
The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. The action is unlikely to be responsible for the significant loss of this EEC provided that recommendations for impact minimisation as listed within Section 6.4 are undertaken.

Invasion of native plant communities by exotic perennial grasses.
Specimens of exotic perennial grasses such as *Chloris gayana* (Rhodes Grass), *Eragrostis curvula* (African Love Grass), *Andropogon virginicus* (Whisky Grass) and *Hyparrhenia hirta* (Coolatai Grass) were present. These exotic grasses compete with species within this CEEC for space, light, and other resources and may threaten its persistence at several sites. The action is unlikely to be responsible for the significant loss of this EEC provided recommendations for impact minimisation as listed within Section 6.4 are undertaken.

High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition
It is unknown what impact fire has had within areas of this EEC. The proposal is unlikely to increase

Herbivory and environmental degradation caused by feral deer
Tracks of Feral Deer were recorded within several sections of the REZ. Feral Deer would be considered to have an impact on native flora in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Invasion, establishment and spread of Lantana (*Lantana camara*)
Lantana was recorded within parts of the REZ proposal. The proposal is unlikely to cause the spread of this weed species.

Invasion of native plant communities by African Olive *Olea europaea* subsp. *cuspidata*
The African Olive was recorded along parts of the REZ route. The proposal is unlikely to cause further spread of this introduced tree.

Removal of dead wood and dead trees
Dead wood and trees were recorded along small sections of the REZ route. Dead wood and trees such be avoided wherever possible.

Predation by the Vulpes vulpes (Red Fox)
The Red Fox was recorded along the REZ route a number of times and would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in numbers of this introduced species.

Predation by the *Felis catus* (Feral Cat)
The Feral Cat was not recorded along the REZ route during fieldwork; however, this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Conclusion

Climacteris picumnus victoriae Brown Treecreeper
The proposal will result in a small incremental reduction of suitable habitat for the Brown Treecreeper however, it is considered unlikely to have a significant impact on this threatened bird species.

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C2.7 *POMATOSTOMUS TEMPORALIS TEMPORALIS* GREY-CROWNED BABBLER

Pomatostomus temporalis temporalis Grey-crowned Babbler	
Description	Reaching to 30 cm long. It has a curved beak with a broad white eyebrow and a pale grey crown-stripe. A dark band passes from the bill through the eye, separating the pale throat and brow to giving a 'masked' look. It has dark greyish-brown upperparts and is paler brown on the underparts, grading to a whitish throat. It is distinctive in flight, showing white tips to the tail feathers, and orange-buff patches in the broad, rounded wings. Young birds have dark brown eyes, with the iris becoming paler with age, reaching a yellow colour by about three years.
Habitat Requirements and Ecology	Ranges through open forest, woodland, scrubland, farmland, and outer suburbs. Prefers woodlands with regenerating trees, tall shrubs, and an intact ground cover of grass and forbs. Members of this species are rare in settled areas and are threatened by vegetation clearance, habitat fragmentation and degradation, and competition from introduced species. Grey-crowned Babblers occur in sedentary family units of 2-13 birds. Babbler groups' home ranges vary from 2-53 ha (Blakers et al. 1984) Groups normally consist of a primary breeding pair along with several non-breeding birds (sometimes groups may contain two breeding pairs or two females that both breed). Most members of the group help to build nests, with the primary female contributing the most effort. Two types of nests are built: roost-nests (usually larger and used by the whole group) and brood-nests (for the breeding females), and often old nest sites are renovated and re-used from year to year. The large domed nests are placed in a tree fork usually 4-7 m high and are made of thick sticks with projections that make a hood and landing platform for the entrance tunnel. The nest chamber is lined with soft grass, bark, wool, and feathers. The brooding female (sometimes more than one) is fed by the other group members and all help to feed the nestlings. Larger groups tend to raise a greater number of young and two broods are usually raised per season. The breeding season is between July and February, however, within NSW, almost all observations of breeding activity have been from July to December. The species produces 2-6 buff, purple-brown or dark grey eggs with dark brown scribbles.
Distribution	The Grey-crowned Babbler occurs in NSW. on the western slopes and plains, with isolated populations in coastal woodlands on the North Coast, Hunter Valley and South Coast near Nowra.

Pomatostomus temporalis temporalis	**Grey-crowned Babbler**
	
BC Act 2016	Vulnerable
EPBC Act 1999	Not Listed

Five Part Test of Significance
The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

a. *have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,*

Pomatostomus temporalis subsp. *temporalis* (Grey-crowned Babbler) was observed along the REZ route at several locations such as the Singleton Army Base. A number of Nest/Roosts were also noted along the edge of the existing easement. Suitable foraging nesting/roosting habitat was present along much of the REZ route for the Grey-crowned Babbler. Taking into consideration the of preclearance searches for nests before any tree removal, and relocation of deadwood outside impact areas the proposal is unlikely to have a significant impact on the Grey-crowned Babbler such that a local population would be placed at risk of extinction.

b. *in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*
   i. *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*
   ii. *is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,*

   NA

c. *in relation to the habitat of a threatened species or ecological community:*
   i. *the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
   ii. *whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and*
   iii. *the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,*

Pomatostomus temporalis temporalis	Grey-crowned Babbler

Given the presence of large areas of similar adjoining woodland and open forest habitat, no areas are likely to become further fragmented or isolated from other areas for the Grey-crowned Babbler that are important to the long-term survival of this threatened bird species in the local area.

d. *whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),*

No areas declared areas of outstanding biodiversity value were present within proximity to the REZ proposal.

e. *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

The 'Key Threatening Processes' currently listed under Schedule 4 of the Biodiversity Conservation Act 2016 Act that are relevant to the site have been listed in bold below followed by an assessment of the applicability of the threatening process in regards to the proposal and the species considered.

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the proposal have been addressed below:

Clearing of Native Vegetation.
The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. The action is unlikely to be responsible for the significant loss of this EEC provided that recommendations for impact minimisation as listed within Section 6.4 are undertaken.

Invasion of native plant communities by exotic perennial grasses.
Specimens of exotic perennial grasses such as *Chloris gayana* (Rhodes Grass), *Eragrostis curvula* (African Love Grass), *Andropogon virginicus* (Whisky Grass) and *Hyparrhenia hirta* (Coolatai Grass) were present. These exotic grasses compete with species within this CEEC for space, light, and other resources and may threaten its persistence at several sites. The action is unlikely to be responsible for the significant loss of this EEC provided recommendations for impact minimisation as listed within Section 6.4 are undertaken.

