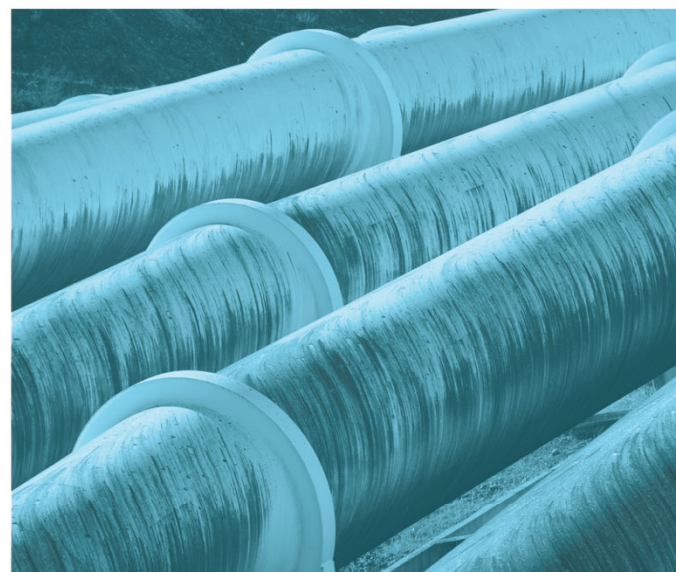




New England Solar Farm

Modification report for the modification to development consent
SSD-9255

Prepared for UPC\AC Renewables Australia Pty Ltd
December 2020





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New England Solar Farm

Modification report for the modification to development consent SSD-9255

Report Number

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Client

UPC\AC Renewables Australia Pty Ltd

Date

16 December 2020

Version

Final

Prepared by**Approved by**

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16 December 2020

**Duncan Peake**

Director

16 December 2020

This report has been prepared in accordance with the brief provided by the client and has relied upon the information collected at the time and under the conditions specified in the report. All findings, conclusions or recommendations contained in the report are based on the aforementioned circumstances. The report is for the use of the client and no responsibility will be taken for its use by other parties. The client may, at its discretion, use the report to inform regulators and the public.

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Executive Summary

UPC\AC Renewables Australia Pty Ltd (UPC) has approval to develop the New England Solar Farm; a significant grid-connected solar farm and battery energy storage system along with associated infrastructure, approximately 6 kilometres (km) east of the township of Uralla, which lies approximately 19 km south of Armidale, in the Uralla Shire local government area (LGA) (the project). The project was approved, subject to conditions, by the NSW Independent Planning Commission (IPC) on 9 March 2020 (SSD-9255).

In accordance with Condition 3 of Schedule 3 of SSD-9255, all vehicles associated with the project must travel to and from the site via the New England Highway, Barleyfields Road (north), Big Ridge Road and two site access points off Big Ridge Road. Condition 4 of Schedule 3 of SSD-9255 includes requirements for upgrades to Barleyfields Road (north) and Big Ridge Road (Segments 1, 3, 4 and 5) and two intersections, which must be implemented prior to the commencement of construction.

As a result of detailed design works, additional disturbance (ie beyond that assessed and approved as part of SSD-9255 is required to facilitate the road upgrade requirements listed in Appendix 4 of SSD-9255, including:

- road widening works on Barleyfields Road (north) and Big Ridge Road (Segments 1, 3, 4 and 5); and
- upgrades at the intersections of the New England Highway/Barleyfields Road (north) and Barleyfields Road/Big Ridge Road.

Subsequently, UPC is seeking to modify SSD-9255, pursuant to Section 4.55(1A) of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act), to increase the extent of the disturbance boundary for the road upgrades. The layers used to define the primary vehicle access route in Appendix 1 of SSD-9255 will be updated to encompass the area required following the completion of detailed design.

The NSW Department of Planning, Industry and Environment (DPIE), Uralla Shire Council and key stakeholders have been consulted regarding the proposed modification to assist in identifying all of the relevant issues to be assessed. This modification report (MR) assesses the potential impacts from the proposed modification.

The proposed modification has been designed to avoid and minimise adverse biophysical, social and economic impacts where possible. The proposed modification will not result in significant environmental, social or economic impacts and this MR has identified that any residual impacts can be appropriately managed or offset.

The road upgrades will have direct impacts on biodiversity primarily due to the clearing of native vegetation and loss of species habitat. A total of 41 ecosystem credits and 271 species credits are required to offset the residual impacts of the proposed modification. Offsets will be provided in accordance with the biodiversity offset framework. Residual impacts on biodiversity will be managed through the implementation of the biodiversity management plan.

All aspects relating to environmental management will be undertaken in accordance with the *New England Solar Farm – Environmental Impact Statement* (EIS) (EMM 2019a), *New England Solar Farm – Amendment Report* (AR) (EMM 2019b) and SSD-9255. Once approved, the project's environmental management strategy (Condition 1 of Schedule 4 of SSD-9255) will govern the avoidance, minimisation and management of impacts during the construction and ongoing operation of the project and will be set out to ensure the responsibilities and accountabilities for environmental performance are clear.

The proposed modification is required to facilitate the road upgrade requirements listed in Appendix 4 of SSD-9255, is of minimal environmental impact and will remain substantially the same development for which consent was originally granted. As such it is considered the modification can be approved pursuant to Section 4.55(1A) of the EP&A Act.

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1 Introduction

1.1 Overview

UPC\AC Renewables Australia Pty Ltd (UPC) has approval to develop the New England Solar Farm; a significant grid-connected solar farm and battery energy storage system along with associated infrastructure, approximately 6 kilometres (km) east of the township of Uralla, which lies approximately 19 km south of Armidale, in the Uralla Shire local government area (LGA) (the project) (Figure 1.1). The project was approved, subject to conditions, by the NSW Independent Planning Commission (IPC) on 9 March 2020 (SSD-9255).

In accordance with Condition 3 of Schedule 3 of SSD-9255, all vehicles associated with the project must travel to and from the site via the New England Highway, Barleyfields Road (north), Big Ridge Road and two site access points off Big Ridge Road. Condition 4 of Schedule 3 of SSD-9255 includes requirements for upgrades to Barleyfields Road (north) and Big Ridge Road (Segments 1, 3, 4 and 5) and at the intersections of the New England Highway/Barleyfields Road (north) and Barleyfields Road/Big Ridge Road (Figure 1.2). These upgrades must be implemented prior to the commencement of construction.

As a result of detailed design works, additional disturbance (ie beyond that assessed and approved as part of SSD-9255 is required to facilitate the road upgrade requirements listed in Appendix 4 of SSD-9255, including:

- road widening works on Barleyfields Road (north) and Big Ridge Road (Segments 1, 3, 4 and 5); and
- upgrades at the intersections of the New England Highway/Barleyfields Road (north) and Barleyfields Road/Big Ridge Road.

Subsequently, UPC is seeking to modify SSD-9255, pursuant to Section 4.55(1A) of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act), to increase the extent of the disturbance boundary for the road upgrades. The layers used to define the primary vehicle access route in Appendix 1 of SSD-9255 will be updated to encompass the area required following the completion of detailed design. The revised road upgrade disturbance boundary is shown in Appendix A.

EMM Consulting Pty Limited (EMM) has been engaged by UPC to prepare a modification report (MR) to accompany the application to modify SSD-9255. This MR assesses the impacts of the proposed modification and proposes mitigation measures, where required, to minimise potential impacts.

1.2 Proponent

UPC is the proponent for the modification. The relevant address is:

UPC\AC Renewables Australia Pty Ltd
Suite 2, Level 2, 13-17 Castray Esplanade
Hobart 7004 Tasmania

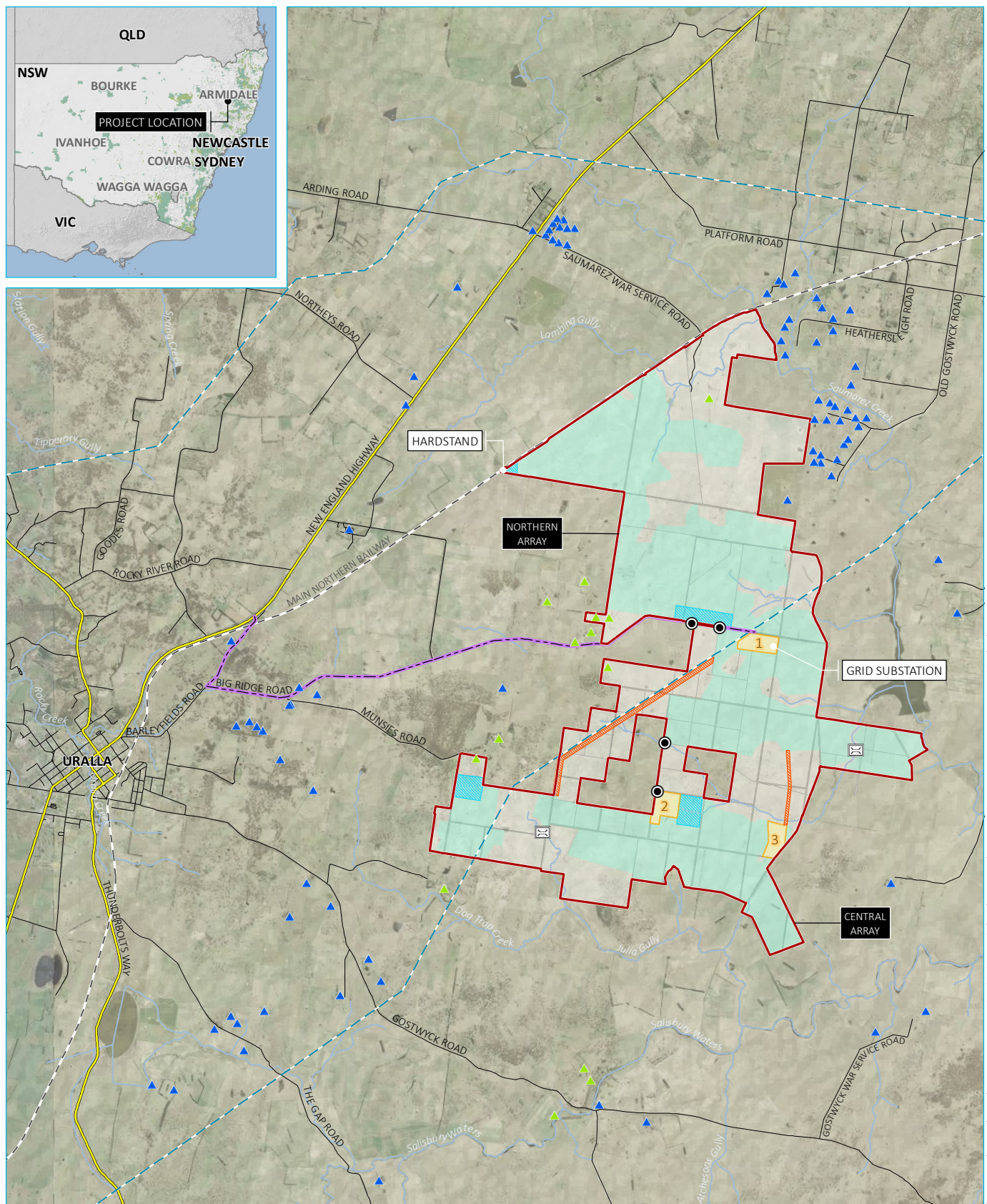
1.3 Objectives

This document has been prepared to support the application to modify SSD-9255. The objective of this modification is to increase the extent of the disturbance boundary for the road upgrades, thereby allowing the road upgrades to commence. Construction of the project is expected to follow on from the successful completion of the proposed road upgrades.

The proposed modification will not change the approved life of project operations. No physical changes to project infrastructure or the development footprint, as currently approved under SSD-9255, are required.

1.4 Report contents

This MR describes the project, details of the proposed modification, legislative framework, stakeholder consultation and provides an environmental assessment and justification of the proposed modification. This MR is accompanied and supported by an addendum to the biodiversity development assessment report (BDAR) prepared by EMM (Appendix B).



Source: EMM (2020); DFSI (2017); GA (2011); UPC (2020)

*The extent of Lot 1 of DP 227322 within the development footprint is 205.4 hectares, which represents approximately 8.4% of the total lot. Subsequently, the full extent of Lot 1 of DP 227322 has been excluded from the project boundary.

** The grid substation (location 1) and only one of potential substation location numbers 2 or 3 to be constructed

KEY

- 330 kV transmission line
- Rail line
- Main road
- Local road
- Watercourse/drainage line

Sensitive receptors

- Project-related
- Non-project related

Project boundary *

Development footprint

- Solar array
- Potential electrical cabling
- Potential laydown area/site compound
- Potential substation/BESS footprint (location number) **

Hardstand in rail corridor

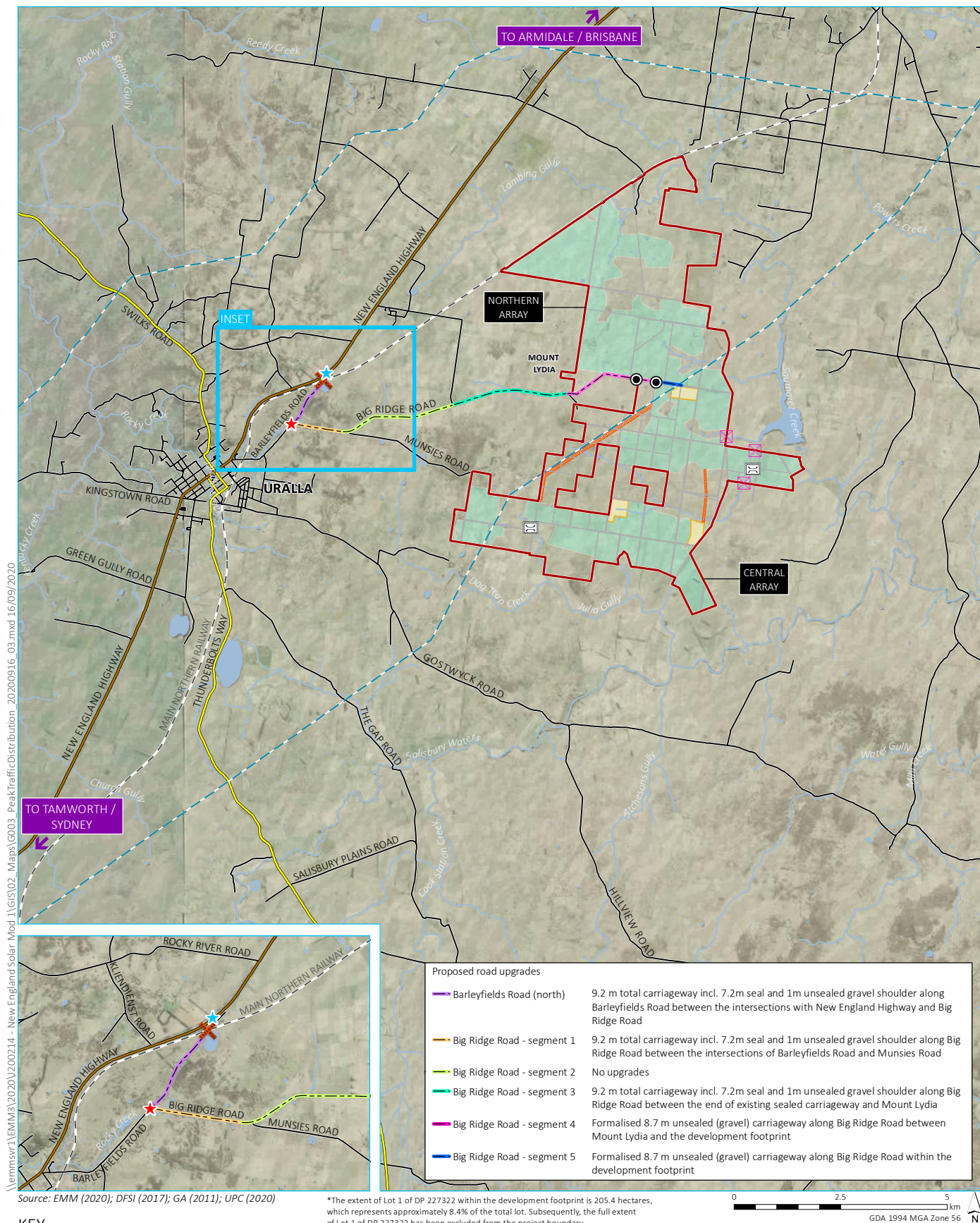
Primary vehicle access route

Potential creek crossing

Proposed primary site access point

Location of the New England Solar Farm

New England Solar Farm Modification report Figure 1.1



KEY

- Project boundary *
- Development footprint
- Solar array
- Potential ETL easement
- Potential substation/BESS footprint
- Potential creek crossing
- Primary site access point
- Indicative location of security fencing across third order watercourses

- 330 kV transmission line
- Rail line
- Main road
- Local road
- Watercourse/drainage line
- Waterbody
- X Level crossing
- Light/heavy vehicle traffic route

- Proposed intersection upgrades
- ★ New England Highway and Barleyfields Road
 - ★ Barleyfields Road and Big Ridge Road

Proposed road upgrades

New England Solar Farm
Modification report
Figure 1.2

2 Proposed modification

2.1 Overview

As part of the assessment process for the EIS and AR, UPC amended the access route and revised the road upgrades in consultation with Uralla Shire Council and NSW Department of Planning, Industry and Environment (DPIE). This resulted in better road safety outcomes and a reduction in the number of local roads required to access the site.

The upgrades defined in Appendix 4 of SSD-9255 (Table 2.1) include:

- road widening works along Barleyfields Road (north) and Big Ridge Road (Segments 1, 3, 4 and 5); and
- upgrades at the intersections of the New England Highway/Barleyfields Road (north) and Barleyfields Road/Big Ridge Road.

The detailed engineering design that has been prepared since the project was approved indicates that a wider disturbance footprint is required in some areas.

Table 2.1 Road upgrades and site access

Road	Location	Upgrade requirements	Timing
New England Highway and Barleyfields Road (north)	Intersection	Channelised right turn (CHR) treatment for the largest vehicle accessing the site (excluding over-dimensional vehicles). ¹	Prior to construction.
Barleyfields Road	Between New England Highway and Big Ridge Road	Seal to a width of 7.2 m with 1 m unsealed shoulders (total carriageway 9.2 m). ¹	
Barleyfields Road and Big Ridge Road	Intersection	Basic left turn (BAL) treatment to cater for the largest vehicle accessing the site (excluding over-dimensional vehicles). ¹	
Big Ridge Road	Segment 1	Seal to a width of 7.2 m with 1 m unsealed shoulders (total carriageway of 9.2 m). ¹	
	Segment 3		
	Segment 4	Gravel (unsealed) carriageway to a width of 8.7 m.	
	Segment 5		
	Site access points	Rural property access type. ¹	

1. Upgrades must comply with the *Austrroads Guide to Road Design* (as amended by RMS supplements).

Previously, it was assumed that the maximum disturbance as part of the proposed upgrades would be 10 m (ie 5 m either side of the existing centreline). To facilitate construction, the detailed design works indicate that there will be a requirement for a maximum disturbance of approximately 12.35 ha (an increase of approximately 43% from the 8.63 ha disturbance area assessed and approved previously). This includes areas of native vegetation, non-vegetated land (ie hard surfaces or gravelled tracks and driveways), vegetation within the maintained easement and exotic vegetation. Figures illustrating the extent of disturbance are provided in Appendix A.

The access route utilises existing roads, tracks and maintained road shoulders to the extent practicable to minimise the amount of vegetation clearing and surface disturbance required.

Vegetation and surface disturbance will be restricted to:

- a narrow strip on the northern side of the existing carriageway of the New England Highway; and
- narrow strips on either side of the existing carriageways for Barleyfields Road (north) and Big Ridge Road (Segments 1, 3, 4 and 5).

Vegetation and surface disturbance works will remain within the designated road corridors in the majority of locations (Appendix A). In some instances, areas where the proposed road upgrade disturbance boundary is shown to extend beyond the designated road corridor (eg Figure A.6 and Figure A.10) are a direct result of the accuracy of the NSW Digital Cadastral Database (DFSI 2017), which has been used in the figures in Appendix A and can be up to 15 m off the surveyed cadastral boundary in a given location. Data from the NSW Digital Cadastral Database (DFSI 2017) cannot be relied upon for accurate representations of property boundaries due to known sources of error.

In order to perform the design works for the proposed road upgrades, New England Surveying and Engineering were commissioned by UPC to perform a site survey, which included survey of the cadastral boundaries along the designated road reserve. The surveyed cadastral boundaries have been included, where relevant, in Appendix A and are accurate to within ± 100 mm. All design work has been based on the surveyed cadastral boundaries (Appendix A).

The proposed design extends into private property to ensure that driveways into private property are satisfactorily tied-in to the new road geometry and water from culverts is able to flow freely through the road corridor without pooling. In those instances where the proposed road upgrade disturbance boundary extends onto private property, landowner's consent has been sought to support the lodgement of the modification application.

2.2 Management measures

The mitigation measures outlined in the *New England Solar Farm – Environmental Impact Statement* (EIS) (EMM 2019a) and *New England Solar Farm – Amendment Report* (AR) (EMM 2019b) will be incorporated into the detailed design and construction of the project and into the required management plans as relevant.

Where relevant, the mitigation measures detailed in Appendix B of the AR (EMM 2019b) will be implemented during the proposed road upgrades.

2.3 Conditions of consent

The ecosystem credit (Table 1) and species credit (Table 2) requirements listed under Condition 10 of Schedule 3 of SSD-9255 will be updated to account for the additional disturbance works required to facilitate the road upgrades.

No other changes to the conditions in SSD-9255 are required as part of the proposed modification.

3 Legislation and policy

3.1 Introduction

This chapter describes the relevant Commonwealth and State legislation and regulatory framework under which the proposed modification will be assessed and determined.

3.2 Commonwealth legislation

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is administered by the Commonwealth Department of Agriculture, Water and the Environment (DAWE). It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places defined as ‘matters of national environmental significance’ (MNES). If significant impacts are considered likely, and the action is deemed to be a ‘controlled action’, the proponent may be asked to provide further information about the proposal.

An assessment of the impacts of the project on MNES, considering cumulative impacts of the construction of the project and the proposed road upgrades was prepared as part of the preparation of the EIS and the AR. This included assessments of significance for entities which were either recorded or considered as having potential to occur, including:

- one Critically Endangered Ecologically Community (CEEC) - White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and derived native grassland;
- two vulnerable plant species – Bluegrass (*Dicanthium setosum*) and Austral Toadflax (*Thesium australe*);
- two critically endangered fauna species – Regent Honeyeater (*Anthochaera phrygia*) and Swift Parrot (*Lathamus discolor*);
- two vulnerable fauna species – Painted Honeyeater (*Grantiella picta*) and Koala (*Phascolarctos cinereus*); and
- two migratory species – Fork-tailed Swift (*Apus pacificus*) and White-throated Needletail (*Hirundapus caudacutus*).

All assessments concluded that no significant impacts on threatened entities are predicted to result from the project and, subsequently, referral of the project to the Commonwealth Minister for the Environment for assessment was not required.

The proposed modification will not have a significant impact on any MNES as listed in the EPBC Act and consequently has not been referred to DAWE.

3.3 NSW State legislation

3.3.1 NSW Environmental Planning and Assessment Act 1979

i Section 4.55(1A) modification

The project was approved, subject to conditions, by the IPC on 9 March 2020 (SSD-9255). UPC is seeking to modify SSD-9255 under Section 4.55(1A) of the EP&A Act. Compliance of the proposed modification with the requirements of Section 4.55(1A) is summarised in Table 3.1.

Table 3.1 Compliance with Section 4.55(1A) requirements

Section 4.55 (1A) requirements	Comment
(a) it is satisfied that the proposed modification is of minimal environmental impact, and	The environmental assessment in Chapter 5 found that the proposed modification will have minimal environmental impacts (ie beyond those assessed and approved as part of SSD-9255).
(b) it is satisfied that the development to which the consent as modified relates is substantially the same development as the development for which the consent was originally granted and before that consent as originally granted was modified (if at all), and	The proposed modification is consistent with the objectives of SSD-9255, being the construction and operation of a solar farm. The revisions to the road upgrade disturbance boundary are necessary to facilitate the road upgrades detailed in Appendix 4 of SSD-9255. As part of the assessment process for the EIS and AR, UPC amended the access route and revised the road upgrades in consultation with Uralla Shire Council and DPIE. This resulted in better road safety outcomes and a reduction in the number of local roads required for site access. The approved access route utilises existing roads, tracks and maintained road shoulders to the extent practicable to minimise the amount of vegetation clearing and surface disturbance required.
(c) it has notified the application in accordance with: i) the regulations, if the regulations so require, or ii) a development control plan, if the consent authority is a council that has made a development control plan that requires the notification or advertising of applications for modification of a development consent, and	Notice of the application must be published in a local newspaper by DPIE. DPIE must also cause notice of the proposed modification to be given to each person who made a submission in relation to the original development application.
(d) it has considered any submissions made concerning the proposed modification within any period prescribed by the regulations or provided by the development control plan, as the case may be.	Any submissions made concerning the proposed modification will be reviewed by DPIE and forwarded to UPC to consider and respond to (via a submissions report).

ii Matters for consideration

Modification applications under Section 4.55(1A) of Division 4.9 are required to take into consideration the relevant matters referred to in Section 4.15 of the EP&A Act which include:

- (a) the provisions of:
 - (i) any environmental planning instrument, and
 - (ii) any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Planning Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved), and
 - (iii) any development control plan, and
 - (iiia) any planning agreement that has been entered into under section 7.4, or any draft planning agreement that a developer has offered to enter into under section 7.4, and
 - (iv) the regulations (to the extent that they prescribe matters for the purposes of this paragraph), and

(v) (Repealed)

that apply to the land to which the development application relates,

- (b) the likely impacts of that development, including environmental impacts on both the natural and built environment, and social and economic impacts in the locality,
- (c) the suitability of the site for the development,
- (d) any submissions made in accordance with this Act or the regulations,
- (e) the public interest.

Matters (a) (i), (iii) and (iv) have been addressed in the following sections of this chapter. Matters (b) to (e) are addressed in Chapters 4, 5 and 6. There are no proposed instruments (matter (ii)) that require consideration.

3.3.2 NSW Environmental Planning and Assessment Regulation 2000

Clause 115 of the EP&A Regulation lists the information required with an application for a modification under Section 4.55(1A) of the EP&A Act. Table 3.2 summarises where this information is provided.

The modification is not considered to be designated development under the EP&A Regulation.

Table 3.2 EP&A Regulation Clause 115 information requirements

Clause 115 information requirement	Where addressed
(a) the name and address of application	Section 1.2 of this MR.
(b) a description of the development to be carried out under the consent (as previously modified)	Appendix A of the AR (EMM 2019b).
(c) the address, and formal particulars of title, of the land on which the development is to be carried out,	Appendix 2 of SSD-9255. Private land parcels that intersect the revised road upgrade disturbance boundary and for which landowner's consent has been sought include: • Lot 7001 of DP1072093; • Lot 170 of DP755814; • Lot 1 of DP587246; • Lot 2 of DP587246; • Lot 3 of DP109536; • Lot 204 of DP755814; • Lot 203 of DP755814; • Lot 1 of DP1005647; • Lot 1 of DP1015933; • Lot 300 of DP1036398; • Lot 1 of DP1026550; • Lot 216 of DP755814; • Lot 207 of DP755814; • Lot 24 of DP1171290; • Lot 206 of DP755814; and • Lot 201 of DP755814.

Table 3.2 EP&A Regulation Clause 115 information requirements

Clause 115 information requirement	Where addressed
(d) a description of the proposed modification to the development consent,	Chapter 2 of this MR.
(e) a statement that indicates either: i. that the modification is merely intended to correct a minor error, misdescription or miscalculation, or ii. that the modification is intended to have some other effect, as specified in the statement,	Section 2.1 of this MR.
(f) a description of the expected impacts of the modification,	Chapter 5 of this MR.
(g) an undertaking to the effect that the development (as to be modified) will remain substantially the same as the development that was originally approved,	Chapter 5 of this MR.
(g1) in the case of an application that is accompanied by a biodiversity development assessment report, the reasonable steps taken to obtain the like-for-like biodiversity credits required to be retired under the report to offset the residual impacts on biodiversity values if different biodiversity credits are proposed to be used as offsets in accordance with the variation rules under the <i>Biodiversity Conservation Act 2016</i> ,	An addendum to the BDAR has been prepared (Appendix B).
(h) if the applicant is not the owner of the land, a statement signed by the owner of the land to the effect that the owner consents to the making of the application (except where the application for the consent the subject of the modification was made, or could have been made, without the consent of the owner),	In those instances where the proposed road upgrade disturbance boundary extends onto private property, landowner's consent has been sought to support the lodgement of the modification application.
(i) a statement as to whether the application is being made to the Court (under Section 4.55) or to the consent authority (under Section 4.56)	The proposed modification application is not being made to the NSW Land and Environment Court.
and, if the consent authority so requires, must be in the form approved by that authority.	The form of this application is consistent with DPIE's requirements.

3.3.3 NSW Roads Act 1993

Under Section 138 or Part 9, Division 3 of the *NSW Roads Act 1993* (Roads Act), a person must not undertake any works that impact on a road, including connecting a road (whether public or private) to a classified road, without approval of the relevant authority, being either Transport for NSW (TfNSW) or local council, depending upon classification of the road.

UPC will be required to lodge a Section 138 Certificate (Work on Public Lands) for approval before the road upgrades are carried out. Under the provisions of the EP&A Act, an approval under Section 138 or Part 9, Division 3 of the Roads Act cannot be refused if it is necessary for carrying out a State significant development (SSD) authorised by a development consent.

3.4 Uralla Local Environmental Plan 2012

The development footprint is zoned RU1 Primary Production under the Uralla Local Environmental Plan 2012 (Uralla LEP). The majority of land adjacent to the relevant sections of Barleyfields Road (north) and Big Ridge Road is also zoned RU1 Primary Production, with the exception of a parcel of land west of Barleyfields Road (north) that is zoned RU2 Rural Landscape (Figure 2.5 of the EIS).

Development for the purpose of electricity generation is prohibited in the RU1 Zone as it is not specified in item 2 or 3 of the Uralla LEP. Notwithstanding, clause 34 (7) of the Infrastructure SEPP states that:

...development for the purpose of a solar energy system may be carried out by any person with consent on any land.

Therefore, development for the purpose of a solar energy system may be carried out within the project boundary with development consent.

4 Stakeholder consultation

4.1 NSW Department of Planning, Industry and Environment

UPC wrote to DPIE on 3 April 2020 to introduce the proposed modification and seek advice with regard to the assessment pathway and scope of this MR. DPIE responded on 25 May 2020 to confirm the assessment scope and nominated application under Section 4.55(1A) of the EP&A Act as the appropriate approval pathway. A copy of this correspondence is provided in Appendix C. Feedback provided by DPIE and how this has been addressed is summarised in Table 4.1.

Table 4.1 Feedback from DPIE and how it has been addressed

Matter raised	Response
DPIE agreed that the application will be assessed as a Section 4.55(1A) application under the EP&A Act.	The approval pathway for the modification is nominated and described in Section 3.3.1 of this MR.
DPIE confirmed that a Biodiversity Development Assessment Report (BDAR) was not required as part of the proposed modification application and instead requested that the application include an updated biodiversity assessment to reflect the increased disturbance area, including: - amended calculations of impacts to native vegetation and species requiring offsets; - updated figures detailing the additional disturbance area; and - management and mitigation measures to address the impacts associated with the increased disturbance area (if required), including the provision of additional ecosystem and species credits to offset these impacts.	On 4 June 2020, DPIE confirmed that an addendum to the BDAR would be required (ie rather than the previously requested biodiversity assessment) as this had been explicitly requested by DPIE's Biodiversity Conservation Division (BCD). EMM has prepared an addendum to the BDAR, which assesses the potential biodiversity impacts of the proposed modification (Appendix B).
DPIE requested that UPC consult with the relevant registered Aboriginal parties (RAPs), Uralla Shire Council, Biodiversity Conservation Division (BCD) and any potentially impacted residents and detail the outcomes of the consultation.	The outcomes of consultation with relevant stakeholders are provided below. An addendum to the BDAR has been prepared in response to feedback from DPIE and BCD.

4.2 Uralla Shire Council

UPC provides Uralla Shire Council regular project updates. In recent months, this has included a formal presentation of the preliminary road design and other communications (phone calls and emails) to discuss the proposed modification and the revised extent of disturbance works required to facilitate the road upgrades.

Uralla Shire Council has had a number of opportunities to review various iterations of the detailed design for the proposed road upgrades. The detailed design upon which the revised road upgrade disturbance boundary is based (Appendix A) has been presented to, and reviewed by, representatives from Uralla Shire Council.

A copy of the following documentation is included in Appendix C as evidence of the extent of consultation with Uralla Shire Council in relation to the proposed modification:

- slideshow presented to Uralla Shire Council;
- Uralla Shire Council's survey report investigating vegetation clearing requirements; and
- email correspondence with representatives from Uralla Shire Council (including an email from the Director of Infrastructure and Development providing concurrence with the revised design subject to conditions).

As part of their review of the design, representatives from Uralla Shire Council undertook a survey of the extent of the vegetation clearing within the revised road upgrade disturbance boundary (Appendix C). Options to preserve vegetation within the disturbance boundary were explored in consultation with Uralla Shire Council; however, it was concluded that the proposed alignment and level of disturbance is justified.

Engagement with Uralla Shire Council will be ongoing through finalisation of the design, approval of the road design (in accordance with Section 138 of the Roads Act) and throughout the construction of the project.

4.3 Private landholders

As part of the preparation of this MR, representatives from UPC engaged with private landholders and residents along Barleyfields Road (north), Big Ridge Road and Munsies Road between 8 and 14 October 2020 to introduce the proposed modification and notify them that a MR will be submitted to DPIE.

Landholders and residents were also advised of the additional vegetation clearance required and potential impacts to their existing driveways and access points. The revised road upgrade disturbance boundary (Appendix A) accounts for agreed improvements to driveways and access points for some landholders and residents.

A record of these discussions is provided in Appendix C.

4.4 Crown land

The revised road upgrade disturbance boundary extends onto one parcel of Crown land (Lot 7001 of DP1072093). Accordingly, UPC submitted an application for landowner's consent to Crown land on 8 December 2020. The application included an outline of the proposed works on Lot 7001 of DP1072093. A copy of the landowner's consent letter will be provided to DPIE.

4.5 Aboriginal stakeholders

An Aboriginal cultural heritage assessment (ACHA) was prepared for the project to address the Secretary's Environmental Assessment Requirements and was prepared in accordance with NSW guidelines. Eight registered Aboriginal parties (RAPs) were involved in the ACHA, which included an addendum that considered potential impacts to Aboriginal cultural heritage as a result of the previously assessed and approved road upgrade works.

A letter was sent to the RAPs on the 18 September 2020 to introduce the proposed modification and notify them that a MR will be submitted to DPIE (Appendix C). No feedback regarding the proposed modification has been received to date.

5 Environmental assessment

This section addresses the potential impacts of the proposed modification.

5.1 Biodiversity

5.1.1 Overview

An addendum to the biodiversity development assessment report (BDAR) (Appendix B) has been prepared by EMM to assess any additional biodiversity impacts resulting from the revisions to the road upgrade disturbance boundary.

As discussed in Section 2.1, the detailed engineering design that has been prepared since the project was approved indicates that a wider disturbance footprint is required in some areas. The access route still utilises existing roads, tracks and maintained road shoulders to the extent practicable to minimise the amount of vegetation clearing and surface disturbance required.

This section of the MR provides a summary of the biodiversity impacts associated with the proposed modification.

5.1.2 Existing environment

i Landscape features

The Interim Biogeographic Regionalisation for Australia (IBRA) bioregions for the revised road upgrade disturbance boundary comprise the New England Tablelands IBRA Bioregion and the Armidale Plateau IBRA subregion.

The revised road upgrade disturbance boundary intersects several mapped watercourses. During the site survey, the mapped watercourses were inspected and no aquatic habitat was identified. The watercourses are likely to be historical and mapped prior to modification by surrounding agricultural practices.

ii Native vegetation

a Overview

The extent and type of native vegetation was assessed by a review of regional vegetation and habitat mapping as well as a site survey, carried out in accordance with the *Biodiversity Assessment Method* (BAM) guidelines and tools (OEHL 2017). The percentage of native vegetation cover within a 500 m buffer of the revised road upgrade disturbance boundary is approximately 20.7%.

b Plant community types

Two plant community types (PCTs) and five vegetation zones were identified within the revised road upgrade disturbance boundary from vegetation mapping and site surveys (Table 5.1).

Table 5.1 **Vegetation zones mapped within the revised road upgrade disturbance boundary**

Plant community type	Condition class	Area (ha)	Vegetation integrity score
510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	Low_woodland	0.26	15.5
	Moderate_DNG (ie derived native grassland)	0.06	2.8
	Moderate_pasture	2.18	2.6
	Moderate_woodland	0.74	57.1
567 - Broad-leaved Stringybark - Yellow Box shrub/grass open forest of the New England Tableland Bioregion	Moderate_woodland	0.59	61.4

Areas of land within the revised road upgrade disturbance boundary that have not been assigned to PCTs do not require inputting to the BAM calculator and therefore do not require plots, a condition description or generate a vegetation integrity score.

iii **Habitat assessment**

A habitat assessment was undertaken to identify fauna habitat features within the revised road upgrade disturbance boundary. The majority of the revised road upgrade disturbance boundary is cleared of canopy and midstorey vegetation. A small portion of woodland habitat occurs and contains a variety of key habitat features with the potential to support a greater diversity of fauna species (eg a diversity of eucalypts, a midstorey dominated by *Acacia* species, woody debris, leaf litter and hollow-bearing trees).

iv **Threatened species**

A search of DAWE's Protected Matters Search Tool (PMST) for MNES, including threatened species likely to occur within the road upgrade disturbance boundary was performed as part of the BDAR addendum.

An assessment of habitat constraints for threatened species was undertaken to indicate the likelihood of threatened species being present. The following species were identified as having the potential to be present in the revised road upgrade disturbance boundary:

- Bluegrass (*Dichanthium setosum*);
- Northern Blue Box (*Eucalyptus magnificata*);
- Narrow-leaved Black Peppermint (*Eucalyptus nicholii*);
- Hawkweed (*Picris evae*);
- Silky Swainson Pea (*Swainsona sericea*);
- Austral Toadflax (*Thesium australe*);
- Pale-headed Snake (*Hoplocephalus bitorquatus*);
- Bush Stone Curlew (*Burhinus grallarius*);
- Glossy Black Cockatoo (*Calyptorhynchus lathami*);

- Little Eagle (*Hieraaetus morphnoides*);
- Square-tailed Kite (*Lophoictinia isura*);
- Barking Owl (*Ninox connivens*);
- Eastern Pigmy Possum (*Cercartetus nanus*);
- Squirrel Glider (*Petaurus norfolcensis*); and
- Koala (*Phascolarctos cinereus*).

Targeted flora and fauna surveys were undertaken to identify the presence or absence of a number of these species in the revised road upgrade disturbance boundary. No threatened species were recorded within the road upgrade disturbance boundary opportunistically or during targeted surveys.

5.1.3 Impact assessment

i Potential direct, indirect and prescribed impacts

An assessment of potential direct, indirect and prescribed impacts is provided in Section 5.1 of the BDAR addendum (Appendix B). The most relevant direct impacts of the road upgrades include the clearing of native vegetation and the removal of potential threatened species habitat.

Unmitigated, the road upgrades have potential to result in minor indirect or minor prescribed impacts, including:

- vehicle collision with fauna;
- fragmentation of habitats and associated impacts to connectivity and fauna movement;
- increased noise, vibration and dust levels; and
- increase in prevalence of weeds and pathogens.

The increased road width is unlikely to significantly change the ability of species to move between either side of the impacted roads or in the wider landscape.

ii Serious and irreversible impacts

White Box Yellow Box Blakely's Red Gum Woodland is considered a potential entity to meet the serious and irreversible impacts (SAILs) principle detailed in Appendix 3 of the BAM (OEH 2017).

Potential for SAILs to this ecological community have been considered in accordance with Section 10.2.2.1 of the BAM (OEH 2017) (Section 5.3 of Appendix B).

This ecological community is adjacent to an existing road and is already subjected to fragmentation. Removal as part of the proposed modification will be limited to narrow strips on either side of the existing road alignment.

iii Impacts requiring offsets

This section provides an assessment of the impacts requiring offsetting in accordance with Section 10 of the BAM (OEH 2017). The ecosystem credit (Table 1) and species credit (Table 2) requirements listed under Condition 10 of Schedule 3 of SSD-9255 will need to be updated to account for the additional disturbance works required to facilitate the road upgrades.

a Impacts on native vegetation

Impacts to native vegetation requiring offsets include:

- direct impacts on 0.26 ha of PCT 510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion (510_low_woodland);
- direct impacts on 0.74 ha of PCT 510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion (510_moderate_woodland); and
- direct impacts on 0.59 ha of PCT 567 - Broad-leaved Stringybark - Yellow Box shrub/grass open forest of the New England Tableland Bioregion (567_moderate_woodland).

A summary of the ecosystem credits required for all vegetation zones is provided in Table 5.2.

Table 5.2 Summary of ecosystem credits required for the proposed modification

Plant community type	Vegetation zone	Area (ha)	Vegetation integrity score	Future vegetation integrity score	Change in vegetation integrity score	Credits required
510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	510_low_woodland	0.26	15.5	0	-15.5	2
510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	510_moderate_woodland	0.74	57.1	0	-57.1	21
567 - Broad-leaved Stringybark - Yellow Box shrub/grass open forest of the New England Tableland Bioregion	567_moderate_woodland	0.59	61.4	0	-61.4	18

A total of 41 ecosystem credits are required to offset the residual impacts of the road upgrades, an increase of 25 ecosystem credits from the previous road upgrade disturbance boundary.

A credit report is provided in Appendix B of the BDAR addendum (Appendix B). Offsets will be provided in accordance with the biodiversity offset framework outlined in Section 6.6 of the BDAR (EMM 2018).

b Impacts on threatened species

Impacts to species requiring offsets include three threatened flora species and five fauna species. A summary of the species credits required for all vegetation zones is provided in Table 5.3.

Table 5.3 Summary of species credits required for the proposed modification

Common name	Species	Vegetation zone	Area (ha) / Individual (HL)	Habitat condition	Candidate SAI	Species credits
Glossy Black Cockatoo	<i>Calyptorhynchus lathami</i>	510_low_woodland	0.26	-15.5	No	2
		510_moderate_pasture	0.82	-2.6	No	1
		510_moderate_woodland	0.61	-57.1	No	17
		567_moderate_woodland	0.33	-61.4	No	10
Bluegrass	<i>Dichanthium setosum</i>	510_moderate_DNG	0.06	-2.8	No	1
		510_moderate_pasture	2.2	-2.6	No	3
		510_moderate_woodland	0.74	-57.1	No	21
		567_moderate_woodland	0.59	-61.4	No	18
Pale-headed Snake	<i>Hoplocephalus bitorquatus</i>	510_moderate_woodland	0.74	-57.1	No	21
		567_moderate_woodland	0.59	-61.4	No	18
Barking Owl	<i>Ninox connivens</i>	510_low_woodland	0.13	-15.5	No	1
		510_moderate_pasture	0.07	-2.6	No	1
		510_moderate_woodland	0.06	-57.1	No	2
		567_moderate_woodland	0.01	-61.4	No	1
Squirrel Glider	<i>Petaurus norfolcensis</i>	510_moderate_woodland	0.74	-57.1	No	21
		567_moderate_woodland	0.59	-61.4	No	18
Koala	<i>Phascolarctos cinereus</i>	510_moderate_woodland	0.74	-57.1	No	21
		567_moderate_woodland	0.59	-61.4	No	18
Hawkweed	<i>Picris evae</i>	510_moderate_DNG	0.06	-2.8	No	1
		510_moderate_pasture	2.2	-2.6	No	3
		510_moderate_woodland	0.74	-57.1	No	21
		567_moderate_woodland	0.59	-61.4	No	18
Austral Toadflax	<i>Thesium australe</i>	510_moderate_DNG	0.06	-2.8	No	1
		510_moderate_pasture	2.2	-2.6	No	2
		510_moderate_woodland	0.74	-57.1	No	16
		567_moderate_woodland	0.59	-61.4	No	14

A total of 271 species credits are required to offset the residual impacts of the road upgrades, an increase of 146 species credits from the previous road upgrade disturbance boundary.

A limited number of targeted surveys were undertaken for readily detectable species credit species. Where habitat was identified for species credit species and no targeted surveys were undertaken, the species have been assumed present and credits have been calculated accordingly.

A credit report is provided in Appendix B of the BDAR addendum (Appendix B). Offsets will be provided in accordance with the biodiversity offset framework outlined in Section 6.6 of the BDAR (EMM 2018).

An assessment of the impacts of the proposed modification on MNES within the revised road upgrade disturbance boundary was prepared to determine whether referral to the Commonwealth Minister for the Environment is required (Section 6.1 of Appendix B). All assessments concluded that no significant impacts on threatened entities are predicted to result from the proposed modification.

5.1.4 Management and mitigation

A biodiversity management plan (BMP) will be prepared in consultation with BCD and in accordance with Condition 11 of Schedule 3 of SSD-9255. The BMP will include advice regarding the effective implementation of each of the biodiversity management and mitigation measures listed in Table 6.1 of the BDAR (EMM 2018), including a clearing procedure for hollow bearing trees/habitat trees.

5.1.5 Conclusion

The access route has not changed as a result of the proposed modification.

The road upgrades will have direct impacts on biodiversity primarily due to the clearing of native vegetation and loss of species habitat. Indirect impacts on biodiversity may also occur during construction as a result of increased vehicle movements and noise and vibration.

A total of 41 ecosystem credits and 271 species credits are required to offset the residual impacts of the proposed modification. Offsets will be provided in accordance with the biodiversity offset framework.

Residual impacts on biodiversity will be managed through the implementation of the BMP, which will include measures such as pre-clearance surveys and standard erosion and sediment control and biosecurity management procedures.

5.2 Other environmental aspects

The EIS (EMM 2019a) and AR (EMM 2019b) contain assessments of the potential impacts of the project on a number of different environmental aspects. Due to the minor extent of additional clearance and disturbance requirements (ie narrow strips either side of existing carriageways) and the temporary nature of the proposed road upgrade works, no updates to the outcomes of these assessments are considered necessary.

An assessment of other environmental aspects as a result of the proposed modification is provided in Table 5.4. Where relevant, the proposed modification has been compared to the approved project, as assessed in the EIS (EMM 2019a) and AR (EMM 2019b).

Table 5.4 Potential impacts of the proposed modification

Environmental consideration	Impact assessment
Aboriginal cultural heritage	Prior to project determination (September 2019), an addendum to the ACHA was prepared to consider potential impacts to Aboriginal cultural heritage as a result of the road upgrade works (as proposed at that time) and to identify appropriate mitigation and management measures. The addendum to the ACHA presented the outcomes of additional consultation and survey with RAP representatives and provided an updated impact assessment in response to the findings of the archaeological investigations. The previous survey of the road upgrade works on 8 August 2019 assessed the road corridor where additional disturbance is now proposed. The survey: ...generally involved coverage of the entire width of the road corridor from the edge of the sealed road to the fence line to inspect key elements such as rock outcrops and trees along the general transect alignment. All mature trees in proximity to the area where the proposed works will take place were inspected for scars (EMM 2019c). Importantly, no Aboriginal objects were identified as a result of the survey effort and it was considered unlikely that subsurface archaeological deposits would occur within the area of the proposed works. Figures showing the extent of previous surveys in relation to the proposed modification are presented in Appendix A of the letter that was sent to the RAPs (Appendix C). Based on the extent of field survey completed as part of the addendum to the ACHA and low archaeological potential of this area, no further assessment of potential impacts to Aboriginal cultural heritage has been undertaken. Should any Aboriginal objects be identified during the road upgrade works; they will be managed in accordance with the Aboriginal heritage management plan (AHMP). The AHMP will be submitted to DPIE in the coming months, and pending approval, UPC will be in contact about enacting the provisions of the AHMP regarding Aboriginal site mitigation and protection.
Historic heritage	The proposed modification will not impact any listed heritage items. As there are no additional impacts to historic heritage, the management and mitigation measures outlined in the EIS, AR and SSD-9255 are considered sufficient to address the potential impacts of the proposed modification. No additional mitigation measures are required.
Land	UPC has selected an access route which utilises existing roads and tracks in order to minimise the amount of additional disturbance required to provide adequate clearance for vehicle access. This has largely limited the need for disturbance to narrow strips on either side of existing carriageways. As noted in Appendix B of the AR (EMM 2019b), the project will adopt a two-level hierarchical system for erosion and sediment control management and mitigation, consisting of a soil and water management plan (SWMP) supported by a set of progressive erosion and sediment control plans (ESCPs). A similar system will be implemented during the proposed road upgrades as required. No additional mitigation measures are required.
Visual	The proposed modification will not significantly change the existing landscape character along relevant sections of Barleyfields Road (north) and Big Ridge Road. As there are will be limited impacts to visual amenity, the management and mitigation measures outlined in the EIS, AR and SSD-9255 are considered sufficient to address the potential impacts of the proposed modification. No additional mitigation measures are required.

Table 5.4 Potential impacts of the proposed modification

Environmental consideration	Impact assessment
Noise	The proposed modification will not result in significant additional construction activities than those previously assessed and approved under SSD-9255 and is unlikely to contribute to additional noise impacts within the surrounding area. UPC has selected an access route which utilises existing roads and tracks in order to minimise the amount of work required to provide adequate clearance for vehicle access. As prescribed by Condition 13 of Schedule 3 of SSD-9255, UPC will minimise noise generated during the proposed road upgrades in accordance with the best practice requirements outlined in the <i>Interim Construction Noise Guideline</i> (DECC 2009). No additional mitigation measures are required.
Transport	The project's potential impacts on the local and regional road network have been assessed as part of the EIS and AR. UPC revised its proposed road upgrades following advice from Uralla Shire Council and this has led to better road safety outcomes and a reduction in the number of local roads required for site access. As prescribed by Condition 4 of Schedule 3 of SSD-9255, prior to commencing construction, UPC must implement the road upgrades identified in Appendix 4 of SSD-9255 (Table 2.1). The proposed modification will not result in significant additional construction activities than those previously assessed and approved under SSD-9255 and is unlikely to contribute to additional traffic impacts within the surrounding area. UPC will prepare a traffic management plan in consultation with TfNSW and Uralla Shire Council, which will amongst other things, include the details of the road upgrade works required by Condition 4 of Schedule 3 of SSD-9255. The requirements of SSD-9255, as they relate to traffic, are considered to remain relevant to the modified project and will ensure the traffic associated with the construction and operation of the project is appropriately managed. No additional mitigation measures are required.
Water	The proposed modification will not result in any significant changes to the project's water use. As noted in Appendix B of the AR (EMM 2019b), the project will adopt a two-level hierarchical system for erosion and sediment control management and mitigation, consisting of a SWMP supported by a set of progressive ESCPs. A similar system will be implemented during the proposed road upgrades as required. No additional mitigation measures are required.
Hazards and risks	The proposed modification will not result in any significant changes to the hazards and risks associated with the construction and operation of the project. The hazard and risk management and mitigation measures outlined in the EIS, AR and SSD-9255 are considered sufficient to address the potential impacts of the modification. No additional mitigation measures are required.
Bushfire	The proposed modification will not result in any significant changes to the bushfire risks associated with the construction and operation of the project. The bushfire management and mitigation measures outlined in the EIS, AR and SSD-9255 are considered sufficient to address the potential impacts of the modification. No additional mitigation measures are required.

Table 5.4 Potential impacts of the proposed modification

Environmental consideration	Impact assessment
Socio-economics	The proposed modification is consistent with the objectives of the project's approval, being the construction and operation of a solar farm. As noted in Appendix B of the AR (EMM 2019b), during construction, regional residents will be employed preferentially where they have the required skills and experience and are able to demonstrate a cultural fit with the organisation. In addition, non-labour inputs will be sourced locally where local producers can be cost and quality competitive. Prior to the commencement of the proposed road upgrades, UPC will establish a procedure for handling complaints, disputes, non-compliances and emergency responses. UPC will continue to maintain open lines of communication with the local community for the duration of the proposed road upgrades. No additional mitigation measures are required.
Air quality	The proposed modification will not result in significant additional construction activities than those previously assessed and approved under SSD-9255 and is unlikely to contribute to additional air quality impacts within the surrounding area. Consistent with Condition 14 of Schedule 3 of SSD-9255, UPC will minimise dust generated by the project. Any air quality impacts will be minimised and managed through measures outlined in the EIS and AR. No additional mitigation measures are required.
Waste management	The proposed modification will not generate any additional waste than that outlined in the EIS or AR. All waste generated by the project will be minimised and managed through the implementation of a waste management plan, as outlined in the EIS and AR. No additional mitigation measures are required.
Cumulative impacts	The proposed modification will not result in significant additional construction activities than those previously assessed and approved under SSD-9255 and is unlikely to contribute to additional cumulative impacts within the surrounding area. Any cumulative impacts contributed to by the project will be managed through the implementation of the management and mitigation measures outlined in the EIS and AR. No additional mitigation measures are required.

6 Evaluation of merits

A description of the need and justification for the proposed modification is provided below with regard to biophysical, social and economic factors; the principles of ecologically sustainable development (ESD); and the consistency of the proposed modification with the objects of the EP&A Act.

