Transmission Line Augmentation Works; Lot 141 DP1144786 to Raglan Substation

High level environmental assessment

October 2022

Project Number: 21-785

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1. Introduction

The proposed Glanmire Solar Farm, to be located on Lot 141 DP1144786, Glanmire, NSW in the Bathurst Regional Local Government Area of NSW, includes the construction, operation and eventual decommissioning of a solar farm that would be connected into the electricity grid. The applicant proposing the Glanmire Solar Farm is Elgin Energy Pty. Ltd. The works required to commission the solar farm can be considered in separate stages:

- The solar farm site and site access are subject to detailed assessment within the body of the EIS.
- The offsite electricity infrastructure works will be required prior to commissioning the solar farm and will require a full assessment under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), with Essential Energy to be the determining authority.

Details of the refurbishment of the overhead 66kV line from the solar farm site to the Raglan substation, and any flow on effects, such as re-routing the existing 11kV line, have not been finalised by Essential Energy. It is understood that most works will be within the existing easements and that the works have been characterised by Essential Energy as likely to have a low level of impact.

This document includes Elgin Energy's current understanding of the scope of works, as of October 2022, and provides a high-level assessment using a risk based-approach, in order that the impacts of these works can also be considered by agencies and the community, as part of the public exhibition of the Glanmire Solar Farm Environmental Impact Statement (EIS). It focuses on the overhead 66kV line from the proposed solar farm site to the Raglan substation; these being the most certain and most directly linked to the solar farm's requirements. This assessment forms an appendix to the EIS in order that all impacts associated with the proposed Glanmire Solar Farm are considered.

Solar farm site	Located entirely within Lot 141 DP1144786, key components include: • Ground mounted solar photovoltaic panels; single axis tracking, single portrait solar arrays. • Inverters and voltage step-up transformers positioned throughout the solar arrays. • Underground and aboveground cabling to connect the arrays to the inverters/transformer stations. • A hybrid Battery Energy Storage System. • A switchyard and on-site substation. • National Energy Market compliant metering. • Internal access tracks. • Security fencing and Closed-Circuit Television (CCTV). • An operations and maintenance building. • Specific areas of vegetation screen planting.
Site access upgrades	Development of an appropriate site access off Brewongle Lane, accessed off the Great Western Highway.
Transmission line connection and augmentation	An existing Essential Energy 66kV infrastructure (currently operated at 11kV) is located adjacent to the site's northern boundary. Refurbishment of this infrastructure to the intended capacity of 66kV is required for the energy generated by the Glanmire Solar Farm to be connected to the Raglan substation. Re-routing of the existing 11kV line is also required.

2. Scope of augmentation works

2.1 Location

The existing Essential Energy 66kV infrastructure (currently operated at 11kV) is located adjacent to the site's northern boundary. It connects to the Raglan substation, approximately 7km east.

The electricity easement transverses modified farmland. The height of the current 66kV poles is between 15.5–18.5m above ground level. They are timber poles with one set of power lines located at the full height of each pole.

2.2 Background

The Glanmire Solar Farm Project requires connection to the electricity network. Essential Energy confirmed that options exist for the refurbishment/augmentation of existing transmission lines built for 66kV capacity within existing easements, with the possibility of relocation of a short section of 11kV line.

Capacity for the electricity grid to accommodate the electricity generated from the Project has been confirmed and Elgin Energy has consulted with Essential Energy regarding connection requirements, with feasibility studies on the network capacity and grid connection to the Raglan Zone Substation. Specific to the Glanmire Solar Farm Project, the technical impacts and benefits and the outcome of detailed network studies is as follows:

> *A Preliminary Impact Assessment undertaken by Essential Energy has determined that the connection of Glanmire Solar Farm and BESS resulted in a positive available fault level at their Raglan 66kV bus (the point of connection to their network).*
>
> *Due to this positive outcome, it has been determined that the project will not have an adverse impact to the network and a Full Impact Assessment is not required according to AEMO's 'System Strength Impact Assessment Guidelines' (effective July 1st, 2018).*
>
> *Detailed network studies undertaken to date have demonstrated that under certain network conditions, the generation output from Glanmire Solar Farm and BESS contributes to reducing a constraint on Transgrid's Line 94T (Molong – Orange North 132kV Line).*
>
> *The reactive capability of the inverters can also be configured and utilised to stabilise voltage during system normal and particularly during network contingency conditions.*
>
> Pers. comm. 28 Sept. 2022. Shane Slattery, Head of Grid, Australia, Elgin Energy.

Details of the refurbishment and any flow on effects, such are re-routing the existing 11kV line, have not been finalised by Essential Energy. It is understood that most works will be within the existing easements and that the works have been characterised by Essential Energy as likely to have a low level of impacts.

High level assessment and consultation in relation to the offsite transmission line works is required in the Glanmire Solar Farm EIS. This document contains Elgin Energy's current understanding of the scope of works required by Essential Energy and provides a high-level assessment of their impacts in order to facilitate assessment and consultation, as required. These impacts are summarised in the EIS, Section 7.3 Cumulative Impacts. This approach is considered appropriate to the low level of impact anticipated, as directed by the SEARs, which require

'a*ssessment of the likely impacts of all stages … which is commensurate with the level of impact…'*

And consistent with the cumulative impact guidance which considers cumulative impacts as

'…*the additional impacts arising from further planned or foreseeable future developments*…'.

2.3 Works proposed

Essential Energy will provide a detailed design at a later stage of the connection process. However, during Elgin Energy's consultation with Essential Energy they advised that the refurbishment works are expected to involve replacing the existing conductors and potentially most of the existing poles to meet current standards on the existing route between the solar farm site and the Raglan substation.

- Replacement poles, where required, will be installed according to current standards. The existing 15.5–18.5m poles may increase to between 17–20.7m above ground level.
- The replacement poles will be made from either wood, steel or concrete.
- Around 47 poles are currently located on the existing line.
- Conductor replacement, pole top refurbishments and conductor re-tension, removal of redundant infrastructure on the existing route between the solar farm site and the Raglan substation.

Associated, or flow on effects of this refurbishment, may also include:

- Works within the Raglan 66/11kV Zone Substation including an extension of the 66kV bus bar and upgrade to accommodate 60MW.
- Re-routing the 11kV line either beneath the new 66kV line or by establishing new overhead or underground line routes.
- Telecommunication pathways (diverse paths) to meet the automatic access standard and remote monitoring to AEMO for embedded generation >30MW.

The detailed designs will be developed in compliance with the Bathurst Airport and CASA requirements to ensure the relevant safety standards are met. Essential Energy have characterised the works as likely to be of low impact.

2.4 Assessment pathways

Consultation with Essential Energy has verified refurbishment of this line will require assessment under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), with Essential Energy to be the determining authority.

Essential Energy have expressed their clear preference to fully assess the works under Part 5 as this gives them full control of the network and any mitigation strategies required to manage their assets. Furthermore, Essential Energy have advised the augmentation works would be straight forward, of low impact and would fall under a REF worksheet (Review of Environmental Factors) (pers. comm. J. Clearwater, Major Complex Connections Specialist Commercial Services Essential Energy, 10 Aug 2022).

At the same time, as the works are required to connect the Glanmire Solar Farm to the grid, they must also be assessed at a high level within the EIS, as the works are required as part of the State

Significant Development (requiring Part 4 assessment; pers. comm. N. Brewer, Director, Energy Assessments Planning and Assessment, Department of Planning and Environment, 22 July 2022). This document aims to meet this requirement. The information and strategies herein are also likely to be used to inform the subsequent Part 5 assessment.

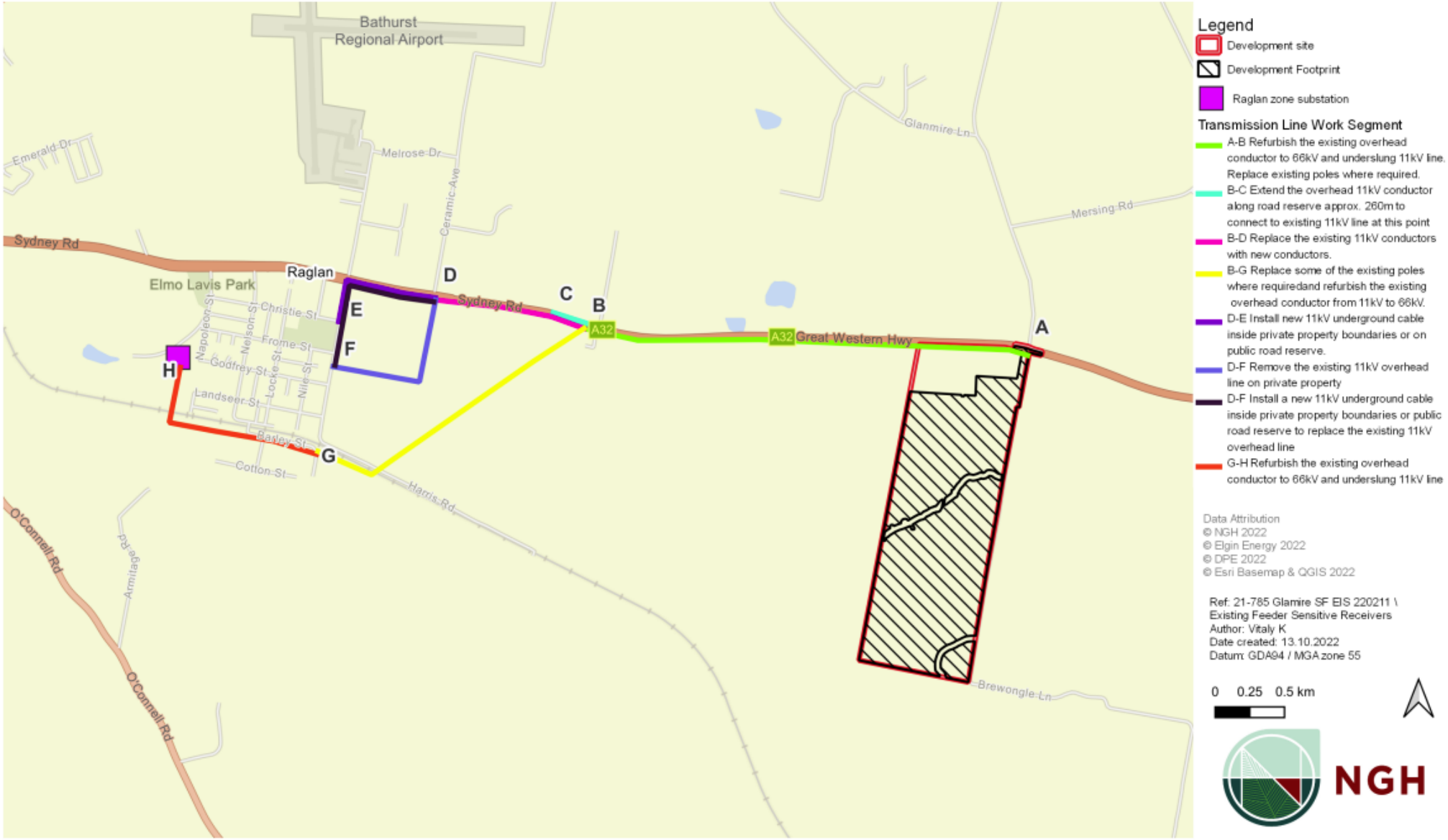


Figure 2-1 Likely refurbishment options for the transmission line connecting to Raglan substation.

Table 2-1 Works summary

Start point	End point	Colour on map	Description of the work	Existing conditions
A	B	Green	Refurbish the existing overhead conductor to 66kV and underslung 11kV line. Replace existing poles where required.	
B	C	Blue	Extend the overhead 11kV conductor along road reserve approx. 260m to connect to existing 11kV line at this point	
B	D	Pink	Replace the existing 11kV conductors with new conductors.	

Start point	End point	Colour on map	Description of the work	Existing conditions
D	E	Purple	Install new 11kV underground cable inside private property boundaries or on public road reserve.	
D	F	Light purple	Remove the existing 11kV overhead line on private property	
D	F	Light purple	Install a new 11kV underground cable inside private property boundaries or public road reserve to replace the existing 11kV overhead line (co-located with D – E)	

Start point	End point	Colour on map	Description of the work	Existing conditions
G	H	Orange	Refurbish the existing overhead conductor to 66kV and underslung 11kV line	
B	G	Yellow	Replace some of the existing poles and refurbish the existing overhead conductor from 11kV to 66kV	

Figure 2-2 Example of an 'underslung' line, applicable to Sections A-B and G-H

3. Risk assessment

Table 3-1 below has been created to develop a high-level assessment method for relevant environmental parameters that could be affected by the proposed works. Further commentary is provided in Sections 3.1–3.6.

The assessment in Section 3 is mostly focused on the more certain sections of the works between the solar farm site and the Raglan substation (Sections A-B; B-G; G-H; overhead line works on the existing Essential Energy easement) as the remaining sections:

- Are flow on effects to the network, not directly required by the Glanmire Solar Farm.
- Will be subject to Essential Energy's consultation with third parties (including private property and Transport for NSW) and are at this point less certain.

However, in Section 4, the findings of Section 3 are extrapolated to all works proposed to provide a high-level assignment of key issues and environmental risks of all works. Key areas of uncertainty are clearly identified.

Table 3-1 Summary of environmental risks and proposed assessment methodology

Environmental issue	Sensitivity of receiving environment	Nature and extent of key impacts	Assessment methodology
Aviation impacts	High– located close to Bathurst Regional Airport	Moderate – 2–6 m increase in pole height on 700m of existing transmission line route. Small sections of new overhead line (260m).	*Desktop assessment of Obstacle Limitation Surfaces (OLS) by specialist.*
Amenity impacts: Visual impact on scenic amenity, landscape character, noise impacts	Moderate sensitivity – due to the scenic value of the Bathurst Plains and close proximity to residential receivers for sections of works	Low – 2–6 m increase in pole height on 700m of existing transmission line route The removal of existing 11kV overhead line on private property would be a potential improvement to views and the landscape character.	*Field work and desktop evaluation to consider impacts.*
Aboriginal cultural heritage	Moderate – potential for surface scatters and subsurface artefacts	Low – replacement of around 47 poles in an existing transmission line easement. Moderate-High – trenching or other soil disturbance outside of existing easements.	*Desktop evaluation by specialist.*

Environmental issue	Sensitivity of receiving environment	Nature and extent of key impacts	Assessment methodology
Historic heritage	Low – number of surrounding listed historic sites	Moderate - trenching or other soil disturbance outside of existing easements.	*Desktop evaluation by specialist.*
Biodiversity	Low – highly modified grassland	Low – replacement of around 47 poles in an existing transmission line easement. Low-Moderate- trenching or other soil disturbance / vegetation clearing outside of existing easements.	*Desktop evaluation by specialist.*
Hazards and physical impacts; soil, water, air	Low – existing areas of disturbance, stable, low relief terrain, few close receivers no change in land use.	Low – replacement of around 47 poles in an existing transmission line easement. Low-Moderate- trenching or other soil disturbance / vegetation clearing outside of existing easements.	*Desktop assessment.*

3.1 Aviation impact

Aviation Projects Pty Ltd was engaged to complete a preliminary review of the potential Obstacle Limitation Surface (OLS) impacts of the transmission line refurbishment; specifically, the increase in power pole heights within close proximity of Bathurst Airport. The report is appended as Appendix A and summarised below.

3.1.1 Existing environment

Bathurst Airport (YBTH) is a Code 3, non-precision approach certified aerodrome. The OLS established for the aerodrome runways is shown in Figure 3-1 in relation to the existing transmission line location and the proposed Glanmire Solar Farm. The transmission line is located underneath the OLS Inner Horizontal Surface for a portion of the Runway 35 Transitional and Approach Surfaces and also for a portion of the OLS Conical Surface.

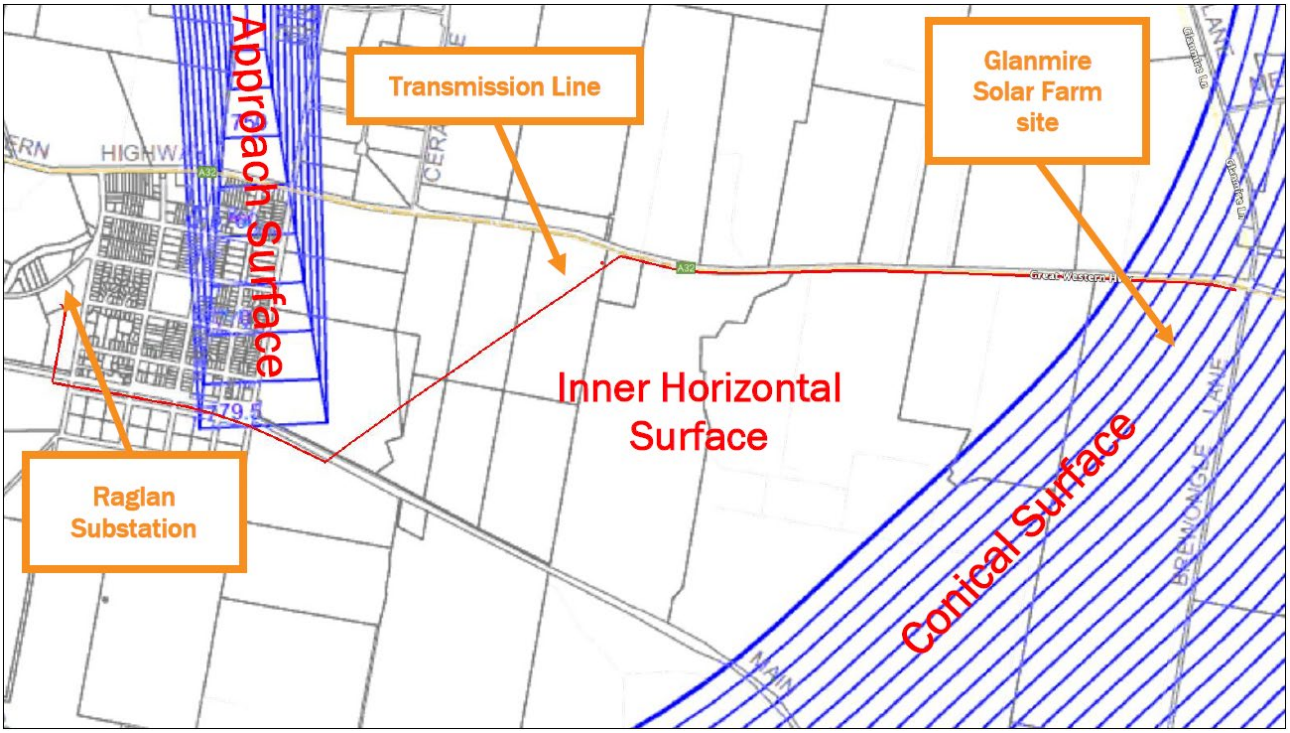


Figure 3-1 Bathurst Airport OLS in relation to the transmission line

3.1.2 Nature and scale of impacts

Obstacles which penetrate the OLS height limits are required to be reported to Civil Aviation Safety Authority (CASA) for assessment. The OLS height limits in relation to each section of the transmission line are assessed below. For the purpose of this assessment the maximum expected pole height of 20.7m Above Ground Level (AGL) is used. All poles would be located within the existing easement.

Raglan power substation to the Bathurst – Raglan train line (Section 1)

This section of the transmission line is wholly contained within the OLS Inner Horizontal Surface. The OLS Inner Horizontal Surface has a height of 779.5m Australian Height Datum (AHD). Ground elevations in this section of the transmission line vary from a low of 722m at the power substation rising to 730m at the train line as seen in Figure 3-2. At the maximum ground elevation in this section of line, a 20.7m pole would have a maximum height of 750.7m and be below the height of the OLS Inner Horizontal Surface.

Therefore, this section of transmission line will not have any impact on the OLS.

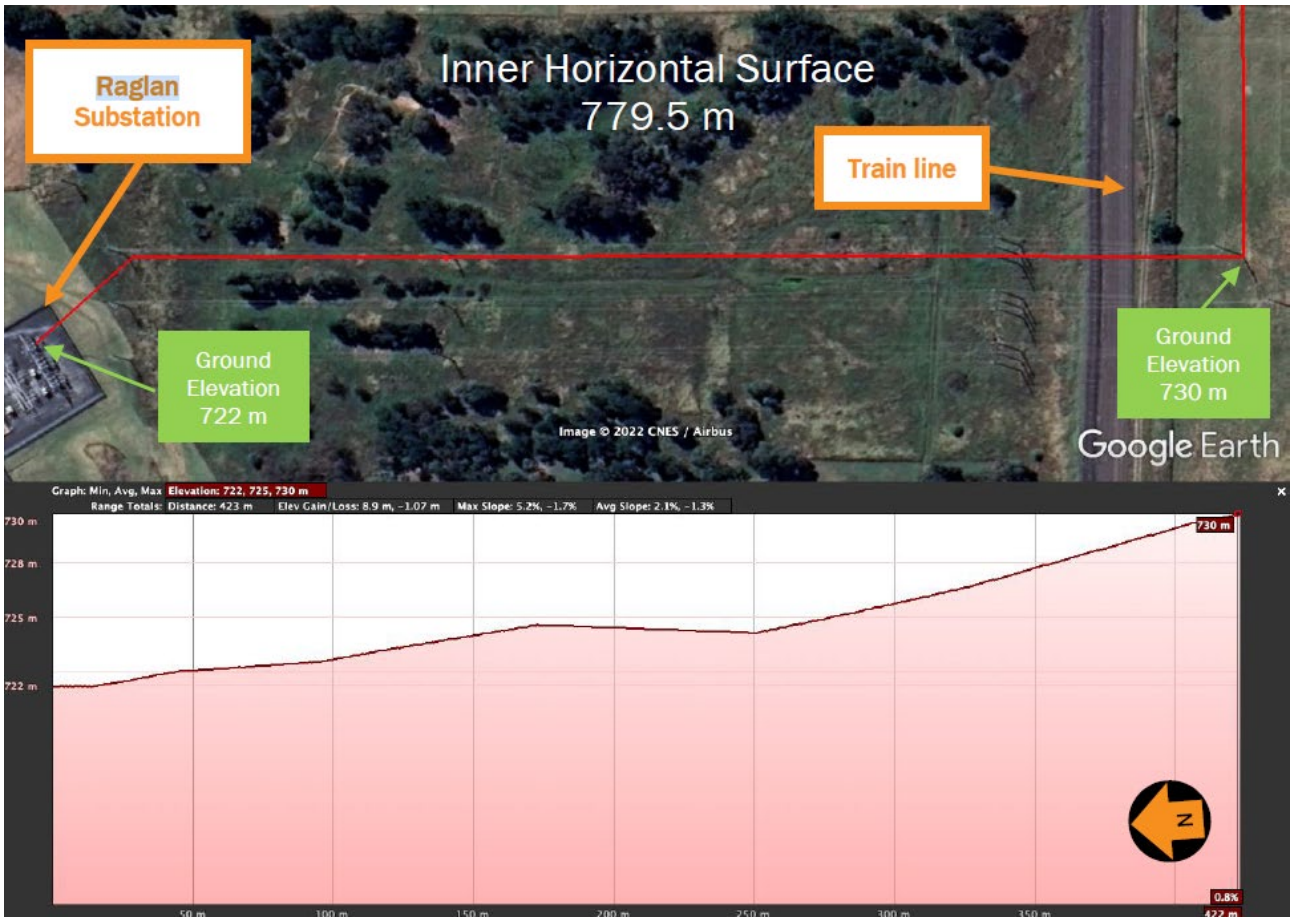


Figure 3-2 Transmission line section 1 ground elevation profile

Along Bathurst to Raglan Train Line (Section 2)

Along the Bathurst to Raglan Train Line, the transmission line is contained primarily within the OLS Inner Horizontal Surface but also passes through the Runway 35 Transitional and Approach Surface.

