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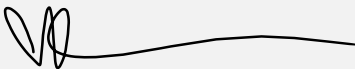
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### Acknowledgement of Country

Endeavour Energy acknowledges the traditional owners of country where we work - the people of the Dharug, Wiradjuri, Dharawal and Gundungarra nations – and recognises their continuing connection to the land, waters and community. We pay our respect to them and their culture and to the elders both past, present and emerging.

# Document Approval/ Declaration

To the best of the knowledge of the below signatories, this REF assessment has been prepared to be neither false nor misleading in accordance with The Code of practice for Authorised Network Operators and will be approved under clause 244 (k) of the Environmental Planning and Assessment Regulation 2000.

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## The project

The project involves the refurbishment of the foundations of 25 existing transmission towers located along a section of Feeder 940, located between Lawson at the eastern end and Marrangaroo (west of Lithgow) at the western end. The feeder traverses the Blue Mountains and travels through the Blue Mountains and Lithgow local government areas. The refurbishment works involve a staged process comprising:

- vegetation removal (where required) and excavation of each tower foundation to expose each structural element
- cleaning of the foundation
- visual (condition) inspection and determination of the appropriate refurbishment works
- undertaking the necessary refurbishment works
- backfilling and rehabilitation work.

The project would also include upgrades of existing access tracks to enable access each of the transmission towers.

## Need for the project

The foundations of some towers along Feeder 940 are a “grillage” design, which uses steel bars and plates attached to the leg that are direct buried in the ground. Because the steel tower legs, bars and plates are in contact with soil, the grillage footings are at risk of rust/corrosion damage.

Tower footings inspections identified that a number of the towers along the feeders were at a high risk of a loss of strength or integrity, and it was recommended that a program to refurbish the footings be initiated.

The proposed refurbishment of these towers is required as without such works there is a risk of a failure of the tower structures. Such a failure would result in the need to shut down part or all of the feeder during any works to reinstate the line. During this time there is potential for interruptions to power supply.

## Environmental impacts

The environmental impacts of the project are not likely to be significant and, therefore, it is not necessary for an Environmental Impact Statement to be prepared or approval sought for the project from the Minister for Planning under Division 5.1 of the EP&A Act.

The main environmental impacts of the project are:

- Short term noise and air impacts because of the operation of construction equipment
- Short term visual impacts due to establishment of work areas at each tower location
- Short term increases in traffic on the road network and potential restrictions to movements along access tracks
- Minor trimming of non-threatened vegetation

## Conclusion

The project to investigate and refurbish the foundations of towers on Feeder 940 is subject to assessment under Division 5.1 of the EP&A Act. The REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

A number of potential environmental impacts from the project have been avoided or reduced during the concept design development and options assessment. Mitigation measures as detailed in this REF would ameliorate or minimise these expected impacts. The project would also result in benefits to the community as it would reduce the risk of a tower failure which would potentially impact upon the supply of electricity.

The projects benefits are considered to outweigh any adverse environmental impacts which are considered to be minor and short term in nature.



## 1. Introduction

### 1.1 Background

Endeavour Energy (Endeavour) has a network of about 300 kilometres of 132kV transmission feeders supported on steel towers. Most of these towers were built between the early 1950's and 1970 and thus many are now more than 50 years of age. The towers of transmission feeder 940 (referred to as Feeder 940 in this document) are some of the oldest in Endeavour network. The foundations of many of these towers are a "grillage" design, which uses steel bars and plates attached to the leg that are direct buried in the ground. Because the steel tower legs, bars and plates are in contact with soil, the grillage footings are at risk of rust/corrosion damage. The need for the project is discussed further in section 2.1.

Endeavour has previously completed the refurbishment of foundations along Feeder 940 as well as along other lines. The process of completing these works is based on a risk assessment of towers likely to be greater need for such works.

### 1.2 Overview of the project

The project involves the refurbishment of the foundations of 25 existing transmission towers located along Feeder 940, located between Lawson at the eastern end and Marrangaroo (west of Lithgow) at the western end. The refurbishment works involve the following key tasks:

- site establishment, including minimal laydown areas
- vegetation removal (where required) and excavation of each tower foundation to expose each structural element
- cleaning of the foundation
- visual (condition) inspection and determination of the appropriate refurbishment works
- undertaking the necessary refurbishment works
- backfilling and rehabilitation work.

The project would also include upgrades of existing access tracks to access each of the transmission towers.

Further details of the project are outlined in section 5.3.

### 1.3 Location of the study area

Feeder 940 is located within the Blue Mountains and Lithgow local government areas (LGAs) west of Sydney. The feeder runs in a north westerly direction between the Warrimoo Transmission Substation in the east (near Blaxland) to the Wallerawang Bulk Supply Point in the west (near Lithgow). The project involves works in two distinct sections of Feeder 940 as follows:

- Lawson to Mount Victoria – this section includes twelve towers and runs in a westerly direction to the east of the Great Western Highway. This includes the Towns and villages of Lawson, Wentworth Falls, Leura, Mount Victoria in the Blue Mountains LGA.

- Mount Victoria to Marrangaroo – this section includes thirteen towers and runs in a northerly direction and crosses the Great Western Highway between Hartley and South Bowenfels. This includes the towns and villages of Hartley Vale, South Bowenfels and Marrangaroo in the Lithgow LGA.

As shown in Figure the transmission runs parallel to the Great Western Highway which traverses the Blue Mountains.

#### **1.4 Purpose of this report**

This Review of Environmental Factors (REF) has been prepared by GHD Pty Ltd (GHD) on behalf of Endeavour. For the purposes of these works, Endeavour is the proponent and determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The purpose of the REF is to describe the project, to document the impacts of the project on the environment, and to detail mitigation and management measures to be implemented.

The description of the project and assessment of associated environmental impacts has been undertaken in the context of section 171 of the Environmental Planning and Assessment Regulation 2021.

In doing so, the REF helps to fulfil the requirements of Section 5.5 of the EP&A Act including that Endeavour examine and take into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity.

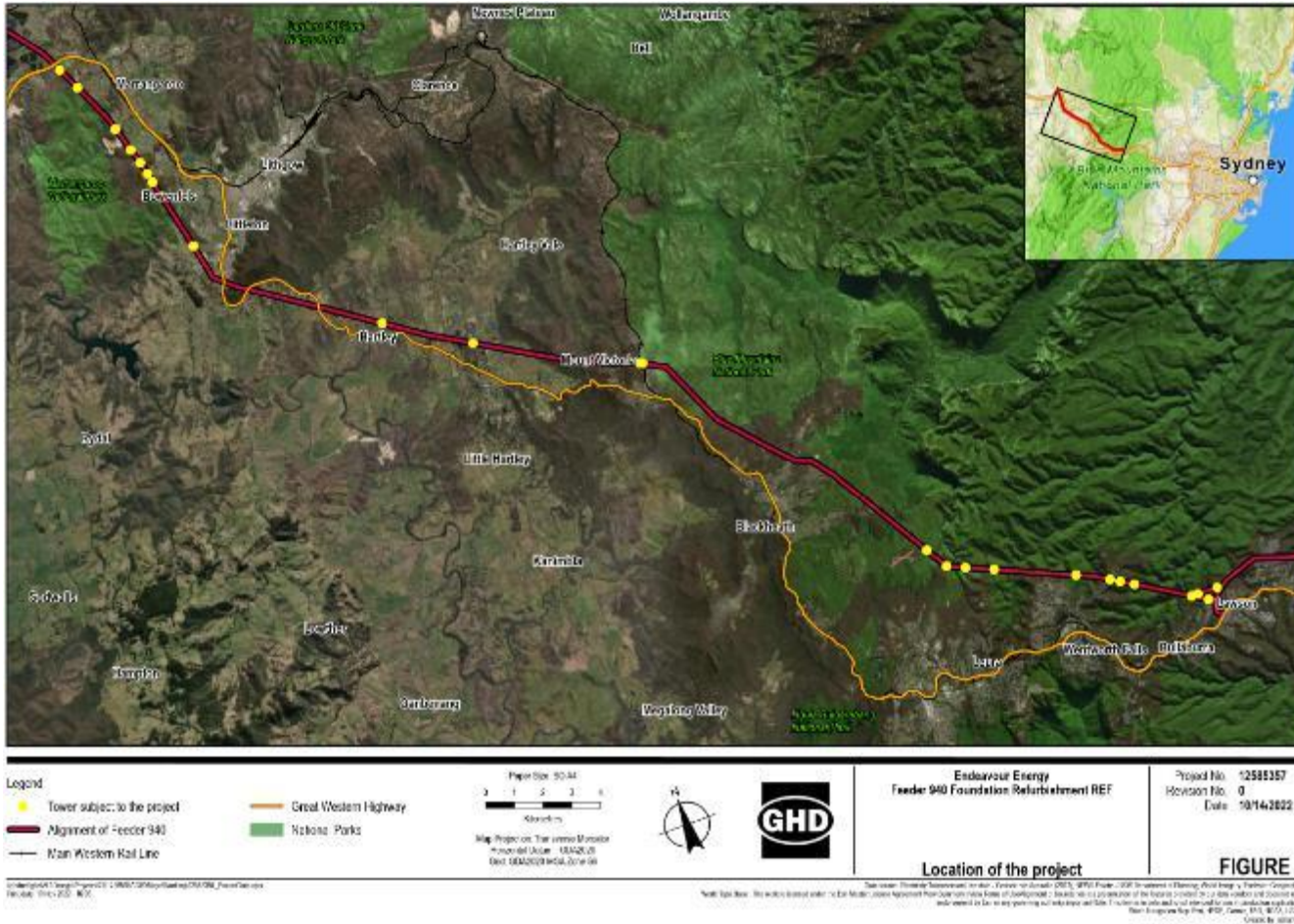


Figure 1 Location of the project

Feeder 940 Foundation Refurbishment



## 1.5 Existing environment

### 1.5.1 General context

Endeavour Energy (Endeavour) proposes to remediate the foundations of 25 existing tower sites located along Feeder 940 alignment in the vicinity of Lawson, Wentworth Falls, Leura, Mount Victoria, Hartley Vale, South Bowenfels and Marrangaroo. The feeder is within an existing easement that runs generally parallel to the Great Western Highway. Access to the easement is via existing tracks from the public road network which feed into the Great Western Highway as the main route across the Blue Mountains in the vicinity of the project.

The Lawson to Mount Victoria section of the line subject to the project runs predominantly through the Blue Mountains National Park which is part of the Greater Blue Mountains World Heritage Area (GBMWSHA). This section passes by the towns and villages of Bullaburra, Wentworth Falls, Leura and Katoomba (Refer to Figure and Figure ).

The Mount Victoria to Marrangaroo section runs through a predominantly rural areas and passes by the towns and villages of Little Hartley, Hartley Vale, Hartley, Littleton and Bowenfels. The northern most part of this section between Bowenfels and Marrangaroo runs through small portions of Marrangaroo National Park to the west of Lithgow (Refer to Figure ).

### 1.5.2 Physical setting

The towers are located within an existing easement. The land surrounding the towers can be broadly characterised into four settings:

- Vegetated areas within National Park – Towers are located within dense bushland which forms part of National Parks (as outlined below). The landscape in these areas is generally undulating with the transmission line located at the high points above the below valleys. Six towers are in National Parks, including towers 10, 14, 16, 17 and 18 in the Blue Mountains National Park and tower 94 located in Marrangaroo National Park.
- Vegetated areas outside National Park – The landscape and setting of these areas is comparable with those in National Parks however the land is not protected under the *National Parks and Wildlife Act 1979*. 10 towers are in densely vegetated areas including towers 1, 2, 3, 6, 42, 43, 63, 83, 87 and 96. Towers 42 and 43 are however located adjacent to the Main Western Rail Line and the Darling Causeway to the north of Mount Victoria Station.
- Rural – Rural areas are characterised by a mixture of open grassland and densely vegetated areas. Landscape features include flat to undulating terrain with scattered rock outcrops. Six towers are in rural areas and include towers 55, 79, 85, 86, 88 and 90.
- Urban – areas that are characterised as being urban in nature with the towers located within or adjacent to urban areas consisting of primarily residential areas. Three towers are in urban areas with tower 2A located within the urban area while towers 7 and 8 are in vegetated areas directly adjacent to urban areas.

### 1.5.3 Cultural setting

The project area is on land of the Dharug, Gundungurra and Wiradjuri People. The Blue Mountains area has a rich history of Aboriginal occupation. Areas of Aboriginal cultural heritage sensitivity relate to

landforms and soil types where Aboriginal places are more likely to be located. These include land within 200 metres of named waterways and land within 50 metres of registered Aboriginal cultural heritage places. Searches undertaken of the Aboriginal Heritage Information Management System (AHIMS) found multiple items of Aboriginal heritage within the study area. The project would be undertaken in an existing easement on land that has previously been disturbed as part of the construction of the transmission line.

The Lawson to Mount Victoria section is located within World Heritage listed Greater Blue Mountains area. European settlement in the area was centred around the main ridgeline across the Blue Mountains area along which the Great Western Highway and Main Western Rail Line travel. Items of Local and State heritage are present throughout the towns and villages in the vicinity of the project.

Items of Aboriginal and historic significance and potential impacts are discussed section 8.10.

## 2. Project justification

### 2.1 Project need

The foundations of many of the towers along Feeder 940 are a “grillage” design, which uses steel bars and plates attached to the leg that are direct buried in the ground. Figure provides an example of an excavated grillage foundation.

Because the steel tower legs, bars and plates are in contact with soil, the grillage footings are at risk of rust/corrosion damage. Given the age of many of these towers and based on a series of inspections, there is concern regarding the integrity of the foundations.

Tower footings inspections identified that a number of the towers along the feeders were at a high risk of a loss of strength or integrity, and it was recommended that a program to refurbish the footings be initiated.

Test excavations carried out some years ago at a number of other towers along this feeder identified that all the grillage foundations had complete loss of their original galvanizing coating. Many of the grillage foundations had also suffered a significant loss of steel thickness.

The proposed refurbishment of these towers is required as without such works there is a risk of a failure of the tower structures. Such a failure would result in the need to shut down part or all of the feeder during any works to reinstate the line. During this time there is potential for interruptions to power supply particularly following the initial failure until any temporary power arrangements can be organised.





**Figure 2 Example of excavated grillage foundation**

## **2.2 Project objectives**

The objectives of the project are as follows:

- To identify towers where refurbishment works are required and to identify the degree of works which are required on a tower-by-tower basis
- To refurbish towers to minimise the risk of a failure due to deteriorated foundations
- To rectify any erosion and sedimentation issues at the proposed tower locations as well as along existing access tracks to these towers
- To minimise impacts on the environment of any refurbishment works.

## **3. Project design requirements**

Based on the identified constraints at the project site and the context within which the project is to be carried out, the following factors have been identified as key to meeting the project objectives:

- network safety – the proposed solution does not present any future safety issues for operations and maintenance personnel or members of the public and it addresses any identified current safety concerns.

- supply security – ensuring that customers power supply in accordance with Endeavor’s obligations under the *Electricity Supply Act 1995*
- environmental impacts – ensuring that any proposed works result in as little impact on the environment as possible
- technical suitability – all relevant design standards must be met

These requirements were considered as part of the options assessment outlined in section 44 in determining which options was the preferred option.

## 4. Consideration of alternatives

### 4.1 Options considered

#### 4.1.1 Option 1 – Do nothing

The ‘do nothing’ option would involve not undertaking the inspection and refurbishment works (as required) on Feeder 940.

#### 4.1.2 Option 2 – Investigation and refurbishment of tower locations

This option would involve completing investigation works at the identified tower locations to determine which need refurbishment works as well as the level of works required. It is noted that the nature of any refurbishment works at each tower would be determined following the onsite investigations and that this may include consideration of options which are not discussed in this document. All refurbishment options are however considered to have similar environmental impacts including the area in which they would impact.

### 4.2 Assessment of options

#### 4.2.1 Option 1

This option was not considered acceptable given the assessed condition of the existing assets and the risk of a potential structural failure. This risk of failure would result in Endeavour not satisfying their obligations under the *Electricity Supply Act 1995* to provide a safe and reliable supply of electricity.

#### 4.2.2 Option 2

This option while resulting in some environmental impacts (discussed further in section 8), would reduce the safety risk associated with a potential tower failure and the potential impacts to power supply in the Blue Mountains or potentially other areas of NSW. Any adverse environmental impacts are considered minimal with most works associated with this option being in already disturbed areas along the easement, at the tower locations and along access tracks currently providing access to the easement. Many of the impacts would also be limited to the relatively short construction period at each location.

### 4.3 Preferred option

The preferred option is Option 2 which involves the inspection and refurbishment of tower structures. This option is the preferred option as it would reduce the risk of a tower failure which may come about due to the deterioration of the existing foundations. While this option involves greater environmental impacts these are minimal and are outweighed by the benefits of the project to reduce the risk of a tower failure.



## 5. Community consultation

### 5.1 Statutory consultation

Consultation was undertaken in accordance with the statutory requirements outlined in *State Environmental Planning Policy (Transport and Infrastructure) 2021* and the *Electricity Supply Act 1995*. The details of the requirement for this consultation and any responses received are outlined in the below sections.

#### 5.1.1 State Environmental Planning Policy (Transport and Infrastructure) 2021

A review of the project against the consultation requirements outlined in *State Environmental Planning Policy (Transport and Infrastructure) 2021* (Transport and Infrastructure SEPP) has been undertaken. In accordance Clause 2.15 of the Transport and Infrastructure SEPP, it is a requirement to notify NSW National Parks and Wildlife Service (NPWS) due to the works in proximity to a National Park or Reserve.