6.1 Modification impacts

This MR examines the potential impacts that may result from the proposed modification. The assessment of environmental issues has been multi-disciplinary and involved consultation with DPIE and other key stakeholders (including Uralla Shire Council, RAPs and private landholders).

The proposed modification will not result in significant biophysical, social or economic impacts and the MR has identified that any residual impacts can be appropriately managed or offset.

6.2 Modification benefits

The proposed modification is seeking to increase the extent of the disturbance boundary for the road upgrades, thereby allowing the proposed road upgrades to commence. The proposed modification is an alteration to an approved development with minimal environmental impact. Construction of the project is expected to follow on from the successful completion of the proposed road upgrades.

As part of the project, there will be economic investment and employment benefits both locally and regionally and a realised opportunity for renewable energy generation, while minimising potential environmental and social impacts. A suite of design, mitigation and management measures are proposed to avoid, minimise and manage the biophysical, social and economic impacts of the project.

All aspects relating to environmental management will be undertaken in accordance with the EIS, AR and SSD-9255.

6.3 Ecological sustainable development

Under Section 516A of the EPBC Act, Commonwealth organisations have a statutory requirement to report on their environmental performance and how they accord with, and advance, the principles of ESD.

Australia's *National Strategy for Ecologically Sustainable Development* (AGESDSC 1992) defines ESD as "using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased".

The principles of ESD, for the purposes of the EP&A Act, are provided in Clause 7(4) of Schedule 2 of the EP&A Regulation. The four principles of ESD are:

- precautionary principle – the precautionary principle states that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;
- inter-generational equity – the principle of inter-generational equity is that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;

- conservation of biological diversity and maintenance of ecological integrity – the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making; and
- improved valuation and pricing of environmental resources – improved valuation, pricing and incentive mechanisms should be promoted.

The overall objectives of ESD are to use, conserve and enhance natural resources. This ensures that ecological processes are maintained facilitating improved quality of life, now and into the future. UPC is committed to the principles of ESD and understands that biophysical, social and economic objectives are interdependent.

The proposed modification is an alteration to an approved development with minimal environmental impact. Where impacts are unavoidable, appropriate management measures (including offsets) have been identified to mitigate any residual impacts.

6.3.1 Precautionary principle

This MR has enabled an understanding of the potential impacts of the proposed modification on biophysical, social and economic factors. The proposed modification will not result in significant biophysical, social or economic impacts and any residual impacts can be appropriately managed (or offset) in accordance with the relevant conditions of SSD-9255. No additional safeguards are warranted to monitor, mitigate and/or manage the potential impacts or residual impacts.

6.3.2 Inter-generational equity

The project is consistent with the principle of inter-generational equity. The project will contribute to the sustainable transition of electricity generation in NSW to a more reliable, more affordable and cleaner energy future. Once decommissioned, the land within the development footprint can be rehabilitated to its current use if required thereby allowing for either continuation of renewable energy generation or a return to agricultural production, both of which would provide benefits for future generations.

6.3.3 Conservation of biological diversity and maintenance of ecological integrity

The potential environmental impacts of the proposed modification are detailed in this MR. The proposed modification is not expected to cause any significant impacts to threatened species or endangered ecological communities.

A total of 41 ecosystem credits and 271 species credits are required to offset the residual impacts of the proposed modification. Offsets will be provided in accordance with the biodiversity offset framework.

Residual impacts on biodiversity will be managed through the implementation of the BMP, which will include measures such as pre-clearance surveys and standard erosion and sediment control and biosecurity management procedures.

6.3.4 Improved valuation and pricing of environmental resources

The proposed modification is an alteration to an approved development with minimal environmental impact. Construction of the project is expected to follow on from the successful completion of the proposed road upgrades. Once operational, the project will contribute to the sustainable transition of electricity generation in NSW to a more reliable, more affordable and cleaner energy future.

6.4 Conclusion

All aspects relating to environmental management will be undertaken in accordance with the EIS, AR and SSD-9255.

Once approved, the project's environmental management strategy (Condition 1 of Schedule 4 of SSD-9255) will govern the avoidance, minimisation and management of impacts during the construction and ongoing operation of the project and will be set out to ensure the responsibilities and accountabilities for environmental performance are clear.

The proposed modification has been designed to avoid and minimise adverse biophysical, social and economic impacts, where possible and is anticipated to result in minimal environmental impacts beyond those previously assessed and approved under SSD-9255.

The proposed modification is consistent with the relevant objects of the EP&A Act, including Section 4.55(1A) and the principles of ESD, demonstrating that the proposed modification involves minimal environmental impact, and will minimally change the nature of the project originally approved.

References

Australian Government Ecologically Sustainable Development Steering Committee (AGESDSC) 1992, *National Strategy for Ecologically Sustainable Development*.

EMM Consulting Pty Limited (EMM) 2019a, *New England Solar Farm – Environmental Impact Statement*. Report prepared by EMM for UPC\AC Renewables Australia.

- 2019b, *New England Solar Farm – Amendment Report*. Report prepared by EMM for UPC\AC Renewables Australia.
- 2019c, *New England Solar Farm – Addendum to the Aboriginal Cultural Heritage Assessment Report*. Report prepared by EMM for UPC\AC Renewables Australia.
- 2018, *New England Solar Farm – Biodiversity Development Assessment Report*. Report prepared by EMM for UPC\AC Renewables Australia.

NSW Department of Environment and Climate Change (DECC) 2009, *Interim Construction Noise Guideline*.

NSW Office of Environment and Heritage (OEH) 2017, *Biodiversity Assessment Method*.

Abbreviations

ACHA	Aboriginal cultural heritage assessment
AHMP	Aboriginal heritage management plan
AR	amendment report
BAL	basic left turn
BAM	biodiversity assessment method
BC Act	<i>NSW Biodiversity Conservation Act 2016</i>
BDAR	biodiversity development assessment report
BMP	biodiversity management plan
CHR	channelised right-turn
DAWE	Commonwealth Department of Agriculture, Water and Environment
DPIE	NSW Department of Planning, Industry and Environment
EIS	environmental impact statement
EMM	EMM Consulting Pty Limited
EP&A Act	<i>NSW Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	NSW Environmental Planning and Assessment Regulation 2000
EPBC Act	<i>Commonwealth Environment Protection and Biodiversity Conservation Act 1999</i>
ESCPs	erosion and sediment control plans
ESD	ecologically sustainable development
IBRA	Interim Biogeographic Regionalisation of Australia
Infrastructure SEPP	State Environmental Planning Policy (Infrastructure) 2007
km	kilometre
LGA	local government area
MNES	matters of national environmental significance
NSW	New South Wales
PCT	plant community type
PMST	Protected Matters Search Tool
PV	photovoltaic
RAP	registered Aboriginal party
RTS	response to submissions

SRD SEPP	State Environmental Planning Policy (State and Regional Development) 2011
SSD	State significant development
SWMP	soil and water management plan
TfNSW	Transport for NSW
TIA	traffic impact assessment
UPC	UPC\AC Renewables Australia Pty Ltd
Uralla LEP	Uralla Local Environmental Plan 2012

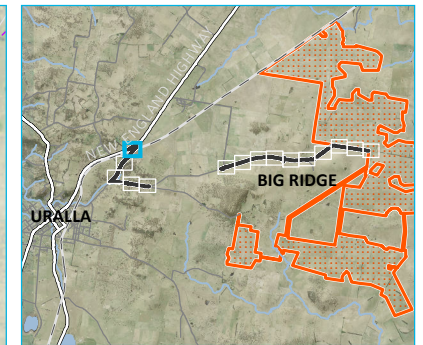
Appendix A

Revised road upgrade disturbance boundary

\\lemmsvr1\EMM\3\2020\200214 - New England Solar Mod 1\GIS\02 Maps\G001 DDP RoadDisturbanceBoundary 20201211 09.mxd 11/12/2020



Source: EMM (2020); DFSI (2017); Elecnor (2020); GA (2011); UPC (2020); NESE (2020)

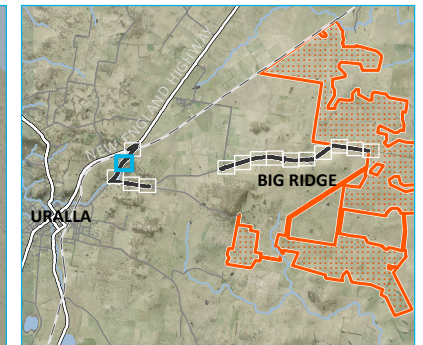


- KEY**
- Proposed road upgrade disturbance boundary
 - Previously assessed and approved road upgrade disturbance boundary
 - Development footprint
 - Surveyed cadastral boundary
 - Rail line
 - Main road
 - Local road
 - Waterbody
 - Cadastral boundary (DFSI 2017)
 - Maintained easement

Proposed road upgrade
disturbance boundary

New England Solar Farm
Modification report
Figure A.1

\\emmsvr1\EMM3\2020\200214 - New England Solar Mod 1\GIS\02 Maps\G001 DDP RoadDisturbanceBoundary 20201211_09.mxd 11/12/2020



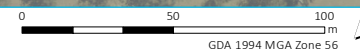
- KEY**
- Proposed road upgrade disturbance boundary
 - ▬ Previously assessed and approved road upgrade disturbance boundary
 - ▭ Development footprint
 - - - Surveyed cadastral boundary
 - - - Rail line
 - ▬ Main road
 - ▬ Local road
 - ▬ Watercourse/drainage line
 - ▬ Waterbody
 - ▭ Cadastral boundary (DFSi 2017)
 - ▨ Maintained easement

Proposed road upgrade
disturbance boundary

New England Solar Farm
Modification report
Figure A.2



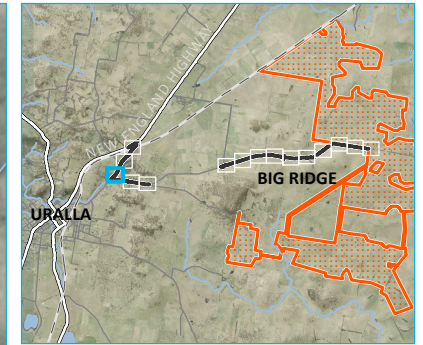
Source: EMM (2020); DFSi (2017); Elecnor (2020); GA (2011); UPC (2020); NESE (2020)



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Source: EMM (2020); DFSI (2017); Elecnor (2020); GA (2011); UPC (2020); NESE (2020)



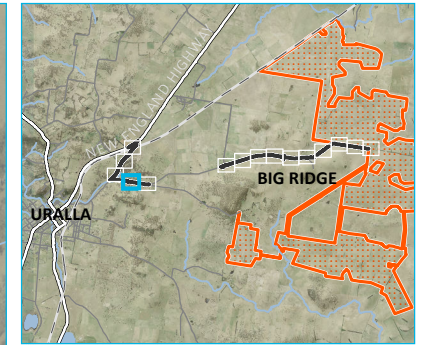
KEY

- Proposed road upgrade disturbance boundary
- Previously assessed and approved road upgrade disturbance boundary
- Development footprint
- Surveyed cadastral boundary
- Rail line
- Main road
- Local road
- Watercourse/drainage line
- Waterbody
- Cadastral boundary (DFSI 2017)
- Maintained easement

Proposed road upgrade
disturbance boundary

New England Solar Farm
Modification report
Figure A.3

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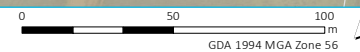
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 - Maintained easement

Proposed road upgrade
disturbance boundary

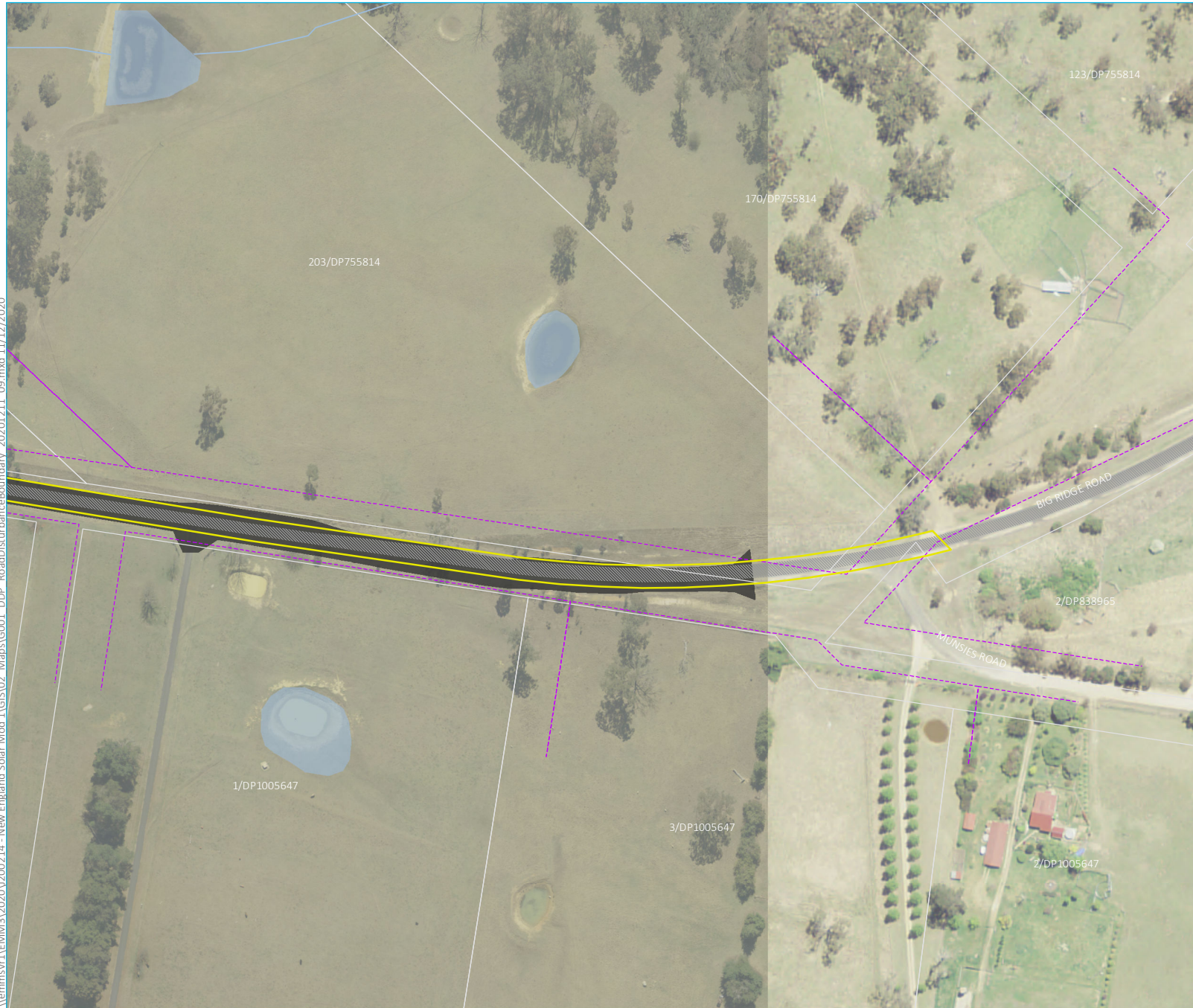
New England Solar Farm
Modification report
Figure A.4



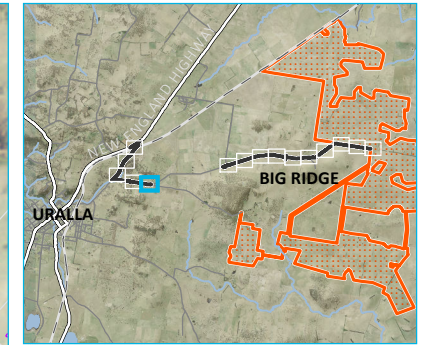
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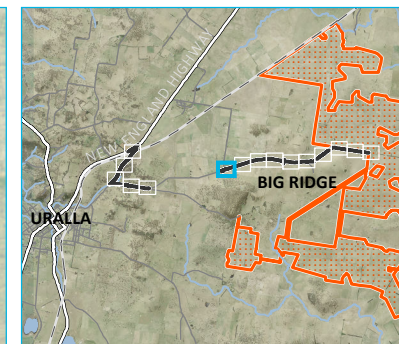
Proposed road upgrade
disturbance boundary

New England Solar Farm
Modification report
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Source: EMM (2020); DFSI (2017); Elecnor (2020); GA (2011); UPC (2020); NESE (2020)



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 - Maintained easement

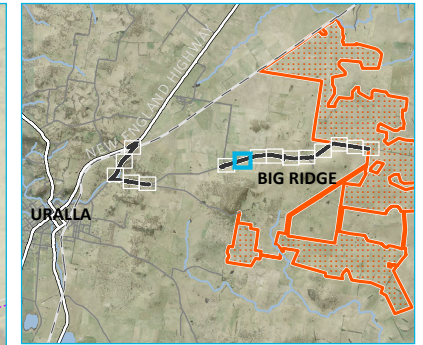
Proposed road upgrade
disturbance boundary

New England Solar Farm
Modification report
Figure A.6



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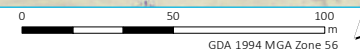
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 - Watercourse/drainage line
 - Waterbody
 - Cadastral boundary (DFS1 2017)
 - Maintained easement

Proposed road upgrade
disturbance boundary

New England Solar Farm
Modification report
Figure A.7



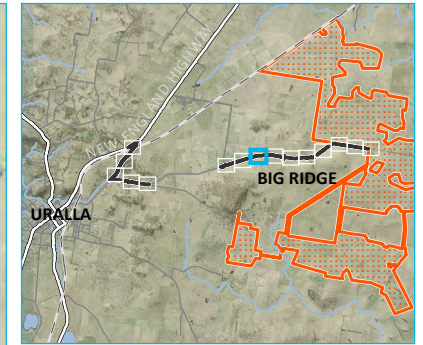
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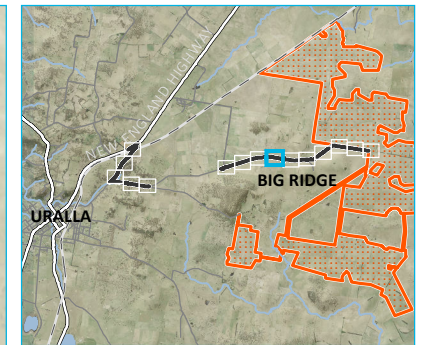


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 - Development footprint
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 - Watercourse/drainage line
 - Waterbody
 - Cadastral boundary (DFSI 2017)
 - Maintained easement

Proposed road upgrade
disturbance boundary

New England Solar Farm
Modification report
Figure A.8

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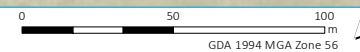
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 - ▬ Cadastral boundary (DFS1 2017)
 - ▨ Maintained easement

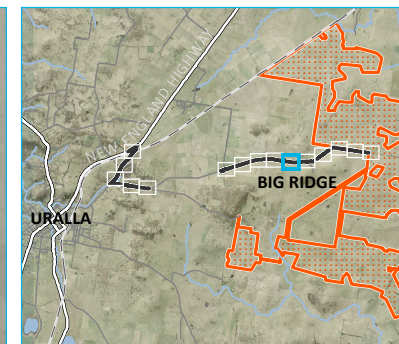
Proposed road upgrade
disturbance boundary

New England Solar Farm
Modification report
Figure A.9



Source: EMM (2020); DFS1 (2017); Elecnor (2020); GA (2011); UPC (2020); NESE (2020)





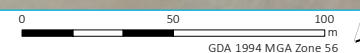
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 - ▨ Maintained easement

Proposed road upgrade
disturbance boundary

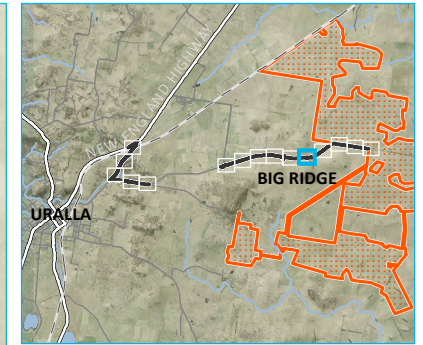
New England Solar Farm
Modification report
Figure A.10



Source: EMM (2020); DFSi (2017); Elecnor (2020); GA (2011); UPC (2020); NESE (2020)



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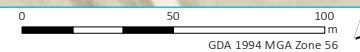
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 - - - Surveyed cadastral boundary
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 - Main road
 - Local road
 - Watercourse/drainage line
 - Waterbody
 - Cadastral boundary (DFS1 2017)
 - Maintained easement

Proposed road upgrade
disturbance boundary

New England Solar Farm
Modification report
Figure A.11



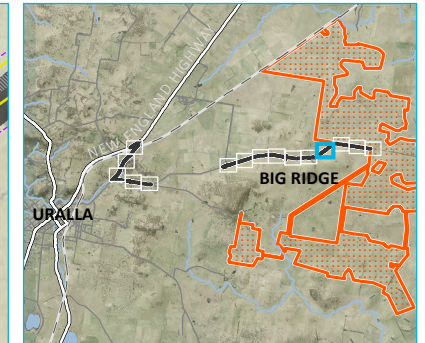
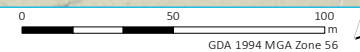
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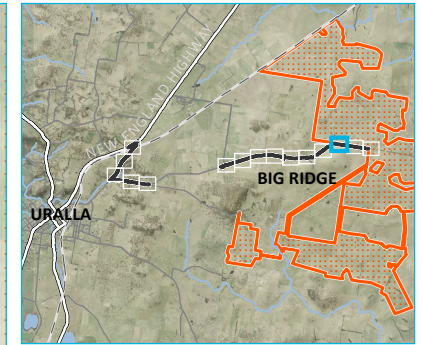
Source: EMM (2020); DFSI (2017); Elecnor (2020); GA (2011); UPC (2020); NESE (2020)



- KEY**
- Proposed road upgrade disturbance boundary
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 - Rail line
 - Main road
 - Local road
 - Watercourse/drainage line
 - Waterbody
 - Cadastral boundary (DFSI 2017)
 - Maintained easement

Proposed road upgrade
disturbance boundary

New England Solar Farm
Modification report
Figure A.12



- KEY**
- Proposed road upgrade disturbance boundary
 - Previously assessed and approved road upgrade disturbance boundary
 - Development footprint
 - Surveyed cadastral boundary
 - Rail line
 - Main road
 - Local road
 - Waterbody
 - Cadastral boundary (DFSI 2017)
 - Maintained easement

Proposed road upgrade
disturbance boundary

New England Solar Farm
Modification report
Figure A.13



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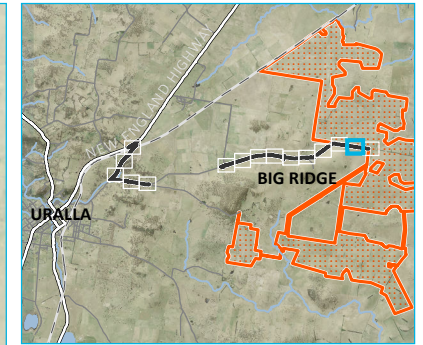
Source: EMM (2020); DFSI (2017); Elecnor (2020); GA (2011); UPC (2020); NESE (2020)

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Source: EMM (2020); DFSI (2017); Elecnor (2020); GA (2011); UPC (2020); NESE (2020)

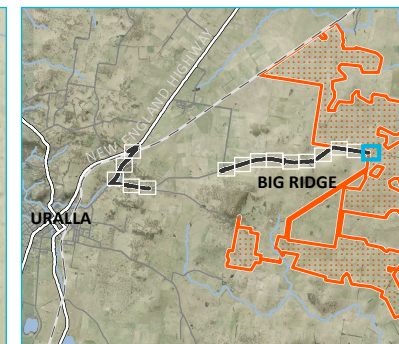


KEY

- Proposed road upgrade disturbance boundary
- ▭ Previously assessed and approved road upgrade disturbance boundary
- ▭ Development footprint
- - - Surveyed cadastral boundary
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- ▬ Watercourse/drainage line
- ▬ Waterbody
- ▭ Cadastral boundary (DFSI 2017)
- ▨ Maintained easement

Proposed road upgrade
disturbance boundary

New England Solar Farm
Modification report
Figure A.14



- KEY**
- Proposed road upgrade disturbance boundary
 - Previously assessed and approved road upgrade disturbance boundary
 - Development footprint
 - Surveyed cadastral boundary
 - Rail line
 - Main road
 - Local road
 - Watercourse/drainage line
 - Waterbody
 - Cadastral boundary (DFSi 2017)
 - Maintained easement

Proposed road upgrade
disturbance boundary

New England Solar Farm
Modification report
Figure A.15

Appendix B

Biodiversity development assessment report – Addendum

New England Solar Farm Modification 1

Biodiversity development assessment report - Addendum

Prepared for UPC\AC Renewables Australia Pty Ltd
December 2020



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Deakin ACT 2600

New England Solar Farm Modification 1

Biodiversity development assessment report - Addendum

Report Number

J200214 RP1

Client

UPC\AC Renewables Australia Pty Ltd

Date

11 December 2020

Version

Final

Prepared by

Approved by



Cecilia Phu

Associate Ecologist (BAAS17058)

11 December 2020



Katie Diver

National Technical Leader - Ecology (BAAS17013)

11 December 2020

This report has been prepared in accordance with the brief provided by the client and has relied upon the information collected at the time and under the conditions specified in the report. All findings, conclusions or recommendations contained in the report are based on the aforementioned circumstances. The report is for the use of the client and no responsibility will be taken for its use by other parties. The client may, at its discretion, use the report to inform regulators and the public.

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1 Introduction

1.1 Project overview

UPC\AC Renewables Australia Pty Ltd (UPC) has approval to develop the New England Solar Farm; a significant grid-connected solar farm and battery energy storage system along with associated infrastructure, approximately 6 kilometres (km) east of the township of Uralla, which lies approximately 19 km south of Armidale, in the Uralla Shire local government area (LGA) (the project) (Figure 1.1). The project was approved, subject to conditions, by the NSW Independent Planning Commission (IPC) on 9 March 2020 (SSD-9255).

In accordance with Condition 3 of Schedule 3 of SSD-9255, all vehicles associated with the project must travel to and from the site via the New England Highway, Barleyfields Road (north), Big Ridge Road and two site access points off Big Ridge Road. Condition 4 of Schedule 3 of SSD-9255 includes requirements for upgrades to Barleyfields Road (north) and Big Ridge Road (Segments 1, 3, 4 and 5) and two intersections, which must be implemented prior to the commencement of construction (Figure 1.2 of the modification report).

As part of the assessment process for the project, a supplementary biodiversity development assessment report (BDAR) (EMM 2019) was prepared to assess the biodiversity impacts associated with the road upgrades.

As a result of detailed design works, additional disturbance (ie beyond that assessed and approved as part of SSD-9255) is required to facilitate the road upgrade requirements listed in Appendix 4 of SSD-9255, including:

- road widening works on Barleyfields Road (north) and Big Ridge Road (Segments 1, 3, 4 and 5); and
- upgrades at the intersections of the New England Highway/Barleyfields Road (north) and Barleyfields Road/Big Ridge Road.

Consequently, UPC is seeking to modify SSD-9255, pursuant to Section 4.55(1A) of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) the extent of the disturbance boundary for the road upgrades (the proposed modification). The layers used to define the primary vehicle access route in Appendix 1 of SSD-9255 will be updated to encompass the area required following the completion of detailed design. The revised road upgrade disturbance boundary is shown in Appendix A of the modification report.

EMM Consulting Pty Limited (EMM) has been engaged by UPC to prepare a modification report to accompany the application to modify SSD-9255. The modification report will assess the impacts of the proposed modification, provide mitigation measures to minimise potential impacts.

EMM has also prepared an addendum (this report) to the BDAR (BDAR addendum) to accompany the modification report and assesses the biodiversity impacts of the proposed modification.

1.2 Purpose of this report

EMM has prepared this BDAR addendum to:

- satisfy the requirements of the *Biodiversity Assessment Method* (BAM) (OEH 2017a);
- re-assess biodiversity impacts presented in the supplementary BDAR (EMM 2019); and
- provide management measures for the proposed modification.

This BDAR addendum supersedes the biodiversity impacts presented in the supplementary BDAR (EMM 2019). Specifically, it assesses impacts on native vegetation and species requiring offsets for the proposed modification.

For the purposes of this assessment, a conservative approach has been taken to facilitate the progression of the proposed modification through the approval process. This includes an assumption of threatened species presence where threatened species surveys were unable to be undertaken within the recommended survey months.

This BDAR addendum was prepared in accordance with the BAM (OEH 2017a), with credit calculations performed in the BAM calculator (BAM-C) application version 1.3.0.00 (last updated 22 October 2020), using BAM data version 31 (last imported 21 October 2020).

1.3 Subject land

As part of the assessment process for the environmental impact statement (EIS) and amendment report (AR), UPC amended the access route and revised the road upgrades in consultation with Uralla Shire Council and NSW Department of Planning, Industry and Environment (DPIE). This resulted in better road safety outcomes and a reduction in the number of local roads required to access the site.

The upgrades defined in Appendix 4 of SSD-9255 include:

- road widening works along Barleyfields Road (north) and Big Ridge Road (Segments 1, 3, 4 and 5); and
- upgrades at the intersections of the New England Highway/Barleyfields Road (north) and Barleyfields Road/Big Ridge Road.

The detailed engineering design that has been prepared since the project was approved indicates that a wider disturbance footprint is required in some areas.

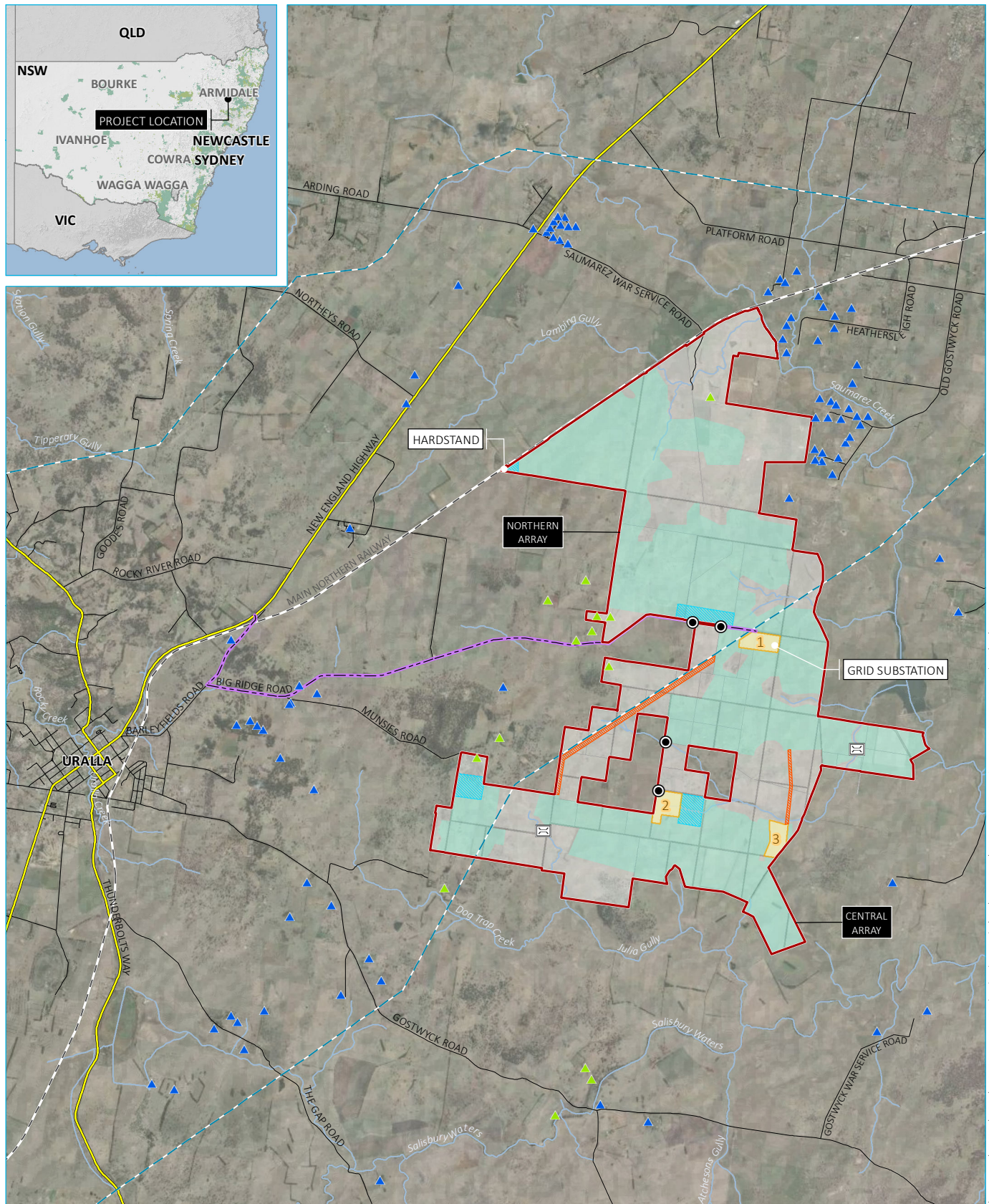
Previously, it was assumed that the maximum disturbance as part of the proposed upgrades would be 10 m (ie 5 m either side of the existing centreline). To facilitate construction, the detailed design works indicate that there will be a requirement for a maximum disturbance of approximately 12.35 hectares (ha) (an increase of approximately 43% from the 8.63 ha disturbance area assessed and approved previously).

At two intersections (ie Barleyfields Road (north)/New England Highway and Barleyfields Road/Big Ridge Road), the width of disturbance has been increased to facilitate intersection improvement works.

Figures illustrating the extent of disturbance for the proposed modification are provided in Appendix A. Vegetation and surface disturbance works will remain within the designated road corridors (Appendix A).

The existing roads/tracks and any maintained vegetation on either side of these have been excluded from the impact assessment presented in Chapter 5. The maintained easement (ie maintained vegetation) either side of the existing road was verified via measurement in the field and via interpretation of aerial imagery.

For the purposes of this BDAR addendum, the term 'subject land' has been used to describe the revised road upgrade disturbance boundary. The term 'development site' has been used to describe the approved disturbance area for the northern and central array areas and associated infrastructure (as assessed by EMM (2018)).



KEY

- 330 kV transmission line
- Rail line
- Main road
- Local road
- Watercourse/drainage line

Sensitive receptors

- Project-related
- Non-project related

- Project boundary *
- Development footprint
- Solar array
- Potential electrical cabling
- Potential laydown area/site compound
- Potential substation/BESS footprint (location number) **

- Hardstand in rail corridor
- Primary vehicle access route
- Potential creek crossing
- Proposed primary site access point

Regional context and location map

New England Solar Farm
Biodiversity development
assessment report - Addendum
Figure 1.1

2 Landscape assessment

The identification of landscape features within the subject land was determined using Section 4 of the BAM (OEH 2017a), as summarised within this chapter. This section of the report provides an update to the description of landscape features provided in Chapter 3 of the BDAR (EMM 2018). All landscape features are shown on Figure 2.1.

2.1 Bioregion and landscapes

The bioregion and subregion remain unchanged for the subject land and comprise the New England Tablelands IBRA Bioregion and the Armidale Plateau IBRA subregion. A total of three Mitchell landscapes intersect with the subject land, including:

- Moonbi - Walcha Granites;
- Niangala Plateau and Slopes; and
- Uralla Basalts and Sands.

For the purposes of consistency with the BDAR, the Moonbi - Walcha Granites Mitchell landscape was selected in the BAM-C; however, the Uralla Basalts and Sands Mitchell landscape is most prevalent within the subject land (Figure 2.1).

2.2 Waterways and wetlands

The subject land is within part of the Macleay catchment as described in the BDAR (EMM 2018). The subject land intersects several mapped watercourses categorised in accordance with Strahler categorisation, including;

- one third order watercourse (Rocky Creek);
- one unnamed second order watercourse; and
- seven unnamed first order watercourses.

All of the mapped watercourses were inspected during the assessment and were dry at the time of survey. No aquatic habitat was recorded within the subject land.

The watercourses are likely to be historical and mapped prior to modification by surrounding agricultural practices. This is consistent with the development site with watercourses being highly modified and in many cases indiscernible owing to multiple dams and retention banks.

The section of Rocky Creek that intersects the subject land is an ephemeral drain in grassland that connects two online farm dams. It is currently dry and does not support a riparian corridor. The second order watercourse is also a drain through a grassland paddock with no associated riparian corridor. There is one intersecting (unnamed) first order stream to the west of the Munsies Road intersection that is vegetated; however, this vegetation is part of a larger dryland forest patch and does not appear to be a clearly differentiated riparian corridor.

Whilst no wetlands occur within the subject land, Barley Field Lagoon is approximately 50 m south-east of Barleyfields Road, close to the existing level crossing on the Main Northern Railway Line (Figure 2.1). The lagoon is ephemeral, typically existing in a dry state and was dry at the time of survey. Farm dams within proximity of the subject land were also dry at the time of survey.

2.3 Connectivity

The proposed road upgrades have potential to remove up to 3.83 ha of native vegetation, including 1.59 ha of woodland. Taking into account the existing carriageways and any maintained vegetation on either side, the actual vegetation removal is limited to narrow strips either side of the existing carriageways.

Given that a narrow strip of vegetation will be removed, impacts to connectivity are considered negligible, especially when considering the presence of the existing roads. The increased road width is unlikely to significantly change the ability of species to move between either side of the road or in the wider landscape.

2.4 Areas of geological significance and soil hazard features

The subject land does not contain karst, caves, crevices, cliffs or other areas of geological significance. Similarly, there are no soil hazard features that occur within the subject land or buffer area.

2.5 Areas of outstanding biodiversity value

There are no areas of outstanding biodiversity value, as declared by the Minister, within the subject land.

2.6 Assessment of site context

Site context has been assessed in accordance with Section 4.3 of BAM (OEH 2017a) for linear-based developments.

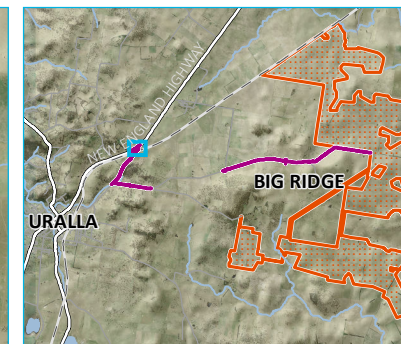
2.7 Native vegetation extent

Mapping of native vegetation within a 500 m buffer of the subject land (linear assessment) was undertaken using the Northern River Catchment Management Authority Native Vegetation Mapping (VIS map 524) and Border Rivers Gwydir/Namoi Region Version 2.0. (VIS map 4467 www.data.nsw.gov.au).

Regional mapping of plant community types (PCTs) within the 500 m buffer includes:

- Broad-leaved Stringybark;
- New England Stringybark – Peppermint;
- Yellow Box-Blakely's Red Gum;
- Yellow Box-Broad-leaved Stringybark;
- PCT 567 Broad-leaved Stringybark - Yellow Box shrub/grass open forest of the New England Tableland Bioregion;
- PCT 510 Blakely's Red Gum - Yellow Box grassy woodland of the New England Tablelands Bioregion; and
- candidate native grasslands.

The native vegetation extent (mapped by EMM) within the subject land is 3.83 ha. When combined with the 500 m buffer, the native vegetation extent is 201.69 ha (Figure 2.1). Given that the combined area of the subject land and the 500 m buffer is 973.61 ha, the percentage of native vegetation cover is estimated to be approximately 20.7 %.



- KEY**
- Subject land
 - Disturbance boundary buffer (500 m)
 - Development footprint
 - Main road
 - Local road
 - Watercourse/drainage line
 - Waterbody
 - Native vegetation
 - Strahler stream order
 - 1st order
 - 2nd order
 - 3rd order
 - Riparian buffer
 - 10 m
 - 20 m
 - 30 m
 - Mitchell landscape
 - Moonbi - Walcha Granites
 - Niangala Plateau and slopes
 - Uralla Basalts and sands

Disturbance boundary 500 m buffer falls completely within the Armidale Plateau IBRA subregion

Site map

New England Solar Farm
Biodiversity development
assessment report - addendum
Figure 2.1

3 Native vegetation

This section reproduces relevant sections and provides an update on the description of native vegetation provided in Chapter 4 of the BDAR (EMM 2018). This section also provides additional consideration of the identification of PCTs and vegetation zones within the subject land, where this differs from the development site.

3.1 Methods

3.1.1 Vegetation mapping and threatened species habitat assessment

Vegetation mapping and habitat assessment for threatened species within the subject land was undertaken on 12 and 13 August 2019. Additional survey was undertaken from 29 September to 2 October 2020. Further details are provided below.

In the August 2019 surveys, a significant part of the subject land was traversed on foot, with the remainder viewed from vehicle, with vegetation mapped and aligned with PCTs. These PCTs were stratified into vegetation zones based on their broad condition state and grouped according to their quality and levels of disturbance. Due to the effects of drought and grazing pressure, it was noted that many groundcover species were not detectable or identifiable at this time.

In the September/October 2020 survey period, the PCT and vegetation zone mapping was reviewed during additional ground-truthing surveys undertaken over the subject land. It was noted during this period that groundcover condition was substantially recovered from the condition state observed in August 2019.

3.1.2 Vegetation integrity plots

Biometric plot data was collected between 29 September and 2 October 2020 to calculate vegetation integrity scores. A total of eight plots were surveyed across all vegetation zones identified and were configured to 10 x 40 metre (m) floristic plots to take into account the linear nature of the subject land.

3.2 Results

3.2.1 Vegetation description

The roadside vegetation mapped along Big Ridge Road and Barleyfields Road comprises a mix of remnant patches of woodland and long sections of roadside grassland. The woodlands are largely concentrated on the western end of Big Ridge Road and along Barleyfields Road, with smaller patches of woodland at the eastern end of Big Ridge Road. Grassland areas consist of derived native grassland (DNG) through to areas of exotic grassland with few native species.

Key disturbances within the subject land include invasion of pasture species from adjacent farmland, clearing associated with road maintenance and grazing associated with travelling stock.

3.2.2 Plant community types

Site investigations identified the presence of two PCTs within the subject land (Figures A.1 – A.19, Appendix A), occurring in various condition states, from woodlands through to derived grasslands.

The PCT, vegetation formation and vegetation class (Keith 2004) are described within Table 3.1.

Table 3.1 Native plant community types within the subject land with corresponding formation and class

Plant community type	Vegetation formation	Vegetation class	Area (ha)
510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	Grassy Woodlands	New England Grassy Woodlands	3.25
567 - Broad-leaved Stringybark - Yellow Box shrub/grass open forest of the New England Tableland Bioregion	Grassy Woodlands	New England Grassy Woodlands	0.59
Total (all)			3.83

Note: The subject land also includes non-vegetated land (ie hard surfaces or gravelled tracks and driveways), maintained vegetation within the maintained easement, and exotic vegetation, which has not been considered further as part of this assessment (Section 1.3).

3.2.3 Vegetation zones

Each of the PCTs identified within the subject land were stratified into vegetation zones based on broad condition state, as per the method outlined in Section 4.2.2 of the BDAR (EMM 2018) and allocated a condition class as per the descriptions in Table 3.2. This process identified five vegetation zones.

Descriptions of vegetation zones and exotic vegetation are provided in Table 3.3, Table 3.4 and Table 3.5, with their locations shown on the figures presented in Appendix A.

Table 3.2 Plant community types and vegetation zones mapped within the subject land

Vegetation zone	PCT	Condition / Veg zone name	Area (ha)
1	510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	Low_woodland	0.26
2	510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	Moderate_DNG (ie derived native grassland)	0.06
3	510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	Moderate_pasture	2.18
4	510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	Moderate_woodland	0.74
5	567 - Broad-leaved Stringybark - Yellow Box shrub/grass open forest of the New England Tableland Bioregion	Moderate_woodland	0.59
Total			3.83

Table 3.3 Description of PCT 510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion

PCT ID	510
Common name	Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion
Condition class and extent within subject land	• Moderate_woodland: 0.74 ha; • Low_woodland: 0.26 ha; • Pasture: 2.18 ha; and • DNG: 0.06 ha.
Description	<u>Moderate woodland</u> The canopy is dominated by Yellow Box (<i>Eucalyptus melliodora</i>) and Blakely's Red Gum (<i>Eucalyptus blakelyi</i>), with a common occurrence of Ribbon Gum (<i>E. viminalis</i>) and less frequent occurrence of Rough-barked Apple (<i>Angophora floribunda</i>). The midstorey is fairly sparse consisting of Native Blackthorn (<i>Bursaria spinulosa</i>) and Fern-leaved Wattle (<i>Acacia filicifolia</i>). Ground cover is predominately grassy and composed of a mixture of native and exotic grasses including Weeping Grass (<i>Microlaena stipoides</i>), Kangaroo Grass (<i>Themeda triandra</i>), Wallaby grasses (<i>Rytidosperma</i> spp.), Slender Rat's Tail Grass (<i>Sporobolus creber</i>) and Red Grass (<i>Bothriochloa macra</i>). <u>Low woodland</u> Presents as an open canopy dominated by Rough-barked Apple (<i>Angophora floribunda</i>) and Blakely's Red Gum (<i>Eucalyptus blakelyi</i>), with no midstorey or shrub layer. An open grassy understorey is present and is dominated by exotic grasses and forbs with a low diversity of native species, including Slender Rat's Tail Grass (<i>Sporobolus creber</i>), Weeping Grass (<i>Microlaena stipoides</i>), Common Woodruff (<i>Asperula conferta</i>) and Native Geranium (<i>Geranium solanderi</i>). <u>Pasture</u> The ground cover is dominated by Kangaroo Grass (<i>Themeda triandra</i>). Other native grass species are present in fewer numbers and include Weeping Grass (<i>Microlaena stipoides</i>), Slender Rat's Tail Grass (<i>Sporobolus creber</i>) and Wallaby grasses (<i>Rytidosperma</i> spp.). A few native forb species are present in low numbers and include <i>Brachyscome nova anglica</i>, Common Woodruff (<i>Asperula conferta</i>), Native Geranium (<i>Geranium solanderi</i>), Common Everlasting (<i>Chrysocephalum apiculatum</i>), and <i>Brachyscome nova anglica</i>. Canopy and midstorey species are absent. <u>Derived native grassland</u> The ground cover is dominated by a mix of native grass species including Snowgrass (<i>Poa sieberiana</i>), Slender Rat's Tail Grass (<i>Sporobolus creber</i>) and Kangaroo Grass (<i>Themeda triandra</i>). A range of native forbs are present in low numbers and includes Common Woodruff (<i>Asperula conferta</i>), Common Everlasting (<i>Chrysocephalum apiculatum</i>), Blue Flax-lily (<i>Dianella caerulea</i>), Kidney Weed (<i>Dichondra repens</i>), Stinking Pennywort (<i>Hydrocotyle laxiflora</i>), Native Geranium (<i>Geranium solanderi</i>), Australian Stonecrop (<i>Crassula sieberiana</i>), Bear's Ear (<i>Cymbonotus lawsonianus</i>), and <i>Brachyscome nova anglica</i>. Canopy and midstorey species are absent.

Table 3.3 **Description of PCT 510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion**

Condition description	<u>Moderate woodland</u> This zone occurs within the road reserve, as discrete strips of vegetation or connected to larger patches of adjacent woodland. The canopy and midstorey are largely intact; however, disturbance due to earthworks is visible in several areas. Ground cover vegetation is dominated by native species; however, invasion of exotic pastures species is prevalent in several patches, namely Meadow Fescue (<i>Festuca pratensis</i>), African Lovegrass (<i>Eragrostis curvula</i>) and Perennial Ryegrass (<i>Lolium perenne</i>). African Lovegrass is a High Threat Weed. At the time of the August 2019 survey, grazing pressure was high, with much of the vegetation having been grazed close to the ground. In September and October 2020, the groundcover appears to be substantially recovered from the 2019 drought, with an abundance of groundcover present. <u>Low woodland</u> The canopy exhibits noticeable dieback of the crown and trees do not appear to be in good health. The ground cover is dominated by exotic species Perennial Ryegrass (<i>Lolium perenne</i>), Squirrel Tail Fesque (<i>Vulpia bromoides</i>) and Lamb's Tongue (<i>Plantago lanceolata</i>), with common occurrence of other exotics including Cocksfoot (<i>Dactylis glomerata</i>), Barley Grass (<i>Hordeum leporinum</i>), Variegated Thistle (<i>Silybum marianum</i>) and White Clover (<i>Trifolium repens</i>). High Threat Weeds are present in low numbers and include Hawthorn (<i>Crataegus monogyna</i>) and Saffron Thistle (<i>Carthamus lanatus</i>). <u>Pasture</u> This zone is subject to similar disturbances as the woodland areas including grazing from livestock and invasion by pasture species, especially where adjacent to pasture areas. Exotic grass species are prevalent and include African Lovegrass (<i>Eragrostis curvula</i>), Paspalum (<i>Paspalum dilatatum</i>) and Sweet Vernal Grass (<i>Anthoxanthum odoratum</i>), Cocksfoot (<i>Dactylis glomerata</i>), Barley Grass (<i>Hordeum leporinum</i>) and Perennial Ryegrass (<i>Lolium perenne</i>). Other introduced pasture weeds are present and include Lamb's Tongue (<i>Plantago lanceolata</i>), clovers (<i>Trifolium</i> spp.), Burr-medics (<i>Medicago</i> spp.), Common Thornapple (<i>Datura stramonium</i>), Chilean Whitlow (<i>Paronychia brasiliana</i>) and Sheep's Burnet (<i>Sanguisorba minor</i>). This zone includes high threat weeds comprising African Lovegrass (<i>Eragrostis curvula</i>), Bathurst Burr (<i>Xanthium spinosum</i>), Paspalum (<i>Paspalum dilatatum</i>) and Saffron Thistle (<i>Carthamus lanatus</i>). <u>Derived native grassland</u> This zone is subject to similar disturbances as the woodland areas including grazing from livestock and invasion by pasture species, especially where adjacent to pasture areas. Exotic species are common although not dominant, and include Lamb's Tongue (<i>Plantago lanceolata</i>), clovers (<i>Trifolium</i> spp.), Burr-medics (<i>Medicago</i> spp.) and Sheep's Burnet (<i>Sanguisorba minor</i>).
Characteristic species used for identification of PCT	PCT 510 is typically dominated by Rough-barked Apple, Yellow Box and/or Blakely's Red Gum according to the vegetation description in the BioNet Vegetation Classification. All of these species are present within the zone, with Yellow Box and Rough Barked Apple and Blakely's Red Gum being dominant. In addition, Ribbon Gum; a characteristic species of the PCT, were also recorded.
Justification of evidence used to identify the PCT	PCT 510 occurs on undulating areas at intermediate to high altitudes, which is consistent with the subject land, at approximately 1,000 m elevation with gently sloping or flat topography. The subject land occurs within the New England Tablelands IBRA bioregion, in which this PCT is known to occur. The PCT occupies deep, relatively fertile soils on a number of different geologies, but mainly sedimentary rocks and basalt. Site observations indicate that the PCT occurs on fairly deep soils, with limited rock outcropping present. Soil types within the subject land include both sedimentary and basalt derived soils, providing further consistency with the PCT.