Runway 35 Transitional and Approach Surface:

The runway 35 Transitional and Approach Surface, at the points the transmission line passes through them, varies in height from 777.6m at the most western point to 779.5m AHD at the most eastern point as shown in Figure 3-3. The ground elevation at the western point is 746m and a 20.7m pole would have a maximum height of 766.7m which is below the 777.6m height of the Transitional Slope at this point. The ground elevation at the eastern point is 750m and a 20.7m pole would have a height of 777.7m which is below the 779.5m height of the Approach Surface at this point.

Therefore, the transmission line in this section will not have any impact on the Transitional or Approach Surfaces.

OLS Inner Horizontal Surface:

In the remainder of this section where the transmission line passes through the inner horizontal surface, ground elevations vary from a low of 730m at the western end of the section rising to 759m at the eastern end of the section as shown in Figure 3-3. Where the ground elevation exceeds 758.8m, a 20.7m pole will penetrate the inner horizontal surface with a height of 779.5m.

For practical purposes, in the area where ground elevation exceeds 758m up to 759m, pole height should be reduced to not above 20m in height to avoid OLS penetration. This applies in the most easterly 100m of this transmission line section.

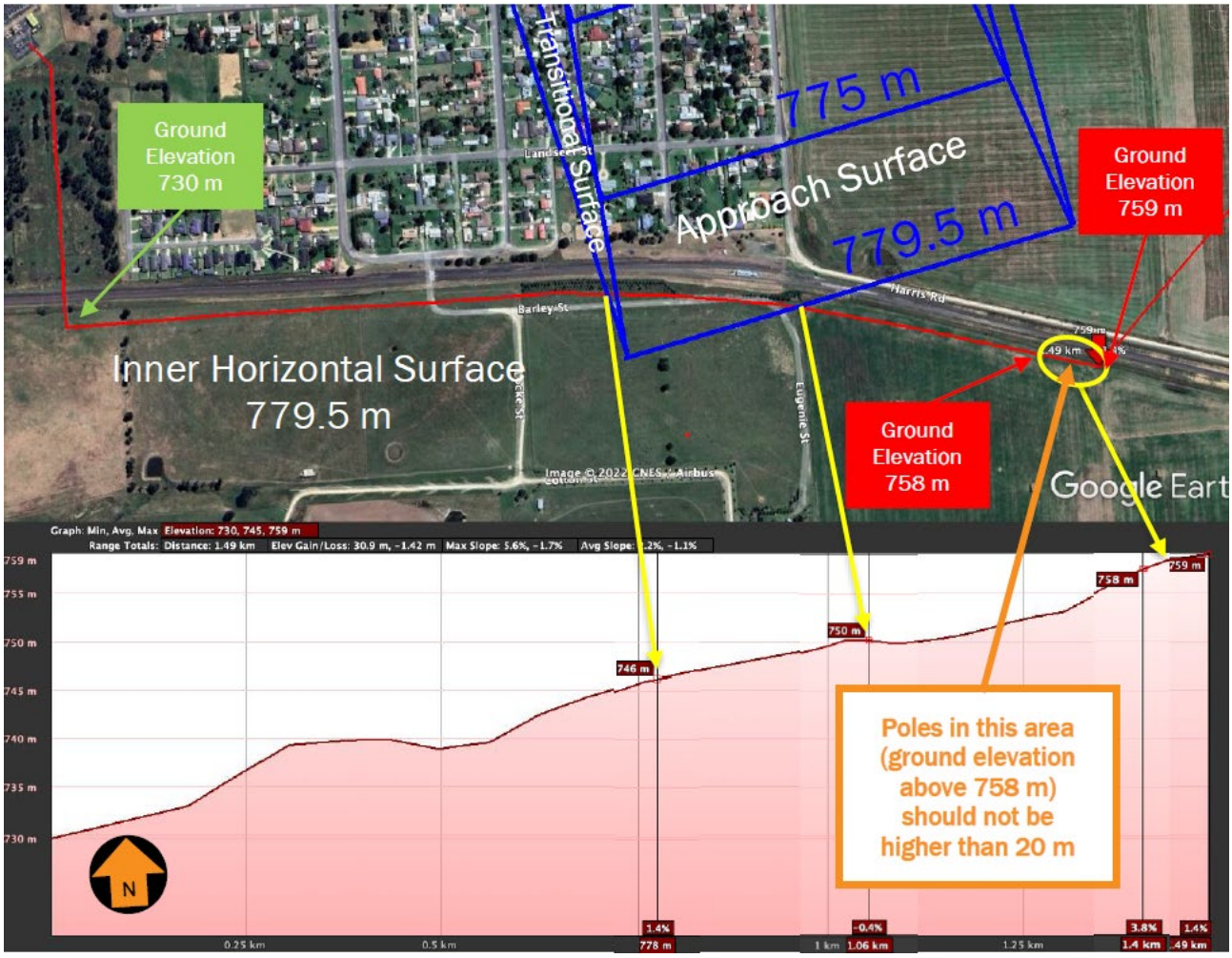


Figure 3-3 Transmission line section 2 ground level elevation profile.

Across farmland (Section 3)

This section of the transmission line is wholly contained within the OLS Inner Horizontal Surface.

The OLS Inner Horizontal Surface has a height of 779.5m AHD. Ground elevations in this section vary from a low of 759m at the most southern end rising to 761m within the first 300m of transmission line then undulating down to the north with a ground elevation of 747m at the most northern end as shown in Figure 3-4. Where the ground elevation exceeds 758.8m, a 20.7m pole will penetrate the inner horizontal surface with a height of 779.5m.

For practical purposes, in the area where ground elevation exceeds 75m up to 761m, pole height should be reduced to not above 18m in height to avoid OLS penetration. This applies in the most southerly 500m of this transmission line section.

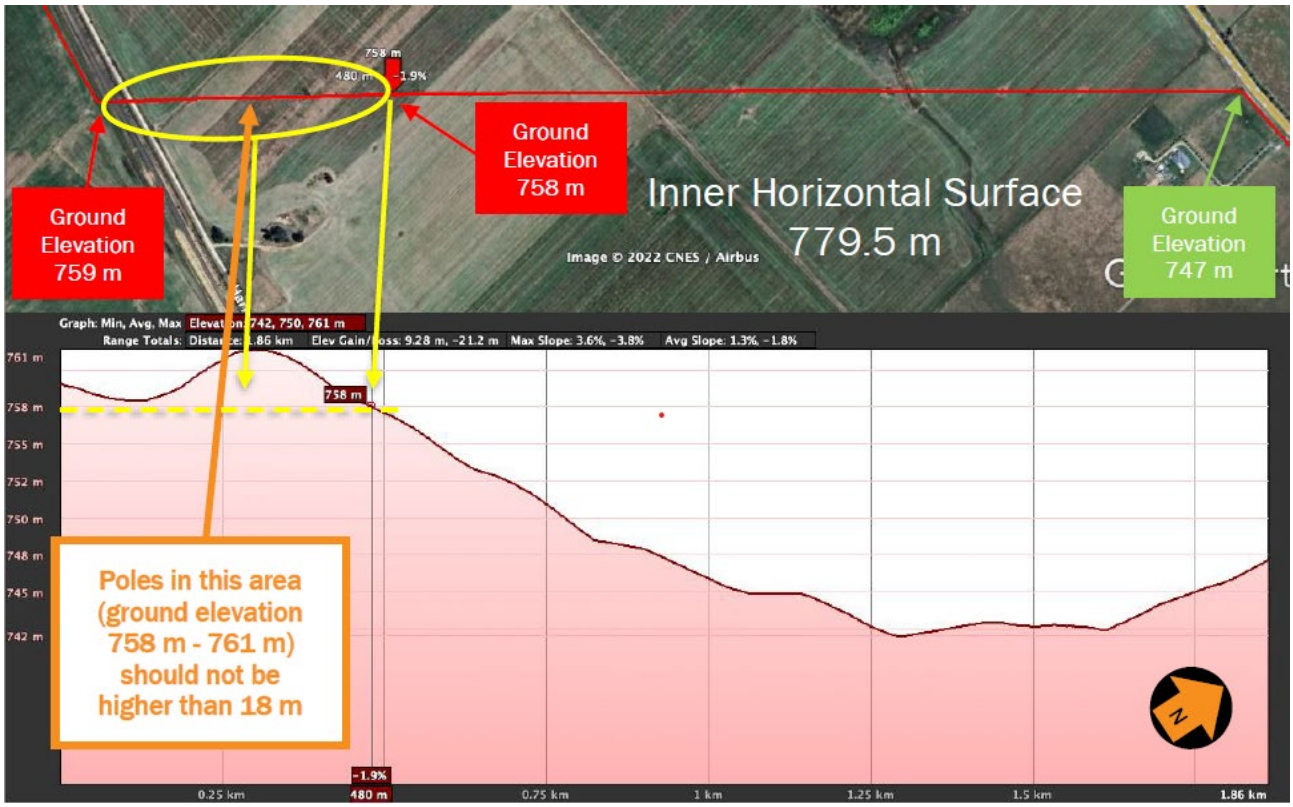


Figure 3-4 Transmission line section 3 ground elevation profile

Along Great Western Highway (Section 4)

This section of the transmission line is primarily contained within the OLS Inner Horizontal Surface and partially within the Conical Surface. The OLS Inner Horizontal Surface has a height of 779.5m AHD. In the section where the transmission line passes under the Conical Surface, the Conical Surface starts at a height of 779.5m and increases to 806m. Ground elevations vary from a low of 747m at the most western end rising to 760m where the Conical Surface starts and up to 773m at the most eastern end of the section as shown in Figure 3-5.

Within the section under the Inner Horizontal surface, where the ground elevation exceeds 758.8m, a 20.7m pole will penetrate the inner horizontal surface with a height of 779.5m. Within the section under the Conical Surface, because the surface slopes upward, a 20.7m pole will only penetrate the Conical Surface until the ground elevation reaches 761m (Conical Surface height of 782m), after which the rate of upward slope of the Conical Surface exceeds the rate of upward slope of the ground elevation.

For practical purposes, in the area where ground elevation exceeds 758m in the Inner Horizontal Surface to the point where the ground elevation reaches 761m under the Conical Surface, pole height should be reduced to not above 18m in height to avoid OLS penetration. This applies in an approximately 400m section, starting at 1,000m from the easterly end of this transmission line section as shown in Figure 3-6.

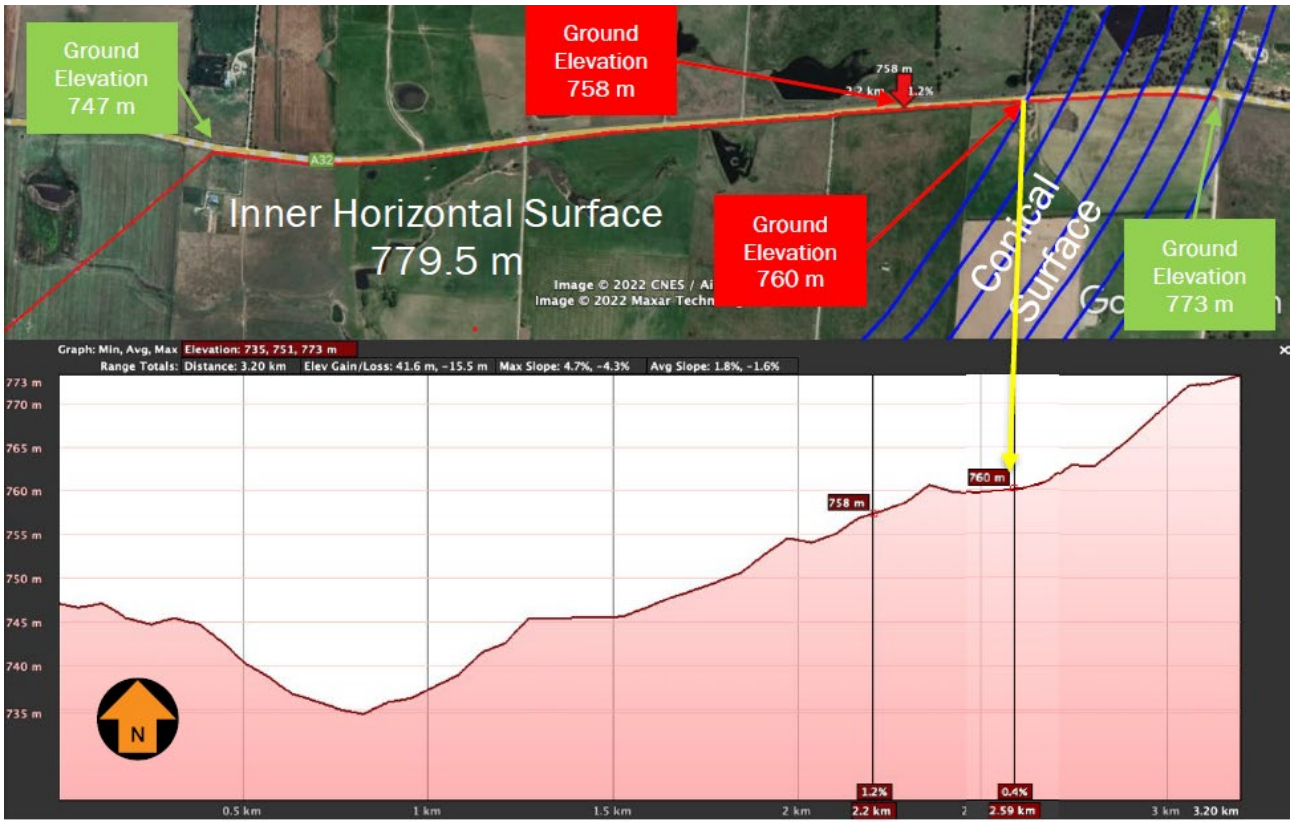


Figure 3-5 Transmission line lection 4 ground elevation profile

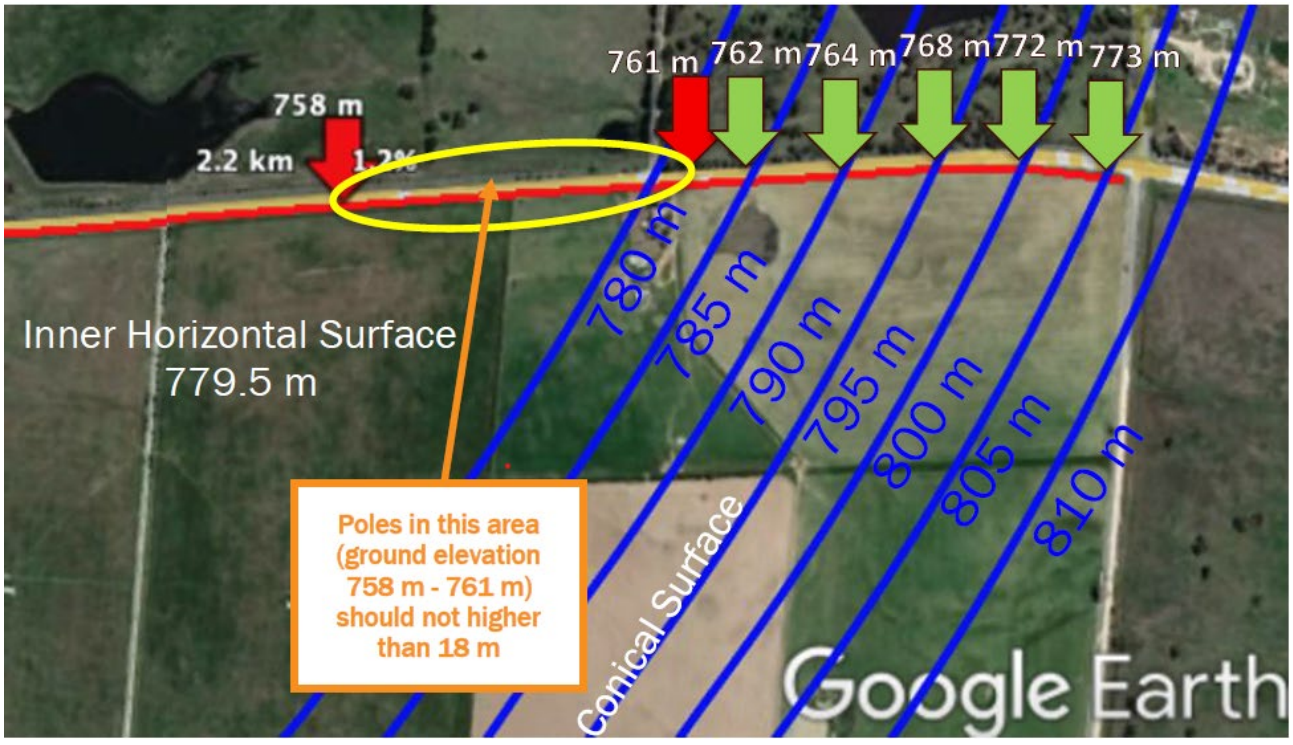


Figure 3-6 Transmission line section 4 area where pole heights must be reduced

3.1.3 Recommended mitigation strategies

- Obstacles which penetrate the OLS height limits are required to be reported to CASA for assessment.

- Accurate survey information should be used to determine actual acceptable pole heights in relation to the OLS surfaces in the locations identified and address the accuracy limitations of this desktop assessment, prior to works.

On the basis of this preliminary assessment, it is recommended the following height restrictions would be required to avoid OLS impacts:

- Raglan power substation to the Bathurst – Raglan train line (Section 1): No restrictions
- Along Bathurst to Raglan Train Line (Section 2): Poles in the eastern approximately 100m of the transmission line, where the ground elevation exceeds 758.8m, poles must be less than 20m in height to avoid OLS penetration.
- Across farmland (Section 3): Poles in the southern approximately 500m of the transmission line section that crosses farmland would be less than 18m in height to avoid OLS penetration
- Along Great Western Highway (Section 4): Poles at the eastern end of the transmission line section that runs along the Great Western Highway, in an approximately 40m section starting approximately 1km from the eastern end of the transmission line, would be less than 18m in height to avoid OLS penetration.

Consultation with Essential Energy (pers. comm. S. Melotte Elgin Energy, 8/9/22) has verified these height restrictions would be achievable.

3.2 Amenity impacts (visual and noise impacts)

3.2.1 Existing environment

The proposed route of the transmission line upgrade follows an existing 66kV transmission line easement located along the southern side of the Great Western Highway. East of Ragland, the route traverses rural fields then crosses and continues along the south side of the Great Western railway line, before turning north and connecting to Ragland substation. Landform along the proposed route is gently undulating, including rolling hills and undulating plains, rising from the Macquarie River and its tributaries. To the east of Raglan, there is an area of higher land extending north-south, which blocks view to the transmission line from suburban dwellings in Raglan.

The landscape along the route is highly modified, having been cleared for agricultural purposes, and mainly used for livestock grazing. The fields are mostly open and contain few scattered trees. Tree cover is denser around rural dwellings and along watercourses, field boundaries and roads.

The land between Glanmire and Raglan, along the Great Western Highway forms part of the eastern approach and ‘gateway’ into Bathurst. This area is described in the Bathurst Vegetation Management Plan (BVMP) (Bathurst Regional Council, 2019) as a “*predominately a rural setting situated on the generally treeless Bathurst Plains”*, with existing roadside vegetation consisting of “*exotic grasses, widely dispersed small, isolated clumps of immature Silver Wattle and Hawthorn”* (BVMP, s. 11.3.3). The field to the east of Raglan is also identified as part of the “*visually significant”* portion of the Bathurst Plains landscape (BVMP, s. 6.3.2d).

3.2.2 Nature and scale of impacts

The following table describes the potential magnitude of change by section.

Table 3-2 Visual impact risk assessment – magnitude of change

Section start point	Section end point	Colour on map	Description of the work	Visual change	Potential magnitude of change
A	B	Green	Refurbish the existing overhead conductor to 66kV and underslung 11kV line	No perceived change to the amenity of views expected due to additional conductors and wire.	Negligible
B	C	Blue	Extend the overhead 11kV conductor along road reserve approx. 260m to connect to existing 11kV line at this point	Additional 260 metre section of poles and wires. Slightly larger with similar character to existing. viewed within a context of the highway and existing roadside power lines. Minimal visual change.	Low
B	D	Pink	Replace the existing 11kV conductors with new conductors.	No perceived change to the amenity of views expected due to new conductors.	Negligible
D	E	Purple	Install new 11kV underground cable inside private property boundaries or on public road reserve.	Underground elements would result in no visual change during operation.	Negligible
D	F	Light purple	Remove the existing 11kV overhead line on private property	Removal of existing 11kV overhead line would reduce the number of poles and wires seen in this area.	Low improvement
D	F	Light purple	Install a new 11kV underground cable inside private property boundaries or public road reserve to replace the existing 11kV overhead line (co-located with D – E)	Underground elements would result in no visual change during operation.	Negligible
G	H	Orange	Refurbish the existing overhead conductor to 66kV and underslung 11kV line	No perceived change to the amenity of views expected due to refurbishment and additional wire.	Negligible
B	G	Yellow	Replace some of the existing poles and refurbish the existing overhead conductor from 11kV to 66kV	Replacement of some poles with slightly larger poles with similar character to existing. viewed and additional wire. Minimal visual change.	Low

The upgrade of the transmission line would be generally consistent with the character of the existing easement, replacing the timber poles with steel or concrete monopoles, which are taller, and adding conductors and additional overhead wires. These poles would be of a slightly larger scale but of a similar visual character to the existing poles and wires. Raglan substation reconfiguration works would occur entirely within the existing substation compound and also have similar visual characteristics to the existing facility. Due to the undulating landform, the proposed transmission line upgrade would be seen from a limited area, including from a short section of the

Great Western Highway between Glanmire and Raglan, a small section of the Great Western railway line south of Raglan, and nearby dwellings, such as the rural dwelling at 4823 and 5077 Great Western Highway, Glanmire and 39 and 73 Cotton Street, Raglan. The proposal would also be glimpsed from several suburban dwellings on the southern side of Raglan. All of these properties and locations have existing views to a landscape containing transmission line structures, or the existing substation.

This landscape has a high capacity to absorb an upgrade to the powerline infrastructure due to precedent of poles and wires, the undulating hills and scattered trees which limit views from the eastern outskirts of Raglan.