High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition
It is unknown what impact fire has had within areas of this EEC. The proposal is unlikely to increase

Herbivory and environmental degradation caused by feral deer
Tracks of Feral Deer were recorded within several sections of the REZ. Feral Deer would be considered to have an impact on native flora in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.

Invasion, establishment and spread of Lantana (*Lantana camara*)
Lantana was recorded within parts of the REZ proposal. The proposal is unlikely to cause the spread of this weed species.

Invasion of native plant communities by African Olive *Olea europaea* subsp*. cuspidata*
The African Olive was recorded along parts of the REZ route. The proposal is unlikely to cause further spread of this introduced tree.

Removal of dead wood and dead trees
Dead wood and trees were recorded along small sections of the REZ route. Dead wood and trees such be avoided wherever possible.

Predation by the Vulpes vulpes (Red Fox)
The Red Fox was recorded along the REZ route a number of times and would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in numbers of this introduced species.

Predation by the *Felis catus* (Feral Cat)

Pomatostomus temporalis temporalis Grey-crowned Babbler
The Feral Cat was not recorded along the REZ route during fieldwork; however, this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species. **Conclusion** The proposal will result in a small incremental reduction of suitable habitat for the Grey-crowned Babbler however, it is considered unlikely to have a significant impact on this threatened bird species.

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APPENDIX D

TOTAL FLORA

Introduced species are indicated by an asterisk ("*").

The following standard abbreviations are used to indicate subspecific taxa:

subsp.	subspecies
var.-	variety
× -	hybrid between the two indicated species

Threatened Species - NSW Biodiversity Conservation Act 2016 (BC Act)

V	Vulnerable
E1	Endangered
E2	Endangered Population
E4A	Critically Endangered Population

Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

V	Vulnerable
E	Endangered
CE	Critically Endangered

Serious and Irreversible Impact SAII

Regional Significance (Hunter Rare Plants Database – Version 1 2003)

L	endemic to Hunter Region
DA	disjunct in the Hunter Region, rare or localized (aggregated)
DB	disjunct in the Hunter Region, widespread and uncommon (broad)

R rare but extends beyond the Hunter Region
U everywhere uncommon
N at northern distributional limit in the Hunter
E at eastern distributional limit in the Hunter
S at southern distributional limited in the Hunter
W at western distributional limited in the Hunter
T may be threatened in the Hunter Region
S Probably secure in the Hunter Region

Weeds

Priorities under the Biosecurity Act 2015

G General Biosecurity Duty - any person dealing with plant matter must take measures to prevent, minimise or eliminate the biosecurity risk (as far as is reasonably practicable).
P Prohibition on dealings - Must not be imported into the State or sold.
R Regional Recommended Measure - Land managers mitigate the risk of the plant being introduced to their land. Land managers reduce impacts from the plant on priority assets. Land managers prevent spread from their land where feasible. The plant or parts of the plant are not traded, carried, grown or released into the environment.

NSW BC Act 2016

T Listed as a Threatening Process under the NSW BC Act 2016.

National

N Weed of National Significance (WoNS)

Table C1 Total Flora List

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAII	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	FLOWERING PERIOD
CLASS FILICOPSIDA (Ferns)							
Azollaceae							
Azolla pinnata	Ferny Azolla						
Dennstaedtiaceae							
Hypolepis muelleri	Harsh Ground Fern						
Pteridium esculentum	Bracken						
Pteridaceae							
Adiantum aethiopicum	Common Maidenhair Fern						
Cheilanthes distans	Bristly Cloak Fern						
Cheilanthes sieberi ssp. *sieberi*	Mulga Fern						
CYCADOPSIDA (Cycads)							
Zamiaceae							
Macrozamia flexuosa					L N S W		
MAGNOLIOPSIDA: Magnoliidae							
LILOPSIDA: (Monocotyledons)							
Amaryllidaceae							
**Nothoscordum gracile*	Onion Weed						
Asparagaceae							
**Asparagus asparagoides*	Bridal Creeper						
**Asparagus aethiopicus*	Asparagus Fern						
**Asparagus officinalis*	Asparagus						
Arthropodium minus	Small Vanilla Lily						
Arthropodium strictum syn. *Dichopogon strictus*	Chocolate Lily						
Eustrephus latifolius	Wombat Berry						
Laxmannia gracilis	Slender Wire Lily						
Lomandra confertifolia							
Lomandra filiformis							
Lomandra gracilis							
Lomandra longifolia	Spiny Mat Rush						Aug, Sept
Lomandra multiflora subsp. *multiflora*	Many-flowered Mat-rush						Sept

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAII	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	FLOWERING PERIOD
Asphodelaceae							
Caesia parviflora	Pale Grass-lily						
Dianella caerulea var. caerulea	Blue Flax-lily						
Dianella caerulea var. *producta*	Blue Flax-lily						
Dianella longifolia	Smooth Flax Lily						
Dianella revoluta	Blue Flax-lily						
Geitonoplesium cymosum	Scrambling Lily						
Stypandra glauca	Nodding Blue Lily						
Tricoryne elatior	Yellow Rush-lily						
Xanthorrhoea glauca subsp. *glauca*	Giant Grass Tree						
Colchicaceae syn Uvulariaceae							
Wurmbea dioica	Early Nancy						
Commelinaceae							
Commelina cyanea	Scurvy Weed						
**Tradescantia fluminensis*	Wandering Jew						
Cyperaceae							
Carex appressa	Saw Sedge						
**Cyperus brevifolius*	Mullumbimby Couch						
Cyperus difformis	Dirty Dora						
**Cyperus eragrostis*	Umbrella Sedge						
Cyperus gracilis	Slender Flat-sedge						
Eleocharis sphacelata	Tall Spike-rush						
Fimbristylis dichotoma	Common Fringe Sedge						
Gahnia aspera	Rough Saw Sedge						
Lepidosperma laterale	Sword Sedge						
Ptilothrix deusta							
Schoenoplectus mucronatus							
Schoenus apogon	Common Bog-rush						
Iridaceae							
**Romulea rosea* var. *australis*	Onion Grass						
Juncaceae							
**Juncus acutus*	Spiny Rush						
**Juncus cognatus*							