Table 3.3 Description of PCT 510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion

Status	<u>Commonwealth <i>Environment, Protection and Biodiversity Conservation Act 1999</i> (EPBC Act)</u> All zones were assessed against the potentially aligned White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland, Critically Endangered Ecological Community (CEEC) (<i>EPBC Act Policy Statement 3.5 - White box - yellow box - Blakely's red gum grassy woodlands and derived native grasslands</i> (DEH 2006)). <i>Moderate_woodland – listed CEEC</i> The zone is not in exemplary condition given that the ground cover is grazed, with low species diversity; however, the zone meets several other condition criteria including, greater than 2 ha patch size, and an average of 20 or more mature trees per ha and natural regeneration of the dominant overstorey species. <i>Low_woodland – not the listed CEEC</i> This zone does not meet the listing criteria as it does not have a predominantly native understorey. <i>Pasture – not the listed CEEC</i> This zone does not meet listing criteria given that there are less than 12 native non-grass understorey species, and the patch does not have either 20 mature trees per ha, nor natural regeneration of the overstorey. <i>Derived native grassland – not the listed CEEC</i> This zone does not meet the listing criteria given that the overall patch size is less than 0.1 ha and has just under the required 12 native non-grass understorey species. <u>NSW <i>Biodiversity Conservation Act 2016</i> (BC Act)</u> <i>Moderate_woodland – listed EEC</i> This PCT is directly aligned with White Box Yellow Box Blakely's Red Gum Woodland Endangered Ecological Community (EEC). <i>Low_woodland, Pasture, and Derived native grassland – listed EEC.</i> In contrast to the Commonwealth listing, the NSW guidelines specifically include highly disturbed sites, where few native species are present. This is providing that vegetation, either understorey, or overstorey, or both, would under appropriate management, respond through natural regeneration. In the case of these zones, the condition of the vegetation would likely improve if grazing pressure was reduced further. Currently the road easement can be used as a travelling stock route. Therefore, these zones are considered to form part of the EEC under the BC Act.
Estimate of percent cleared value of PCT	79%



Photograph 3.1 **PCT 510 - moderate woodland**



Photograph 3.2 **PCT 510 – pasture**

Table 3.4 Description of PCT 567 - Broad-leaved Stringybark - Yellow Box shrub/grass open forest of the New England Tableland Bioregion

PCT ID	567
Common name	Broad-leaved Stringybark - Yellow Box shrub/grass open forest of the New England Tableland Bioregion
Condition class and extent within subject land	Moderate_woodland: 0.59 ha
Description	The canopy is dominated by Broad-leaved Stringybark (<i>Eucalyptus caliginosa</i>) with Blakely's Red Gum, Yellow Box and Rough-barked Apple also present. Box Mistletoe (<i>Amyema miquelli</i>) was recorded in the canopy. The midstorey was well developed in most areas, consisting of Native Blackthorn, Fern-leaved Wattle (<i>Acacia filicifolia</i>), Sticky Wattle (<i>Acacia viscidula</i>), Wallaby Weed (<i>Olearia viscidula</i>), Hop Bitter Pea (<i>Daviesia latifolia</i>) and Peach Heath (<i>Lissanthe strigosa</i>) Ground cover is predominately grassy composed of a mixture of native and exotic grasses including Weeping Grass, Slender Rat's Tail Grass, Common Wheatgrass (<i>Anthosachne scabra</i>), <i>Eragrostis</i> sp., and Red Grass. Other native groundcovers and low shrub species recorded include Native Raspberry (<i>Rubus parvifolius</i>), False Sarsaparilla (<i>Hardenbergia violacea</i>), Stinking Pennywort, Bear's Ear, Kidney Weed, Australian Stonecrop, Native Geranium, Ivy Goodenia, Bidgee-widgee (<i>Acaena novae-zelandiae</i>) and Common Woodruff.
Condition description	This zone occurs within the road reserve, as discrete strips of vegetation or more often connected to larger patches of adjacent woodland. The canopy and midstorey are largely intact; however, disturbance due to earthworks is visible in several areas. Ground cover vegetation is dominated by native species; however, invasion of exotic pastures species is prevalent in several patches. At the time of the August 2019 survey, grazing pressure was high with much of the vegetation grazed close to the ground. In September and October 2020, the groundcover appears to be substantially recovered from the 2019 drought, with an abundance of groundcover present.
Characteristic species used for identification of PCT	PCT 567 is dominated by Broad-leaved Stringybark with a broad range of associates including Rough-barked Apple, Yellow Box and Blakely's Red Gum, all of which were recorded within this zone. Characteristic mid-storey species which were recorded include Peach Heath, Hop Bitter Pea, and Native Blackthorn. Characteristic groundcover species that were recorded include Ivy Goodenia, Common Wheatgrass, Red Grass and Slender Rat's Tail Grass.
Justification of evidence used to identify the PCT	PCT 567 is a very tall woodland or tall open forest, widespread on tablelands and low hills on a variety of substrates. The woodland recorded was tall, within an area of gently rolling hills matching the PCT attributes.
Status	<u>Commonwealth EPBC Act</u> <i>Woodland_moderate – not the listed CEEC</i> The zone was assessed against the potentially aligned White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC (<i>EPBC Act policy statement 3.5 - White box - yellow box - Blakely's red gum grassy woodlands and derived native grasslands</i> (DEH 2006)). The community is not considered to meet the listing as the dominant canopy species is Broad-leaved Stringybark, rather than one of the key characteristic canopy species (ie White Box (<i>Eucalyptus albens</i>), Yellow Box, or Blakely's Red Gum). <u>NSW BC Act</u> <i>Woodland_moderate – listed EEC</i> This PCT is directly aligned with White Box Yellow Box Blakely's Red Gum Woodland EEC. The BC Act determination refers to characteristic species including both Yellow Box and Blakely's Red Gum, which while not dominant, are present within the PCT.
Estimate of percent cleared value of PCT	62%



Photograph 3.3 **PCT 567 – moderate woodland**

Table 3.5 **Description of exotic grassland**

PCT ID	Not applicable
Common name	Exotic grassland
Description	Exotic grassland within the subject land is floristically variable but is consistently dominated by introduced grasses and broad-leaved forbs, with low abundances of native groundcover vegetation. Commonly recorded species include the following, some of which are also high threat weeds (as indicated by an asterisk): • Paspalum* (<i>Paspalum dilatatum</i>); • Perennial Ryegrass (<i>Lolium perenne</i>); • African Lovegrass* (<i>Eragrostis curvula</i>); • Meadow Fescue (<i>Festuca pratensis</i>); • Sweet Vernal Grass (<i>Anthoxanthum odoratum</i>); • Cocksfoot (<i>Dactylis glomerata</i>); • Lamb's Tongue (<i>Plantago lanceolata</i>); • Clovers (<i>Trifolium</i> spp.); • Sheep's Burnet (<i>Sanguisorba minor</i>); and • Wild Carrot (<i>Daucus carota</i>).
Characteristic species used for identification of PCT	Not applicable

Table 3.5 **Description of exotic grassland**

Justification of evidence used to identify the PCT	Not applicable
Status	Not applicable
Estimate of percent cleared value of PCT	Not applicable

3.2.4 Assessment of patch size

Two vegetation zones; PCT 510_woodland_moderate and PCT 567_woodland_moderate were allocated a patch size of 101 ha (Table 3.6). Both vegetation zones are well connected to large areas of vegetation which are greater than 101 ha in size, which is the maximum size class in the BAM.

The remaining three zones were not considered intact vegetation, given that at least one of their strata were absent. Patch size is therefore determined to be zero for these vegetation zones.

Table 3.6 **Patch size for all vegetation zones**

Vegetation zone	PCT	Condition	Patch size (ha)
1	510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	Low_woodland	0
2	510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	DNG	0
3	510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	Pasture	0
4	510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	Moderate_woodland	101
5	567 - Broad-leaved Stringybark - Yellow Box shrub/grass open forest of the New England Tableland Bioregion	Moderate_woodland	101

3.2.5 Vegetation integrity score

The vegetation integrity score for each vegetation zone is presented in Table 3.7.

Table 3.7 **Vegetation integrity scores for all vegetation zones**

Vegetation zone	PCT	Condition	Vegetation integrity score
1	510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	Low_woodland	15.5
2	510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	Moderate_DNG	2.8
3	510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	Moderate_Pasture	2.6
4	510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	Woodland_moderate	57.1
5	567 - Broad-leaved Stringybark - Yellow Box shrub/grass open forest of the New England Tableland Bioregion	Woodland_moderate	61.4

4 Threatened species

4.1 Habitat assessment

Concurrent with the vegetation mapping, habitat assessments were undertaken seeking to identify the following fauna habitat features within the subject land:

- habitat trees including large hollow-bearing trees;
- availability of flowering shrubs and feed tree species;
- waterway condition;
- quantity of ground litter and logs; and
- searches for indirect evidence of fauna.

The habitat within PCT 510_Woodland and PCT 510_Pasture (Appendix A) is consistent with habitat described in Section 5.1 of the BDAR (EMM 2018).

The majority of the subject land is cleared of canopy and midstorey vegetation. This habitat is likely to support fauna species which are able to persist in highly modified agricultural landscapes.

A smaller portion of woodland habitat occurs within the subject land, which contains a variety of key habitat features with the potential to support a greater diversity of fauna species. These habitat features include a diversity of eucalypts, a midstorey dominated by *Acacia* species, woody debris and leaf litter. Hollow-bearing trees are also present.

There is a lack aquatic habitat within the subject land with any historically occurring watercourses no longer present, likely due to surrounding agricultural practices, including implementation of drainage contours and dams.

Aquatic habitat within a broader vicinity of the subject land is limited to small farm dams and the ephemeral Barley Field Lagoon. Barley Field Lagoon is approximately 50 m from the subject land at its closest point. Given that the lagoon is highly ephemeral, its value to fauna is likely to be limited to highly mobile species such as waterbirds, which may be able to utilise a periodic resource.

No impacts to the lagoon are anticipated as a result of the proposed modification.

4.2 Ecosystem credit species (ie 'predicted' species) assessment

A list of ecosystem credit species predicted to occur within the subject land is provided in Table 4.1. This list has been generated by the BAM calculator, based on the mapped PCTs. The potential for these 'predicted' species to occur within the subject land was assessed in accordance with Section 6.2 of the BAM (OEH 2017a).

Species for which formally described habitat constraints and geographic limitations (as listed in the Threatened Biodiversity Data Collection) do not apply to the subject land were excluded from further assessment as an ecosystem credit species.

Table 4.1 **Assessment of ecosystem credit species within the subject land**

Scientific name	Common name	Justification for exclusion
<i>Anthochaera phrygia</i>	Regent Honeyeater (foraging)	Excluded from PCT 510_DNG and PCT 510_pasture as no suitable feed trees are present.
<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow	Excluded from PCT 510_DNG and PCT 510_pasture as no suitable feed trees are present.
<i>Calyptrorhynchus lathamii</i>	Glossy Black-Cockatoo (foraging)	Excluded from all vegetation zones as no suitable feed trees are present.
<i>Chalinolobus nigrogriseus</i>	Hoary Wattled Bat	Not excluded.
<i>Chthonicola sagittata</i>	Speckled Warbler	Excluded from PCT 510_DNG and PCT 510_pasture as no woodland habitat present.
<i>Circus assimilis</i>	Spotted Harrier	Not excluded.
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper	Excluded from PCT 510_DNG and PCT 510_pasture as no woodland habitat present.
<i>Daphoenositta chrysoptera</i>	Varied Sittella	Excluded from PCT 510_DNG and PCT 510_pasture as no woodland habitat present.
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	Not excluded.
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	Not excluded.
<i>Glossopsitta pusilla</i>	Little Lorikeet	Excluded from PCT 510_DNG and PCT 510_pasture as no woodland habitat present.
<i>Grantiella picta</i>	Painted Honeyeater	Excluded from all vegetation zones except PCT 567_woodland as mistletoes not present at a density of greater than five plants per hectare.
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle (foraging)	Excluded from all vegetation zones given the lack of preferred aquatic foraging habitat within proximity to the subject land.
<i>Hieraaetus morphnoides</i>	Little Eagle (foraging)	Not excluded.
<i>Lathamus discolor</i>	Swift Parrot (foraging)	Excluded from PCT 510_DNG and PCT 510_pasture as no woodland habitat present.
<i>Lophoictinia isura</i>	Square-tailed Kite (foraging)	Not excluded.
<i>Melanodryas cucullata cucullata</i>	Hooded Robin (south-eastern form)	Excluded from PCT 510_DNG and PCT 510_pasture as no woodland habitat present.
<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater (eastern subspecies)	Not excluded.
<i>Miniopterus orianae oceanensis</i>	Eastern Bent-winged Bat (foraging)	Excluded from PCT 510_DNG and PCT 510_pasture as no woodland habitat present.
<i>Neophema pulchella</i>	Turquoise Parrot	Excluded from PCT 510_DNG and PCT 510_pasture as no woodland habitat present.
<i>Ninox connivens</i>	Barking Owl (foraging)	Not excluded.
<i>Ninox strenua</i>	Powerful Owl (foraging)	Excluded from all vegetation zones as subject land is more than 5 km away from the Macleay Gorges subregion.
<i>Petaurus australis</i>	Yellow-bellied Glider	Not excluded.
<i>Petroica boodang</i>	Scarlet Robin	Not excluded.
<i>Petroica phoenicea</i>	Flame Robin	Not excluded.
<i>Phascolarctos cinereus</i>	Koala (foraging)	Excluded from PCT 510_DNG and PCT 510_pasture as no woodland foraging habitat present.
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox (foraging)	Excluded from PCT 510_DNG and PCT 510_pasture as no foraging habitat present.
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	Not excluded.
<i>Stagonopleura guttata</i>	Diamond Firetail	Not excluded.
<i>Tyto novaehollandiae</i>	Masked Owl (foraging)	Excluded from PCT 510_DNG and PCT 510_pasture as no foraging habitat present.

4.3 Species credit species (ie 'candidate' species) assessment

4.3.1 Assessment of habitat constraints

An assessment of habitat constraints and geographic limitations for potential 'candidate' species was undertaken in accordance with Step 2 of Section 6.4 of the BAM (OEH 2017a).

For those species for which habitat constraints or geographic limitations are formally described (in the Threatened Biodiversity Data Collection), an assessment was undertaken to determine if those species can be excluded on the basis of these constraints/limitations or require additional consideration.

The results of this assessment are presented in Table 4.2 and indicate that the following species can be excluded from requiring further consideration:

- Regent Honeyeater;
- Narrow-leaved Bertya;
- Granite Boronia;
- Pygmy Cypress Pine;
- Large-eared Pied Bat;
- Beadle's Grevillea;
- White-Bellied Sea-Eagle (Breeding);
- Swift Parrot (Breeding);
- Large Bent-winged Bat (Breeding);
- Southern Myotis;
- Powerful Owl;
- Brush-tailed Rock-wallaby; and
- Grey-headed Flying-fox (Breeding).

No further assessment is required for the species listed above as per Section 6.4.1.13 of the BAM (OEH 2017a).

All other species have not been excluded on the basis of the identified geographic or habitat constraints.

Further consideration is given to these species in Section 4.3.2.

Table 4.2 **Assessment of geographic and habitat features and habitat constraints within the subject land for potential candidate species**

Scientific name	Common name	Feature	Sensitivity to gain class	Habitat/geographic constraint present in subject land	Justification
<i>Anthochaera phrygia</i>	Regent Honeyeater (Breeding)	As per mapped areas.	High	No	The subject land is outside any mapped important areas for the Regent Honeyeater.
<i>Bertya ingramii</i>	Narrow-leaved Bertya	- Cliffs or within 20 m. - Escarpments or within 20 m. - Rocky areas or within 20 m.	High	No	Cliffs, escarpments and rocky areas are absent.
<i>Boronia granitica</i>	Granite Boronia	- Rocky areas. - Appropriate vegetation within 50 m of granite outcrops or slabs.	High	No	Appropriate granite outcrops, rocky crevices, granitic scree and shallow soils are absent.
<i>Burhinus grallarius</i>	Bush Stone Curlew	Fallen/standing dead timber including logs.	High	Yes	Woodland areas contain fallen timber.
<i>Callitris oblonga</i>	Pygmy Cypress Pine	East of Chandler River.	High	No	The subject land is west of the Chandler River.
<i>Calyptrorhynchus lathamii</i>	Glossy Black-Cockatoo (Breeding)	- Hollow bearing trees. - Living or dead tree with hollows greater than 15 cm diameter and greater than 5 m above ground.	High	Yes	Hollow-bearing trees containing large hollows are present in the subject land.
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	- Cliffs. - Within 2 km of rocky areas containing caves, overhangs, escarpments, outcrops, or crevices, or within 2 km of old mines or tunnels.	Very High	No	None of the required features exist.
<i>Grevillea beadleana</i>	Beadle's Grevillea	- Cliffs or within 200 m. - Escarpments or within 200 m. - Rocky areas or within 200 m. - Oxley Wild Rivers National Park or within a 10 km buffer around the park.	High	No	None of the required features exist and the subject land is over 10 km from Oxley Wild Rivers National Park.

Table 4.2 **Assessment of geographic and habitat features and habitat constraints within the subject land for potential candidate species**

Scientific name	Common name	Feature	Sensitivity to gain class	Habitat/geographic constraint present in subject land	Justification
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle (Breeding)	Living or dead mature trees within suitable vegetation within 1 km of a rivers, lakes, large dams or creeks, wetlands and coastlines.	High	No	The subject land contains large trees within 1 km of Barley Field lagoon, which is a grassy paddock that periodically floods. Barley Field Lagoon was dry during all site visits.
<i>Hieraaetus morphnoides</i>	Little Eagle (Breeding)	Nest trees – live (occasionally dead) large old trees within vegetation.	Moderate	Yes	The subject land contains large suitable nest trees.
<i>Lathamus discolor</i>	Swift Parrot (Breeding)	As per mapped areas.	Moderate	No	The subject land is outside any mapped important areas for the Swift Parrot.
<i>Lophoictinia isura</i>	Square-tailed Kite (Breeding)	Nest trees.	Moderate	Yes	The subject land contains large suitable nest trees.
<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat (Breeding)	Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records with microhabitat code "IC - in cave;" observation type code "E nest-roost;" with numbers of individuals >500.	Very high	No	None of the required features exist.
<i>Myotis macropus</i>	Southern Myotis	- Hollow bearing trees within 200 m of riparian zone. - Bridges, caves or artificial structures within 200 m of riparian zone. - Waterbodies – this includes rivers, creeks, billabongs, lagoons, dams and other waterbodies on or within 200 m of the site.	High	No	No waterbodies within 200 m of the subject land contained water at the time of survey. There are no differentiated riparian zones within 200 m of the subject land.
<i>Ninox connivens</i>	Barking Owl (Breeding)	- Hollow bearing trees. - Living or dead trees with hollows greater than 20 cm diameter and greater than 4m above the ground.	High	Yes	Hollow-bearing trees containing large hollows are present in the subject land.

Table 4.2 **Assessment of geographic and habitat features and habitat constraints within the subject land for potential candidate species**

Scientific name	Common name	Feature	Sensitivity to gain class	Habitat/geographic constraint present in subject land	Justification
<i>Ninox strenua</i>	Powerful Owl (Breeding)	- Hollow bearing trees. - Living or dead trees with hollow greater than 20 cm diameter. - Within 5 km buffer of Macleay Gorges subregion.	High	No	Hollow-bearing trees containing large hollows are present in the subject land. However, the subject land is more than 5 km from the Macleay Gorges subregion.
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	Land within 1 km of rocky escarpments, gorges, steep slopes, boulder piles, rock outcrops or clifflines.	Very high	No	No such habitat features exist.
<i>Phascolarctos cinereus</i>	Koala (Breeding)	- Areas identified via survey as important habitat. - Important habitat is defined by the density of Koalas and quality of habitat determined by on-site survey.	High	Yes	The species has been assumed present.
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox (Breeding)	Breeding camps.	High	No	No breeding camps were observed.
<i>Tyto novaehollandiae</i>	Masked Owl (Breeding)	- Hollow bearing trees - Living or dead trees with hollows greater than 20 cm diameter	High	Yes	Hollow-bearing trees containing large hollows are present in the subject land.

4.3.2 Identifying candidate species credit species for further assessment

The species credit species in Table 4.3 are potential 'candidate' species that cannot be excluded on the basis of missing habitat constraints or geographic limitations.

For these potential 'candidate' species, further assessment of habitat suitability was undertaken in accordance with Step 3 of Section 6.4 of the BAM (OEH 2017a) to identify a confirmed list of 'candidate' species for which further assessment was required to determine presence.

Table 4.3 Further habitat suitability assessment for potential candidate species

Common name	Scientific name	Candidate species	Justification
Flora			
Barrington Tops Ant Orchid	<i>Chiloglottis platyptera</i>	No	Grows in moist areas in tall open eucalypt forest with a grassy understorey, and also around rainforest edges. Found along the eastern edge of the New England Tablelands, from Ben Halls Gap to east of Tenterfield, and also in the Barrington Tops area. It generally occurs in rich brown loam soils. No suitable habitat exists within the subject land given that mesic rich brown loam soils are absent from the subject land. The high disturbance and grazing pressure also precludes this species from occurring.
Bluegrass	<i>Dichanthium setosum</i>	Yes	Bluegrass occurs on heavy basaltic black soils and red-brown loams with clay subsoil. It is often found in moderately disturbed areas such as cleared woodland, grassy roadside remnants and highly disturbed pasture. Locally common or found as scattered clumps in broader populations. Given this species can occur in disturbed areas and suitable soils types are present, this species has the potential to occur within the subject land.
Small Snake Orchid	<i>Diuris pedunculata</i>	No	The Small Snake Orchid grows on grassy slopes or flats. Often on peaty soils in moist areas and also on shale and trap soils, on fine granite, and among boulders. No suitable soil types exist within the subject land. The Small Snake Orchid is susceptible to grazing and with the grazing pressure within the subject land, the species is unlikely to occur.
Northern Blue Box	<i>Eucalyptus magnificata</i>	Yes	Grassy open forest or woodland on shallow, sandy or loamy soils. Occurs on moderately hilly sites and at the edge of gorges, usually at altitudes from 900–1,050 m. Known in NSW from only a few widely separate populations on the New England Tablelands, around Hillgrove east of Armidale and in the Glen Innes and Tenterfield region, where they occur individually or in small populations. This species cannot be excluded based on habitat basis alone.
Narrow-leaved Black Peppermint	<i>Eucalyptus nicholii</i>	Yes	This species is sparsely distributed but widespread on the New England Tablelands from Nundle to north of Tenterfield, being most common in central portions of its range. Typically grows in dry grassy woodland, on shallow soils of slopes and ridges. Found primarily on infertile soils derived from granite or metasedimentary rock. This species cannot be excluded based on habitat basis alone.
Tall Velvet Sea-berry	<i>Haloragis exalata</i> subsp. <i>velutina</i>	No	Grows in damp places near watercourses. This subspecies also occurs in woodland on the steep rocky slopes of gorges. No suitable habitat exists within the subject land.
Hawkweed	<i>Picris evae</i>	Yes	All recent collections appear to come from modified habitats such as weedy roadside vegetation and paddocks. Its main habitat is open Eucalypt forest including a canopy of Yellow Box, Narrow-leaved Ironbark (<i>Eucalyptus crebra</i>), Poplar Box (<i>E. populnea</i>), White Box, Broad-leaves Apple (<i>Angophora subvelutina</i>), Forest Oak (<i>Allocasuarina torulosa</i>), and/or River Oak (<i>Casuarina cunninghamiana</i>) with a <i>Dichanthium</i> sp. grassy understorey. Soils are black, dark grey or red-brown (specified as shallow, stony soil over basalt for one collection) and reddish clay-loam or medium clay soils. The flowering and fruiting period is mainly October to January, with a few plants collected in flower or fruit until May. This species cannot be excluded based on habitat basis alone.

Table 4.3 Further habitat suitability assessment for potential candidate species

Common name	Scientific name	Candidate species	Justification
Silky Swainson-pea	<i>Swainsona sericea</i>	Yes	Found in Box-Gum Woodland in the Southern Tablelands and South West Slopes, sometimes in association with cypress-pines <i>Callitris</i> spp. This species has the potential to occur within the subject land owing to the presence of Box Gum woodland habitat.
Austral Toadflax	<i>Thesium australe</i>	Yes	Austral Toadflax occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast, often in association with Kangaroo Grass (<i>Themeda australis</i>). This species is a root parasite that takes water and some nutrients from other plants, especially Kangaroo Grass. This species is found in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands region. This species has the potential to occur within the subject land owing to the presence of grassy woodland and DNG with Kangaroo Grass.
Amphibians			
Tusked Frog population in the Nandewar and New England Tableland Bioregions	<i>Adelotus brevis</i> - endangered population	No	Rainforests, wet forests and flooded grassland and pasture. They are usually found near creeks, ditches and ponds, and call while hidden amongst vegetation or debris. The subject land does not contain suitable aquatic breeding habitat, nor is there any adjacent breeding habitat.
Glandular Frog	<i>Litoria subglandulosa</i>	No	Glandular Frogs may be found along streams in rainforest, moist and dry eucalypt forest or in subalpine swamps. The subject land does not contain suitable aquatic breeding habitat, nor is there any adjacent breeding habitat.
Reptiles			
Pale-headed Snake	<i>Hoplocephalus bitorquatus</i>	Yes	Found mainly in dry eucalypt forests and woodlands, cypress forest and occasionally in rainforest or moist eucalypt forest. The species may occur within woodland areas within the subject land.
Birds			
Bush Stone-curlew	<i>Burhinus grallarius</i>	Yes	Inhabits open forests and woodlands with a sparse grassy ground layer and fallen timber. Species has the potential to occur within woodland areas within the subject land.
Glossy Black-Cockatoo (Breeding)	<i>Calyptorhynchus lathami</i>	Yes	Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of Sheoak occur (<i>Casuarina</i> and <i>Allocasuarina</i> spp.). Dependent on large hollow-bearing eucalypts for nest sites. Although no foraging resources were present for the species there is potential for the species to nest within woodland areas within the subject land.
Little Eagle (Breeding)	<i>Hieraetus morphnoides</i>	Yes	Occupies open eucalypt forest, woodland or open woodland. Sheoak or <i>Acacia</i> woodlands and riparian woodlands of interior NSW are also used. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter. The species has the potential to nest within woodland areas within the subject land.

Table 4.3 Further habitat suitability assessment for potential candidate species

Common name	Scientific name	Candidate species	Justification
Square-tailed Kite (breeding)	<i>Lophoictinia isura</i>	Yes	Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses. Nest sites generally located along or near watercourses, in a fork or on large horizontal limbs. The species has the potential to nest within woodland areas within the subject land.
Barking Owl (Breeding)	<i>Ninox connivens</i>	Yes	Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. Requires large tree hollow for breeding. Hollow-bearing trees with large hollows are present in the subject land.
Masked Owl (Breeding)	<i>Tyto novaehollandiae</i>	No	Lives in dry eucalypt forests and woodlands from sea level to 1,100 m. Requires large tree hollow for breeding, or sometimes caves. Strong preference for breeding and roosting sites within moist eucalypt forests in gullies; this habitat is not present in the subject land.
Mammals			
Eastern Pygmy Possum	<i>Cercartetus nanus</i>	Yes	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. The species has the potential occur within woodland areas within the subject land.
Squirrel Glider	<i>Petaurus norfolcensis</i>	Yes	The Squirrel Glider inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. The species prefers mixed species stands with a shrub or Acacia mid-storey. The species relies on large old trees with hollows for breeding and nesting; however, trees need to be less than 50 m apart. The species may occur within woodland areas of the subject land.
Koala (Breeding)	<i>Phascolarctos cinereus</i>	Yes	Koala inhabits eucalypt woodlands and forests, feeding on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species. The subject land is within the Northern Tablelands Koala Management Area. One primary feed tree was recorded within the subject land, Ribbon Gum, though this was not dominant. Yellow Box, secondary feed trees, were recorded within the subject land. The species may occur within woodland areas within the subject land.

This assessment confirmed six threatened flora and nine threatened fauna as candidate species requiring further assessment to determine presence. Confirmed candidate species are outlined in Table 4.4.

Table 4.4 Confirmed candidate species

Scientific name	Common name	BC Act	EPBC Act	Assumed present/surveyed
Flora				
<i>Dichanthium setosum</i>	Bluegrass	V	VU	Assumed present
<i>Eucalyptus magnificata</i>	Northern Blue Box	V	-	Surveyed
<i>Eucalyptus nicholii</i>	Narrow-leaved Black Peppermint	V	VU	Surveyed
<i>Picris evae</i>	Hawkweed	V	VU	Assumed present
<i>Swainsona sericea</i>	Silky Swainson-pea	V	-	Surveyed
<i>Thesium australe</i>	Austral Toadflax	V	VU	Assumed present
Reptiles				
<i>Hoplocephalus bitorquatus</i>	Pale-headed Snake	V	-	Assumed present
Birds				
<i>Burhinus grallarius</i>	Bush Stone-curlew	E	-	Surveyed
<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo (Breeding)	V	-	Assumed present
<i>Hieraetus morphnoides</i>	Little Eagle (Breeding)	V	-	Surveyed
<i>Lophoictinia isura</i>	Square-tailed Kite (Breeding)	V	-	Surveyed
<i>Ninox connivens</i>	Barking Owl (Breeding)	V	-	Assumed present
Mammals				
<i>Cercartetus nanus</i>	Eastern Pygmy Possum	V	-	Surveyed
<i>Petaurus norfolcensis</i>	Squirrel Glider	V	-	Assumed present
<i>Phascogale cinerea</i>	Koala (Breeding)	V	VU	Assumed present

Notes: 1. BC Act status: E4A – critically endangered, E1 – endangered, E2 – endangered population, V – vulnerable
2. EPBC Act status: CE – critically endangered, EN – endangered, VU – vulnerable

4.3.3 Targeted species survey methods

i Flora surveys

Flora surveys were conducted for Northern Blue Box and Narrow-leaved Black Peppermint during August 2019. All rough-barked and box-type bark trees within the subject land were assessed to determine the presence or absence of the species. These surveys were undertaken on foot over two days (12 and 13 August 2019) and focussed on the strip of vegetation either side of the existing roads/vehicular tracks.

Flora surveys were conducted for Silky Swainson-pea during September and October 2020. Walking transects were undertaken over two days (29 and 30 September 2020) and focussed on the strip of vegetation either side of the existing roads/vehicular tracks.

Targeted surveys for the above threatened flora species were undertaken via parallel transects and generally in accordance with the *NSW Guide to Surveying Threatened Plants* (OEH 2016, DPIE 2020). Due to the narrow configuration of the subject land, only one transect per roadside was required.

ii Raptor breeding surveys

Raptor surveys were conducted during August 2019 for Little Eagle and Square-tailed Kite breeding habitat. All large trees within the subject land were viewed to determine the presence or absence of large stick nests. The surveys were conducted concurrently with the threatened eucalypt surveys.

Additional survey was undertaken over 30 September and 1 October 2020.

iii Call playback and spotlighting surveys

Call playback and spotlighting surveys for Bush Stone-curlew were undertaken by two ecologists over two nights (30 September and 1 October 2020) at four locations each night.

At each site, calls were broadcasted three times. Each broadcast was followed by a five-minute listening period. Spotlighting was undertaken at the conclusion of each call playback survey, involving walking through areas of potential habitat around the broadcast site (with powerful spotlights).

The total call playback survey effort was approximately four person hours (ie approximately 0.5 person hours per site, each night).

iv Infra-red camera surveys

Infra-red camera surveys were undertaken for Eastern Pygmy-possum. Five infra-red camera units were deployed at various locations within woodland/open forest habitat over 15 nights (set up 30 September and retrieved 15 October 2020), totalling 75 trap nights. The cameras were focussed on arboreal bait stations set up with bait tubes containing a honey mixture as an attractant.

v Hollow-bearing tree survey

A systematic hollow-bearing tree survey was undertaken within the subject land over two days (30 September and 1 October 2020), during which the following information was recorded:

- location of tree;
- tree species;
- diameter at breast height (cm); and
- number of hollows by hollow entrance size (small <5 cm, medium 5–20 cm, large >20 cm, very large >40 cm).

4.3.4 Targeted species survey results

i Threatened flora

No threatened eucalypt species were identified during the targeted species surveys and it is concluded that neither the Northern Blue Box nor the Narrow-leaved Black Peppermint occur within the subject land. No Silky Swainson-pea was detected during targeted survey in the known flowering season.

ii Threatened fauna

The raptor breeding survey did not reveal any large stick nests; therefore, it is concluded that neither the Little Eagle nor the Square-tailed Kite breed within the subject land. No Bush Stone-curlew was detected during nocturnal survey and no Eastern Pygmy-possum was recorded by camera trapping.

iii Hollow-bearing trees

A total of 26 hollow-bearing trees were recorded within the subject land (Table 4.5). Of these, six trees contained large to very large hollows that may be suitable for Barking Owl or Glossy Black-Cockatoo, with an additional 16 trees containing medium-sized hollows that may be suitable for Glossy Black-Cockatoo.

Table 4.5 Hollow-bearing tree data

Tree species		DBH (cm)	Hollow size category ¹ (cm)			
			Small	Medium	Large	Very large
1	Stag	90		1		
2	Rough barked Apple	100	1			
3	Stag (Rough-barked Apple)	-			1	
4	Yellow Box	80		1		
5	Yellow Box	70	1			
6	Stag	120		1	2	1
7	Yellow Box	70	1	1		
8	Yellow Box	-		1		
9	Stag	100	1	2	1	
10	Yellow Box	100		1		
11	Blakely's Red Gum	70	1			
12	Blakely's Red Gum	90		1		
13	Blakely's Red Gum	96		1		
14	Blakely's Red Gum	100		1		
15	Blakely's Red Gum	100		2		
16	Stringybark	110		2		
17	Stag (fallen)	70		1		
18	Stag (fallen)	90		2		
19	Blakely's Red Gum	80		1		
20	Blakely's Red Gum	70		2		
21	Stag	80		1		
22	Blakely's Red Gum	80		1	1	
23	Stag	-				1
24	Stag	150		3	1	
25	Stringybark	70	2			
26	Blakely's Red Gum	62		1		
Total			7	27	6	2

¹Refers to size of hollow entrance as visible from the ground: small <5 cm, medium 5-20 cm, large >20 cm, very large >40 cm.

4.3.5 Confirmed candidate species

A summary of the confirmed species requiring further assessment for species credits is provided within Table 4.6.

Species polygons were created in accordance with Step 5 of Section 6.4 of the BAM (OEH 2017a) to calculate species credits for species that were either assumed present or determined through survey to be present (and hence assessed as likely to be impacted by the proposed works).

Table 4.6 Candidate species requiring further assessment for species credits

Common name	Scientific name	Impacted by proposed works	Justification	Species polygons	Habitat present within the subject land included in species polygon
Flora					
Bluegrass	<i>Dichanthium setosum</i>	Assumed	Assumed present given the presence of suitable habitat.	Species polygon includes all vegetation zones representing habitat.	510_mod_DNG (0.06 ha) 510_mod_pasture (2.18 ha) 510_mod_woodland (0.74 ha) 567_mod_woodland (0.59 ha)
Northern Blue Box	<i>Eucalyptus magnificata</i>	No	Not recorded during targeted survey.	Not required.	Not applicable.
Narrow-leaved Black Peppermint	<i>Eucalyptus nicholii</i>	No	Not recorded during targeted survey.	Not required.	Not applicable.
Hawkweed	<i>Picris evae</i>	Assumed	Assumed present given the presence of suitable habitat.	Species polygon includes all vegetation zones representing habitat.	510_mod_DNG (0.06 ha) 510_mod_pasture (2.18 ha) 510_mod_woodland (0.74 ha) 567_mod_woodland (0.59 ha)
Silky Swainson-pea	<i>Swainsona sericea</i>	No	Not recorded during targeted survey.	Not required.	Not applicable.
Austral Toadflax	<i>Thesium australe</i>	Assumed	Assumed present given the presence of suitable habitat.	Species polygon includes all vegetation zones representing habitat.	510_mod_DNG (0.06 ha) 510_mod_pasture (2.18 ha) 510_mod_woodland (0.74 ha) 567_mod_woodland (0.59 ha)
Amphibians					
Pale-headed Snake	<i>Hoplocephalus bitorquatus</i>	Assumed	Assumed present given the presence of suitable habitat.	Species polygon includes all vegetation zones representing habitat.	510_mod_woodland (0.74 ha) 567_mod_woodland (0.59 ha)
Birds					
Bush Stone-curlew	<i>Burhinus grallarius</i>	No	Not recorded during targeted survey.	Not required.	Not applicable.

Table 4.6 Candidate species requiring further assessment for species credits

Common name	Scientific name	Impacted by proposed works	Justification	Species polygons	Habitat present within the subject land included in species polygon
Glossy Black-Cockatoo (Breeding)	<i>Calyptorhynchus lathami</i>	Assumed	Assumed present given the presence of suitable habitat.	Species polygon includes native vegetation within 200 m buffer of hollow-bearing trees containing medium to very large hollows.	510_low_woodland (0.26 ha) 510_mod_pasture (0.82 ha) 510_mod_woodland (0.61 ha) 567_mod_woodland (0.33 ha)
Little Eagle (Breeding)	<i>Hieraetus morphnoides</i>	No	Not recorded during targeted survey.	Not required.	Not applicable.
Square-tailed Kite (Breeding)	<i>Lophoictinia isura</i>	No	Not recorded during targeted survey.	Not required.	Not applicable.
Barking Owl (Breeding)	<i>Ninox connivens</i>	Assumed	Assumed present given the presence of suitable habitat.	Species polygon includes native vegetation within 100 m buffer of hollow-bearing trees containing large to very large hollows.	510_low_woodland (0.13 ha) 510_mod_pasture (0.07 ha) 510_mod_woodland (0.06 ha) 567_mod_woodland (0.01 ha)
Mammals					
Eastern Pygmy Possum	<i>Cercartetus nanus</i>	No	Not recorded during targeted survey.	Not required.	Not applicable.
Squirrel Glider	<i>Petaurus norfolcensis</i>	Assumed	Assumed present given the presence of suitable habitat.	Species polygon includes all vegetation zones representing habitat.	510_mod_woodland (0.74 ha) 567_mod_woodland (0.59 ha)
Koala (Breeding)	<i>Phascolarctos cinereus</i>	Assumed	Assumed present given the presence of suitable habitat.	Species polygon includes all vegetation zones representing habitat.	510_mod_woodland (0.74 ha) 567_mod_woodland (0.59 ha)

5 Impact assessment (biodiversity values)

5.1 Potential direct, indirect and prescribed impacts

A detailed assessment of potential direct, indirect and prescribed impacts is provided within the BDAR (EMM 2018). The most relevant direct impacts of the proposed road upgrades include the clearing of native vegetation and the removal of potential threatened species habitat.

Unmitigated, the proposed road upgrades have the potential to result in minor indirect or minor prescribed impacts. Prescribed impacts, as per Section 8.2.1.2 of the BAM (OEH 2017a), that are most relevant to this addendum include:

- vehicle collision with fauna; and
- fragmentation of habitats and associated impacts to connectivity and fauna movement.

Unmitigated indirect impacts that could occur as a result of the proposed road upgrades include:

- increased noise, vibration and dust levels; and
- increase in weeds and pathogens.

As discussed in the BDAR (EMM 2018), increased vehicle movements associated with the project have the potential to result in fauna vehicle strikes and associated fauna mortality. Mitigation measures outlined in Section 5.2 of this report and Section 6.2 of the BDAR (EMM 2018) have been presented to reduce this risk. The proposed modification will not contribute to an increase in the number of vehicle movements associated with the project.

The removal of native vegetation has the potential to result in fragmentation of fauna habitat, with resultant effects on fauna species movement, reproduction and gene flow. Within the subject land, the impact of vegetation clearance on habitat fragmentation is anticipated to be very low to negligible. Much of the vegetation removal is associated with grassland, which offers little connectivity benefit. The removal of woodland vegetation is limited to a narrow strip either side of an existing road/vehicular track (Section 1.1). This is unlikely to significantly reduce the ability of fauna to move across the landscape.

Construction activities may result in increased levels of noise and vibration. These impacts will be limited to relatively small sections of the subject land during road upgrades and impacts will be temporary in nature. Given the temporary nature of the disturbance and the ability for most species to move to other areas of adjacent habitat (that will not be impacted), significant impacts to fauna are not anticipated.

Increased movement of vehicles has the potential to transport weeds and pathogens into the subject land and adjacent vegetation. Mitigation measures to reduce the potential for the spread of weeds and pathogens are outlined in Section 6.2 of the BDAR (EMM 2018).

5.2 Measures to avoid, minimise and mitigate impacts

UPC has selected an access route which utilises existing sealed roads and unsealed tracks for its entirety. In sections where road widening is necessary, this is limited to narrow strips either side of the existing carriageway.

Additional recommendations, including measures to mitigate residual impacts, after all measures to avoid and minimise impacts have been considered, are provided in Table 6.1 of the BDAR (EMM 2018).

A biodiversity management plan (BMP) will be prepared in consultation with DPIE and BCD and in accordance with Condition 11 of Schedule 3 of SSD-9255 and will contain advice regarding the effective implementation of each of the biodiversity management and mitigation measures listed in Table 6.1 of the BDAR (EMM 2018).

Measures to mitigate impacts specific to the road upgrade works include reduced speed limits for project-related vehicle movements, which will be detailed in the traffic management plan (TMP). Given that the access route utilises public roads, reduced speed limits for public vehicles may not be enforced (except during road upgrade works).

5.3 Serious and irreversible impacts

White Box Yellow Box Blakely's Red Gum Woodland is considered a potential entity to meet the serious and irreversible impacts (SAILs) principle (refer Appendix 3 of the BAM (OEH 2017a)).

All five vegetation zones recorded within the subject land meet the criteria for the BC Act listing of White Box Yellow Box Blakely's Red Gum Woodland. Potential for SAILs to this ecological community have been considered in accordance with Section 10.2.2.1 of the BAM below.

a) The action and measures taken to avoid the direct and indirect impact on the potential entity for an SAIL.

UPC has selected an access route to the development site which utilises existing sealed roads and tracks for its entirety, with additional vegetation clearance restricted to narrow strips either side of the existing carriageway. This reduces clearance of Box Gum Woodland to the least amount possible whilst allowing scope for modifications to detailed design and meeting relevant road specifications and safety measures.

b) The area (ha) and condition of the threatened ecological community (TEC) to be impacted directly and indirectly by the proposed development. The condition of the TEC is to be represented by the vegetation integrity score for each vegetation zone.

The condition of the vegetation zones are described in detail in Section 3.2.3. The area and vegetation integrity scores are displayed in Table 5.1.

Two vegetation zones, PCT 510_pasture and PCT 510_DNG, have a vegetation integrity score of 2.6 and 2.8 respectively, which are both below the threshold requiring further assessment; therefore, these areas have not been considered further as per the BDAR. These areas are well below benchmark condition, given that livestock grazing pressure is relatively high and species diversity appears to be low. In many areas there is also a high presence of exotic pasture species.

The two moderate woodland vegetation zones (PCT 510_moderate, PCT 567_moderate) have a largely intact canopy cover and midstorey; however, are below benchmark, given grazing pressure from travelling livestock and historical earthworks associated with the original road construction.

The low woodland vegetation zone (PCT 510_moderate) is well below benchmark, with poor canopy health and missing midstorey. These areas are also affected by High Threat Weeds including Paspalum, African Lovegrass and Hawthorn. The ground cover does not appear to have a high native species diversity, despite noticeable recovery of ground cover growth since the August 2019 surveys.

Risks of indirect impacts to the TEC as a result of the proposed road upgrades are low and further reduced to negligible levels through mitigation measures outlined in Table 6.1 of the BDAR (EMM 2018).

Table 5.1 **Vegetation zones aligned with Box Gum woodland**

Vegetation zone	PCT	Condition	Vegetation integrity score	Area (ha)
1	510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	Low_woodland	15.5	0.26
2	510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	Moderate_DNG	2.8	0.06
3	510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	Moderate_pasture	2.6	2.18
4	510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	Moderate_woodland	57.1	0.74
5	567 - Broad-leaved Stringybark - Yellow Box shrub/grass open forest of the New England Tableland Bioregion	Moderate_woodland	61.4	0.59
Subtotal of vegetation above BAM threshold				1.59
Total				3.83

- c) A description of the extent to which the impact exceeds the threshold for the potential entity that is specified in the Guidance to assist a decision-maker to determine a serious and irreversible impact.**

No condition thresholds have been provided to date.

- d) The extent and overall condition of the potential TEC within an area of 1,000 ha, and then 10,000 ha, surrounding the subject land.**

A combination of Northern River Catchment Management Authority (VIS map 524) and Border Rivers Gwydir/Namoi Region Version 2.0. (VIS map 4467) vegetation mapping was used to calculate the area of vegetation in the surrounding area which align with the TEC.

A total of 149.92 ha of the TEC is mapped within a 1,000 ha buffer and 1,064.33 ha is mapped within a 10,000 ha buffer. Based on this mapping the clearance of 1.59 ha will represent a loss of 1.1% of the TEC within a 1,000 ha area and 0.1% within a 10,000 ha area.

- e) An estimate of the extant area and overall condition of the potential TEC remaining in the IBRA subregion before and after the impact of the proposed development has been taken into consideration.**

Vegetation mapping to PCT level was obtained for Armidale Plateau IBRA subregion, of which 26,927.59 ha includes PCTs aligned with the TEC. The removal of 1.59 ha will contribute to removal of 0.006% of the TEC.

- f) An estimate of the area of the potential TEC that is in the reserve system within the IBRA region and the IBRA subregion.**

The total area of the TEC mapped within the IBRA region is 4,108.52 ha, with 313.67 ha mapped within the subregion.

The development, clearing or biodiversity certification proposal's impact on:

- g) Abiotic factors critical to the long-term survival of the potential TEC; for example, how much the impact will lead to a reduction of groundwater levels or the substantial alteration of surface water patterns.**

The proposed works will have minimal abiotic influence on the TEC with groundwater and surface water unlikely to be significantly altered.

- h) Characteristic and functionally important species through impacts such as, but not limited to, inappropriate fire/flooding regimes, removal of understorey species or harvesting of plants.**

The ecosystem functioning of the TEC is currently impacted by surrounding agricultural land use and the current use of the existing roads. The road upgrades are likely to cause minor indirect impacts, none of which are likely to significantly exacerbate impacts to any functionally important species.

- j) The quality and integrity of an occurrence of the potential TEC through threats and indirect impacts including, but not limited to, assisting invasive flora and fauna species to become established or causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants which may harm or inhibit growth of species in the potential TEC.**

The TEC is currently surrounded by agricultural land and is adjacent to an existing road. The widening of the road and subsequent increased traffic volumes during construction of the project will have negligible impacts, given that any increases in the magnitude of these impacts are temporary and otherwise will remain consistent with the currently existing threats and indirect impacts. The sealing of currently unsealed roads and tracks has the potential to benefit the adjacent remaining TEC by reducing the amount of dust.

- k) Direct or indirect fragmentation and isolation of an important area of the potential TEC.**

The TEC is adjacent to an existing road and is already subjected to fragmentation owing to surrounding agriculture. Removal of the TEC will be limited to a narrow strip either side of the current road alignment, which is considered unlikely to significantly exacerbate fragmentation or isolation of the TEC. The TEC will not be intersected at any point as a result of the road upgrades, remaining within the wider road reserve area.

- l) The measures proposed to contribute to the recovery of the potential TEC in the IBRA subregion.**

The TECs will be offset in accordance with the BAM which, owing to management, will result in a functionally superior and viable community compared to that in the subject land.

5.4 Impacts requiring offsets

This section provides an assessment of the impacts requiring offsetting in accordance with Section 10 of the BAM (OEH 2017a).

5.4.1 Impacts on native vegetation

Impacts to native vegetation requiring offsets are summarised in Table 5.2. A total of 41 ecosystem credits are required to offset the residual impacts of the road upgrades. A credit report is provided in Appendix B.

Offsets will be provided in accordance with the biodiversity offset framework outlined in Section 6.5 of the BDAR (EMM 0218).

Table 5.2 **Ecosystem credits required**

Vegetation zone number	PCT	Vegetation zone name	Area (ha)	Vegetation integrity score	Future vegetation integrity score	Change in vegetation integrity score	Credits required
1	510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	510_low_woodland	0.26	15.5	0	-15.5	2
4	510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	510_moderate_woodl and	0.74	57.1	0	-57.1	21
5	567 - Broad-leaved Stringybark - Yellow Box shrub/grass open forest of the New England Tableland Bioregion	567_moderate_woodl and	0.59	61.4	0	-61.4	18

5.4.2 Impacts on threatened species

Impacts to species requiring offsets include three threatened flora species and five fauna species. A summary of the species credits required for all vegetation zones is provided in Table 5.3. A total of 271 species credits are required to offset the residual impacts of the road upgrades. A credit report is provided in Appendix B.

Offsets will be provided in accordance with the biodiversity offset framework outlined in Section 6.6 of the BDAR (EMM 2018).

Table 5.3 Threatened species credits required

Species	Vegetation zone name	Area (ha)/individual (HL)	Habitat condition	Candidate SAI	Species credits required
Glossy Black-Cockatoo	510_low_woodland	0.26	-15.5	No	2
	510_moderate_pasture	0.82	-2.6	No	1
	510_moderate_woodland	0.61	-57.1	No	17
	567_moderate_woodland	0.33	-61.4	No	10
Bluegrass	510_moderate_DNG	0.06	-2.8	No	1
	510_moderate_pasture	2.2	-2.6	No	3
	510_moderate_woodland	0.74	-57.1	No	21
	567_moderate_woodland	0.59	-61.4	No	18
Pale-headed Snake	510_moderate_woodland	0.74	-57.1	No	21
	567_moderate_woodland	0.59	-61.4	No	18
Barking Owl	510_low_woodland	0.13	-15.5	No	1
	510_moderate_pasture	0.07	-2.6	No	1
	510_moderate_woodland	0.06	-57.1	No	2
	567_moderate_woodland	0.01	-61.4	No	1
Squirrel Glider	510_moderate_woodland	0.74	-57.1	No	21
	567_moderate_woodland	0.59	-61.4	No	18
Koala	510_moderate_woodland	0.74	-57.1	No	21
	567_moderate_woodland	0.59	-61.4	No	18
Hawkweed	510_moderate_DNG	0.06	-2.8	No	1
	510_moderate_pasture	2.2	-2.6	No	3
	510_moderate_woodland	0.74	-57.1	No	21
	567_moderate_woodland	0.59	-61.4	No	18
Austral Toadflax	510_moderate_DNG	0.06	-2.8	No	1
	510_moderate_pasture	2.2	-2.6	No	2
	510_moderate_woodland	0.74	-57.1	No	16
	567_moderate_woodland	0.59	-61.4	No	14

5.5 Impacts not requiring offsets

A number of vegetation zones were degraded and below the minimum vegetation integrity score (ie 15) that requires offsetting. In line with the requirements of Section 10.3.2.2 of the BAM (OEH 2017a), impacts to the vegetation zones in Table 5.4 do not require offsets.

Additional areas not requiring assessment in accordance with Section 10.4 of the BAM (OEH 2017a) include:

- existing roads;
- cleared and highly disturbed land; and
- watercourses.

Table 5.4 Summary of impacts not requiring offsets – native vegetation

Veg zone number	PCT	Vegetation zone name	Area (ha)	Vegetation integrity score	Future vegetation integrity score	Change in vegetation integrity score	Credits required
2	510-Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	510_moderate_ DNG	0.06	2.8	0	-2.8	0
3	510-Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	510_moderate_ pasture	2.18	2.6	0	-2.6	0

5.6 Cumulative impacts

As outlined in Section 1.2 this BDAR addendum accompanies a modification application to SSD-9255. A total of 203 ecosystem credits and 271 species credits are required to offset the residual impacts of the project and the proposed modification (Table 5.5). Offsets will be provided in accordance with the biodiversity offset framework outlined in Section 6.5 of the BDAR (EMM 0218).

Table 5.5 Ecosystem and species credits required for the project and proposed modification

Plant community types, paddock trees and threatened species	Number of credits required		
	The project	Proposed modification ¹	Cumulative
PCT 510 – Blakely’s Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	35	23	58
Paddock trees assigned to PCT 510 – Blakely’s Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	49	0	49
PCT 567 – Broad-leaved Stringybark - Yellow Box shrub/grass open forest of the New England Tableland Bioregion	0	18	18
PCT 1174 – Silvertop Stringybark open forest of the New England Tableland Bioregion	73	0	73
Paddock trees assigned to PCT 1174 – Silvertop Stringybark open forest of the New England Tableland Bioregion	5	0	5
Austral Toadflax	0	33	33
Barking Owl	0	5	5
Bluegrass	0	43	43
Glossy Black-Cockatoo	0	30	30
Hawkweed	0	43	43
Koala	0	39	39
Pale-headed Snake	0	39	39
Squirrel Glider	0	39	39
Total	162	312	474

1. Ecosystem and species credits required for the proposed modification are inclusive of credits for the road upgrade assessed in the supplementary BDAR. Accordingly, credits for the proposed modification supersede and replace credit requirements for the road upgrade assessed in the supplementary BDAR (EMM 2019).

5.7 Biodiversity offset framework

Section 6.6 of the BDAR (EMM 2018) provides an outline of methods which UPC can use to meet their credit obligation for the proposed modification, including purchasing credits, payment into the Biodiversity Conservation Trust (BCT) and establishment of a biodiversity stewardship site.

5.7.1 Purchasing credits

As stated in the BDAR (EMM 2018), UPC may be able to purchase existing credits available on the market and retire these to satisfy their offset obligations. Initially, like-for-like options should be fully investigated before any variation criteria is explored under Clause 6.2 of the NSW Biodiversity Conservation Regulation 2017 (BC Regulation).

Like-for-like attributes for each of the species credit species, is the species itself. Like-for-like attributes for PCT 510 are provided in the BDAR (EMM 2018) and remain unchanged; however, PCT 567 was not recorded in the development site.

Like-for-like options for PCT 567 are the same as PCT 510 and are as follows:

- require hollows to be present in the offset vegetation;

- the community needs to be within any IBRA subregion that is within 100 km of the outer edge of the development site/subject land; or in one of the following IBRA subregions; Armidale Plateau, Bundarra Downs, Coffs Coast and Escarpment, Eastern Nandewars, Ebor Basalts, Glenn Innes-Guyra Basalts, Macleay Gorges, Moredun Volcanics, Round Mountain, Walcha Plateau, Wongwibinda Plateau and Yarrowyck-Kentucky Downs; and
- PCT 510 can be offset with PCTs which meet the White Box Yellow Box Blakely's Red Gum Woodland TEC (including PCT's 2, 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 506, 508, 509, 510, 511, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 840, 847, 851, 921, 1099, 1103, 1303, 1304, 1307, 1324, 1329, 1330, 1331, 1332, 1333, 1334, 1383, 1401, 1512, 1601, 1606, 1608, 1611, 1691, 1693, 1695 and 1698).

5.7.2 Payment into the Biodiversity Conservation Trust

The Biodiversity Offsets Payment Calculator (BOPC) provides a current credit price for the ecosystem credits required, noting that the credit prices are market-based and may fluctuate. Credit prices are typically updated on a quarterly basis (last updated 22 October 2020).

If UPC elects to pay into the BCT at current prices, the ecosystem credits associated with the proposed modification will cost \$308,312.83 and species credits will cost \$126,598.49, with a combined total of \$434,911.32 (all prices are exclusive of GST).

5.7.3 Establishment of a biodiversity stewardship site

UPC may wish to establish a biodiversity stewardship agreement by acquiring suitable land or using any existing land holdings. This involves permanent conservation and management of the biodiversity values on the land.