NPWS were notified on 6 September 2022 of the proposed works for towers 6, 10, 14, 16 and 18 that are located within Blue Mountains National Park and tower 94 which is in the Marrangaroo National Park.

A response was received from NPWS on the 23 September 2022, with the comments raised in this response outlined in Table along with any response or details of where they have been addressed in the REF.

**Table 1 NPWS responses to Transport and Infrastructure SEPP consultation**

Comment	Response
It would be useful if the extent of the planned excavation for this stage could be described.	Endeavour Energy would continue to consult with NPWS and once a construction contractor is onboard more details regarding the expected excavation required can be provided to NPWS for comment.
Access is via existing tracks, and not in wet weather or when more than 25 mm has fallen in the previous 48 hours.	Access to the towers is proposed to be via all existing tracks currently used by Endeavour to access the easement and towers. Mitigation measures have been included in section 8.8.3.
Monitor the alerts and closure page for each park: <a href="https://www.nationalparks.nsw.gov.au/things-to-do/visitor-centres/blue-mountains-heritage-centre/local-alerts">https://www.nationalparks.nsw.gov.au/things-to-do/visitor-centres/blue-mountains-heritage-centre/local-alerts</a> and <a href="https://www.nationalparks.nsw.gov.au/visit-a-park/parks/marrangaroo-national-park/local-alerts">https://www.nationalparks.nsw.gov.au/visit-a-park/parks/marrangaroo-national-park/local-alerts</a>	Monitoring of alerts would form part of the planning and safety protocols for the selected construction contractor.
Notification will be given to Upper Mountains Area for towers 6,10,14,16 and 18 via email to <a href="mailto:npws.uppermountains@environment.nsw.gov.au">npws.uppermountains@environment.nsw.gov.au</a> and Kanangra Area for tower 94 via email to <a href="mailto:npws.kanangra@environment.nsw.gov.au">npws.kanangra@environment.nsw.gov.au</a> , at least 5 days prior to work commencing to ensure that there is no operational conflicts such as hazard reductions, aerial shooting programs, aerial baiting programs and no access issues.	Notifications requirements are noted and will be passed on to the selected construction contractor. Mitigation measures in section 8.17 have been included to ensure this notification is implemented.

Comment	Response
Sediment and erosion control measures, such as silt fencing, will be installed around areas of excavation.	Erosion and sedimentation would be managed on site in accordance with the Blue Book as outlined in section 8.8.3.
An Aboriginal and Heritage Information Management System check will be completed as a minimum Due Diligence assessment of potential impact on Aboriginal heritage in the vicinity of all towers.	An AHIMS search has been completed and forms part of the assessment on Aboriginal heritage impacts outlined in section 8.10.
No damage to vegetation, such as via parking or movement of machinery off tracks.	The project proposes to not remove any vegetation however some trimming of vegetation along primarily access tracks would potentially be required. This would be undertaken in accordance with the existing maintenance of these tracks. Parking of vehicles is proposed to occur at each tower location with access tracks to be used for parking if required. Mitigation measures outlined in section 8.4.3.

### 5.1.2 Electricity Supply Act 1995

In accordance with Section 45(4) of the *Electricity Supply Act 1995*, which requires any maintenance works to a transmission line to be undertaken only following notification of the works to the local council. Blue Mountains City Council (BMCC) were therefore notified on 6 September 2022 of the proposed works along Feeder 940.

No response has been received within the required 40-day notification period.

## 5.2 Other consultation

Consultation with NPWS and Blue Mountains Council was undertaken to invite them to the site visit undertaken as part of this assessment. Blue Mountains Council attended and provided the following comments:

- Council was supportive of the project and had no major comments
- Council indicated they were potentially willing to take any woody debris that needed to be trimmed from vegetation. This would be used in landscaping work and habitat restoration.

No other consultation has been undertaken to date including with the community. Notifications of the works would form part to the construction planning to be undertaken by the selected contractor.

## 5.3 Resident consultation

All notifications to residents thus far have been verbal. Written notification of the works will be provided following the completion of the works program and the award of the contract to complete the works.

This section of the REF will be updated with any formal responses received from residents.

## 6. Project description

### 6.1 Description of work

#### 6.1.1 Overview

The project involves the refurbishment of the foundations of 25 existing transmission towers located along a section of Feeder 940, located between Lawson at the eastern end and Marrangaroo (west of Lithgow) at the western end. The location of the towers subject to the project are shown in Figure to Figure .

The refurbishment works involve a staged process comprising:

- establishment of site laydown area
- vegetation removal (where required) and excavation of each tower foundation to expose each structural element
- cleaning of the foundation
- visual (condition) inspection and determination of the appropriate refurbishment works
- undertaking the necessary refurbishment works
- backfilling and rehabilitation work.

The potential stages of the refurbishment works are described in sections 6.1.2 to 6.1.6.

The project would also include upgrades of existing access tracks to access each of the transmission towers. Details of these works are outlined in section 6.1.7.

#### 6.1.2 Excavation of tower foundations

Prior to excavation works commencing, any vegetation within 5 metres around the foundation would be removed. Based on the site inspection conducted, this would involve the removal of predominately grasses and small shrubs along with any woody debris and rocks. Where possible, vegetation would be retained onsite for use as part of rehabilitation works (discussed further in section 6.1.6). Further details of existing biodiversity conditions are described in section 8.2.

Excavation works would only be undertaken at one foundation per tower at any one time. Excavation would be undertaken to an initial depth of about 1.5 metres to expose the foundation. If corrosion is found to continue below this depth, further excavation would occur to allow the refurbishment of any section subject to corrosion.

#### Temporary tower leg stabilisation

The excavation of a single tower foundation has the potential to cause stability issues for the tower. To stabilise the tower during any excavation works it is proposed that a stay wire would be attached to the tower leg using slings and connected onto two 2 tonne concrete blocks placed on the ground either side of the foundation being refurbished. These blocks would be positioned within about three metres of the foundation to ensure adequate access to the foundation is maintained. In some locations these blocks may be required to be positioned up to five metres from the foundation.

Water filled jersey kerbs or intermediate bulk containers (IBCs) may be used at locations where access limits the use or installation of concrete type blocks. Any such container must be clean and free of contaminants such that water discharged on site at the completion of the works is not contaminated and does not cause any contamination of land or water.

Other stabilisation methods may be required to be determine on site based on site conditions at each tower location. A potential alternate stabilisation method would include installation of a single or twin ground screw positioned up to five metres from the tower with cable stays attached to the tower.

### 6.1.3 Cleaning of existing foundation

To enable the effective inspection of the foundation, it would be cleaned using sand blasting or similar methods. Methods for cleaning would be confirmed by the contractor and would be required to factor in the presence of lead paints which may or may not have been used on these towers in the past.

### 6.1.4 Visual inspection

A visual inspection of the foundation would be undertaken to determine the overall condition of the foundation and the extent of corrosion. This would involve taking various measurements including measuring the thickness of the remaining foundation steel and determining any significant losses from the 'as installed' condition.

### 6.1.5 Refurbishment

The works to be undertaken to refurbish the foundation would be determined from the following options:

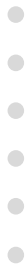
- where the foundation is found to be in a serviceable condition, the foundation elements would be repainted with protective paint.
- where the foundation is found to be in poor condition, the foundation elements would be repaired or replaced as required prior to repainting.

Based on initial non-intrusive investigations undertaken to date and previous works on other sections of the feeder, the project is not expected to require the complete replacement of any foundations due to severe corrosion. Where such works are required, a method would be determined based on the nature of the existing corrosion. An example of such method would include the installation of an alternate twin pile foundation which consists of two foundations either side of the existing foundation. The tower legs would then be placed on a beam installed between the two new foundations.

### 6.1.6 Backfilling and rehabilitation

The foundation would be backfilled using the excavated material which would be stockpiled adjacent to the foundation. In some cases, backfilling may potentially require the importation of material, for example where existing foundations may have been subject to extensive erosion and additional material is required to return the ground to the desired levels. The extent of material required to be imported would be determined by the construction contractor undertaking the proposed works. Any material imported with be clean fill and free of any hazardous or contaminated materials.

Rehabilitation of disturbed areas would occur utilising previously removed vegetation onsite. If this is not possible, revegetation will occur utilising species (typically grasses) which are native to the area.



### 6.1.7 Access tracks

All tower locations are accessible via existing access tracks from nearby public roads. To ensure access is available for the required vehicles and equipment, existing tracks may be required to be upgraded to improve track conditions or remove vegetation encroachment. The access tracks to be used for the project and potentially subject to improvement works are shown in Figure to Figure .

The nature of improvements would be confirmed on site by the contractors and would be based on the condition of tracks and the vehicles which are required access each tower location. Based on initial inspection of the access tracks by Endeavour Energy, improvement works to access tracks are likely to be limited to the following activities:

- minor vegetation removal where vegetation has encroached on existing tracks; this would include primarily the trimming of tree branches
- re-grading of tracks including importation of gravel to rectify any existing issues such as track washouts, eroded areas or waterlogged areas.

It is not expected that widening of any existing tracks would be required as part of the project. All improvement works would be confined to the limits of the original track.