Due to the minor changes expected, the magnitude of change would be very low in most areas, including a low magnitude of change in section B-C and section B-G where there may be additional poles or replacement poles which would be taller than what currently exists. There would also be the potential for a low magnitude of change that improves views in the vicinity of section D-F where the existing poles and wires would be removed.

3.2.3 Impact rating

Overall, there would be a low magnitude of change to a landscape containing views and landscape character of moderate sensitivity, resulting in a low visual impact during construction and operation.

During construction, the visual impacts of the pole replacement works, pole removal and undergrounding would be low as the works would be progressive, and not viewed from any one residence for more than a short duration.

3.2.4 Recommended mitigation strategies

Visual

- Due to the low landscape and visual impact anticipated, no mitigation is proposed.

3.3 Aboriginal cultural heritage impacts

3.3.1 Existing environment

The proposed transmission line augmentation alignment is located entirely within an existing, in use powerline easement.

Data base searches

A search of the AHIMS database (search date 02/09/2022) centred on the proposal and covering a 15 x 10km search area demonstrated no Aboriginal objects or sites have been recorded within the proposed transmission line augmentation alignment (Figure 3-7). Details of the Aboriginal sites have been withheld to respect NSW DPE Sensitive Data Policy. A limitation of a AHIMS search is an absence of evidence is not evidence of absence as a lack of data points simply may reflect no survey effort has occurred in these areas.

Five of the six data points are Aboriginal stone artefact sites, one with one flake and the rest with several but generally fewer than 10 Aboriginal stone objects. The remaining datapoint is a griding groove and Aboriginal ceremony and dreaming site.

Regional Aboriginal heritage context

There is a growing body of archaeological investigations in the Bathurst area. There have been some compliance-based heritage assessments adding to the archaeological record. Many of these assessments have relied on the predictive model outline by (Pearson, 1981) which they have found to be supported in the archaeological record. The review of sites from across the Bathurst region found that of the 222 sites reviewed artefact scatters were by far the most frequently observed site type (n=102), followed by Isolated finds (n=20), stone arrangements (n=17), modified trees (n=16) and carved trees (n=11) (Extent Heritage, 2017). Quartz artefacts are the most frequently recorded artefact type across the Bathurst region with less frequent reporting of artefacts made of granite or volcanic stone (Williams and Barber, 1994, Gollan and Bowdler, 1983, OzArk, 2019, Navin Officer Heritage Consultants, 2013). Further detail regarding the Regional Aboriginal heritage context is provided in the Aboriginal Heritage Assessment, appended to the Glanmire Solar Farm EIS, Appendix D.3.

Local Aboriginal heritage context

Site surveys in relation to the proposed Glanmire solar farm (Lot 141 DP1133786), approximately 11 kilometres (km) east of Bathurst, to which this electricity easement forms a northern boundary, were completed with members of Bathurst Local Aboriginal Land Council (Bathurst LALC). Two Aboriginal sites were recorded, a culturally modified tree (scarred) and an isolated quartz artefact. Both Aboriginal sites are no less than 1,400m south of the proposed transmission line augmentation alignment (Figure 3-7).

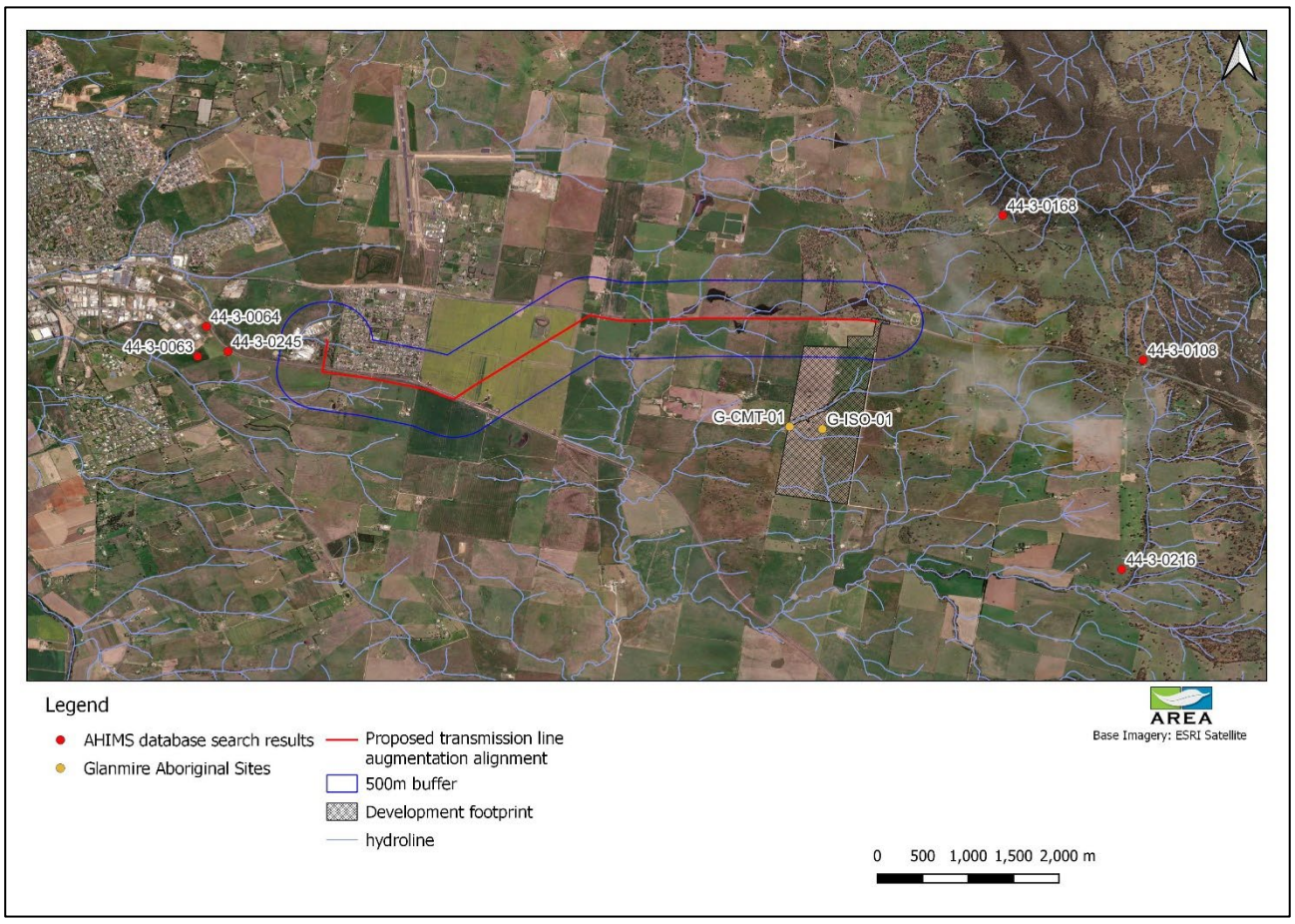


Figure 3-7 AHIMS database and Glanmire Solar heritage assessment records

Waterways

Archaeological sensitive landforms follow the definitions supplied in the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010), one of these landforms are '*within 200m of waters*'. As a general rule of thumb, the archaeological record shows smaller waterways have smaller and less frequently utilised Aboriginal site types and bigger or more permanent waterways have bigger and more complex and frequently used Aboriginal sites.

The proposed transmission line augmentation alignment intersects with five non-perennial waterways (Figure 3-16). Of these:

- All are unnamed
- Three are first Strahler Order waterways, and two are third Strahler Order waterways according to hydroline spatial data map layers.

Any ground disturbing activity within 200m of waters has potential to harm Aboriginal objects. Wherever these waterways occur, it is unlikely to be the location of existing poles, and therefore unlikely to a point of disturbance for this proposal, most notable would be the case of at the third Strahler Order waterways.

Land use

Areas of archaeological potential are regarded as any sensitive landform with a reasonable level of intactness (i.e., little to no disturbance or minor ground surface disturbance only and in areas not on self-mulching soils). The definition of disturbance used here follows that of the *National Parks and Wildlife Regulation 2009* (Clause 80B, Subclause 4).

The NSW Land Use 2017 spatial data layer maps various land uses within 500 metres (Figure 3-17). The proposed transmission line augmentation works intersect with the following mapped land uses:

- Grazing native vegetation
- Cropping
- Utilities
- Transport and communication.

The NSW Land Use map is not always correct, subsequently aerial imagery shows all areas mapped as 'Grazing modified pastures' are actually cropped. These data demonstrate any archaeologically sensitive landform within the proposed transmission line augmentation works have high levels of ground surface disturbance and will affect the probability of Aboriginal sites such as culturally modified trees being recorded or for stone artefact site types remaining unaffected by ploughing agricultural activities.

Predictive model

A predictive model combines the archaeological context for the study area with landscape information to propose likely site types, distributions, and intactness within the area.

Areas of archaeological potential are regarded as any sensitive landform with a reasonable level of intactness. Sensitive landforms follow the definitions supplied in the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010):

- within 200m of waters

- located within a sand dune system
- located on a ridge top, ridge line or headland
- located within 200m below or above a cliff face
- within 20m of or in a cave, rock shelter, or a cave mouth.

Aboriginal settlement patterns in areas of low water security likely fluctuated or were cyclical, and marginal areas such as that of the assessment areas would have been exploited for resources during periods of more secure precipitation. Therefore, the archaeological record of areas within the region that are removed from reliable water should reflect less intense, temporary (but repeated) occupation and resource gathering.

The broader archaeological context indicates Aboriginal sites are very unlikely to occur unless there are landscape features able to hold water for short periods of time following heavy inundation. If present, Aboriginal site types are most likely to be stone artefact sites based on the regional archaeological context. The geology of the study area indicates stone for artefacts would need to be brought into the area rather than locally manufactured. However, many tools and other objects were made from wood, bone and shell which do not survive into the archaeological record as well as stone.

Culturally modified trees can occur anywhere on old growth trees to produce suitable bark to create carrying dishes (commonly known as *coolamons*), canoes and other items. Trees may also be modified as markers or other types of communication. Due to the high levels of land clearing in the region old growth trees occur less frequently and subsequently the likelihood of recording culturally modified trees is lower.

3.3.2 Nature and scale of impacts

Considering impacts to Aboriginal cultural heritage, likely impacts associated with the transmission line upgrade include boring holes for new pole placement (ground surface disturbing activity) as well as placing components on the ground as required to build the line and plant required to build the electrical asset such as cranes, trucks and light vehicles (unlikely to cause ground surface disturbance).

In summary, the risk to Aboriginal objects is associated with ground surface disturbing activities.

Historical aerials indicate the proposed transmission line augmentation alignment has been affected by ground surface disturbing work associated with land clearing, ploughing agriculture or infrastructure development. Due to this, Aboriginal sites are unlikely to occur in areas more than 200m from waters and if present on a sensitive landform they will be small stone artefact scatters in a disturbed context.

3.3.3 Recommended mitigation strategies

- Due Diligence assessment of the proposed transmission line augmentation alignment in consultation with Bathurst Local Aboriginal Land Council.
- This assessment would focus on sensitive landforms within 200m of waters and provide a more general assessment elsewhere.

3.4 Historic heritage impact

3.4.1 Existing environment

Data base searches

Databases searches were undertaken by uploading a GIS shapefile 500m either side of the proposed transmission line augmentation into the State Heritage Inventory to identify any registered historic heritage items (Table 3-3). Items 1 and 2 were identified by this method and an additional item (Item 3) was identified by manually searching the Bathurst LEP and entering its address into google maps to check proximity. The location of these items to the proposed transmission line augmentation are shown on Figure 3-8.

1. The Raglan Railway Station group is listed on both the State Heritage Register (SHR) and the Bathurst Local Environmental Plan 2014 (LEP) (State and local heritage significance).
2. The Woodside Inn was assessed in 2014 for inclusion on the SHR but remains listed only on the Bathurst LEP (local heritage significance has been retained).
3. Raglan Well and Windmill (former travelling stock route) is listed on the Bathurst LEP (local heritage significance). Note this is mapped on Figure 3-8 as 'Durham Court', the property name.

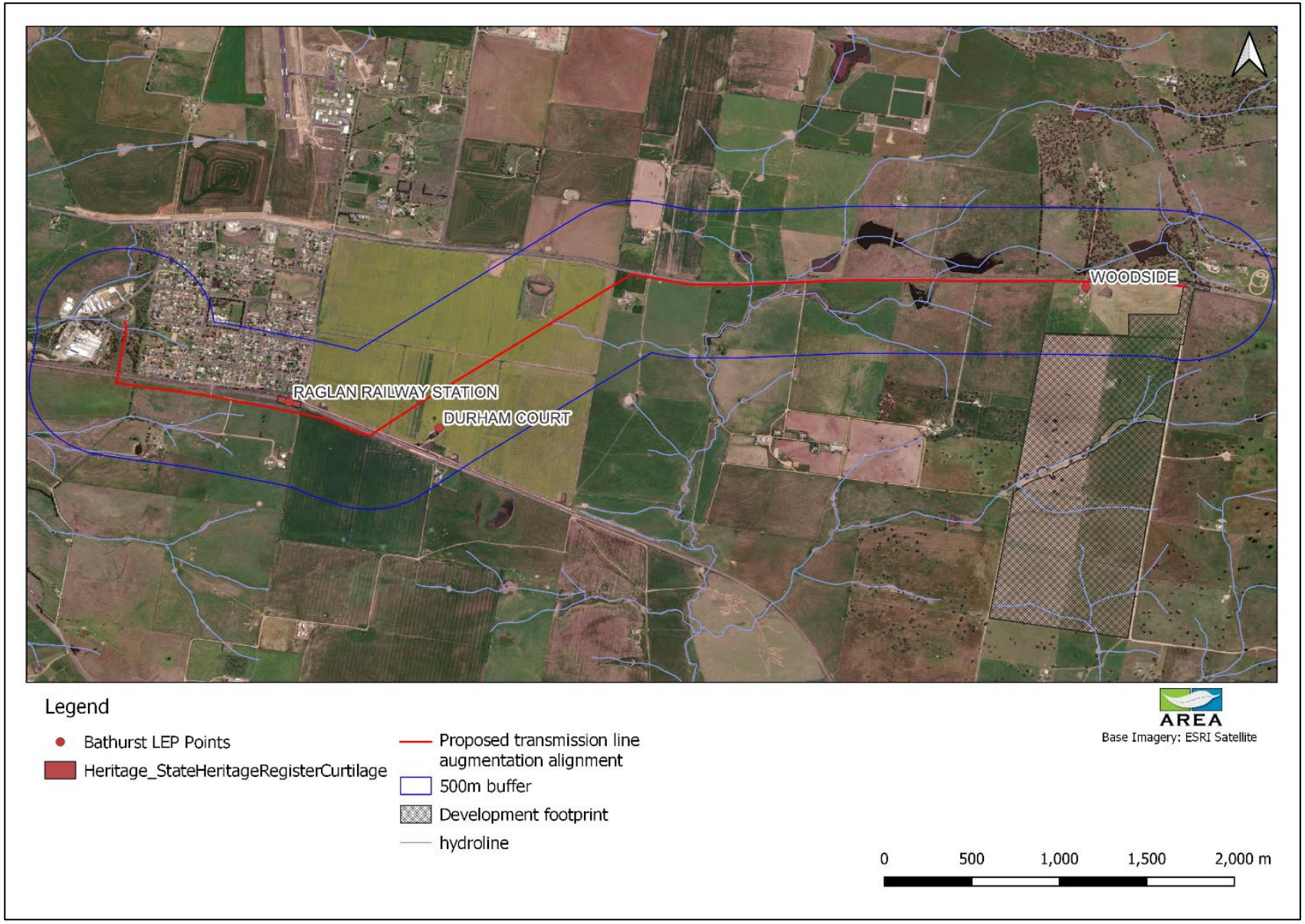


Figure 3-8 Location of historic heritage items to the proposed transmission line augmentation

Figure 3-9 Raglan railway station group image showing proximity of the proposed upgrade (Source Facebook: Phil Buckley, photo taken 1986)

Figure 3-10 Woodside (formerly Woodside Inn) showing proximity of the proposed upgrade (Source: Google maps)

Figure 3-11 Raglan Well and Windmill (Source: SHI listing)

Raglan Railway Station group (State Heritage Register & Local Environmental Plan)

Listing Type: SHR #01228

Primary Address: Main Western railway RAGLAN NSW 2795

Local Govt. Area: Bathurst Regional

Local Aboriginal Land Council: Bathurst

Type of Item: Complex / Group

Group/Collection: Transport – Rail

Distance and direction from proposed transmission line augmentation alignment: Closest point to SHR curtilage is 40m south, the structure is 65m south (Figure 3-8).

Description

Station building - type 9, timber non-standard building on island platform transitional building with brackets,1890.

Structures - platform face - brick, 1890.

Statement and assessment of significance

Raglan is an interesting site as it is non-standard and built at a time when the railway administration was radically changing and the first use of standard buildings was being introduced. It is important illustrating the change of design and policy.

This item is assessed as historically rare. This item is assessed as archaeologically rare. This item is assessed as socially rare.

Additional information

Buckley (2019) states:

> Raglan is in Central Western NSW, just east of Bathurst and 233km west of Sydney on the NSW Great Western Railway. The railway from Sydney first reached Raglan in 1873, but this station building dates from 1890 when Raglan station was re-sited. Whilst the line remained busy, passenger trains had been withdrawn from Raglan and this station closed to passengers by the time this photo was taken. Nonetheless many features remained in place including station signs (large and small) and platform lights with decorative brackets.
>
> Today, Raglan station still stands although it is boarded up and some of the features including the bracketed light poles and the semaphore signals have been removed. The Central West XPT makes its day-return trip from Sydney to Dubbo, and the 'Bathurst Bullet' runs past each day. The Outback XPlorer on its weekly journey to and from Broken Hill and the Indian Pacific to and from Perth also pass by here, but no trains stop at Raglan these days.

Woodside (formerly Woodside Inn) Bathurst Local Environmental Plan

Heritage Name: Woodside (formerly Woodside Inn)

LGA: Bathurst Regional

LALC: Bathurst

Listing No: I142 (I = local)

Gazette Date: 19/11/2014

Distance and direction from proposed transmission line augmentation alignment: 35m due south (Figure 3-8).

Description

The STR lists statement of significance for the Woodside specifically identifies the cottage as the item of significance. Describing the building as a

> "…cottage that was constructed in 1850-60 and was the Woodside Inn. The verandah was added circa 1930. Rear adjoining building and beehive style ground tank demonstrate its interesting past. The area was connected with significant gold mining in its construction period." (State Heritage Inventory, 2006).

Statement and assessment of significance

Woodside Inn was assessed against the State Heritage Inventory but remains as locally significant See: State Heritage Inventory – Woodside (formerly Woodside Inn) (State Heritage Inventory, 2006).

The building was found to have historical significance because of its age and association with past gold mining and transport activities, and aesthetic significance because of its distinctive hipped roof and verandah.

Raglan Well and Windmill, Bathurst Local Environmental Plan

Listing Type: LEP #I213

Primary Address: 71 Harris Road RAGLAN NSW 2795

Local Govt. Area: Bathurst Regional

Local Aboriginal Land Council: Bathurst

Type of Item: Built

Group/Collection: Farming and Grazing

Item Category: Windmill

Distance and direction from proposed transmission line augmentation alignment: Closest point is 203m SSE.

Description

The windmill itself sits over the well and behind it is three old, corrugated iron, galvanised iron tanks sitting on timber tank stands and a small paddock is fenced around the whole area, approximately 20mx 30m.

Nearby is some old fruit trees, succulent plants and lilac bush. A large brick structure is broken up which probably constituted an animal trough, as this used to be a TSR or similar watering place.

The trough structure is made up of a couple of courses of brickwork and cement rendered into a curve shape and the centre is now broken into about four parts.

It is believed originally instead of a square fenced paddock that a stretch of land was fenced from the highway back to the well.

Statement and assessment of significance

Old watering place important location in the story of stock travelling and early road travel to Bathurst. Believed to be part of an early travelling stock route, probably dating from mid to late 19th century. Unusual item of significance in the LGA.

Summary of key results

A summary of database searches for historic heritage has been provided on Table 3-3.

Table 3-3 Summary of database searches for Historic Heritage

Database	Date of Search	Parameters	Results
National and Commonwealth Heritage Listings	24/06/2022	NSW	No sites of heritage are on the database nearby to the development site.
Australian Heritage Database Comprises the World Heritage and Register of National Estate (in addition to National and Commonwealth Heritage)	24/06/2022	Glanmire, Ragland	No sites of heritage are on the database nearby to the development site.
State Heritage Register (SHR)	24/06/2022	Bathurst LGA	**Raglan Railway Station group** • Listing Type: SHR #01228 • Primary Address: Main Western railway RAGLAN NSW 2795 • Local Govt. Area: Bathurst Regional • Local Aboriginal Land Council: Bathurst • Type of Item: Complex / Group • Group/Collection: Transport – Rail • Distance and direction from proposed transmission line augmentation alignment: Closest point to SHR curtilage is 40m south, the structure is 65m south.
Bathurst Local Environment Plan (LEP)	24/06/2022	Schedule 5 Environmental heritage	**Raglan Railway Station group** • See above. **Woodside (formerly Woodside Inn) Bathurst** • Heritage Name: Woodside (formerly Woodside Inn) • LGA: Bathurst Regional • LALC: Bathurst • Listing No: I142 (I = local) • Gazette Date: 19/11/2014 • Distance and direction from proposed transmission line augmentation alignment: 35m due south. **Raglan Well and Windmill** • Listing Type: LEP #I213 • Primary Address: 71 Harris Road RAGLAN NSW 2795

Database	Date of Search	Parameters	Results
			• Local Govt. Area: Bathurst Regional • Local Aboriginal Land Council: Bathurst • Type of Item: Built • Group/Collection: Farming and Grazing • Item Category: Windmill Distance and direction from proposed transmission line augmentation alignment: Closest point is 203m SSE.

Land use summary

The historical archaeological potential of the development site can be assessed by examining the former uses of the land.

1. (Pre 1815) Aboriginal occupation of the area
2. (1815–1830s) Early European settlement and continued Aboriginal occupation
    - Land clearing
    - Grazing and agricultural practices
3. (1830s–1851) Pastoral settlement
    - Continued land clearing
    - Expanded grazing and agricultural activities
4. (1851–1872) Inn, pastoral settlement, goldmining
    - Limited gold mining on the property following Hughes discovery in 1856
    - Woodside Inn operated at site just outside development site
    - Continued land clearing
    - Grazing and agricultural practices
5. (1872–present) Pastoral settlement & Frail infrastructure
    - Rail line built by 1873
    - Grazing and agricultural practices
    - Building of dams across property
    - Construction of water tank between 1972-1984.

3.4.2 Nature and scale of impacts

No items, including their curtilages, identified through database searches detailed in Section 4.3.1 will be directly affected by the proposed transmission line augmentation alignment.

Two items, Raglan Railway Station group Listing Type: SHR #01228 (S= State significance), and Woodside (formerly Woodside Inn) Listing No: I142 (I = Local significance) are within 80m of the proposed transmission line augmentation alignment.

Potential construction impacts could result from vibration or other indirect impacts of hauling materials to the site or if the areas were inadvertently used as a storage and laydown area.