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAII	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	FLOWERING PERIOD
Juncus planifolius							
Juncus prismatocarpus							
Juncus subsecundus	Finger Rush						
Juncus usitatus	Common Rush						
Orchidaceae							
Diuris tricolor	Pine Donkey Orchid	V	V		E U R*		Sept. Oct, Nov
Philydraceae							
Philydrum lanuginosum	Woolly Frogsmouth						
Poaceae							
**Andropogon virginicus*	Whisky Grass						
**Anthoxanthum odoratum*	Sweet Vernal Grass						
Aristida ramosa var. *ramosa*	Three-awn Speargrass				W?		
Aristida vagans	Three-awn Speargrass						
**Arundo donax*	Giant Reed						
Austrostipa verticillata	Slender Bamboo Grass						
**Avena fatua*	Wild Oats						
**Axonopus fissifolius*	Narrow-leaved Carpet Grass						
Bothriochloa decipens	Red grass						
**Briza maxima*	Quaking Grass						
**Briza minor*	Shivery Grass						
**Bromus catharticus*	Prairie Grass						
Capillipedium spicigerum	Scented Top						
**Cenchrus clandestinus syn Pennisetum clandestinum*	Kikuyu						
**Chloris gayana*	Rhodes Grass						
Chloris ventricosa	Tall Windmill Grass						
Cynodon dactylon	Common Couch						
Cymbopogon refractus	Barbed Wire Grass						
Dichelachne micrantha	Plume Grass						
Digitaria parviflora	Smallflower Fingergrass						
**Ehrhartia erecta*	Panic Veldt Grass						
**Elusine indica*	Crowsfoot Grass						
Enteropogon acicularis							
Entolasia marginata	Bordered Panic						
Entolasia stricta	Wiry Panic						

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAII	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	FLOWERING PERIOD
Eragrostis brownii	Browns Love Grass						
**Eragrostis cilianensis*	Stinkgrass						
**Eragrostis curvula*	African Lovegrass						
Eragrostis leptostachya	Paddock Lovegrass						
**Eragrostis tenuifolia*	Elastic Grass						
**Hyparrhenia hirta*	Coolatai Grass						Sept
Imperata cylindrica var. *major*	Blady Grass						
**Lolium perenne*	Perennial Ryegrass						
**Megathyrsus maximus* syn. *Panicum maximum*	Guinea Grass						
Microlaena stipoides var. *stipoides*	Weeping Meadow Grass						
Oplismenus imbecillis	Basket Grass						
Panicum effusum	Hairy Panic						
Paspalidium distans	Spreading Panic Grass						
**Paspalum dilatatum*	Paspalum						
Paspalum distichum	Water Couch						
**Paspalum urviillei*	Vasey Grass						
Phragmites australis	Native Reed						
**Poa annua*	Winter Grass						Aug, Sept
Rytidosperma fulvum	Wallaby Grass						
**Setaria parviflora* syn. *Setaria gracillis*	Slender Pigeon Grass						
**Setaria sphacelata*	South African Pigeon Grass						
**Sporobolus africanus*	Parramatta Grass						
**Sorghum halepense*	Johnson Grass						
**Sporobolus africanus*	(African) Parramatta Grass						
Sporobolus creber	Slender Rats Tail						
Themeda triandra syn. *Themeda australis*	Kangaroo Grass						Oct, Nov
Typhaceae							
Typha orientalis	Cumbungi						
MAGNOLIIDAE (Dicotyledons)							
Acanthaceae							
Brunoniella australis	Blue Trumpet						
Rostellularia adscendens							
Aceraceae							
**Acer pseudoplatanus*	Sycamore Maple						

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAII	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	FLOWERING PERIOD
Aizoaceae							
**Galenia pubescens*	Galenia						
Amaranthaceae							
Alternanthera denticulata	Lesser Joyweed						
**Gomphrena celosioides*	Gomphrena Weed						
Anacardiaceae							
**Schinus areira syn. Schinus molle*	Pepper Tree						
Apiaceae							
Centella asiatica	Indian Pennywort						
**Cyclospermum leptophyllum*	Slender Celery						
Daucus glochidiatus	Native Carrot						
**Foeniculum vulgare*	Fennel						
Apocynaceae							
**Araujia sericifera* (*syn. A. hortorum*).	Moth Plant						
**Gomphocarpus fruticosus*	Narrow-leaved Cottonbush						
Parsonsia straminea var. *straminea*	Common Silkpod				W?		
Araliaceae							
**Hedera helix*	English Ivy						
**Hydrocotyle bonariensis*	Kurnell Curse						
Polyscias sambucifolia	Elderberry Panax						
Asteraceae							
**Ageratina adenophora*	Crofton Weed						Sept
** Aster subulatus* syn. *Aster squamatus*	Bushy Starwort						
**Bidens pilosa*	Cobblers Pegs						
**Bidens subalternans*	Greater Beggar's Ticks						
Brachyscome multifida	Cut-leaved Daisy						Sept
Calotis cuneifolia	Blue Burr-daisy						
Calotis lappulacea	Yellow Burr-daisy						Sept
**Carthamus lanatus*	Saffron Thistle						
Cassinia sifton syn Cassinia arcuata	Sifton Bush, Chinese Scrub						
Chrysocephalum apiculatum	Yellow Buttons						