6 Assessment against key legislation and policy

6.1 Environment Protection and Biodiversity Conservation Act 1999

An assessment of the impacts of the project on matters of national environmental significance (MNES), considering cumulative impacts of the development site and the subject land, was prepared to determine whether referral of the project to the Commonwealth Minister for the Environment is required.

A detailed desktop assessment was completed, evaluating a range of information sources, including a search of the Protected Matter Search Tool (PMST) (Appendix C).

A likelihood of occurrence assessment was completed for each entity individually (Appendix D). This assessment concluded one TEC, seven threatened species and one migratory species as being recorded or considered as having a moderate or high likelihood of occurring. These include:

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and derived native grassland;
- Vulnerable flora:
 - Bluegrass;
 - Austral Toadflax;
- Critically endangered fauna:
 - Regent Honeyeater;
 - Swift Parrot;
- Vulnerable fauna:
 - Painted Honeyeater;
 - Koala;
 - White-throated Needletail (*Hirundapus caudacutus*); and
- Migratory fauna:
 - Fork-tailed Swift (*Apus pacificus*).

To support a determination as to whether the project is likely to have a 'significant impact' on MNES the *Matters of National Environmental Significance – Significance Impact Guidelines 1.1* (DoE 2013) have been applied.

A 'significant impact' is defined as:

An impact which is important, notable, or of consequence, having regard to its context or intensity. Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment, which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts (DoE 2013).

Consideration has been given to all threatened species and communities and migratory species recorded and/or with potential to occur within the subject land, with reference to DoE (2013). Significant impact assessments have been completed for the MNES listed above and are provided in Appendix E.

All assessments concluded that no significant impacts on threatened entities are predicted to result from the project (including the proposed modification). Referral of the project to the Commonwealth Minister for the Environment for assessment is not required.

MNES relevant to the development site and subject land are summarised in Table 6.1.

Table 6.1 **Assessment of the project against the EPBC Act**

MNES	Project specifics	Potential for significant impact
Threatened species	Twelve flora species and 20 fauna species have been recorded or are predicted to occur within the locality. The majority of these species are considered unlikely to occur within the development site and subject land owing to the high levels of disturbance present. Sup-optimal habitat is considered present for five threatened fauna species, namely Regent Honeyeater, Painted Honeyeater, White-throated Needletail, Swift Parrot and Koala. Two threatened flora species have the potential to occur, namely Bluegrass and Austral Toadflax. Significant impact criteria assessments have been completed for these species in Appendix E.	Significant impact unlikely to result from the project and proposed modification.
Threatened ecological communities	Three threatened ecological communities, as listed under the EPBC Act, are predicted to occur within the locality. Woodland areas of PCT 510_woodland_moderate meet the condition thresholds for the White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC. A significant impact criteria assessment has been completed for this TEC in Appendix E.	Significant impact unlikely to result from the project and proposed modification.
Migratory species	Twelve migratory species have been recorded or are predicted to occur within the locality. The development site and subject land does not provide important habitat for an ecologically significant proportion of any of these species. A significant impact criteria assessment has been completed for the Fork-tailed Swift in Appendix E.	Significant impact unlikely to result from the project and proposed modification.
Wetlands of international importance	The development site and subject land does not flow directly into a Ramsar site and the project is not likely to result in a significant impact. The nearest Ramsar wetland is the Gwydir wetlands, approximately 224 km north-west of the development site and subject land.	Significant impact unlikely to result from the project and proposed modification.

6.2 State Environmental Planning Policy (Koala Habitat Protection) 2019

State Environmental Planning Policy (Koala Habitat Protection) 2019 (Koala SEPP) aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for Koalas (*Phascolarctos cinereus*) to ensure a permanent free-living population over their present range and reverse the current trend of Koala population decline.

The Koala SEPP does not apply as the project is a State significant development and Uralla Shire Council is not the determining authority for the proposed modification. Notwithstanding, due consideration has been given to Koala habitat as Koala has been assumed present within woodland areas of the subject land (given that there are records within the immediate vicinity). The following Schedule 2 koala use species were recorded within the subject land:

- Rough-barked Apple;
- Blakely's Red Gum;
- Broad-leaved Stringybark;
- Yellow Box; and
- Ribbon Gum.

7 Conclusion

This addendum to the BDAR has been completed to consider biodiversity impacts resulting from the proposed modification within the subject land. UPC has selected an access route which utilises existing roads and tracks in order to minimise the amount of vegetation clearing to provide adequate clearance for vehicle access. This has largely limited additional impacts to narrow strips of vegetation on either side of the existing carriageway.

A total of five vegetation zones were mapped in the subject land. Two vegetation zones do not require offsetting as their vegetation integrity scores were below threshold. Impacts to native vegetation requiring offsets include:

- direct impacts on 1 ha of PCT 510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion (23 credits); and
- direct impacts on 0.59 ha of PCT 567 - Broad-leaved Stringybark - Yellow Box shrub/grass open forest of the New England Tableland Bioregion (18 credits).

The total number of ecosystem credits required to offset impacts to PCTs in the subject land is 41 credits.

A limited number of targeted surveys were undertaken for readily detectable species credit species. Where habitat was identified for species credit species and no targeted surveys were undertaken, the species have been assumed present and credits have been calculated accordingly. Impacts to species credit species requiring offsets include:

- Bluegrass (43 species credits);
- Barking Owl (5 species credits);
- Hawkweed (43 species credits);
- Austral Toadflax (33 species credits);
- Pale-headed Snake (39 species credits);
- Glossy Black-Cockatoo (breeding) (30 species credits);
- Squirrel Glider (39 species credits); and
- Koala (breeding) (39 species credits).

The total number of species credits required to offset impacts to the subject land is 271.

One TEC and candidate for SAILs, White Box Yellow Box Blakely's Red Gum Woodland was recorded within the subject land. This is assessed in Section 5.3 of this report with the impacts considered of low magnitude.

An assessment of the impacts of the project on MNES within the development site and subject land was prepared to determine whether referral of the project to the Commonwealth Minister for the Environment is required. The assessment concluded that no significant impacts on threatened entities are predicted to result from the project.

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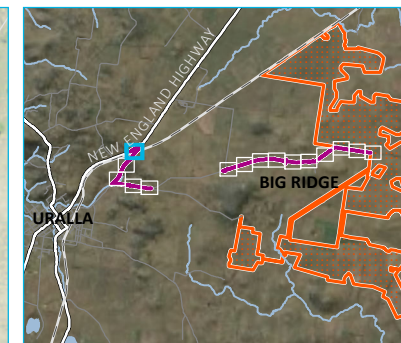
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Appendix A

Plant community types and vegetation zones within
the subject land

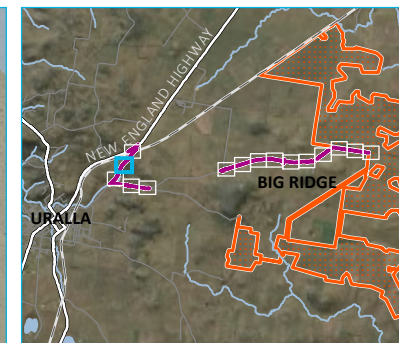




- KEY**
- Subject land
 - Development footprint
 - Rail line
 - Main road (refer to inset)
 - Local road (refer to inset)
 - Watercourse/drainage line
 - Waterbody
 - Cadastral boundary (DFSI 2017)
 - Maintained easement
 - ▲ Hollow bearing tree
 - Not vegetated
 - PCT and vegetation zone
 - Exotic grassland
 - 510 | Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion
 - Pasture
 - Woodland (moderate)*
- *Impacts requiring offsetting

Plant community type and vegetation zones

New England Solar Farm
Biodiversity development
assessment report - addendum
Figure A.1



KEY

- Subject land
- Development footprint
- Rail line
- Main road (refer to inset)
- Local road (refer to inset)
- Watercourse/drainage line
- Waterbody
- Cadastral boundary (DFSI 2017)
- Maintained easement
- Plot location
- ▲ Hollow bearing tree
- Spotlighting
- ⦿ Camera
- PCT and vegetation zone
- Exotic grassland
- 567 | Broad-leaved Stringybark - Yellow Box shrub/grass open forest of the New England Tableland Bioregion
- Woodland (moderate)*
- *Impacts requiring offsetting

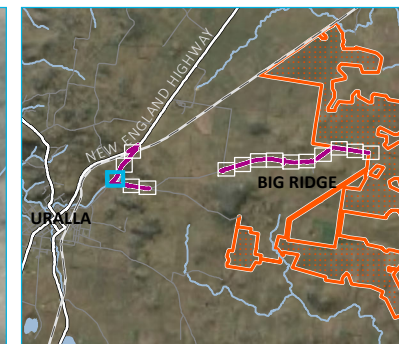
Plant community type and vegetation zones

New England Solar Farm
Biodiversity development
assessment report - addendum
Figure A.2

\\emmsvr1\EMM\3\2020\200214 - New England Solar Mod 1\GIS\02 Maps\ECO002 DDP_PCTs_20201211_05.mxd 11/12/2020



Source: EMM (2020); DFSI (2017); Elecnor (2020); GA (2011); UPC (2020); NESE (2020)

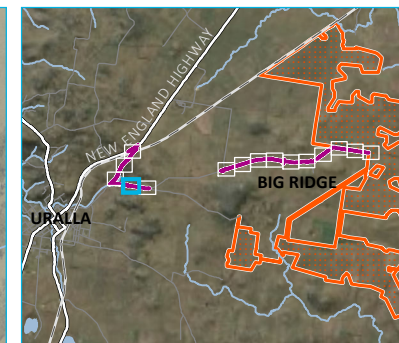


KEY

- Subject land
- Development footprint
- Rail line
- Main road (refer to inset)
- Local road (refer to inset)
- Watercourse/drainage line
- Waterbody
- Cadastral boundary (DFSI 2017)
- Maintained easement
- ▲ Hollow bearing tree
- Camera
- Not vegetated
- PCT and vegetation zone
- Exotic grassland
- 510 | Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion
- Woodland (moderate)*
- 567 | Broad-leaved Stringybark - Yellow Box shrub/grass open forest of the New England Tableland Bioregion
- Woodland (moderate)*
- *Impacts requiring offsetting

Plant community type and vegetation zones

New England Solar Farm
Biodiversity development
assessment report - addendum
Figure A.3

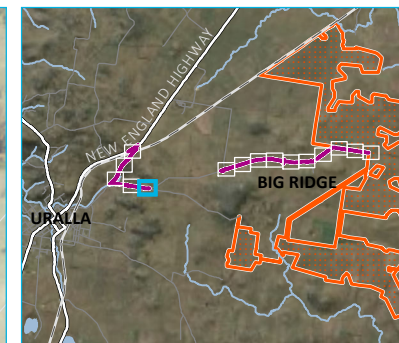
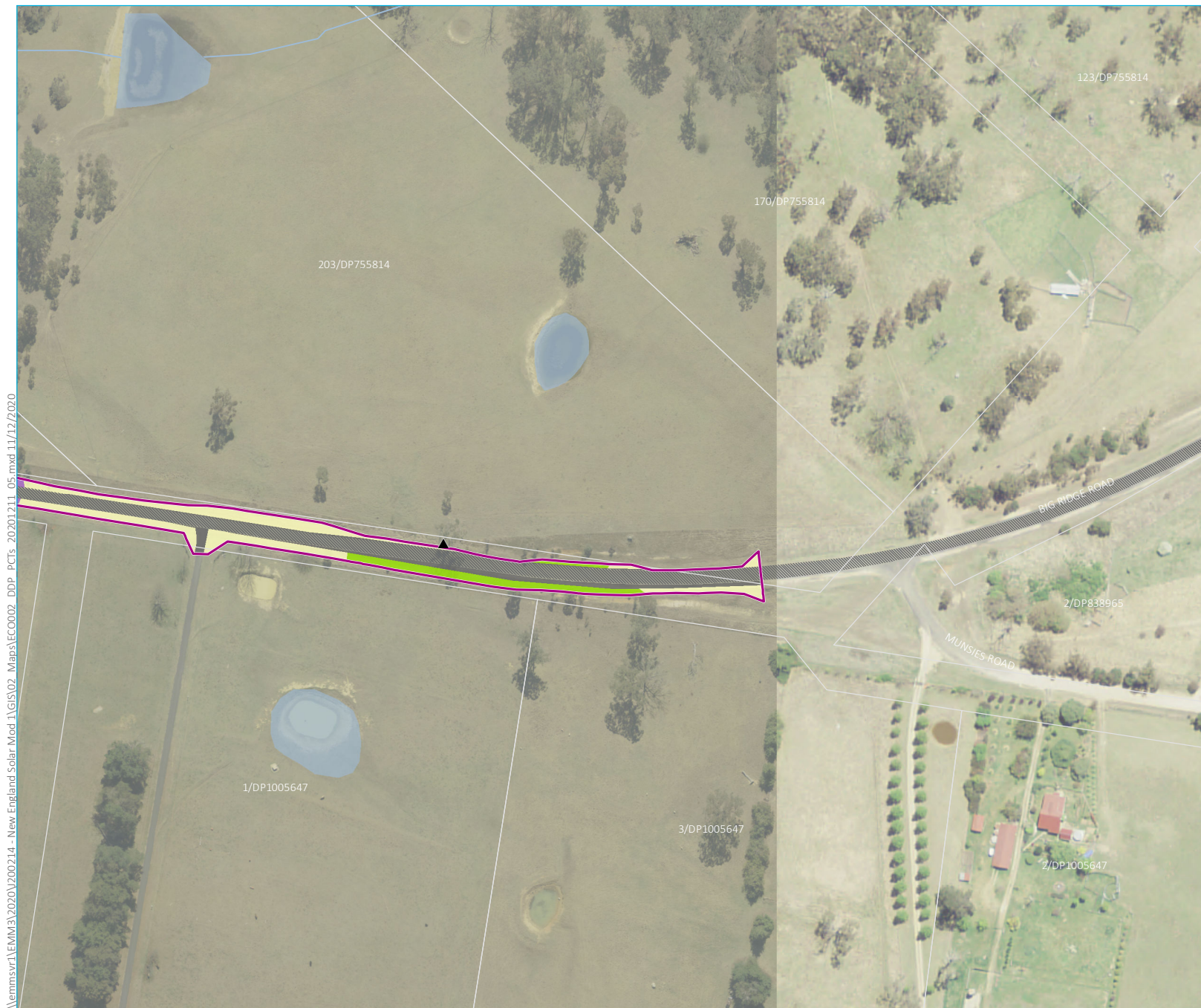


KEY

- Subject land
- Development footprint
- Rail line
- Main road (refer to inset)
- Local road (refer to inset)
- Watercourse/drainage line
- Waterbody
- Cadastral boundary (DFS1 2017)
- Maintained easement
- Plot location
- ▲ Hollow bearing tree
- Spotlighting
- Camera
- Not vegetated
- PCT and vegetation zone
- Exotic grassland
- 510 | Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion
- Woodland (moderate)*
- 567 | Broad-leaved Stringybark - Yellow Box shrub/grass open forest of the New England Tableland Bioregion
- Woodland (moderate)*
- *Impacts requiring offsetting

Plant community type and vegetation zones

New England Solar Farm
Biodiversity development
assessment report - addendum
Figure A.4

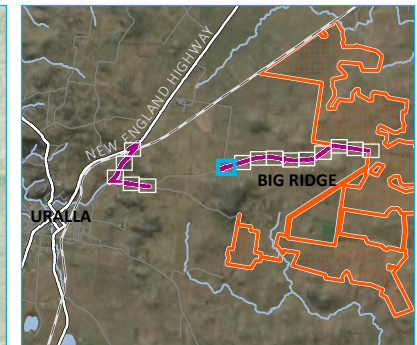


KEY

- Subject land
- Development footprint
- Rail line
- Main road (refer to inset)
- Local road (refer to inset)
- Watercourse/drainage line
- Waterbody
- Cadastral boundary (DFS1 2017)
- Maintained easement
- ▲ Hollow bearing tree
- Not vegetated
- PCT and vegetation zone
- Exotic grassland
- 510 | Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion
- Woodland (moderate)*
- 567 | Broad-leaved Stringybark - Yellow Box shrub/grass open forest of the New England Tableland Bioregion
- Woodland (moderate)*
- *Impacts requiring offsetting

Plant community type and vegetation zones

New England Solar Farm
Biodiversity development
assessment report - addendum
Figure A.5



KEY

- Subject land
- Development footprint
- Rail line
- Main road (refer to inset)
- Local road (refer to inset)
- Watercourse/drainage line
- Waterbody
- Cadastral boundary (DFSI 2017)
- Maintained easement
- Plot location
- ▲ Hollow bearing tree
- Spotlighting
- ⦿ Camera
- Not vegetated

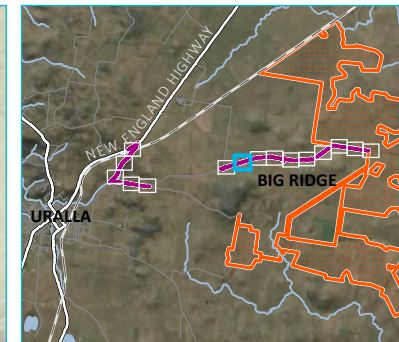
PCT and vegetation zone

- Exotic grassland
- 510 | Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion
- Woodland (moderate)*

*Impacts requiring offsetting

Plant community type and vegetation zones

New England Solar Farm
Biodiversity development
assessment report - addendum
Figure A.6



KEY

- Subject land
- Development footprint
- Rail line
- Main road (refer to inset)
- Local road (refer to inset)
- Watercourse/drainage line
- Waterbody
- Cadastral boundary (DFSI 2017)
- Maintained easement
- Plot location
- ▲ Hollow bearing tree
- PCT and vegetation zone
- Exotic grassland
- 510 | Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion
- Pasture
- Woodland (moderate)*
- *Impacts requiring offsetting

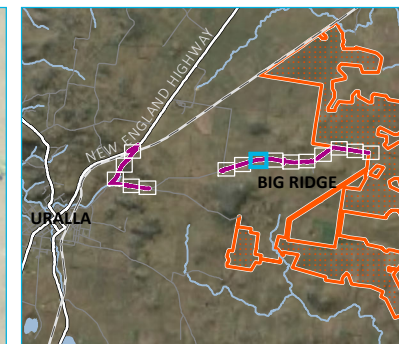
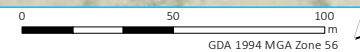
Plant community type and vegetation zones

New England Solar Farm
Biodiversity development
assessment report - addendum
Figure A.7

\\lemmsvr1\EMM3\2020\200214 - New England Solar Mod 1\GIS\02 Maps\ECO002 DDP_PCTs_20201211_05.mxd 11/12/2020



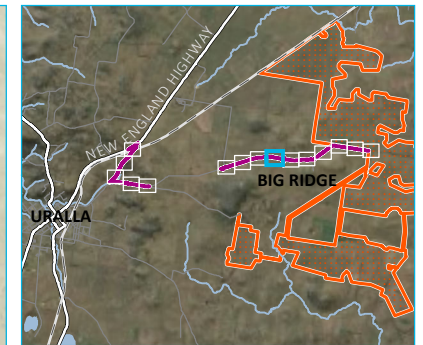
Source: EMM (2020); DFSI (2017); Elecnor (2020); GA (2011); UPC (2020); NESE (2020)



- KEY**
- Subject land
 - Development footprint
 - Rail line
 - Main road (refer to inset)
 - Local road (refer to inset)
 - Watercourse/drainage line
 - Waterbody
 - Cadastral boundary (DFSI 2017)
 - Maintained easement
 - PCT and vegetation zone**
 - Exotic grassland
 - 510 | Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion
 - Woodland (moderate)*
- *Impacts requiring offsetting

Plant community type and vegetation zones

New England Solar Farm
Biodiversity development
assessment report - addendum
Figure A.8



KEY

- Subject land
- Development footprint
- Rail line
- Main road (refer to inset)
- Local road (refer to inset)
- Watercourse/drainage line
- Waterbody
- Cadastral boundary (DFSI 2017)
- Maintained easement
- Hollow bearing tree
- Not vegetated
- PCT and vegetation zone
- Exotic grassland
- 510 | Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion
- Woodland (moderate)*

*Impacts requiring offsetting

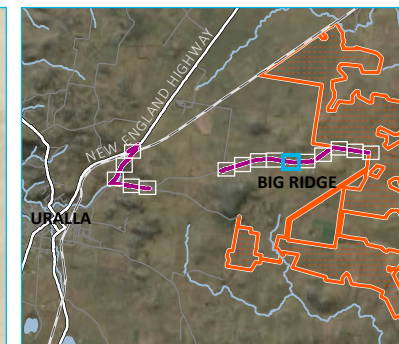
Plant community type and vegetation zones

New England Solar Farm
Biodiversity development
assessment report - addendum
Figure A.9



\\lemmsvr1\EMM\3\2020\200214 - New England Solar Mod 1\GIS\02 Maps\ECO002 DDP_PCTs_20201211_05.mxd 11/12/2020

Source: EMM (2020); DFSI (2017); Elecnor (2020); GA (2011); UPC (2020); NESE (2020)

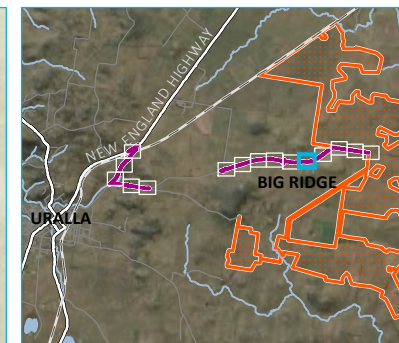


KEY

- Subject land
- Development footprint
- Rail line
- Main road (refer to inset)
- Local road (refer to inset)
- Watercourse/drainage line
- Waterbody
- Cadastral boundary (DFSI 2017)
- Maintained easement
- ▲ Hollow bearing tree
- Spotlighting
- Not vegetated
- PCT and vegetation zone
- Exotic grassland
- 510 | Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion
- Woodland (moderate)*
- *Impacts requiring offsetting

Plant community type and vegetation zones

New England Solar Farm
Biodiversity development
assessment report - addendum
Figure A.10

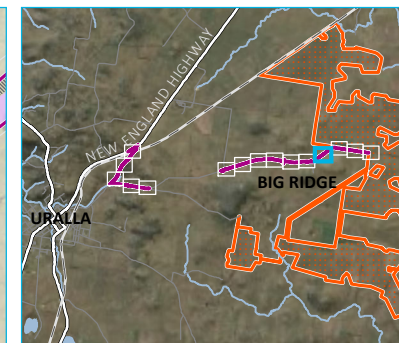


KEY

- Subject land
- Development footprint
- Rail line
- Main road (refer to inset)
- Local road (refer to inset)
- Watercourse/drainage line
- Waterbody
- Cadastral boundary (DFS1 2017)
- Maintained easement
- Plot location
- Not vegetated
- PCT and vegetation zone
- Exotic grassland
- 510 | Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion
- Pasture
- Derived native grasslands

Plant community type and vegetation zones

New England Solar Farm
Biodiversity development
assessment report - addendum
Figure A.11



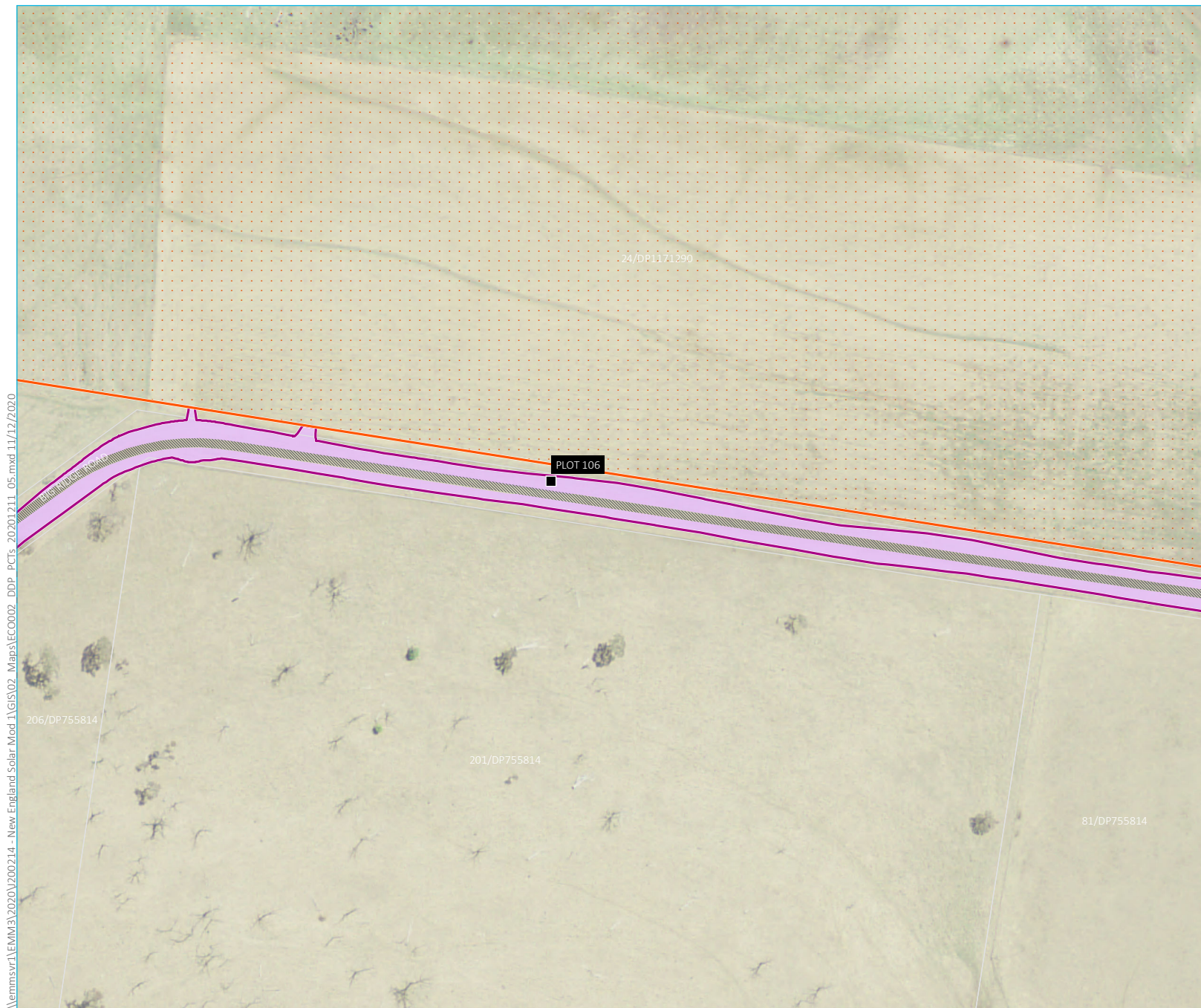
KEY

- Subject land
 - Development footprint
 - Rail line
 - Main road (refer to inset)
 - Local road (refer to inset)
 - Watercourse/drainage line
 - Waterbody
 - Cadastral boundary (DFS1 2017)
 - Maintained easement
 - Hollow bearing tree
- 510 | Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion
- Pasture

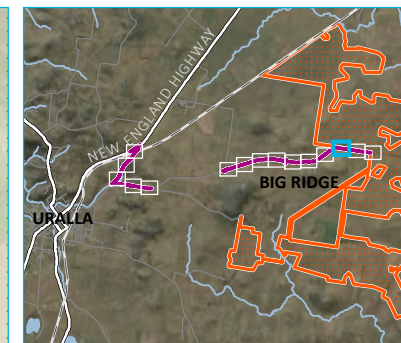
Plant community type and vegetation zones

New England Solar Farm
Biodiversity development
assessment report - addendum
Figure A.12





Source: EMM (2020); DFSI (2017); Elecnor (2020); GA (2011); UPC (2020); NESE (2020)

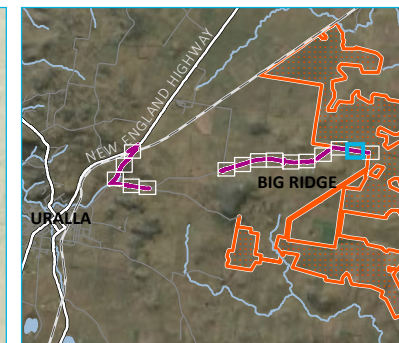


KEY

- Subject land
- Development footprint
- Rail line
- Main road (refer to inset)
- Local road (refer to inset)
- Watercourse/drainage line
- Waterbody
- Cadastral boundary (DFSI 2017)
- Maintained easement
- Plot location
- 510 | Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion
- Pasture

Plant community type and vegetation zones

New England Solar Farm
Biodiversity development
assessment report - addendum
Figure A.13

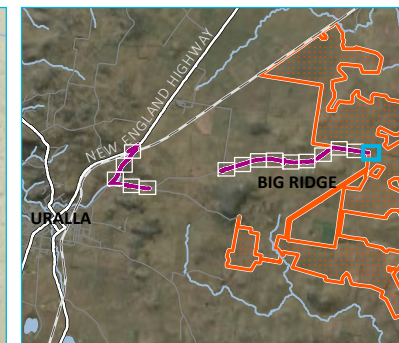
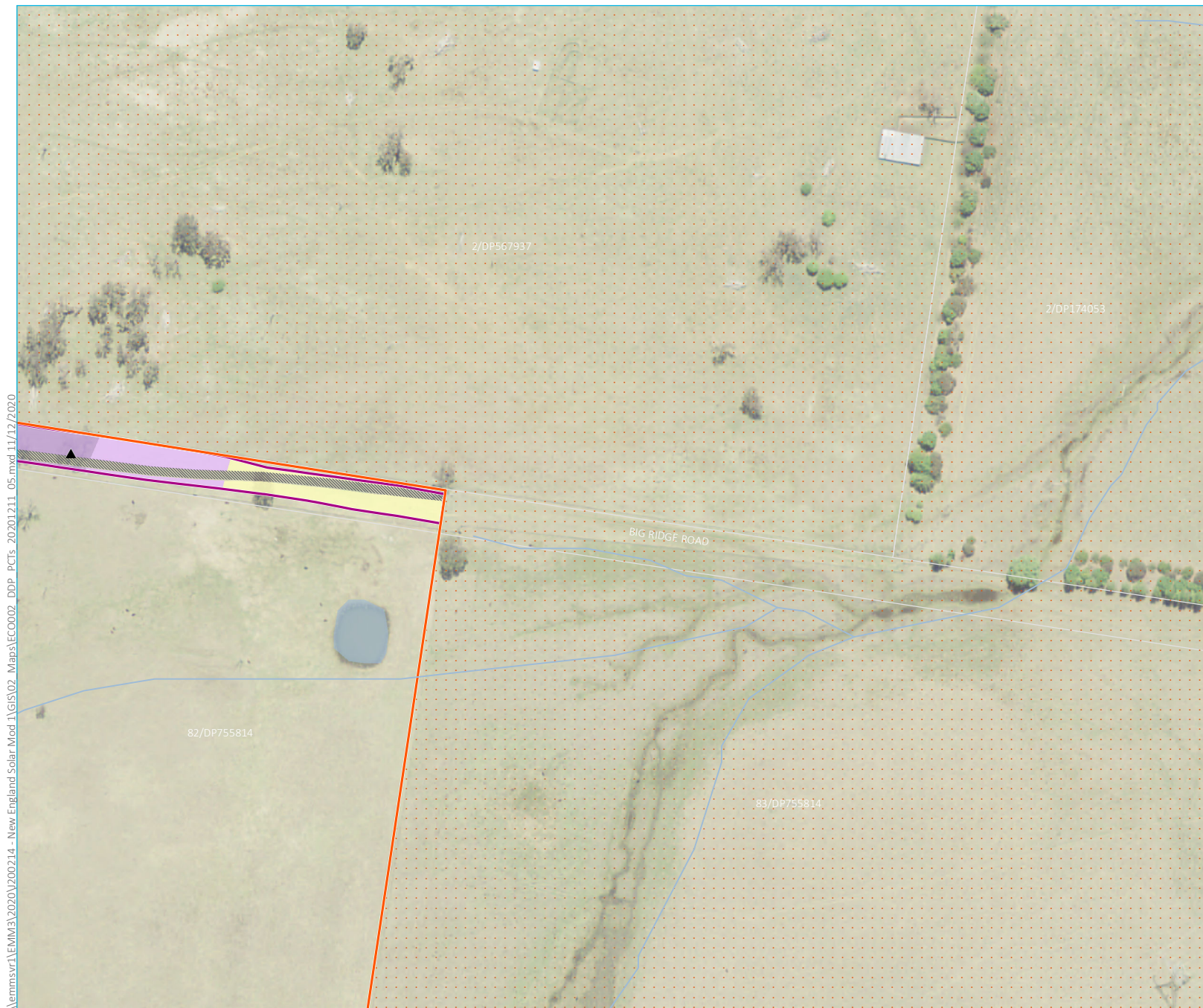


KEY

- Subject land
 - Development footprint
 - Rail line
 - Main road (refer to inset)
 - Local road (refer to inset)
 - Watercourse/drainage line
 - Waterbody
 - Cadastral boundary (DFS1 2017)
 - Maintained easement
 - Plot location
 - ▲ Hollow bearing tree
 - Not vegetated
- 510 | Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion
- Pasture
 - Woodland (low)*
- *Impacts requiring offsetting

Plant community type and vegetation zones

New England Solar Farm
Biodiversity development
assessment report - addendum
Figure A.14



KEY

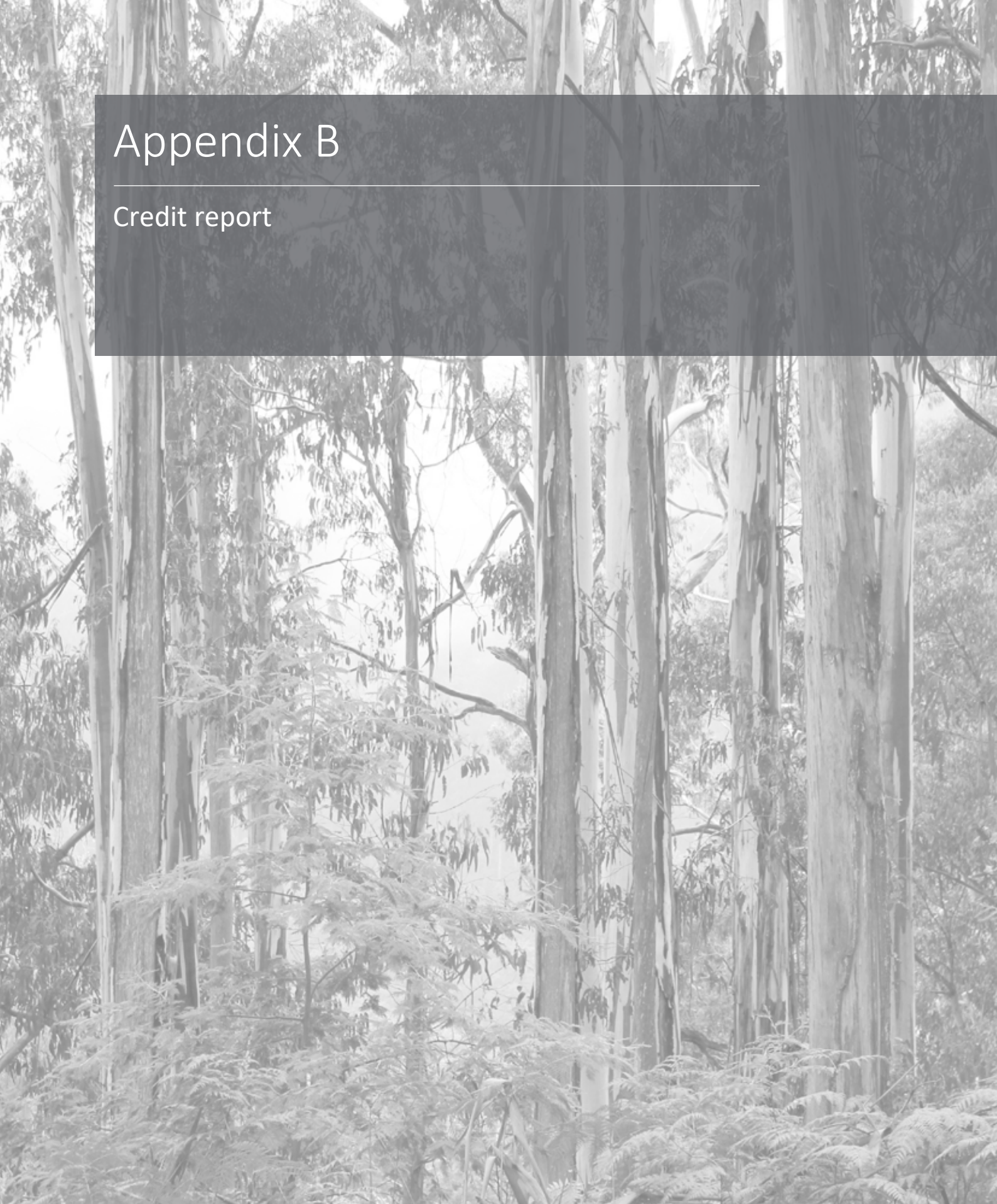
- Subject land
- Development footprint
- Rail line
- Main road (refer to inset)
- Local road (refer to inset)
- Watercourse/drainage line
- Waterbody
- Cadastral boundary (DFS1 2017)
- Maintained easement
- ▲ Hollow bearing tree
- PCT and vegetation zone
- Exotic grassland
- 510 | Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion
- Pasture
- Woodland (low)*
- *Impacts requiring offsetting

Plant community type and vegetation zones

New England Solar Farm
Biodiversity development
assessment report - addendum
Figure A.15

Appendix B

Credit report



BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00022503/BAAS17058/20/00022504	NESF MOD1	07/12/2020
Assessor Name	Assessor Number	BAM Data version *
Cecilia Phu	BAAS17058	34
Proponent Names	Report Created	BAM Case Status
	10/12/2020	Finalised
Assessment Revision	Assessment Type	Date Finalised
4	Major Projects	10/12/2020

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

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
White Box Yellow Box Blakely's Red Gum Woodland	Endangered Ecological Community	510-Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion
White Box Yellow Box Blakely's Red Gum Woodland	Endangered Ecological Community	567-Broad-leaved Stringybark - Yellow Box shrub/grass open forest of the New England Tableland Bioregion
Species		
Nil		

BAM Biodiversity Credit Report (Like for like)

Additional Information for Approval

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
Calyptorhynchus lathami / Glossy Black-Cockatoo
Ninox strenua / Powerful Owl
Haliaeetus leucogaster / White-bellied Sea-Eagle

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

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
510-Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	White Box Yellow Box Blakely's Red Gum Woodland	3.2	23	0	23
567-Broad-leaved Stringybark - Yellow Box shrub/grass open forest of the New England Tableland Bioregion	White Box Yellow Box Blakely's Red Gum Woodland	0.6	18	0	18

510-Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion	Like-for-like credit retirement options					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region

BAM Biodiversity Credit Report (Like for like)

	White Box Yellow Box Blakely's Red Gum Woodland This includes PCT's: 2, 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 506, 508, 509, 510, 511, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 840, 847, 851, 921, 1099, 1103, 1303, 1304, 1307, 1324, 1329, 1330, 1331, 1332, 1333, 1334, 1383, 1401, 1512, 1601, 1606, 1608, 1611, 1691, 1693, 1695, 1698	-	510_low_woodl and	Yes	2 Armidale Plateau, Bundarra Downs, Coffs Coast and Escarpment, Eastern Nandewars, Ebor Basalts, Glenn Innes-Guyra Basalts, Macleay Gorges, Moredun Volcanics, Round Mountain, Walcha Plateau, Wongwibinda Plateau and Yarrowyck-Kentucky Downs. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
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BAM Biodiversity Credit Report (Like for like)

	White Box Yellow Box Blakely's Red Gum Woodland This includes PCT's: 2, 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 506, 508, 509, 510, 511, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 840, 847, 851, 921, 1099, 1103, 1303, 1304, 1307, 1324, 1329, 1330, 1331, 1332, 1333, 1334, 1383, 1401, 1512, 1601, 1606, 1608, 1611, 1691, 1693, 1695, 1698	-	510_moderate_ DNG	No	0 Armidale Plateau, Bundarra Downs, Coffs Coast and Escarpment, Eastern Nandewars, Ebor Basalts, Glenn Innes-Guyra Basalts, Macleay Gorges, Moredun Volcanics, Round Mountain, Walcha Plateau, Wongwibinda Plateau and Yarrowyck-Kentucky Downs. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
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BAM Biodiversity Credit Report (Like for like)

	White Box Yellow Box Blakely's Red Gum Woodland This includes PCT's: 2, 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 506, 508, 509, 510, 511, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 840, 847, 851, 921, 1099, 1103, 1303, 1304, 1307, 1324, 1329, 1330, 1331, 1332, 1333, 1334, 1383, 1401, 1512, 1601, 1606, 1608, 1611, 1691, 1693, 1695, 1698	-	510_moderate_ pasture	No	0 Armidale Plateau, Bundarra Downs, Coffs Coast and Escarpment, Eastern Nandewars, Ebor Basalts, Glenn Innes-Guyra Basalts, Macleay Gorges, Moredun Volcanics, Round Mountain, Walcha Plateau, Wongwibinda Plateau and Yarrowyck-Kentucky Downs. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
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BAM Biodiversity Credit Report (Like for like)

	White Box Yellow Box Blakely's Red Gum Woodland This includes PCT's: 2, 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 506, 508, 509, 510, 511, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 840, 847, 851, 921, 1099, 1103, 1303, 1304, 1307, 1324, 1329, 1330, 1331, 1332, 1333, 1334, 1383, 1401, 1512, 1601, 1606, 1608, 1611, 1691, 1693, 1695, 1698	-	510_moderate_woodland	Yes	21	Armidale Plateau, Bundarra Downs, Coffs Coast and Escarpment, Eastern Nandewars, Ebor Basalts, Glenn Innes-Guyra Basalts, Macleay Gorges, Moredun Volcanics, Round Mountain, Walcha Plateau, Wongwibinda Plateau and Yarrowyck-Kentucky Downs. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
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BAM Biodiversity Credit Report (Like for like)

567-Broad-leaved Stringybark - Yellow Box shrub/grass open forest of the New England Tableland Bioregion	Like-for-like credit retirement options					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region

BAM Biodiversity Credit Report (Like for like)

	White Box Yellow Box Blakely's Red Gum Woodland This includes PCT's: 2, 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 506, 508, 509, 510, 511, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 840, 847, 851, 921, 1099, 1103, 1303, 1304, 1307, 1324, 1329, 1330, 1331, 1332, 1333, 1334, 1383, 1401, 1512, 1601, 1606, 1608, 1611, 1691, 1693, 1695, 1698	-	567_moderate_woodland	Yes	18	Armidale Plateau, Bundarra Downs, Coffs Coast and Escarpment, Eastern Nandewars, Ebor Basalts, Glenn Innes-Guyra Basalts, Macleay Gorges, Moredun Volcanics, Round Mountain, Walcha Plateau, Wongwibinda Plateau and Yarrowyck-Kentucky Downs. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
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BAM Biodiversity Credit Report (Like for like)

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Calyptrorhynchus lathami / Glossy Black-Cockatoo	510_low_woodland, 510_moderate_pasture, 510_moderate_woodland, 567_moderate_woodland	2.0	30.00
Dichanthium setosum / Bluegrass	510_moderate_DNG, 510_moderate_pasture, 510_moderate_woodland, 567_moderate_woodland	3.6	43.00
Hoplocephalus bitorquatus / Pale-headed Snake	510_moderate_woodland, 567_moderate_woodland	1.3	39.00
Ninox connivens / Barking Owl	510_low_woodland, 510_moderate_pasture, 510_moderate_woodland, 567_moderate_woodland	0.3	5.00
Petaurus norfolcensis / Squirrel Glider	510_moderate_woodland, 567_moderate_woodland	1.3	39.00
Phascolarctos cinereus / Koala	510_moderate_woodland, 567_moderate_woodland	1.3	39.00

BAM Biodiversity Credit Report (Like for like)

Picris evae / Hawkweed	510_moderate_DNG, 510_moderate_pasture, 510_moderate_woodland, 567_moderate_woodland	3.6	43.00
Thesium australe / Austral Toadflax	510_moderate_DNG, 510_moderate_pasture, 510_moderate_woodland, 567_moderate_woodland	3.6	33.00

Credit Retirement Options

Like-for-like credit retirement options

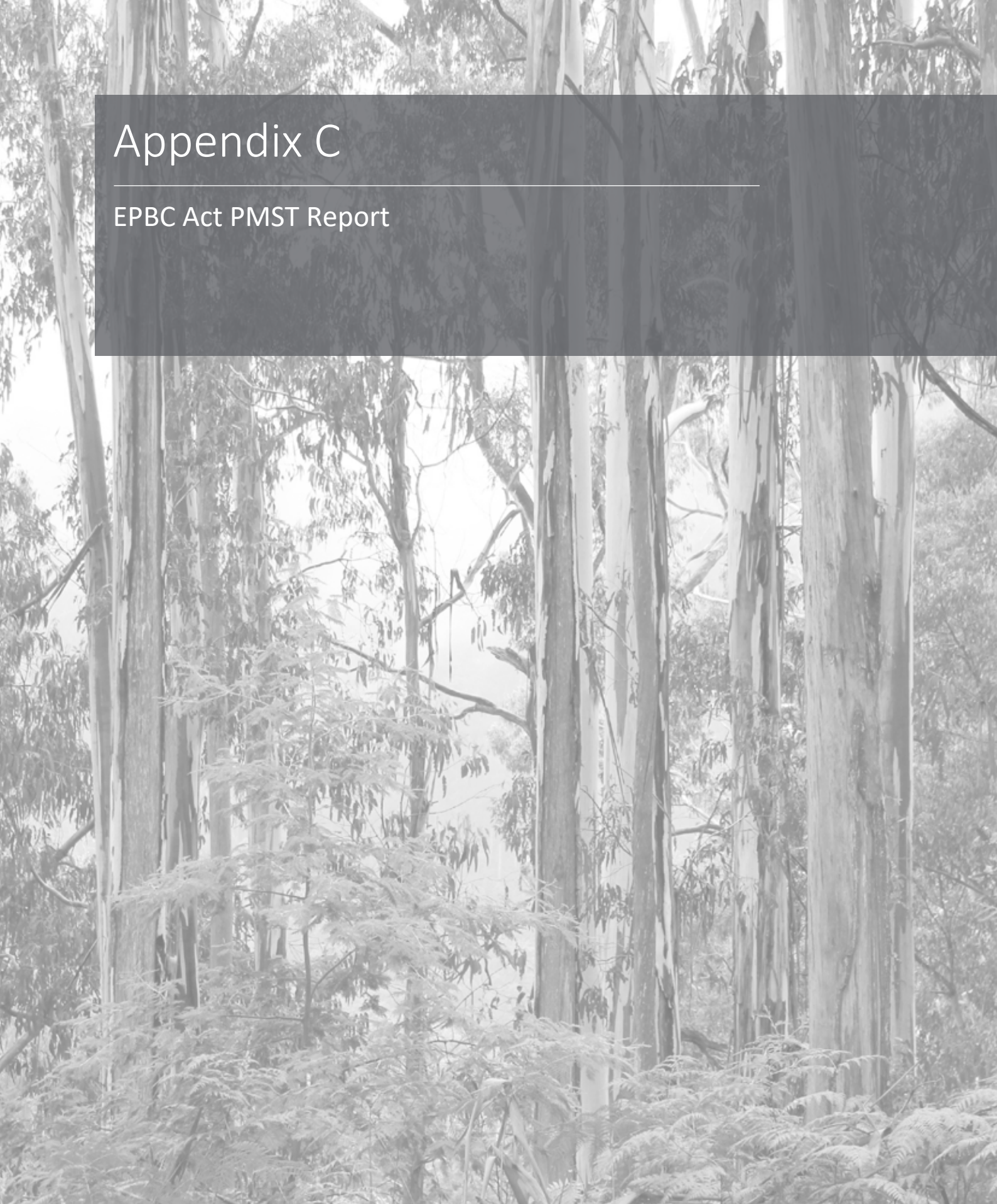
Calyptrorhynchus lathami / Glossy Black-Cockatoo	Spp	IBRA subregion
	Calyptrorhynchus lathami / Glossy Black-Cockatoo	Any in NSW
Dichanthium setosum / Bluegrass	Spp	IBRA subregion
	Dichanthium setosum / Bluegrass	Any in NSW
Hoplocephalus bitorquatus / Pale-headed Snake	Spp	IBRA subregion
	Hoplocephalus bitorquatus / Pale-headed Snake	Any in NSW
Ninox connivens / Barking Owl	Spp	IBRA subregion
	Ninox connivens / Barking Owl	Any in NSW

BAM Biodiversity Credit Report (Like for like)

Petaurus norfolcensis / Squirrel Glider	Spp	IBRA subregion
	Petaurus norfolcensis / Squirrel Glider	Any in NSW
Phascolarctos cinereus / Koala	Spp	IBRA subregion
	Phascolarctos cinereus / Koala	Any in NSW
Picris evae / Hawkweed	Spp	IBRA subregion
	Picris evae / Hawkweed	Any in NSW
Thesium australe / Austral Toadflax	Spp	IBRA subregion
	Thesium australe / Austral Toadflax	Any in NSW

Appendix C

EPBC Act PMST Report





EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 14/09/20 10:07:11

[Summary](#)

[Details](#)

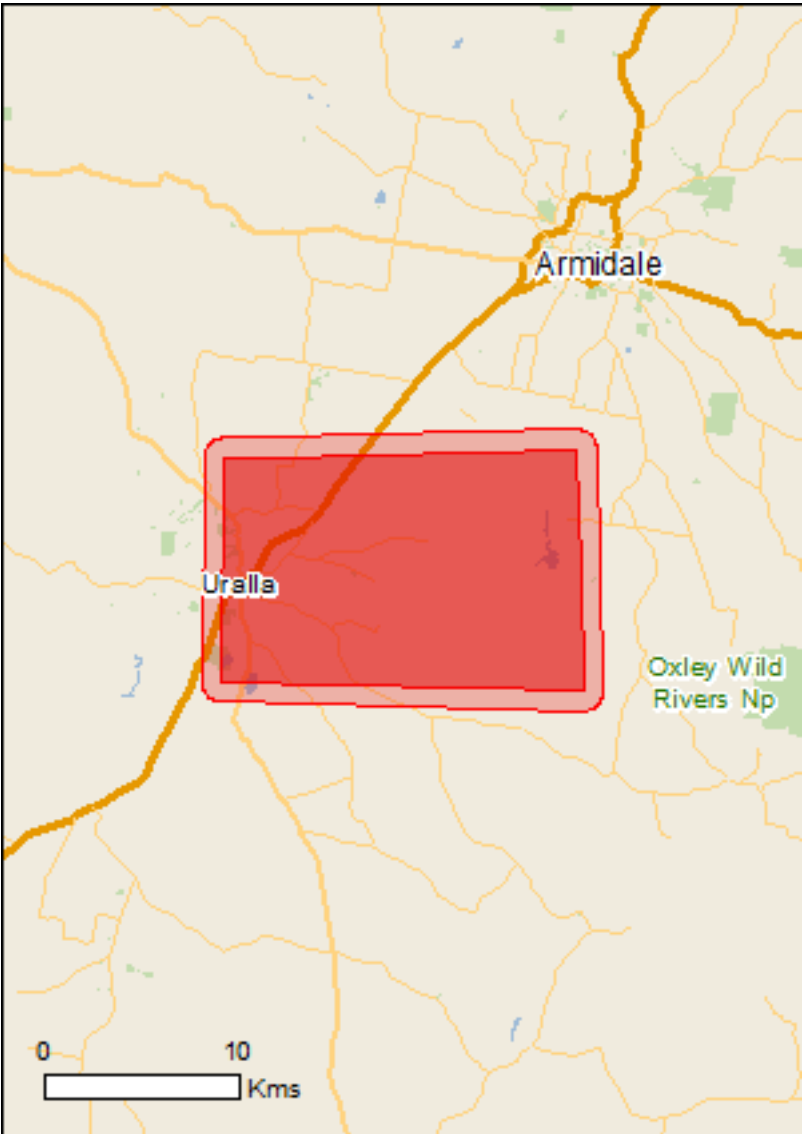
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



This map may contain data which are
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[Coordinates](#)

[Buffer: 1.0Km](#)



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	4
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	32
Listed Migratory Species:	13

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	20
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	None
Regional Forest Agreements:	1
Invasive Species:	30
Nationally Important Wetlands:	1
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)		[Resource Information]
Name	Proximity	
Banrock station wetland complex	1100 - 1200km	
Gwydir wetlands: gingham and lower gwydir (big leather) watercourses	200 - 300km upstream	
Riverland	1000 - 1100km	
The coorong, and lakes alexandrina and albert wetland	1200 - 1300km	

Listed Threatened Ecological Communities	[Resource Information]
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For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
New England Peppermint (Eucalyptus nova-anglica) Grassy Woodlands	Critically Endangered	Community may occur within area
Upland Wetlands of the New England Tablelands (New England Tableland Bioregion) and the Monaro Plateau (South Eastern Highlands Bioregion)	Endangered	Community likely to occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species	[Resource Information]
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Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within

Name	Status	Type of Presence
Rostratula australis Australian Painted Snipe [77037]	Endangered	area Species or species habitat likely to occur within area
Fish		
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area
Frogs		
Litoria castanea Yellow-spotted Tree Frog, Yellow-spotted Bell Frog [1848]	Critically Endangered	Species or species habitat likely to occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat may occur within area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Plants		
Acacia pubifolia Velvet Wattle [19799]	Vulnerable	Species or species habitat may occur within area
Arthraxon hispidus Hairy-joint Grass [9338]	Vulnerable	Species or species habitat likely to occur within area
Bertya ingramii a shrub [21383]	Endangered	Species or species habitat may occur within area
Callistemon pungens [55581]	Vulnerable	Species or species habitat likely to occur within area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area
Diuris pedunculata Small Snake Orchid, Two-leaved Golden Moths, Golden Moths, Cowslip Orchid, Snake Orchid [18325]	Endangered	Species or species habitat likely to occur within area
Eucalyptus mckieana McKie's Stringybark [20199]	Vulnerable	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Eucalyptus nicholii Narrow-leaved Peppermint, Narrow-leaved Black Peppermint [20992]	Vulnerable	Species or species habitat likely to occur within area
Euphrasia arguta [4325]	Critically Endangered	Species or species habitat may occur within area
Haloragis exalata subsp. velutina Tall Velvet Sea-berry [16839]	Vulnerable	Species or species habitat may occur within area
Leionema lachnaeoides [64924]	Endangered	Species or species habitat may occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area

Reptiles		
Uvidicolus sphyrurus Border Thick-tailed Gecko, Granite Belt Thick-tailed Gecko [84578]	Vulnerable	Species or species habitat likely to occur within area
Wollumbinia belli Bell's Turtle, Western Sawshelled Turtle, Namoi River Turtle, Bell's Saw-shelled Turtle [86071]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species	[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.	