The only perceivable operational impact to these historic heritage items is a change to its current visual amenity (considered specifically in Section 3.1) which is assessed as a low impact and not mitigation is considered warranted in this regard.

3.4.3 Recommended mitigation strategies

- Works would be carried out to ensure the listings above are avoided for all direct and indirect impacts during haulage and construction.

3.5 Biodiversity impact

3.5.1 Existing environment

Threatened species - BioNet records

The NSW Government BioNet species records database was searched for listed species and species protected under international bilateral agreements with China (C), Japan (J) and Korea (K). Species records within 500 metres and 10 kilometres since 1972 (50 years) are presented in Table 3-4 and Table 3-5 respectively. Proximity of these records to the proposed transmission line augmentation alignment is provided in Figure 3-12 and Figure 3-13.

Species signing records within 10 kilometres are clustered around Macquarie River through Bathurst in to the west and densely vegetation hills to the east of the proposed transmission line augmentation alignment, suggesting more valuable habitat is available in these areas that within 500 metres.

Species recorded within 500 metres which are not already identified for considered in section 4.4.2 have been added to Table 3-4.

Table 3-4 BioNet species records within 500 metres

Scientific	Common Name	NSW Status	Comm Status	Number of records
Stictonetta naevosa	Freckled Duck	Vulnerable	Not listed	1

Table 3-5 BioNet species records within 10 kilometres

Scientific Name	Common Name	NSW Status	Comm Status	Number of records
Litoria aurea	Green and Golden Bell Frog	Endangered	Vulnerable	4
Litoria booroolongensis	Booroolong Frog	Endangered	Endangered	22
Litoria castanea	Yellow-spotted Tree Frog	Endangered	Endangered	1
Anseranas semipalmata	Magpie Goose	Vulnerable	Not listed	3
Anthochaera phrygia	Regent Honeyeater	Endangered	Critically Endangered	3
Apus pacificus	Fork-tailed Swift	Not listed	C, J, K	2
Artamus cyanopterus	Dusky Woodswallow	Vulnerable	Not listed	3
Calidris acuminata	Sharp-tailed Sandpiper	Not listed	C, J, K	3

Scientific Name	Common Name	NSW Status	Comm Status	Number of records
Calidris ferruginea	Curlew Sandpiper	Endangered	Critically Endangered C, J, K	4
Callocephalon fimbriatum	Gang-gang Cockatoo	Vulnerable	Endangered	12
Chthonicola sagittata	Speckled Warbler	Vulnerable	Not listed	1
Circus assimilis	Spotted Harrier	Vulnerable	Not listed	5
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Vulnerable	Not listed	1
Daphoenositta chrysoptera	Varied Sittella	Vulnerable	Not listed	5
Epthianura albifrons	White-fronted Chat	Vulnerable	Not listed	1
Falco subniger	Black Falcon	Vulnerable	Not listed	1
Gallinago hardwickii	Latham's Snipe	Not listed	J, K	4
Hieraaetus morphnoides	Little Eagle	Vulnerable	Not listed	5
Hirundapus caudacutus	White-throated Needletail	Not listed	Vulnerable C, J, K	1
Ninox connivens	Barking Owl	Vulnerable	Not listed	1
Ninox strenua	Powerful Owl	Vulnerable	Not listed	1
Petroica boodang	Scarlet Robin	Vulnerable	Not listed	9
Petroica phoenicea	Flame Robin	Vulnerable	Not listed	4
Phaethon rubricauda	Red-tailed Tropicbird	Vulnerable	C, J	1
Rostratula australis	Australian Painted Snipe	Endangered	Endangered	3
Stagonopleura guttata	Diamond Firetail	Vulnerable	Not listed	3
Stictonetta naevosa	Freckled Duck	Vulnerable	Not listed	1
Eucalyptus aggregata	Black Gum	Vulnerable	Vulnerable	1
Eucalyptus pulverulenta	Silver-leafed Gum	Vulnerable	Vulnerable	2
Euphrasia scabra	Rough Eyebright	Endangered	Not listed	1
Lepidium hyssopifolium	Aromatic Peppercress	Endangered	Endangered	1
Swainsona sericea	Silky Swainson-pea	Vulnerable	Not listed	3
Chalinolobus dwyeri	Large-eared Pied Bat	Vulnerable	Vulnerable	1
Dasyurus maculatus	Spotted-tailed Quoll	Vulnerable	Endangered	2

Scientific Name	Common Name	NSW Status	Comm Status	Number of records
Miniopterus orianae oceanensis	Large Bent-winged Bat	Vulnerable	Not listed	5
Myotis macropus	Southern Myotis	Vulnerable	Not listed	1
Petaurus australis	Yellow-bellied Glider	Vulnerable	Vulnerable	1
Petaurus norfolcensis	Squirrel Glider	Vulnerable	Not listed	3
Phascolarctos cinereus	Koala	Endangered	Endangered	26
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Vulnerable	44
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	Vulnerable	Not listed	1
Tympanocryptis lineata	Canberra Grassland Earless Dragon	Endangered	Endangered	2

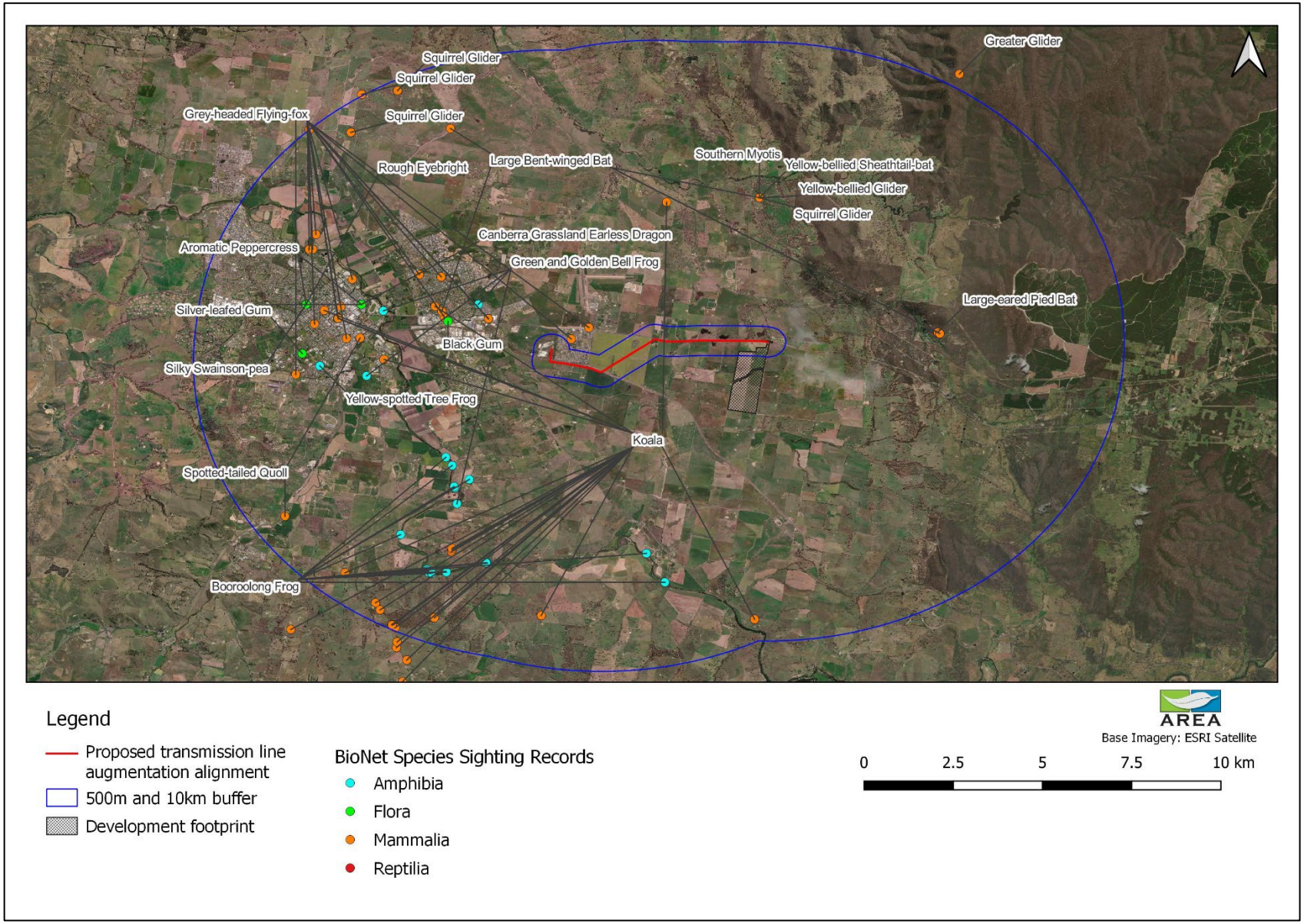


Figure 3-12 BioNet species sighting records within 10km (without bird records)

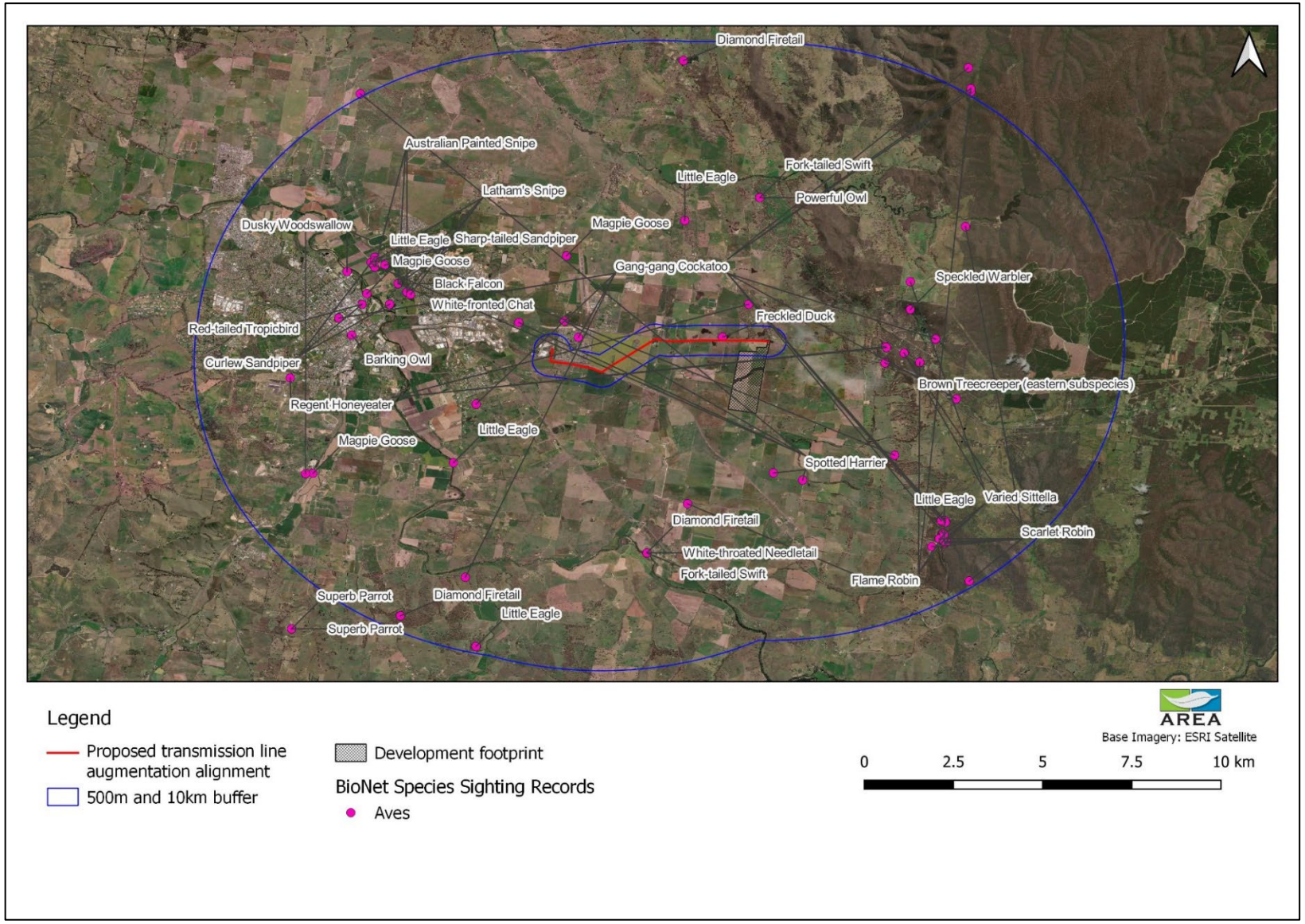


Figure 3-13 BioNet species sighting records within 10km (bird records only)

Plant Community Types – State Vegetation Map

One Plant Community Type (PCT), PCT1330 - Yellow Box – Blakely's Red Gum grassy woodland on the tablelands; Southeastern Highlands Bioregion is mapped on the NSW Government State Vegetation Map for the Central Tablelands (4778) within 500 metres of the proposed transmission line augmentation alignment. Non-native vegetation is also mapped within 500 metres.

The proposed transmission line augmentation alignment is entirely in areas mapped as not native vegetation and does not pass through any area of native vegetation as mapped on this state vegetation map. For the purposes of this desktop review, it is assumed that there may be some areas of native groundcover vegetation where cropping does not occur.

Threatened Ecological Communities

Threatened Ecological Communities are predicted by state and Commonwealth protected matters database searches. This desktop assessment considers the likelihood of these predicted communities being present in the existing transmission easement based on the assumption PCT1330 is the PCT most likely to have been present which limits the applicable BC Act listed TECs. Where other EPBC Act listed TECs are identified, the definitions of these communities are used to inform the likelihood assessment.

PCT1330 is associated with threatened ecological communities listed under the BC Act and EPBC Act:

- White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions – Listed as Critically Endangered BC Act
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland – Listed as Critically Endangered EPBC Act

Likelihood of these two TECs occurring in the existing transmission easement is considered in Table 3-6.

Other TECs predicted by NSW database searches are not associated with this PCT and are therefore unlikely to be present in the existing transmission line easement.

One other TEC is predicted in the *Environment Protection and Biodiversity Conservation Act 1979* (EPBC Act) Protected Matters Report generated for 500 metres around the proposed transmission line augmentation alignment. The likelihood of presence and impact to this community is considered in Table 3-6. It is unlikely this community is present in the existing transmission easement, and as such, a test of significance is not required for this community.

Refer Figure 3-14 showing the disturbed road verge / easement comprised of pasture grasses.

Table 3-6 Assessment of likelihood - threatened ecological communities

TEC name	BC Act status	EPBC Act status	Likely to be present	Likely to be impacted
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions	Critically Endangered	Not Listed	Possible - Table 3-7 – Flowchart identifies that this TEC is possible to occur. Noting that in some areas of the existing easement, the vegetation may be in a degraded state such that this community is actually not present.	Possible A test of significance has been completed for this TEC under the BC Act.
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Not Listed	Critically Endangered	Unlikely - Table 3-7 – Two most likely pathways are followed in this flowchart. Both lead to this Commonwealth listed TEC unlikely to be present.	N/A
Natural Temperate Grassland of the Southern Tablelands of NSW and the Australian Capital Territory	Not listed	Critically Endangered	Unlikely - The areas of grassy, un-cropped land are along the roadside. It is unlikely the groundcover in this area would be of sufficient quality to meet the Commonwealth condition requirements for this TEC). These areas are dominated by a densely grassy layer, the dominant species of which is not one listed as a key dominant species in the Approved Conservation Advice for this TEC[1].	N/A

[1] http://www.environment.gov.au/biodiversity/threatened/communities/pubs/152-conservation-advice.pdf

Figure 3-14 Great Western Highway road verge pasture grasses

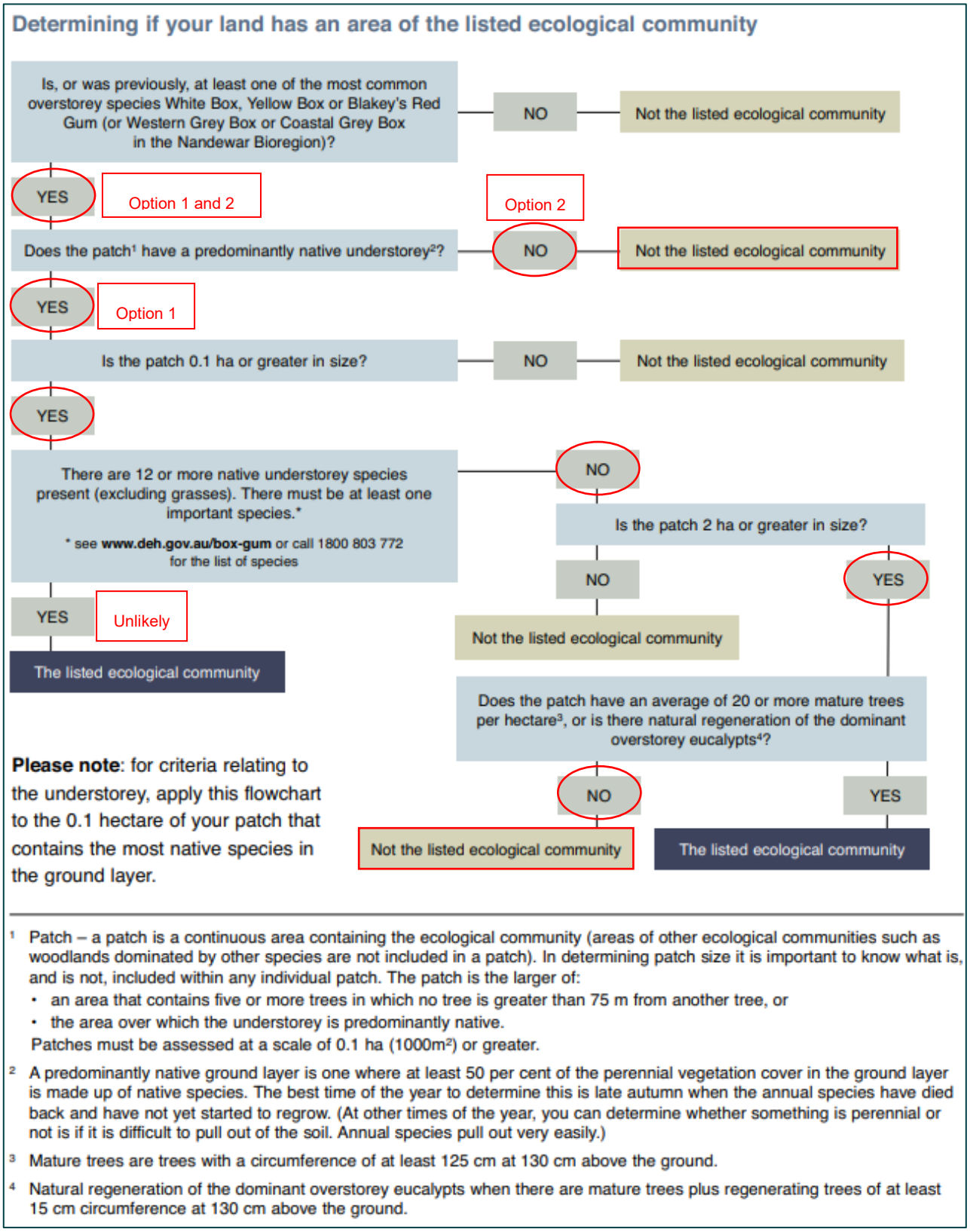
Source: Google Earth Image

Table 3-7 White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland identification[2]

1	The site is in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands or NSW South Western Slopes Bioregions: **2**
1*	The site is outside the above bioregions: **the site is not Box-Gum Woodland**
2	There are no native species in the understorey, and the site is unlikely to respond to assisted natural regeneration (see section on Degraded Sites, page 3): **the site is not Box-Gum Woodland**
2*	The understorey is otherwise: **3**
3	The site has trees: **4**
3*	The site is treeless, but is likely to have supported White Box, Yellow Box or Blakely's Red Gum prior to clearing: **5**
4	White Box, Yellow Box or Blakely's Red Gum, or a combination of these species, are or were present: **5**
4*	White Box, Yellow Box or Blakely's Red Gum have never been present: **the site is not Box-Gum Woodland**
5	The site is predominantly grassy: **the site is Box-Gum Woodland**
5*	The understorey of the site is dominated by shrubs excluding pioneer species (see section on The Understorey: page 2): **the site is not Box-Gum Woodland**

[2] https://www.environment.nsw.gov.au/resources/nature/box-gumIdGuidelines.pdf

Table 3-8 Commonwealth White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland identification3



[3] https://www.dcceew.gov.au/sites/default/files/documents/box-gum.pdf

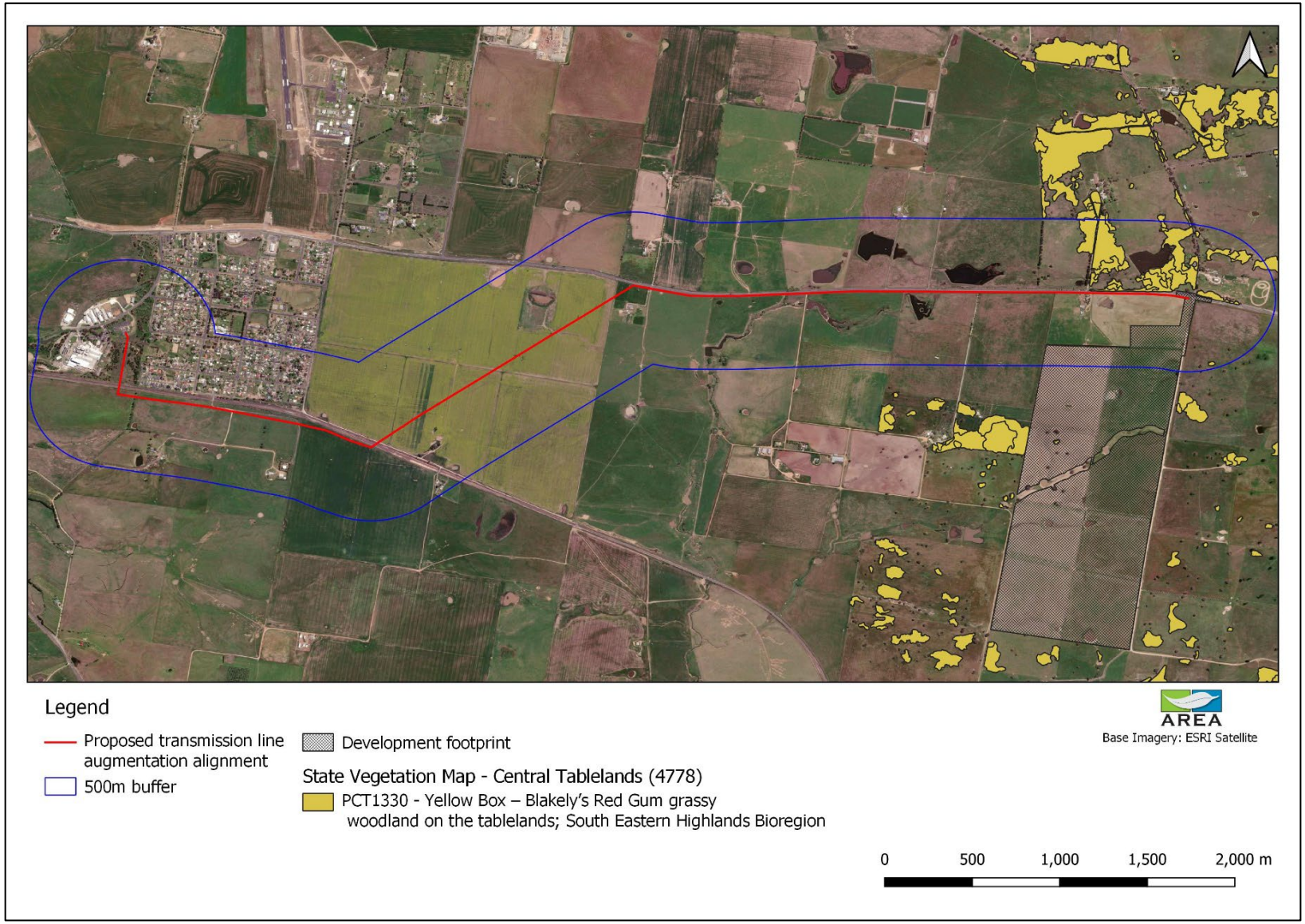


Figure 3-15 State Vegetation Map – Plant Community Types

Waterways

The proposed works intersect five non-perennial waterways (Figure 3-16). Of these:

- All are unnamed
- Three are first Strahler Order waterways, and two are third Strahler Order waterways according to hydroline spatial data map layers.