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAII	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	FLOWERING PERIOD
Chrysocephalum semipapposum	Clustered Everlasting						
**Cirsium vulgare*	Spear Thistle						Sept
**Conyza bonariensis*	Flax-leaved Fleabane						
**Coreopsis lanceolata*	Coreopsis						
Cotula australis	Carrot Weed						
Cymbonotus lawsonianus	Bear's Ear						
Euchiton sphaericus	Common Cudweed						
**Facelis retusa*	Facelis						
**Gamochaeta coarctata* syn.*Gamochaeta spicata*	Spiked Cudweed						
Glossocardia bidens syn. *Glossogyne tannensis*	Cobbler's Tack						
**Hypochaeris radicata*	Catsear, Flatweed						
**Lactuca serriola*	Prickly Lettuce						
Lagenophora stipitata (syn. Lagenifera stipitata)	Blue Bottle-daisy						
Olearia elliptica	Sticky Daisy Bush						20200310
Ozothamnus diosmifolium	White Dogwood						Sept
**Senecio madagascariensis*	Fireweed						Sept, Oct
**Sonchus asper*	Prickly Sowthistle						
**Sonchus oleraceus*	Common Sow Thistle						
**Tagetes minuta*	Stinking Roger						
**Taraxacum officinale*	Dandelion						
**Tragopogon porrifolius*	Salsify						
Vittadinia cuneata var. *cuneata*	Fuzzweed						Sept, Oct
**Xanthium occidentale*	Noogoora Burr						
**Xanthium spinosum*	Bathurst Burr						
Basellaceae							
**Anredera cordifolia*	Madeira Vine						
Bignoniaceae							
**Dolichandra unguis-cati syn. Macfadyena unguis-cati*	Cats Claw Creeper						
Pandorea pandorana	Wonga-wonga Vine						Aug, Sept
Boraginaceae							
**Echium plantagineum*	Paterson's Curse						
**Heliotropium amplexicaule*	Blue Heliotrope						

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAII	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	FLOWERING PERIOD
Brassicaceae							
**Capsella bursa-pastoris*	Shepherd's Purse						
**Lepidium africanum*	Peppercress						
**Rapistrum rugosum*	Turnip Weed, Giant Mustard						
Cactaceae							
**Opuntia aurantiaca*	Tiger Pear						
**Opuntia stricta*	Prickly Pear						
Campanulaceae							
Lobelia concolor	Poison Pratia						
Lobelia purpurascens	White Root						
Wahlenbergia communis	Native Bluebell						
Wahlenbergia gracillis	Sprawling Bluebell						
Caryophyllaceae							
**Cerastium glomeratum*	Mouse Ear Chickweed						
**Paronychia brasiliana*	Brazilian Whitlow						
**Petrorhagia nanteuilii*	Proliferous Pink						Sept, Oct
**Stellaria media*	Common Chickweed						Aug, Sept
Cassythaceae							
Cassytha pubescens	Common Devils Twine						
Casuarinaceae							
Allocasuarina littoralis	Black She-oak						
Allocasuarina luehmannii	Bulloak						
Allocasuarina torulosa	Forest Oak						
Casuarina cunninghamiana ssp. *cunninghamiana*	River She-oak						
Casuarina glauca	Swamp She-oak						
Celastraceae							
Denhamia silvestris syn. Maytenus silvestris	Narrow leaved Orangebark				U		Oct, April
Chenopodiaceae							
**Chenopodium alba*	Fat Hen						

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAII	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	FLOWERING PERIOD
Einadia hastata	Berry Saltbush						
Einadia nutans	Nodding Saltbush						
Enchylaena tomentosa	Ruby Saltbush						
Maireana microphylla	Small-leaf Bluebush				E?		
Sclerolaena muricata	Black Roly Poly						
Convolvulaceae							
Convolvulus erubescens	Australian Bindweed						
Dichondra repens	Kidney Weed						
Polymeria calycina	Swamp Bindweed						
Crassulaceae							
**Bryophyllum delagoense*	Mother of Millions						Noxious weed
Crassula sieberana	Australian Stonecrop						
Dilleniaceae							
Hibbertia aspera	Rough Guinea Flower						Nov
Hibbertia diffusa	Guinea Flower						
Hibbertia linearis	Guinea Flower						
Hibbertia obtusifolia	Hoary Guinea Flower						
Hibbertia pedunculata							
Hibbertia scandens	Climbing Guinea Flower						Sept, Oct
Droseraceae							
Drosera peltata subsp. *peltata*	Sundew						
Ericaceae formerly Epacridaceae							
Acrotriche divaricata	Ground Berry				N		
Epacris pulchella	NSW Coral Heath						April. May
Leucopogon juniperinus	Prickly Bearded Heath						July, Aug
Lissanthe strigosa	Native Cranberry						
Melichrus urceolatus	Urn Heath						
Euphorbiaceae							
Euphorbia drummondii	Caustic Weed						
**Euphorbia peplus*	Petty Spurge						
**Ricinus communis*	Castor Oil Plant						

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAII	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	FLOWERING PERIOD
Fabaceae Subfamily (Caesalpinioideae)							
**Senna pendula* var. *glabrata*							
Fabaceae Subfamily (Faboideae)							
Chorizema parviflorum	Eastern Flame Pea						
Daviesia genistifolia	Broom Bitter Pea						
Daviesia ulicifolia	Gorse Bitter Pea						Aug
Desmodium varians	Slender Tick-trefoil						
Dillwynia retorta subsp. *retorta*	Heathy Parrot Pea						July, Aug, Sept
Glycine clandestina subsp. complex	Love Creeper						Sept
Glycine tabacina sp. complex	Love Creeper						
Gompholobium pinnatum							
Hardenbergia violacea	False Sarsaparilla						Aug, Sept
Indigofera australis	Austral Indigo						July, Aug
Jacksonia scoparia	Dogwood						Sept, Oct
Kennedia rubicunda	Dusky Coral Pea						Sept, Oct
**Medicargo polymorpha*	Burr Medic						
**Medicago sativa*	Lucerne, Alfalfa						
**Melilotus indicus*	Hexham Scent						
Pultenaea microphylla							
Pultenaea spinosa syn. *Pultenaea cunninghamii*	Spiny Bush-pea						Sept
Templetonia stenophylla	Leafy Templetonia						Fruit Sept
**Trifolium arvense*	Haresfoot Clover						
**Trifolium campestre*	Hop Clover						Sept, Oct
**Trifolium repens*	White Clover						Sept, Oct
**Vicia sativa*	Common Vetch						
Zornia dyctiocarpa var. *dyctiocarpa*	Zornia						
Fabaceae (Subfamily Mimosoideae)							
Acacia decora	Western Silver Wattle				U*		
Acacia elata	Cedar Wattle						
Acacia elongata	Swamp Wattle						Aug
Acacia falcata	Falcata Wattle				W		
Acacia implexa	Hickory						
Acacia longifolia subsp. *longifolia*	Sydney Golden Wattle						July, Aug
Acacia parvipinnula	Silver-stemmed Wattle						
Acacia pendula	Weeping Myall	E - pop			E R T*		