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area

Migratory Terrestrial Species		
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area

Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land	[Resource Information]
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The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land - Commonwealth Scientific & Industrial Research Organisation

Listed Marine Species	[Resource Information]
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* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within

Name	Threatened	Type of Presence
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		area Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat may occur within area

Extra Information

Regional Forest Agreements	[Resource Information]
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Note that all areas with completed RFAs have been included.

Name	State
North East NSW RFA	New South Wales

Invasive Species	[Resource Information]
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Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Alauda arvensis Skylark [656]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat may occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Equus caballus Horse [5]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur

Name	Status	Type of Presence
Vulpes vulpes Red Fox, Fox [18]		within area Species or species habitat likely to occur within area
Plants		
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643] Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area Species or species habitat likely to occur within area
Cytisus scoparius Broom, English Broom, Scotch Broom, Common Broom, Scottish Broom, Spanish Broom [5934]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Nassella neesiana Chilean Needle grass [67699]		Species or species habitat likely to occur within area
Nassella trichotoma Serrated Tussock, Yass River Tussock, Yass Tussock, Nassella Tussock (NZ) [18884]		Species or species habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area

Nationally Important Wetlands		[Resource Information]
Name		State
New England Wetlands		NSW

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-30.592453 151.513641,-30.589202 151.653374,-30.684911 151.65612,-30.681368 151.490295,-30.592453 151.491325,-30.592453 151.513641

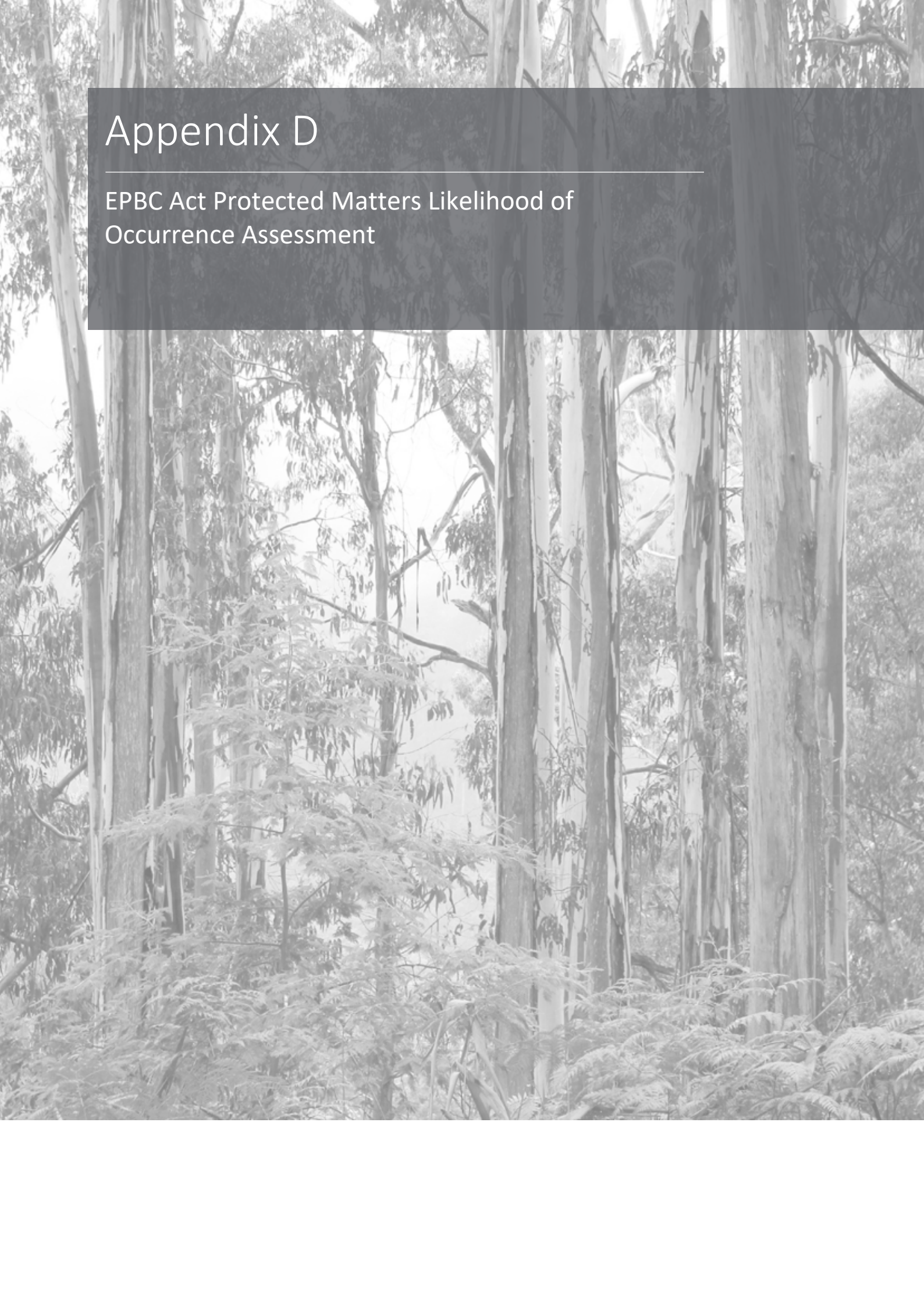
Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.



Appendix D

EPBC Act Protected Matters Likelihood of Occurrence Assessment

D.1 Threatened ecological communities

Table D.1 Likelihood of occurrence assessment – threatened ecological communities

Threatened Ecological Community	EPBC Act status ¹	BC Act status ²	Likelihood of occurrence	Habitat preference	Rationale
New England Peppermint (<i>Eucalyptus nova-anglica</i>) Grassy Woodlands	CE	CE	Negligible	The ecological community occurs in northern NSW in the New England Tablelands. The tree canopy is typically dominated or co-dominated by New England Peppermint. Other associated tree species that may be present and may be co-dominant are Snow Gum (<i>Eucalyptus pauciflora</i>) and Mountain Gum (<i>Eucalyptus dalrympleana</i> subsp. <i>heptantha</i>). Understorey is made up of a dense, species-rich ground layer of grasses and herbs. Shrubs are typically sparse to absent. This ecological community mostly occupies sites in valley bottoms, flats or lower slopes, often in areas subject to cold air drainage. It may occur on basaltic, granitic or sedimentary substrates.	The species composition of the vegetation within the subject land is not consistent with this TEC. The PCTs within the subject land are not associated with this TEC.
Upland Wetlands of the New England Tablelands (New England Tableland Bioregion) and the Monaro Plateau (South Eastern Highlands Bioregion)	E	E	Negligible	The ecological community occurs in closed, high altitude topographic depressions that are not connected to rivers or streams. These wetlands occur on undulating, mostly basalt plateau with organic soils, forming in the lagoons, over dark chocolate loam. The distinguishing factor from other similar wetlands is the absence or near absence of peat underlying the vegetation, and the absence of heath through the wetland floor. Associated vegetation of this ecological community includes closed to mid-dense sedgeland and grassland. Deep lagoons tend to have vegetation on shores and shallow reaches whereas shallow wetlands have vegetation across the depression.	The species composition of the vegetation within the subject land is not consistent with this TEC. The PCTs within the subject land are not associated with this TEC.

Table D.1 **Likelihood of occurrence assessment – threatened ecological communities**

Threatened Ecological Community	EPBC Act status ¹	BC Act status ²	Likelihood of occurrence	Habitat preference	Rationale
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	CE	E	Present	This ecological community occurs along the western slopes and tablelands of the Great Dividing Range through NSW in the New England Tableland. This ecological community can occur either as woodland or derived grassland. The ecological community must be, or have previously been, dominated or co-dominated by one or more of the following overstorey species: White Box, Yellow Box or Blakely's Red Gum. The community must have a predominately native understorey with 12 or more understorey species, shrubs are generally sparse or absent.	A total of 0.74 ha of Box Gum woodland, which meets the EPBC condition criteria, occurs within the subject land. An assessment of significance has been prepared for this community in Appendix E.

Notes: 1. EPBC Act status: CE – critically endangered, E – endangered, V – vulnerable
 2. BC Act status: CE – critically endangered, E – endangered, V - vulnerable

D.2 Threatened flora

Table D.2 Likelihood of occurrence assessment – threatened flora

Scientific name	Common name	EPBC Act status ¹	BC Act status ²	Likelihood of occurrence	Habitat preference and rationale	Rationale
<i>Acacia pubifolia</i>	Velvet Wattle	V	E	Unlikely	Velvet Wattle occurs in NSW and Qld. In NSW it is known from two main populations, one north of Emmaville and the other near Warrabah National Park. The species prefers dry shrubby woodland on granite and metasediment soils.	This species is restricted to two locations that contain a very specific geology (granite and metasediment soils). The subject land lacks this geology, and it is therefore unlikely that this species would occur.
<i>Arthraxon hispidus</i>	Hairy-joint Grass	V	V	Unlikely	Creeping perennial grass with a distribution spanning from the northern tablelands to the north coast of NSW. Grows in moist, shaded areas within the vicinity of rainforest and wet sclerophyll woodland, often close to waterbodies.	The subject land is outside the species known and predicted distribution. The subject land also lacks suitable moist rainforest and wet sclerophyll woodland.
<i>Bertya ingramii</i>	a shrub	E	E	Unlikely	Medium sized shrub confined to the Oxley Wild Rivers National Park in the New England Tablelands. Grows close to cliff edges, amongst rocks in New England Grassy Woodlands. Grows in thin, skeletal soils.	The species is restricted to the Oxley Wild Rivers National Park. The subject land lacks suitable rocky habitat for this species.
<i>Callistemon pungens</i>	-	V	-	Unlikely	The species occurs from Inverell to the eastern escarpment in New England National Park. It occurs along rocky watercourses usually with sandy granite (or occasionally basalt) creek beds, and generally among naturalised species. Habitats range from riparian areas dominated by River Oak to woodland and rocky shrubland. Flowering occurs over spring and summer, mostly in November.	The subject land lacks suitable rocky watercourses or sandy creek beds. Watercourses within the subject land lack suitable woodland or shrubland and are highly disturbed. This species was not recorded and is unlikely to occur within the subject land.

Table D.2 **Likelihood of occurrence assessment – threatened flora**

Scientific name	Common name	EPBC Act status ¹	BC Act status ²	Likelihood of occurrence	Habitat preference and rationale	Rationale
<i>Dichanthium setosum</i>	Bluegrass	V	V	Potential	Bluegrass occurs on the New England Tablelands. The species is associated with heavy basaltic black soils and stony red-brown hard-setting loam with clay subsoil. It is often found in moderately disturbed areas such as cleared woodland, grassy roadside remnants, grazed land and highly disturbed pasture. Habitat is generally variously grazed, nutrient-enriched and water-enriched. The species overlaps the TEC White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.	Given this species can occur in disturbed areas and suitable soils types are present, this species has the potential to occur within the habitat adjacent to the subject land. An assessment of significance has been prepared for this species in Appendix E.
<i>Diuris pedunculata</i>	Small Snake Orchid	E	E	Unlikely	The Small Snake Orchid is confined to north east NSW, mainly found on the New England Tablelands. The species prefers moist areas and has been found growing in open areas of dry sclerophyll forests with grassy understories, in riparian forests, swamp forests, and in sub-alpine grasslands and herbfields. It is not often found in dense forests or heavily shrubby areas. Soils are well-structure red-brown clay loams, although can also be found on peaty soils, or on shale and trap soils, on fine granite, and among boulders. Flowering occurs during August to October.	The subject land does not have the moist microhabitats preferred by this species. Furthermore, the closest record is 150 km from the subject land.
<i>Eucalyptus mckieana</i>	McKie's Stringybark	V	V	Unlikely	The McKie's Stringybark is confined to the drier western side of the New England Tablelands of NSW. It is found in grassy open forest or woodland on poor sandy loams, most commonly on gently sloping or flat sites. It grows on a range of soil types, including deep clay loams but more commonly on sandy loams. The species overlaps the TEC White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.	The subject land is not on the drier western side of the New England Tablelands and therefore is out of the main species distribution of the species. This species is therefore unlikely to occur within the subject land.

Table D.2 **Likelihood of occurrence assessment – threatened flora**

Scientific name	Common name	EPBC Act status ¹	BC Act status ²	Likelihood of occurrence	Habitat preference and rationale	Rationale
<i>Eucalyptus nicholii</i>	Narrow-leaved Peppermint	V	V	Unlikely	Narrow-leaved Peppermint is sparsely distributed on the New England Tablelands. It occurs in grassy or sclerophyll woodland in association with many other eucalypts that grow in the area. It is often found on shallow soils of slopes and ridges, on infertile soils derived from granite or metasedimentary rock.	An examination of previous records indicate that the species has not been previously recorded within the locality. Nearest records occur to the east, near Armidale. The species is therefore considered unlikely to occur within subject land and the species was not recorded during the field surveys.
<i>Euphrasia arguta</i>	-	CE	CE	Unlikely	The species is known in the NSW north western slopes and tablelands. It grows in grassy areas near rivers at elevations up to 700 m above sea level, with an annual rainfall of 600 mm or regrowth vegetation following clearing of a firebreak.	The subject land is outside of the known range of the species. No suitable understorey vegetation is present. The habitat adjacent to the subject land is heavily grazed and disturbed, therefore the species is unlikely to occur.
<i>Haloragis exalata</i> subsp. <i>velutina</i>	Tall Velvet Sea-berry	V	V	Unlikely	Tall Velvet Sea-berry occurs on the north coast of NSW. It often occurs in damp places near watercourses and in woodland on steep rocky slopes. It is associated with the TEC White Box-Yellow Box-Blakely's Gum Grassy Woodland and Derived Native Grassland.	The subject land is highly disturbed as a result of historical grazing. The habitat is therefore considered to be unsuitable habitat for this species.
<i>Leionema lachnaeoides</i>	-	E	E	Unlikely	Medium sized shrub restricted to 10 sites in the upper Blue Mountains within a 12 km range spanning from Katoomba to Blackheath. Grows on the south-east to south-west facing aspects of rocky, barren areas at elevations of between 960 m to 1000 m in Sydney Montane Dry Sclerophyll Forests, Eastern Riverine Forests, Sydney Montane Heaths and Northern Warm Temperate Forests.	<i>Leionema lachnaeoides</i> is currently only known from the Megalong and Jamison Valleys in the Blue Mountains. The subject land lacks suitable rocky habitat for this species.

Table D.2 Likelihood of occurrence assessment – threatened flora

Scientific name	Common name	EPBC Act status ¹	BC Act status ²	Likelihood of occurrence	Habitat preference and rationale	Rationale
<i>Thesium australe</i>	Austral Toadflax	V	V	Potential	Austral Toadflax is found in very small populations scattered across eastern NSW. It occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. It is often found in associated with Kangaroo Grass.	Areas of box gum woodland may contain habitat for this species. An assessment of significance has been prepared for this species in Appendix E.

Notes: 1. EPB Act status: CE- critically endangered, E – endangered, V – vulnerable
 2. BC Act status: CE – critically endangered, E – endangered, E2 – endangered population, V– vulnerable

D.3 Threatened fauna

Table D.3 Likelihood of occurrence assessment – threatened fauna

Scientific name	Common name	EPBC Act status ¹	BC Act status ²	Likelihood of occurrence	Habitat preference and rationale	Rationale
Birds						
<i>Anthochaera Phrygia</i>	Regent Honeyeater	CE	CE	Potential	The Regent Honeyeater mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. These birds are also found in drier coastal woodlands and forests in some years. The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Oak. Every few years non-breeding flocks are seen foraging in flowering coastal Swamp Mahogany (<i>Eucalyptus robusta</i>) and Spotted Gum (<i>Corymbia maculata</i>) forests, particularly on the central coast and occasionally on the upper north coast. Birds are occasionally seen on the south coast.	The subject land is considered to contain suboptimal foraging habitat for the Regent Honeyeater. It is considered the species could potentially occur. An assessment of significance has been prepared for this species in Appendix E.
<i>Botaurus poiciloptilus</i>	Australasian Bittern	E	E	Unlikely	Australasian Bitterns are widespread but uncommon over south-eastern Australia. In NSW they may be found over most of the state except for the far north-west. Favours permanent freshwater wetlands with tall, dense vegetation, particularly Bullrushes (<i>Typha</i> spp.) and Spikerushes (<i>Eleocharis</i> spp.).	The subject land does not contain suitable wetland or habitat. It is unlikely this species occurs within the subject land.
<i>Calidris ferruginea</i>	Curlew Sandpiper	CE	E	Unlikely	The Curlew Sandpiper is distributed around most of the Australian coastline, particularly in the Hunter Estuary within NSW. It mainly occurs on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. Occasionally they are recorded around floodwaters.	The subject land does not contain suitable wetland or estuarine habitat. It is unlikely this species occurs within the subject land.

Table D.3 **Likelihood of occurrence assessment – threatened fauna**

Scientific name	Common name	EPBC Act status ¹	BC Act status ²	Likelihood of occurrence	Habitat preference and rationale	Rationale
<i>Erythrotriorchis radiatus</i>	Red Goshawk	V	CE	Unlikely	The Red Goshawk is endemic to Australia, sparsely distributed through northern and eastern Australia. It inhabits open woodland and forest, preferring a mosaic of vegetation types, large populations of birds (prey), and permanent water. They are often found in riparian habitats along or near watercourses or wetlands. Preferred habitats include mixed subtropical rainforest, <i>Melaleuca</i> swamp forest and riparian <i>Eucalyptus</i> forest of coastal rivers. Nests are made in tall trees within 1 km of a watercourse or wetland.	The subject land does not contain suitable permanent watercourses with suitable vegetation layers including mid-storey and understorey species.
<i>Falco hypoleucos</i>	Grey Falcon	V	E	Unlikely	Found over open country and wooded lands of tropical and temperate Australia. Mainly found on sandy and stony plains of inland drainage systems with lightly timbered acacia scrub. Restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions. Also occurs near wetlands.	The subject land is outside the species known distribution. The subject land does not contain suitable vegetation adjacent to watercourses.
<i>Grantiella picta</i>	Painted Honeyeater	V	V	Potential	The species is sparsely distributed from south-eastern Australia to north-western Queensland, with its greatest concentrations and breeding locations occurring on the inland slopes of the Great Dividing Range in NSW. It inhabits mistletoes in eucalypt forests/woodlands, riparian woodlands of Black Box (<i>Eucalyptus largiflorens</i>) and River Red Gum (<i>E. camaldulensis</i>), Box-Ironbark-Yellow Gum woodlands, Acacia-dominated woodlands, Paperbarks, Casuarina, Callitris, and trees on farmland or gardens. The species prefers woodlands which contain a higher number of mature trees, as these host more mistletoes. It is more common in wider blocks of remnant woodland than in narrower strips although it breeds in quite narrow roadside strips if ample mistletoe fruit is available.	The subject land contains suboptimal habitat for the Painted Honeyeater. It is considered the species could potentially occur. An assessment of significance has been prepared for this species in Appendix E.

Table D.3 **Likelihood of occurrence assessment – threatened fauna**

Scientific name	Common name	EPBC Act status ¹	BC Act status ²	Likelihood of occurrence	Habitat preference and rationale	Rationale
<i>Hirundapus caudacutus</i>	White-throated Needletail	Mi, M, V	-	Potential	The White-throated Needletail is widespread in eastern and south-eastern Australia. In NSW this species extends inland to the western slopes of the Great Divide and occasionally onto the adjacent inland plains. In Australia, the White-throated Needletail is almost exclusively aerial, recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland.	The species does not breed within Australia. Sub-optimal foraging habitat occurs within the subject land; therefore, the species could potentially occur. An assessment of significance has been prepared for this species in Appendix E.
<i>Lathamus discolour</i>	Swift Parrot	CE	E	Potential	The Swift Parrot breeds in Tasmania during spring and summer, then migrates in the autumn and winter months to south-eastern Australia. In NSW, it mostly occurs on the coast and south-west slopes in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany, Spotted Gum, Red Bloodwood (<i>C. gummifera</i>), Mugga Ironbark and White Box. Commonly used lerp infested trees include Inland Grey Box, Grey Box (<i>E. moluccana</i>) and Blackbutt (<i>E. pilularis</i>).	The subject land is considered to contain suboptimal habitat for the Swift Parrot. It is considered the species could potentially occur. An assessment of significance has been prepared for this species in Appendix E.
<i>Rostratula australis</i>	Australian Painted-snipe	E	E	Unlikely	The Australian Painted Snipe is restricted to Australia, most records from the south east, particularly the Murray Darling Basin. The Australian Painted Snipe generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. The species also uses inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Nests are made on the ground amongst tall vegetation, such as grasses, tussocks or reeds.	The subject land does not contain suitable wetland habitat. Therefore, it is unlikely this species occurs.
Frogs						

Table D.3 **Likelihood of occurrence assessment – threatened fauna**

Scientific name	Common name	EPBC Act status ¹	BC Act status ²	Likelihood of occurrence	Habitat preference and rationale	Rationale
<i>Litoria castanea</i>	Yellow-spotted Tree Frog	E	CE	Unlikely	The Yellow-spotted Tree Frog is known from the New England Tableland. The species requires large permanent ponds or slow flowing 'chain-of-ponds' streams with abundant emergent vegetation such as bulrushes and aquatic vegetation. During breeding season, males call at night from the open water. During autumn and winter, the Yellow-spotted Tree Frog shelters under fallen timber, rocks, other debris or thick vegetation.	The subject land lacks necessary aquatic habitat for this species, as such, this species is considered unlikely to occur.
Mammals						
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	V	Unlikely	In NSW, this species has been recorded from a large range of vegetation types including dry and wet sclerophyll forest; Cyprus Pine (<i>Callitris glauca</i>) dominated forest; tall open eucalypt forest with a rainforest sub-canopy; sub-alpine woodland; and sandstone outcrop country. The species requires a combination of sandstone cliff/escarpment to provide roosting habitat that is adjacent to higher fertility sites, particularly box gum woodlands or river/rainforest corridors which are used for foraging.	The subject land does not contain suitable roosting habitat, lacking caves and sandstone cliffs. Therefore, it is unlikely the species occurs.
<i>Dasyurus maculatus</i> (SE mainland population)	Spotted-tailed Quoll	E	V	Unlikely	This species has been recorded from a wide range of habitats, including: coastal heathlands, open and closed eucalypt woodlands, wet sclerophyll and lowland forests. Unlogged forest or forest that has been less disturbed by timber harvesting is preferable. Habitat requirements include suitable den sites such as hollow logs, tree hollows, rocky outcrops or caves. Individuals require an abundance of food, such as birds and small mammals, and large areas of relatively intact vegetation through which to forage. Home ranges are estimated to be 620–2,560 ha for males and 90–650 ha for females.	The subject land does not contain any suitable den habitat for the Spotted-tailed Quoll. The subject land is highly fragmented with habitat degradation due to livestock grazing. No suitable den sites were observed during the surveys.

Table D.3 **Likelihood of occurrence assessment – threatened fauna**

Scientific name	Common name	EPBC Act status ¹	BC Act status ²	Likelihood of occurrence	Habitat preference and rationale	Rationale
<i>Nyctophilus corbeni</i>	Corben's Long-eared Bat	V	V	Unlikely	Inhabits a variety of vegetation types, including mallee, Bull Oak 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. Overall, the distribution of the south eastern form coincides approximately with the Murray Darling Basin with the Pilliga Scrub region being the distinct stronghold for this species. Roosts in tree hollows, crevices, and under loose bark. A slow flying agile bat, utilising the understorey to hunt non-flying prey - especially caterpillars and beetles - and will even hunt on the ground. The species has also been found to be much more abundant in habitats that have a distinct tree canopy and a dense, cluttered understorey layer.	Examination of previous records of this species indicates that this species has not previously been recorded within the locality, with its distribution occurring west of the subject land. This species is therefore considered unlikely to occur.
<i>Petauroides volans</i>	Greater Glider	V	-	Unlikely	The Greater Glider is restricted to eastern Australia. The Greater Glider is an arboreal nocturnal marsupial largely restricted to eucalypt forests and woodlands. It is primarily folivorous, with a diet mostly comprising eucalypt leaves, and occasionally flowers. It is typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows. The greater glider favours forests with a diversity of eucalypt species, due to seasonal variation in its preferred tree species. During the day it shelters in tree hollows, with a particular selection for large hollows in large, old trees.	The Greater Glider is unlikely to occur within the subject land as they favour moist eucalypt forests with dense cover and old trees. As such, this species is considered unlikely to occur.

Table D.3 **Likelihood of occurrence assessment – threatened fauna**

Scientific name	Common name	EPBC Act status ¹	BC Act status ²	Likelihood of occurrence	Habitat preference and rationale	Rationale
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	V	E	Unlikely	In NSW, the Brush-tailed Rock Wallaby occurs from the Queensland border in the north to the Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit. This species occupies rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north. The Brush-tailed Rock Wallaby browse on vegetation in and adjacent to rocky areas eating grasses and forbs as well as the foliage and fruits of shrubs and trees. The Brush-tailed Rock Wallaby is most active at night, spending day time sheltering/basking in rock crevices, caves and overhangs.	The subject land lacks rocky escarpments and cliffs with complex structures. Therefore, it is unlikely the Brush-tailed Rock-wallaby utilises this habitat.
<i>Phascolarctos cinereus</i>	Koala	V	V	Potential	The Koala has a fragmented distribution throughout eastern Australia. Within NSW it mainly occurs on the central and north costs with some populations in the west of the Great Dividing Range. Koalas inhabit a range of temperate, sub-tropical and topical forest, woodland and semi-arid communities dominated by Eucalypt species. Koalas feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species. Distribution is affected by altitude, temperature and leaf moisture.	The subject land contains Koala feed tree species, including Ribbon Gum. An assessment of significance has been prepared for this species in Appendix E.
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V	Unlikely	The Grey-headed Flying-fox is generally found within 200 km of the eastern coast of Australia. They occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. This species feeds on the nectar and pollen of native trees, in particular <i>Eucalyptus</i> , <i>Melaleuca</i> and <i>Banksia</i> , and fruits of rainforest trees and vines.	Although this species has been occasionally recorded on the tablelands any occurrence is likely to be transient, preferring areas close to the coast. Camps of this species are considered unlikely to occur within proximity to the subject land.

Table D.3 **Likelihood of occurrence assessment – threatened fauna**

Scientific name	Common name	EPBC Act status ¹	BC Act status ²	Likelihood of occurrence	Habitat preference and rationale	Rationale
Reptiles						
<i>Uvidicolus sphyrurus</i>	Border Thick-tailed Gecko	V	V	Unlikely	The Border Thick-tailed Gecko is found only on the tablelands and slopes of northern NSW and southern Queensland. The species is most common in the granite country of the New England Tablelands. This species often occurs on steep rocky or scree slopes, especially granite. Favouring forest and woodland areas with boulders, rock slabs, fallen timber and deep leaf litter. Commonly found in areas which often have a dense tree canopy, helping create a sparse understorey. The Border Thick-tailed Gecko is active during the night, sheltering by day under rock slabs, in or under logs, and under the bark of standing trees.	The habitat adjacent to the subject land lacks suitable dense canopy and has a paucity of suitable shelter site, with insufficient rock and woody debris. Furthermore, there are no records of the species within the vicinity of the subject land. As such, this species is considered unlikely to occur.
<i>Wollumbinia belli</i>	Bell's Turtle	V	-	Unlikely	Within NSW, the species is found in the upper reaches of the Namoi, Gwydir and MacDonald Rivers on the North West Slopes. The Bell's Turtle inhabits narrow sections of rivers in granite country, preferring shallow to deep pools in upper reaches or small tributaries of major rivers. Favoured pools are generally less than 3 m deep, where there is a sandy or rocky substrate with small patches of weed. Much of the species habitat is now in grazing land where introduced willow trees grow alongside gum trees on the river banks. Nests are dug out in riverbanks of sand or loam between September and January.	The habitat adjacent to the subject land does not contain suitable aquatic habitat for the species. Nearby watercourses are outside of the known catchments where this species occurs. As such, this species is considered unlikely to occur.
Fish (FM Act status³ applies)						

Table D.3 **Likelihood of occurrence assessment – threatened fauna**

Scientific name	Common name	EPBC Act status ¹	BC Act status ²	Likelihood of occurrence	Habitat preference and rationale	Rationale
<i>Maccullochella peelii</i>	Murray Cod	V	-	Unlikely	The Murray Cod is endemic to the Murray-Darling River system in south-eastern Australia. It occurs in a range of flowing and standing waters, from small, clear rocky streams on the inland slopes and uplands of the Great Dividing Range, to the large turbid, meandering slow-flowing rivers, creeks, anabranches, and lakes and larger billabongs, of the inland plains of the Murray Darling Basin. Within these habitats they are often associated with complex structural cover such as large rocks, large snags and smaller structural woody habitat, undercut banks and overhanging vegetation.	No suitable aquatic habitat is present within the subject land. As such, this species is considered unlikely to occur.

Notes:

1. EPB Act status: CE – critically endangered, E – endangered, V – vulnerable, Mi – migratory, M – marine
2. BC Act status: CE – critically endangered, E – endangered, E2 – endangered population, V – vulnerable
3. FM Act status: CE – critically endangered, E – endangered, V – vulnerable

D.4 Migratory species

Table D.4 Likelihood of occurrence assessment – migratory species

Scientific name	Common name	EPBC Act status ¹	BC Act status ²	Likelihood of occurrence	Habitat preference and rationale	Rationale
Migratory marine birds						
<i>Apus pacificus</i>	Fork-tailed Swift	Mi, M	-	Potential	The Fork-tailed Swift has been recorded in all regions within NSW. Many records occur east of the Great Dividing Range; however, some populations have been found west. The Fork-tailed Swift is almost exclusively aerial. Within Australia they mostly occur over inland plains but sometimes above foothills or in coastal areas. They often occur over cliffs and beaches and also over islands. Habitats include riparian woodland and tea-tree swamps, low scrub and heathland or saltmarsh. Sometimes they can occur above rainforests, wet sclerophyll forest or open forest.	The species does not breed within Australia. The habitat within the subject land may represent sub-optimal foraging habitat for this species. An assessment of significance has been prepared for this species in Appendix E.
Migratory terrestrial species						
<i>Monarcha melanopsis</i>	Black-faced Monarch	Mi, M	-	Unlikely	The Black-faced Monarch occurs around the eastern slopes and tablelands of the Great Divide. It mainly occurs in rainforest ecosystems, including semi-deciduous vine-thickets, complex notophyll vine-forest, tropical (mesophyll) rainforest, subtropical (notophyll) rainforest, mesophyll (broadleaf) thicket/shrubland and warm temperate rainforest. It is also found in nearby open eucalypt forests, including in gullies with a dense, shrubby understorey as well as in dry sclerophyll forests and woodlands, often with a patchy understorey.	The subject land lacks suitable dense shrubby vegetation for this species. As such, this species is considered unlikely to occur.
<i>Motacilla flava</i>	Yellow Wagtail	Mi, M	-	Unlikely	This species occupies a range of damp or wet habitats with low vegetation, from damp meadows, marshes, waterside pastures, sewage farms and bogs to damp steppe and grassy tundra.	The subject land is highly disturbed and lacks suitable wet habitats for this species. As such, this species is considered unlikely to occur.

Table D.4 **Likelihood of occurrence assessment – migratory species**

Scientific name	Common name	EPBC Act status ¹	BC Act status ²	Likelihood of occurrence	Habitat preference and rationale	Rationale
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	Mi, M	-	Unlikely	The Satin Flycatcher is widespread in eastern Australia and vagrant to New Zealand. Satin Flycatchers inhabit heavily vegetated gullies in eucalypt-dominated forests and taller woodlands. They also occur in eucalypt woodlands with open understorey and grass ground cover and are generally absent from rainforest. The species is mainly recorded in eucalypt forests dominated by Brown Barrel (<i>Eucalypt fastigata</i>), Mountain Gum, Mountain Grey Gum, Narrow-leaved Peppermint, Messmate or Manna Gum, or occasionally Mountain Ash (<i>E. Regnans</i>). Such forests usually have a tall shrubby understorey of tall acacias, for example Blackwood (<i>Acacia melanoxylon</i>).	The subject land is highly disturbed and is lacking suitable dense shrubby vegetation for this species. As such, this species is considered unlikely to occur.
<i>Rhipidura rufifrons</i>	Rufous Fantail	Mi, M	-	Unlikely	In east and south-east Australia, the Rufous Fantail mainly inhabits wet sclerophyll forests, often in gullies dominated by eucalypts such as Tallow-wood (<i>Eucalyptus microcorys</i>), Mountain Grey Gum (<i>E. cypellocarpa</i>), Narrow-leaved Peppermint (<i>E. radiata</i>), Mountain Ash, Alpine Ash (<i>E. delegatensis</i>), Blackbutt or Red Mahogany (<i>E. resinifera</i>); usually with a dense shrubby understorey often including ferns.	The subject land lacks suitable dense shrubby vegetation for this species, as such, this species is considered unlikely to occur.
Migratory wetlands species						
<i>Actitis hypoleucos</i>	Common Sandpiper	Mi, M	-	Unlikely	The Common Sandpiper is found along all coastlines of Australia and in many areas inland. The species utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats. The Common Sandpiper forages in shallow water and on bare soft mud at the edges of wetlands. Roosting sites are typically on rocks or in roots or branches of vegetation, especially mangroves. The species is also associated with mangroves, and sometimes found in areas of mud littered with rocks or snags.	The subject land lacks suitable wetland habitat, as such, this species is considered unlikely to occur.

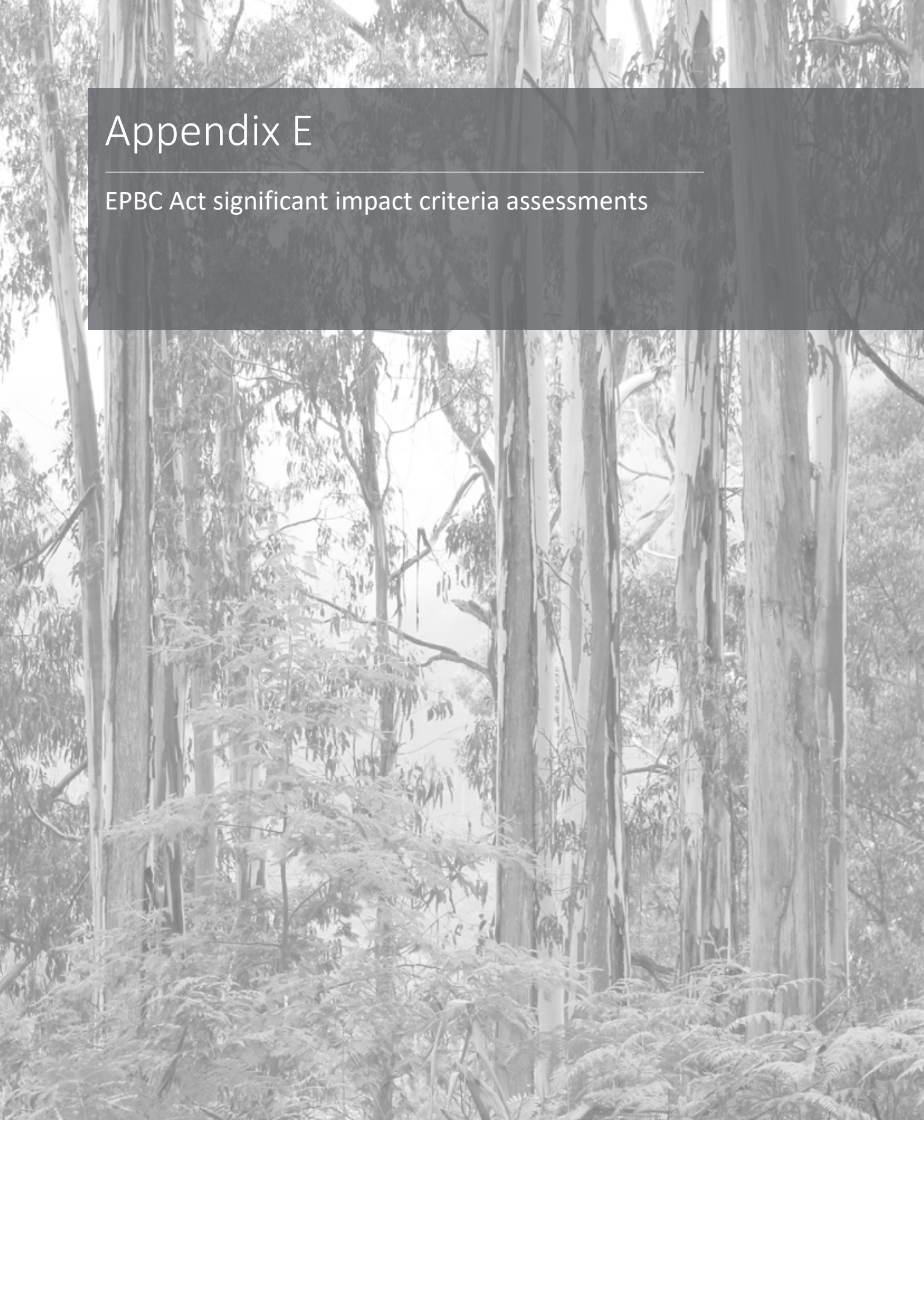
Table D.4 **Likelihood of occurrence assessment – migratory species**

Scientific name	Common name	EPBC Act status ¹	BC Act status ²	Likelihood of occurrence	Habitat preference and rationale	Rationale
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	Mi, M	-	Unlikely	The Sharp-tailed Sandpiper spends its non-breeding season in Australia. During this time the species is widespread along much of the coast and is very sparsely scattered inland, particularly in central and south-western regions. Within Australia the Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast. They also use flooded paddocks, sedgeland and other ephemeral wetlands. Roosting occurs at the edges of wetlands, on wet open mud or sand, in shallow water or in sparse vegetation.	The subject land lacks suitable wetland habitat, as such, this species is considered unlikely to occur.
<i>Calidris ferruginea</i>	Curlew Sandpiper	CE, Mi, M	-	Unlikely	Mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. Occasionally they are recorded around floodwaters.	The subject land lacks suitable wetland habitat, as such, this species is considered unlikely to occur.
<i>Calidris melanotos</i>	Pectoral Sandpiper	Mi, M	-	Unlikely	The Pectoral Sandpiper prefers shallow fresh to saline wetlands. It is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. They forage in shallow water or soft mud at the edge of wetlands.	The subject land lacks suitable wetland habitat for the Pectoral Sandpiper. As such, this species is considered unlikely to occur within the subject land.

Table D.4 **Likelihood of occurrence assessment – migratory species**

Scientific name	Common name	EPBC Act status ¹	BC Act status ²	Likelihood of occurrence	Habitat preference and rationale	Rationale
<i>Gallinago hardwickii</i>	Latham's Snipe	Mi, M	-	Unlikely	Latham's Snipe extends inland over the eastern tablelands in south-eastern Queensland and to west of the Great Dividing Range in NSW. Within Australia it occurs in permanent and ephemeral wetlands, usually favouring open, freshwater wetlands with low, dense vegetation. They also occur in habitats with saline or brackish water, in modified or artificial habitats and areas located close to humans. It occurs in temperate and tropical regions of Australia. Foraging occurs in areas of mud and some form of cover. Roosting occurs on the ground near foraging areas, usually in sites providing some ditches or plough marks, among boulders or in shallow water.	The subject land lacks suitable wetland habitat, as such, this species is considered unlikely to occur.
<i>Pandion haliaetus</i>	Osprey	Mi, M		Unlikely	The Osprey is found right around the Australian coastline, common around the northern coast on rocky shorelines, islands and reefs. The species favours coastal areas, especially the mouths of large rivers, lagoons and lakes. The Osprey occurs in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia. They require extensive areas of open fresh, brackish or saline water for foraging.	The subject land is outside the mapped range for the species. No suitable aquatic habitat is present. As such, this species is considered unlikely to occur.
<i>Tringa nebularia</i>	Common Greenshank	Mi, M		Unlikely	The Common Greenshank has been recorded within NSW in most coastal regions. It is widespread west of the Great Dividing Range. The species is found in a variety of inland wetlands and sheltered coastal habitats, varying in salinity. Habitats include embayments, harbours, river estuaries, deltas and lagoons. The edges of the wetlands occupied are generally of mud or clay, occasionally of sand, and may be bare of with emergent or fringing vegetation, including short sedges and saltmarsh, mangroves.	The subject land lacks suitable wetland habitat, as such, this species is considered unlikely to occur.

Notes: 1. EPBC Act status: CE – critically endangered, E – endangered, V – vulnerable, Mi – migratory, M – marine
 2. BC Act status: CE – critically endangered, E – endangered, E2 – endangered population, V – vulnerable



Appendix E

EPBC Act significant impact criteria assessments

This section includes an assessment of the potential direct and indirect impacts of the proposed action on MNES. The direct impact of the project is the clearance of vegetation. The impact assessment for this project assumes complete disturbance/removal of 36 ha of woodland habitat within the development site in addition to 1.59 ha of woodland and 2.24 ha of derived grasslands/native pasture associated with the subject land. Where the species has the potential to occur in both the development site and the subject land, cumulative impacts have been considered.

E.1 White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

White Box Yellow Box Blakely's Red Gum Woodland (commonly referred to as Box-Gum Woodland) is an open woodland community (sometimes occurring as a forest formation), in which the most obvious species are one or more of the following: White Box, Yellow Box and Blakely's Red Gum. Intact sites contain a high diversity of plant species, including the main tree species, additional tree species, some shrub species, several climbing plant species, many grasses and a very high diversity of herbs. The community also includes a range of mammal, bird, reptile, frog and invertebrate fauna species. Intact stands that contain diverse upper and mid-storeys and groundlayers are rare.

Modified sites include the following:

- areas where the main tree species are present ranging from an open woodland formation to a forest structure, and the groundlayer is predominantly composed of exotic species; and
- sites where the trees have been removed and only the grassy groundlayer and some herbs remain.

Areas that are part of the Australian Government listed ecological community must have either:

- an intact tree layer and predominately native ground layer; or
- an intact native ground layer with a high diversity of native plant species but no remaining tree layer.

The vegetation assessment identified areas of woodland within the development site and subject land. However, due to historical disturbance the majority of this vegetation was found to be degraded and lacked many of the features of good quality woodland such as an intact canopy, midstorey and groundcover. The assessment determined that only the better-quality areas of woodland within the subject land with an intact canopy are likely to meet the EPBC listing criteria. It is therefore estimated that approximately 0.74 ha of this vegetation type will require removal. An assessment of significance has been prepared to address these impacts in accordance with the EPBC significant impact guidelines in Table E.1.

Table E.1 Significant impact criteria assessment – White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

Criteria	Discussion
1: reduce the extent of an ecological community	The total removal of up to 0.74 ha of vegetation commensurate with White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland will occur.
2: fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines	The road upgrades will require vegetation clearing within an existing road reserve where the vegetation is already substantially fragmented by historical land clearing activities. The proposed road upgrades would therefore result in a minor increase in fragmentation of this community within the locality.
3: adversely affect habitat critical to the survival of an ecological community	Critical habitat refers to areas critical to the survival of the ecological community and includes areas necessary for: • Recovery of the ecological community • Maintenance of genetic diversity and long-term evolutionary development; and • Reintroduction of the ecological community. The National Recovery Plan recognises all patches that meet the minimum condition criteria as habitat critical to the survival of the community. However, the area of vegetation to be removed consists of a narrow margin of roadside vegetation that is already highly fragmented and disturbed. The majority of woodland will not be impacted and will continue to contribute to the persistence of the community.
4: 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	Given that the road upgrade involves mainly widening of an existing road, this is unlikely to modify or destroy abiotic (non-living) factors necessary for survival of the ecological community within the locality. The proposed works are unlikely to affect groundwater levels, or substantial alteration of surface water drainage patterns.
5: 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 road upgrades will require removal of a small number of trees and shrubs from the existing road reserve. Edge effects are likely to be similar following completion of the proposed works and therefore composition of the community is unlikely to be substantially altered.
6a: 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	There is potential for works associated with the road upgrades to increase the spread of weeds throughout the subject land and surrounds. The risk of weed introduction can be managed through appropriate control measures. Provided appropriate weed control measures are adhered to it is unlikely that the proposed modification would cause a substantial reduction in the quality or integrity of the community.
6b: 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,	Existing agricultural activities in the surrounding locality may already result in occasional mobilisation of fertilisers, herbicides or other chemicals or pollutants. The proposed works would not result in additional regular mobilisation of fertilisers, herbicides or other chemicals or pollutants. Provided that standard environmental management measures are implemented during construction, it is unlikely that chemicals or pollutants will be introduced into the community.
7: interfere with the recovery of an ecological community.	A national recovery plan has been prepared for this community. Mitigation measures such as weed control and vehicle hygiene protocols will also be implemented throughout construction to further minimise impacts to the community and maximise natural recovery within the locality.

Table E.1 Significant impact criteria assessment – White Box-Yellow Box-Blakely’s Red Gum Grassy Woodland and Derived Native Grassland

Criteria	Discussion
Conclusion	Based on the consideration of the above assessment criteria it is unlikely that the project and proposed modification will have a significant impact on White Box-Yellow Box-Blakely’s Red Gum Grassy Woodland and Derived Native Grassland as: • The removal of vegetation for the proposed works would comprise only a minor fraction of this woodland in the wider locality. • The road upgrades will not result in any substantial further fragmentation and/or isolation of any patches of the community beyond what already exists along the existing roadsides. • The proposed works would not cause a substantial reduction in the extent, quality or integrity of an occurrence of the community. • The proposed works would not modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for the community’s survival. • The proposed works would not adversely affect habitat critical to the survival of the community. • The area to be impacted by the proposed works is relatively small compared to the extent of the community likely to be present in the locality and as such would be unlikely to interfere with the recovery of the community.

E.2 Bluegrass (*Dichanthium setosum*) – vulnerable

Bluegrass occurs on the New England Tablelands, North West Slopes and Plains and the Central Western Slopes of NSW, extending to northern Queensland. It occurs widely on private property, including in the Inverell, Guyra, Armidale and Glen Innes areas.

The species is mainly associated with heavy basaltic black soils and red-brown loams with clay subsoil. It is often found in moderately disturbed areas such as cleared woodland, grassy roadside remnants and highly disturbed pasture. The species is often collected from disturbed open grassy woodlands on the northern tablelands, where the habitat has been variously grazed, nutrient-enriched and water-enriched). It is open to question whether the species tolerates or is promoted by a certain amount of disturbance, or whether this is indicative of the threatening processes behind its depleted habitat. Associated species include White Box, Silver-leaved Ironbark (*Eucalyptus melanophloia*), Yellow Box, Ribbon Gum, Winter Apple (*Myoporum debile*), Purple Wiregrass (*Aristida ramosa*), Kangaroo Grass, Snowy Grass (*Poa sieberiana*), Red Grass, Woolly Burr (*Medicago minima*), *Leptorhynchos squamatus*, *Lomandra aff. longifolia*, Austral Bugle (*Ajuga australis*), Bogan Flea (*Calotis hispidula*) and *Austrodanthonia*, *Dichopogon*, *Brachyscome*, *Vittadinia*, *Wahlenbergia* and *Psoralea* species. The species is locally common or found as scattered clumps in broader populations. The extensive distribution and wide environmental tolerances make predictions about suitable habitat difficult.

Assessment of Bluegrass within the development site concluded that Bluegrass is unlikely to occur based on the degradation of the habitat, high livestock grazing pressure and lack of any individuals being recorded during targeted surveys.

The vegetation condition within the subject land contains better quality habitat, which has a moderate possibility of containing a population of the species. Furthermore, targeted surveys have not been undertaken. It is estimated that the road upgrades could potentially remove 3.57 ha of habitat (1.33 ha of woodland and 2.24 ha of derived native grasslands and pasture) for this species.

An assessment of significance for removal of this habitat has been prepared in accordance with the relevant EPBC Act significant impact guidelines in Table E.2.

Table E.2 **Significant impact criteria assessment – Bluegrass**

Criteria	Discussion
1: long-term decrease in population size	Due to habitat degradation and livestock grazing, no areas within the subject land are likely to contain optimal habitat for Bluegrass. Given that the subject land will impact a small area of suboptimal habitat (3.57 ha), this is unlikely to cause a long-term decrease in the size of a local population.
2: reduce area of occupancy	It is unlikely that the loss of a small area of potential habitat (3.57 ha) will significantly reduce the occupancy of bluegrass within the subject land. The impact on the potential occupancy area of this species is considered negligible.
3: fragment a population	The vegetation within the subject land is fragmented and subject to disturbance. If bluegrass has been able to persist in such an over-cleared landscape, it is unlikely that the loss of a small linear area of habitat (3.57 ha) would cause significant further fragmentation of a local population.
4: adversely affect critical habitat	No critical habitat has been defined for the species. Given that the habitat to be removed is considered to be degraded and there are no records of the species within the vicinity, it is unlikely that this habitat is critical to the survival of Bluegrass.
5: disrupt the breeding cycle of a population	The habitat to be removed is limited to a narrow strip either side of an existing carriageway. A substantial amount of habitat will remain which will allow for uninterrupted propagation of the species.
6: decrease availability or quality of habitat	The road upgrades will disturb a small area of suboptimal potential habitat (3.57 ha) for the species. Much larger areas of similar habitat will be retained within the road reserve and wider vicinity.
7: result in invasive species	Without management, the increased machinery required during construction has the potential to introduce novel weeds to the area. Weed control protocols will be undertaken in accordance with the BMP in order to minimise this risk.
8: introduce disease	This species is not known to be particularly susceptible to disease and the project will not introduce any disease relevant to the species.
9: interfere with recovery	Given that the habitat to be removed is considered to be suboptimal and does not include a known population of the species, it is unlikely that this habitat is important to the recovery of Bluegrass within the locality.
Conclusion	The project and proposed modification are unlikely to have a significant impact on Bluegrass as: • no habitat for Bluegrass was identified within the development site; • only 3.57 ha of potential habitat will be removed within the subject land; and • the habitat to be removed is considered to be in low condition and is not considered to be important to the long-term survival of the species in the locality.

E.3 Austral Toadflax (*Thesium australe*) – vulnerable

Austral Toadflax is found in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands. It is also found in Tasmania and Queensland and in eastern Asia. Although originally described from material collected in the SW Sydney area, populations have not been seen in a long time. It may persist in some areas in the broader region.

The species prefers grassland on coastal headlands or grassland and grassy woodland away from the coast. The species is a root parasite that takes water and some nutrient from other plants, especially Kangaroo Grass.

Due to a lack of habitat quality within the development site, Austral Toadflax is considered unlikely to occur; however, vegetation condition within the subject land contains better quality habitat, which has a moderate possibility of containing a population of the species. It is estimated that the road upgrades could potentially remove 3.57 ha of habitat (1.33 ha of woodland and 2.24 ha of derived native grasslands and pasture) for this species.

An assessment of significance for removal of this habitat has been prepared in accordance with the relevant EPBC significant impact guidelines in Table E.3.

Table E.3 Significant impact criteria assessment – Austral Toadflax

Criteria	Discussion
1: long-term decrease in population size	Due to habitat degradation, no areas within the subject land are likely to constitute optimal habitat for Austral Toadflax, with occurrences of Kangaroo Grass limited to small patches. An examination of aerial imagery indicates that the vegetation within the road reserve is highly fragmented due to historical vegetation clearing. As such, it is unlikely that these areas would support a large population of Austral Toadflax. Given that the road upgrades will only disturb a small area of potential habitat (3.57 ha) this is unlikely to cause a long-term decrease in the size of a local population.
2: reduce area of occupancy	It is unlikely that the loss of a small area of potential habitat (3.57 ha) will significantly reduce the occupancy of Austral Toadflax within the subject land. The impact of the project on the occupancy of this species is considered negligible.
3: fragment a population	The subject land exists within a highly cleared landscape with poor existing landscape connectivity. The vegetation within the subject land is similarly fragmented. If Austral Toadflax has been able to persist in such an over-cleared landscape, it is unlikely that the loss of a small linear area of habitat (3.57 ha) would cause significant further fragmentation of a local population.
4: adversely affect critical habitat	No critical habitat has been defined for the species. Given that the habitat to be removed is degraded and there are no local records of the species, it is unlikely that this habitat is critical to the survival of Austral Toadflax.
5: disrupt the breeding cycle of a population	The habitat to be removed is limited to a narrow strip either side of an existing carriageway. A substantial amount of habitat will remain which will allow for uninterrupted propagation of the species.
6: decrease availability or quality of habitat	The road upgrades will disturb a small area of suboptimal potential habitat (3.57 ha) for the species. Much larger areas of similar habitat will be retained within the road reserve and wider vicinity.
7: result in invasive species	Without management, the increased machinery required during the construction has the potential to introduce novel weeds to the area. Weed control protocols will be undertaken in accordance with the BMP, in order to minimise this risk.
8: introduce disease	This species is not known to be particularly susceptible to disease and the proposed works will not introduce any disease relevant to the species.
9: interfere with recovery	Given that the habitat to be removed is considered to be highly degraded, it is unlikely that this habitat is important to the recovery of Austral Toadflax within the locality.