Wherever these waterways occur, it is unlikely to be the location of existing poles, and therefore unlikely to a point of disturbance for this proposal, most notable would be the case of at the third Strahler Order waterways. Waterways and associated riparian vegetation would therefore not be impacted by this proposal.

Land use

The NSW Land Use 2017 spatial data layer maps various land uses within 500 metres (Figure 3-17). The proposed transmission line augmentation works intersect with the following mapped land uses:

- Grazing native vegetation
- Cropping
- Utilities
- Transport and communication.

Native vegetation, listed species and habitat for listed species are unlikely to occur on land used for cropping, utilities and transport and communication. Native vegetation, listed species and habitat values are more likely to occur in the section of the existing transmission easement which occurs in land mapped as grazing native vegetation.

Land mapped as grazing native vegetation is however mapped as not native vegetation on the State Vegetation Map as indicated earlier in this section.

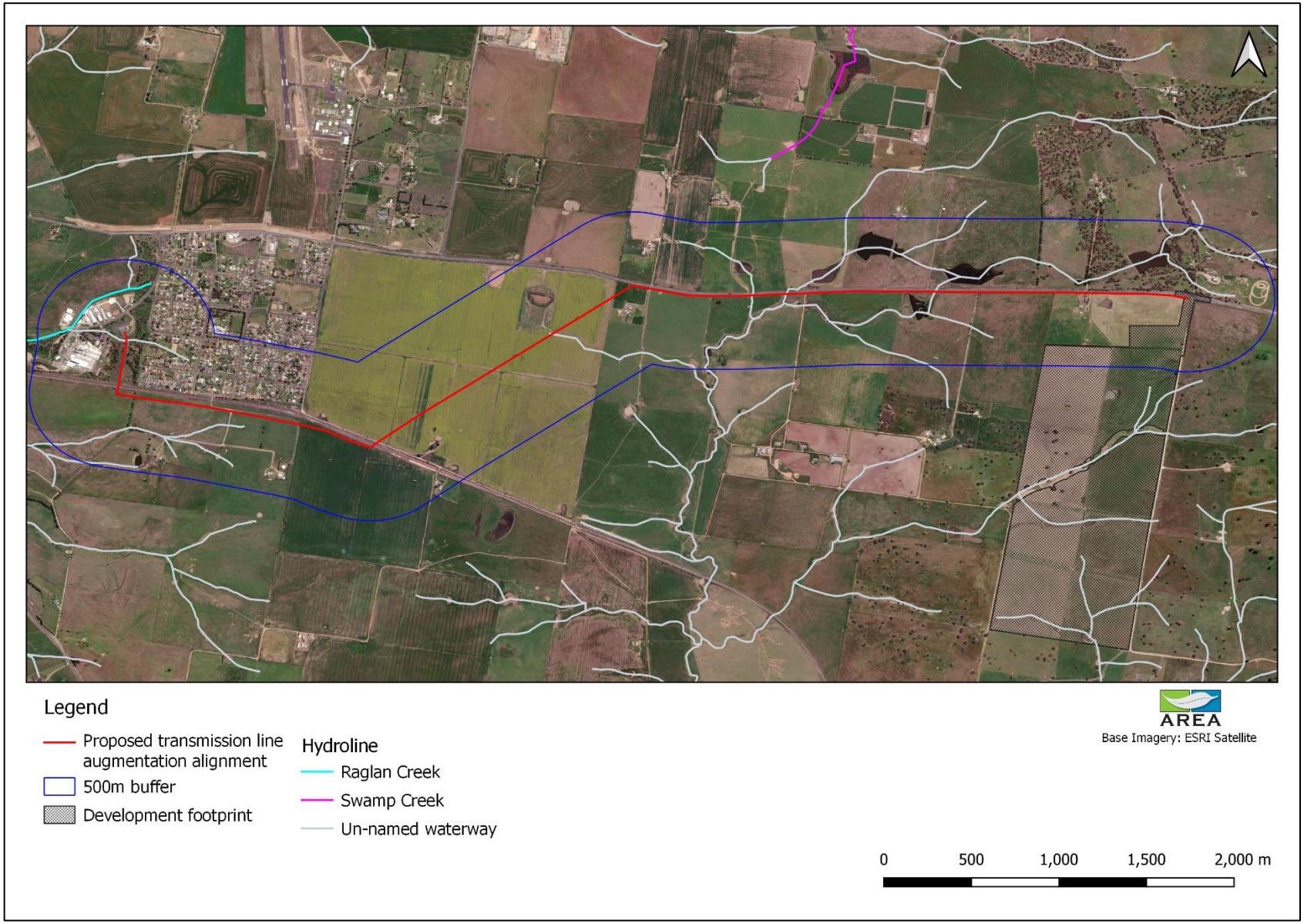


Figure 3-16 Waterways

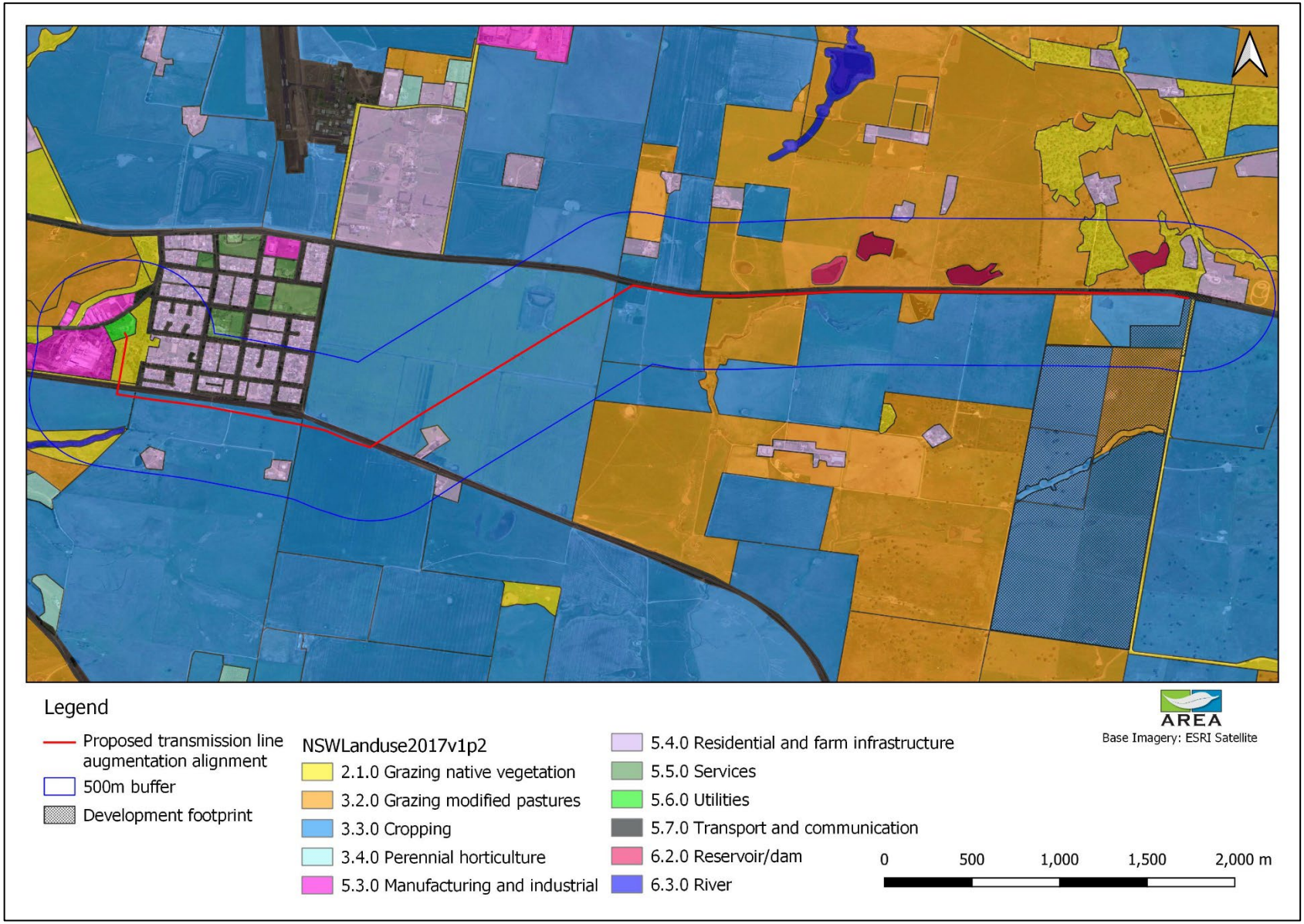


Figure 3-17 NSW Land Use 2017

3.5.2 Nature and scale of impacts

The NSW Government threatened species search identified matters listed under the *Biodiversity Conservation Act 2016* (BC Act). This search identified threatened matters likely to occur in the Bathurst IBRA subregion and the Southern Tablelands Grassy Woodlands vegetation class. The results of this search are provided in Appendix B.

The *Environment Protection and Biodiversity Conservation Act 1979* (EPBC Act) Protected Matters Report predicts matters relevant to Commonwealth legislation. This report, generated for matters predicted to occur within 500 metres of the proposed transmission line augmentation alignment is provided in Appendix B.

The combined predicted threatened species and ecological communities are presented in Table 3-9. This table also considers the likelihood of each matter occurring in the existing transition line easement, and the likelihood of those species to be impacted by the proposal. Species likely to occur in the existing transition line easement *and* likely to be impacted by the proposal have been considered in a test of significance (Appendix C).

The potential impact of this proposal to native vegetation, listed species and habitat values is likely to be low. The following points have been demonstrated at a desktop level in the above sections:

- The extent of disturbance associated with this proposal is minor.
- It is unlikely native vegetation in reasonable condition is present in the existing easement.
- It is unlikely habitat values including tree hollows are present in the existing easement.
- It is unlikely many listed species would use/ rely on the habitat value within the existing easement.
- It is unlikely any species, population or community would be significantly impacted by the proposal.

Table 3-9 Assessment of likelihood – listed species

Scientific name	Common name	Likely to be present and impacted by this proposal
Amphibians		
Litoria aurea	Green and Golden Bell Frog	Unlikely No waterways would be disturbed by this proposal
Litoria booroolongensis	Booroolong Frog	Unlikely No waterways would be disturbed by this proposal
Litoria castanea	Yellow-spotted Tree Frog	Unlikely No waterways would be disturbed by this proposal
Litoria raniformis	Southern Bell Frog	Unlikely No waterways would be disturbed by this proposal
Mixophyes balbus	Stuttering Frog	Unlikely No waterways would be disturbed by this proposal
Birds		
Anthochaera phrygia	Regent Honeyeater	Unlikely No trees occur within the existing transmission easement
Artamus cyanopterus	Dusky Woodswallow	Unlikely

Scientific name	Common name	Likely to be present and impacted by this proposal
		No trees occur within the existing transmission easement
Botaurus poiciloptilus	Australasian Bittern	Unlikely Suitable wetland habitat is unlikely to be impacted.
Burhinus grallarius	Bush Stone-curlew	Unlikely Suitable woody habitat is unlikely to be present
Calidris ferruginea	Curlew Sandpiper	Unlikely Suitable wetland habitat is unlikely to be impacted.
Callocephalon fimbriatum	Gang-gang Cockatoo	Unlikely No trees occur within the existing transmission easement
Calyptorhynchus lathami	Glossy Black-Cockatoo	Unlikely No trees occur within the existing transmission easement
Calyptorhynchus lathami	South-eastern Glossy Black-Cockatoo	Unlikely No trees occur within the existing transmission easement
Chthonicola sagittata	Speckled Warbler	Unlikely No trees occur within the existing transmission easement
Circus assimilis	Spotted Harrier	Possible Foraging habitat may be present
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Unlikely No trees occur within the existing transmission easement
Daphoenositta chrysoptera	Varied Sittella	Unlikely No trees occur within the existing transmission easement
Falco hypoleucos	Grey Falcon	Possible Foraging habitat may be present
Falco subniger	Black Falcon	Unlikely No trees occur within the existing transmission easement
Glossopsitta pusilla	Little Lorikeet	Unlikely No trees occur within the existing transmission easement
Grantiella picta	Painted Honeyeater	Unlikely No trees occur within the existing transmission easement
Haliaeetus leucogaster	White-bellied Sea-Eagle	Unlikely No suitable large waterbodies
Hieraaetus morphnoides	Little Eagle	Unlikely Suitable woodland nesting/ foraging habitat is not present

Scientific name	Common name	Likely to be present and impacted by this proposal
Hirundapus caudacutus	White-throated Needletail	Unlikely No trees occur within the existing transmission easement
Lathamus discolor	Swift Parrot	Unlikely No trees occur within the existing transmission easement
Leipoa ocellata	Malleefowl	Unlikely No trees occur within the existing transmission easement
Lophoictinia isura	Square-tailed Kite	Unlikely No trees occur within the existing transmission easement
Melanodryas cucullata	Hooded Robin (south-eastern form)	Unlikely No trees occur within the existing transmission easement
Melithreptus gularis	Black-chinned Honeyeater (eastern subspecies)	Unlikely No trees occur within the existing transmission easement
Numenius madagascariensis	Eastern Curlew	Unlikely Suitable wetland habitat is unlikely to be impacted.
Ninox connivens	Barking Owl	Unlikely Suitable woodland habitat is not present
Ninox strenua	Powerful Owl	Unlikely Suitable woodland habitat is not present
Petroica boodang	Scarlet Robin	Unlikely Suitable woodland habitat is not present
Petroica phoenicea	Flame Robin	Unlikely Suitable woodland habitat is not present
Polytelis swainsonii	Superb Parrot	Unlikely No trees occur within the existing transmission easement
Rostratula australis	Australian Painted Snipe	Unlikely Suitable wetland habitat is unlikely to be impacted.
Stagonopleura guttata	Diamond Firetail	Unlikely Suitable woodland habitat is not present
Stictonetta naevosa	Freckled Duck	Unlikely Suitable wetland habitat is not present where disturbance would occur
Tyto novaehollandiae	Masked Owl	Unlikely Suitable woodland habitat is not present
Fish		
Maccullochella peelii	Murray Cod	Unlikely No waterways would be disturbed by this proposal

Scientific name	Common name	Likely to be present and impacted by this proposal
Macquaria australasica	Macquarie Perch	Unlikely No waterways would be disturbed by this proposal
Invertebrates		
Keyacris scurra	Key's Matchstick Grasshopper	Unlikely Unlikely the existing easement has suitable abundance of native forbs/ other groundcover species combined with a low level of agricultural and urbanisation disturbance.
Paralucia spinifera	Purple Copper Butterfly	Unlikely Elevation is too low, and key habitat species unlikely to be present
Mammals		
Cercartetus nanus	Eastern Pygmy-possum	Unlikely No trees occur within the existing transmission easement
Chalinolobus dwyeri	Large-eared Pied Bat	Unlikely No trees or caves occur within the existing transmission easement
Dasyurus maculatus	Spotted-tailed Quoll	Unlikely Suitable woodland habitat is not present
Falsistrellus tasmaniensis	Eastern False Pipistrelle	Unlikely No trees occur within the existing transmission easement
Miniopterus orianae oceanensis	Large Bent-winged Bat	Unlikely No trees or caves occur within the existing transmission easement
Myotis macropus	Southern Myotis	Unlikely No trees occur within the existing transmission easement and no waterways would be impacted
Petauroides volans	Greater Glider	Unlikely No trees occur within the existing transmission easement
Petaurus australis	Yellow-bellied Glider	Unlikely No trees occur within the existing transmission easement
Petaurus norfolcensis	Squirrel Glider	Unlikely No trees occur within the existing transmission easement
Petrogale penicillata	Brush-tailed Rock-wallaby	Unlikely No suitable rocky habitat present or nearby
Phascogale tapoatafa	Brush-tailed Phascogale	Unlikely No trees occur within the existing transmission easement

Scientific name	Common name	Likely to be present and impacted by this proposal
Phascolarctos cinereus	Koala	Unlikely No trees occur within the existing transmission easement
Pteropus poliocephalus	Grey-headed Flying-fox	Unlikely No trees occur within the existing transmission easement
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	Unlikely No trees occur within the existing transmission easement
Scoteanax rueppellii	Greater Broad-nosed Bat	Unlikely No trees or caves occur within the existing transmission easement
Plants		
Acacia flocktoniae	Flockton Wattle	Unlikely Restricted distribution and large shrubs unlikely to be present in the easement
Asterolasia buxifolia	-	Unlikely Very restricted known distribution along rocky granite riparian zone of Lett River – similar habitat is not present
Caladenia attenuata	Duramana Fingers	Unlikely Groundcover heavily dominated by exotic and native grasses
Dichanthium setosum	Bluegrass	Possible Known to occur amongst other dominant grass species along roadsides.
Eucalyptus aggregata	Black Gum	Unlikely No trees exist in the easement
Eucalyptus pulverulenta	Silver-leafed Gum	Unlikely No trees exist in the easement
Eucalyptus robertsonii subsp. hemisphaerica	Robertson's Peppermint	Unlikely No trees exist in the easement
Euphrasia arguta	-	Possible Known to occur in grassy areas near Bathurst
Goodenia macbarronii	Narrow Goodenia	No longer a listed species despite occurring in search results
Lepidium hyssopifolium	Aromatic Peppercress	Possible Known to occur in grassy areas near Bathurst
Leucochrysum albicans var. tricolor	Hoary Sunray	Unlikely Groundcover heavily dominated by exotic and native grasses
Persoonia marginata	Clandulla Geebung	Unlikely

Scientific name	Common name	Likely to be present and impacted by this proposal
		Groundcover heavily dominated by exotic and native grasses
Swainsona recta	Small Purple-pea	Unlikely Groundcover heavily dominated by exotic and native grasses
Swainsona sericea	Silky Swainson-pea	Unlikely Groundcover heavily dominated by exotic and native grasses
Thesium australe	Austral Toadflax	Unlikely Groundcover heavily dominated by exotic and native grasses which are unlikely to be compatible species
Veronica blakelyi	Veronica blakelyi	Unlikely Groundcover heavily dominated by exotic and native grasses and suitable woodland is not present
Zieria obcordata	Granite Zieria	Unlikely Suitable rocky woodland habitat is more present
Reptiles		
Aprasia parapulchella	Pink-tailed Legless Lizard	Unlikely Suitable rocky habitat is unlikely to be present
Delma impar	Striped Legless Lizard	Possible Known to occur in grassland with significant content of exotic species.
Hoplocephalus bungaroides	Broad-headed Snake	Unlikely Suitable rocky habitat is not present
Tympanocryptis mccartneyi	Bathurst Grassland Earless Dragon	Possible Known to occur in grassland with significant content of exotic species.
Varanus rosenbergi	Rosenberg's Goanna	Unlikely Suitable woodland habitat is not present

3.5.3 Recommended mitigation strategies

The following mitigation strategies are recommended for this proposal:

- Minimise disturbance of the groundcover, particularly where there are native grasses present.
- Avoid impact outside the existing transmission easement during upgrade of the poles and wires.
- Avoid disturbance around mapped hydrolines / waterways.
- Contact local wildlife carers should injury to wildlife occur during implementation of the proposal.

3.6 Hazards (fire) and physical impacts (soil, water, air)

3.6.1 Existing environment

As detailed above, the existing easement traverses disturbed road verge, working farmlands and residential areas (Figure 3-17).

Receptors (dwellings) are concentrated around Raglan with few occurring to the east.

No bushfire prone land occurs nearby however, grassfires can still be serious and may generate visibility and safety issues on the nearby highway.

While the alignment intersects with five non-perennial waterways (Figure 3-16), it is unlikely to be the location of existing poles, and therefore unlikely to a point of disturbance for this proposal, most notable would be the case of at the third Strahler Order waterways. Waterways and associated riparian vegetation would therefore not be impacted.

The soils are mapped as class 3 and class 5 but may be less, based on the soil survey verification undertaken at the proposed solar farm site. Class 3 soils are considered important agricultural land and Class 5 has severe limitations for ongoing agricultural use.

3.6.2 Nature and scale of impacts

In construction, excavation works represent the highest risk of soil disturbance and pollution of waterways. No trenching is likely, so impacts are expected to be highly discrete. No additional access ways are expected to be required.

Plant required would be minimal and would progress along the route, and therefore not be generating impacts continuously in one location for very long. The works would result in very minor traffic and access impacts during construction. The following equipment is likely to be used on site during construction:

- Truck mounted borer;
- Cable trucks;
- Elevated Work Platforms (EWP);
- Trucks;
- Whacker rammers; and
- Truck mounted augers and cranes.

No site compound would be required as part of the works. Material to site each day would likely be transported from a Bathurst depot.

In operation, key risks are of a damaged line starting a fire in grasslands below. There would be a minor increase in this risk, given the higher voltage.

Electric and Magnetic Fields (EMFs) are produced wherever electricity or electrical equipment is in use. Powerlines, electrical wiring, household appliances and electrical equipment all produce EMF. The electric field is proportional to the voltage. The magnetic field is proportional to the current. Both electric and magnetic fields are also dependent on the source geometry (i.e., conductor heights, cable depths, phase separations etc.). All fields decrease rapidly with distance from the source. The smaller the object or closer the conductors producing the field, the more rapidly the field would decrease with distance from the source.