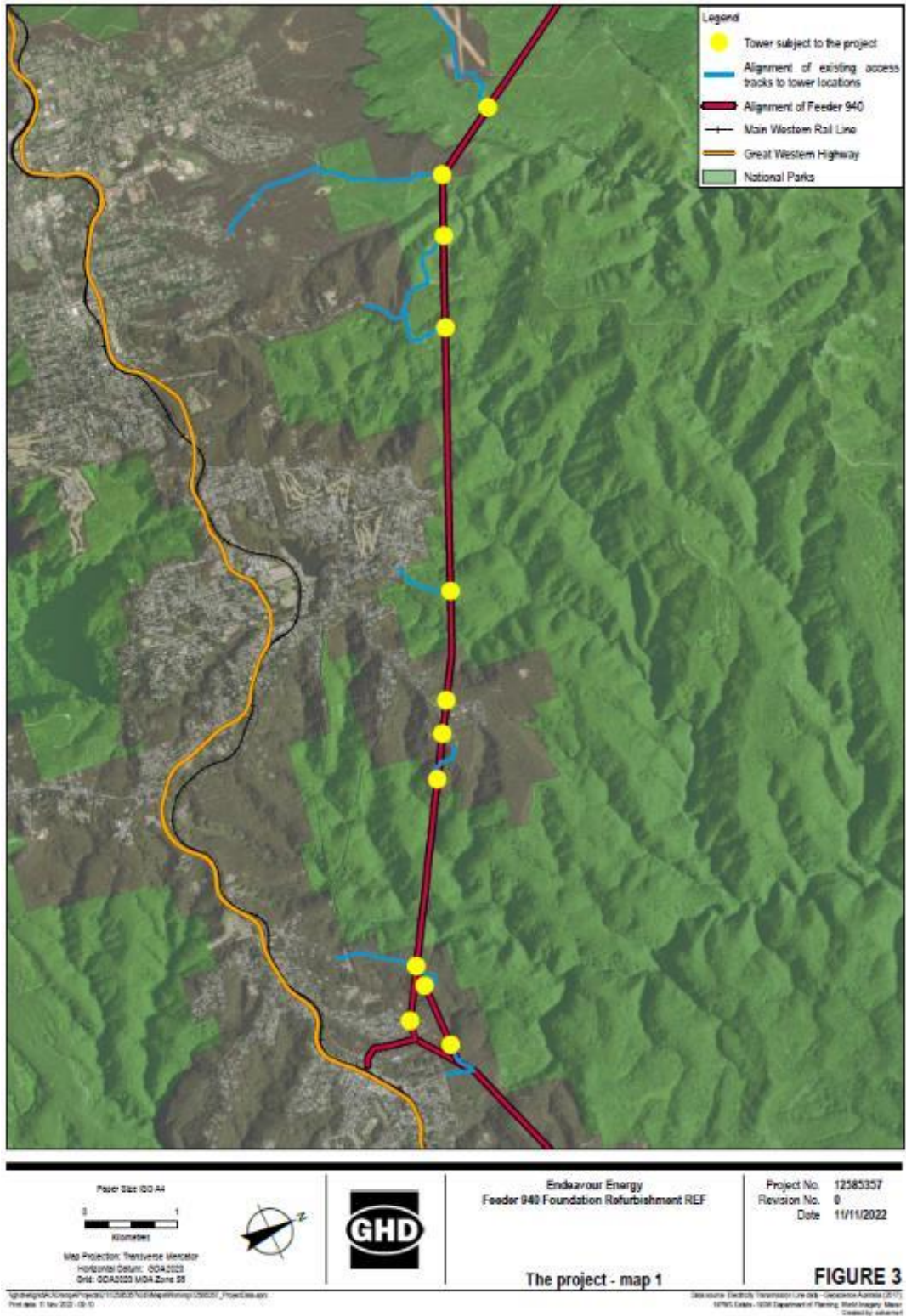


Figure 3 The project – map 1



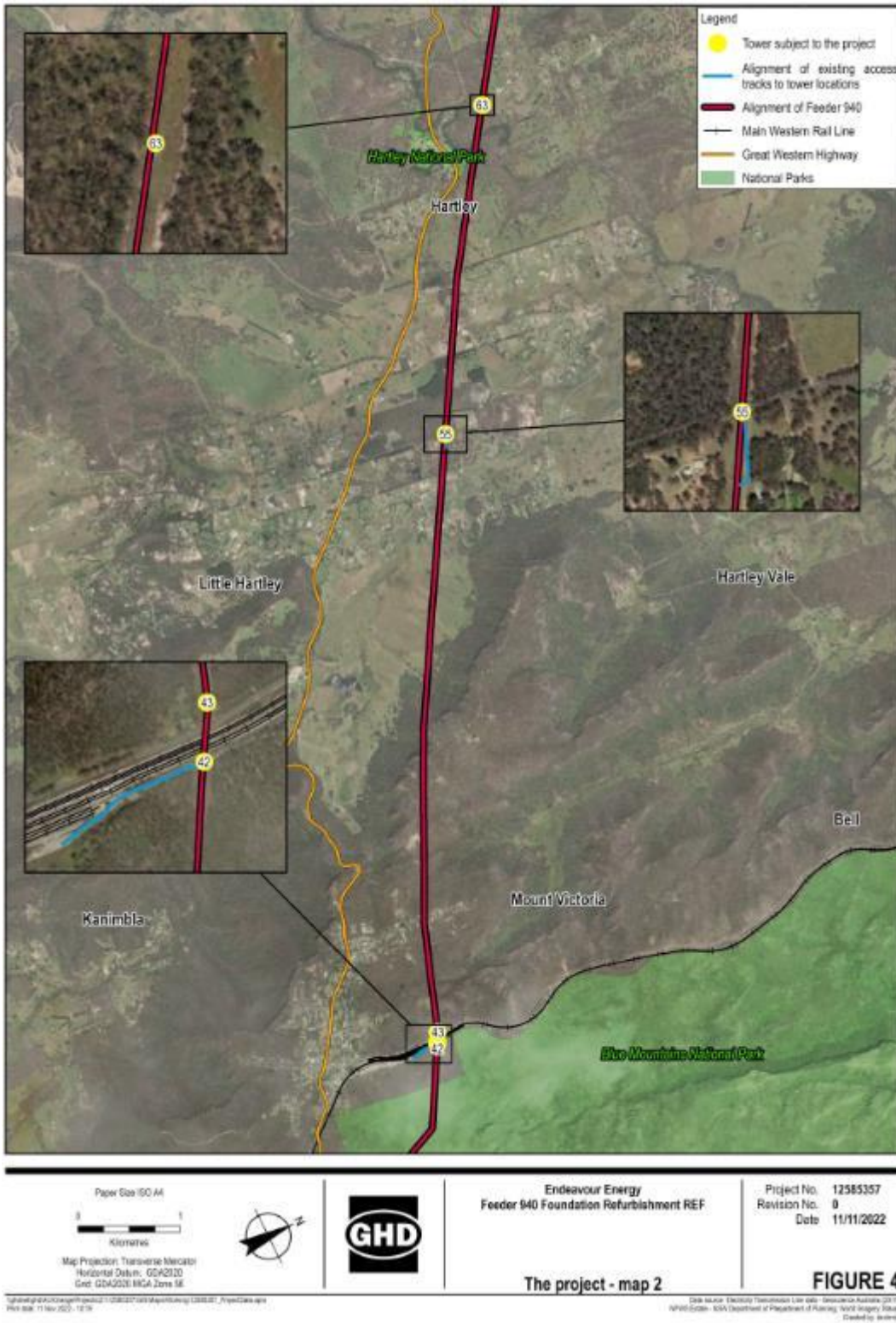


Figure 4 The project – map 2



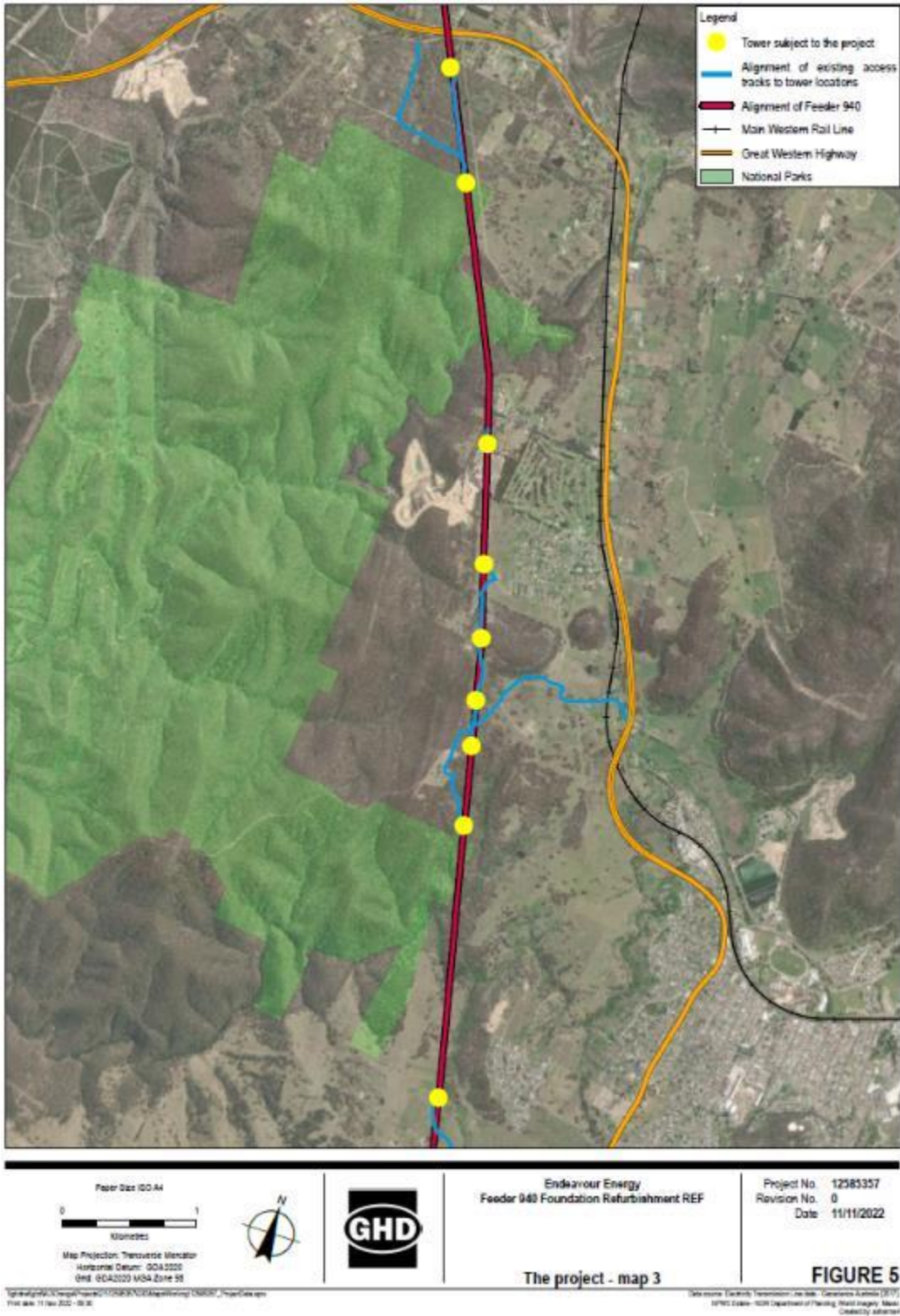


Figure 5 The project – map 3

## 6.2 Timing, duration, hours of work

### 6.2.1 Program

The project is expected to commence in late 2022 or early 2023 subject to all approvals being received as well as weather conditions. The duration of works at any one tower could take from one to four weeks depending on the level of refurbishment works required as well as any works along the access tracks. It is expected that the duration of works at most towers is likely to be up to about two weeks based on the expected refurbishment requirements based on initial investigations undertaken by Endeavour Energy.

The overall duration of the project would be confirmed with the selected contractor who may implement works on multiple towers at any one time, thus reducing the overall program for the project.

### 6.2.2 Hours of work

The project would be undertaken during the recommended standard hours detailed in the Interim Construction Noise Guideline (DECC 2009) as follows:

- Monday to Friday 7am to 6pm
- Saturday 8am to 1pm
- no work Sundays or public holidays.

## 6.3 General construction information

### 6.3.1 Plant and equipment

The plant and equipment likely to be required for the construction of the project would be confirmed during construction planning. The following equipment is anticipated to be required:

- excavator
- 4WD truck with hi-ab crane
- non-destructive digging truck
- compactor
- sand blaster
- concrete anchor blocks
- steel cable
- trailer-mounted air compressor
- generator
- jackhammer
- portable toilet
- trailer mounted water tank
- caravan/portable site office.

### 6.3.2 Construction workforce

The construction workforce is expected to comprise about five staff per tower location. The number of staff required would multiply where work on multiple towers is proposed. The final number of construction workers would be confirmed by the construction contractor during construction planning.

### 6.3.3 Construction traffic and access

#### **Construction access**

Access to the project site would be via existing access tracks which provide access to each tower and are used by Endeavour as part of maintenance activities for the feeder. The location of each track to be used is shown in Figure to Figure . Section 6.1.7 outlines the improvement works required for these access tracks.

#### **Construction traffic**

It is estimated that up to 10 construction vehicles would be used to access each tower per day during construction. This would include a mix of light vehicles for workers and heavy vehicles delivering equipment and materials. The average number of vehicles accessing the site each day would potentially be lower with some vehicles potentially being retained on site overnight.

The project has the potential to be undertaken at multiple towers at any one time (to be confirmed by the construction contractor) by a single work crew moving between sites. Vehicles accessing various work sites across the line are not expected to result in a cumulative increase in vehicles in any one location as vehicles utilising the arterial road network (primarily the Great Western Highway) would represent a very small proportion of vehicles.

### 6.3.4 Ancillary facilities

The project would include the laydown of equipment and materials and parking of construction vehicles at each tower location. Laydown and parking are proposed to occur within the existing cleared easement within five metres of each tower. Existing access tracks may also be used to park vehicles, ensuring that access is always maintained, for example, in the event of an emergency.

The exception to this would be at tower 42 where land within the easement is limited and it is proposed that the laydown area and most vehicles would potentially be in already cleared areas located in the vicinity of Mount Victoria Station (to the south). The exact location to be used at the station will be agreed with Sydney Trains to minimise any impacts to the operation of the rail network at the station (including the adjacent stabling area).

## 6.4 Easement requirements

The project is proposed to be undertaken at the existing tower locations which are located within an existing transmission easement. It is not proposed to modify the existing easement. The project would also not impact upon Endeavour's ability to access the easement at any time with the works to ensure access to and along the easement is always available.

## 7. Environmental legislation

### 7.1 Environmental planning

#### 7.1.1 Planning background

The Code of Practice for ANOs (Authorised Network Operators) and the EP&A Act provides the statutory planning context for environmental assessment and approval of works to be undertaken by an ANO. Endeavour Energy is an ANO.

The EP&A Act defines two approval processes depending on whether a proposal, or components of it, is considered an “Activity” (addressed under Part 5 of the EP&A Act) or a “Development” (addressed under Part 4 of the EP&A Act).

The Code requires an ANO to classify its proposals into one of six possible assessment classes. The Code applies to Class 3, 4, 5 and 6 proposals only.

**Class 3:** requires the preparation of a Summary Environmental Report (SER) refers to projects which are expected on a reasonable basis to be minor and neither extensive or complex.

**Class 4:** requires the preparation of an REF and refers to projects which are expected on a reasonable basis to have impacts which go beyond minor, can be extensive and/or complex and at the discretion of the ANO be a project for which it is deemed appropriate to prepare, such as a project which may generate considerable public interest.

**Class 5:** refers to projects as defined in Class 4 above, but also require the preparation of a Species Impact Statement (SIS)

**Class 6:** refers to projects which are “likely to significantly affect the environment” and therefore an EIS is required.

On 14 June 2017, Endeavour Energy was transacted and became an ANO. Endeavour Energy is now a privately managed network business, in accordance with the *Electricity Networks Assets (Authorised Transactions) Act 2015* and is subject to “*The Code of Practice for Authorised Network Operators*” gazetted in September 2015 under Section 198(1)(c) of the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation). The Code is deemed to be in force until it is revoked or varied in accordance with the EP&A Regulation.

The NSW Government has prescribed the ANOs as “Prescribed Determining Authorities” for the purposes of Part 5 Section 5.6 of the EP&A Act and the definition of “public authority” under Section 4(1) of that Act. This prescription allows an ANO to be a Part 5 Determining Authority for the purposes of an electricity transmission or distribution network.

While Part 5 Activities do not require development consent under Part 4 of the EP&A Act, consideration of an Activity’s environmental impact is required under Section 5.5 of that Act. This is accompanied by Section 5.7, which requires an EIS to be prepared if an Activity is likely to significantly affect the environment.

Section 198(1)(c), in Division 6 of the EP&A Regulation provides that The Code may make provision for or with respect to the exercise by an ANO of its functions under Section 5.5 of the EP&A Act in respect of

“the exercise by an authorised network operator of its functions under the Act”. Section 198(1)(c) outlines the types of activities this section applies to as follows:

- development for the purposes of the construction, maintenance or operation of a transacted electricity transmission or distribution network.
- geotechnical investigations relating to a transacted electricity transmission or distribution network.
- environmental management and pollution control relating to a transacted electricity transmission or distribution network.
- access for the purposes of the construction, maintenance or operation of a transacted electricity transmission or distribution network.
- temporary construction sites and storage areas, including batching plants, the storage of plant and equipment and the stockpiling of excavated material.

As a Determining Authority, an ANO can assess and self-determine Activities that are not likely to significantly affect the environment and are conducted for and on behalf of the ANO for the purposes of electricity transmission or distribution.

By virtue of an ANO’s status under the Transport and Infrastructure SEPP, certain of its activities will be subject to Chapter 2, Part 2, *Division 5, Subdivision 1- Electricity Transmission or Distribution Networks* - of the State Environmental Planning Policy (Transport and Infrastructure) 2021 (Transport and Infrastructure SEPP) for the purposes of development connected with electricity transmission or distribution.

These are outlined below:

*Under “Clause 2.44 Development permitted without consent”*

*(1) “Development for the purpose of an electricity transmission or distribution network may be carried out by or on behalf of an electricity supply authority or public authority without consent on any land. However, such development may be carried out without consent on land reserved under the National Parks and Wildlife Act 1974 only if the development—*

*(a) is authorised by or under that Act, or*

*(b) is, or is the subject of, an existing interest within the meaning of section 39 of that Act, or*

*(c) is carried out on land to which that Act applies over which an easement has been granted and is not contrary to the terms or nature of the easement, or*

*(d) is an electricity work to which section 53 of the Electricity Supply Act 1995 applies.*

The Transport and Infrastructure SEPP’s definition of an “electricity transmission or distribution network” includes the following components:

*(a) Above or below ground electricity transmission or distribution lines (and related bridges, cables, conductors, conduits, poles, towers, trenches, tunnels, ventilation and access structures)*

*(b) Above or below ground electricity kiosks or electricity substations, feeder pillars or transformer housing, substation yards or substation buildings.*

The aim of the Transport and Infrastructure SEPP, Chapter 2 Infrastructure is to facilitate the effective delivery of infrastructure across the State, through increased regulatory certainty, improved efficiency and flexibility in the location of infrastructure and service facilities, while still providing adequate stakeholder consultation.

### 7.1.2 Project Classification

## 7.2 Land use zoning

The project traverses the Blue Mountains and Lithgow City local government areas and therefore the following two local environmental plans (LEPs) apply to the site:

- *Blue Mountains Local Environmental Plan 2015* (BM LEP)
- *Lithgow Local Environmental Plan 2014* (Lithgow LEP).

Table outlines the land use zones and land use permissibility for the relevant LEP.

**Table 2 Land use zoning under relevant LEP**

Zone	Relevant LEPs	Permissibility
C1 National Parks and Nature Reserves	BM	Prohibited
C2 Environmental Conservation	BM	Prohibited
C3 Environmental Management	BM	Prohibited
C4 Environmental Living	BM and Lithgow	Prohibited
R2 Low Density Residential	Lithgow	Prohibited
RU1 Primary Production	Lithgow	Prohibited

Under the BM LEP and Lithgow LEP, the project is located within prohibited intersecting zones. Clause 5.12 of these LEPs state that the Plan does not restrict or prohibit, or enable the restriction or prohibition of, the carrying out of any development, by or on behalf of a public authority, that is permitted to be carried out with or without development consent, or that is exempt development, under Chapter 2 of the Transport and Infrastructure SEPP.

As outlined in section 7.1.1, under section 2.44(1) of the Transport and Infrastructure SEPP, development for the purpose of an electricity transmission or distribution network may be carried out by or on behalf of an electricity supply authority or public authority without consent on any land. As outlined in section 7.1, Endeavour Energy is a Determining Authority for the purposes of an electricity transmission or distribution network therefore the project is permitted without consent within the above zones due to the application of the Transport and Infrastructure SEPP.



### **7.3 Electricity Supply Act 1995**

The *Electricity Supply Act 1995* (Electricity Supply Act) defines Endeavour's licencing requirements and provides a framework for the development and maintenance of electrical infrastructure. In summary, it allows Endeavour Energy to trim and remove trees, carry out works on public roads and acquire land. The Act also requires that works (other than routine repairs or maintenance works) must not be undertaken unless a minimum of 40 days' notice is supplied to the relevant local council. Any submission received must be considered by Endeavour. Details of this consultation which has been undertaken is outlined in section 5.1.2.

### **7.4 Protection of the Environment Operations Act 1997**

The *Protection of the Environment Operations Act 1997* (POEO Act) is the key piece of environmental protection and pollution control legislation in NSW. All work potentially resulting in pollution must comply with the POEO Act.

Electricity transmission is not listed as a schedule activity under Schedule 1 of the POEO Act and therefore an Environment Protection License is not required for the project.

### **7.5 Biodiversity Conservation Act 2016**

The BC Act seeks to conserve biological diversity at bioregional and State scales; to maintain the diversity and quality of ecosystems and enhance their capacity to adapt to change and provide for the needs of future generations; to assess the extinction risk of species and ecological communities and identify key threatening processes through an independent and rigorous scientific process; and to establish a framework to avoid, minimise and offset the impacts of proposed development and land use change on biodiversity.

The BC Act lists species, populations and ecological communities to be considered in deciding whether there is likely to be a significant impact on threatened biota, or their habitats. If any of these could be impacted by the project, an assessment of significance that addresses the requirements of Section 7.3 of the BC Act must be completed to determine the significance of the impact.

The project is not expected to impact upon any species, populations or ecological communities listed under the BC Act as outlined in section 8.2.

### **7.6 National Parks and Wildlife Act 1979**

The project is partially located on land contained within the Blue Mountains and Marrangaroo National Parks which are reserved under the *National Parks and Wildlife Act 1974* (NPW Act) and therefore the NPW Act applies to the site.

The project is permissible under the NPW Act in accordance with Section 39 of the NPW Act which states that the reservation of land does not impact the uses permitted under existing interest. Given the transmission line and the associated easement and access tracks are considered existing interests, the project is therefore considered permissible under the NPW Act.

Table outlines the consistency of the project with the objects of the NPW Act, while Table outlines the consistency of the project against the management principles for national park areas. The project is consistent with both the objects of the act and the management principles for a national park area.



In accordance with Section 81(4) of the NPW Act, all works within National Parks estate must be in accordance with the plan of management for the relevant park or reserve. The project is consistent with the Blue Mountains National Park Plan of Management and the Marrangaroo National Park Statement of Management Intent as the works involve the upgrade of the existing transmission line and would not impact upon the operation of either national park.

This REF has been prepared with consideration of Development adjacent to National Parks and Wildlife Service lands: Guidelines for consent and planning authorities (NPWS 2020).

**Table 3 Consistency with the Objects of the *National Parks and Wildlife Act 1974***

Object	Consistency with object
(a) the conservation of nature, including, but not limited to, the conservation of—	
(i) habitat, ecosystems and ecosystem processes, and	Impacts on native vegetation in the project site are considered minimal with no vegetation removal proposed and only some minor trimming of vegetation along access tracks used to access the transmission line and associated easement. Impacts on biodiversity are discussed further in section 8.2.
(ii) biological diversity at the community, species and genetic levels, and	The project is not considered to reduce the biodiversity in the locality with impacts likely to be limited to areas already disturbed because of past establishment of the transmission line and associated easement and access tracks. Impacts on biodiversity are discussed further in section 8.2.
(iii) landforms of significance, including geological features and processes, and	The project site is not considered to contain any landforms of significance with work areas located in landforms which were modified during the establishment of the transmission line and associated easement and access tracks.
(iv) landscapes and natural features of significance including wilderness and wild rivers,	The project is not in an area declared to be wilderness or wild river.
(b) the conservation of objects, places or features (including biological diversity) of cultural value within the landscape, including, but not limited to—	
(i) places, objects and features of significance to Aboriginal people, and	As outlined in section 8.10, the likelihood of Aboriginal heritage items is considered limited due largely to the past disturbance of the site due to the establishment of the transmission line and the associated easement and access tracks.
(ii) places of social value to the people of New South Wales, and	The project site is not considered a place of social value to the people of NSW.

(iii) places of historic, architectural or scientific significance,	The project would occur in the curtilage of the World and National Heritage listed Greater Blue Mountains Area and a number of other items. The impacts on heritage are discussed in greater detail in section 8.10.
(c) fostering public appreciation, understanding and enjoyment of nature and cultural heritage and their conservation,	The project would ensure that the existing transmission line can continue to provide electricity supply to the Blue Mountains area including many facilities which are used by the public.
(d) providing for the management of land reserved under this Act in accordance with the management principles applicable for each type of reservation.	The consistency of the project with the management principles for a national park area (as outlined in clause 30I of the NPW Act) are detailed in Table .