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAII	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	FLOWERING PERIOD
Acacia podalyriifolia	Queensland Silver Wattle						
Acacia salicina	Cooba				E		Mar,
Acacia saligna	Golden Wreath Wattle						Aug, Sept
Acacia suaveolens	Sweet-scented Wattle						
Acacia ulicifolia	Prickly Moses						Mar, Apr
Acacia uncinata	Gold Dust Wattle						
Gentianaceae							
**Cenaurium erythraea*	Common Centaury						
Geraniaceae							
Erodium crinitum	Blue Heronsbill						Sept, Oct
Geranium homeanum	Cranesbill						
Geranium solanderi	Native Geranium						
Goodeniaceae							
Goodenia heterophylla	Varible-leaved Goodenia						
Goodenia ovata	Hop Goodenia						Sept
Goodenia pinnatifida							
Goodenia rotundifolia							
Haloragaceae							
Gonocarpus tetragynus	Poverty Raspwort						
Hypericaceae							
Hypericum gramineum	Native St John's Wort						
Hypericum perforatum	St John's Wort						
Lamiaceae							
Mentha satureioides	Native Pennyroyal						
Plectranthus parviflorus	Cockspur Flower						
**Stachys arvensis*	Stagger Weed						
Lauraceae							
**Cinnamomum camphora*	Camphor Laurel						
Linaceae							
Linum marginale	Native Flax						Sept

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAII	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	FLOWERING PERIOD
**Linum trigynum*	French Flax						
Loranthaceae							
Amyema miquelii	Box Mistletoe						
Amyema pendula	Drooping Mistletoe						
Dendrophthoe vitellina	Apostle Mistletoe						Sept, Oct, Nov
Lythraceae							
Lythrum hyssopifolia	Hyssop Loosestrife						
Malvaceae							
Brachychiton populneus subsp. *populneus*	Kurrajong						
**Malva parviflora*	Small-flowered Mallow						
**Modiola carliniana*	Red-flowered Mallow						Sept
**Pavonia hastata*	Pink Parvonia						
Sida corrugata	Corrugated Sida						
Sida hackettiana syn *Sida subspicata*	Golden Rod, Spiked Sida						
**Sida rhombifolia*	Paddys Lucerne						
Meliaceae							
Melia azedarach var. *australasica*	White Cedar						
Myrtaceae							
Angophora bakeri	Narrow-leaved Apple						
Angophora floribunda	Rough-barked Apple						Nov, Dec
Callistemon linearifolius	Netted Bottlebrush	V					
Callistemon linearis	Narrow-leaved Bottlebrush						
Callistemon rigidus	Stiff Bottlebrush						
Callistemon salignus	Willow Bottlebrush						
Callistemon viminalis	Weeping Bottlebrush						
Calytrix tetragona	Common Fringe-myrtle						
Corymbia maculata	Spotted Gum						Mar, Apr
Eucalyptus amplifolia subsp. *amplifolia*	Cabbage Gum						
Eucalyptus blakelyi	Blakely's Red Gum						
Eucalyptus crebra	Narrow-leaved Ironbark						Sept, Oct
Eucalyptus fibrosa subsp. *fibrosa*	Broad-leaved Ironbark						
Eucalyptus glaucina	Slaty Red Gum	V	V				
Eucalyptus globoidea	White Stringybark						

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAII	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	FLOWERING PERIOD
Eucalyptus moluccana	Grey Box						Mar
Eucalyptus parramattensis subsp. *decadens*	Drooping Red Gum	V	V				
Eucalyptus punctata	Grey Gum						
Eucalyptus siderophloia	Grey Ironbark						
Eucalyptus sideroxylon	Mugga						
Eucalyptus tereticornis	Forest Red Gum						May, Aug, Sept, Oct
Eucalyptus umbra	Thick-leaved White Mahogany						
Euryomyrtus ramosissima subsp. *ramosissima*	Rosy Baeckea						Sept, Oct
Gaudium multicaule syn *Leptospermum multicaule*	Silver Tea-tree						
Kunzea ambigua	Tick Bush						Oct, Nov
Leptospermum polygalifolium subsp. *cismontanum*							
Leptospermum polygalifolium subsp. *polygalifolium*	Teatree						Sept
Lophostemon confertus							
Melaleuca decora	White Feather Honeymyrtle						Nov, Dec
Melaleuca linearifolia	Snow in Summer						Oct, Nov
Melaleuca nodosa	Ball Honeymyrtle						Late Sept, Oct
Melaleuca quinquenervia	Broad-leaved Paperbark						Feb, Mar
Melaleuca styphelioides	Prickly-leaved Paperbark						
Oleaceae							
**Ligustrum sinense*	Small-leaved Privet						Sept
Notelaea longifolia	Mock Olive						
Notelaea microcarpa	Native Olive						
**Olea europaea* subsp. *cuspidata*	African Olive						
Onagraceae							
Ludwigia peploides subsp. *montevidensis*	Water Primrose						
Oxalidaceae							
Oxalis corniculata	Creeping Oxalis						
Oxalis perennans	-						
Phyllanthaceae							

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAII	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	FLOWERING PERIOD
Breynia oblongifolia	Coffee Bush						
Phyllanthus hirtellus	Thyme Spurge						
Poranthera microphylla							
Pittosporaceae							
Billardiera scandens	Apple Dumplings						Sept
Bursaria spinosa subsp. *spinosa*	Blackthorn						Jan
Pittosporum undulatum	Sweet Pittosporum						Aug, Sept
Plantaginaceae							
Plantago debilis							
**Plantago lanceolata*	Plantain						
Polygonaceae							
Persicaria decipens	Slender Knotweed						
**Polygonum aviculare*	Wireweed						
Rumex brownii	Swamp Dock						
**Rumex crispus*	Curled Dock						
**Rumex sagittatus* syn. *Acetosa sagittata*	Turkey Rhubarb						
Portulacaceae							
Portulaca oleracea	Purslane, Pigweed						
Primulaceae							
**Lysimachia arvensis* syn. *Anagallis arvensis*	Scarlet Pimpernel						
Proteaceae							
Banksia collina							Mar
Grevillea montana	Mountain Grevillea						
Grevillea parviflora subsp. *parviflora*	Small-flowered Grevillea	**V**	**V**				Sept
Grevillea robusta	Silky Oak						
Hakea sericea	Needlebush						
Isopogon anemonifolius	Drumsticks						
Lambertia formosa	Mountain Devil						
Persoonia linearis	Narrow-leaved Geebung						
Ranunculaceae							
Clematis aristida	Old Man's Beard						