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), as part of the Health and Ageing Portfolio, is a Federal Government agency charged with responsibility for protecting the health and safety of people, and the environment, from EMF. ARPANSA advises that:

> *"On balance, the scientific evidence does not indicate that exposure to 50 Hz EMFs found around the home, the office or near power lines is a hazard to human health."*
>
> *"… the majority of scientists and Australian radiation health authorities in particular, do not regard chronic exposure to 50 Hz electric and magnetic fields at the levels commonly found in the environment as a proven health risk. Moreover, the evidence we have is inconclusive and does not allow health authorities to decide whether there is a specific magnetic field level above which chronic exposure is dangerous or compromises human health."*
>
> *"At the present time there is no evidence that exposure to electric fields is a health hazard (excluding of course electric shock)."*

There are currently no Australian standards regulating exposure to these fields. The National Health and Medical Research Council has issued interim guidelines on limits of exposure to 50/60 Hz electric and magnetic fields. These guidelines are aimed at preventing immediate health effects resulting from exposure to these fields. The recommended magnetic field exposure limit for members of the public (24-hour exposure) is 0.1 milli Tesla (1,000 mG - milligauss) and for occupational exposure (whole working day) is 0.5 milli Tesla (5,000 mG). Essential Energy operates its powerlines, substations and other electrical infrastructure well within these interim guideline limits.

Design, operation and maintenance of the equipment and easement would comply with Essential Energy's specifications.

Figure 3-18 Land and soil capability mapping

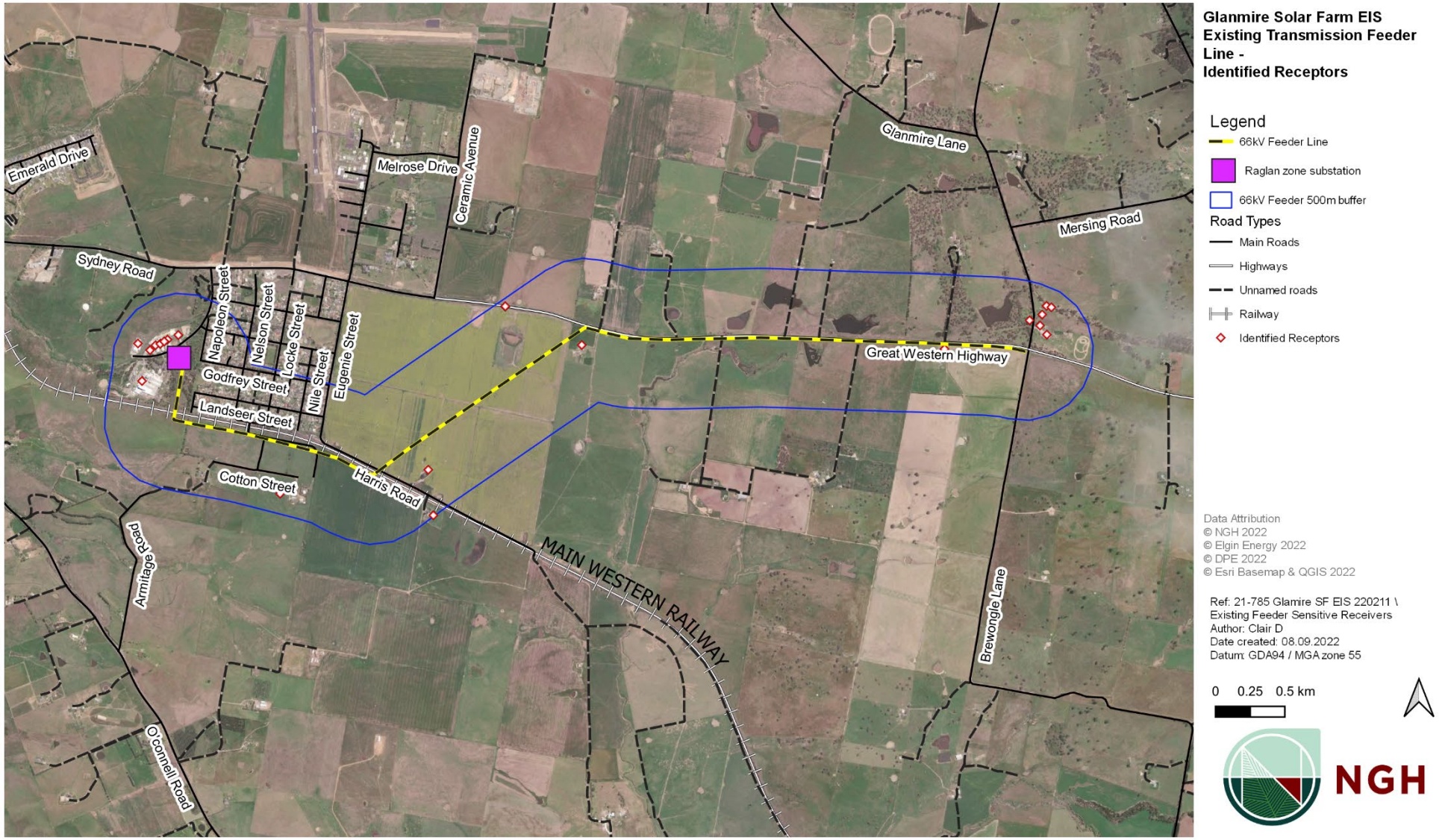


Figure 3-19 Dwellings within 500m of the transmission easement.

3.6.3 Recommended mitigation strategies

The following mitigation measures are required to manage relevant hazards:

Bushfire

- During construction, firefighting equipment would be present within all vehicles that would be on site.

EMF

- No specific controls required.

Soils and waterways

- Disturbed areas should be stabilised as soon as practicable following construction activities.
- Areas of disturbance would be kept to the minimum required for the safe and effective completion of the works.
- Spill kits would be kept on site and in machinery at all times.
- Any accidental leakages or spillage of liquid substances would be dealt with by taking immediate measures to contain, clean up and remove the spilled substance.
- And If signs of contaminated soils are discovered (e.g., smell, discolouration, suspect rubbish), the site should be marked and the soil replaced to cover the contamination. Work must stop in the vicinity of the discovery with soil samples analysed to determine the type of contamination and an appropriate management plan would then be developed and followed.
- Control measures will be implemented to manage risks associated with the handling of fuel through providing spill kits in close proximity to major plant items, using spill trays when undertaking in field re-fuelling (although avoid and use service station where practicable) and temporary fuel storage to be positioned away from waterways and bunded;
- Monitoring of weather patterns during construction to inform construction staff about the threat of flooding.
- Contingency planning, to ensure equipment is not left within flood liable areas.

Air

- Appropriate dust minimisation measures would be implemented as required.
- Any potential dust borne materials (such as surplus spoil) transported from the activity site would be covered at all times during transportation.
- All vehicles and machinery would be well maintained according to manufacturer requirements to sustain emissions within acceptable limits.

5 Ecologically Sustainable Development (ESD)

Sustainability relates to the continuity of economic, technical, social, institutional and environmental aspects of human society, as well as the non-human environment.

The proposal has been assessed against the following four principles of ESD listed in the *Protection of the Environment Administration Act 1991.*

The four principles of ESD are:

- The precautionary principle section 6(2)(a)(i)(ii);
- The principle of inter-generational equity section 6(2)(b);
- The principle of biological diversity and ecological integrity section 6(2)(c); and
- The principle of improved valuation of environmental resources section 6(2)(d)(i)(ii)(iii).

An assessment of the proposal against the principles is provided below.

5.1 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.

In the application of the precautionary principle, public and private decisions should be guided by:

1) *careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment; and*
2) *an assessment of the risk weighted consequence of various options.'*

For the precautionary principle to be applicable two pre-conditions must be satisfied; "*first it is not necessary that serious or irreversible environmental damage has actually occurred – it is the threat of such damage that is required. Secondly, the environmental damage threatened must attain the threshold of being serious or irreversible*"[4].

If there is no threat of serious or irreversible environmental damage, there is no basis upon which the precautionary principle can apply.

A high-level assessment has determined the works are of low risk however, further detailed investigations are required to satisfy this criterion. The proposal is therefore consistent with the precautionary principle.

5.2 Principle of inter-generational equity

The principle of inter-generational equity states that:

'The present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.'

To the extent possible all environmental impacts and appropriate mitigation measures have been identified. The proposal would not harm the health, diversity and productivity of the environment to

[4] Telstra Corporation Limited v Hornsby Shire Council [2006] NSWLEC 133, Preston CJ at 129

such an extent that future generations would not be able to benefit. Consequently, the proposal is consistent with the principle of inter-generational equity.

5.3 Principle of biological diversity and ecological integrity

The principle of biological diversity and ecological integrity states that:

'Conservation of biological diversity and ecological integrity should be a fundamental consideration.'

Consideration of the habitat in the works areas and the potential for flora and fauna, and particularly species and communities under threat, has determined the proposal would be a low risk to biodiversity. The assessment concluded that impacts upon the ecological integrity would be negligible.

5.4 Improved valuation of environmental resources

The principle of improved valuation of environmental resources states that:

'Environmental factors should be included in the valuation of assets and services such as:

- Polluter pays – that is, those who generate pollution and waste should bear the cost of containment, avoidance and abatement.
- The users of goods and services should pay prices based on the full life cycle of costs of providing those goods and services, including the use of natural resources and assets and the ultimate disposal of any waste.
- Environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structures, including market mechanisms that enable those best placed to maximise benefits or minimise cost to develop their own solutions and responses to environmental problems.'

The proposal has been designed taking into consideration the least possible impact on the environment.

4. Assessment and mitigation summary

The assessment in Section 3 is focused on the more certain options between the solar farm site and the Raglan substation (Sections A–B; B–G; G–H; Overhead lines on existing easement). In the table below, the findings are extrapolated to other sections that may require works. Key areas of uncertainty are identified, including: the need for further survey and consultation in relation to aviation, biodiversity and heritage.

The risk levels are rated low based on current information for all areas with the exception of areas outside current easements (sections B–C; D–E; D–F) which will require further investigation for biodiversity and Aboriginal heritage to down grade this risk. Considering the mitigation measures available to manage the works and their small scale, it is expected further investigation will down grade these risks to low.

Table 4-1 Risk assessment summary; all works options

Works sections:	**A–B; B–G; G–H** **Overhead lines on existing easement**	**C–D** **Replace conductors on existing easement**	**B–C** **New overhead line; 260m in road reserve**	**D–E; D–F** **Removal of overhead lines / new underground lines**
Aviation; key issues include OLS penetration, CASA consultation, Accurate survey information required				
Risk rating	Low impact	Nil	Low impact	Low impact
Mitigation	Pole height limits in specific sections of route likely to be required.	Nil	Pole height limits in specific sections of route likely to be required.	Nil
Amenity impacts (visual and noise impacts; key issues include Landscape character impacts, Management of noise during construction works				
Risk rating	Low	Nil	Low	Low
Mitigation	Standard noise management and complaints management protocols during construction	Nil	Standard noise management and complaints management protocols during construction	Standard noise management and complaints management protocols during construction
Aboriginal cultural heritage; key issues include Sites / values in close proximity to works				
Risk rating	Low	Nil	Moderate without further assessment to these works	Moderate without further assessment

Works sections:	**A–B; B–G; G–H** **Overhead lines on existing easement**	**C–D** **Replace conductors on existing easement**	**B–C** **New overhead line; 260m in road reserve**	**D–E; D–F** **Removal of overhead lines / new underground lines**
Mitigation	Due Diligence assessment focussed on sensitive landforms within 200m of waters and a more general assessment elsewhere.	Nil	Due Diligence assessment focussed on sensitive landforms within 200m of waters and a more general assessment elsewhere.	Due Diligence assessment focussed on sensitive landforms within 200 m of waters and a more general assessment elsewhere.
Historic heritage; key issues include Heritage listings in close proximity to works				
Risk rating	Low	Nil	Low	Low
Mitigation	Avoidance of works near these listings.	Nil	Site survey for any unlisted items.	Site survey for any unlisted items.
Biodiversity; key issues include Potential to degrade habitat or injure threatened species				
Risk rating	Low	Nil	Moderate without further assessment to these works.	Moderate without further assessment.
Mitigation	Minimise disturbance of the ground cover, restrict to existing easements.	Nil	Survey to validate existing conditions and further assessment .	Survey to validate existing conditions and further assessment.
Hazards; key issues include Fire ignition, EMFs, Soil and water pollution risks, Air pollution risks				
Risk rating	Low	Low	Low	Low
Mitigation	Standard bushfire, soil, water and air quality protocols to manage impacts.	Design in accord with Australian standards to minimise EMFs.	Design in accord with Australian standards to minimise EMFs.	Standard bushfire, soil, water, and air quality protocols to manage impacts.

5. Conclusion

The existing Essential Energy 66kV infrastructure (currently operated at 11kV) is located adjacent to the proposed Glanmire Solar Farm project site's northern boundary. Refurbishment of this line to the intended capacity of 66kV is required for the energy generated and stored by the Glanmire Solar Farm Project to be utilised by the electricity grid.

As the detailed design of the refurbishment and any flow on ancillary works has not yet been developed by Essential Energy, assessment and consultation with the community around these works has been undertaken based on the most up to date information able to be obtained from Essential Energy. However, it is noted that this is an indicative scope at this point in time and changes may occur. Essential Energy will design, assess (in accordance with Part 5 of the EP&A Act) and contract out these works.

This high-level assessment using a risk-based approach, in order that these works can be considered by agencies and the community, as part of the public exhibition of the Glanmire Solar Farm EIS. The proposed works have been demonstrated as likely to be low risk, subject to specific further assessment required to confirm this assessment's assumptions. Considering their scale, the existing environment and the mitigation options available, they works appear to be highly manageable with the adoption of standard mitigation protocols. They adhere to the principles of Ecologically Sustainable Development. They are required to facilitate the connection of an important renewable energy project to the grid.

Prior to works commencing the following will be required:

- Detailed assessment and determination under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), with Essential Energy to be the determining authority.
- Preparation of project environmental management protocols (design, construction and operation) in accordance with the measures set out in the detailed assessment.

The assumptions regarding the likely works method are stated clearly in this document. Should changes that invalidate these assumptions be made, the conclusions of this assessment would be required to be revisited.

6. References

Bathurst Regional Council, 2019, *Bathurst Vegetation Management Plan 2019*, URL: https://www.bathurst.nsw.gov.au/vegetationplan.html (accessed 12/05/2022).

Appendix A Aviation preliminary review

Tammy Vesely
Senior Project Manager
NGH Consulting Pty Ltd

By email: tammy.v@nghconsulting .com.au

Our ref: 102605-01

Dear Tammy

Re: Glanmire Solar Farm - Preliminary OLS Review

Reference is invited to your request for an assessment of OLS impacts from a proposed upgrade to transmission lines associated with the proposed Glanmire Solar Farm.

Please find in this correspondence a summary of our preliminary review. This analysis is based on the data provided to us in your 02 September 2022 email correspondence.

1.1. Project background

Transmission lines which run from the proposed Glanmire Solar Farm site, located in Glanmire NSW, to Raglan power substation located approximately 1.6 km south-west of Bathurst Airport are to be upgraded. The upgrade will include replacement of power poles which will be up to 6 m higher above ground level (AGL) than the existing poles.

The transmission line is in close proximity to Bathurst Airport and an assesssment of impacts on the Bathurst Airport Obstacle Limitiation Surfaces (OLS) is required.

1.2. References

References used or consulted in the preparation of this report include:

- Airservices Australia, Aeronautical Information Package; including AIP Book, Departure and Approach Procedures, Designated Airspace Handbook and En-Route Supplement Australia, dated 08 September 2022
- Civil Aviation Safety Authority, Civil Aviation Safety Regulations 1998 (CASR)
- Civil Aviation Safety Authority, Part 139 (Aerodromes) Manual of Standards 2019, dated 13 August 2020 Version F2020C00797
- ISO 31000:2018 Risk management—Guidelines, Standards Australia.

1.3. Client material

NGH provided the following information in email correspondence for the purposes of this analysis:

- A drawing of the Glanmire Solar Farm EIS Existing Transmission Feeder Line showing the transmission line location
- A statement that the height of the current 66kV poles is between 15.5 m and 18.5 m AGL and that replacement poles will be between 17 m and 20.7 m above ground level
- A link to the online document '*Bathurst Regional Local Environmental Plan 2014, Obstacle Limitation Surface Map – Sheet OLS_011'*.

1.4. Site overview

The transmission line runs from Raglan power substation, south approximately 0.4 km to the Bathurst to Raglan train line, then east along the train line for approximately 1.5 km, then north-east for approximately 1.9 km across farmland to reach the Great Western Highway, then east along the southern boundary of the highway for approximately 3.2 km to reach the Glanmire Solar Farm site

Figure 1 shows the transmission line pathway (dashed black/yellow line) (source: NGH).

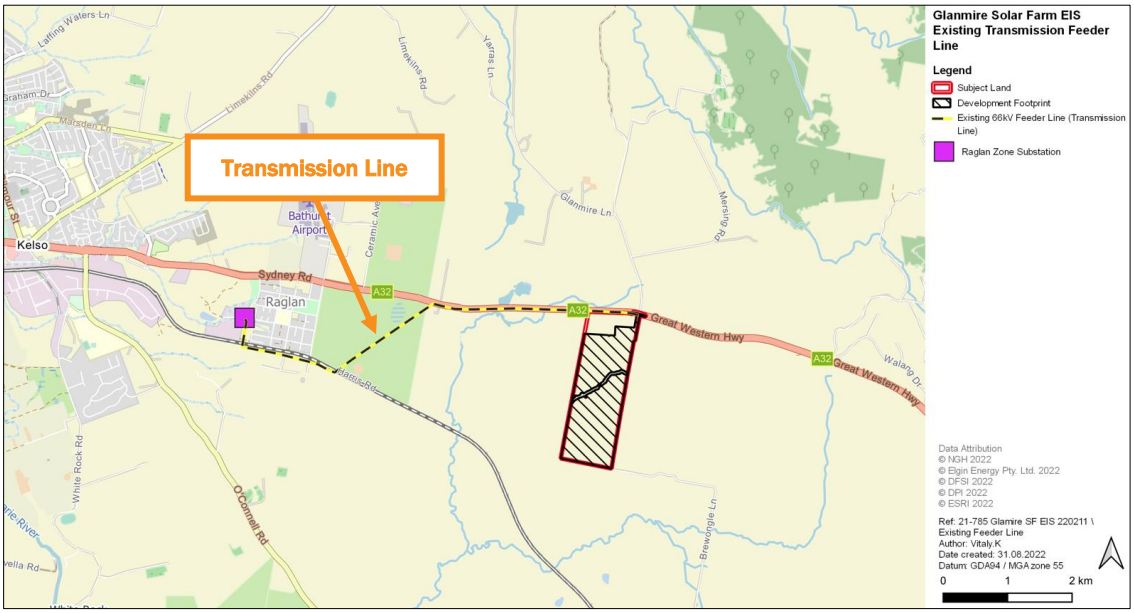


Figure 1 Transmission line location

1.5. Bathurst Airport OLS

Bathurst Airport (YBTH) is a Code 3, non-precision approach certified aerodrome. The OLS established for the aerodrome runways is shown in Figure 2 in relation to the transmission line location.

The transmission line is located underneath the OLS Inner Horizontal Surface, a portion of the Runway 35 Transitional and Approach Surfaces and a portion of the OLS Conical Surface. (Source: NGH, Google Earth, Bathurst Regional Council)

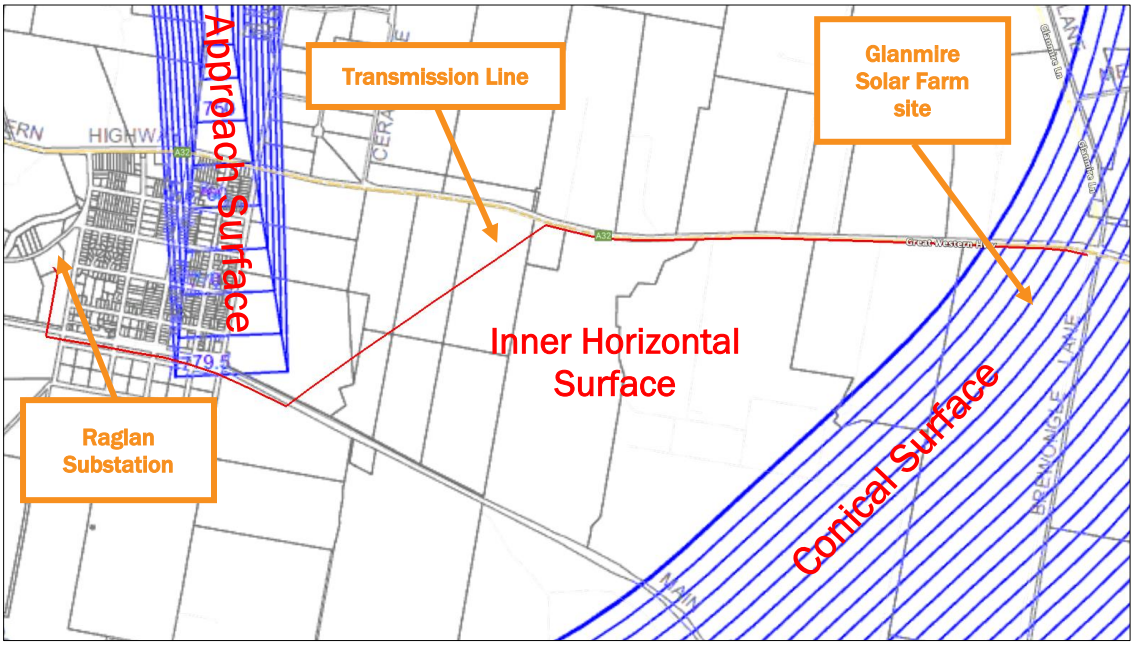


Figure 2 YBTH OLS in relation to the Transmission Line

1.6. Transmission Line Assessment

Obstacles which penetrate the OLS height limits are required to be reported to CASA for assessment. The OLS height limits in relation to each section of the transmission line are assessed. For the purpose of this assessment the maximum expected pole height of 20.7 m AGL is used.

1.6.1. Raglan power substation to the Bathurst – Raglan train line (Section 1)

This section of the transmission line is wholly contained within the OLS Inner Horizontal Surface.

The OLS Inner Horizontal Surface has a height of 779.5 m Australian Height Datum (AHD).

Ground elevations in this section of the transmission line vary from a low of 722 m at the power substation rising to 730 m at the train line. At the maximum ground elevation in this section of line, a 20.7 m pole would have a maximum height of 750.7 m and be below the height of the OLS Inner Horizontal Surface.

Therefore, this section of transmission line will not have any impact on the OLS.