**Table 4 Consistency with the management principles for national park area**

Management principles	Consistency with principles
(a) the conservation of biodiversity, the maintenance of ecosystem function, the protection of geological and geomorphological features and natural phenomena and the maintenance of natural landscapes	The project would not remove any vegetation with any impacts limited to some vegetation trimming along access tracks which forms part of the existing maintenance of the tracks. Biodiversity impacts are discussed further in section 8.2.
(b) the conservation of places, objects, features and landscapes of cultural value	The project is not expected to impact upon any items of heritage (both Aboriginal and non-Aboriginal heritage) as outlined in section 8.10.
(c) the protection of the ecological integrity of one or more ecosystems for present and future generations	The project would not remove any vegetation with any impacts limited to some vegetation trimming along access tracks which forms part of the existing maintenance of the tracks. Biodiversity impacts are discussed further in section 8.2.
(d) the promotion of public appreciation and understanding of the national park's natural and cultural values	The project would not impact upon the public's appreciation of the national parks.
(e) provision for sustainable visitor or tourist use and enjoyment that is compatible with the conservation of the national park's natural and cultural values	The project would not provide any tourist uses and would also not impact upon any such uses. The project would ensure that electricity supply can be maintained to such facilities across the Blue Mountains through avoiding any unexpected failure of a tower which would potentially impact upon electricity supply to any tourist land uses.
(f) provision for the sustainable use (including adaptive reuse) of any buildings or structures or modified natural areas having regard to the conservation of the national park's natural and cultural values	The project would not alter any buildings. The project would not result in any modification of natural areas which are not already modified due to the establishment of the transmission line and associated easement and access tracks.

(f) (a) provision for the carrying out of development in any part of a special area (within the meaning of the Hunter Water Act 1991) in the national park that is permitted under section 185A having regard to the conservation of the national park's natural and cultural values,	The project is not located within a special area.
(g) provision for appropriate research and monitoring.	The project would not result in a change of the research and monitoring potential of the national parks as works would be to an existing transmission line.

## 7.7 Heritage Act 1977

The *Heritage Act 1977* (Heritage Act) provides protection for items of State heritage significance that are listed on the State Heritage Register, as well as for unlisted archaeological relics. Section 57 of the Heritage Act requires that works proposed for items protected by the Heritage Act are approved by the Heritage Council of NSW or its delegates, as appropriate.

The project is potentially located within the curtilage of the Blue Mountains Walking Tracks which is listed on the State Heritage Register under the Heritage Act. Remediation works are expected to be undertaken along the track which forms part of this listing (track to towers 2 and 3).

As outlined in section 8.10.2, impacts on this track would occur and potentially impact upon the item's significance. However, as the proposed works would be limited to the upgrade of these existing tracks (which are currently used as access to the easement), the proposal is considered comply with the following exemptions under the Schedule of Standard Exemptions to Subsection 57(1) of the Heritage Act:

- Standard Exemption 1 Maintenance and cleaning: This includes the maintenance of an item (that is, an access track) to ensure its continued use as an access and walking track
- Standard Exemption 2 Repairs to non-significant fabric: this includes the maintenance for sections of the track which contain no significant fabric.

As outlined in section 8.10.3, mitigation measures are proposed that any works along the track to towers 2 and 3 is reviewed by an archaeologist with any significant fabric to be identified and avoided. Where avoidance is not possible as part of the track upgrade works, works are to be halted in this location and a section 60 application sort for any impacts on the fabric.

## 7.8 Environment Protection and Biodiversity Conservation (EPBC) Act, 1999

Under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) a referral is required to the Australian Government for proposed actions that have the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land.

The matters of national environmental significance are addressed in Appendix A with any impacts on these matters also considered in Chapter 8 of this REF.

The assessment of the project's impact on matters of national environmental significance and the environment of Commonwealth land found that there is unlikely to be a significant impact on relevant matters of national environmental significance or on Commonwealth land. Accordingly, the project has not been referred to the Australian Government Department of Agriculture, Water and the Environment under the EPBC Act.

The project is located adjacent to the Greater Blue Mountains World Heritage Area (GBMWhA). The project will not have an impact on this listing, as outlined in section 8.10.

## 7.9 Summary of other legislative requirements

Table outlines the other legislative requirements which apply to the project during the construction and operation of the project.

**Table 5 Other legislative requirements relevant to the project**

Legislation	Authority	Responsibility	Requirement	Comment
EP&A Act 1979	Endeavour Energy	Endeavour Energy	The projects REF is to be prepared to meet the environmental assessment requirements of Part 5, Division 5.1 of the EP&A Act	REF prepared in accordance with Part 5 of the EP&A Act
EP&A Regulation 2021	Endeavour Energy	Endeavour Energy	Consideration – Cl 171 (2) of the factors to consider regarding the impact of an activity on the environment.	See Clause 171 (2) considerations.
Contaminated Land Management Act 1997	NSW EPA	Principal Contractor/Endeavour Energy	Notification – s60 by a person whose activities have contaminated land or a landowner whose land has been contaminated is required to notify OEH when they become aware of the contamination.	If contamination is identified, the duty to report would be triggered as appropriate.
Rural Fires Act 1997	NSW Rural Fire Service (RFS)	Principal Contractor/Endeavour Energy	Consideration – s63 public authorities must take all reasonable steps to prevent the occurrence and minimise the spread of bushfires on or from lands vested in or under its control/management.	See section 8.6

## 8. Environmental Impact Assessment

### 8.1 Section 171 (2) considerations

For the purposes of Part 5 of the *EP&A Act* and in accordance with the Code, the factors or aspects to be taken into account when consideration is being given to the likely impact of an activity are outlined in Section 171(2) of the Environmental Planning and Assessment Regulation 2021. A review of the project against these considerations has been undertaken and can be found in Appendix A.

## 8.2 Biodiversity

### 8.2.1 Methodology

#### Desktop assessment

A desktop assessment was carried out to create a list of threatened species, populations and ecological communities (biota) listed under the BC Act, and MNES listed under the EPBC Act that could be expected to occur in the locality based on previous records, known distribution ranges, and habitats present. The desktop assessment involved searching the following:

- NSW BioNet species sighting search (DPE, 2022a) for records of threatened species listed under the BC Act and EPBC Act which have been recorded within 10 km of the transmission line.
- Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) Protected Matters Search Tool (PMST) online database (DCCEEW, 2022a) for MNES listed under the EPBC Act which may occur within 10 km of the transmission line, as well as nationally important wetlands
- NSW State Vegetation Mapping Version C1.1 (DPE, 2022b) mapping was reviewed to determine if any plant community types (PCTs) commensurate with threatened ecological communities (TECs) listed under the BC Act or EPBC Act occur within or adjacent to the transmission line
- NSW WeedWise (DPI, 2022) to identify priority weeds in the Greater Sydney and Central Tablelands local land service regions and weeds of national significance (WoNS)
- NSW Vegetation Classification Database (DPE, 2022c)
- NSW Threatened Biodiversity Profile Search (DPE, 2022d)
- Commonwealth Online Species Profiles and Threats (SPRAT) Database (DCCEEW, 2022b).

The results of the desktop assessment informed the field survey as described in the following section.

#### Field survey

A three-day, diurnal field survey was carried out between and 31 August and 2 September 2022, by three GHD ecologists accompanied by Endeavour staff. The field survey involved the following methodology:

- diurnal bird survey – involved recording bird species either observed or heard at each site
- flora survey – involved targeted survey for those threatened flora species that were detectable at the time of the field survey
- opportunistic observations of fauna – involved opportunistically recording fauna species that were heard calling or were seen at each site
- habitat assessment – involved assessing the quality of potential habitat for threatened fauna and flora at each site.

## 8.2.2 Existing environment

### Flora

#### *Plant community types*

All access tracks and the areas under and around each tower have been previously cleared as part of establishment of the transmission line and the associated easement and access tracks. Existing regional vegetation mapping (DPE, 2022b)R was accessed as part of the desktop assessment to identify the PCTs likely to be present around each tower location and their associated access tracks. This vegetation mapping was ground-truthed during the field survey. Table provides a summary of the PCTs present at each tower and associated access track. In some instances, there are multiple PCTs around towers, or their access tracks were adjacent to multiple PCTs, as shown in Table 6.

**Table 6 Plant community types at tower locations**

Plant community type	Tower number
PCT3578 (Blue Mountains Low Heathy Woodland)	1
PCT3617 (Sydney Hinterland Peppermint-Apple Forest)	2
PCT3622 (Sydney Hinterland Yellow Bloodwood Woodland)	3, 17
PCT3694 (Upper Blue Mountains Ridgetop Woodland)	6, 8, 10, 14, 16, 17, 18
PCT3863 (Upper Blue Mountains Mallee Heath)	10, 14, 16, 17, 18
PCT3929 (Blue Mountains Swamp Heath)	14, 17
PCT3692 (Upper Blue Mountains Moist Forest)	18,
PCT3735 (Central Tableland Peppermint Shrub-Grass Forest)	55, 83, 85, 94, 96
PCT3348 (Southern Tableland Granites Ribbon Gum Grassy Forest)	63
PCT3369 (Central Tableland Ranges Peppermint-Gum Grassy Forest)	63
PCT3367 (Central Tableland Granites Grassy Box Woodland)	83, 94, 96
PCT3747 (Southern Tableland Western Hills Scribbly Gum Forest)	94, 96
Exotic vegetation (no PCT attributed)	2A, 7, 42, 43, 79, 85, 86, 87, 88, 90

#### *Threatened ecological communities*

Of the PCTs outlined in Table , only one is commensurate with a threatened ecological community (TEC); Blue Mountains Swamp Heath (PCT 3929). This PCT aligns with the Blue Mountains Swamps in the



Sydney Basin Bioregion vulnerable ecological community as listed under the BC Act, and the Temperate Highland Peat Swamps on Sandstone endangered ecological community as listed under the EPBC Act.

This community is located directly adjacent to towers 14 and 17, and their associated access tracks. Towers 3, 10, 16 and 18 and/or their access tracks are in proximity (less than 30 metres away) to this PCT.

#### Threatened flora

One threatened flora species was recorded during the field surveys; Needle Geebung (*Persoonia acerosa*), listed as Vulnerable under the BC Act and EPBC Act. This species was found in two populations along the access track at tower 1 and west of tower 7. *Persoonia acerosa* plants growing west of tower 7 were at least 10-15 m away from the access track and tower whilst individuals growing near tower 1 were located next to the access track.

Several other threatened flora species have been previously recorded within the locality of the transmission line, including Smooth Bush-Pea (*Pultanaea glabra*), which has been previously recorded to the south of tower 3. No individuals of *Pultanaea glabra* were located around the access tracks or towers during the field survey. No other threatened flora species were recorded during field surveys. An assessment of the likelihood of other threatened flora species occurring within the project footprint has been included in Appendix B.

#### Weeds

A number of plant species identified as priority weeds listed under the NSW *Biosecurity Act 2015* for the Greater Sydney and Central Tablelands regions (which encompass the transmission line), and weeds of national significance (WoNS) were recorded within disturbed areas along the existing transmission line easements, around the towers as well as along access tracks. Few weeds were encountered within National Park land. Table lists the priority weeds and WoNS that were encountered during the field survey.

**Table 7 Weed species recorded**

Common name	Scientific name	Priority weed	Weed of National Significance
African Boxthorn	<i>Lycium ferocissimum</i>	Y	Y
African Lovegrass	<i>Eragrostis curvula</i>	Y	N
Blackberry	<i>Rubus fruticosus</i> species aggregate	Y	Y
Fireweed	<i>Senecio madagascariensis</i>	Y	Y
Pampas Grass	<i>Cortaderia selloana</i>	Y	N

## Fauna

### *Threatened fauna*

One species of threatened fauna was recorded; the Gang-gang Cockatoo (*Callocephalon fimbriatum*). A pair were observed foraging within vegetation adjacent to tower 3. This species is vulnerable under the BC Act and endangered under the EPBC Act. No other threatened fauna species were observed during field surveys, however no targeted threatened fauna searches were completed.

Based on the results of the desktop assessment, numerous threatened fauna species have been previously recorded or are predicted to occur within the locality of the transmission line. An assessment of the likelihood of occurrence of other threatened fauna species occurring within the study area has been included in Appendix B.

### *Migratory species*

No migratory species listed under the EPBC Act were observed within the study area during field surveys. The desktop review identified several species with the potential to occur in the study area, based on the habitats present.

Migratory species may forage within the study area on occasion or may utilise habitats within the study area on an intermittent or transient basis but are unlikely to rely on any habitats within the study area.

Important habitat for migratory birds is defined in the significance criteria for listed migratory species (DotE, 2013) as follows:

- Habitat utilised by a migratory species occasionally or periodically within the region that supports an ecologically significant proportion of the population of the species
- Habitat that is of critical importance to the species at particular life-cycle stages
- Habitat utilised by a migratory species which is at the limit of the species range
- Habitat within an area where the species is declining.

The study area is not considered important habitat for any of these species, according to the significant impact criteria for migratory species (DotE, 2013).

### *Fauna habitats*

There was a variety of potential habitat for common and threatened fauna species present around many of the towers. This is summarised in Table 8.

Outside of the National Park, many of the existing access tracks that lead to towers, as well as tracks along the existing easement are used by recreational four-wheel drivers and dirt bikers on a regular basis, and tracks within the National Park are used regularly by bushwalkers and mountain bikers (with tyre marks observed during the field survey). It is likely that any fauna species that use habitats within and adjacent to the existing transmission line easement and along the associated access tracks are habituated to some degree of disturbance, given the regular maintenance of vegetation within the easement and along access tracks, and visitation by recreational users.

Of note, was the occurrence of one *Bursaria spinosa* subsp. *lasiophylla* plant approximately 50 metres north of tower 55. This plant is a native shrub that comprises the food source for the larvae of Purple Copper Butterfly (*Paralucia spinifera*), which is listed as Endangered under the BC Act, and Vulnerable

under the EPBC Act). To survive in an area, the Purple Copper Butterfly relies upon the presence of *Bursaria spinosa* subsp. *lasiophylla*, and an attendant ant species, *Anonychomyrma itinerans*. The field survey completed to date was insufficient to confirm or exclude the presence of the Purple Copper Butterfly or the attendant ant species. The one specimen of *Bursaria spinosa* subsp. *lasiophylla* observed was in an area unlikely to be disturbed during the works, and Tower 55 is below an elevation of 850 metres above sea level (776 metres) at which point the Purple Copper Butterfly is unlikely to occur. However, care should be taken to avoid impacts to any other individuals of *Bursaria*, should they be located within the area of proposed works.

**Table 8 Fauna habitat**

Fauna habitat type	Description
Cleared areas	All towers have previously been completely cleared around their bases, and now support some regrowth native and exotic grass within about five metres of each tower. In areas within urban settings, that is, towers 2A, 7 and 8, as well as locations where access tracks ran under the easement, the surrounding land was also mostly cleared of native or intact vegetation. These areas consisted of disturbed areas of predominantly exotic grassland typically with infestations of African Lovegrass ( <i>Eragrostis curvula</i> ). These areas provide low quality habitat for most fauna species, with only species that are capable of persisting in disturbed areas that lack floristic and structural diversity, such as birds including the Jacky Winter ( <i>Microeca fascinans</i> ) and Australian Raven ( <i>Corvus coronoides</i> ). It is likely that common reptiles such as skinks and snakes also use these areas as basking habitat. They may also support potential hunting habitat for raptors and large forest owls on occasion.
Rocky habitat and woody debris	Rocky habitat, in the form of partially embedded rocks, or small piles of loose rock was present at the base of many towers. Woody debris including sticks and logs of various sizes was present at some towers. Piles of rocks and woody debris provides potential habitat for a range of fauna species, such as invertebrates and reptiles. Woody debris that is close to large tracts of contiguous, intact native vegetation may also contribute to perching habitat for small woodland birds.
Heath, shrubland, regrowth and native grassland	Heath and shrubland vegetation were present alongside several access tracks, and areas of low, regrowth vegetation was present around several of the towers, presumably because of ongoing easement maintenance, slashing and impacts association with previous construction works. Intact stands of heath vegetation were present along the access route to tower 14. Regrowth in the easement was especially dense around towers in, or near, National Park land, especially towers 1, 2, 6, 10, 17 and 18. Areas of heath, shrubland and regrowth vegetation may provide foraging and refuge habitat for small birds, such as honeyeaters, and mammals. Small patches of native grass were present around the legs of some towers, for instance at towers 1 and 18. This may provide limited refuge habitat for small mammals and lizards. Any areas with <i>Bursaria spinosa subsp. lasiophylla</i> west of the Blue Mountains at altitudes of more than 850 metres (NPWS 2001; DPE, 2022d) may provide potential habitat for the Bathurst Copper Butterfly. A single <i>Bursaria spinosa subsp. lasiophylla</i> individual was identified 30 metres away from tower 55, however none were identified within the project footprint.
Swamps	No towers are within swamps, however, some towers are near swampy areas and several access tracks run close to swamps, and bisect small, first order drainage lines, with some tracks waterlogged at the time of the field survey. Towers 14 and 17, and their access tracks, were mapped as surrounded by PCT3929 while towers 3, 10, 16 and 18, and their access tracks, were in proximity to PCT3929. Swampland is likely to provide habitat for the threatened Giant Dragonfly ( <i>Petalura gigantea</i> ) and the Blue Mountains Water-skink ( <i>Eulamprus leuraensis</i> ) whilst bogs on areas of sandstone escarpment, such as near tower 14, is potential habitat for the Red-crowned Toadlet ( <i>Pseudophryne australis</i> ).