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAII	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	FLOWERING PERIOD
Clematis glycinoides var. *glycinoides*	Headache Vine						Aug, Sept
Ranunculus inundatus	River Buttercup						
Ranunculus lappaceus	Common Buttercup						
Rhamnaceae							
Pomaderris lanigera	Woolly Pomaderris						
Rosaceae							
**Rubus fruticosus* ssp. *aggregate*	Blackberry						
Rubiaceae							
Asperula conferta	Common Woodruff						
**Galium aparine*	Clevers						
Opercularia diphylla	Stinkweed						
Pomax umbellata	Pomax						
**Richardia humistrata*							
Rutaceae							
Boronia polygalifolia	Dwarf Boronia						
Geijera parviflora	Wilga						
Zieria smithii	Sandfly Zieria						Sept, Oct
Santalaceae							
Choretrum candollei	White Sour Bush						
Exocarpus cupressiformis	Cherry Ballart						
Sapindaceae							
**Cardiospermum grandiflorum*	Balloon Vine						
Dodonaea viscosa subsp. *cuneata*	Wedge-leaf Hop Bush						
Dodonaea triquetra	Hop Bush						
Scrophulariaceae							
Eremophila debilis	Amulla						
Myoporum montanum	Western Boobialla						
**Verbascum virgatum*	Twiggy Mullein						
Veronica plebeia	Speedwell						
Solanaceae							

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAII	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	FLOWERING PERIOD
**Cestrum parqui*	Green Cestrum						Sept, Oct
**Datura stramonium*	Common Thornapple						
**Lycium ferocissimum*	African Boxthorn						
Solanum cinereum	Narrawa Burr						
**Solanum mauritianum*	Wild Tobacco						
**Solanum nigrum*	Blackberry Nightshade						
**Solanum pseudocapsicum*	Jerusalem Cherry						
Solanum prinophyllum	Forest Nightshade						
**Solanum seaforthianum*	Climbing Nightshade						March, April
Solanum stelligerum	Devils Needle's						
Stackhousiaceae							
Stackhousia viminea	Slender Stackhousia						
Stylidiaceae							
Stylidium graminifolium	Trigger Plant						Sept
Thymelaeaceae							
Pimelea linifolia	Rice Flower						Sept
Urticaceae							
Urtica incisa	Stinging Nettle						
**Urtica urens*	Small Nettle						
Verbenaceae							
**Lantana camara*	Lantana						Noxious
**Phyla canescens*	Lippia						Noxious
**Verbena bonariensis*	Purple Top						
Verbena gaudichaudii							
**Verbena rigida* var. *rigida*	Veined Verbena						
Vitaceae							
Cayratia clematidea	Slender Grape						
Zygophyllaceae							
Tribulus sp.	Caltrop						

APPENDIX E

SURVEYED TREE DATA

Significant Tree Data Key for Table B1.

- ***DBH** – Diameter at Breast Height. Tree trunk diameter measured at breast height (1.4 metres above ground level).
- ***Tree Height** –(m)
- **Coordinates** - **GDA – 2020, MGA 56**
- **Habitat/Hollows** –

  Class 1 – very large sized hollow openings (i.e., >20cm) suitable for species such as Owls

  Class 2 – large sized hollow openings (i.e., 15-20cm) suitable for species such as Owls and Possums

  Class 3 – medium sized hollow-openings (i.e., 5-15cm) suitable for species such as Gliders and Possums

  Class 4 – small sized hollow openings (i.e., <5cm) suitable for species such as microchiropteran bats.

  Spout - Hollow opening towards sky offering little protection from the weather

  Arboreal Termite Nest – provides potential nesting opportunities for hollow-dependent birds, such as kingfishers and kookaburras

Table D1: Details of significant trees impacted by the REZ.

No.	Species of Tree	Easting	Northing	Height (m)	DBH (m)	Habitat Present				Comments	Removal Required?
						Class 1	Class 2	Class 3	Class 4		
T1	Stringybark	357791	6369986	20	1.13				1		Likely retain
T2	*A. floribunda*	357766	6370028		1.02			1?		Large scar in trunk	Likely retain
T3	*A. floribunda*	357754	6370028		1.11					Branch leaning into easement	Likely retain
T4		354258	6373718	17	0.42				1	Dead branches. Scar in trunk. Hollow suitable for bats and lizards	
T5	*E. tereticornis*	349586	6376906	14	0.45						
T6	*E. tereticornis*	349586	6376900	15	0.42						
T7	*E. tereticornis*	349576	6376927	15	0.77						
T8	*C. maculata*	349136	6377953	15	0.45						Likely removal
T9	*E. fibrosa*	347684	6382740	16	0.63, 0.70						Retain
T10	*E. tereticornis*	346839	6383916	18	0.83			1			Possible branch trimming
T11	*C. maculata*	344329	6385055	22	1.03			1?		Scar at base	Possible branch trimming
T12	*E. tereticornis*	342397	6385186		1.08		3	4	3	Large scratches on trunk	Possible branch trimming
T13	*E. moluccana*	342002	6385113	18	1.13				1		
T13	*E. moluccana*	341946	6385101	17	0.89		1	2	2		Minor branch trimming
T14	*E. moluccana*	340546	6385062	13	0.73					Hollow 4m up trunk	Possible branch trimming
T15	*E. tereticornis*	338964	6385633	18	0.8				2		
T16	*E. tereticornis*	338949	6385641		1		2	2	2	Large scratches on trunk	
T17	*C. maculata*	336972	6385823		1						Possible branch trimming
T18	*E. crebra*	319014	6399108		0.9	1		2	2	Cracks in trunk	
T19	*E. moluccana*	319078	6399191	18	0.86				1		Possible branch trimming
T20	*Allocasuarina luehmannii*	303476	6430401	10	0.47						Possible removal

T21	*E. blakelyi*	304229	6430944	8	0.2						Possible removal
T22	*E. blakelyi*	305917	6432402		1.06						Possible removal
T23	*E. parramattensis* subsp. *decadens*	359373	6369253	7	0.52		1	1	1		Likely retain
T24	Stringy	357791	6369986	20	1.13				1		Likely retain

APPENDIX F

FAUNA SPECIES LIST

VERTEBRATE FAUNA LIST

Family sequencing and taxonomy follow for each fauna class:

Fish

Allen, G.R., Midgley, S.H. & Allen, M. (2002). *Field Guide to the Freshwater Fishes of Australia*. Western Australian Museum, Perth.