The elevation profile for this section 1 of the transmission line is shown in Figure 3. (Source: Google Earth, NGH)

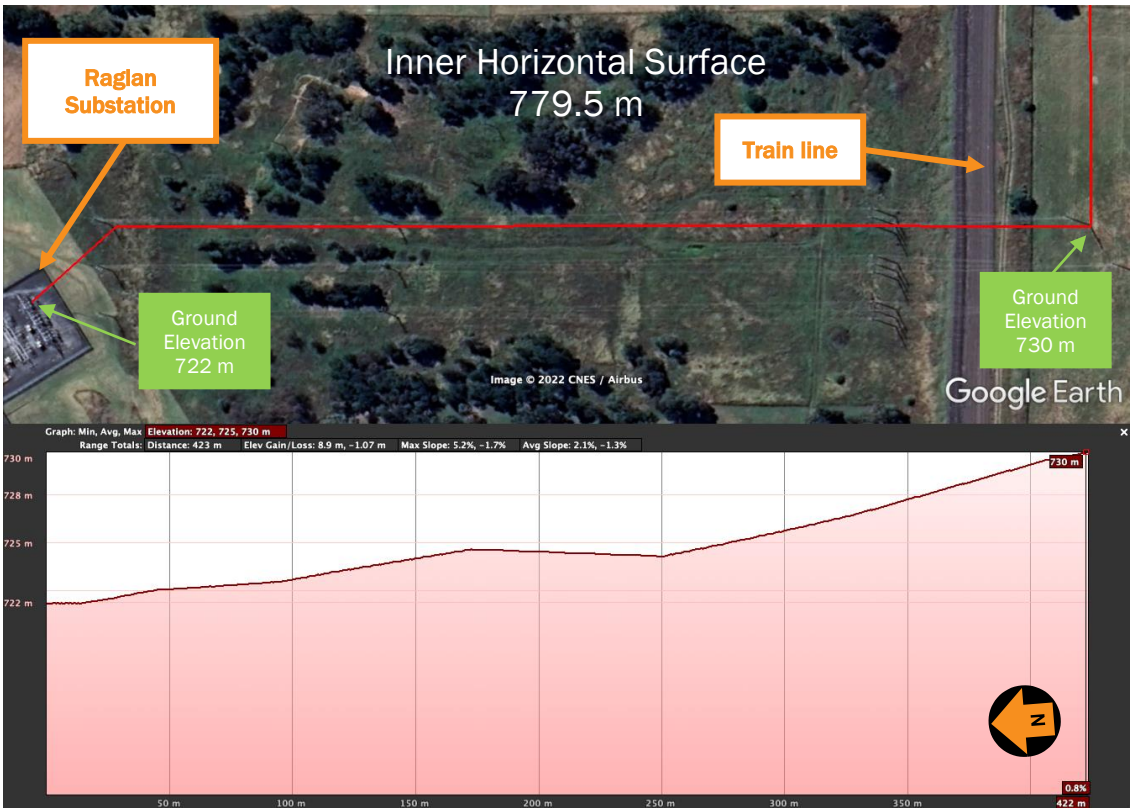


Figure 3 Transmission line section 1 ground elevation profile

1.6.2. Along Bathurst to Raglan Train Line (Section 2)

This section of the transmission line is contained primarily within the OLS Inner Horizontal Surface but also passes through the Runway 35 Transitional and Approach Surface.

Runway 35 Transitional and Approach Surface:

The runway 35 Transitional and Approach Surface, at the points the transmission line passes through them, varies in height from 777.6 m at the most western point to 779.5 m AHD at the most eastern point. The ground elevation at the western point is 746 m and a 20.7 m pole would have a maximum height of 766.7 m which is below the 777.6 m height of the Transitional Slope at this point. The ground elevation at the eastern point is 750 m and a 20.7 m pole would have a height of 777.7 m which is below the 779.5 m height of the Approach Surface at this point. Therefore, the transmission line in this section will not have any impact on the Transitional or Approach Surfaces.

OLS Inner Horizontal Surface:

In the remainder of this section where the transmission line passes through the inner horizontal surface, ground elevations vary from a low of 730 m at the western end of the section rising to 759 m at the eastern end of the section. Where the ground elevation exceeds 758.8 m, a 20.7 m pole will penetrate the inner horizontal surface with a height of 779.5 m.

For practical purposes, in the area where ground elevation exceeds 758 m up to 759 m, pole height should be reduced to not above 20 m in height to avoid OLS penetration. This applies in the most easterly 100 m of this transmission line section.

The elevation profile for this section 2 of the transmission line is shown in Figure 4 (Source: Google Earth, NGH)

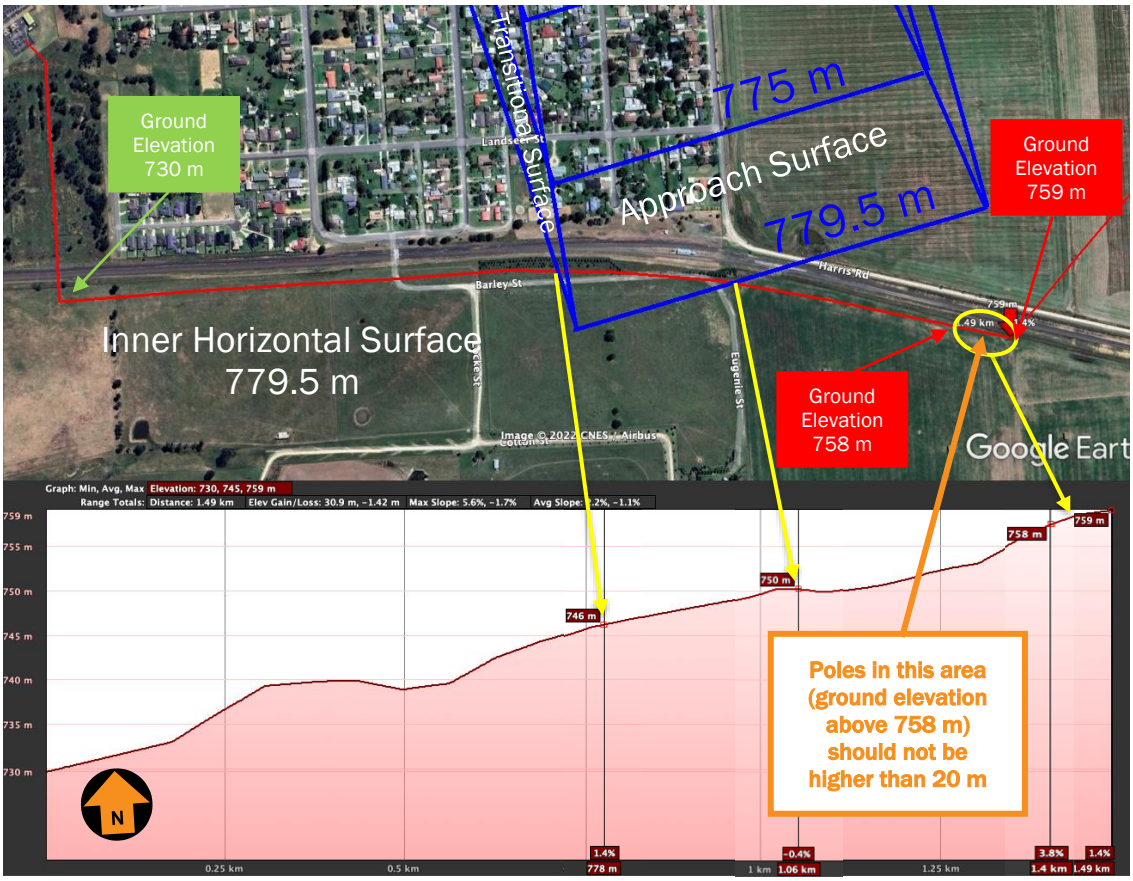


Figure 4 Transmission line section 2 ground elevation profile

1.6.3. Across farmland (Section 3)

This section of the transmission line is wholly contained within the OLS Inner Horizontal Surface.

The OLS Inner Horizontal Surface has a height of 779.5 m AHD.

Ground elevations in this section vary from a low of 759 m at the most southern end rising to 761 m within the first 300 m of transmission line then undulating down to the north with a ground elevation of 747 m at the most northern end.

Where the ground elevation exceeds 758.8 m, a 20.7 m pole will penetrate the inner horizontal surface with a height of 779.5 m.

For practical purposes, in the area where ground elevation exceeds 758 m up to 761 m, pole height should be reduced to not above 18 m in height to avoid OLS penetration. This applies in the most southerly 500 m of this transmission line section.

The elevation profile for this section 3 of the transmission line is shown in Figure 5. (Source: Google Earth, NGH)

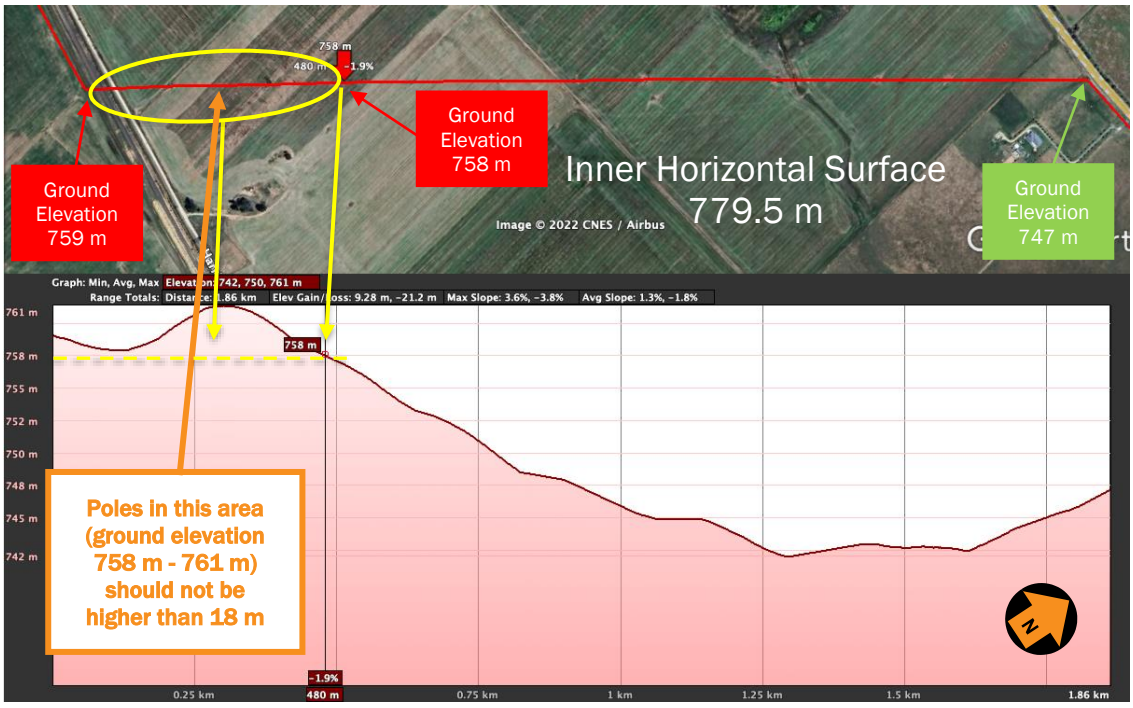


Figure 5 Transmission line section 3 ground elevation profile

1.6.4. Along Great Western Highway (Section 4)

This section of the transmission line is primarily contained within the OLS Inner Horizontal Surface and partially within the Conical Surface.

The OLS Inner Horizontal Surface has a height of 779.5 m AHD. In the section where the transmission line passes under the Conical Surface, the Conical Surface starts at a height of 779.5m and increases to 806 m.

Ground elevations vary from a low of 747 m at the most western end rising to 760 m where the Conical Surface starts and up to 773 m at the most eastern end of the section.

Within the section under the Inner Horizontal surface, where the ground elevation exceeds 758.8 m, a 20.7 m pole will penetrate the inner horizontal surface with a height of 779.5 m.

Within the section under the Conical Surface, because the surface slopes upward, a 20.7 m pole will only penetrate the Conical Surface until the ground elevation reaches 761 m (Conical Surface height of 782 m), after which the rate of upward slope of the Conical Surface exceeds the rate of upward slope of the ground elevation.

For practical purposes, in the area where ground elevation exceeds 758 m in the Inner Horizontal Surface to the point where the ground elevation reaches 761 m under the Conical Surface, pole height should be reduced to not above 18 m in height to avoid OLS penetration. This applies in an approximately 400 m section, starting at 1000 m from the easterly end of this transmission line section.

The elevation profile for this section 4 of the transmission line is shown in Figure 6 and the area where pole heights need to be reduced is shown in Figure 7. (Source: Google Earth, NGH)

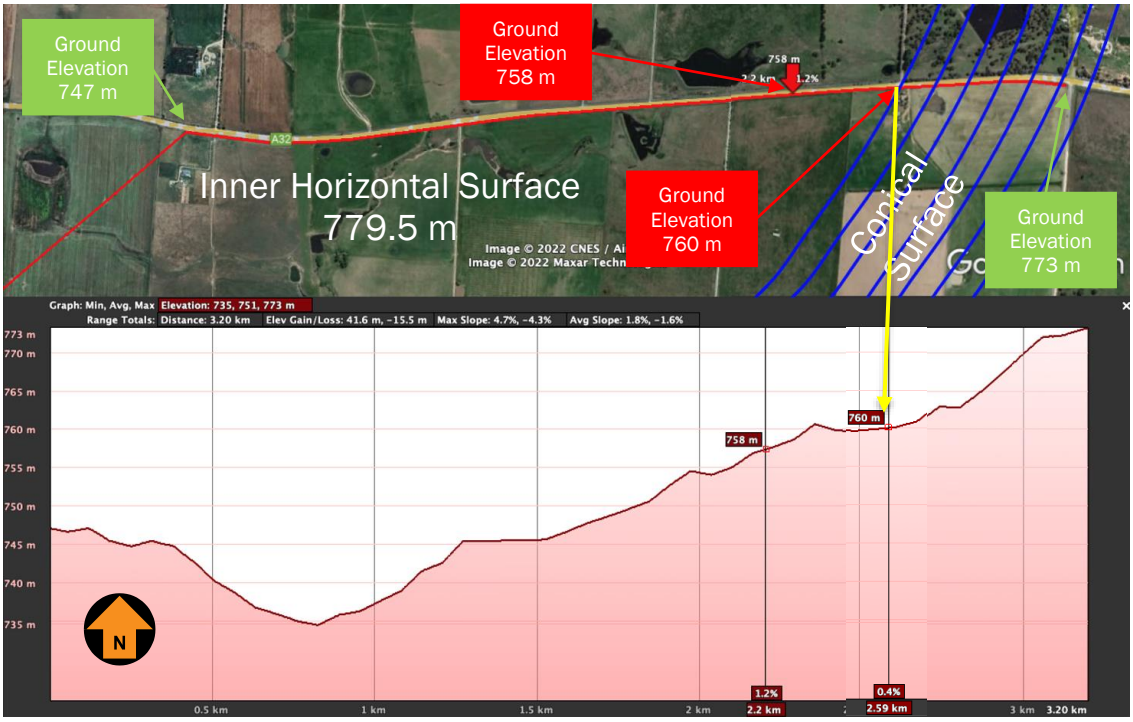


Figure 6 Transmission line section 4ground elevation profile

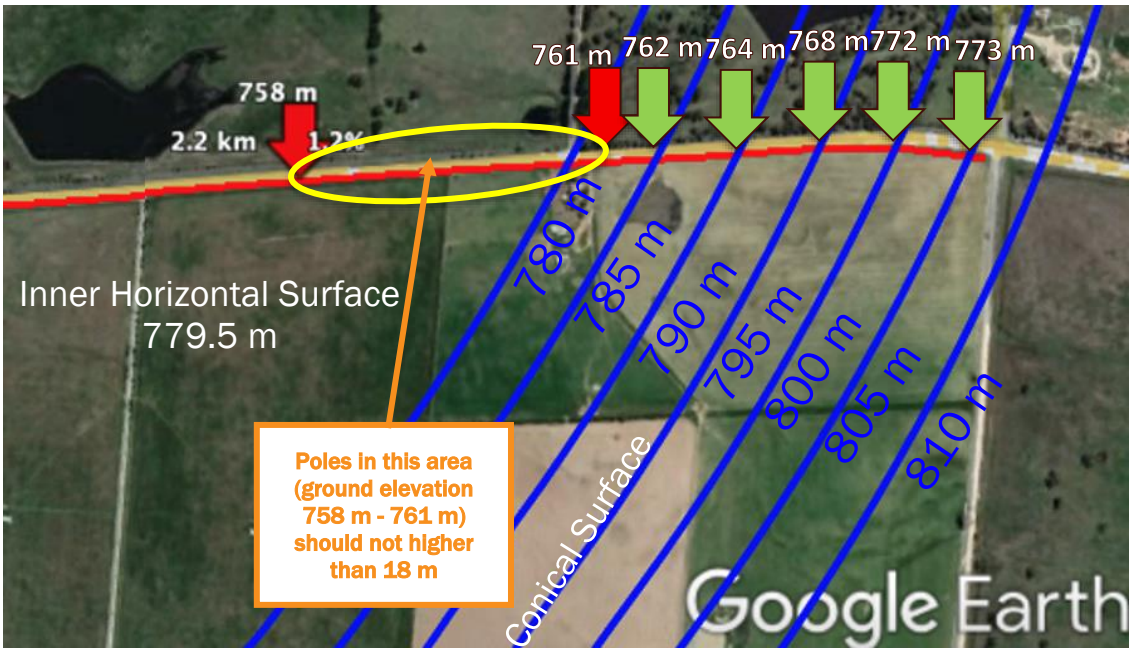


Figure 7 Transmission line section 4 area where pole heights must be reduced

1.7. Summary

Following an evaluation of the Glanmire Power Transmission Line pole height increase, the following impacts on the OLS were identified:

1. In the eastern approximately 100 m of the transmission line section that runs along the Bathurst to Raglan train line, where the ground elevation exceeds 758.8 m, a 20.7 m pole will penetrate the OLS Inner Horizontal Surface. Poles in this location should be less than 20 m in height to avoid OLS penetration. See Section 1.6.2.

2. In the southern approximately 500 m of the transmission line section that crosses farmland, where the ground elevation exceeds 758.8 m, a 20.7 m pole will penetrate the OLS Inner Horizontal Surface. Poles in this location should be less than 18 m in height to avoid OLS penetration. See Section 1.6.3.

3. At the eastern end of the transmission line section that runs along the Great Western Highway, in an approximately 400 m section starting approximately 1 km from the eastern end of the transmission line, a 20.7 m pole will penetrate both the OLS Inner Horizontal Surface and the Conical Surface. Poles in this location should be less than 18 m in height to avoid OLS penetration. See Section 1.6.4.

It should be noted that this desktop assessment relies upon Google Earth elevation data and distance assessment and is therefore limited in accuracy. Accurate survey information should be used to determine actual acceptable pole heights in relation to the OLS surfaces in the locations identified.

If you wish to clarify or discuss the contents of this correspondence, please contact me on 0417 631 681.

Kind regards

Keith Tonkin

Managing Director

7 September 2022

Appendix B Database searches and supporting mapping

IBRA subregion threatened species search, filtered by Southern Tablelands Grassy Woodland vegetation class

Scientific name	Common name	NSW status	Commonwealth status
Amphibians			
Litoria aurea	Green and Golden Bell Frog	Endangered	Vulnerable
Litoria booroolongensis	Booroolong Frog	Endangered	Endangered
Litoria castanea	Yellow-spotted Tree Frog	Critically Endangered	Endangered
Litoria raniformis	Southern Bell Frog	Endangered	Vulnerable
Mixophyes balbus	Stuttering Frog	Endangered	Vulnerable
Birds			
Anthochaera phrygia	Regent Honeyeater	Critically Endangered	Critically Endangered
Artamus cyanopterus cyanopterus	Dusky Woodswallow	Vulnerable	
Botaurus poiciloptilus	Australasian Bittern	Endangered	Endangered
Burhinus grallarius	Bush Stone-curlew	Endangered	
Callocephalon fimbriatum	Gang-gang Cockatoo	Vulnerable	Endangered
Calyptorhynchus lathami	Glossy Black-Cockatoo	Vulnerable	
Chthonicola sagittata	Speckled Warbler	Vulnerable	
Circus assimilis	Spotted Harrier	Vulnerable	
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Vulnerable	
Daphoenositta chrysoptera	Varied Sittella	Vulnerable	
Falco subniger	Black Falcon	Vulnerable	
Glossopsitta pusilla	Little Lorikeet	Vulnerable	
Grantiella picta	Painted Honeyeater	Vulnerable	Vulnerable
Haliaeetus leucogaster	White-bellied Sea-Eagle	Vulnerable	
Hieraaetus morphnoides	Little Eagle	Vulnerable	
Hirundapus caudacutus	White-throated Needletail	Not listed	Vulnerable
Lathamus discolor	Swift Parrot	Endangered	Critically Endangered
Lophoictinia isura	Square-tailed Kite	Vulnerable	
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	Vulnerable	
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	Vulnerable	

Scientific name	Common name	NSW status	Commonwealth status
Ninox connivens	Barking Owl	Vulnerable	
Ninox strenua	Powerful Owl	Vulnerable	
Petroica boodang	Scarlet Robin	Vulnerable	
Petroica phoenicea	Flame Robin	Vulnerable	
Polytelis swainsonii	Superb Parrot	Vulnerable	Vulnerable
Stagonopleura guttata	Diamond Firetail	Vulnerable	
Tyto novaehollandiae	Masked Owl	Vulnerable	
Ecological Community			
Tableland Basalt Forest in the Sydney Basin and South Eastern Highlands Bioregions		Endangered Ecological Community	
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions	Box-gum Woodland	Critically Endangered Ecological Community	
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland		Not listed	Critically Endangered
Invertebrates			
Keyacris scurra	Key's Matchstick Grasshopper	Endangered	
Paralucia spinifera	Purple Copper Butterfly	Endangered	Vulnerable
Mammals			
Cercartetus nanus	Eastern Pygmy-possum	Vulnerable	
Chalinolobus dwyeri	Large-eared Pied Bat	Vulnerable	Vulnerable
Dasyurus maculatus	Spotted-tailed Quoll	Vulnerable	Endangered
Falsistrellus tasmaniensis	Eastern False Pipistrelle	Vulnerable	
Miniopterus orianae oceanensis	Large Bent-winged Bat	Vulnerable	
Myotis macropus	Southern Myotis	Vulnerable	
Petauroides volans	Greater Glider	Not listed	Endangered
Petaurus australis	Yellow-bellied Glider	Vulnerable	Vulnerable
Petaurus norfolcensis	Squirrel Glider	Vulnerable	
Petrogale penicillata	Brush-tailed Rock-wallaby	Endangered	Vulnerable
Phascogale tapoatafa	Brush-tailed Phascogale	Vulnerable	
Phascolarctos cinereus	Koala	Endangered	Endangered
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Vulnerable
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	Vulnerable	
Scoteanax rueppellii	Greater Broad-nosed Bat	Vulnerable	

Scientific name	Common name	NSW status	Commonwealth status
Plants			
Acacia flocktoniae	Flockton Wattle	Vulnerable	Vulnerable
Asterolasia buxifolia	Asterolasia buxifolia	Endangered	
Caladenia attenuata	Duramana Fingers	Critically Endangered	Critically Endangered
Eucalyptus aggregata	Black Gum	Vulnerable	Vulnerable
Eucalyptus pulverulenta	Silver-leafed Gum	Vulnerable	Vulnerable
Eucalyptus robertsonii subsp. hemisphaerica	Robertson's Peppermint	Vulnerable	Vulnerable
Goodenia macbarronii	Narrow Goodenia	Not listed	
Lepidium hyssopifolium	Aromatic Peppercress	Endangered	Endangered
Leucochrysum albicans var. tricolor	Hoary Sunray	Not listed	Endangered
Persoonia marginata	Clandulla Geebung	Vulnerable	Vulnerable
Swainsona sericea	Silky Swainson-pea	Vulnerable	
Thesium australe	Austral Toadflax	Vulnerable	Vulnerable
Veronica blakelyi	Veronica blakelyi	Vulnerable	
Reptiles			
Aprasia parapulchella	Pink-tailed Legless Lizard	Vulnerable	Vulnerable
Delma impar	Striped Legless Lizard	Vulnerable	Vulnerable
Hoplocephalus bungaroides	Broad-headed Snake	Endangered	Vulnerable
Tympanocryptis mccartneyi	Bathurst Grassland Earless Dragon	Critically Endangered	
Varanus rosenbergi	Rosenberg's Goanna	Vulnerable	

EPBC Act – Protected Matters Report

Australian Government
Department of Agriculture, Water and the Environment

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. Please see the caveat for interpretation of information provided here.