Fauna habitat type	Description
Forests and woodlands	Large expanses of woodland and forest surrounded many of the access track routes and towers, especially those located in Blue Mountains National Park and at towers 94 and 96. This vegetation is likely to support a range of species, including threatened birds, microbats, and arboreal mammals.
Dams	A dam was located downslope of tower 79. This area had dense sedges and rushes, including <i>Juncus spp.</i> . The dam would provide potential habitat for frog species as well and a watering source for fauna and refuge for small birds including the Superb Fairy-wren ( <i>Malurus cyaneus</i> ).

### 8.2.3 Potential impacts

#### Construction

The project assumes a worst-case disturbance area of no more than five metres from the base of each tower. These areas have been previously cleared of vegetation and now provide minimal habitat for threatened flora or fauna. Work would be undertaken to upgrade existing access tracks to each tower, entirely within the extent of the footprint of the existing access tracks to enable access for construction plant and vehicles. Track upgrade works would involve trimming of vegetation where required, however no permanent removal of vegetation would be needed.

#### *Vegetation removal and threatened flora*

Vegetation to be removed by the project comprises non-threatened native and exotic grasses that have grown around the towers. There are no stands of intact native vegetation within the proposed area of impact, with any vegetation present already subject to existing easement maintenance activities to maintain the necessary safety clearance required. No threatened flora species were identified within the proposed area of impact, nor is any habitat present for any threatened flora within the five-metre disturbance area around the tower bases.

A small amount of native vegetation would be trimmed along the edges of existing access tracks to allow access for plant and machinery travelling to and from each tower site. No trees would be removed during construction, with only overhanging branches from trees and shrubs to be trimmed. Similar clearing already occurs along these tracks as part of existing track maintenance works.

Vegetation trimming has the potential to impact *Persoonia acerosa* that was recorded growing close to the access track to tower 1 (see Figure ). Mitigation measures would be implemented to minimise impacts to this species (see section 8.2.4). The population of this species growing 10 to 15 metres away from tower 7 is far enough away to not be impacted. An assessment of significance for impacts on *Persoonia acerosa*, pursuant to Section 7.3 of the BC Act, was undertaken and the impact determined to not be significant (refer to Appendix B).





### *Impacts to fauna habitat*

Minimal habitat for most fauna species was present at each tower site, with habitats present limited to some partially embedded rocks, small rock piles and small amounts of woody debris around the tower bases. Some occurrences of self-recruited native and exotic plant species would also be impacted at the base of towers. These habitat resources would be impacted during construction, potentially reducing available habitat for less-mobile terrestrial fauna species such as reptiles, which are not able to easily relocate away from disturbance. It is anticipated that any threatened fauna species using habitats in surrounding areas would do so as part of a larger home range and would not rely on the habitats present within the access tracks or at the base of towers for their ongoing persistence in the locality, given regular disturbance associated with easement and access track management and use by bushwalkers, four-wheel drivers and dirt bike riders.

Large quantities of comparable or better-quality habitat are present throughout surrounding areas, particularly within National Park lands. Therefore, it is unlikely that any threatened species rely on habitat around towers for their continued presence within the locality, and no threatened species are likely to experience a significant impact because of impacts to these habitat features. Mitigation measures are recommended in section 8.2.4 to minimise impacts to these habitat features and the species that may use them.

Habitat resources alongside access tracks are more plentiful, with areas of intact native vegetation present adjacent to many tracks. Impacts would be restricted to the existing access track footprints, with no permanent clearing of native vegetation or fauna habitats required. There would be some trimming of vegetation along some tracks to enable access for plant and machinery needed to complete the proposed works. Any such impacts are in line with the existing maintenance operations carried out along the tracks from time to time, and do not represent a new, or additional impact.

Upgrades to existing access tracks have the potential to impact small, unnamed watercourses, where they intersect access tracks, such as at tower 96, along with other waterbodies such as bogs and seeps. Access track upgrades may involve activities such as 'gravelling', which involves laying coarse gravel over waterlogged or boggy portions of a track. Any such works would be restricted to areas where tracks have degraded to a point where bogs threaten safe passage. These works may lead to erosion and sedimentation, if not adequately managed. Mitigation measures are included in section 8.2.4 to minimise impacts associated with these works.

This project would not result in any increase to fragmentation or isolation of fauna habitats, given all works would be within the footprint of the existing transmission line, easement, and access tracks. The proposal would not impact habitat connectivity and no new barriers to movement would be created because of the proposal.

### *Impacts to threatened ecological communities*

One TEC was identified close to areas of proposed works; Blue Mountains Swamps in the Sydney Basin Bioregion listed as a vulnerable ecological community under the BC Act, which is also commensurate with the Temperate Highland Peat Swamps on Sandstone endangered ecological community listed under the EPBC Act (see section 8.2.2).

The proposal would not result in direct impacts to this TEC, and, assuming all recommended mitigation measures are adopted and implemented, the risk of any indirect impacts would also be minimised. All works would be completed in areas of existing infrastructure; within the existing easement, access tracks or around the base of existing towers, with no new or additional permanent removal of vegetation required.

An assessment of significance pursuant to Section 7.3 of the BC Act has been completed for this TEC (Appendix B) and impacts are not expected to be significant. As the community is listed as a 'vulnerable' ecological community under the EPBC Act, assessment against the *Matters of National Environmental Significance Significant impact guidelines 1.1* (DotE 2013) is not required.

#### *Impacts to threatened fauna*

One threatened fauna species was identified during surveys; the Gang-gang Cockatoo, with a pair foraging in native vegetation observed near tower 3. It is not anticipated that this species, or any other threatened fauna species, would be directly impacted during the proposed works.

The proposed works have the potential to result in temporary disturbance to areas of marginal habitat (comprising areas previously impacted during construction of the transmission line, easement and access tracks, and areas already subject to regular and ongoing maintenance of the infrastructure) for several threatened fauna species, through an increase in visitation, noise and vibration, as well as potential trimming of some vegetation along access roads during the proposed works. None of the threatened fauna species that may occur within the locality would be likely to depend on habitats present within the area of works for their continued persistence within the locality. Instead, species may use habitats present in response to favourable conditions or as part of a larger home range.

Some less-mobile, common native fauna species may use the habitats within the area of works on a more regular basis, such as the Common Skink (*Lampropholis guichenoti*). The proposed works may result in the mortality of some of these less-mobile species such as small reptiles or invertebrates that cannot readily relocate from the areas of disturbance, however any such impact would be unlikely to impact on such a large proportion of any local populations that it would threaten their continued persistence in the local area.

The proposal would require minimal impacts to native vegetation or habitat resources of relevance to any threatened fauna species with the potential to occur in the locality. No hollow-bearing trees, stags or intact native vegetation would be impacted by the proposal.

#### *Indirect impacts*

Possible indirect effects of the project on flora and fauna include:

- Erosion, sedimentation and accidental spills: Erosion and sedimentation would be most likely to cause impacts in areas near surface waterbodies or in sites that are upslope of waterways. Safeguards to minimise runoff and erosion would need to be implemented and retained throughout construction at each tower. Spills and accidental release of chemicals are unlikely but would also need to be managed with appropriate safeguards. In doing so, the risk of this would be further minimised.
- Dispersal of weeds and pathogens: Weeds are present at many of the towers. These include priority weeds such as Blackberry and Fireweed. Pathogens like Chytrid Fungus may also be present in the areas the towers are located, especially at locations that have been degraded. Weeds and pathogens may be spread via workers and equipment moving between sites. As a result, safeguard measures to ensure adequate site hygiene are necessary to minimise transmission of weeds and pathogens into new areas, especially sensitive sites located within the Blue Mountains National Park.
- Light and noise: Workers would create noise and light disturbance during construction. This may disturb fauna in areas adjacent to the towers. However, as all work would be constructed during the day, this is unlikely to pose a substantial impact for fauna.

Mitigation measures for all potential indirect impacts are described in section 8.2.4.

### Operation

It is not anticipated that any additional impacts to threatened biota would occur post-refurbishment, given the proposal is for upgrades to existing infrastructure. After completion of refurbishment at each tower leg, any potential habitat resources, such as rocks or large woody debris, which are within the area of works would be relocated to a suitable location outside of the area impacted by construction. This would minimise the need for any future disturbance to potential habitat features, such as when maintenance activities occur periodically. Maintenance works would be very minor in nature and take place infrequently and generally would not require ground or vegetation disturbance and instead would involve routine inspections of towers. The usage of access tracks may also cause erosion in areas that are waterlogged. However, as vehicles using these would only drive them occasionally, it is unlikely to increase sedimentation in waterways and would not be likely to impact threatened biota or ecological communities. Any ongoing maintenance of the towers and access tracks will be conducted in accordance with Endeavours EMS0012 *Notification of access to National Parks and Water NSW Special and Controlled Areas*.

### 8.2.4 Mitigation measures

Table describes the mitigation measures which would be implemented to ensure potential impacts to biodiversity values are minimised.

**Table 9 Mitigation measures – biodiversity**

Potential impact	Mitigation measures
Impacts to native vegetation and habitat	<p>Project specific biodiversity mitigation measures will be developed before the commencement of construction as part of the CEMP. Measures will be implemented before, during and after construction to avoid and mitigate impacts to flora and fauna within the study area. The CEMP will include the following measures:</p> <ul style="list-style-type: none"> <li>• A designated project ecologist with wildlife handling/fauna catcher qualifications should be present for all works within the National Park, to provide clear instructions and guidance on any sensitive areas where impacts should be minimised, and to rescue and relocate any fauna species within the area of proposed works.</li> <li>• No machinery, plant, vehicles or site staff would be permitted into vegetated areas adjacent to the area of proposed works. All plant, machinery, vehicles and site staff would be restricted to existing cleared and disturbed areas within the existing transmission line easement. At tower 14 and 17, additional care should be taken not to impact on the adjacent sensitive vegetation. If considered necessary by the project ecologist or Endeavour environmental representative, exclusion zones should be established around the perimeter of the work zone to clearly designate areas where site staff are not permitted to enter.</li> <li>• Any habitat resources that would be disturbed are to be relocated outside the project impact area.</li> <li>• Any fauna found prior to or during clearing will be relocated to nearby vegetation with suitable habitat features (e.g. logs, large rocks).</li> <li>• No clearing of vegetation is to occur outside of the existing access tracks and existing cleared areas around the towers.</li> <li>• No areas of rocky habitat outside of the existing access tracks and existing cleared areas around the towers would be impacted.</li> </ul>

Potential impact	Mitigation measures
	<ul style="list-style-type: none"> <li>• Locations of <i>Persoonia acerosa</i> near tower 1 would be marked as 'no go areas' prior to construction, appropriate signage and fencing erected and no vegetation trimming, or other access track work undertaken at, or within 5 metres of, these marked locations.</li> <li>• No impact to any areas of habitat not marked for removal would occur.</li> <li>• All staff would be inducted and informed of the limits of vegetation clearing and the areas of vegetation to be retained.</li> <li>• If any unexpected, threatened flora or fauna not considered in this ecological assessment are identified in the project site, work will cease immediately, and the environmental specialist will be contacted.</li> </ul>
Spread of weeds	<p>Project specific weed and pest mitigation measures will be developed before the commencement of construction (as part of the CEMP). Measures will be implemented before, during and after construction to prevent the establishment and/or spread of weeds within and beyond the study area. As there are priority weeds and WoNS present in the site, these will need to be specifically considered when drafting the CEMP. The CEMP will include the following measures:</p> <ul style="list-style-type: none"> <li>• The weed management plan will include: <ul style="list-style-type: none"> <li>– a description of the weed for identification purposes, including a description of its relevance to the site</li> <li>– specific function of the weed, including flowering and seeding periods</li> <li>– identified risk of spread</li> <li>– identification of specific management measures for individual weed control</li> <li>– limits of movement during construction to reduce spread to areas of high-quality habitat.</li> </ul> </li> <li>• Weeds including priority weeds and WoNS will be identified and controlled prior to any earthworks commencing to assist in minimising spread of pest plants and WoNS.</li> <li>• Vehicle and machinery wash/brush downs will be required to ensure that weed species are not spread to non-infested areas, particularly prior to entry to land within the National Park.</li> <li>• No machinery, light vehicle, or construction staff access to adjacent vegetated areas would occur, to minimise the risk of spread of weeds to sensitive areas.</li> <li>• When transporting weed waste from the site to the waste facility, trucks must be covered to avoid the spread of weed-contaminated material. Disposal must be documented, and evidence of appropriate disposal must be kept.</li> <li>• Protocols to prevent introduction or spread of chytrid fungus should be implemented following Department of Primary Industry and Environment's Hygiene Guidelines for Wildlife (DPIE, 2020).</li> </ul>

## 8.3 Noise

### 8.3.1 Existing environment

Noise levels at most of the project locations are typical of natural landscape with limited noise sources in proximity. At locations located closer to urban area background noise levels increase slightly with standard urban noise sources such as vehicles on surrounding roads and household noise. Background noise levels at locations in or near urban areas while increased compared to those in isolated areas are still considered to be low due to the limited noise sources present.

Towers 42 and 43 would be subject to infrequent rail noise due to their positioning adjacent to the Main Western Rail Line. Some noise from Mount Victoria Station (announcements etc) and the stabling yard north of the station may also contribute to noise in this location.

The project is in isolated areas with no nearby sensitive receivers. Works at towers 2A, 7, 8, 43, 55, 79, 88 and 90 are near residential receptors with the closest being the dwellings at tower 2A which is about 10 metres from the nearest receiver.

### 8.3.2 Potential impacts

#### Construction

Noise impacts during construction have the potential to disturb sensitive receivers located near the project. Construction noise would be associated with construction vehicle movements and the operation of plant and equipment for the following activities:

- clearing vegetation along access tracks.
- regrading of access tracks
- excavation of tower foundations
- sandblasting of existing tower foundations
- backfilling excavated tower foundations
- rehabilitation of tower sites.

Construction noise and vibration impacts would be short term (about four weeks at any single tower location) and would not permanently affect the community and surrounding environment. Noise and vibration impacts would be limited to the construction period and would occur over short durations when the construction equipment is operational. Noisy equipment would be required at each located during excavation activities of the foundation. Outside of these times noise levels are expected to be lower while refurbishment works are determined and completed. Noise impact may increase at locations where refurbishment works would include replacement of steel structures however the likelihood of such works being required and extensive is considered minimal. Elevated levels of noise due to construction-related activities would occur and mitigation measures would be implemented to reduce impacts as far as reasonably practicable. Noise impacts would occur during the day with no proposed night works. Where night works are required approval from Endeavour would be required prior to the works occurring.

The above-described impacts would only likely be present at the towers outlined in section 8.3.2 due to their proximity to urban areas.

Vibration impacts have the potential to be experienced where works are in very close proximity to homes. The nature of the proposed works means that the risk of vibration is minimal due to the short duration of any vibratory works associated with excavation of the foundations.

#### Operation

The project is not expected alter the operation of the transmission line and therefore noise impacts are not expected to differ from the existing situation.

### 8.3.3 Mitigation measures

Table describes the mitigation measures which would be implemented to ensure noise and vibration impacts are minimised.

**Table 10 Mitigation measures – noise and vibration**

Potential impacts	Safeguard measures
Noise disturbance to residents from construction activity.	Works must be carried out within the standard construction work hours, unless otherwise approved (see next). This includes the movement of vehicles in and out of work areas.
Potential out-of-hours works – to comply with wide/heavy load permit requirements.	For out-of-hours works, contact S&E not less than three weeks in advance of such works and refer to EE Environmental Guidelines Handbook.
Construction noise from machinery and equipment	Plant and vehicles would be turned off when not in use
Construction noise from machinery and equipment	All plant and equipment will be appropriately maintained to ensure optimum running conditions, with periodic monitoring.
Construction noise from machinery and equipment	Noise-emitting plant will be directed away from sensitive receivers, where possible.
Noise impacts from vehicle movements	Use of exhaust brakes on heavy vehicles would be minimised when in residential areas
Impacts on nearby receivers	Potentially affected residents would be contacted at least two weeks prior to the commencement of works and would be informed of the project, working hours, and the period of construction. Residents would also be provided with a contact name and number should they wish to register any complaints.

## 8.4 Traffic and access

### 8.4.1 Existing environment

The Great Western Highway, a classified state road, runs generally south of the feeder between Lawson and South Bowenfels. with the exception between Hartley and South Bowenfels where the feeder crosses the highway multiple times where the highway turns north towards Marrangaroo. The Great Western Highway is the sole access across the Blue Mountains in the vicinity of the project with all towns and villages relying upon this road for access.

Traffic volumes data obtained from Transport for NSW's *Traffic Volume Viewer* indicates average daily vehicle numbers using the Great Western Highway between Mount Victoria and South Bowenfels are in the region of 11,700 vehicles per day (in 2022) as total in both directions. About 20 per cent of vehicles are heavy vehicles. Historical traffic data also suggests that east of Katoomba movements along the highway have been measured in the vicinity of 30,000 vehicles (total of both directions)

Access to the project would be via residential streets to the proposed existing access tracks providing access to the feeder. These residential streets are all accessed off the Great Western Highway or in the case of towers 42 and 43 off the Darling Causeway (which is also accessed off the Great Western Highway or the Bells Line of Road). Traffic numbers on roads away from the Great Western Highway are typical of residential streets fanning out from a major arterial road.



## 8.4.2 Potential impacts

### Construction

#### *Traffic generation*

The project would result in the generation of traffic which would be required to access the site. As outlined in section 6.3.3, it is estimated that up to 10 construction vehicles would be used to access each tower per day during construction. This would include a mix of light vehicles for workers and heavy vehicles delivering equipment and materials. The introduction of this number of vehicles to the road network in any one location is not expected to cause any impact on the operation of the road network in any one location.