Herpetofauna

Cogger, H.G. (2014). *Reptiles and Amphibians of Australia* (7th edn.). CSIRO Publishing.

Birds

Pizzey and Knight (2012) (9th edn).

Mammals

Van Dyck, S. and Strahan, R. (Ed) (2008). The Mammals of Australia (3rd edn). New Holland Publishers, Australia –

Churchill, S. (2008). *Australian Bats*. (2nd edn.). Allen & Unwin Australia.

(?) - Indicates a species identified without certainty or to a Genus level only.

* - Indicates an introduced species.

Threatened species addressed within this assessment appear in **bold** font.

Introduced species are indicated by an asterisk ("*").

The following standard abbreviations are used to indicate subspecific taxa:

subsp. -subspecies
var.- variety
× - hybrid between the two indicated species

Biodiversity Conservation Act 2016 (BC Act)

V Vulnerable
E1 Endangered
E2 Endangered Population
E4A Critically Endangered Population

Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

V **Vulnerable**
E **Endangered**
CE **Critically Endangered Population**
M **Migratory**

Regionally Significant Fauna Species.

+ Region includes Gosford, Wyong, Cessnock, Maitland, Lake Macquarie, Newcastle and Port Stephens LGA's. Produced from Stage 1 of the LHCCREMS – Regional Biodiversity Conservation Strategy.

Observation Type

O - Observed (sighted)
W - Heard call
OW – Observed and heard call
X - In scat
P – Scat
T - Trapped or netted
H – Hair, feathers or skin
A - Stranded/Beached
G – Crushed cones
R – Road Kill
D – Dog Kill
Q – Camera
C – Cat Kill
V – Fox Kill
K – Dead
S – Shot
I – Fossil/subfossil
FB – Burrow
F – Tracks, scratching
Z – In raptor/owl Pellet
U – Ultrasonic recording
M - Miscellaneous
E – Nest/roost
B - Burnt
Y – Bones, teeth or shell
N – Not located
AR – Acoustic Recording

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
Phylum - Chordata					
Subphylum - Vertebrata					
Class - Actinopterygii					
Order Cyprinodontiformes					
Family Poeciliidae					
**Gambusia holbrooki*	Mosquitofish				
Class Amphibia - Amphibians					
Order Salientia - Frogs					
Family Myobatrachidae - 'Southern Frogs'					
Crinia signifera	Common Eastern Froglet				
Limnodynastes peronii	Striped Marsh Frog				
Limnodynastes tasmaniensis	Spotted Grass Frog			+	
Family Hylidae - Tree Frogs					
Litoria peronii	Peron's Tree Frog				
Class Reptilia - Reptiles					
Order Squamata – Lizards and Snakes					
Suborder Sauria - Lizards					
Family Agamidae - Dragons					
Pogona barbata	Eastern Bearded Dragon			+	

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
Family Varanidae - Monitors					
Varanus varius	Lace Monitor				
Family Scinidae - Skinks					
Anomalopus leuckartii	Two-clawed worm-skink				
Carlia tetradactyla	Rainbow Skink			+	
Cryptoblepharus pulcher	Fence Skink, Wall Skink				
Ctenotus robustus	Striped Skink				
Egernia striolata	Tree Skink			+	
Eulamprus tenuis	Bar-sided Skink			+	
Lampropholis delicata	Grass Skink				
Suborder Serpentes - Snakes					
Family Elapidae - Venomous Snakes					
Pseudechis porphyriacus	Red-bellied Black Snake				
Pseudonaja textilis	Eastern Brown Snake			+	
Class Aves - Birds					
Family Phasianidae					
Coturnix pectoralis	Stubble Quail				
Family Anatidae - Ducks, Swans and Geese					
Anas superciliosa	Pacific Black Duck				
Chenonetta jubata	Australian Wood Duck				
Family Podicipedidae - Grebes					
Tachybaptus novaehollandiae	Australian Grebe				
Family Columbidae - Pigeons, Doves					
Geopelia humeralis	Bar-shouldered Dove				
Leucosarcia melanoleuca	Wonga Pigeon				

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
Ocyphaps lophotes	Crested Pigeon				
Phaps chalcoptera	Common Bronzewing				
Family Phalacrocoridae - Cormorants					
Phalacrocorax fuscescens	Pied Cormorant				
Phalacrocorax sulcirostris	Little Black Cormorant				
Phalacrocorax varius	Little Pied Cormorant				
Family Ardeidae - Herons, Egrets and Bitterns					
Ardea alba	Great Egret				
Ardea ibis	Cattle Egret		M		
Ardea pacifica	White-necked Heron				
Egretta novaehollandiae	White-faced Heron				
Family Threskiornithidae - Ibises and Spoonbills					
Threskiornis molucca	Australian White Ibis				
Threskiornis spinicollis	Straw-necked Ibis				
Family Accipitridae - Osprey, Hawks, Eagles and Harriers					
Accipiter fasciatus	Brown Goshawk				
Accipiter cirrhocephalus	Collared Sparrowhawk				
Aquila audax	Wedge-tailed Eagle				
Elanus axillaris	Black-shouldered Kite				
Haliaeetus leucogaster	**White-bellied Sea-Eagle**	**V**	**M**	**+**	
Haliastur sphenurus	Whistling Kite				
Family Falconidae - Falcons					
Falco cenchroides	Nankeen Kestrel				
Falco longipennis	Australian Hobby				
Falco peregrinus	Peregrine Falcon			+	