Table E.3 **Significant impact criteria assessment – Austral Toadflax**

Criteria	Discussion
Conclusion	The project and proposed modification are unlikely to have a significant impact on Austral Toadflax as: • no habitat for Austral Toadflax: was identified within the development site; • 3.57 ha of habitat will be removed within the subject land; and • the habitat to be removed is considered to be in low condition and is not considered to be important to the long-term survival of the species in the locality.

E.4 Regent Honeyeater (*Anthochaera phrygia*) – critically endangered

The Regent Honeyeater is endemic to mainland south-east Australia and is listed as a critically endangered species under the EPBC Act. The species has an extremely patchy distribution which extends from south-east Queensland, through New South Wales and the Australian Capital Territory, to central Victoria. However, it is highly mobile, occurring only irregularly in most sites, and in variable numbers, often with long periods with few observations anywhere.

Within the current distribution, there are four known key breeding areas where the species is regularly recorded. These are the Bundarra-Barraba, Capertee Valley and Hunter Valley districts in New South Wales, and the Chiltern area in north-east Victoria (DoE 2016). The project is closest to the Bundarra-Barraba breeding area. The easternmost point of the Bundarra-Barraba breeding area is approximately 22 km north-east of the development site.

The species typically nest in the canopy of mature trees with rough bark, eg Ironbarks, Sheoaks (*Casuarina*) and Rough-barked Apple (*Angophora*). A cup-shaped nest is constructed in which two to three eggs are laid. Nests may be near or far from food resources; one nest has been recorded 700 m from a resource tree (DoE 2016). Pairs now mostly nest solitarily, but historical records show in the past they often nested in loose aggregations (DoE 2016).

The Regent Honeyeater comprises a single population, with some exchange of individuals between regularly used areas (DoE 2016). The species can undertake large-scale nomadic movements in the order of hundreds of kilometres (OEH 2019a). Despite the ability of this species to migrate over large area it is likely that many historically used areas are no longer utilised due to the loss of important foraging habitat or habitat fragmentation resulting in the inability of regent honeyeaters to access these areas and because the areas have been colonised by larger more aggressive honeyeaters, such as the noisy miner.

There are no records of this species within the development site, with two records occurring adjacent to one another, approximately 8 km to the north-east of the development site. These are from within the Imbota nature reserve and dated from 1984 and 2000. The next closest records are the City of Armidale approximately 10 km to the north. More broadly, very few records are found within the locality of the development site, likely due to the over-cleared and agricultural landscape.

The species often inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Oak. The Regent Honeyeater is a generalist forager, which mainly feeds on the nectar from a wide range of eucalypts and mistletoes, targeting those which flower most profusely. Key eucalypt species identified in the National Recovery Plan for the Regent Honeyeater (DoE 2016) comprise Mugga Ironbark (*Eucalyptus sideroxylon*), Yellow Box, White Box, Yellow Gum (*E. leucoxylon*), Spotted Gum, Swamp Mahogany, Needle-leaf Mistletoe (*Amyema cambagei*) which grows on River Oak, Box Mistletoe (*A. miquellii*) and Long-flower Mistletoe (*Dendrophoe vitellina*). Other tree species may be regionally important. For example, the Lower Hunter Spotted Gum forests have recently been demonstrated to support regular breeding events of Regent Honeyeaters. Flowering of associated species such as Thin-leaved stringybark (*E. eugenioides*), other stringybark species, and Broad-leaved Ironbark (*E. fibrosa*) can also contribute important nectar flows at times.

The species has the potential to fly over or utilise seasonal foraging resources within the development site and subject land on a transient basis. Table E.4 provides an assessment of significance for the removal of 36 ha of woodland habitat within the development site and 1.59 ha of woodland habitat within the subject land, in accordance with the relevant assessment criteria (DoE 2013).

Table E.4 Significant impact criteria assessment – Regent Honeyeater

Criteria	Discussion
1: long-term decrease in population size	The Regent Honeyeater occurs as a single, contiguous population (DoE 2016). An action that would lead to a long-term decrease of the Regent Honeyeater population would be one that is undertaken in a breeding area, or one that removes important foraging habitat. As the proposed action is not located in a known breeding area for the species, it is not expected to result in a long-term decrease in population size. The development site includes Yellow Box, identified as a key eucalypt species in the National Recovery Plan for the Regent Honeyeater (DoE 2016). However, potential foraging is likely to be limited owing to the relatively small patches sizes of woodland and the over cleared landscape, which would require the species to fly large distances between patches of woodland to forage. The habitat within the subject land contains more optimal foraging habitat; however, the magnitude of the impact will be 1.59 ha. It is unlikely that the species is reliant on foraging resources within the development site or subject land, nor are any substantial numbers of the species likely to occur within these areas. As such, a long-term decrease in the population size is unlikely.
2: reduce area of occupancy	The Regent Honeyeater has not been recorded within the development site, with very occasional records in the surrounding locality; most of them historic and all in excess of an 8 km radius. The species is considered to have potential to occur based on the presence of a key feed tree species, Yellow Box. The foraging habitat within the development site is considered sub-optimal based on the highly fragmented landscape. The habitat within the subject land is more optimal foraging habitat; however, the magnitude of the impact will be limited to 1.59 ha. It is unlikely that the loss of a small area of sub-optimal foraging habitat will significantly reduce the occupancy of the species. The development site and subject land are not likely to contain breeding habitat and is not within any key breeding area, as identified in the recovery plan. The impact of the project and proposed modification on the occupancy of this species is considered negligible.
3: fragment a population	The Regent Honeyeater occurs as a single, contiguous population (DoE 2016). This species is highly mobile and able to cross open areas in order to exploit seasonal foraging resources. The development site exists within a highly cleared landscape with very poor existing landscape connectivity. If the species is already able to persist in such an over-cleared landscape it is unlikely that the loss of small patches of woodland (totalling 36 ha within the development site and 1.59 ha within the subject land) will cause any effect of the ability of this species to move across the landscape.

Table E.4 Significant impact criteria assessment – Regent Honeyeater

Criteria	Discussion
4: adversely affect critical habitat	Habitat critical to the survival of the Regent Honeyeater includes, any breeding or foraging habitat in areas where the species is likely to occur (as defined in Figure 1 of the National Recovery Plan (DoE 2016)); and any newly discovered breeding or foraging locations. The development site and subject land is over 22 km from the Bundarra-Barraba breeding area and is not listed within any of the associated subsidiary areas as listed in the Recovery Plan (DoE 2016). The species is known to utilise Rough-barked Apple, which occurs within the development site and subject land for nest construction, however it is unlikely that the development site would be selected for breeding, owing to lack of shelter and the sparse foraging resources. Most records of regent honeyeaters come from box-ironbark eucalypt associations, where the species seems to prefer more fertile sites with higher soil water content, including creek flats, broad river valleys and lower slopes. A single key tree species listed in the recovery plan, Yellow Box, occurs within the development site. This species is scattered through the development site in low densities, typically only remaining on slopes and low ridgelines, with the most fertile areas completely cleared. The foraging habitat is considered poor, due to the sparse nature of the trees within the predominately cleared landscape. The large distance between trees would make foraging energetically inefficient and the lack of any shelter between paddock trees would likely leave the species vulnerable to competitive exclusion from Noisy Miner. The habitat within the subject land is more optimal foraging habitat, given a high density of feed trees, however the magnitude of the impact will be small, limited to 1.59 ha. If the Regent Honeyeater occurs within the development site and subject land, it is likely to be an occasional occurrence. Furthermore, it is likely to be a transient occurrence, whilst seeking more optimal areas of foraging habitat such as movements between coastal foraging areas and the Box-Ironbark communities on the western slopes. It is unlikely that the species is reliant on foraging resources within the development site and subject land, nor are any substantial numbers of the species likely to occur. Therefore, the project and proposed modification will not affect any habitat critical to the survival of the Regent Honeyeater.
5: disrupt the breeding cycle of a population	The development site and subject land are not within a known breeding area for the species, with the closest key breeding area, the Bundarra-Barraba, 22 km to the north-east. Considering that foraging habitat is sub-optimal, it is unlikely that the species would select the area for breeding. The energetic expenditure of foraging across large areas to supply enough food to raise chicks is likely to be prohibitive to breeding. Furthermore, the sparse, thinned and patchy woodland, with a complete absence of any small trees or shrubs is unlikely to provide sufficient protection for chicks from the aggressive Noisy Miner, which is listed as key threatening process. The woodland within the development site and subject land is not likely to be important in enabling the species to reach breeding condition given the sub-optimal nature of the foraging habitat. The project and proposed modification are not anticipated to have any impact on the breeding cycle of the Regent Honeyeater, considering that breeding is not likely to occur and foraging resources are considered sub-optimal.
6: decrease availability or quality of habitat	The species has not been recorded within the development site or subject land and if it does occur, it is likely to be on a transient basis only, passing through to more optimal areas of foraging habitat. With the majority of Box-Gum woodland areas avoided by iterative design, the clearance of sub-optimal foraging habitat is not likely to cause any discernible impact to the species, and the species will remain largely unaffected by the project and proposed modification.
7: result in invasive species	Without management, the increased machinery required during construction has the potential to introduce novel weeds to the area. Weed control protocols will be undertaken in accordance with the BMP in order to minimise this risk. Currently there are few habitat values in the development site and subject land, relevant to the Regent Honeyeater, which are likely to be impacted by invasive species. For example, potential foraging resources are limited to remnant trees, with no recruitment occurring owing to grazing and management practices. Weed invasion would not result in any increased competition as there is no regeneration occurring.

Table E.4 **Significant impact criteria assessment – Regent Honeyeater**

Criteria	Discussion
8: introduce disease	This species is not known to be particularly susceptible to disease and the project and proposed modification will not introduce any disease relevant to the Regent Honeyeater.
9: interfere with recovery	The recovery of the Regent Honeyeater is closely linked the extent and quality of habitat, and recovery actions include the protection of intact (high quality) areas of Regent Honeyeater breeding and foraging habitat (DoE 2016). The development site and subject land are not within a known breeding or foraging area and is unlikely to provide breeding habitat. Although the habitats present provide a potential foraging resource; it is not considered high quality as the key eucalypt feed species, Yellow Box, is sparsely distributed across the landscape and does not occur in fertile valley areas, which are typically the most productive. The potential habitat to be removed is small in area and at best, will only be utilised transiently basis. Therefore, it is unlikely that any individuals are reliant on the habitat and its removal will have no impact on the recovery of the species.
Conclusion	The project and proposed modification are unlikely to have a significant impact on Regent Honeyeater as: • the development site and subject land are not within a known breeding area, and do not provide optimal breeding habitat for the species; and • if the species does occur, it is likely to be on a transient basis only, passing through to more optimal areas of foraging habitat.

E.5 Swift Parrot (*Lathamus discolor*) – critically endangered

The Swift Parrot is listed as a critically endangered species under the EPBC Act. This species migrates from its Tasmanian breeding grounds to south-eastern Australia in the autumn and winter months. In NSW, the species mostly occurs on the coast and south-west slopes in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations (OEH 2019b). The species is not typically associated with the northern tablelands of NSW and detailed information within the national recovery plan (Saunders & Tzaros 2011) regarding regional distributions, is largely restricted to the Western Slopes and coastal areas.

Records of the Swift Parrot are largely absent from the southern and eastern portions of the Northern Tablelands, with a single record existing within a 10 km radius of the development site. This record was within the Imbota Nature Reserve, approximately 8 km north-east of the development site.

Favoured feed trees in NSW include Grey Box (*Eucalyptus microcarpa*), Yellow Box, Swamp Mahogany, Spotted Gum, Blackbutt (*E. pillularis*), Mugga Ironbark, and White Box.

The Swift Parrot is not considered to be dependent on habitat in the development site and subject land as optimal habitat is in areas with a higher density of larger, preferred feed trees. However, the species has been assessed as having the potential to occur given the presence of feed trees identified in the species recovery plan (Saunders & Tzaros 2011).

Habitat for the Swift Parrot to be removed for the project and proposed modification consists of 36 ha of woodland habitat within the development site and 1.59 ha of woodland habitat within the subject land. Table E.5 provides an assessment of significance for the removal of this potential foraging habitat, in accordance with the relevant assessment criteria (DoE 2013).

Table E.5 Significant impact criteria assessment – Swift Parrot

Criteria	Discussion
1: long-term decrease in population size	Within the development site, foraging habitat is largely limited to sparse Yellow Box trees existing within a largely cleared agricultural landscape. It is unlikely that the species would preference the area for foraging given the energetic expenditure of moving large distances between trees. Furthermore, the sparse, thinned and patchy woodland, with a complete absence of any small trees or shrubs is unlikely to provide sufficient protection from the aggressive Noisy Miner. The habitat within the subject land is more optimal foraging habitat, given the more dense occurrence of Yellow Box; however, the magnitude of the impact will be small, limited to 1.59 ha. It is unlikely that the species is reliant on foraging resources within the development site and subject land, nor are substantial numbers of the species likely to occur. Further, the species does not breed on mainland Australia, and hence there is no potential for breeding habitat to be impacted. As such, there is not likely to be any population level impacts.
2: reduce area of occupancy	A total area of 36 ha of sub-optimal potential foraging habitat will be removed as a result of the development site. Additionally, 1.59 ha of slightly more optimal habitat will require removal within the subject land. This species is wide ranging, foraging within much of south east NSW, typically occurring in areas where profuse flowering of feed trees is occurring. It is unlikely that the loss of sub-optimal foraging habitat will significantly reduce the occupancy of the species. The species has not previously been recorded within the development site or subject land, with very sparse records existing within the region.
3: fragment a population	This species exists as a single population, is highly mobile and is able to cross open areas. The loss of potential foraging habitat, which occurs in an already highly fragmented landscape, will not cause any significant fragmentation effects.
4: adversely affect critical habitat	Habitats of particular importance to the Swift Parrot are outlined in the recovery plan for the species (Saunders & Tzaros 2011); including: • for nesting;

Table E.5 Significant impact criteria assessment – Swift Parrot

Criteria	Discussion
	• by large proportions of the Swift Parrot population; • repeatedly between seasons (site fidelity), or • for prolonged periods of time (site persistence). As the proposed works are within mainland Australia, there is no potential for nesting occur. The species has not been recorded within the development site or subject land, with a single historical record existing within the locality (10 km buffer of the development site). There is no evidence of prolonged occurrence, repeat use or large number of the species occurring within the development site or surrounding locality. Therefore, the project and proposed modification will not affect any habitat critical to the survival of the Swift Parrot.
5: disrupt the breeding cycle of a population	The Swift Parrot breeds within Tasmania and has no potential to breed within the development site or subject land.
6: decrease availability or quality of habitat	The species has not been recorded within the development site or subject land and if it does occur is likely to be on a transient basis only, passing through to more optimal areas of foraging habitat. The Swift Parrot is not considered to be dependent on habitat in development site and subject land; the clearance of sub-optimal foraging habitat is not likely to cause any discernible impact to the Swift Parrot, and the species will remain largely unaffected by the project and proposed modification.
7: result in invasive species	Weed invasion impacting on habitat regeneration and health, and aggressive exclusion from forest and woodland habitat by over abundant Noisy Miners are two key threats that invasive species pose on the Swift Parrot. Noisy Miners are already abundant within the development site and likely to be a resident feature in the highly cleared landscape. The project and proposed modification are not anticipated to exacerbate the occurrence of Noisy Miners. Without management, the increased machinery required during construction has the potential to introduce novel weeds to the area. Weed control protocols will be undertaken in accordance with the BMP in order to minimise this risk. Currently there are few habitat values in the development site, relevant to the Swift Parrot, which are likely to be impacted by invasive species. For example, potential foraging resources are limited to remnant trees, with no recruitment currently occurring owing to grazing and management practices. Weed invasion would not result in any increased completion as there is no regeneration occurring.
8: introduce disease	This species is vulnerable to Psittacine Beak and Feather Disease; however, the proposed works do not play a role in the introduction of this threat.
9: interfere with recovery	The key action within the recovery plan for the Swift Parrot (Saunders & Tzaros 2011), which is relevant to the project and proposed modification is the management and protection of Swift Parrot habitat at the landscape scale. The habitat within the development site and subject land is unlikely to be important for this species and there is expected to be no impact on its recovery.
Conclusion	It is unlikely that the species is reliant on foraging resources within the development site or the subject land. Therefore, the habitat to be removed is unlikely to be important for the species and the project and proposed modification are not anticipated to have a significant impact on the Swift Parrot.

E.6 Painted Honeyeater (*Grantiella picta*) – Vulnerable

The Painted Honeyeater is endemic to Australia, ranging from north-eastern South Australia, through Victoria and New South Wales, and up to north-western Queensland and eastern Northern Territory (DoE 2015). Many of the species move to semi-arid regions after breeding season. The species is considered to have a single population (DoE 2015).

The Painted Honeyeater occurs within eucalypt forests/woodlands, riparian woodlands of black box and river red gum, box-ironbark-yellow gum woodlands, acacia-dominated woodlands, paperbarks casuarinas, callitris, and trees on farmland. Mistletoe is one of the key factors for the species habitat as their diet mainly consists of mistletoe fruits. However, they also feed on nectar from flowering eucalypts, as well as arthropods (DoE 2015). Favoured habitat is generally woodlands with higher numbers of mature trees containing mistletoes. The Painted Honeyeater is more commonly known to occur in wider blocks of remnant woodland rather than in narrow strips (DoE 2015).

Breeding occurs between October to March, within vegetation where mistletoe prevalence is high. Nests are made from plant-fibre, particularly mistletoe, spiders' webs and rootlets. Nests are placed in the outer foliage of trees and can sometimes be found in narrow roadside strips of vegetation where mistletoe fruit is available (DoE 2015).

Key threats to the Painted Honeyeater include clearing of breeding habitat, particularly in box-ironbark and boree woodlands. Grazing on private land inhibits tree recruitment, ultimately resulting in an uneven age structure of mistletoe host trees leading to the depletion of them. The presence of invasive species also affects the Painted Honeyeater, including competition with the Noisy miner (*Manorina melanocephala*), predation by the Black rat (*Rattus rattus*). Other threats include collision with road vehicles, decline in habitat trees through pasture activities and nest predation by other birds such as Pied Currawongs (*Strepera graculina*), pied and grey butcherbirds (*Cracticus nigrogularis* and *Cracticus torquatus*), and crows and ravens (*Corvidae*). Degradation of habitat by infestation of weeds is also a threat to the Painted Honeyeater (OEH 2017b).

The development site consists of highly fragmented woodland, with small patch sizes and an absence of mid storey species. There is a lack of mistletoe and therefore a paucity of habitat features for the Painted Honeyeater. Woodland within the subject land contains a higher density of trees with occasional mistletoe present. This area is within a highly fragmented landscape and is considered sub-optimal habitat for the species.

Table E.6 provides an assessment of significance for the removal of 1.59 ha of potential sub-optimal woodland habitat.

Table E.6 Significant impact criteria assessment – Painted Honeyeater

Criteria	Discussion
1: long-term decrease in population size	The Painted Honeyeater occurs as a single, contiguous population (DoE 2015). An action that would lead to long-term decrease of the population would be one within breeding area or removing important foraging habitat. The Painted Honeyeater requires mistletoe for breeding and foraging habitat. The subject land contains some mistletoe in low densities. It is unlikely that these isolated patches of woodland are favourable for the species. Therefore, it is unlikely that the proposed works will result in a long-term decrease in the Painted Honeyeaters population size.

Table E.6 **Significant impact criteria assessment – Painted Honeyeater**

Criteria	Discussion
2: reduce area of occupancy	The Painted Honeyeater has not been recorded within the subject land, with very occasional records in the surrounding locality; most of which are historic. The foraging habitat is considered sub-optimal based on low records of the species and mistletoe being largely absent from the subject land. Habitat removal for this species will comprise 1.59 ha of more sub-optimal potential. It is considered if these areas would be utilised by the species on a transient basis. It is unlikely that the loss of the small isolated patches of habitat will significantly reduce the occupancy of the species. The impact of the project and proposed modification on the occupancy of this species is considered negligible.
3: fragment a population	The Painted Honeyeater occurs as a single, contiguous population (DoE 2015). This species is highly mobile, travelling across most of the eastern side of Australia. The Painted Honeyeater can cross open areas in search for woodlands with ample mistletoe available. It is unlikely that the species population will become fragmented as a result of the road upgrades considering that the species is already able to disperse across agricultural landscapes.
4: adversely affect critical habitat	Habitat considered critical to the survival of the Painted Honeyeater includes breeding or foraging habitat. Habitat quality is considered sub-optimal given the low density of mistletoe present and its situation in an over cleared landscape. The Painted Honeyeater is more common within wider blocks of woodland (DoE 2015), providing more suitable foraging habitat. The Painted Honeyeater has not been recorded within the subject land, should it occur, it is likely to be an occasional occurrence, considering vegetation within the development site does not provide critical foraging habitat.
5: disrupt the breeding cycle of a population	The Painted Honeyeater favours breeding habitat with an abundance of mistletoe. Habitat within the subject land does not contain sufficient amounts of mistletoe to support the species during breeding season, therefore it is unlikely the project and proposed modification will disrupt the breeding cycle of the population.
6: modify, destroy or decrease availability or quality of habitat	The species has not been recorded within the subject land. The species may occasionally, occur passing through to more optimal foraging areas in the surrounding area. The removal of small areas of potential sub-optimal foraging habitat is unlikely to cause the decline of the species.
7: result in invasive species	The Painted Honeyeater is susceptible to the effects of invasive species including the introduction of weeds potentially degrading critical habitat, competition from Noisy Miners and predation by the black rat. Mitigation measures will be implemented to minimise the introduction or spread of invasive weeds. A BMP will be prepared to outline weed control protocols in order to minimise the risk. Noisy Miners are abundant within the subject land. However, it is unlikely that the project and proposed modification will exacerbate the abundance of the Noisy Minter. Similarly, black rats are potentially present within the area; however, it is unlikely that the project and proposed modification will exacerbate their abundance.
8: introduce disease	The Painted Honeyeater is not known to be susceptible to any disease and the project and proposed modification are unlikely to introduce a harmful disease to the Painted Honeyeater.
9: interfere with recovery	The Painted Honeyeater currently does not have a Recovery Plan.
Conclusion	The project and proposed modification are unlikely to have a significant impact on the Painted Honeyeater as the habitat to be removed comprises a small area of potential habitat. No optimal breeding habitat occurs. If the species does occur within the locality, it is likely to occur on a transient basis considering foraging habitat is sparse and lacking abundance of mistletoe. Therefore, it is considered the habitat to be removed is unlikely to have any significant effect on the Painted Honeyeater.

E.7 Koala (*Phascolarctos cinereus*) – Vulnerable

Koala have been considered absent from the development site owing to a lack of suitable habitat, high fragmentation and by an absence of the species during targeted surveys.

Woodland within the subject land is better connected than the development site and the species has been recorded within close proximity to the western portion of the subject land. Given that targeted surveys have not been conducted in the subject land, the species was assumed present in woodland, comprising a total area of 1.33 ha.

The Koala inhabits eucalypt woodlands and forests, feeding on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browsing species. The subject land is within the northern tablelands koala management area. One primary food tree was recorded, Ribbon Gum. This species was recorded within the woodland areas, though was never dominant. Several secondary feed trees were recorded including Blakely's Red Gum and Yellow Box.

Table E.7 provides an assessment of significance for the removal of 1.33 ha of potential Koala habitat within the subject land.

Table E.7 Significant impact criteria assessment – Koala

Criteria	Discussion
1: long-term decrease in the size of an important population of the species	There are few records of Koala within the immediate vicinity of the subject land and given low density of primary feed trees, it is unlikely that an important population is supported. The removal of 1.33 ha of potential habitat is unlikely to cause any population level effects.
2: reduce area of occupancy of an important population	The loss of 1.33 ha of potential habitat is likely to be negligible, given that the majority of similar potential habitat within the vicinity will remain unaffected.
3: fragment an important population	Clearance will be restricted to a narrow strip of woodland either side of the existing carriageway. The increase road width represents a minor increase in fragmentation and no woodland patches will be intersected given that woodland will be retained within the road reserve.
4: adversely affect critical habitat	Habitat considered critical to the survival of the Koala includes both breeding and foraging habitat. Potential habitat within the subject land has a low density of primary feed tree species with foraging resources largely restricted to secondary feed trees. If present, Koala are likely to occur transiently in low densities. The 1.33 ha of habitat to be removed is unlikely to adversely affect habitat critical to the survival of this species.
5: disrupt the breeding cycle of an important population	The small areas of habitat to be removed represents a minor proportion of available habitat in the locality. The project and proposed modification will not isolate any areas of habitat or cause significant habitat fragmentation that would affect the breeding, foraging or dispersive movements of this species.
6: modify, destroy or decrease availability or quality of habitat	The 1.33 ha of vegetation to be removed comprises a very small proportion of native vegetation within the locality. The area of vegetation to be removed is therefore not regarded to be critical for the long-term survival of the species in the locality.
7: result in invasive species	Mitigation measures will be implemented to minimise the introduction or spread of invasive weeds. A BMP will be prepared to outline weed control protocols in order to minimise the risk. Invasive fauna species, including predators such as cats, dogs and foxes, are likely to be already present within the locality. The proposed works will not significantly fragment or isolate any habitat nor result in any other changes that are likely to favour feral animals. The proposed works are unlikely to increase incidence of invasive predators.

Table E.7 **Significant impact criteria assessment – Koala**

Criteria	Discussion
8: introduce disease	No diseases that may cause the species to decline are likely to become established in the development site or subject land as a result of the project and proposed modification.
9: interfere with recovery	There is no Commonwealth recovery plan for the Koala. The proposed works are inconsistent with the overall objectives of the DECC (2008) Recovery Plan for the Koala, given that potential Koala habitat requires clearance. The magnitude of the impact is considered negligible however, limited to 1.33 ha.
Conclusion	On consideration of the above criteria, the project and proposed modification are unlikely to have a significant effect on the Koala given that: • Koala density is likely to be low given the few primary feed trees present and few historical records; and • vegetation to be removed comprises a very small proportion of similar habitat vegetation retained within the road reserve and the surrounding locality. The project and proposed modification will not isolate or fragment any areas of potential koala habitat.

E.8 White-throated Needletail (*Hirundapus caudacutus*) – vulnerable

The White-throated Needletail is widespread in eastern and south-eastern Australia. The White-throated Needletail occurs above most types of habitat, with the most common being woodland and heathland. The species is less often to occur within grasslands or swamps as they lack trees. the species forages aerially above a variety of habitats. The species will occasionally forage over recent disturbed areas. The White-throated Needletail roost in trees in forests and woodlands, among dense foliage in the canopy or in hollows (TSSC 2019). The species does not breed within Australia and is almost exclusively aerial, occurring over most habitat types.

The vegetation to be removed within the subject land contains potential (sub-optimal) foraging habitat for the White-throated Needletail. The habitats to be removed generally lack mid-storey and understorey dense foliage for optimal roosting habitat.

Table E.8 provides a significant impact assessment for the removal of 1.59 ha of potential White-throated Needletail habitat within the subject land.

Table E.8 Significant impact criteria assessment – White-throated Needletail

Criteria	Discussion
1: long-term decrease in the size of an important population of the species	An important population has not been defined for the White-throated Needletail. The habitat within the development site and subject land is fragmented and degraded. These areas are not considered important for the White-throated Needletail. The species occurs almost exclusively aerially and does not breed within Australia. Therefore, the project and proposed modification are not considered to cause a long-term decrease in the size of an important population.
2: reduce area of occupancy of an important population	The project and proposed modification will result in the removal of 1.59 ha of potential foraging habitat. These areas are highly degraded and are not considered important foraging areas.
3: fragment an important population	The species is highly mobile and almost exclusively aerial. Given this and the existing fragmented habitat, the project and proposed modification are not considered to fragment an important population.
4: adversely affect critical habitat	Potential foraging habitat within the subject land is not considered critical habitat for the White-throated Needletail, lacking mid-storey and understorey dense foliage for optimal roosting habitat.
5: disrupt the breeding cycle of an important population	The White-throated Needletail breeding range is confined to Asia; therefore, the project and proposed modification will not impact on the species breeding cycle.
6: modify, destroy or decrease availability or quality of habitat	The habitat within the development site and subject land is fragmented and degraded; hence these areas do not represent important habitat for the species. Sub-optimal foraging habitat for the White-throated Needletail will be removed.
7: result in invasive species	The project and proposed modification have the potential to result in the introduction and/or spread of weeds during the construction period. Weed control protocols will be undertaken in accordance with the BMP, in order to minimise this risk.
8: introduce disease	There are no known diseases associated with the White-throated Needletail.
9: interfere with recovery	There is no Recovery Plan for the White-throated Needletail.
Conclusion	The project and proposed modification will not have a significant impact on the White-throated Needletail considering the species is almost exclusively aerial and sub-optimal foraging habitat exists within the subject land.

E.9 Fork-tailed Swift (*Apus pacificus*) – migratory

The Fork-tailed Swift is known to occur throughout Australia. Within NSW the species has been recorded in all regions. The species is known to extend to the western slopes of the Great Dividing Range (DAWE 2020). Fork-tailed Swift occurs within a wide range of habitats include dry or open woodland, tea-tree swamps, within low scrub, heathland, saltmarsh, grassland, sandplains, open farmland and coastal sand-dune. Occasionally they will occur about rainforests and wet sclerophyll forest. The Fork-tailed Swift feeds on insects aerially among tree-tops in open forest (DAWE 2020). The species does not breed within Australia and is almost exclusively aerial, occurring over most habitat types.

The development site and subject land do not contain any areas of ‘important habitat’ for the Fork-tailed Swift. The development site exists within a predominantly cleared agricultural landscape, highly prevalent in NSW. Potential foraging habitat includes cleared isolated patches of woodland with large numbers of exotic flora species.

The vegetation to be removed within the subject land contains potential (sub-optimal) foraging habitat for the Fork-tailed Swift. The habitats to be removed generally lack mid-storey and understorey dense foliage for optimal roosting habitat.

Table E.9 provides an assessment of significance for the removal of 1.59 ha of potential Fork-tailed Swift foraging habitat within the subject land.

Table E.9 Significant impact criteria assessment – Fork-tailed Swift

Criteria	Discussion
1: substantially modify, destroy or isolate an area of important habitat	The habitat within the development site and subject land is fragmented and degraded; hence these areas do not represent important habitat for the Fork-tailed Swift. Sub-optimal foraging habitat for these species will be removed.
2: result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat	Exotic vegetation occurs within both the development site and subject land. The project and proposed modification have the potential to introduce new exotic plant species; therefore, weed control protocols are recommended to be undertaken in accordance with the BMP. Considering the development site and subject land do not contain any important habitat for the Fork-tailed Swift and mitigation measures will be implemented, the proposed works are likely to have a negligible impact on the Fork-tailed Swift.
3: seriously disrupt the lifecycle of an ecologically significant proportion of the population	The Fork-tailed Swift does not breed within Australia. The foraging habitat within the development site and subject land are unlikely to be important such that its removal would not be important for the species lifecycle.
Conclusion	No important habitat was identified during the assessment. Sub-optimal foraging habitat exists; however, due to the minor scale of removal of this habitat, this is likely to have a negligible effect on the Fork-tailed Swift.





Appendix C

Stakeholder engagement materials

Mr Timothy Kirk
Project Development Manager
UPC\AC RENEWABLES AUSTRALIA
Level 14, 77 King Street
SYDNEY NSW 2000

Via email: Tim.Kirk@upc-ac.com

25/05/2020

Dear Mr Kirk

**New England Solar Farm
Modification 1 – Revised layout road upgrades (SSD 9255 MOD 1)**

I refer to your letter dated 3 April 2020 and additional information provided on 6 May 2020 indicating the intention to modify the New England Solar Farm development consent (SSD 9255) to revise the layout of road upgrades along Barleyfields Road (north) and Big Ridge Road following detailed design.

Based on the information provided, which states that the changes would have minimal environmental impact, the Department considers the modification could be made under section 4.55(1A) of the *Environmental Planning and Assessment Act 1979*. As such, the Department would notify relevant government agencies and surrounding landowners.

Having reviewed the correspondence including the description of the modification, the Department confirms that an assessment of the environmental impacts of the proposed modification as proposed in your letter is required.

For the Department to consider the modification under section 4.55(1A), the modification assessment would need to include detailed evidence that the proposed modification is of minimal environmental impact including consideration of biodiversity and heritage.

While the Department considers on the information provided that a Biodiversity Development Assessment Report (BDAR) is not required as part of the proposed modification application, the Department requires the application to include an updated biodiversity assessment to reflect the increased disturbance area. The biodiversity assessment should include the following information:

- amended calculations of impacts to native vegetation and species requiring offsets;
- updated figures detailing the additional disturbance area; and
- management and mitigation measures to address the impacts associated with the increased disturbance area (if required), including the provision of additional ecosystem and species credits to offset these impacts.

You should also consult with the relevant registered Aboriginal parties (RAPs), Uralla Shire Council, the Department's Biodiversity Conservation Division (BCD) and any potentially impacted residents and detail the outcomes of the consultation.

Your next step will be to lodge your Modification Report through your dashboard on the major projects website (<http://www.planningportal.nsw.gov.au/major-projects>).

Please advise the Department prior to the lodgement of the modification application. This will enable the Department to confirm the application fee (see Division 1AA, Part 15 of the *Environmental Planning and Assessment Regulation 2000*).

If you have any questions, please contact Lander Robinson, who can be contacted on 9274 6052 / Lander.Robinson@planning.nsw.gov.au.

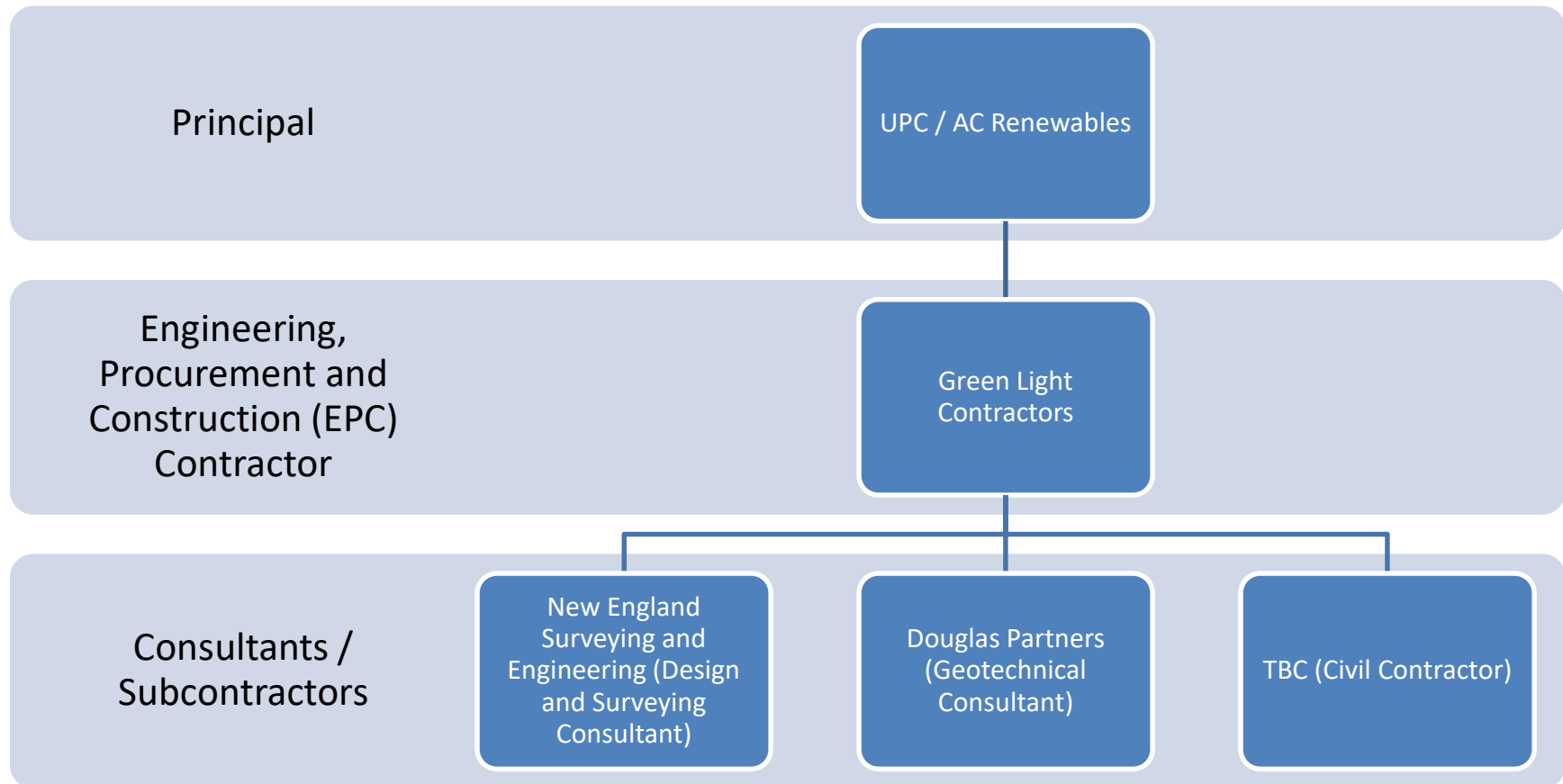
Yours sincerely,



Nicole Brewer
Director
Energy Assessments

**NEW ENGLAND SOLAR FARM
ACCESS ROAD UPGRADES:
+ Barleyfields Road
+ Big Ridge Road**





- Speed Limits:
 - Barleyfields Road
 - Big Ridge Road, segments 1 - 3
 - Big Ridge Road, segments 4 & 5
- Clear Zones
- Geometry
- Drainage:
 - Existing drainage in Barleyfields Road, Big Ridge Road Segments 1 & 3
 - New drainage in Segments 4 & 5
- Roadside Furniture, Signage & Delineation
- Temporary Traffic Management For Solar Farm Traffic
- Staged Design, Approvals & Construction For Access Road

- Generating capacity of 400MWac (520MWp) - enough electricity to supply around 250,000 homes.
- UPC / AC Renewables (UPC) is the Principal of New England Solar Farm.
- Green Light Contractors (GLC) has been engaged by UPC to perform the Early Works at NESF, which includes upgrading the public roads on the main access route in accordance with the Development's Development Consent.

Development Consent

Section 4.38 of the *Environmental Planning & Assessment Act 1979*

The Independent Planning Commission of NSW approves consent to the development application referred to in Schedule 1, subject to the conditions in Schedules 2 to 4.

These conditions are required to:

- prevent, minimise and/or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the ongoing environmental management of the development.



Andrew Hutton (Chair)
Member of the Commission



Professor Zada Lipman
Member of the Commission



Professor Snow Barlow
Member of the Commission

Sydney

9 March 2020

SCHEDULE 1

Application Number:	SSD 9255
Applicant:	UPC Renewables Australia Pty Ltd
Consent Authority:	Independent Planning Commission
Land:	See Appendix 2
Development:	New England Solar Farm

APPENDIX 4 ROAD UPGRADES AND SITE ACCESS

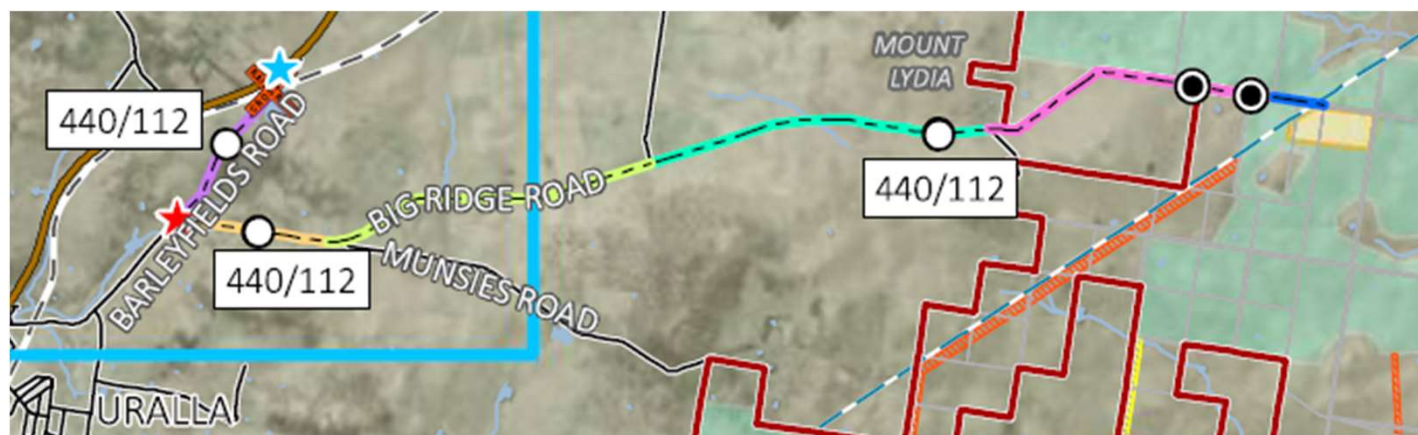
Road	Location ¹	Upgrade Requirements	Timing
New England Highway and Barleyfields Road (north)	Intersection	Channelised Right Turn (CHR) treatment for the largest vehicle assessing the site (excluding over-dimensional vehicles) ²	Prior to construction
Barleyfields Road	Between New England Highway and Big Ridge Road	Seal to a width of 7.2 m with 1 m unsealed shoulders (total carriageway 9.2 m) ²	
Barleyfields Road and Big Ridge Road	Intersection	Basic Left Turn (BAL) treatment to cater for the largest vehicle accessing the site (excluding over-dimensional vehicles) ²	
Big Ridge Road	Segment 1	Seal to a width of 7.2 m with 1 m unsealed shoulders (total carriageway of 9.2 m) ²	
	Segment 3		
	Segment 4	Gravel (unsealed) carriageway to a width of 8.7 m	
	Segment 5		
	Site access points	Rural Property Access Type ²	

¹ Refer to the figure in Appendix 4 for the location and further details of the road upgrades.

² Upgrades must comply with the Austroads Guide to Road Design (as amended by RMS supplements).

OBLIGATION TO MINIMISE HARM TO THE ENVIRONMENT

1. In meeting the specific environmental performance criteria established under this consent, the Applicant must implement all reasonable and feasible measures to prevent and/or minimise any material harm to the environment that may result from the construction, operation, upgrading or decommissioning of the development.



- | | |
|--|--|
|  Barleyfields Road (north) | 9.2m total carriageway incl. 7.2m seal and 1m unsealed gravel shoulder along Barleyfields Road between the intersections with New England Highway and Big Ridge Road |
|  Big Ridge Road - segment 1 | 9.2m total carriageway incl. 7.2m seal and 1m unsealed gravel shoulder along Big Ridge Road between the intersections of Barleyfields Road and Munsies Road |
|  Big Ridge Road - segment 2 | No upgrades proposed |
|  Big Ridge Road - segment 3 | 9.2m total carriageway incl. 7.2m seal and 1m unsealed gravel shoulder along Big Ridge Road between the end of existing sealed carriageway and Mount Lydia |
|  Big Ridge Road - segment 4 | Formalised 8.7m unsealed (gravel) carriageway along Big Ridge Road between Mount Lydia and the development footprint |
|  Big Ridge Road - segment 5 | Formalised 8.7m unsealed (gravel) carriageway along Big Ridge Road within the development footprint |

Transport for NSW (RMS)

- Works Authorisation Deed
- Channelised Right Turn (CHR) or Short Channelised Right Turn (CHR-S) Treatments

John Holland Country Rail Network (JHCRN)

- Third Party Works Application
- Approval in Principle (AIP) for Concept Design

Department of Planning, Industry and Environment

- Modification of Consent

2. Design Objectives

The principal design objective is to achieve a context-sensitive design (CSD) for the upgrade of Barleyfields Road and Big Ridge Road to safely and efficiently meet the transport demands for all construction, upgrading, operational and decommissioning traffic generated by the solar farm development, consistent with the requirements of development consent SSD 9255.

More specific design objectives include:

- maximising road safety by providing a safe road and roadside environment, with improved sight distances, batter embankment slopes and clear zone widths;
- maximise operational efficiency by providing a road capable of conveying design traffic volumes at a speed and ride quality commensurate with the road class and road safety objectives;
- maintaining uniformity of design parameters along the route to provide a consistent driving experience for motorists;
- ensuring the upgraded roads are fit for purpose, to minimise whole-of-life costs associated with the road while meeting all other objectives;
- minimise the clearing of high-value native roadside vegetation.

Relevant to this design is the concept of 'Extended Design Domain' which is outlined within the Austroads Guide to Road Design¹, whereby lower-bound values may be necessary for one or more design elements when improving the standard of existing roads in constrained situations (brownfield sites), compared to the minimum values traditionally specified for new roads (greenfield sites), where these values can be justified and supported on engineering grounds and operating experience. Overall it is desired that road improvements occur while achieving a balance of safety, whole-of-life costs, flexibility for future upgrading or rehabilitation, and environmental impact.

Table 4.1 - Existing Site Constraints

Physical	▪ Topography generally undulating and includes gradients up to 9%; ▪ Location and levels of intersecting roads and property access driveways; ▪ Location of mature trees within the clear zone; ▪ Width of the public road reservation, and alignment of the existing road within the road corridor; ▪ Existing roads do not fully conform with modern design standards. ▪ Width and configuration of multiple waterway crossings; ▪ Quality of existing pavement material; ▪ Level crossing of the Main Northern Railway rail corridor. ▪ Existing public road corridors are of fixed width, and adjoining lands are private owned and not available to be purchased for road widening.
Heritage	▪ Nil identified historic or Aboriginal sites identified within the road areas to be upgraded, based on Memoranda from EMM to the NSW Department of Planning in 2019.
Environmental	▪ Patches of high-quality remnant native vegetation exist within the public road reserves in proximity to the design road alignment. Plant community type mapping within the Border Rivers / Gwydir CMA identifies sections of Barleyfields Road and Big Ridge Road roadside as derived native grasslands, pasture, woodland, woodland (moderate), exotic grassland, and exotic trees.
Services	▪ Presence of three (3) telecommunication cables within the work extent including AARNET, Optus and Telstra, as well as overhead electricity, underground water and transverse drainage crossings.

6.3 Design Speeds

The posted speed limit on Barleyfields Road is currently 80km/h, which is a control on the 'desired' speed of motorists³. Big Ridge Road does not presently have speed zone signage or pavement markings, and inherits the maximum legal speed of 80km/h from Barleyfields Road.

A Traffic Management Plan (TMP) will be implemented during construction of the solar farm which will introduce controls where necessary to ensure a safe traffic environment. During the construction phase, project traffic is expected to be limited to an appropriate reduced maximum speed, which will be documented within the project TMP.

“80km/h signposted speed is noted and adopted as design speed in the report for both roads. This should be confirmed with Council.” -
ACOR

Table 6.1 - Cross-Section Details

Road segment/s	Barleyfields Road New England Hwy to Big Ridge Rd	Big Ridge Road Segments 1 & 3	Big Ridge Road Segments 4 & 5
Chainage	0.0m to 1,420m	0.0m to 1,150m 3,850m to 6,680m	6,680m to 9,920m
Lanes	2 x 3.6m sealed		2 x 4.35m unsealed
Lane Crossfall	3%		
Shoulders	2 x 1.0m unsealed		Nil
Shoulder Crossfall	3%		
Fill Batters	4h:1v		
Cut Batters	3h:1v	4h:1v	
Table Drains (where required)	0.5m wide, centred between 1.45m & 1.75m from the pavement, and between 0.3 and 0.5m below shoulder level.	0.5m wide, centred 1.65m from the pavement, and 0.3m below shoulder level.	

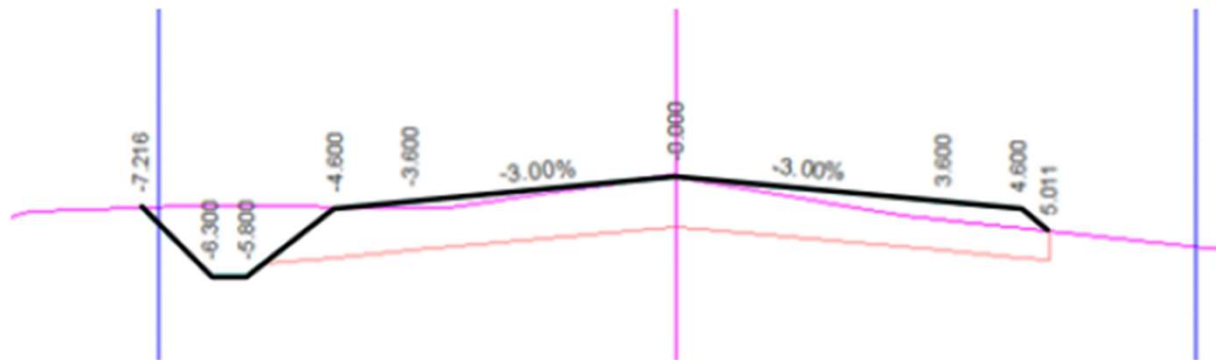


Figure 6.1 - Typical cross-section (Barleyfields Road, chainage 240.0m)

“Localised steepening of batters beyond 1V:4H has been introduced into the design to keep construction within the existing road reserve and to also reduce impact on the roadside vegetation. This is a common design approach in low volume rural roads.” - ACOR

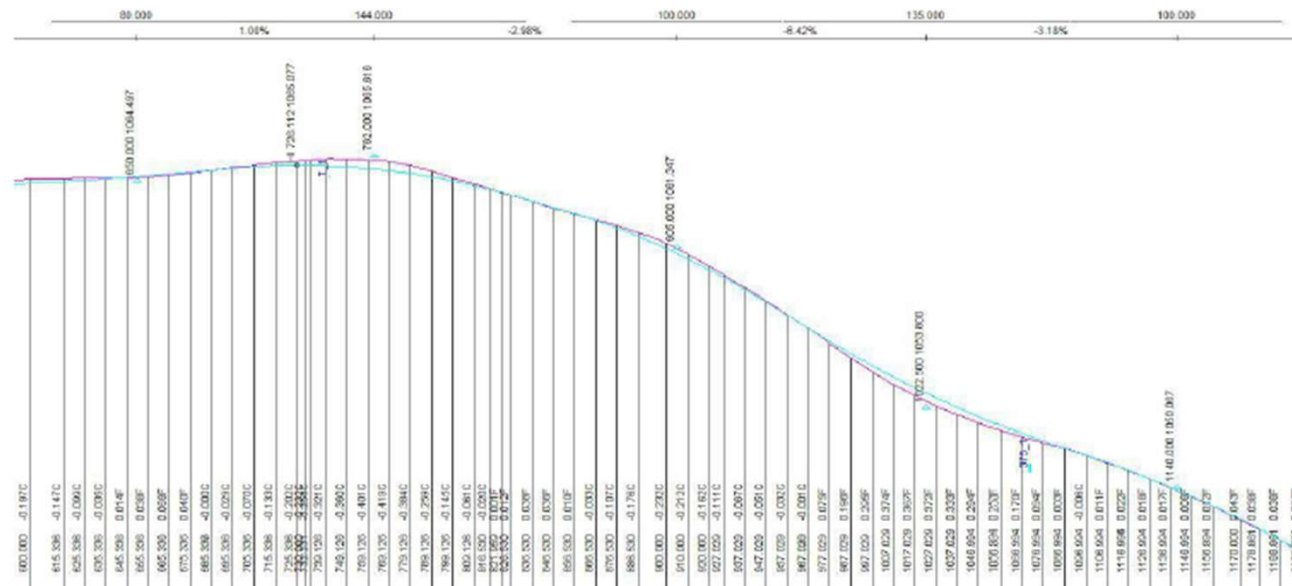
6.6 Horizontal Alignment

Horizontal alignments are constrained by the existing road geometry, roadside vegetation and topography, however in the 50% design, improvements have been made to increase sight distances and provide a more consistent driving experience for motorists.

Optimising the horizontal alignment was an iterative process including reference to preliminary vertical and cross section geometry. Chainages at typically 10m intervals were chosen to enable creation of an accurate Digital Terrain Model (DTM), while not generating excessive data (very high resolution can slow or disrupt machine control equipment and results in large file sizes unsuitable for distribution of 3D models).

6.7 Vertical Alignment

Vertical alignments have been designed in an iterative process to provide consistency in design speeds, while ensuring earthworks batters are constrained to the existing road reservation, and preserving significant stands of native vegetation.