The project has the potential to be undertaken at multiple towers at any one time (to be confirmed by the contractor). This has the potential to increase the traffic generation at any one location on the road network if works location are in proximity to one another. Vehicles accessing various work sites across the line are not expected to result in a cumulative increase in vehicles in any one location as vehicles once on the arterial road network (primarily the Great Western Highway) would represent a very small proportion of vehicles.

#### *Parking*

The project is unlikely to impact upon parking availability at most tower locations as they are located away from any public roads. Where a tower is in or adjacent to an urban area there is potential for parking of worker vehicles in street to reduce the capacity of on-street parking. Where possible vehicles would be parked within the work areas. Where parking on the surrounding streets is proposed this would only occur in areas where sufficient capacity is witnessed.

#### *Access impacts*

Access to towers where works are proposed would be via existing access tracks currently used by Endeavour to access Feeder 940 and the associated easement. Access for the project would be undertaken in line with existing access arrangements used by Endeavour. This includes the following towers which require access via private properties:

- 160 Henderson Road, Wentworth Falls
- 20-26 Dupery Street, Wentworth Falls
- 17C Great Western Highway Bowenfels.

Property access for the project would be arranged with the landowners in advance. Any property access requirements would be communicated to all construction personnel (for example, requirements such as to leave gates as they are found). Private access to these properties would generally not be impacted upon as the towers are located away from any property access points.

The project also has the potential to impact upon access to the easement for Endeavour personnel requiring access for maintenance purposes. Access along some tracks would also be required for Rural Fire Service vehicles as they form part of a network of fire trails used in the event of a fire. Access to the easement is to be always maintained with all tracks to remain accessible particularly to ensure access is available in an emergency. Consultation with Endeavour maintenance and/or emergency staff and the Rural Fire Service would occur throughout construction to confirm any potential access requirements or to communicate any periods in which access along tracks may be impacted.

## Operation

Traffic impacts during operation would be minimal and would be associated with maintenance access which would occur infrequently. This would not represent a change from the existing maintenance activities occurring along the line in terms of volumes and/or frequency.

### 8.4.3 Mitigation measures

Table describes the mitigation measures which would be implemented to ensure impacts to traffic and access are minimised.

**Table 11 Mitigation measures – traffic and access**

Potential impacts	Safeguard measures
General traffic management	Project specific traffic management mitigation measures will be developed within the CEMP in association with Councils and Transport for NSW where appropriate and implemented for the duration of the project.
Traffic generation	Where works on multiple towers on a single access track are proposed, the number of vehicles required to access the site would be minimised where possible. This would include but not be limited to ensuring where possible a single truck or vehicle undertakes deliveries to all towers.
Traffic generation	Vehicle movements (in particularly heavy vehicles) to the project site will avoid peak periods where possible.
Heavy vehicle management	Heavy vehicle routes to the project site and construction compound/stockpile site will be identified and included within the CEMP. All vehicles would then be required to use these designated routes.
Parking in public roads	All construction vehicles shall be legally parked at all times.
Parking along access tracks	Vehicles, plant, machinery and the like shall be parked / stored safely and legally along access tracks. This would include avoidance of parking vehicles in any adjacent vegetation unless in areas within five metres of the towers.
Property access	Vehicular access to all nearby/neighbouring properties shall be maintained as much as practicable at all times.
Impacts on use of existing access tracks by others	Access along access tracks is to be maintained at all times. Consultation with Endeavour, the Rural Fire Service and any other users of the tracks would be undertaken to confirm any known access requirements and to notify them of any planned periods where access along the tracks would be impacted.

## 8.5 Land use

### 8.5.1 Existing environment

The existing feeder is located within an easement which traverses areas of the following land uses:

- vegetated areas including parts located within the Blue Mountains and Marrangaroo national parks
- rural areas which include areas used for agriculture, located between Mount Victoria and Marrangaroo

- urban areas associated with towns and villages located along the Great Western Highway.

### 8.5.2 Potential impacts

The project is not expected to result in any impacts on land use along the easement during construction or operation. Impacts on access to the easement are discussed in section 8.4.2 along with any impacts on private properties.

Where works are in urban area, while direct land use impacts are not considered some amenity-based impacts would be experienced. These amenity-based impacts would include noise, visual and air quality which are discussed in sections 8.3, 8.7 and 8.11 respectively.

### 8.5.3 Mitigation measures

No specific land use mitigation measures are proposed with any amenity based impact to be mitigation through measures outlined in sections 8.3, 8.7 and 8.11.

## 8.6 Safety and hazards

This section outlines hazards and risks relevant to the project, including:

- Bushfires that may impact on the project or be caused by the project
- Electromagnetic fields generated by the project

### 8.6.1 Existing environment

#### **Bushfire**

Most of the project is in a bushland setting which contain areas of vegetation are mapped as bushfire prone land in accordance with the BM LEP and Lithgow LEP mapping. Tower 90 is however not in an area mapped as bushfire prone land.

The transmission line is located within an existing easement that is currently managed by Endeavour and include the clearance of the easement to reduce the risk of the feeder coming into contact with any vegetation and starting a fire.

#### **Electromagnetic fields**

Electromagnetic fields (measured in thousands of volts per metre (kV/m)) are invisible lines of force that surround the earth and any powered electrical appliance or conductor, such as a transmission line. They occur both naturally and because of power generation and are produced every time voltage runs through a wire. The higher the voltage the stronger the electric field is. Electric fields are strongest closest to the wires and their level reduces quickly with distance. Most materials act as a shield or barrier to electric fields.

The existing line is subject to electromagnetic fields however due to the height of the towers along the feeder the existing line is unlikely to cause any risk to the public.

## 8.6.2 Potential impacts

### Construction

#### *Bushfire*

Construction of the project has potential to increase the risk of fires due to

- hot works resulting in ignition of surrounding vegetation
- petrol vehicles operating in long grass
- construction workers smoking or rubbish left at the work site.

The above identified activities have the potential to initiate a bushfire which has the potential to impact on the environment and property. The risk of fires to be ignited because of the project would be minimised through the implementation of mitigation measures in section 8.6.3.

The construction of the project would also be at risk of bushfire caused from off site. Such fires could result in the loss of equipment as well as life of construction workers. The risks associated with a fire originating from off site would be minimise through the implementation of mitigation measures located in section .

#### *Electromagnetic fields*

Electromagnetic fields are not expected to be an issue during construction with any risk associated with the existing line unlikely to result in increased risks to workers or the public.

### Operation

#### *Bushfire*

Following construction of the project, bushfire risks are similar to the existing feeder. The exception to this is that the project would reduce the risk of a tower failure which would potentially occur without the project. Such a failure has the potential to result in the ignition of a bushfire.

#### *Electromagnetic fields*

Following construction of the project, the feeder would operate in the same way that it currently does with the project not considered likely to result in any changes to electromagnetic fields and the risks to the public.

## 8.6.3 Mitigation measures

Table describes the mitigation measures which would be implemented to ensure impacts safety and hazards impacts and risks are minimised.

**Table 12 Mitigation measures – safety and hazards**

Potential impacts	Safeguard measures
Bushfire management	<p>Project specific bushfire prevention and response measures are to be prepared for the project (involving consultation with relevant local fire and emergency services), providing relevant information for fire and emergency service responders and project personnel. The measures should be outlined within the CEMP and should cover</p> <ul style="list-style-type: none"> <li>• measures undertaken to prevent the accidental ignition of bushfires during the project</li> <li>• protocols for the assessment and control of bushfire ignition risks as part of Job Safety Analysis</li> <li>• measures to be undertaken to mitigate the risk of any bushfires that may start, to facilitate fire containment and control</li> <li>• reporting and response actions required in the event a bushfire is detected, or started during project activities</li> <li>• response actions in the event a bushfire, or bushfire smoke, is observed by, or reported to personnel undertaking project activities</li> <li>• response actions required in the event a bushfire alerts (Advice, Watch &amp; Act, or Emergency Warning) affecting the project area is received by either project management personnel, or directly by personnel at work sites via mobile phone notification</li> <li>• controls required when working during the gazetted bushfire danger period and declared Total Fire Ban (TOBAN) days, in accordance with company procedure GAM 0011</li> <li>• triggers and procedures for site evacuation</li> <li>• procedures for providing information and assistance to emergency services responding to bushfires on or threatening project work sites.</li> </ul>
Hot works	Controls required when completing hot work, in accordance with company procedure GSY 0013
Ignition of a fire	Vehicle access onto areas other than on constructed roads and laydown areas prohibited on all days of Severe, Extreme and Catastrophic Fire Danger, at all other times, no parking, equipment laydown or materials storage in long grass.
	Parking of petrol vehicles in long a grass to be prohibited at all times with these vehicles to be parked in cleared areas where possible.
	No smoking on project sites except in designated smoking areas identified in the CEMP
Bushfire protection	Fire extinguisher to be carried on all earthmoving machinery
Safety to workers and residents	Standard OH&S working procedures will be followed.
	Approved information signage is to be erected at the site compound/lay down area and at works locations as works progresses.
	An appropriate project specific risk assessment is to be prepared and submitted to EE HS&E for approval prior to construction commencing.

## Potential impacts

## Safeguard measures

Works are to be conducted in accordance with all relevant EE S&E procedures, EE standards and in accordance with relevant Australian Standards.

## 8.7 Landscape and visual assessment

### 8.7.1 Existing environment

The landscape from Lawson to Mount Victoria is characterised by moderate to very steep slopes of the Blue Mountains Plateau. The topography varies from gently undulating broad crests and ridges to moderate and steep slopes. Gradients vary between five per cent and 35 per cent with elevation ranging from 300 metres to 700 metres. Most of the landscape is covered by dense vegetation and trees.

The landscape from Little Hartley to Marrangaroo is characterised by flat to rounded convex crests and moderate slopes. The topography comprises broad rolling hills and moderate slopes. Gradients vary between 10 per cent and 25 per cent. With elevation ranging from 550 to 1050 metres. The visual landscape comprises grasslands, scattered patches of trees and agricultural landscape features.

The project site is located within an area that is visually sensitive environment because of the surrounding natural and heritage significance of the area however the project is located within an existing easement and is integrated into the landscape. Views of the feeder are limited to users of Blue Mountains National Park and Marrangaroo National Park, and residences located near residential receivers.

### 8.7.2 Potential impacts

#### Construction

Construction of the project would result in the introduction of construction equipment and vehicles into the visual landscape. Any such impacts would be short-term in nature for any one location with works not expected to exceed four weeks at any one location. Most project locations are in isolated locations along the existing easement with limited views of the works from any receptors. Some distant view from receptors may be available particular with work occur along ridges however due to extensive vegetation providing screening and distance to any work location such distant views are considered minimal.

Where the project is in urban areas, views from some receptors would be impacted short term. Due to the natural visual environment and the present of extensive vegetation at properties views of the project from many nearby properties would be completely or partially screened by vegetation. Impacts on these receptors are considered minimal due to the short-term nature of any changes to views.

#### Operation

The project is not expected to result in any impacts to the landscape and visual amenity. The visual amenity of the feeder would be as per the existing situation.

### 8.7.3 Mitigation measures

Table describes the mitigation measures which would be implemented to ensure impacts to visual amenity are minimised.



**Table 13 Mitigation measures – visual amenity**

Potential impacts	Safeguard measures
Site restoration	Site restoration is to be carried out immediately following works
Site management	The construction compound will be left in a clean and tidy state at the end of each working day. Waste is to be disposed regularly [at least weekly] and not allowed to accumulate at site compound areas.
Visual impacts	Fencing with shade cloth of similar to be erected around work areas in urban areas to screen the works as well as provide security for the site.

## 8.8 Water quality, soil erosion and sedimentation

### 8.8.1 Existing environment

#### Soils

The project extends over a large geographical area and is mapped within a number of soil landscapes (eSpade 2022). Soil types vary from sandy and clay loams on crests, upper slopes and well drained areas to clay loams and clay on lower slopes and near drainage lines. Erosion potential of these soils is moderate to high. There are some areas of existing erosion on access tracks and at tower locations. There are no areas mapped with Acid Sulfate Soils (ASS).

#### Contamination

A search of the NSW EPA Contaminated land register, undertaken on 19 August 2022, identified eight notices relating to two sites in the Blue Mountains LGA and eight notices relating to two sites in the Lithgow LGA. None of these sites are near the project with the nearest site being about two kilometres southwest of Tower 79.

It is not known what type of paint coatings are currently applied to the towers. There is potential for the existing paint coatings to contain lead due to the age of the feeder.

#### Water quality

The northern most part of the feeder, between Mount Victoria and Marrangaroo, is located within the Greater Sydney’s drinking water catchment (Warragamba catchment). Water quality in the Blue Mountains LGA varies from fair to excellent, while water quality in tributaries of the Cox’s River are generally excellent which includes Fairy Dell Creek and tributaries of the Grose River generally fair which includes Govetts Creek and Katoomba Creek. Localised water quality in some locations has to be potential to be reduced due to existing erosion issues around some towers and along access tracks.

## 8.8.2 Potential impacts

### **Construction**

#### *Water quality*

Pollutants such as sediment and construction waste have the potential to mobilise and enter drainage lines, particularly during high rainfall events and in areas with steep topography as is present in many locations associated with the project.

Water quality impacts could also potentially occur from fuel or chemical spills from construction equipment. Such impacts are considered minimal as the facilities would be positioned to ensure that any potential leaks would not impact on downstream waters.

The risk of water quality impacts, and the significance of any impacts that may occur, would be minimised by implementing the mitigation measures provided in section 8.8.3.

*State Environmental Planning Policy (Biodiversity and Conservation) 2021* relates to the use of land within the Sydney drinking water catchment. The northern most part of the project site is within the Greater Sydney drinking water catchment (Warragamba catchment). In accordance with section 8.11 of the SEPP, Endeavour is required to consider whether the project would have a neutral or beneficial effect on water quality before carrying out the activity.

A Neutral or Beneficial Effect assessment has been undertaken (refer Appendix C) to determine the impacts of the works on water quality due to the project site being located within the Sydney Drinking Water Catchment. This assessment concluded that the project would have a neutral or beneficial effect on water quality within the Sydney Drinking Water Catchment.

#### *Contamination*

Based on available information the likelihood of contamination being encountered is considered minimal with no known contamination issues at any of the tower locations. There is however a risk that any paint on the existing structure which would be removed using sand blasting or similar could contain lead. In the event such paint is mobilised it has the potential to contaminate surrounding soils and watercourses. Mitigation measures have been proposed to appropriately manage any potential lead paint to be removed as part of the refurbishment works.

### **Operation**

#### *Water quality*

The project is not expected to result in any adverse impacts on water quality along the feeder easement as following construction the easement would be returned to its existing state. The project would however provide a potential benefit as the project would stabilise the existing access tracks and areas around towers which have been subject to erosion that could be contributing to localised impacts on water quality.

#### *Contamination*

The project is not expected to result in any contamination during construction. All paints to be used on the towers as part of the refurbishment works are not considered to pose any contamination risk into the future.

### 8.8.3 Mitigation measures

Table describes the mitigation measures which would be implemented to ensure impacts to water quality and contamination are minimised.

**Table 14 Mitigation measures – Water quality, soil erosion and sedimentation**

Potential impacts	Safeguard measures
General soil and water management	Soil and water management will be implemented as part of the CEMP. The soil and water aspects will identify all reasonably foreseeable risks relating to soil erosion and water pollution and describe how these risks will be addressed during construction. Soil and water management would be prepared in accordance with the Blue Book.
Erosion protection	Erosion prevention and sediment retention/collection are to be implemented as necessary prior to, during and following completion of works.
Tracking of sediment on adjacent road network	Sediment tracking shall be prevented. In the event that tracking does occur, it must be swept up and removed immediately manually or with a street sweeper machine.
Rehabilitation of disturbed areas	Disturbed areas will be resurfaced or revegetated as soon as possible after works have been completed.
Spills and leaks	Spill response kits are to be provided and easily accessible at the work site.
Spills and leaks	EMS 0008 – Environmental Incidence Response and Management will be incorporated into the CEMP. The plan CEMP will include measures to avoid and manage spillages of fuels, chemicals, and fluids into any stormwater inlets and an emergency response procedure.
Spills and leaks	Machinery will be checked daily to ensure there are no oil, fuels or other liquids leaking from the machinery.
Spills and leaks	Refuelling of vehicles and equipment is to be undertaken off-site where possible.
Spoil management	Where it is necessary to store spoil or other loose materials on site, secured catchment and diversionary coir logs are to be installed and maintained along the up slope and down slope sides of the stockpile and/or the stockpile effectively covered.
Spoil management	Spoil is to be managed in accordance with the following EE Standards and the Environmental Guidelines Handbook, all of which are available on the EE's Standards Website, on the Intranet for internal staff and ASP Website for external staff. EMS 0008 – Environmental Incidence Response and Management EMS 0013 – Spoil Management

## 8.9 Hydrology and flooding

### 8.9.1 Existing environment

#### Hydrology

The major watercourses in the Blue Mountains LGA include Wentworth Creek which flows in a north easterly direction towards the Nepean River and the Grose River which flows generally in an easterly direction. The major watercourses in the Lithgow LGA include the River Lett, Farmers Creek and Marrangaroo Creeks which generally run in a south westerly direction toward Cox's River. The feeder traverses creeks and drainage lines that are tributaries of Wentworth Creek, Grose River, and Cox's River. Watercourses in the vicinity of the project area are outlined in Table .