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
Family Rallidae					
Fulica atra	Eurasian Coot				
Gallinula tenebrosa	Dusky Moorhen				
Porphyrio porphyrio	Purple Swamp Hen				
Family Charadriidae Plover, Dotterels, Lapwings					
Vanellus miles	Masked Lapwing				
Family Cacatuidae - Cockatoos and Corellas					
Cacatua galerita	Sulphur-crested Cockatoo				
Cacatua roseicapilla	Galah				
Cacatua sanguinea	Little Corella				
Calyptorhyncus funereus	Yellow-tailed Black-Cockatoo			+	
Family Psittacidae - Parrots, Rosellas and Lorikeets					
Alisterus scapularis	King Parrot				
Glossopsitta concinna	Musk Lorikeet				
Neophema pulchella	Turquoise Parrot	V			
Platycercus elegans	Crimson Rosella				
Platycercus eximius	Eastern Rosella				
Psephotus haematonotus	Red-rumped Parrot				
Trichoglossus chlorolepidotus	Scaly-breasted Lorikeet				
Trichoglossus haematodus	Rainbow Lorikeet				
Family Cuculidae - Cuckoos					
Cacomantis flabelliformis	Fan-tailed Cuckoo				
Cacomantis variolosus	Brush Cuckoo				
Eudynamys orientalis	Common Koel				
Scythrops novaehollandiae	Channel-billed Cuckoo				
Family Halcyonidae - Tree Kingfishers					
Dacelo novaeguineae	Laughing Kookaburra				

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
Todiramphus sanctus	Sacred Kingfisher				
Family Climacteridae - Treecreepers					
Climacteris erythrops	Red-browed Treecreeper			+	
Climacteris picumnus victoriae	**Brown Treecreeper**	**V**		**+**	
Cormobates leucophaea	White-throated Treecreeper				
Family Maluridae					
Malurus cyaneus	Superb Fairy-wren				
Malurus lamberti	Variegated Fairy-wren				
Family Pardalotidae - Pardalotes, Gerygones, Scrubwrens, Heathwrens and Thornbills					
Acanthiza chrysorrhoa	Yellow-rumped Thornbill				
Acanthiza nana	Yellow Thornbill				
Acanthiza pusilla	Brown Thornbill				
Gerygone mouki	Brown Gerygone				
Gerygone olivacea	White-throated Gerygone				
Pardalotus punctatus	Spotted Pardalote				
Pardalotus striatus	Striated Pardalote				
Family Meliphagidae - Honeyeaters					
Acanthorhynchus tenuirostris	Eastern Spinebill				
Anthrochaera carunculata	Red Wattlebird				
Caligavis chrysops	Yellow-faced Honeyeater				
Entomyzon cyanotis	Blue-faced Honeyeater				
Lichenostomus fuscus	Fuscous Honeyeater				
Lichenostomus melanops	Yellow-tuft Honeyeater				
Manorina melanocephala	Noisy Miner				
Philemon corniculatus	Noisy Friarbird				

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
Family Pomatostomidae Australian Babblers					
Pomatostomus temporalis temporalis	**Grey-crowned Babbler**	**V**		**+**	
Family Petroicidae - Robins and Jacky Winter					
Eopsaltria australis	Eastern Yellow Robin				
Microeca fascinans	Jacky Winter				
Family Pachycephalidae - Whistlers, Shrike-tit and Shrike-thrushes					
Colluricincla harmonica	Grey Shrike-thrush				
Pachycephala pectoralis	Golden Whistler				
Pachycephala rufiventris	Rufous Whistler				
Family Monarchidae - Monarchs, Flycatchers and Magpie-Lark					
Grallina cyanoleuca	Magpie-lark				
Family Rhipiduridae - Fantails					
Rhipidura albiscapa syn. *Rhipidura fuliginosa*	Grey Fantail				
Rhipidura leucophrys	Willie Wagtail				
Family Campephagidae - Cuckoo-shrikes and Trillers					
Coracina novaehollandiae	Black-faced Cuckoo-shrike				
Family Hirundinidae - Swallows and Martins					
Cecropis nigricans	Tree Martin				
Hirundo neoxena	Welcome Swallow				
Family Sylvidae - Old World Warblers					
Acrocephalus stentoreus	Clamorous Reed Warbler				

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
Cisticola exilis	Golden-headed Cisticola				
Family Zosteropidae - White-eyes					
Zosterops lateralis	Silvereye				
Family Artamidae - Wood-swallows, Butcherbirds, Magpie and Currawongs					
Cracticus nigrogularis	Pied Butcherbird				
Cracticus tibicen syn. *Gymnorhina tibicen*	Australian Magpie				
Strepera graculina	Pied Currawong				
Family Corvidae - Crows, Raven					
Corvus coronoides	Australian Raven				
Corcoracidae - Chough and Apostlebird					
Corcorax melanorhamphos	White-winged Chough				
Family Estrildidae - Grassfinches					
Neochima temporalis	Red-browed Finch				
Taeniopygia bichenovii	Double-barred Finch				
Family Dicaeidae					
Dicaeum hirundinaceum	Mistletoe Bird				
Family Turdidae - Thrushes					
**Turdus merula*	Common Blackbird				
Family Sturnidae - Starlings and Mynas					
**Sturnus tristis* syn *Acridotheres tristis*	Indian Myna				
**Sturnus vulgaris*	Common Starling				
Class Mammalia - Mammals					
Subclass Prototheria - Monotremes					

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
Order Monotremata					
Family Tachyglossidae - Echidna					
Tachyglossus aculeatus	Echidna			+	
Subclass Marsupialia - Marsupials					
Order Dasyuromorphia – Carnivorus Marsupials					
Order Diprotodontia					
Suborder Vombatiformes					
Family Vombatidae - Wombats					
Vombatus ursinus	Common Wombat				
Superfamily - Macropodoidae					
Family Macropodidae - Kangaroos, Wallabies					
Macropus giganteus	Eastern Grey Kangaroo			+	
Notamacropus rufogriseus syn. *Macropus rufogriseus*	Red-necked Wallaby			+	
Subclass Eutheria - Eutherian Mammals					
Order Rodentia					
Family Muridae - Rodents					
**Mus musculus*	House Mouse				
Order Lagomorpha					

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
Family Leporidae					
**Lepus capensis*	European Hare				
**Oryctolagus cuniculus*	European Rabbit			O	
Order Carnivora					
Family Canidae					
**Vulpes vulpes*	Red Fox				
Order Perissodactyla					
Family Equidae					
**Equus caballus*	Horse				
Order Artiodactyla					
Family Suidae					
**Sus scrofa*	Pig				
Family Bovidae					
**Bos taurus*	Cattle				
Family Cervidae					
**Cervus elaphus*	Red Deer				