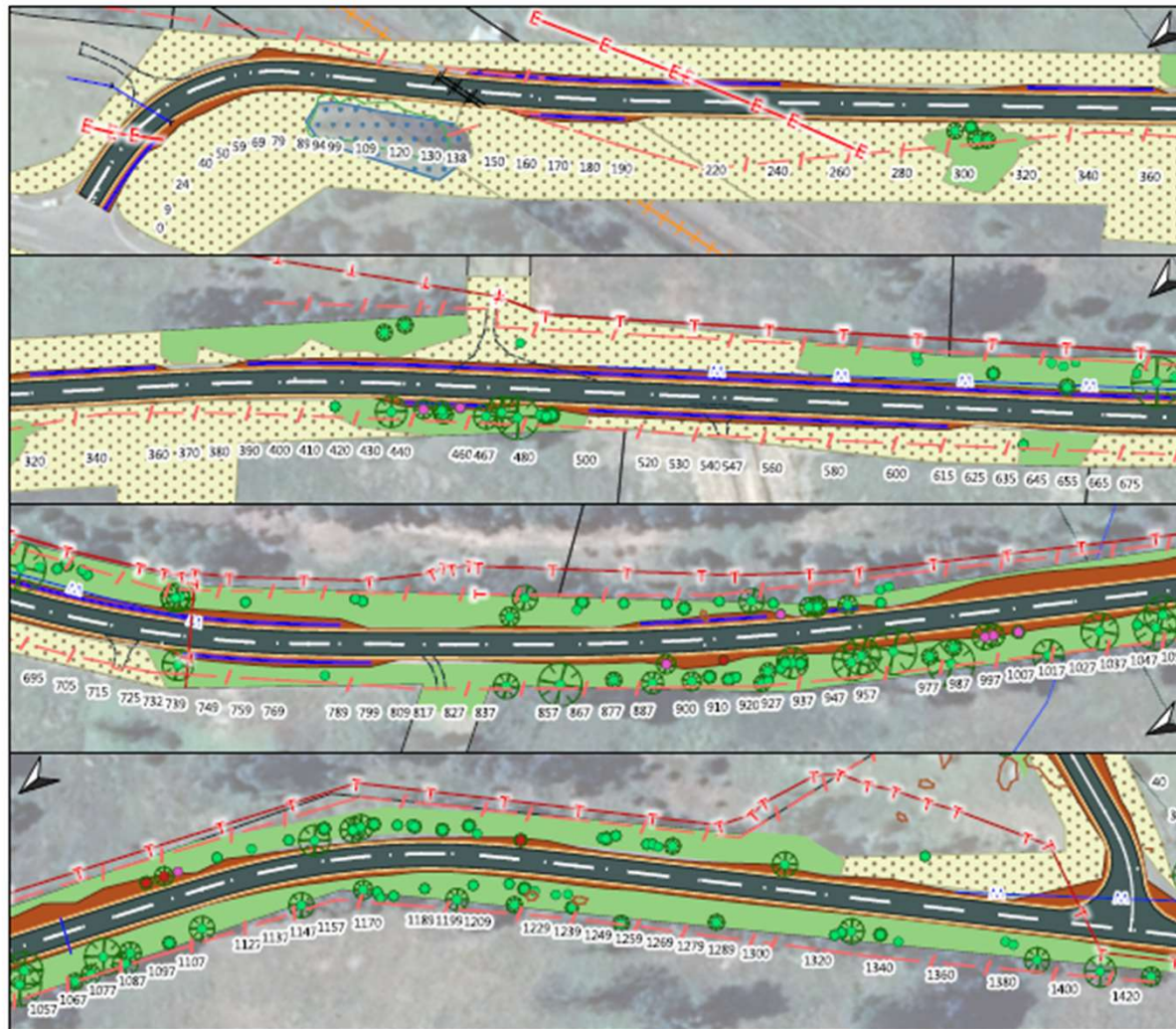


6.10 Roadside Environment and Clear Zones

Roadside hazards including trees, embankments and drainage structures will ultimately be identified using the clear zone concept defined within the Austroads Guide to Road Design: Part 6 – Roadside Design, Safety and Barriers (2009). Clear zones are based on end-state design speed and traffic volumes, since a TMP will be implemented to manage traffic safety during the 40-month construction period.

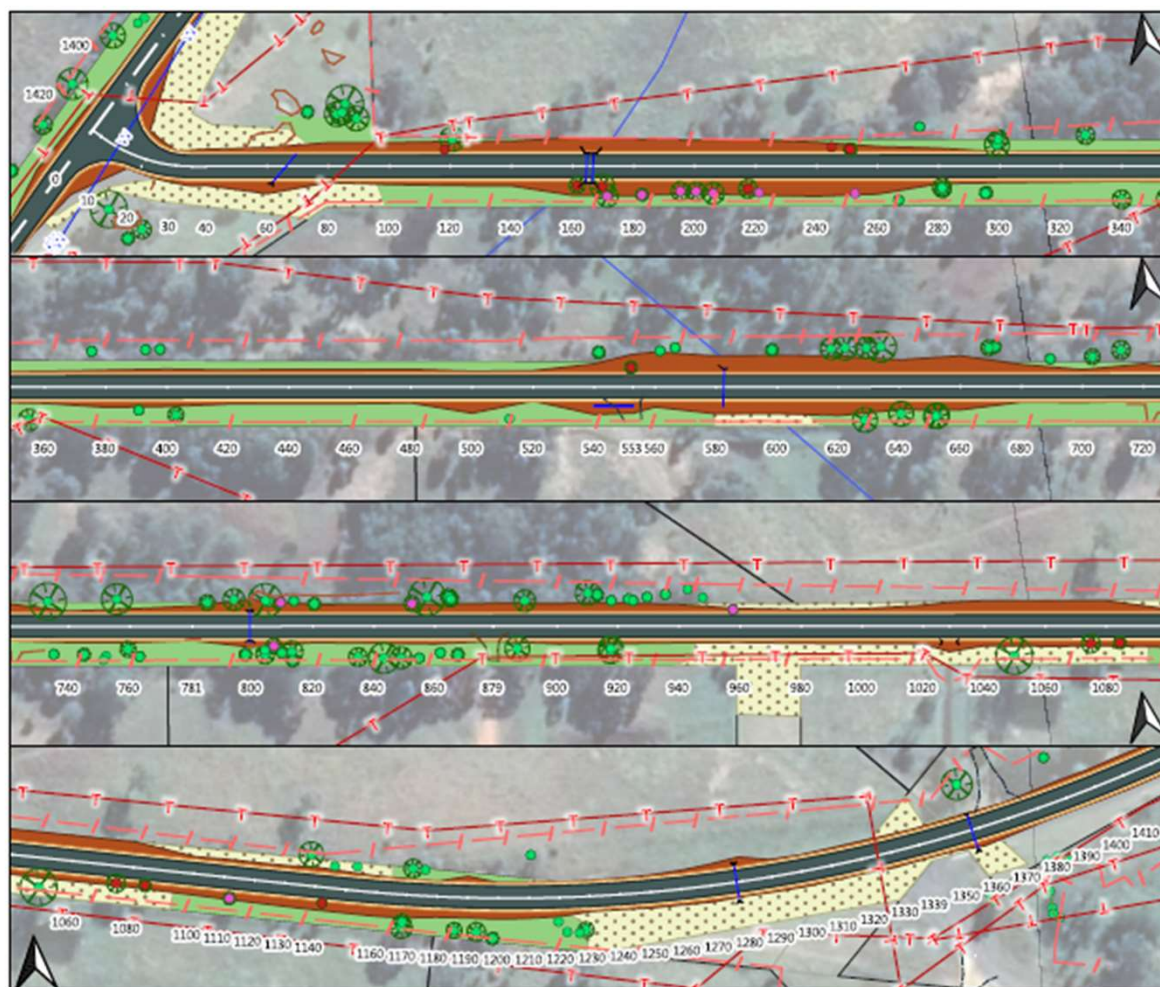
Segment	Barleyfields Rd	Big Ridge Rd Segment 1	Big Ridge Rd Segment 2	Big Ridge Rd Segment 3	Big Ridge Rd Segments 4 & 5	TOTAL (excluding Big Ridge Road Segment 2)
Surveyed Individual Trees	157	117	119	68	19	361
Trees identified for likely removal in 50% design (i.e. generally those trees within design batter extents)	12	23	4	14	8	57
% Removal of surveyed trees	8%	20%	3%	21%	42%	16%
Tree removal with constant 3.0m clear zone + batter extent	12	23	4	14	11	60
% Removal of surveyed trees	8%	20%	3%	21%	58%	17%
Tree removal with constant 4.5m clear zone + batter extent	25	35	7	22	12	94
% Removal of surveyed trees	16%	30%	6%	32%	63%	26%
Tree removal with constant 6.0m clear zone + batter extent	61	68	17	28	14	171
% Removal of surveyed trees	39%	58%	14%	41%	74%	47%

“The design report details the number of trees located within a range of clear zones. It is common practice for Authorities to agree to reduced clear zones on such designs to provide an improved level of safety without making the project cost prohibitive. The environmental impacts of removing significant trees needs to also be considered.” - ACOR



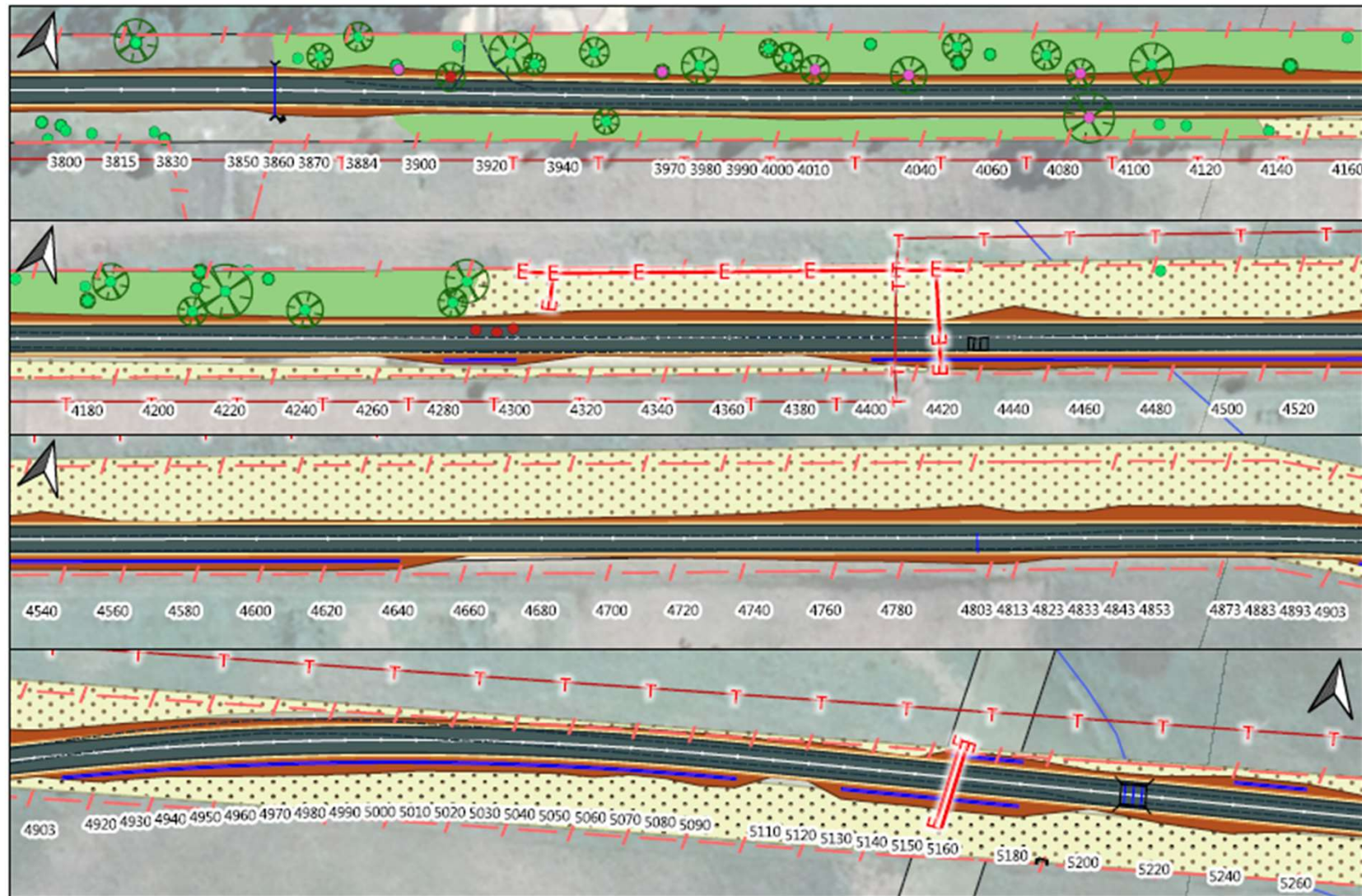
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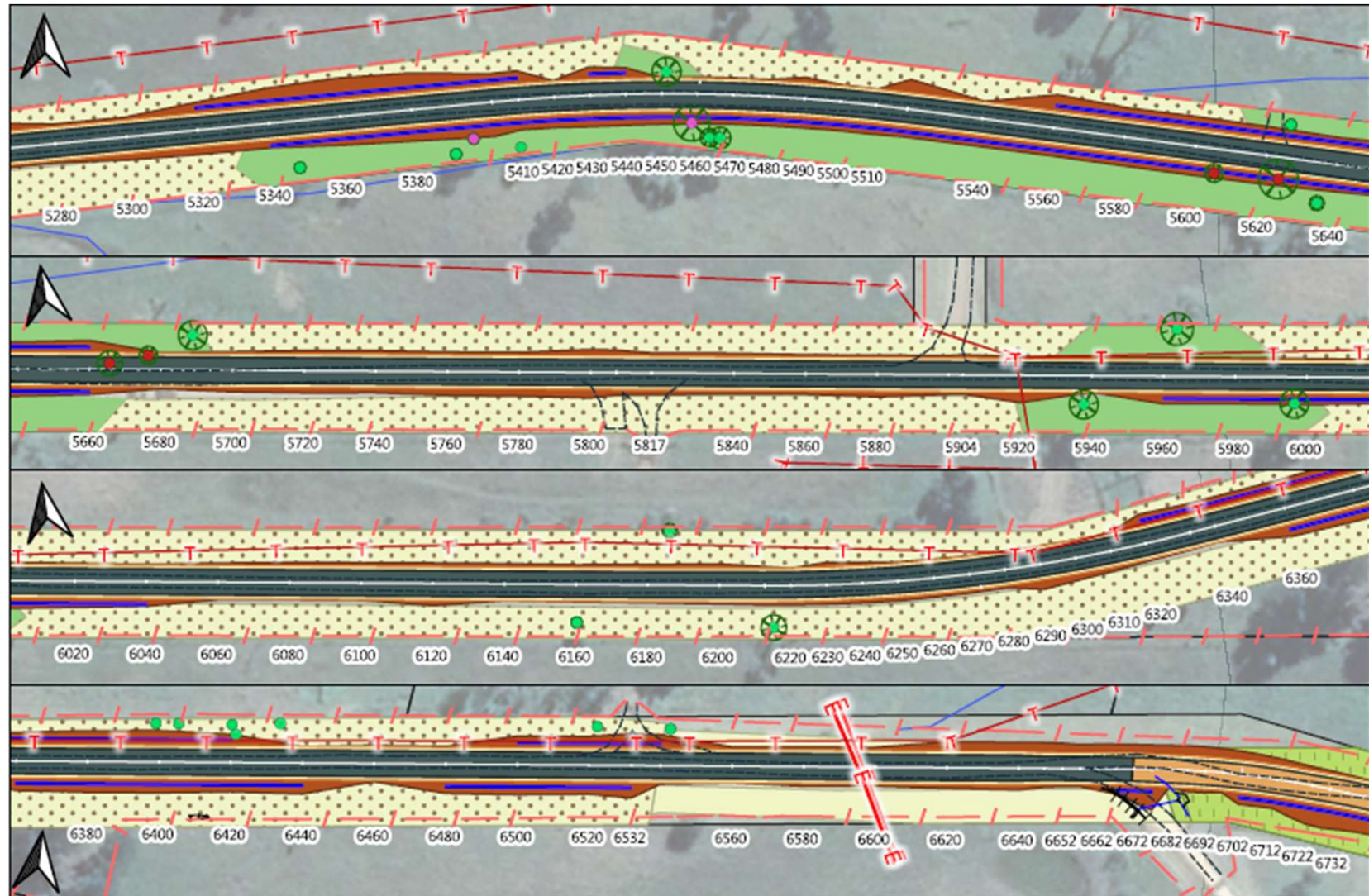
- Design Road Batter
- Design Road Shoulder
- Roadside Plant Community Type**
 - Derived native grasslands
 - Pasture
 - Woodland
 - Woodland (moderate)
 - Exotic grassland
 - Exotic trees

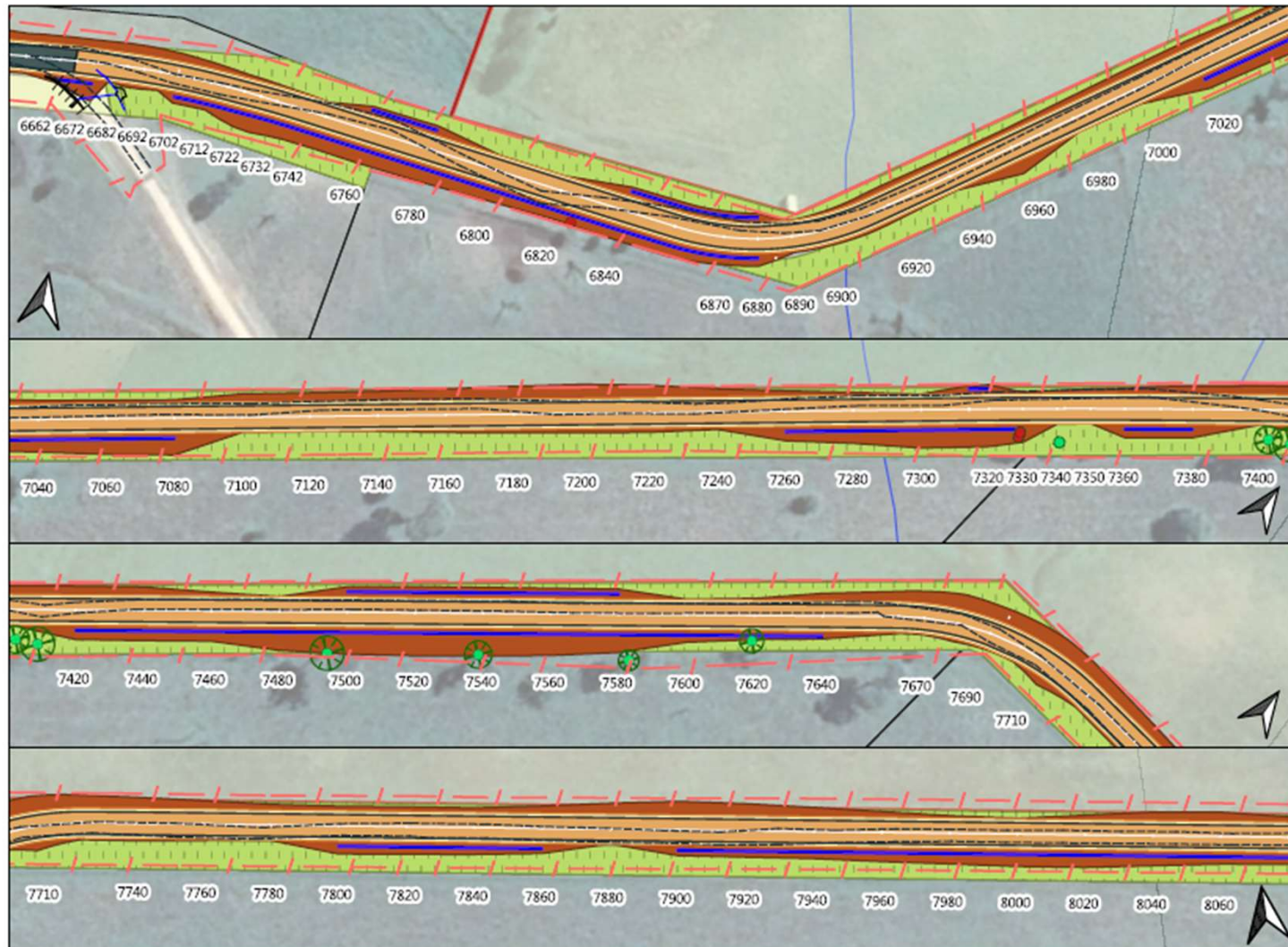


Legend

- Design Road Batter
- Design Road Shoulder
- Telecommunications
- Electricity
- Roadside Plant Community Type**
- Derived native grasslands
- Pasture
- Woodland
- Woodland (moderate)
- Exotic grassland
- Exotic trees
- Existing Concrete/Paving









“Based on the information provided we are comfortable that the 50% design generally meets the intent of the DA while dealing with the various site constraints. The design will provide an increased level of service and safety to the upgraded sections. The main site constraints nominated include the existing vegetation and trees, and the existing road corridor including the vertical and horizontal alignment. These constraints significantly impact the final design.” - ACOR

- final review of roadside environment and clear zones;
- geotechnical investigation and pavement design;
- geometric design of intersections & property access points, including any localised widening as a result of swept path analysis using the Austroads design vehicle;
- refinement of geometric design where needed to suit swale drain capacities;
- assessment and design of transverse drainage structures;
- roadside furniture and delineation;
- erosion and sediment control measures;
- final design documentation including PDF plan set, design report, schedule of approximate quantities, and specifications.

Stage 1: Big Ridge Road Segments 4 & 5 (3.24km unsealed)

Construction Start: 15.09.2020

Construction Finish: 30.10.2020



Stage 3: Big Ridge Road Segment 1 & Barleyfields Road (2.57km sealed)

Construction Start: 18.10.2020

Construction Finish: 17.12.2020

Stage 2: Big Ridge Road Segment 3 (2.83km sealed)

Construction Start: 27.09.2020

Construction Finish: 20.11.2020

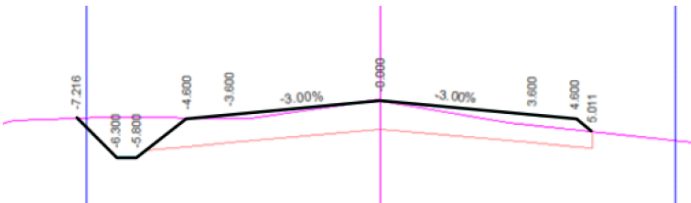
- Speed Limits:
 - Barleyfields Road
 - Big Ridge Road, segments 1 - 3
 - Big Ridge Road, segments 4 & 5
- Clear Zones
- Geometry
- Drainage:
 - Existing drainage in Barleyfields Road, Big Ridge Road Segments 1 & 3
 - New drainage in Segments 4 & 5
- Roadside Furniture, Signage & Delineation
- Temporary Traffic Management For Solar Farm Traffic
- Staged Design, Approvals & Construction For Access Road

Minutes Of Meeting

Project Name:	New England Solar Farm (NESF)		
Meeting Type:	Access Roads 50% Design Meeting with Uralla Council		
Time:	14:00 – 15:00		
Date:	06/08/2020		
Location:	Uralla Shire Council Office		
ATTENDEES			
Name:	Terry Seymour	Company:	Uralla Shire Council (USC)
Name:	Des Anderson	Company:	Uralla Shire Council (USC)
Name:	Kelvyn Tan	Company:	Uralla Shire Council (USC) (part)
Name:	Tim Greenaway	Company:	UPC / AC Renewables (UPC)
Name:	Volodymyr Krasiy	Company:	Green Light Contractors (GLC)
Name:	Liam Carusi	Company:	Green Light Contractors (GLC)
Name:	Malcolm Donnelly	Company:	New England Surveying & Engineering (NESE)
Name:	Carlos Miralles	Company:	Green Light Contractors (GLC) (Hangouts)
Name:	Matt Reilly	Company:	Green Light Contractors (GLC) (Hangouts)

No.:	Comments/Item:	Responsibility:	Date by:
I.	Speed Limits Discussion: - Uralla Shire Council (USC) confirmed that a permanent reduction in the gazetted speed limits is not foreseen. - UPC discussed the constraints in the road corridor that mean that the design speed is not achievable in all circumstances. Constraints include, the width of the road easement, existing road and alignment (particularly Segment 2 of Big Ridge Rd), topography, railway level crossing, New England Hwy intersection, existing driveways and property access points - USC agreed the design speed for Barleyfields Rd and Big Ridge Rd Segments 1 and 3 should be the signposted speed limit of 80km/h, acknowledging that this is not achievable either currently or post-upgrade in all circumstances. Where the design speed is not achievable additional safety measures will be considered. It was acknowledged that the road upgrades will provide a significant improvement on the existing road. - USC agreed the design speed for Big Ridge Rd segments 4 and 5 will be 50km/h speed limit. These segments are unsealed road and constrained by the changes in direction of the road easement. - USC commented that the addition of speed advisory signs would be a good addition to the roads. Decisions: 1. In general, the design speed on Barleyfields Road will be 80 km/h 2. In general, the design speed on Big Ridge Road segments 1 & 3 will be 80 km/h 3. The design speed on Big Ridge Road segments 4 & 5 will be 50 km/h 4. In general, the road geometry will be maximised to the extent possible	GLC & NESE	On-Going

Minutes Of Meeting

	5. In general, the design will prioritise a consistent speed environment to maximise road safety objectives. 6. Where the targeted design speeds cannot be achieved in the road geometry due to existing constraints, measures to improve safety will be implemented, including speed advisory signs.		
2.	Clear Zones Discussion: - It was discussed that the impact to roadside vegetation has been minimised due to: - o Low long-term traffic volumes - o Road classification & function - o Construction Traffic Management Measures including temporary reduced speeds during construction - o Development Consent requirement of minimising impact to the roadside environment - USC requested the GIS files and PDF of the road design before they could make a definitive decision on the clear zones. - USC will review the designs in regards to the clear zones and provide comments. Proposal: 1. Extent of clearing to be limited to road cross-section to minimise the impact on the environment. This is consistent with condition 1 of the development consent.	USC to confirm extent of clearing / clear zones required.	19/08/2020
3.	Geometry Discussion: - The steeping of the roadside drainage batters to minimise impact of the road design on the environment was discussed. USC agreed this was an acceptable approach. Decisions: 1. Typical fill batters will be 4h:1v 2. Typical cut batters will be 3h:1v on Barleyfields Road 3. Typical cut batters will be 4h:1v on Big Ridge Road 4. Batters will be locally increased to a maximum of 2h:1v where constraints, such as the boundary of the road easement, are present Proposals: 1. The below typical cross-section was presented for Council's acceptance.  Figure 6.1 - Typical cross-section (Barleyfields Road, chainage 240.0m)	USC to confirm proposed cross-section is acceptable.	19/08/2020
4.	Drainage Discussion: - It was discussed that new drainage would be designed in ARI 1 in 10. USC agreed this was acceptable, however was concerned	GLC / NESE to submit further information regarding	At 80% Design

Minutes Of Meeting

	with the consequences of a more severe rain event (e.g. ARI 1 in 50) and the potential flooding of the road. Decisions: 1. New drainage structures will be designed for ARI 1 in 10 2. GLC / NESE to provide a description of consequences of more severe rain events, eg. the depth of flooding on the road.		
5.	Roadside Furniture and Delineation Discussion: - Safety barriers (guard rail) were not foreseen to be required as part of the design. - Additional guide posts and signage could be used to highlight changes in alignment.	-	-
6.	Temporary Traffic Management Plan: - It was discussed that a Temporary Traffic Management Plan to assist in controlling the construction traffic will be implemented throughout the construction phase, which will include reduced speed limits.	-	-
7.	Staged Design, Approvals & Construction for Access Road: - It was discussed that the road upgrades would be split into 3 stages. - USC agreed with this methodology and were in favour of the staging of the construction starting works with segment 4 & 5 of Big Ridge Road.	-	-
8.	Pending Actions: - Letter to be sent to USC detailing what was agreed to in this meeting and what items require further clarification. - GIS files and pdf files of road design to be sent to Council ASAP - Details of trees impacted by road formation to be sent to USC for review ASAP	UPC GLC NESE	12/08/2020 12/08/2020 12/08/2020

Minute by: L.Carusi

Signed: L.C.

Uralla Shire Council

Survey Report for Vegetation Clearing – Barleyfields and Big Ridge Road

August 2020

Background.

UPC Renewables Australia Pty Ltd (UPC) proposes to develop the New England Solar Farm approximately 6 kilometres (km) east of Uralla.

The development will require the upgrading of Barleyfields and Big Ridge Road, Uralla, to safely and efficiently meet the transport demands for all construction, operational and decommissioning traffic generated by the solar farm development, consistent with the requirements of development consent SSD 9255.

This report provides the complying conditions identified by Uralla Shire Council prior to approval for the commencement of vegetation clearing activity for the Barleyfields Road and Big Ridge Road upgrade.

As the Consent Authority, Uralla Shire Council is the responsible authority to ensure vegetation clearing is consistent with the principles to avoid, minimise, mitigate and offset environmental impacts.

Purpose

As part of the Development Consent for the solar farm, an environmental assessment has been undertaken with an accompanying Biodiversity Development Assessment (BDAR) to comply with the legislative requirements of the *Biodiversity Conservation Act 2016*.

Uralla Shire Council has subsequently undertaken a survey of the proposed vegetation clearing contained within the 50% road design. The road design is part of the development consent for the project. The findings from the survey will be used to advise UPC of the limitations to vegetation clearing prior to Council approval.

Survey Methods

The survey was undertaken on Wednesday 19 August and Thursday 20 August, 2020. The survey involved walking and driving the Barleyfields and Big Ridge road corridor that is subject to vegetation clearing activity as part of the road corridor upgrade.

The survey focussed on the vegetation marked on the road survey design as;

1. Remove,
2. Maybe.

For the marked vegetation as shown above, an assessment of the location of the vegetation relative to the spatial and safety requirements for the proposed road upgrade was undertaken. Furthermore,

the ecological attributes for each of the marked vegetation sites was recorded and a photo point was taken.

Survey Results

Table 1 - USC Vegetation Survey Big Ridge Road

Location (Chainage)	To Remove/ maybe	USC Comment
8820 (cluster)	Remove	Remove
8720 (cluster)	Remove	Remove
8640 (cluster)	Remove	Remove
8480 (cluster)	Remove	Remove
8370 8480 (cluster)	Remove	Remove
5680 (cluster)	Remove	Remove
5660 (cluster)	Remove	Remove including juvenile
5620 (cluster)	Remove	For further discussion
5600 (cluster)	Remove	For further discussion
5460 (cluster)	Maybe	Remove if necessary
5390	Maybe	Remove if necessary
4300 (cluster)	Remove	Remove
4080 (cluster)	Maybe	Remove if clearing regrowth (juveniles) on shoulder
4040 (cluster)	Maybe	Remove if clearing regrowth (juveniles) on shoulder
4010 (cluster)	Maybe	Remove if clearing regrowth (juveniles) on shoulder
3970	Maybe	Remove if clearing regrowth (juveniles) on shoulder
3900 (cluster)	Maybe	Maybe
3890	Maybe	Remove if clearing regrowth (juveniles) on shoulder
1140 – 1080 (cluster)	Remove	Remove
950	Maybe	Remove if clearing regrowth (juveniles) on shoulder
850 – 800 (cluster)	Maybe	Remove if clearing regrowth (juveniles) on shoulder
553	Maybe	Remove if clearing regrowth (juveniles) on shoulder
220	Remove	Remove
200 - 160	Maybe	Remove if clearing regrowth (juveniles) on shoulder
120	Remove	Remove

Table 2 - USC Vegetation Survey Barleyfields Road

Location (Chainage)	To Remove/ maybe	USC Comment
1220	Remove	Remove
1107	Remove	Remove
997 (cluster)	Maybe	Remove if clearing regrowth (juveniles) on shoulder
937	Maybe	Remove as necessary
910	Remove	Remove
900	Maybe	Remove as necessary
460	Maybe	Remove if clearing regrowth (juveniles) on shoulder
440	Maybe	Remove if clearing regrowth (juveniles) on shoulder

Discussion

The majority of the vegetation marked to be cleared appears to consist of juvenile individual trees (regrowth) that exists within the road maintenance zone of the road corridor. This vegetation is

removed as part of Council's general road safety and maintenance responsibilities. Council can therefore approve the removal of the vegetation, as marked in Tables 1 and 2, for clearing.

As identified in Tables 1 and 2, Council has provided comment for all vegetation proposed for clearing under the condition of road construction and safety requirements.

With respect to the vegetation located at the following chainage points;

1. 5620,
2. 5600,

Council is seeking further discussion with UPC to verify the individual tree and associated clearing requirements.

Conclusion

Council has held discussions with the project proponent in order to finalise the report. Options to preserve the two significant trees at located at chainage points 5620 and 5600 were considered.

The assessment found that:

In order to avoid impacting the subject vegetation, the whole road formation would need to move a further 3.5m – 4.0m to the north, which would adversely affect two further trees in the northern side of the road corridor (at ch. 5625 & ch. 5690). As discussed, the tree at ch. 5690 is also a significant native tree.

Given that the road geometry and alignment in the current design is the best fit for this section of road, despite the undesirable impact to the trees at ch. 5600 and ch. 5620, the conclusion agreed by Council and the proponent is that there is no reasonable solution that would allow these trees to be retained.

From: Terence Seymour <TSeymour@uralla.nsw.gov.au>

Sent: Friday, 11 September, 2020 10:57 AM

To: Tim Greenaway <tim.greenaway@upc-ac.com>

Cc: Matt Clarkson <MClarkson@uralla.nsw.gov.au>; Kelvyn Tan <ktan@uralla.nsw.gov.au>; Des Andersen <DAndersen@uralla.nsw.gov.au>; Sylvia Baxter <SBaxter@uralla.nsw.gov.au>; Bethany White <BWhite@uralla.nsw.gov.au>

Subject: RE: Council assessment - vegetation clearing proposed for Barleyfields and Big Ridge Road Uralla

Hello Tim,

As per our discussion, Council concurs with your approach subject to a safety assessment by your reviewing consultant with a recommendation to Council.

A Section 138 application for each section of road will be required and this should be supported by a TMP prepared by an appropriately accredited person.

Additionally, prior to construction commencing the works should be communicated to the public in consultation with Council.

Please liaise with Bethany in this regard.

Kind Regards

Terry Seymour

Director – Infrastructure and Development

Uralla Shire Council | Po Box 106 Uralla NSW 2358

p 02 6778 6309 | **f** 02 6778 6349 | **m** 0427 215 970

tseymour@uralla.nsw.gov.au | www.uralla.nsw.gov.au

From: Tim Greenaway [<mailto:tim.greenaway@upc-ac.com>]

Sent: Tuesday, 8 September 2020 5:02 PM

To: Terence Seymour

Cc: Matt Clarkson; Kelvyn Tan; Des Andersen; Sylvia Baxter

Subject: Re: Council assessment - vegetation clearing proposed for Barleyfields and Big Ridge Road Uralla

Hello Terry

I refer to the following response provided by New England Surveying and Engineering –

“Section 6.4 of the 50% design report identifies those road chainages where fill batter slopes are steeper than 4H:1V on all roads, and where cut batter slopes are steeper than 4H:1V on Big Ridge Road and 3H:1V on Barleyfields Road, as well as identifying the reason for increasing batter slopes. The report further notes that batter slopes will be locally increased in the final design where feasible.

Batter slopes have been increased in the identified locations for various reasons, including to ensure the road and associated drains can fit within the public road reservation, protect existing remnant native vegetation, minimise environmental disturbances, maintain existing batters where considered appropriate, and tie into existing batters, where required.

The hierarchy of road risk reduction in design involves:

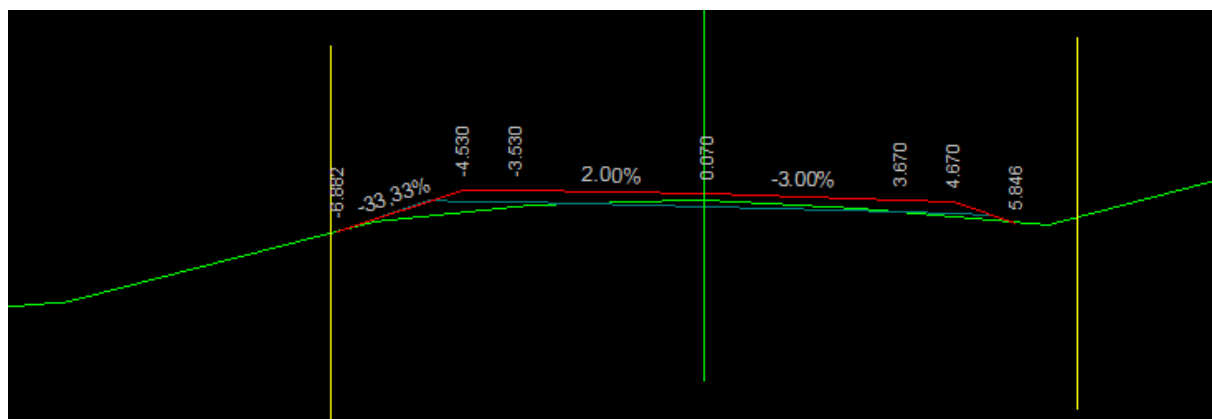
1. Reduction of the inherent hazard;
2. Prevention of an incident;
3. Limiting damage in the event of an incident.

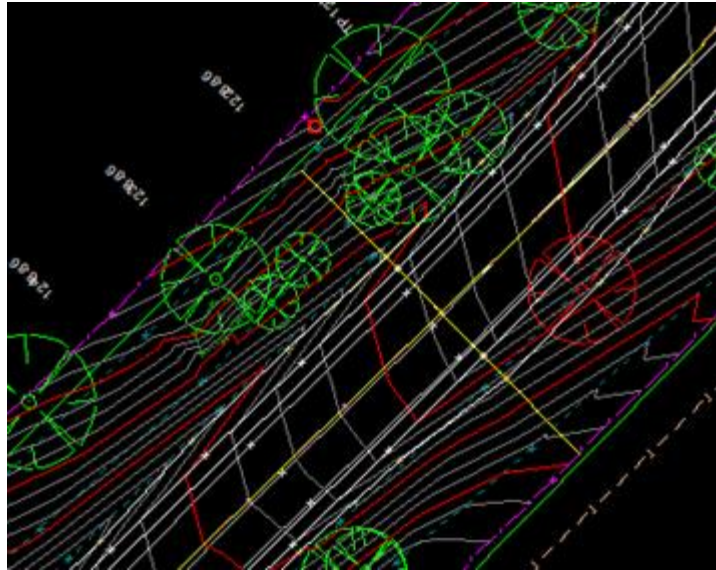
The design aims to manage risk primarily by being inherently safe through provision of horizontal and vertical geometry conforming with Austroads standards, offering improved sight distance and which is coordinated to provide a consistent speed environment and driving experience; wide travelling lanes with full width shoulders not requiring heavy vehicles to cross the road centreline; smooth pavement surface; and with roadside signage and guide posts to clearly delineate to motorists the path the road takes in all driving conditions.

The road improvements, including matched horizontal curve radii to operating speeds, will serve to prevent incidents, as will implementation of a Traffic Management Plan during the construction period. Big Ridge Road is a no-through road, and after construction will revert to being primarily being used by local traffic where drivers have familiarity with the road, and where fatigue-type incidents are far less likely to occur.

Design is still progressing and hazards within clear zones will be individually assessed to ensure a safe and consistent road, however as a general rule it is proposed that off-pavement risks associated with mature remnant vegetation and batter slopes be considered an acceptable risk in this design, for the following reasons:

- Mature native trees and steep batters are a roadside hazard on most local rural roads, and are a risk accepted by Council and the community;
- The design aims to maximise the preservation of native roadside vegetation. Any reduction in batter slopes, or additional widening for crash protection systems, would impact a greater number of trees. As an example, the cross-section of chainage 1229m along Barleyfields Road is shown below – a batter of 3H:1V is shown on the left hand side of the road to match the existing batter slope, and no change is proposed to the existing batter on the right hand side of the road. If a batter of 4H:1V was adopted at this location all existing trees would require clearing;





- The speed environment of a road is influenced by the roadside environment, and the visibility of trees and cut batters will help to create a lower speed environment;
- The Transport for NSW crash history for Barleyfields Road and Big Ridge Road shows no history of accidents on either Barleyfields Road or Big Ridge Road;



Crashes Map - Uralla

Navigation
and Help



- A Transport Management Plan (TMP) will be implemented during the construction period to further minimise risks while traffic counts are elevated and drivers may not have familiarity with the roads.”

The approach to steepen batters locally was reviewed by our independent Engineer, who noted (as included in our presentation on 6 August 2020) -

“Localised steepening of batters beyond 1V:4H has been introduced into the design to keep construction within the existing road reserve and to also reduce impact on the roadside vegetation. This is a common design approach in low volume rural roads.”

Based on the above advice, the 50% Design Report and the independent design review, the road design and geometry balances the competing interests of road safety and protection of roadside vegetation. Any increases in the roadside batters, if feasible, will lead to increases in the environmental impact of the works.

As per our letter of 12 August 2020, we seek your approval of this approach.

Regards

Tim

Tim Greenaway | NESF Project Director
UPC\AC Renewables Australia
A UPC Renewables and AC Energy Company



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E: tim.greenaway@upc-ac.com

Hobart: Suite 2, Level 2, 15 Castray Esplanade, Battery Point, TAS, 7004

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From: Terry Seymour <TSeymour@uralla.nsw.gov.au>

Date: Monday, 7 September 2020 at 3:48 pm

To: Tim Greenaway <tim.greenaway@upc-ac.com>

Cc: Matt Clarkson <MClarkson@uralla.nsw.gov.au>, Kelvyn Tan <ktan@uralla.nsw.gov.au>, Des Andersen <DAndersen@uralla.nsw.gov.au>, Sylvia Baxter <SBaxter@uralla.nsw.gov.au>

Subject: RE: Council assessment - vegetation clearing proposed for Barleyfields and Big Ridge Road Uralla

Hello Tim,

What are you proposing to address the safety issues where the steep batters are required?

Kind Regards

Terry Seymour
Director – Infrastructure and Development
Uralla Shire Council | Po Box 106 Uralla NSW 2358
p 02 6778 6309 | **f** 02 6778 6349 | **m** 0427 215 970
tseymour@uralla.nsw.gov.au | www.uralla.nsw.gov.au

From: Tim Greenaway [<mailto:tim.greenaway@upc-ac.com>]

Sent: Tuesday, 1 September 2020 3:13 PM

To: Terence Seymour

Cc: Matt Clarkson; Kelvyn Tan; Des Andersen

Subject: Re: Council assessment - vegetation clearing proposed for Barleyfields and Big Ridge Road Uralla

Hi Terry

We are pleased to receive the Final Vegetation Report from Council earlier today.

The proposed vegetation clearance is directly related to the road design criteria and the vertical and horizontal road geometry.

Therefore, are you able to confirm the items listed in our letter dated 12 August 2020 (copy attached) are accepted by Council. I take it that the Final Vegetation Report addresses Item 2 in our letter.

Thanks and regards

Tim

Tim Greenaway | NESF Project Director
UPC\AC Renewables Australia
A UPC Renewables and AC Energy Company



M: +61 413 625 097

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Hobart: Suite 2, Level 2, 15 Castray Esplanade, Battery Point, TAS, 7004

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From: Des Andersen <DAndersen@uralla.nsw.gov.au>

Date: Tuesday, 1 September 2020 at 12:12 pm

To: Tim Greenaway <tim.greenaway@upc-ac.com>

Cc: Matt Clarkson <MClarkson@uralla.nsw.gov.au>, Terry Seymour <TSeymour@uralla.nsw.gov.au>, Kelvyn Tan <ktan@uralla.nsw.gov.au>

Subject: RE: Council assessment - vegetation clearing proposed for Barleyfields and Big Ridge Road Uralla

Hi Tim,

Thanks you for providing Council with this assessment.

Please find the Final vegetation report from Uralla Shire Council attached.

Regards

Des Andersen

Environmental Management Co-ordinator

Uralla Shire Council | PO Box 106 Uralla NSW 2358

p 02 6778 6315

DAndersen@uralla.nsw.gov.au | www.uralla.nsw.gov.au

From: Tim Greenaway [<mailto:tim.greenaway@upc-ac.com>]

Sent: Friday, 28 August 2020 3:43 PM

To: Des Andersen

Cc: Terence Seymour

Subject: RE: Council assessment - vegetation clearing proposed for Barleyfields and Big Ridge Road Uralla

Hi Des

As discussed, we have investigated the possibility of protecting and saving two significant native trees located at approximately chainage 5600 and 5620 in Big Ridge Road and do not see a reasonable solution that would allow these trees to be retained.

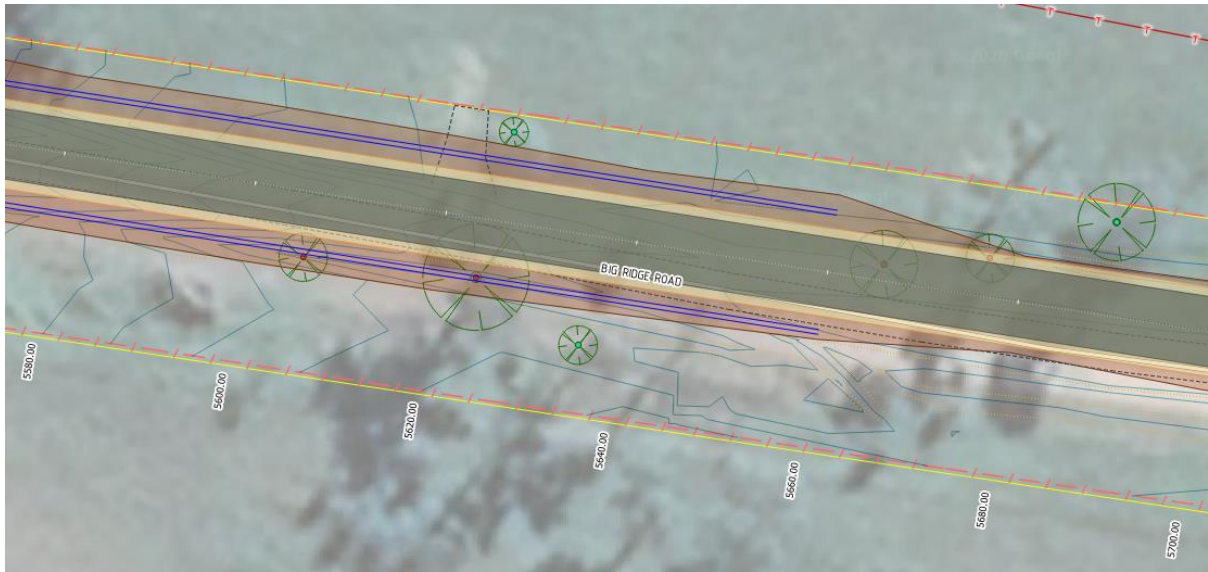
Green Light Contractors and New England Surveying and Engineering have provided the following –

As demonstrated in the embedded imagery (plan, cross section and longitudinal section), these trees are currently located centrally within the proposed table drain. In order to accommodate conforming vertical geometry at this point in the road, the pavement will be located in cut, hence the need for table drains on both sides of the road.

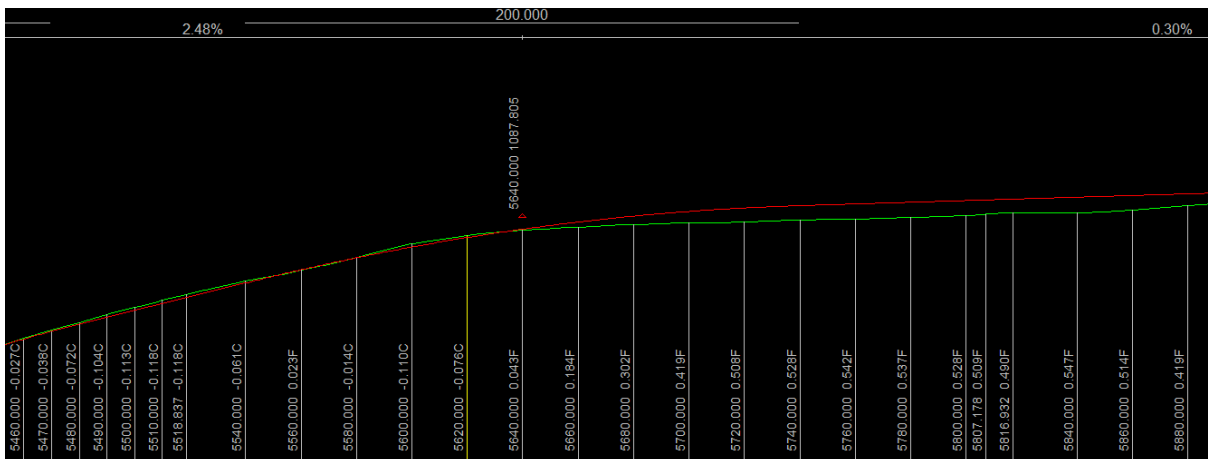
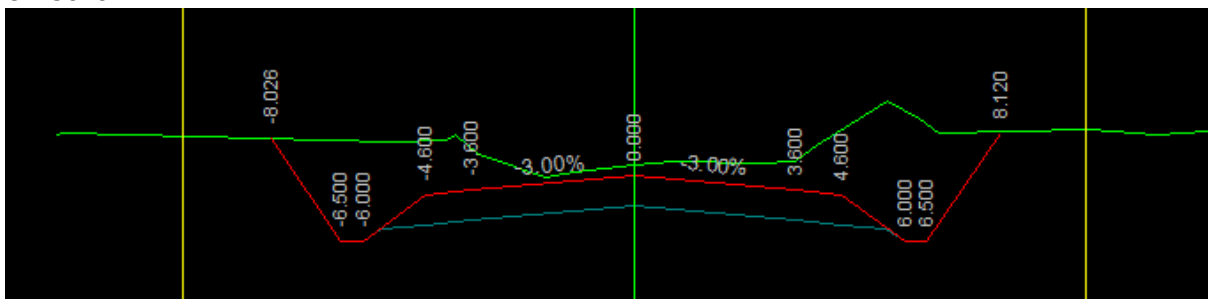
In order to avoid impacting the subject vegetation, the whole road formation would need to move a further 3.5m – 4.0m to the north, which would adversely affect two further trees in the northern side of the road corridor (at ch. 5625 & ch. 5690). As discussed, the tree at ch. 5690 is also a significant native tree.

Further to this impact to vegetation, the driveway opposite would also be adversely impacted and the northern batter would encroach into the adjoining property west of this location.

Given the above, the conclusion of the assessment is that the road geometry and alignment in the current design is the best fit for this section of road, despite the undesirable impact to the trees at ch. 5600 and ch. 5620.



Ch: 5620



Regards

Tim

Tim Greenaway | NESF Project Director
 UPC\AC Renewables Australia
 A UPC Renewables and AC Energy Company



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From: Des Andersen <DAndersen@uralla.nsw.gov.au>

Date: Wednesday, 26 August 2020 at 11:22 am

To: Tim Greenaway <tim.greenaway@upc-ac.com>

Cc: Terry Seymour <TSeymour@uralla.nsw.gov.au>

Subject: RE: Council assessment - vegetation clearing proposed for Barleyfields and Big Ridge Road Uralla

Hi Tim,

Just to follow up on our conversation earlier this morning, Council's preferred option is to align the road to avoid the requirement to clear the two mature trees at chainage;

- 5620
- 5600.

Otherwise, Council is satisfied with the extent of vegetation clearing requirements as shown by the 50% design plan provided by UPC.

Council will finalise and deliver the report to UPC once your determination on the trees listed is complete.

Regards

Des Andersen

Environmental Management Co-ordinator

Uralla Shire Council | PO Box 106 Uralla NSW 2358

p 02 6778 6315

DAndersen@uralla.nsw.gov.au | www.uralla.nsw.gov.au



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Consultation log - Modification 1 - NESF SSD 9255 - Private landholders			
Address	Date	UPC Representative	Comments
114 Big Ridge Road	08-10-20	RB	Discussed extra trees for removal as part of modification. One driveway access point.
	26-11-20	TK	Landowner consent required as driveway is being impacted. Owner's fine and will send through signed letter.
"Barleyfields" New England Highway	08-10-20	RB	Explained modification and no issues raised. 3 accesses points to property from Barleyfields Road. One to rented house, one to cattle yards (ensure room to pull off) and third access to paddock needs to be kept
17 Munsies Road	08-10-20	RB	Explained modification and no issues raised. No need to visit
161 Big Ridge Road	08-10-20	RB	Explained modification and no issues raised. No need to visit. Landowner's access is off section of Big Ridge Road not impacted by construction
88 Big Ridge Road (1)	09-10-20	RB	Explained modification and no issues raised. One ramp and also one gate to property.
88 Big Ridge Road (2)	09-10-20	RB	Explained modification and no issues raised. One ramp and one gate to property.
102 Big Ridge Road	12-10-20	RB	Driveway access needs to be widened. See Tim Kirk's email dated 20/01/2020. Only one access point. Otherwise, fine with proposed modification.
	26-11-20	TG	Visited property and explained why landowner consent letter was required. Landowners fine and signed.
4 Munsies Road	12-10-20	RB	Landowner requested 500 metres of Munsies Road sealed. UPC advised him that was not on the development approval. Otherwise, modification is fine.
10 Munsies Road	14-10-20	RB	UPC attended a site visit. Concerned about the construction as they are regular dog walkers. Provided direct number to contact if any problems before or during construction.
580 Big Ridge Road	14-10-20	RB	Explained modification and no issues raised. Requested to be contacted when tree clearing occurs as she would like to keep the leaves.