**Table 15 Watercourses in the vicinity of the project**

Area	Tower ID	Creek	Distance from project
Lawson	1	Fairy Falls	Directly west
	2	Dantes Glen Fall	Directly east
Wentworth Falls	10	Blue Mountains Creek	200 m Southwest and east
	10	Frankie Creek	200 m east and west
Leura	14	Wentworth Creek	150 m west
	16, 17, 18	Govetts Creek	160 m west, 230 m south, 170 m northeast
	17 ,18	Katoomba Creek	75 m north, 90 m south
Mount Victoria	43	Fairy Dell	210m north
	42	Grose River	530 m south
Hartley Vale South	55	Unnamed waterbody	160 m south
Hartley Vale North	63	Unnamed creek	40 m southwest
South Bowenfels	70	Unnamed creek	110 m east
Marrangaroo South	83	Farmers Creek	110 m east

#### Flooding

The project is not mapped within areas identified as a flood risk (SEED 2022). Due to the elevated topography of the project area, it is unlikely the project area is subject to any large-scale flooding.

## 8.9.2 Potential impacts

### Construction

Impacts on surface water flows could potentially occur during establishment of work sites for laydown and parking which could result in localised changes to drainage patterns. Worksites would be positioned to ensure impacts to surface hydrology are minimised. Placement of compounds and work sites would be short term and would be limited to a very small area.

Multiple small creeks and drainage channels cross the project area. Following heavy rainfall, there is potential for creeks and drainage lines to flood and may impact access during construction. It is not anticipated there would be impacts to the hydrology of larger tributaries by the project area. There are no works proposed in a watercourse.

Groundwater is unlikely to be intercepted during construction due to the estimated depth of excavations being 1.5 metres.

### Operation

Operation of the project is unlikely to impact on hydrology and flooding. Back filling and rehabilitation of the work sites would return the excavated areas similar to existing conditions and in some case would improve surface water flow as rehabilitation works would include levels of ground to remove any low points at towers and on tracks which have formed because of erosion.

## 8.9.3 Mitigation measures

No specific mitigation measures are proposed to manage surface water or flooding.

## 8.10 Heritage and archaeology

### 8.10.1 Existing environment

#### Aboriginal heritage

A search was undertaken of the Aboriginal Heritage Information Management System (AHIMS) on the 18 August 2022. A total of 73 items were identified as being in close proximity to the project however no items have been identified as occurring within areas subject to the project. Five sites are near works at towers 18, 42, 43 and 63.

Past disturbance of the project site due to the establishment of the feeder and associated easement and access tracks results in the likelihood of items being identified to be minimal.

#### Non-Aboriginal heritage

Searches of the following heritage databases were undertaken on the 16 August 2022:

- NSW State Heritage Register
- State agency s170 registers
- heritage schedules of BM LEP and Lithgow LEP
- Australian Heritage Database.

The results of these searches are identified in Table including the location of these items in relation to the project.

**Table 16 Heritage items at project site or directly adjacent**

Item	Listing	Location
Greater Blue Mountains Area	World Heritage List (105127) National Heritage List (105999)	A total of four towers (towers 10, 14, 16, 18) are positioned within the curtilage of this area. A number of others in the vicinity of Lawson and Wentworth Falls are located outside this area however they are in proximity of upslope for areas forming part of this listing.
Blue Mountains Walking Tracks	State Heritage Register (item 00980) NPWS s170 register	Forms part of access track providing access to towers 2 and 3 including track being near tower 3
		Adjacent to access track to towers 14 and 16 with this track forming an intersection with the track to the abovementioned towers.
		Adjacent to access track to tower 17 with this track forming an intersection with the track to the abovementioned towers.
North Lawson Park	BM LEP (LN032) – locally significant	Tower 1 is located within the curtilage.
Coerwull House	Lithgow LEP (I072) locally significant	Located adjacent to access track to towers 83, 85, 86, 87 and 88

## 8.10.2 Potential impacts

### Aboriginal heritage

The project site is located within an area that has been subject to extensive ground disturbance associated with establishment of the feeder and the associate easement and access tracks. As outlined in section 8.10.1, no Aboriginal sites have been previously recorded in any of the proposed work areas.

The potential for unidentified archaeological deposits to exist within the project site is low as ground disturbance areas would be limited to the location of existing foundations of the towers which have already been disturbed during the construction of the existing towers. Impacts on any unknown Aboriginal heritage items would be minimised through the implementation of mitigation measures outlined in section 8.10.3.

### Non-Aboriginal heritage

The following sections outlined the potential heritage impacts to each of the heritage items in which the project is located within the curtilage. This section considers the impacts during both construction and operation.

#### *Greater Blue Mountains Area*



Works at towers 10, 14, 16 and 18 would occur within the Greater Blue Mountains Areas which is listed under both the World and National Heritage lists.

The listing of the Greater Blue Mountains Area under both the World and National Heritage relates to the area’s natural significance. As the project would be located within areas already modified as part of the establishment of the feeder and the associated easement and access tracks, impacts on these listings is not considered to occur with any impacts on vegetation limited to some trimming of vegetation along tracks. This impact on this vegetation would not represent an impact on the significance of the item as the extremely small area in which the project may impact in comparison to the much larger listed area.

*Blue Mountains Walking Tracks*

This listing includes a number of walking tracks across the Blue Mountains area including a track which forms part of the access track to towers 2 and 3. The project would seek to just utilise these tracks for access, in a similar way to which they are currently used. Depending on ground conditions there is potential that this track would be required to be upgraded to allow access. These upgrades have the potential to impact upon this listing however these works would improve the condition of the track which would allow its continued use as a walking track as well as access track to the easement. Overall, the potential impacts on this item are not considered to impact upon the significance of this track particularly since it is currently used as a vehicular access track and the alignment of the track would not be impacted.

*North Lawson Park*

North Lawson Park is of local significance based on that it is an example of bushland reserve developed with walking tracks by local trustees providing access to waterfalls and other scenic attractions. Impact to this item is limited with the works to be contained to existing tower location and access tracks which are not considered to contribute substantially to the heritage significance of this item.

**8.10.3 Mitigation measures**

Table describes the mitigation measures which would be implemented to ensure impacts to heritage are minimised.

**Table 17 Mitigation measures – heritage**

Potential impacts	Safeguard measures
Unknown heritage items	In the event that unexpected finds occur during any activity within the study area, all works must in the vicinity must cease immediately. The find must be left in place and protected from any further harm. Depending on the nature of the find, the following processes must be followed: <ol style="list-style-type: none"> <li>a. If, while undertaking the activity, an Aboriginal object is identified, it is a legal requirement under Section 89A of the NPW Act to notify Heritage NSW, as soon as possible. Further investigations and an AHIP may be required prior to certain activities recommencing.</li> <li>b. If, human skeletal remains are encountered, all work must cease immediately and NSW Police must be contacted, they will then notify the Coroner’s Office. Following this, if the remains are believed to be of Aboriginal origin, then the Aboriginal stakeholders and Heritage NSW must be notified.</li> </ol>
Aboriginal heritage	All contractors undertaking earthworks on site should be briefed on the protection of Aboriginal heritage objects under the National Parks and Wildlife Act 1974 and the penalties for damage to these items.

Potential impacts	Safeguard measures
Impacts on Blue Mountains Walking Tracks State Heritage listing	The project to where possible avoid the need for track works along track to towers 2 and 3 to avoid any potential impacts to the State heritage listed item.
Impacts on Blue Mountains Walking Tracks State Heritage listing	If track access upgrades are confirmed as required along the access track to towers 2 and 3 a heritage consultant will survey the site to confirm the presence of any significant fabric associated with this listing. Where works are unable to avoid impacts on any significant fabric, a section 60 application would be required. Until this approval is obtained no works impacting on significant fabric would be allowed to commence.

## 8.11 Air quality and dust suppression

### 8.11.1 Existing environment

Air quality along the project site is typical of a bushland landscape with limited pollution sources and is considered to be good. A search of the National Pollutant Inventory (NPI) undertaken on 18 August 2022 for the Blue Mountains and Lithgow local government areas. A total of seven sources were identified which included mining, sewerage, waste facilities and chemical wholesaling activities. None are within proximity to the project area that would impact on air quality.

Other local sources are limited to vehicles along the road network in particular the Great Western Highway. Works in the vicinity of tower 42 and 43 would also potential subject to the source of trains along the Main Western Rail Line.

Nearby sensitive receptors are as described on section 8.3.1.

### 8.11.2 Potential impacts

#### Construction

The project has potential to impact air quality during construction by generating dust from excavation, vegetation clearance, vehicle movements over unsealed tracks and wind blowing stockpiles and exposed surfaces. Operation of construction plant and equipment would also result in additional exhaust emissions.

The above impacts would be short term and temporary as the works would only impact each tower location for a short period of time (a period of up to four weeks). The implementation of mitigation measures outlined in Section 8.11.3 would minimise potential impacts.

#### Operation

It is not expected that of the project would generate air quality impacts. Air quality during operation would be representative of the operation of the existing feeder.

### 8.11.3 Mitigation measures

Table describes the mitigation measures which would be implemented to ensure impacts to heritage are minimised.

**Table 18 Mitigation measures – air quality**

Potential impacts	Safeguard measures
Dust generation during construction	All loads will be covered when carrying loose materials to and from the site.
Dust generation during construction	Disturbed surfaces / spoil stockpiles will be effectively dampened with water or effectively covered with geotextile material or otherwise as necessary to prevent dust emissions from site.
Vehicle emissions	All plant and equipment will be appropriately maintained to ensure optimum running conditions, with periodic monitoring.

## 8.12 Waste generation, storage, handling and disposal

### 8.12.1 Potential impacts

The project is considered to result in limited waste with the following potential waste streams:

- domestic waste from workers such as food scraps and wrappers
- excess spoil not required as part of rehabilitation works, however this is unlikely
- waste from refurbishment works such as paint tins or off cuts of any steel members where structure elements need to be replaced.

Where waste would be reused on site and where not feasible it would be recycled. Any waste which cannot be reused or recycled would be disposed of at an appropriately licenced facility.

### 8.12.2 Mitigation measures

Table describes the mitigation measures which would be implemented to ensure waste impacts are minimised.

**Table 19 Mitigation measures – waste**

Potential impacts	Safeguard measures
Waste management	All waste is to be reused and recycled wherever possible.
Waste management	Waste is to be managed in accordance with EE Standard EMS 0007 Waste Management.
Waste management	Any soil identified as VENM or ENM is to be reused if possible (see Landscape Character and Visual Impacts).
Waste management	Any soil suspected of being contaminated is to be stored and sampled separately, then disposed of to an appropriately licenced facility.
Waste management	All waste is to be disposed of at a facility appropriately licenced to accept that waste.

Potential impacts	Safeguard measures
Waste management	Waste data records will be kept for the project.
Waste management	Waste classification certificates and waste disposal dockets are to be retained for audit purposes.

## 8.13 Climate Change and Greenhouse Gas Emissions

### 8.13.1 Existing environment

#### Climate Change

A desktop assessment of historical climate data and climate change projections from publicly available databases and publications was undertaken on 11 October 2022 which included the NSW Government AdaptNSW. The project is in the Metropolitan and Central West regions of NSW. Climate projections for this region based on climate modelling indicate that the climate experienced in this region will become hotter and drier in the near future (2020 - 2039), and hotter and wetter in the far future (2060-2079) (AdaptNSW 2022).

Temperatures in the locality of the project will likely increase by an average of 0.66 degrees C over the next 20 years and 2.0 degrees C by 2070. Annual rainfall is projected to increase by 2.59 percent over the next 20 years with an increase of 7.38 percent by 2070. Fire danger days, which are defined as the number of days when the Forest Fire Danger Index is greater than 50, are projected to increase by 0.15 days per year over the next 20 years and 0.5 days by 2070.

#### Greenhouse gas emissions

Emission of greenhouse gases is believed to be the main instrument driving increased temperatures and other associated indicators of climate change.

Each greenhouse gas that has been identified by the Intergovernmental Panel on Climate Change has been classified with a global warming potential, the units of which are carbon dioxide equivalents. Some of these gases may be produced during construction and operation of the project

### 8.13.2 Potential impacts

#### Construction

##### *Climate change*

Changes to climate has potential for higher frequency of extreme weather events such and could increase risks of flooding and fire. During construction extreme weather events could lead to localised flooding, erosion of exposed soils and mobilise sediment into waterways. High temperature days could increase potential for generation of dust from excavation works or vehicle movements.

Impacts and management of soils are discussed in section 8.8, impacts and management of surface water is discussed in section 8.9 and impacts on air quality are discussed in 8.11

Mitigation measures provided in section 8.13.3 would minimise any potential impacts.

### Greenhouse gases

It is expected that the greenhouse gases released during construction would be carbon dioxide and nitrous oxide generated from liquid fuel used in plant and vehicles (diesel, petrol) during construction, disposal and transport of materials.

Other emissions during construction would mostly be associated with the materials used along the easement and the vegetation clearing that is required to upgrade and construct new access tracks.

Mitigation measures provided in section 8.13.3 would minimise any potential impacts.

Removing vegetation would result in an increase in carbon dioxide in the atmosphere as the carbon would no longer be stored in this vegetation through carbon sequestration. The loss of a small area of vegetation because of the project is considered unlikely to result in a substantial increase in carbon dioxide in the atmosphere.

### Operation

#### Climate change

Operation of the project would maintain the structural integrity of the transmission line feeder. and prevent failure. Upgrading the access track would address any existing erosion and sedimentation issues.

#### Greenhouse gases

Minimal emissions would be generated during operation as only infrequent maintenance works would occur. The greenhouse gas emissions from the operation of the project would be like the existing transmission line.

### 8.13.3 Mitigation measures

Table 20 describes the mitigation measures which would be implemented to ensure waste impacts are minimised.

**Table 20 Mitigation measures – climate change and greenhouse gases**

Potential impacts	Safeguard measures
Potential to influence Climate Change and GHG emissions	Recycled materials to be considered for use where cost effective and have no effect on engineering properties of the works.
Potential to influence Climate Change and GHG emissions	Material supply and waste transport would be scheduled to optimise full loads and minimise required vehicle trips, where possible. Materials would be sourced from local supplies, where feasible.
Potential to influence Climate Change and GHG emission	Appropriately sized construction equipment, plant and vehicles would be used.
Potential to influence Climate Change and GHG emission	Use of alternative fuels and power sources would be investigated, where appropriate
Potential to influence Climate Change and GHG emissions	All plant and equipment to be turned off when not in use.

## Potential impacts

## Safeguard measures

Potential to influence Climate Change and GHG emissions

Fulfil organisational reporting requirements to the Clean Energy Regulator.

## 8.14 Cumulative impacts

### Construction

A search of the Department of Planning and Environment Major projects website was undertaken for the Blue Mountains and Lithgow LGAs to determine the presence of any major projects in the vicinity of the project. The search did not identify any major projects listed for Blue Mountains or Lithgow local government areas near the project.

The project involves works that are small scale and short in duration. The project is not considered likely to contribute to any cumulative impacts with any other nearby projects.

### Operation

The project is not considered to have any adverse cumulative operational impacts.

## 8.15 Ecologically Sustainable Development

Ecologically sustainable development (ESD) is development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends. The principles of ESD have been an integral consideration throughout the development of the project.

ESD requires the effective integration of economic and environmental considerations in decision-making processes. The four main principles supporting the achievement of ESD are discussed below.

### 8.15.1 Precautionary Principle

The precautionary principle deals with reconciling scientific uncertainty about environmental impacts with certainty in decision-making. It provides that where there is a threat of serious or irreversible environmental damage, the absence of full scientific certainty should not be used as a reason to postpone measures to prevent environmental degradation.

This principle was considered during the options assessment (refer to section 4.1). The precautionary principle has guided the assessment of environmental impacts for this REF and the development of safeguards and management measures.

The preferred option was selected as it can provide long term structural integrity and reduce the risk of tower failure for energy network users and improve access to the tower structures for ongoing maintenance. The project does not pose a risk of serious or irreversible environmental damage. Adverse impacts associated with the project would be short term and minor. Measures to reduce adverse impacts as far as practicable have also been identified within this REF.

Best available technical information, environmental standards and measures have been used to minimise environmental risks. These include several safeguards that have been proposed to minimise potential impacts. These safeguards would be implemented during construction and operation of the project. No safeguards have been postponed because of lack of scientific certainty.



A CEMP would be prepared before construction starts. This requirement would ensure the project achieves a high-level of environmental performance. No mitigation measures or management mechanisms would be postponed because of a lack of information

### 8.15.2 Inter-generational equality

Social equity is concerned with the distribution of economic, social and environmental costs and benefits. Inter-generational equity introduces a temporal element with a focus on minimising the distribution of costs to future generations.

The project would not result in any impacts that are likely to adversely impact on the health, diversity or productivity of the environment for future generations.

The project would assist in meeting Endeavour Energy's obligations under the *Electricity Supply Act 1995* to provide a safe and reliable supply of electricity and would provide valuable information which will assist and refine the development of a fuller program to refurbish or replace the grillage foundations of the remainder of the steel towers on Endeavour's network.

### 8.15.3 Conservation of biological diversity and ecological integrity

The environment in which the project would be undertaken is an existing cleared easement within a bushland setting. A thorough assessment of the existing local environment was undertaken to identify and manage any potential impacts of the project on local biodiversity.

The project would not have a significant impact on biological diversity and ecological integrity. An assessment of the biodiversity impacts and appropriate site-specific safeguards are provided in section 8.2.4.

### 8.15.4 Improved valuation, pricing and incentive mechanisms

The principle of internalising environmental costs into decision making requires consideration of all environmental resources which may be affected by the carrying out of a project, including air, water, land and living things.