Report created: 01-Sep-2022

Summary

Matters of National Environment 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 (Ramsar	4
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	34
Listed Migratory Species:	12

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

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 Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	19
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	2
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands)	[Resource Information]
Ramsar Site Name	Proximity
Banrock station wetland complex	800 - 900km upstream from Ramsar site
Riverland	800 - 900km upstream from Ramsar site
The coorong, and lakes alexandrina and albert wetland	900 - 1000km upstream from Ramsar site
The macquarie marshes	300 - 400km upstream from Ramsar site

Listed Threatened Ecological Communities		[Resource Information]
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. Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.		
Community Name	Threatened Category	Presence Text
Natural Temperate Grassland of the South Eastern Highlands	Critically 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]
Status of Conservation Dependent and Extinct are not MNES under the EPBC Act. Number is the current name ID.		
Scientific Name	Threatened Category	Presence Text
BIRD		
Anthochaera phrygia		
Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened Category	Presence Text
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 may occur within area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may 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 known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Polytelis swainsonii Superb Parrot [738]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened Category	Presence Text
Rostratula australis		
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
FISH		
Maccullochella peelii		
Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area
Macquaria australasica		
Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area
FROG		
Litoria aurea		
Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat may occur within area
Litoria booroolongensis		
Booroolong Frog [1844]	Endangered	Species or species habitat likely to occur within area
Litoria castanea		
Yellow-spotted Tree Frog, Yellow-spotted Bell Frog [1848]	Critically Endangered	Species or species habitat likely to occur within area
INSECT		
Paralucia spinifera		
Bathurst Copper Butterfly, Purple Copper Butterfly, Bathurst Copper, Bathurst Copper Wing, Bathurst-Lithgow Copper, Purple Copper [26335]	Vulnerable	Species or species habitat may occur within area
MAMMAL		
Chalinolobus dwyeri		
Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may 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
Petaurus australis australis		
Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened Category	Presence Text
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)		
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	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
PLANT		
Dichanthium setosum		
bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area
Eucalyptus pulverulenta		
Silver-leaved Mountain Gum, Silver-leaved Gum [21537]	Vulnerable	Species or species habitat likely to occur within area
Euphrasia arguta		
[4325]	Critically Endangered	Species or species habitat may occur within area
Lepidium hyssopifolium		
Basalt Pepper-cress, Peppercress, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat may occur within area
Leucochrysum albicans subsp. tricolor		
Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat may occur within area
Swainsona recta		
Small Purple-pea, Mountain Swainson-pea, Small Purple Pea [7580]	Endangered	Species or species habitat may occur within area
Thesium australe		
Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area
Zieria obcordata		
Granite Zieria [3240]	Endangered	Species or species habitat may occur within area
REPTILE		

Scientific Name	Threatened Category	Presence Text
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat likely to occur within area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text
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 known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may 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 may 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 may occur within area

Scientific Name	Threatened Category	Presence Text
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
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
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Scientific Name	Threatened Category	Presence Text
Bird		
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 overfly marine area
Bubulcus ibis as Ardea ibis		
Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area overfly marine area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area

Scientific Name	Threatened Category	Presence Text
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area
Neophema chrysostoma Blue-winged Parrot [726]		Species or species habitat may occur within area overfly marine area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat may occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area

Extra Information

EPBC Act Referrals			[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status
Not controlled action			
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed
Not controlled action (particular manner)			
Aerial baiting for wild dog control	2006/2713	Not Controlled Action (Particular Manner)	Post-Approval

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and 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

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

Where little information is available for a 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 detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

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

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

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

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

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 C Threatened matters – Tests of significance

C.1 BC Act – Test of significance

BC Act Threatened Species Test of Significance for birds of prey species: • **Spotted Harrier *(Circus assimilis)*** • **Grey Falcon *(Falco hypoleucos)***	
Significant impact criteria: An action is likely to have a significant impact on a protected matter if there is a real chance or possibility that it will have:	
Statement	**Response**
Adverse effects on the life cycle of a species (a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	No trees suitable for use for nesting would be impacted. The proposal is unlikely to have an adverse effect on the life cycle of the species, resulting in a local population being placed at risk of extinction. The proposal may temporarily disrupt foraging habitat for this species. It is unlikely to species would experience a significant reduction in prey, causing the species to be affected.
Adverse effects on ecological communities (b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or ii. (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	N/A
Adverse effects on habitats (c) in relation to the habitat of a threatened species or ecological community: i. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and iii. (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	The project would result in the temporary disturbance of foraging land. The availability or functionality of this land would only be marginally impact at completion of the project. The proposal would unlikely result in the removal of habitat, important for the long-term survival of the species in the local area.
Adverse effects on areas of outstanding biodiversity value	The proposal would not have an adverse

BC Act Threatened Species Test of Significance for birds of prey species: • **Spotted Harrier *(Circus assimilis)*** • **Grey Falcon *(Falco hypoleucos)***	
(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)	effect on any declared area of outstanding biodiversity value.
Key threatening processes (e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process	The key threatening processes expected to be exacerbated by the projected are expected to be minimal given the small amount of disturbance and limited functional change to the environment.
Summary statement: The proposal would not result in a significant impact to these species.	
In determining the nature and magnitude of an impact, matters were considered such as: • pre-construction, construction and occupation/maintenance phases • all on-site and off-site impacts, including location, installation, operation and maintenance of auxiliary infrastructure and fire management zones • all direct and indirect impacts • the frequency and duration of each known or likely impact/action • the total impact which can be attributed to that action over the entire geographic area affected, and over time • the sensitivity of the receiving environment • the degree of confidence with which the impacts of the action are known and understood. • All factors should be considered as well as any other information considered relevant to the test. Sources and currency of data and information are to be documented and referenced. Limitations, uncertainties and known gaps in information are also to be documented to inform the decision-maker	

BC Act Threatened Species Test of Significance for plant species: • **Bluegrass (*Dichanthium setosum*)** • ***Euphrasia arguta*** • **Aromatic Peppercress *(Lepidium hyssopifolium)***	
Significant impact criteria: An action is likely to have a significant impact on a protected matter if there is a real chance or possibility that it will have:	
Statement	**Response**
Adverse effects on the life cycle of a species (a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	The proposal may disrupt the life cycle where mature plants are impacted by this proposal The existing easement is unlikely to provide the only local suitable habitat, particularly at the western end of the proposal. Further, local distribution is adjacent areas of woodland at the eastern end of the proposal. Impact to any plants which may occur is

BC Act Threatened Species Test of Significance for plant species: • **Bluegrass (*Dichanthium setosum*)** • ***Euphrasia arguta*** • **Aromatic Peppercress *(Lepidium hyssopifolium)***	
	unlikely to be a significant impact to the local population. Land disturbed by this proposal would be allowed to rehabilitate after the construction phase is complete, beaning the local distribution would not be reduced.
Adverse effects on ecological communities (b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or ii. (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	N/A
Adverse effects on habitats (c) in relation to the habitat of a threatened species or ecological community: i. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and iii. (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	The existing easement is unlikely to provide the only local suitable habitat, particularly at the western end of the proposal. Further, local distribution is adjacent areas of woodland at the eastern end of the proposal. Impact to any plants which may occur is unlikely to be a significant impact to the local population. Land disturbed by this proposal would be allowed to rehabilitate after the construction phase is complete, beaning the local distribution would not be reduced. All three of these species are known to occur and/ or thrive in disturbed areas.
Adverse effects on areas of outstanding biodiversity value (d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)	The proposal would not have an adverse effect on any declared area of outstanding biodiversity value.
Key threatening processes (e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process	The key threatening processes expected to be exacerbated by the projected are expected to be minimal. The connectiveness of the landscapes prevents the key threatening processes from being

BC Act Threatened Species Test of Significance for plant species: • **Bluegrass (*Dichanthium setosum*)** • ***Euphrasia arguta*** • **Aromatic Peppercress *(Lepidium hyssopifolium)***	
	exacerbated in a significant manor The proposal is likely to result in minor exacerbations of buss rock removal, loss of hollow bearing trees, removal of dead wood and dead trees and clearing of native vegetation. Negligible exacerbations of climate change and possible exacerbations of Invasion of native plant communities by exotic perennial grasses
Summary statement: The proposal would not result in a significant impact to these species.	
In determining the nature and magnitude of an impact, matters were considered such as: • pre-construction, construction and occupation/maintenance phases • all on-site and off-site impacts, including location, installation, operation and maintenance of auxiliary infrastructure and fire management zones • all direct and indirect impacts • the frequency and duration of each known or likely impact/action • the total impact which can be attributed to that action over the entire geographic area affected, and over time • the sensitivity of the receiving environment • the degree of confidence with which the impacts of the action are known and understood. • All factors should be considered as well as any other information considered relevant to the test. Sources and currency of data and information are to be documented and referenced. Limitations, uncertainties and known gaps in information are also to be documented to inform the decision-maker	

BC Act Threatened Species Test of Significance for reptile species: • **Striped Legless Lizard (*Delma impar*)** • **Bathurst Grassland Earless Dragon (*Tympanocryptis mccartneyi*)**	
Significant impact criteria: An action is likely to have a significant impact on a protected matter if there is a real chance or possibility that it will have:	
Statement	**Response**
Adverse effects on the life cycle of a species (a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	The proposal may have an impact on the life cycle of these species where individuals of eggs are disturbed. These species are believed to become turbid and spend winter in burrows. The area of land to be disturbed by this proposal is very small, with more intensive disturbance being limited to

BC Act Threatened Species Test of Significance for reptile species: • **Striped Legless Lizard (*Delma impar*)** • **Bathurst Grassland Earless Dragon (*Tympanocryptis mccartneyi*)**	
	that required to upgrade existing transmission line infrastructure.
Adverse effects on ecological communities (b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or ii. (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	N/A
Adverse effects on habitats (c) in relation to the habitat of a threatened species or ecological community: i. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and iii. (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	The extend of available habitat would not be reduced by this proposal and disturbed ground would be allowed to fully rehabilitate after construction is complete. Further, disturbance would be limited to within an existing transmission line, meaning the structure and nature of the habitat would not be materially changed. No animals would be excluded from habitat, and no population would become isolated or fragmented as a result of this proposal.
Adverse effects on areas of outstanding biodiversity value (d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)	The proposal would not have an adverse effect on any declared area of outstanding biodiversity value.
Key threatening processes (e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process	The key threatening processes expected to be exacerbated by the projected are expected to be minimal. The connectiveness of the landscapes prevents the key threatening processes from being exacerbated in a significant manor The proposal is likely to result in minor exacerbations of buss rock removal, loss of hollow bearing trees, removal of dead wood and dead trees and clearing of native vegetation. Negligible exacerbations of climate

BC Act Threatened Species Test of Significance for reptile species: • **Striped Legless Lizard (*Delma impar*)** • **Bathurst Grassland Earless Dragon (*Tympanocryptis mccartneyi*)**	
	change and possible exacerbations of Invasion of native plant communities by exotic perennial grasses
Summary statement: The proposal would not result in a significant impact to these species.	
In determining the nature and magnitude of an impact, matters were considered such as: • pre-construction, construction and occupation/maintenance phases • all on-site and off-site impacts, including location, installation, operation and maintenance of auxiliary infrastructure and fire management zones • all direct and indirect impacts • the frequency and duration of each known or likely impact/action • the total impact which can be attributed to that action over the entire geographic area affected, and over time • the sensitivity of the receiving environment • the degree of confidence with which the impacts of the action are known and understood. • All factors should be considered as well as any other information considered relevant to the test. Sources and currency of data and information are to be documented and referenced. Limitations, uncertainties and known gaps in information are also to be documented to inform the decision-maker.	
Significant impact criteria: An action is likely to have a significant impact on a protected matter if there is a real chance or possibility that it will have:	
Statement	**Response**
Adverse effects on the life cycle of a species (a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	N/A
Adverse effects on ecological communities (b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	The proposal involves the disturbance of a ground stratum which may be consistent with the description of this TEC. The area of occupancy of this TEC would not be notably reduced, as disturbed areas would naturally rehabilitate at the completion of the construction phase. Functionally this TEC is limited in its ability to be rehabilitated as a result of ongoing maintenance within the existing transmission easement.
Adverse effects on habitats (c) in relation to the habitat of a threatened species or ecological community:	The proposal involves the disturbance of a ground stratum which may be consistent with the description of this TEC.

BC Act Threatened Species Test of Significance for reptile species: • **Striped Legless Lizard (*Delma impar*)** • **Bathurst Grassland Earless Dragon (*Tympanocryptis mccartneyi*)**	
i. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and iii. (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	The area of occupancy of this TEC would not be notably reduced, as disturbed areas would naturally rehabilitate at the completion of the construction phase. Functionally this TEC is limited in its ability to be rehabilitated as a result of ongoing maintenance within the existing transmission easement.
Adverse effects on areas of outstanding biodiversity value (d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)	The proposal would not have an adverse effect on any declared area of outstanding biodiversity value
Key threatening processes (e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process	The key threatening processes expected to be exacerbated by the projected are expected to be minimal. The connectiveness of the landscapes prevents the key threatening processes from being exacerbated in a significant manor. The proposal is likely to result in minor exacerbations of buss rock removal, loss of hollow bearing trees, removal of dead wood and dead trees and clearing of native vegetation. Negligible exacerbations of climate change and possible exacerbations of Invasion of native plant communities by exotic perennial grasses
Summary statement: The proposal would not result in a significant impact to this community.	
In determining the nature and magnitude of an impact, matters were considered such as: • pre-construction, construction and occupation/maintenance phases • all on-site and off-site impacts, including location, installation, operation and maintenance of auxiliary infrastructure and fire management zones • all direct and indirect impacts • the frequency and duration of each known or likely impact/action • the total impact which can be attributed to that action over the entire geographic area affected, and over time • the sensitivity of the receiving environment • the degree of confidence with which the impacts of the action are known and understood. • All factors should be considered as well as any other information considered relevant to the test. Sources and currency of data and information are to be documented and referenced. Limitations, uncertainties and known gaps in information are also to be documented to inform the decision-maker.	

C.2 EPBC Act – Test of significance

MNES - Vulnerable bird species considered: • **Grey Falcon (*Falco hypoleucos*)**	
Significant impact criteria: An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Statement	**Response**
• lead to a long-term decrease in the size of an important population of a species	An important population does not occur in the development footprint.
• reduce the area of occupancy of an important population	An important population does not occur in the development footprint.
• fragment an existing important population into two or more populations	An important population does not occur in the development footprint.
• adversely affect habitat critical to the survival of a species	No breeding exists in the development footprint. Foraging land would be temporarily disturbed only.
• disrupt the breeding cycle of an important population	No breeding exists in the development footprint.
• modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposal would result in a negligible loss of possible foraging and breeding habitat. The available habitat values would not be materially changed by this proposal.
• result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Mitigation measures would make the unlikely to introduce an invasive species to the vulnerable species habitat.
• introduce disease that may cause the species to decline, or	Mitigation measures would make the proposal unlikely to result in disease being introduced into a population.
• interfere substantially with the recovery of the species.	A negligible amount of interference would occur with habitat removal.
Summary statement: The proposal would not result in a significant impact to this species.	
What is an important population of a species? An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are: • key source populations either for breeding or dispersal • populations that are necessary for maintaining genetic diversity, and/or • populations that are near the limit of the species range.	
What is an invasive species? An 'invasive species' is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources or which is a predator of native species.	

MNES - Vulnerable bird species considered: • **Grey Falcon (*Falco hypoleucos*)**
Introducing an invasive species into an area may result in that species becoming established. An invasive species may harm listed threatened species or ecological communities by direct competition, modification of habitat or predation.
What is habitat critical to the survival of a species or ecological community? 'Habitat critical to the survival of a species or ecological community' refers to areas that are necessary: • for activities such as foraging, breeding, roosting, or dispersal • for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators) to maintain genetic diversity and long-term evolutionary development, or • for the reintroduction of populations or recovery of the species or ecological community. Such habitat may be but is not limited to: habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community; and/or habitat listed on the Register of Critical Habitat maintained by the minister under the EPBC Act.

MNES - Vulnerable plant species considered: • **Blue Grass (*Dichanthium setosum*)**	
Significant impact criteria: An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Statement	**Response**
• lead to a long-term decrease in the size of an important population of a species	An important population does not occur in the development footprint.
• reduce the area of occupancy of an important population	An important population does not occur in the development footprint.
• fragment an existing important population into two or more populations	An important population does not occur in the development footprint.
• adversely affect habitat critical to the survival of a species	No breeding exists in the development footprint. Foraging land would be temporarily disturbed only.
• disrupt the breeding cycle of an important population	No breeding exists in the development footprint.
• modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposal would result in a negligible loss of possible foraging and breeding habitat. The available habitat values would not be materially changed by this proposal.
• result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Mitigation measures would make the unlikely to introduce an invasive species to the vulnerable species habitat.
	Mitigation measures would make the proposal unlikely to result in disease being introduced into a population.

MNES - Vulnerable plant species considered: • **Blue Grass (*Dichanthium setosum*)**	
• interfere substantially with the recovery of the species.	A negligible amount of interference would occur with habitat removal.
Summary statement: The proposal would not result in a significant impact to this species.	

What is an important population of a species?

An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

- key source populations either for breeding or dispersal
- populations that are necessary for maintaining genetic diversity, and/or
- populations that are near the limit of the species range.

What is an invasive species?

An 'invasive species' is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources or which is a predator of native species. Introducing an invasive species into an area may result in that species becoming established. An invasive species may harm listed threatened species or ecological communities by direct competition, modification of habitat or predation.

What is habitat critical to the survival of a species or ecological community?

'Habitat critical to the survival of a species or ecological community' refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community.

Such habitat may be but is not limited to: habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community; and/or habitat listed on the Register of Critical Habitat maintained by the minister under the EPBC Act.

MNES - Vulnerable reptile species considered: • **Striped Legless Lizard (*Delma impar*)**	
Significant impact criteria: An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Statement	**Response**
• lead to a long-term decrease in the size of an important population of a species	An important population does not occur in the development footprint.
• reduce the area of occupancy of an important population	An important population does not occur in the development footprint.
• fragment an existing important population into two or more populations	An important population does not occur in the development footprint.

MNES - Vulnerable reptile species considered: • **Striped Legless Lizard (*Delma impar*)**	
• adversely affect habitat critical to the survival of a species	No breeding exists in the development footprint. Foraging land would be temporarily disturbed only.
• disrupt the breeding cycle of an important population	No breeding exists in the development footprint.
• modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposal would result in a negligible loss of possible foraging and breeding habitat. The available habitat values would not be materially changed by this proposal.
• result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Mitigation measures would make the unlikely to introduce an invasive species to the vulnerable species habitat.
• introduce disease that may cause the species to decline, or	Mitigation measures would make the proposal unlikely to result in disease being introduced into a population.
• interfere substantially with the recovery of the species.	A negligible amount of interference would occur with habitat removal.
Summary statement: The proposal would not result in a significant impact to this species.	

What is an important population of a species?

An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

- key source populations either for breeding or dispersal
- populations that are necessary for maintaining genetic diversity, and/or
- populations that are near the limit of the species range.

What is an invasive species?

An 'invasive species' is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources or which is a predator of native species. Introducing an invasive species into an area may result in that species becoming established. An invasive species may harm listed threatened species or ecological communities by direct competition, modification of habitat or predation.

What is habitat critical to the survival of a species or ecological community?

'Habitat critical to the survival of a species or ecological community' refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community.

Such habitat may be but is not limited to: habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community; and/or habitat listed on the Register of Critical Habitat maintained by the minister under the EPBC Act.

MNES – Critically Endangered or Endangered plant species considered: • **Aromatic Peppercress – *Lepidium hyssopifolium*** • ***Euphrasia arguta***	
Significant impact criteria: An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Statement	**Response**
• lead to a long-term decrease in the size of a population	This proposal may decrease the size of a population where individuals are impacted, noting no individuals are known to occur in the existing transmission line. Both these species are known to occur/ thrive in disturbed areas, and it would be expected any local population would recover from the very small potential disturbance.
• reduce the area of occupancy of the species	The proposal would result in a material change in the area or structure of the habitat.
• fragment an existing population into two or more populations	The proposal would not fragment any population or change access to suitable habitat.
• adversely affect habitat critical to the survival of a species	The proposal does not provide habitat critical to the survival of the species. This proposal would not materially change the area or structure of the available habitat.
• disrupt the breeding cycle of a population	Breeding cycle may be impacted by the proposal if mature individual plants are impacted.
• modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposal is unlikely to result in species decline. No species were sighted during field assessment and the proposal is not occurring in critical habitat.
• result in invasive species that are harmful to a critically endangered or endangered species becoming established in the critically endangered or endangered species' habitat	Mitigation measures would make the proposal unlikely to introduce an invasive species to the endangered species habitat
• introduce disease that may cause the species to decline, or	Mitigation measures would make the proposal unlikely to introduce and disease to the endangered species habitat
• interfere substantially with the recovery of the species.	The proposal would not interfere substantially with the recovery of the species. The species is not known to occur in the development footprint, which is an already disturbed area.
Summary statement: The proposal would not result in a significant impact to this species.	

MNES – Critically Endangered or Endangered plant species considered:

- **Aromatic Peppercress – *Lepidium hyssopifolium***
- ***Euphrasia arguta***

What is an important population of a species?

An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

- key source populations either for breeding or dispersal
- populations that are necessary for maintaining genetic diversity, and/or
- populations that are near the limit of the species range.

What is an invasive species?

An 'invasive species' is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources or which is a predator of native species. Introducing an invasive species into an area may result in that species becoming established. An invasive species may harm listed threatened species or ecological communities by direct competition, modification of habitat or predation.

What is habitat critical to the survival of a species or ecological community?

'Habitat critical to the survival of a species or ecological community' refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community.

Such habitat may be but is not limited to: habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community; and/or habitat listed on the Register of Critical Habitat maintained by the minister under the EPBC Act.