David Richards

From: Ryan Desic
Sent: Friday, 18 September 2020 2:41 PM
To: 'nganyawana@gmail.com'; 'steven1ahoy@gmail.com'; 'minnamunnung@gmail.com'; 'ceo@alalc.org.au'; Bruce Cohen; Colin Ahoy; colinahoy57@gmail.com; Green, Kevin; Cheryl Kitchener; rhonda.kitchener; 'Bruce.Cohen@hnehealth.nsw.gov.au'; Colin Ahoy; colinahoy57@gmail.com
Cc: David Richards
Subject: Aboriginal consultation for the New England Solar Farm - Proposed modification to development consent SSD-9255
Attachments: J200214_NESF_M1_RAPs_V1.pdf

Dear Registered Party for the New England Solar Farm Project,

Thank you for your continued involvement in Aboriginal cultural heritage matters for the New England Solar Farm (the project) at Uralla NSW. You may recall that in August 2019 last year, EMM and RAP representatives assessed proposed road upgrades on Barelyfields Road and Big Ridge Road, which are required to allow the safe movement of light and heavy vehicles travelling from the New England Highway to the project development footprint. There have since been minor changes to the design of the proposed upgrades and EMM has prepared a letter report to address changes to support a modification to the project approval. Overall, the survey in 2019 covered the areas where changes are proposed and no Aboriginal items were identified. As such, the proposed road upgrade changes are unlikely to impact Aboriginal objects and no further management is proposed. The attached letter provides the details of this assessment and invites any feedback your party wishes to make.

Thank you for your time,

Regards,

Ryan Desic

Associate Archaeologist – Heritage Team Leader
Bushfire, Ecology, Heritage and Spatial Solutions (BEHSS)



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18 September 2020

Level 3, 175 Scott Street
Newcastle NSW 2300

T 02 4907 4800

E info@emmconsulting.com.au

www.emmconsulting.com.au

Re: J200214 - New England Solar Farm - Proposed modification to development consent SSD-9255

Dear Registered Party,

1 Introduction

UPC\AC Renewables Australia Pty Ltd (UPC) has approval to develop the New England Solar Farm; a significant grid-connected solar farm and battery energy storage system along with associated infrastructure, approximately 6 kilometres (km) east of the township of Uralla, which lies approximately 19 km south of Armidale, in the Uralla Shire local government area (LGA) (the project). The project was approved, subject to conditions, by the NSW Independent Planning Commission (IPC) on 9 March 2020 (SSD-9255).

In accordance with Condition 3 of Schedule 3 of SSD-9255, all vehicles associated with the project must travel to and from the site via the New England Highway, Barleyfields Road (north), Big Ridge Road and two site access points off Big Ridge Road. Condition 4 of Schedule 3 of SSD-9255 includes requirements for upgrades to Barleyfields Road (north) and Big Ridge Road (Segments 1, 3, 4 and 5) and two intersections, which must be implemented prior to the commencement of construction.

As part of detailed design works, additional disturbance areas (ie beyond those assessed and approved as part of SSD-9255) have been identified as necessary to facilitate:

- road widening works on Barleyfields Road (north) and Big Ridge Road (Segments 1, 3, 4 and 5); and
- upgrades at the intersections of the New England Highway/Barleyfields Road (north) and Barleyfields Road/Big Ridge Road.

Subsequently, UPC is seeking to modify SSD-9255, pursuant to Section 4.55(1A) of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act), to increase the extent of the disturbance boundary for the road upgrades. The layers used to define the primary vehicle access route in Appendix 1 of SSD-9255 will be updated to encompass the area required following the completion of detailed design.

An Aboriginal cultural heritage assessment (ACHA) was prepared for the project to address the Secretary's Environmental Assessment Requirements and was prepared in accordance with NSW guidelines. Eight registered Aboriginal parties (RAPs) were involved in the ACHA, which included an addendum that considered potential impacts to Aboriginal cultural heritage as a result of the previously assessed and approved road upgrade works. This letter has been prepared to inform RAPs of the proposed modification to the consent.

2 Proposed modification

As part of the assessment process for the environmental impact statement (EIS) and amendment report (AR), UPC amended the access route and revised the road upgrades in consultation with Uralla Shire

Council and NSW Department of Planning, Industry and Environment (DPIE). This resulted in better road safety outcomes and a reduction in the number of local roads required to access the site.

The upgrades defined in Appendix 4 of SSD-9255 (Table 2.1) include:

- road widening works along Barleyfields Road (north) and Big Ridge Road (Segments 1, 3, 4 and 5); and
- upgrades at the intersections of the New England Highway/Barleyfields Road (north) and Barleyfields Road/Big Ridge Road.

The detailed engineering design that has been prepared since the project was approved indicates that a wider disturbance footprint is required in some areas.

Table 2.1 Road upgrades and site access

Road	Location	Upgrade requirements	Timing
New England Highway and Barleyfields Road (north)	Intersection	Channelised right turn (CHR) treatment for the largest vehicle accessing the site (excluding over-dimensional vehicles). ¹	Prior to construction.
Barleyfields Road	Between New England Highway and Big Ridge Road	Seal to a width of 7.2 m with 1 m unsealed shoulders (total carriageway 9.2 m). ¹	
Barleyfields Road and Big Ridge Road	Intersection	Basic left turn (BAL) treatment to cater for the largest vehicle accessing the site (excluding over-dimensional vehicles). ¹	
Big Ridge Road	Segment 1	Seal to a width of 7.2 m with 1 m unsealed shoulders (total carriageway of 9.2 m). ¹	
	Segment 3		
	Segment 4	Gravel (unsealed) carriageway to a width of 8.7 m.	
	Segment 5		
	Site access points	Rural property access type. ¹	

1. Upgrades must comply with the *Austrroads Guide to Road Design* (as amended by RMS supplements).

Previously, it was assumed that the maximum disturbance as part of the proposed upgrades would be 10 m (ie 5 m either side of the existing centreline). The detailed design works indicate that there will be a requirement for a maximum disturbance of approximately 12.6 ha (an increase of approximately 47% from the 8.6 ha disturbance area assessed and approved previously). This excludes the existing maintained easement along Big Ridge Road and Barleyfields Road (north). Figures illustrating the extent of disturbance are provided in Appendix A.

The access route utilises existing roads, tracks and maintained road shoulders to the extent practicable to minimise the amount of vegetation clearing and surface disturbance required. Vegetation and surface disturbance will be restricted to:

- a narrow strip on the northern side of the existing carriageway of the New England Highway; and
- narrow strips on either side of the existing carriageways for Barleyfields Road (north) and Big Ridge Road (Segments 1, 3, 4 and 5).

Vegetation and surface disturbance works will remain within the designated road corridors (Appendix A).

3 Environmental assessment requirements

3.1 Overview

UPC has engaged EMM Consulting Pty Limited (EMM) to prepare a letter to support the modification application. The letter will be submitted to DPIE and will:

- provide an overview of the proposed modification;
- identify and assess any changes to the nature and level of impacts that may occur as a result of the proposed modification; and
- consider whether additional mitigation strategies are required to manage and minimise the environmental impacts of the proposed modification.

Consultation with relevant stakeholders will be undertaken including Uralla Shire Council and the local community (namely residents of Barleyfields Road (north) and Big Ridge Road). Outcomes of this consultation will be described within the letter.

An addendum to the biodiversity development assessment report (BDAR) will also be prepared. The addendum will provide an updated impact assessment and recalculate impacts to native vegetation requiring offsets (including ecosystem and species credit requirements).

3.2 Aboriginal cultural heritage

Prior to project determination (September 2019), an addendum to the ACHA was prepared to consider potential impacts to Aboriginal cultural heritage as a result of the road upgrade works (as proposed at that time) and to identify appropriate mitigation and management measures.

The addendum to the ACHA presented the outcomes of additional consultation and survey with RAP representatives and provided an updated impact assessment in response to the findings of the archaeological investigations.

The previous survey of the road upgrade works on 8 August 2019 assessed the road corridor where additional disturbance is now proposed. The survey:

...generally involved coverage of the entire width of the road corridor from the edge of the sealed road to the fence line to inspect key elements such as rock outcrops and trees along the general transect alignment. All mature trees in proximity to the area where the proposed works will take place were inspected for scars (EMM 2019¹).

Importantly, no Aboriginal objects were identified as a result of the survey effort and it was considered unlikely that subsurface archaeological deposits would occur within the area of the proposed works. Figures showing the outcomes of the previous survey in relation to the proposed modification are presented in Appendix A.

As a result of the previous addendum assessment, EMM consider that the proposed modification is unlikely to impact Aboriginal cultural values such as Aboriginal objects or areas of cultural significance. As such, no further assessment is warranted and no additional management measures are proposed.

Should any Aboriginal objects be identified during the road upgrade works; they will be managed in accordance with the Aboriginal heritage management plan (AHMP). The AHMP will be submitted to DPIE in

¹ EMM 2019, *New England Solar Farm – Addendum to the Aboriginal Cultural Heritage Assessment Report*. Report prepared by EMM for UPC.

the coming months, and pending approval, UPC will be in contact about enacting the provisions of the AHMP regarding Aboriginal site mitigation and protection.

4 Closing

UPC and EMM invite feedback from RAPs on the proposed modification. The modification application will be submitted to DPIE for assessment later this month. If you require any additional information or have any queries please do not hesitate to contact David Richards on 0405 593 675 or via email (refer below).

Yours sincerely

A handwritten signature in black ink, appearing to read 'Ryan Desic', with a stylized flourish at the end.

Ryan Desic
Associate Archaeologist
rdesic@emmconsulting.com.au

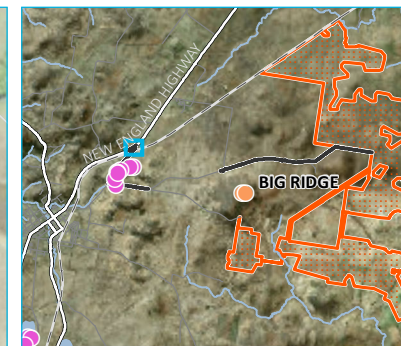
Appendix A

Revised road upgrade disturbance boundary

\\lemmsvr1\EMM3\2020\200214 - New England Solar Mod 1\GIS\02 Maps\AH001 DDP_RoadDisturbanceBoundary_20200917_04.mxd 18/09/2020



Source: EMM (2020); DFSI (2017); GA (2011); UPC (2020)

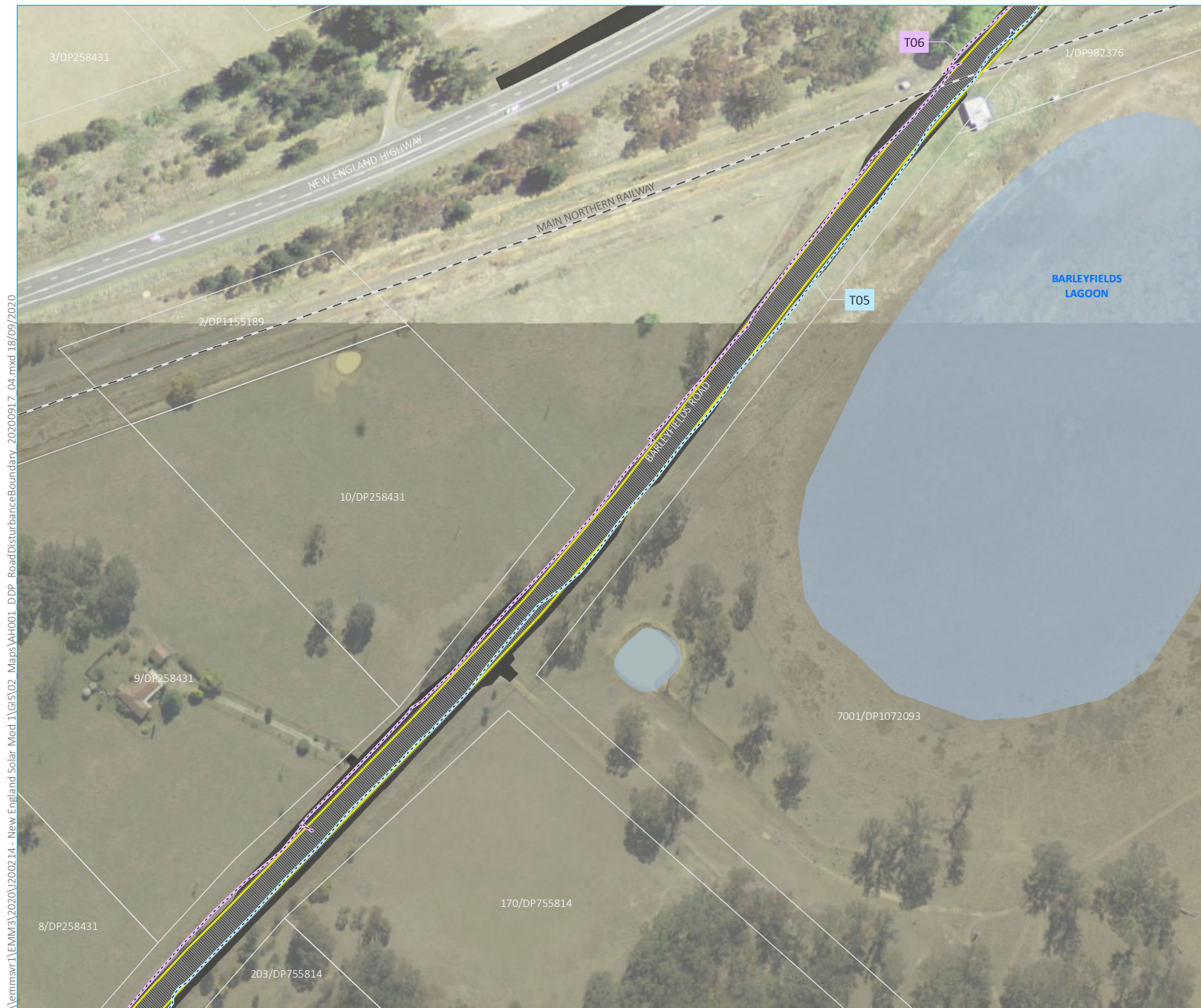


KEY

- Proposed road upgrade disturbance boundary
- Previously assessed and approved road upgrade disturbance boundary
- Development footprint
- Rail line
- Main road
- Local road
- Waterbody
- Cadastral boundary (DFSI 2017)
- Maintained easement
- AHIMS site type**
- Modified tree
- Stone artefact site
- Heritage transect**
- T01
- T05
- T06

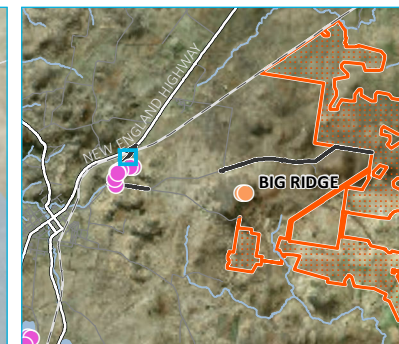
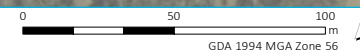
Proposed road upgrade
disturbance boundary

New England Solar Farm
Figure A.1



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Source: EMM (2020); DFSI (2017); GA (2011); UPC (2020)



KEY

- Proposed road upgrade disturbance boundary
- Previously assessed and approved road upgrade disturbance boundary
- Development footprint
- Rail line
- Main road
- Local road
- Waterbody
- Cadastral boundary (DFSI 2017)
- Maintained easement
- AHIMS site type**
 - Modified tree
 - Stone artefact site
- Heritage transect**
 - T05
 - T06

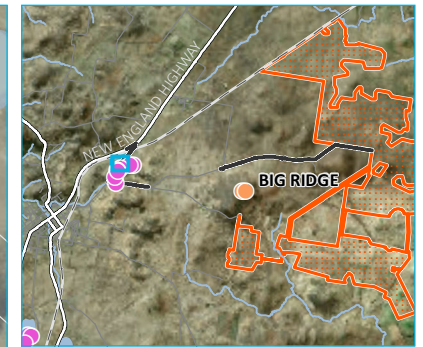
Proposed road upgrade
disturbance boundary

New England Solar Farm
Figure A.2

\\lemmsvr1\EMM3\2020\200214 - New England Solar Mod 1\GIS\02 Maps\AH001 DDP_RoadDisturbanceBoundary_20200917_04.mxd 18/09/2020



Source: EMM (2020); DFSI (2017); GA (2011); UPC (2020)



KEY

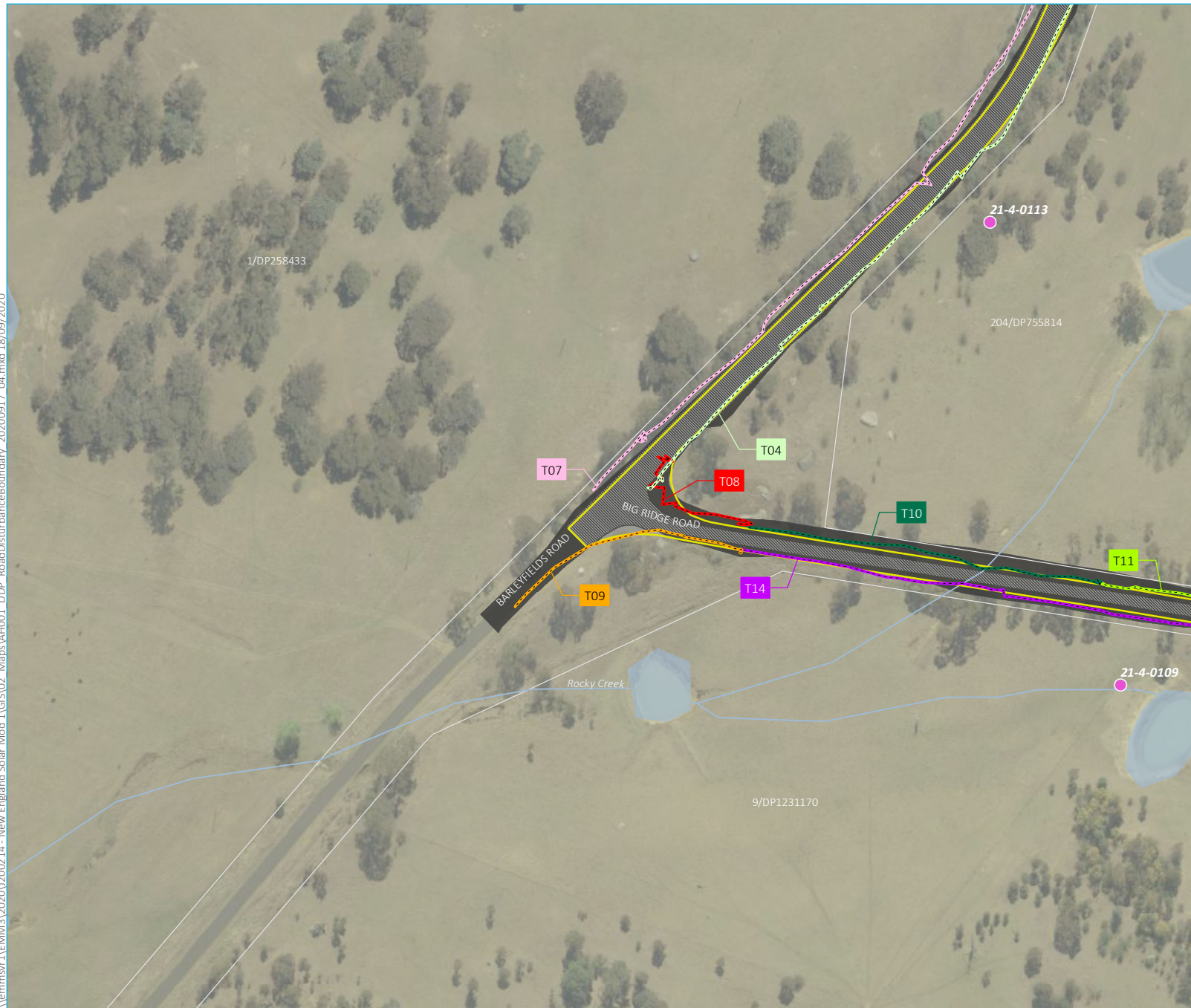
- Proposed road upgrade disturbance boundary
- Previously assessed and approved road upgrade disturbance boundary
- Development footprint
- Main road
- Local road
- Watercourse/drainage line
- Waterbody
- Cadastral boundary (DFSI 2017)
- Maintained easement
- AHIMS site type**
- Modified tree
- Stone artefact site
- Heritage transect**
- T04
- T05
- T06
- T07

Proposed road upgrade
disturbance boundary

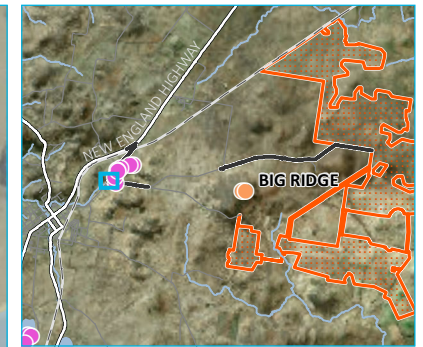
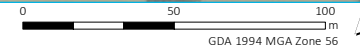
New England Solar Farm
Figure A.3



\\lemmsvr1\EMM3\2020\200214 - New England Solar Mod 1\GIS\02 Maps\AH001 DDP RoadDisturbanceBoundary 20200917 04.mxd 18/09/2020



Source: EMM (2020); DFSI (2017); GA (2011); UPC (2020)



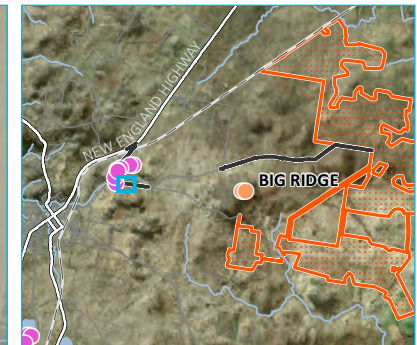
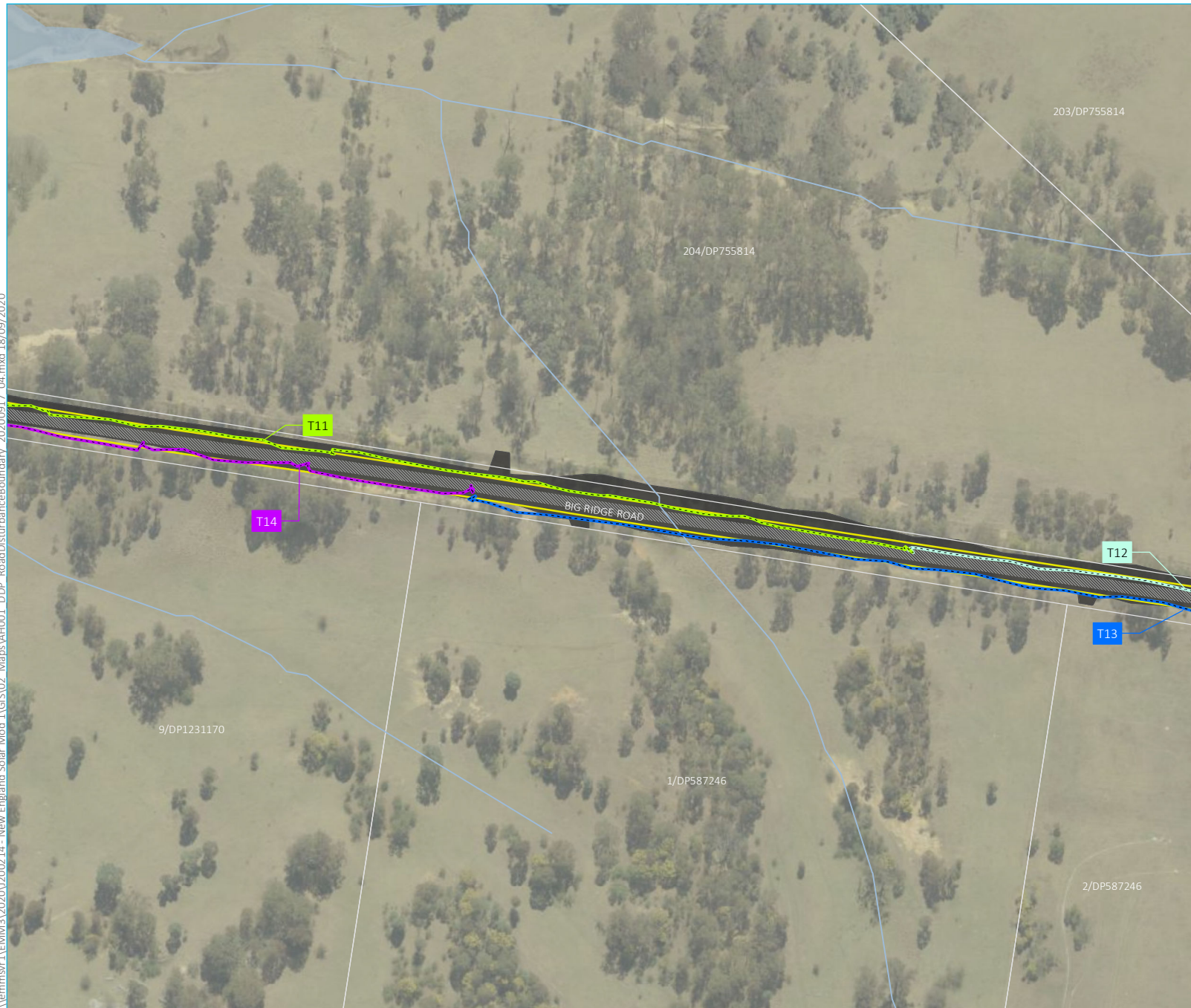
KEY

- Proposed road upgrade disturbance boundary
- ▭ Previously assessed and approved road upgrade disturbance boundary
- ▭ Development footprint
- Main road
- Local road
- Watercourse/drainage line
- Waterbody
- ▭ Cadastral boundary (DFSI 2017)
- ▨ Maintained easement
- AHIMS site type
 - Modified tree
 - Stone artefact site
- Heritage transect
 - T04
 - T07
 - T08
 - T09
 - T10
 - T11
 - T14

Proposed road upgrade disturbance boundary

New England Solar Farm
Figure A.5

\\lemmsvr1\EMM3\2020\200214 - New England Solar Mod 1\GIS\02 Maps\AH001 DDP_RoadDisturbanceBoundary_20200917_04.mxd 18/09/2020



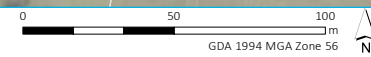
- KEY**
- Proposed road upgrade disturbance boundary
 - ▭ Previously assessed and approved road upgrade disturbance boundary
 - ▭ Development footprint
 - Main road
 - Local road
 - Watercourse/drainage line
 - Waterbody
 - ▭ Cadastral boundary (DFSI 2017)
 - ▨ Maintained easement
 - AHIMS site type**
 - Modified tree
 - Stone artefact site
 - Heritage transect**
 - T11
 - T12
 - T13
 - T14

Proposed road upgrade disturbance boundary

New England Solar Farm
Figure A.6



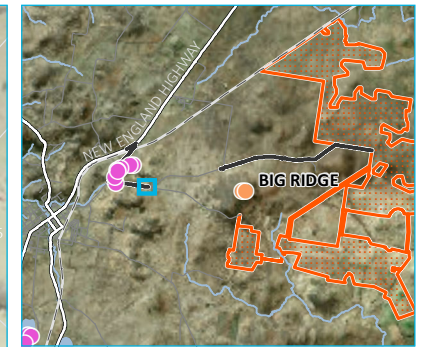
Source: EMM (2020); DFSI (2017); GA (2011); UPC (2020)



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Source: EMM (2020); DFSI (2017); GA (2011); UPC (2020)



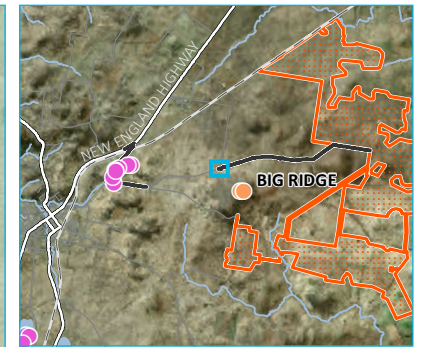
KEY

- Proposed road upgrade disturbance boundary
- Previously assessed and approved road upgrade disturbance boundary
- Development footprint
- Main road
- Local road
- Waterbody
- Cadastral boundary (DFSI 2017)
- Maintained easement
- AHIMS site type**
- Modified tree
- Stone artefact site
- Heritage transect**
- T12
- T13

Proposed road upgrade
disturbance boundary

New England Solar Farm
Figure A.7

\\lemmsvr1\EMM3\2020\200214 - New England Solar Mod 1\GIS\02 Maps\AH001 DDP RoadDisturbanceBoundary_20200917_04.mxd 18/09/2020



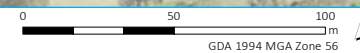
- KEY**
- Proposed road upgrade disturbance boundary
 - ▬ Previously assessed and approved road upgrade disturbance boundary
 - ▭ Development footprint
 - Main road
 - Local road
 - Watercourse/drainage line
 - Waterbody
 - ▭ Cadastral boundary (DFSI 2017)
 - ▨ Maintained easement
 - AHIMS site type**
 - Modified tree
 - Stone artefact site
 - Heritage transect**
 - T15

Proposed road upgrade
disturbance boundary

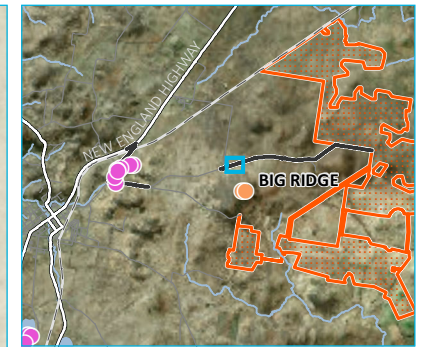
New England Solar Farm
Figure A.8



Source: EMM (2020); DFSI (2017); GA (2011); UPC (2020)



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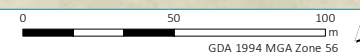
- KEY**
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 - ▭ Previously assessed and approved road upgrade disturbance boundary
 - ▭ Development footprint
 - Main road
 - Local road
 - Watercourse/drainage line
 - Waterbody
 - ▭ Cadastral boundary (DFSI 2017)
 - ▨ Maintained easement
 - AHIMS site type**
 - Modified tree
 - Stone artefact site
 - Heritage transect**
 - T15

Proposed road upgrade
disturbance boundary

New England Solar Farm
Figure A.9



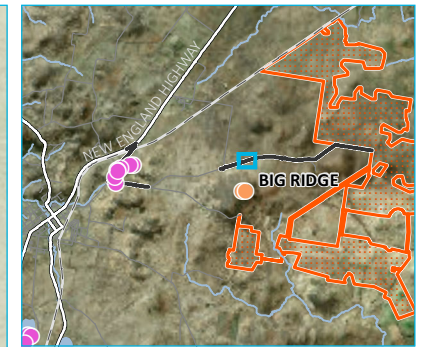
Source: EMM (2020); DFSI (2017); GA (2011); UPC (2020)



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Source: EMM (2020); DFSI (2017); GA (2011); UPC (2020)



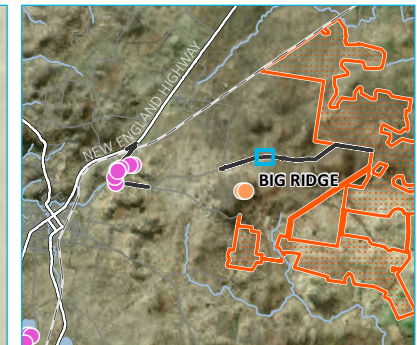
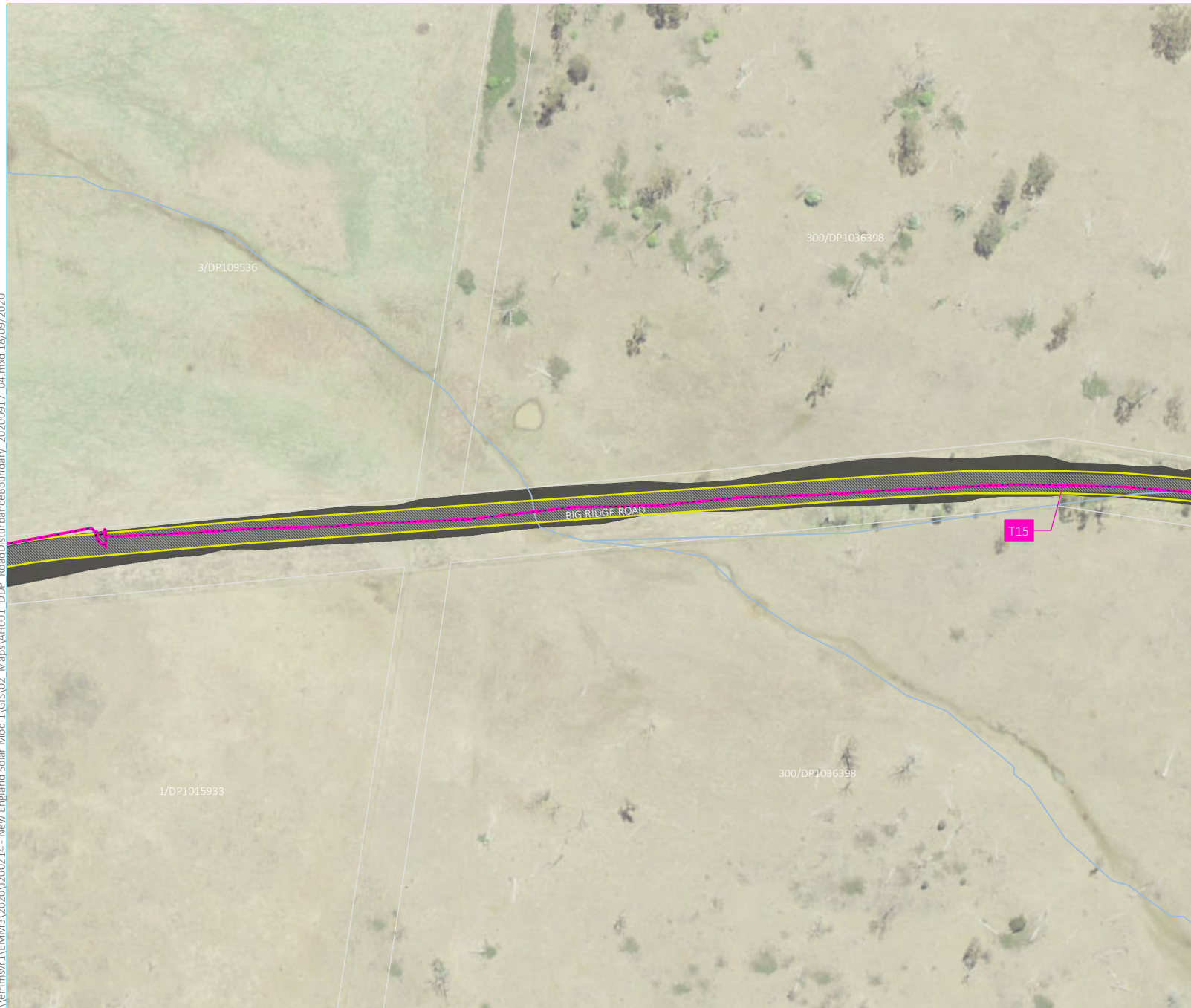
KEY

- Proposed road upgrade disturbance boundary
- Previously assessed and approved road upgrade disturbance boundary
- Development footprint
- Main road
- Local road
- Watercourse/drainage line
- Waterbody
- Cadastral boundary (DFSI 2017)
- ▨ Maintained easement
- AHIMS site type
- Modified tree
- Stone artefact site
- Heritage transect
- T15

Proposed road upgrade
disturbance boundary

New England Solar Farm
Figure A.10

\\emmsvr1\EMM3\2020\200214 - New England Solar Mod 1\GIS\02 Maps\AH001 DDP RoadDisturbanceBoundary_20200917_04.mxd 18/09/2020



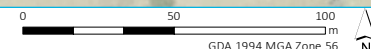
- KEY**
- Proposed road upgrade disturbance boundary
 - Previously assessed and approved road upgrade disturbance boundary
 - Development footprint
 - Main road
 - Local road
 - Watercourse/drainage line
 - Waterbody
 - Cadastral boundary (DFSI 2017)
 - Maintained easement
 - AHIMS site type
 - Modified tree
 - Stone artefact site
 - Heritage transect
 - T15

Proposed road upgrade disturbance boundary

New England Solar Farm
Figure A.11



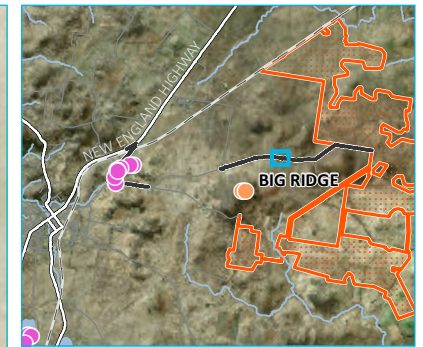
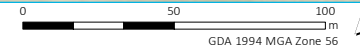
Source: EMM (2020); DFSI (2017); GA (2011); UPC (2020)



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Source: EMM (2020); DFSI (2017); GA (2011); UPC (2020)



KEY

- Proposed road upgrade disturbance boundary
- Previously assessed and approved road upgrade disturbance boundary
- Development footprint
- Main road
- Local road
- Watercourse/drainage line
- Waterbody
- Cadastral boundary (DFSI 2017)
- Maintained easement
- AHIMS site type**
- Modified tree
- Stone artefact site
- Heritage transect**
- T15

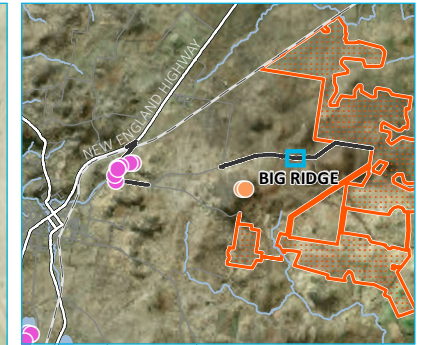
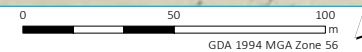
Proposed road upgrade
disturbance boundary

New England Solar Farm
Figure A.12

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Source: EMM (2020); DFSI (2017); GA (2011); UPC (2020)



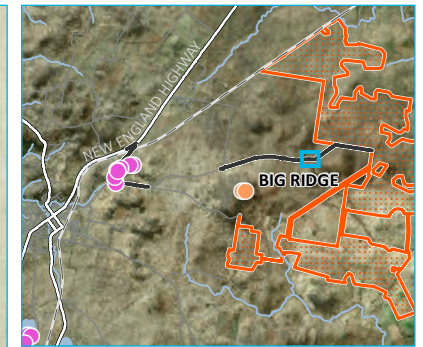
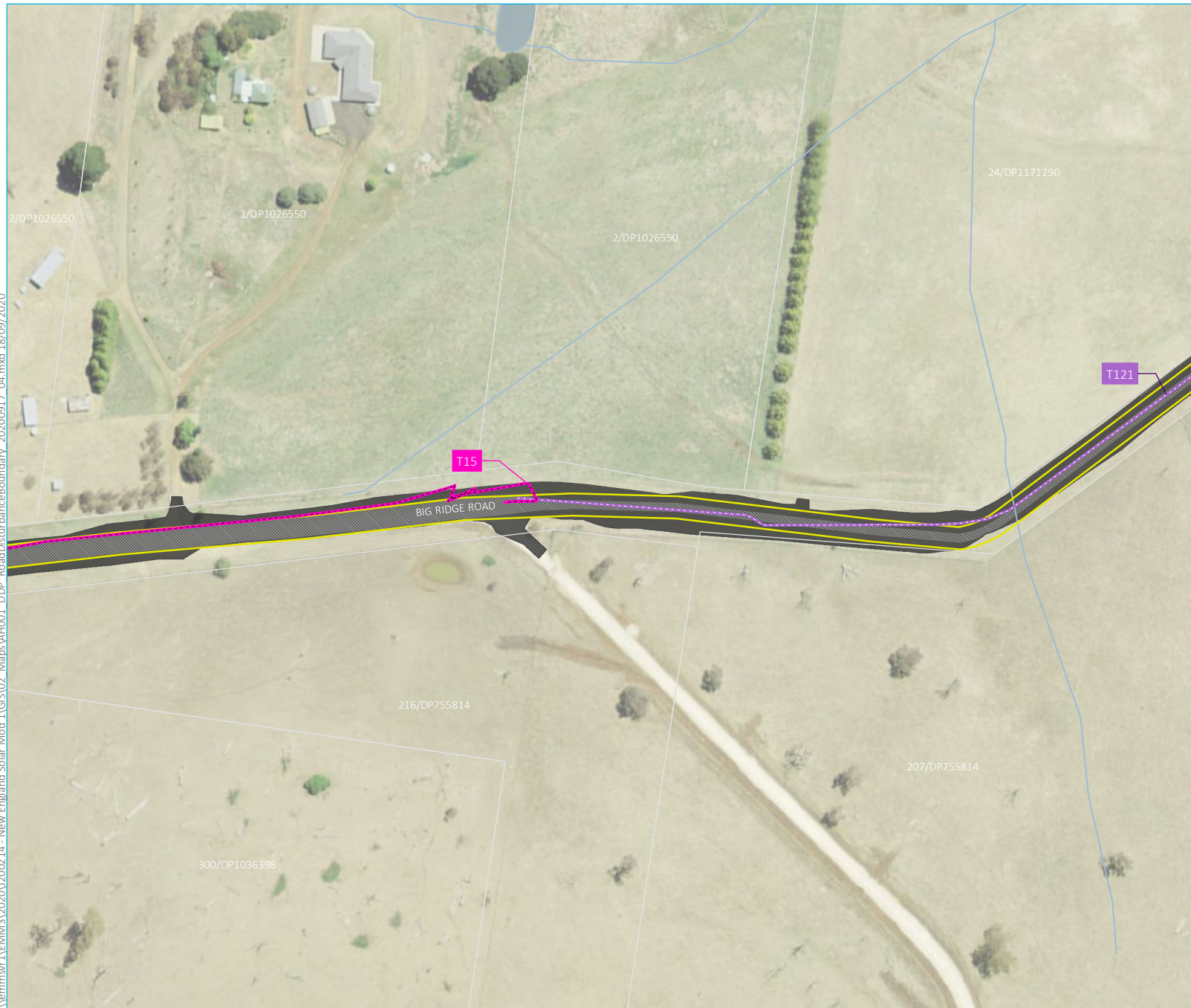
KEY

- Proposed road upgrade disturbance boundary
- Previously assessed and approved road upgrade disturbance boundary
- Development footprint
- Main road
- Local road
- Watercourse/drainage line
- Waterbody
- Cadastral boundary (DFSI 2017)
- Maintained easement
- AHIMS site type**
- Modified tree
- Stone artefact site
- Heritage transect**
- T15

Proposed road upgrade
disturbance boundary

New England Solar Farm
Figure A.13

\\lemmsvr1\EMM3\2020\200214 - New England Solar Mod 1\GIS\02 Maps\AH001 DDP_RoadDisturbanceBoundary_20200917_04.mxd 18/09/2020



KEY

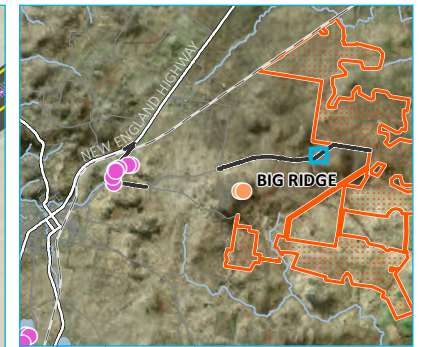
- Proposed road upgrade disturbance boundary
- Previously assessed and approved road upgrade disturbance boundary
- Development footprint
- Main road
- Local road
- Watercourse/drainage line
- Waterbody
- Cadastral boundary (DFSI 2017)
- Maintained easement
- AHIMS site type**
- Modified tree
- Stone artefact site
- Heritage transect**
- T15
- T121

Proposed road upgrade
disturbance boundary

New England Solar Farm
Figure A.14



\\lemmsvr1\EMM3\2020\200214 - New England Solar Mod 1\GIS\02 Maps\AH001 DDP_RoadDisturbanceBoundary_20200917_04.mxd 18/09/2020



KEY

- Proposed road upgrade disturbance boundary
- Previously assessed and approved road upgrade disturbance boundary
- Development footprint
- Main road
- Local road
- Watercourse/drainage line
- Waterbody
- Cadastral boundary (DFSI 2017)
- Maintained easement
- AHIMS site type
- Modified tree
- Stone artefact site
- Heritage transect
- T121

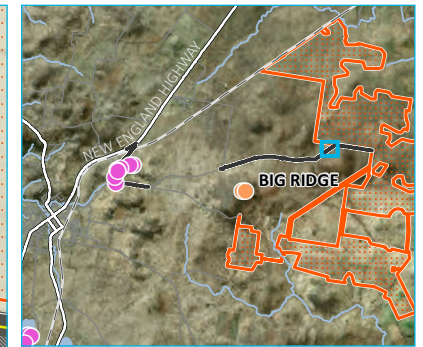
Proposed road upgrade
disturbance boundary

New England Solar Farm
Figure A.15

\\lemmsvr1\EMM3\2020\200214 - New England Solar Mod 1\GIS\02 Maps\AH001 DDP_RoadDisturbanceBoundary_20200917_04.mxd 18/09/2020



Source: EMM (2020); DFSI (2017); GA (2011); UPC (2020)



KEY

- Proposed road upgrade disturbance boundary
- Previously assessed and approved road upgrade disturbance boundary
- Development footprint
- Main road
- Local road
- Watercourse/drainage line
- Waterbody
- Cadastral boundary (DFSI 2017)
- ▨ Maintained easement
- AHIMS site type
- Modified tree
- Stone artefact site
- Heritage transect
- T121

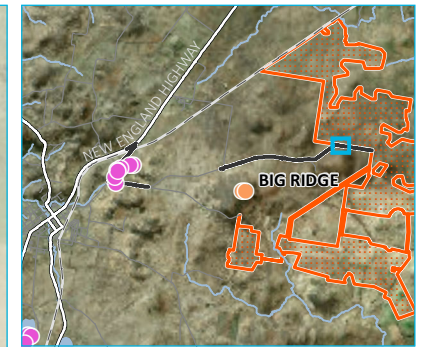
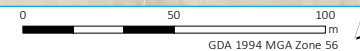
Proposed road upgrade
disturbance boundary

New England Solar Farm
Figure A.16

\\lemmsvr1\EMM3\2020\200214 - New England Solar Mod 1\GIS\02 Maps\AH001 DDP_RoadDisturbanceBoundary_20200917_04.mxd 18/09/2020



Source: EMM (2020); DFSI (2017); GA (2011); UPC (2020)



KEY

- Proposed road upgrade disturbance boundary
- Previously assessed and approved road upgrade disturbance boundary
- Development footprint
- Main road
- Local road
- Waterbody
- Cadastral boundary (DFSI 2017)
- Maintained easement
- AHIMS site type**
- Modified tree
- Stone artefact site
- Heritage transect**
- T121

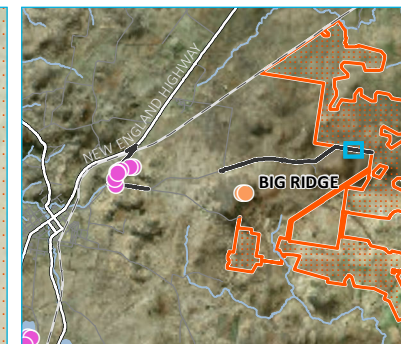
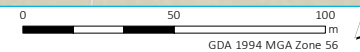
Proposed road upgrade
disturbance boundary

New England Solar Farm
Figure A.17

\\lemmsvr1\EMM3\2020\200214 - New England Solar Mod 1\GIS\02 Maps\AH001 DDP RoadDisturbanceBoundary 20200917 04.mxd 18/09/2020



Source: EMM (2020); DFSI (2017); GA (2011); UPC (2020)



KEY

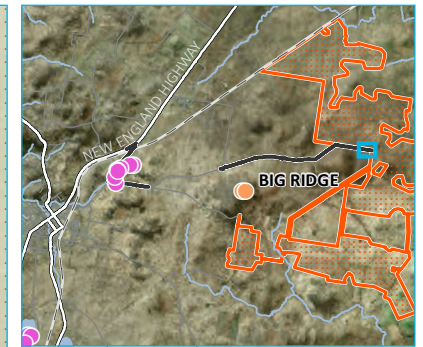
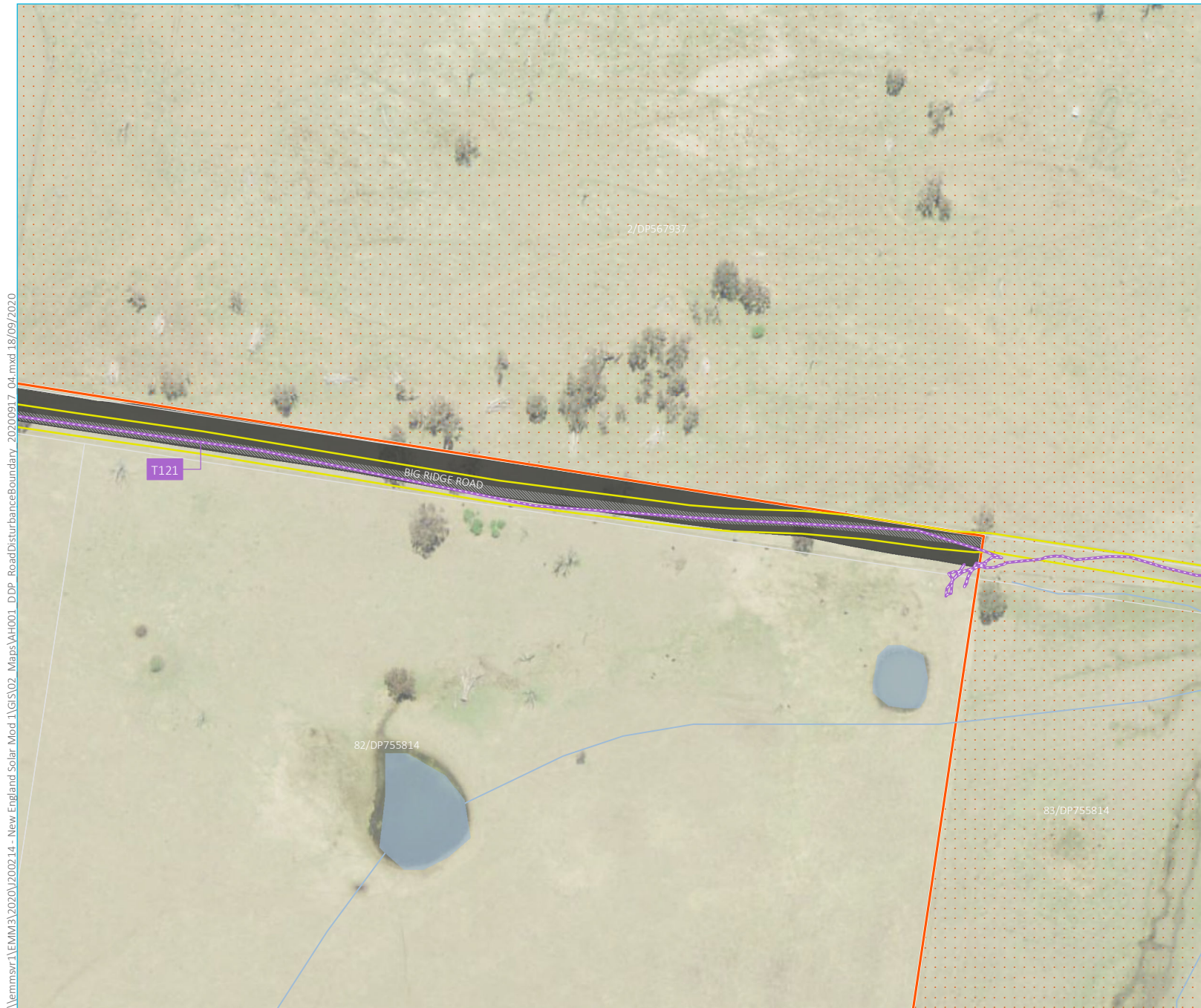
- Proposed road upgrade disturbance boundary
- Previously assessed and approved road upgrade disturbance boundary
- Development footprint
- Main road
- Local road
- Waterbody
- Cadastral boundary (DFSI 2017)
- Maintained easement
- AHIMS site type**
- Modified tree
- Stone artefact site
- Heritage transect**
- T121

Proposed road upgrade
disturbance boundary

New England Solar Farm
Figure A.18



\\lemmsvr1\EMM3\2020\200214 - New England Solar Mod 1\GIS\02 Maps\AH001 DDP RoadDisturbanceBoundary 20200917 04.mxd 18/09/2020



KEY

- Proposed road upgrade disturbance boundary
- Previously assessed and approved road upgrade disturbance boundary
- Development footprint
- Main road
- Local road
- Watercourse/drainage line
- Waterbody
- Cadastral boundary (DFSI 2017)
- Maintained easement
- AHIMS site type**
- Modified tree
- Stone artefact site
- Heritage transect**
- T121

Proposed road upgrade
disturbance boundary

New England Solar Farm
Figure A.19