The REF has examined the environmental consequences of the project and identified mitigation measures to manage the potential for adverse impacts. The requirement to implement these mitigation measures would result in an economic cost to Endeavour Energy. The implementation of mitigation measures would increase both the capital and operating maintenance costs of the project. This signifies those environmental resources have been given appropriate valuation.

The detailed design has been developed with an objective of minimising potential impacts on the surrounding environment. This indicates that the project is being developed with an environmental objective in mind.

## 8.16 Environmental management

Several mitigation measures have been identified in the REF to minimise adverse environmental impacts, which could potentially arise because of the project. Should the project proceed, these safeguards and management measures would be incorporated into the detailed design and applied during the construction of the project.



A Construction Environmental Management Plan (CEMP) will be prepared to describe the safeguards and management measures identified. The CEMP will provide a framework for establishing how these measures will be implemented and who would be responsible for their implementation.

The CEMP would be developed in accordance with relevant guidelines.

**8.17 Summary of aspects, impacts and mitigation**

Table provide an overview of all the mitigation measures proposed in this REF.

**Table 21 Consolidated list of mitigation measures**

Aspect	Potential impacts	Mitigation measures	Responsibility
Environmental Management	CEMP	This Summary of Mitigation Measures table shall be printed and place in a prominent position on the site notice board or similar.	Project Manager
Environmental Management	CEMP	A site-specific CEMP will be prepared for the project prior to commencement.	Project Manager
Environmental Management	CEMP	As a minimum, this CEMP is to include an ESCP, biodiversity, waste, traffic, bushfire, weed and pest management measures.	Project Manager
Environmental Management	CEMP	The CEMP is to address any environmental issues associated with the locations for establishment of site compounds and laydown areas	Project Manager
Environmental Management	CEMP	The CEMP must be approved by S&E prior to commencing construction.	Project Manager
Construction notification	Consultation with stakeholders	Construction notification is to be provided to relevant stakeholders	Project Manager
Construction notification	NPWS notification	<p>Prior to construction commencing within either the Blue Mountains and Marrangaroo National Parks notification is required as follows:</p> <ul style="list-style-type: none"> <li>to Upper Mountains Area for towers 6,10,14,16 and 18 via email to npws.uppermountains@environment.nsw.gov.au</li> <li>to Kanangra Area for tower 94 via email to npws.kanangra@environment.nsw.gov.au.</li> </ul> <p>This notification is to occur at least five days prior to work commencing to ensure that there is no operational conflicts such as hazard reductions, aerial shooting programs, aerial baiting programs and no access issues.</p>	Project Manager

Aspect	Potential impacts	Mitigation measures	Responsibility
Biodiversity	Impacts to native vegetation and habitat	<p>Project specific biodiversity mitigation measures will be developed before the commencement of construction as part of the CEMP. Measures will be implemented before, during and after construction to avoid and mitigate impacts to flora and fauna within the study area. The CEMP will include the following measures:</p> <ul style="list-style-type: none"> <li>• A designated project ecologist with wildlife handling/fauna catcher qualifications should be present for all works within the National Park, to provide clear instructions and guidance on any sensitive areas where impacts should be minimised, and to rescue and relocate any fauna species within the area of proposed works.</li> <li>• No machinery, plant, vehicles or site staff would be permitted into vegetated areas adjacent to the area of proposed works. All plant, machinery, vehicles and site staff would be restricted to existing cleared and disturbed areas within the existing transmission line easement. At tower 14 and 17, additional care should be taken not to impact on the adjacent sensitive vegetation. If considered necessary by the project ecologist or Endeavour environmental representative, exclusion zones should be established around the perimeter of the work zone to clearly designate areas where site staff are not permitted to enter.</li> <li>• Any habitat resources that would be disturbed are to be relocated outside the project impact area.</li> <li>• Any fauna found prior to or during clearing will be relocated to nearby vegetation with suitable habitat features (e.g. logs, large rocks).</li> <li>• No clearing of vegetation is to occur outside of the existing access tracks and existing cleared areas around the towers.</li> <li>• No areas of rocky habitat outside of the existing access tracks and existing cleared areas around the towers would be impacted.</li> <li>• Locations of <i>Persoonia acerosa</i> near tower 1 would be marked as 'no go areas' prior to construction, appropriate signage and fencing erected and no vegetation trimming, or other access track work undertaken at, or within 5 metres of, these marked locations.</li> <li>• No impact to any areas of habitat not marked for removal would occur.</li> <li>• All staff would be inducted and informed of the limits of vegetation clearing and the areas of vegetation to be retained.</li> </ul>	Contractor

Aspect	Potential impacts	Mitigation measures	Responsibility
		<ul style="list-style-type: none"> <li>If any unexpected, threatened flora or fauna not considered in this ecological assessment are identified in the project site, work will cease immediately, and the environmental specialist will be contacted.</li> </ul>	
	Spread of weeds	<p>Project specific weed and pest mitigation measures will be developed before the commencement of construction (as part of the CEMP). Measures will be implemented before, during and after construction to prevent the establishment and/or spread of weeds within and beyond the study area. As there are priority weeds and WoNS present in the site, these will need to be specifically considered when drafting the CEMP. The CEMP will include the following measures:</p> <ul style="list-style-type: none"> <li>The weed management plan will include: <ul style="list-style-type: none"> <li>a description of the weed for identification purposes, including a description of its relevance to the site</li> <li>specific function of the weed, including flowering and seeding periods</li> <li>identified risk of spread</li> <li>identification of specific management measures for individual weed control</li> <li>limits of movement during construction to reduce spread to areas of high-quality habitat.</li> </ul> </li> <li>Weeds including priority weeds and WoNS will be identified and controlled prior to any earthworks commencing to assist in minimising spread of pest plants and WoNS.</li> <li>Vehicle and machinery wash/brush downs will be required to ensure that weed species are not spread to non-infested areas, particularly prior to entry to land within the National Park.</li> <li>No machinery, light vehicle, or construction staff access to adjacent vegetated areas would occur, to minimise the risk of spread of weeds to sensitive areas.</li> <li>When transporting weed waste from the site to the waste facility, trucks must be covered to avoid the spread of weed-contaminated material. Disposal must be documented, and evidence of appropriate disposal must be kept.</li> <li>Protocols to prevent introduction or spread of chytrid fungus should be implemented following Department of Primary Industry and Environment's Hygiene Guidelines for Wildlife (DPIE, 2020).</li> </ul>	Contractor

Aspect	Potential impacts	Mitigation measures	Responsibility
Noise	Noise disturbance to residents from construction activity.	Works must be carried out within the standard construction work hours, unless otherwise approved (see next). This includes the movement of vehicles in and out of work areas.	Contractor
Noise	Potential out-of-hours works – to comply with wide/heavy load permit requirements.	For out-of-hours works, contact S&E not less than three weeks in advance of such works and refer to EE Environmental Guidelines Handbook.	Contractor
Noise	Construction noise from machinery and equipment	Plant and vehicles would be turned off when not in use	Contractor
Noise	Construction noise from machinery and equipment	All plant and equipment will be appropriately maintained to ensure optimum running conditions, with periodic monitoring.	Contractor
Noise	Construction noise from machinery and equipment	Noise-emitting plant will be directed away from sensitive receivers, where possible.	Contractor
Noise	Noise impacts from vehicle movements	Use of exhaust brakes on heavy vehicles would be minimised when in residential areas	Contractor
Noise	Impacts on nearby receivers	Potentially affected residents would be contacted at least two weeks prior to the commencement of works and would be informed of the project, working hours, and the period of construction. Residents would also be provided with a contact name and number should they wish to register any complaints.	Contractor



Aspect	Potential impacts	Mitigation measures	Responsibility
Traffic	General traffic management	Project specific traffic management mitigation measures will be developed within the CEMP in association with Councils and Transport for NSW where appropriate and implemented for the duration of the project.	Contractor
	Traffic generation	Where works on multiple towers on a single access track are proposed, the number of vehicles required to access the site would be minimised where possible. This would include but not be limited to ensuring where possible a single truck or vehicle undertakes deliveries to all towers.	Contractor
	Traffic generation	Vehicle movements (in particularly heavy vehicles) to the project site will avoid peak periods where possible.	Contractor
	Heavy vehicle management	Heavy vehicle routes to the project site and construction compound/stockpile site will be identified and included within the CEMP. All vehicles would then be required to use these designated routes.	Contractor
	Parking in public roads	All construction vehicles shall be legally parked at all times.	Contractor
	Parking along access tracks	Vehicles, plant, machinery and the like shall be parked / stored safely and legally along access tracks. This would include avoidance of parking vehicles in any adjacent vegetation unless in areas within five metres of the towers.	Contractor
	Property access	Vehicular access to all nearby/neighbouring properties shall be maintained as much as practicable at all times.	Contractor
	Impacts on use of existing access tracks by others	Access along access tracks is to be maintained at all times. Consultation with Endeavour, the Rural Fire Service and any other users of the tracks would be undertaken to confirm any known access requirements and to notify them of any planned periods where access along the tracks would be impacted.	Contractor

Aspect	Potential impacts	Mitigation measures	Responsibility
Safety and hazards	Bushfire management	<p>Project specific bushfire prevention and response measures are to be prepared for the project (involving consultation with relevant local fire and emergency services), providing relevant information for fire and emergency service responders and project personnel. The measures should be outlined within the CEMP and should cover</p> <ul style="list-style-type: none"> <li>• measures undertaken to prevent the accidental ignition of bushfires during the project</li> <li>• protocols for the assessment and control of bushfire ignition risks as part of Job Safety Analysis</li> <li>• measures to be undertaken to mitigate the risk of any bushfires that may start, to facilitate fire containment and control</li> <li>• reporting and response actions required in the event a bushfire is detected, or started during project activities</li> <li>• response actions in the event a bushfire, or bushfire smoke, is observed by, or reported to personnel undertaking project activities</li> <li>• response actions required in the event a bushfire alerts (Advice, Watch &amp; Act, or Emergency Warning) affecting the project area is received by either project management personnel, or directly by personnel at work sites via mobile phone notification</li> <li>• controls required when working during the gazetted bushfire danger period and declared Total Fire Ban (TOBAN) days, in accordance with company procedure GAM 0011</li> <li>• triggers and procedures for site evacuation</li> <li>• procedures for providing information and assistance to emergency services responding to bushfires on or threatening project work sites.</li> </ul>	Contractor
	Hot works	Controls required when completing hot work, in accordance with company procedure GSY 0013	Contractor
	Ignition of a fire	Vehicle access onto areas other than on constructed roads and laydown areas prohibited on all days of Severe, Extreme and Catastrophic Fire Danger, at all other times, no parking, equipment laydown or materials storage in long grass.	Contractor

Aspect	Potential impacts	Mitigation measures	Responsibility
	Ignition of a fire	Parking of petrol vehicles in long a grass to be prohibited at all times with these vehicles to be parked in cleared areas where possible.	Contractor
	Ignition of a fire	No smoking on project sites except in designated smoking areas identified in the CEMP	Contractor
	Bushfire protection	Fire extinguisher to be carried on all earthmoving machinery	Contractor
	Safety to workers and residents	Standard OH&S working procedures will be followed.	Contractor
	Safety to workers and residents	Approved information signage is to be erected at the site compound/lay down area and at works locations as works progresses.	Contractor
	Safety to workers and residents	An appropriate project specific risk assessment is to be prepared and submitted to EE HS&E for approval prior to construction commencing.	Contractor
	Safety to workers and residents	Works are to be conducted in accordance with all relevant EE S&E procedures, EE standards and in accordance with relevant Australian Standards.	Contractor
Visual	Site restoration	Site restoration is to be carried out immediately following works	Contractor
	Site management	The construction compound will be left in a clean and tidy state at the end of each working day. Waste is to be disposed regularly [at least weekly] and not allowed to accumulate at site compound areas.	Contractor
	Visual impacts	Fencing with shade cloth of similar to be erected around work areas in urban areas to screen the works as well as provide security for the site.	Contractor

Aspect	Potential impacts	Mitigation measures	Responsibility
Water quality, soil erosion and sedimentation	General soil and water management	Soil and water management will be implemented as part of the CEMP. The soil and water aspects will identify all reasonably foreseeable risks relating to soil erosion and water pollution and describe how these risks will be addressed during construction. Soil and water management would be prepared in accordance with the Blue Book.	Contractor
	Erosion protection	Erosion prevention and sediment retention/collection are to be implemented as necessary prior to, during and following completion of works.	Contractor
	Tracking of sediment on adjacent road network	Sediment tracking shall be prevented. In the event that tracking does occur, it must be swept up and removed immediately manually or with a street sweeper machine.	Contractor
	Rehabilitation of disturbed areas	Disturbed areas will be resurfaced or revegetated as soon as possible after works have been completed.	Contractor
	Spills and leaks	Spill response kits are to be provided and easily accessible at the work site.	Contractor
	Spills and leaks	EMS 0008 – Environmental Incidence Response and Management will be incorporated into the CEMP. The plan CEMP will include measures to avoid and manage spillages of fuels, chemicals, and fluids into any stormwater inlets and an emergency response procedure.	Contractor
	Spills and leaks	Machinery will be checked daily to ensure there are no oil, fuels or other liquids leaking from the machinery.	Contractor
	Spills and leaks	Refuelling of vehicles and equipment is to be undertaken off-site where possible.	Contractor
	Spoil management	Where it is necessary to store spoil or other loose materials on site, secured catchment and diversionary coir logs are to be installed and maintained along the up slope and down slope sides of the stockpile and/or the stockpile effectively covered.	Contractor

Aspect	Potential impacts	Mitigation measures	Responsibility
Heritage	Spoil management	Spoil is to be managed in accordance with the following EE Standards and the Environmental Guidelines Handbook, all of which are available on the EE's Standards Website, on the Intranet for internal staff and ASP Website for external staff. EMS 0008 – Environmental Incidence Response and Management EMS 0013 – Spoil Management	Contractor
	Unknown heritage items	In the event that unexpected finds occur during any activity within the study area, all works must in the vicinity must cease immediately. The find must be left in place and protected from any further harm. Depending on the nature of the find, the following processes must be followed: <ul style="list-style-type: none"> <li>a. If, while undertaking the activity, an Aboriginal object is identified, it is a legal requirement under Section 89A of the NPW Act to notify Heritage NSW, as soon as possible. Further investigations and an AHIP may be required prior to certain activities recommencing.</li> </ul> <p>If, human skeletal remains are encountered, all work must cease immediately and NSW Police must be contacted, they will then notify the Coroner's Office. Following this, if the remains are believed to be of Aboriginal origin, then the Aboriginal stakeholders and Heritage NSW must be notified.</p>	Contractor
	Aboriginal heritage	All contractors undertaking earthworks on site should be briefed on the protection of Aboriginal heritage objects under the National Parks and Wildlife Act 1974 and the penalties for damage to these items.	Contractor
	Impacts on Blue Mountains Walking Tracks State Heritage listing	The project to where possible avoid the need for track works along track to towers 2 and 3 to avoid any potential impacts to the State heritage listed item.	Contractor

Aspect	Potential impacts	Mitigation measures	Responsibility
Air quality	Impacts on Blue Mountains Walking Tracks State Heritage listing	If track access upgrades are confirmed as required along the access track to towers 2 and 3 a heritage consultant will survey the site to confirm the presence of any significant fabric associated with this listing. Where works are unable to avoid impacts on any significant fabric, a section 60 application would be required. Until this approval is obtained no works impacting on significant fabric would be allowed to commence.	Contractor Project Manager
	Dust generation during construction	All loads will be covered when carrying loose materials to and from the site.	Contractor
	Dust generation during construction	Disturbed surfaces / spoil stockpiles will be effectively dampened with water or effectively covered with geotextile material or otherwise as necessary to prevent dust emissions from site.	Contractor
Waste	Vehicle emissions	All plant and equipment will be appropriately maintained to ensure optimum running conditions, with periodic monitoring.	Contractor
	Waste management	All waste is to be reused and recycled wherever possible.	Contractor
	Waste management	Waste is to be managed in accordance with EE Standard EMS 0007 Waste Management.	Contractor
	Waste management	Any soil identified as VENM or ENM is to be reused if possible (see Landscape Character and Visual Impacts).	Contractor
	Waste management	Any soil suspected of being contaminated is to be stored and sampled separately, then disposed of to an appropriately licenced facility.	Contractor
	Waste management	All waste is to be disposed of at a facility appropriately licenced to accept that waste.	Contractor
	Waste management	Waste data records will be kept for the project.	Contractor



Aspect	Potential impacts	Mitigation measures	Responsibility
	Waste management	Waste classification certificates and waste disposal dockets are to be retained for audit purposed.	Contractor
	Potential to influence Climate Change and GHG emissions	Recycled materials to be considered for use where cost effective and have no effect on engineering properties of the works.	Contractor
	Potential to influence Climate Change and GHG emissions	Material supply and waste transport would be scheduled to optimise full loads and minimise required vehicle trips, where possible. Materials would be sourced from local supplies, where feasible.	Contractor
	Potential to influence Climate Change and GHG emission	Appropriately sized construction equipment, plant and vehicles would be used.	Contractor
	Potential to influence Climate Change and GHG emission	Use of alternative fuels and power sources would be investigated, where appropriate	Contractor
	Potential to influence Climate Change and GHG emissions	All plant and equipment to be turned off when not in use.	Contractor
	Potential to influence Climate Change and GHG emissions	Fulfil organisational reporting requirements to the Clean Energy Regulator.	Contractor

## 9. Conclusion

The project to investigate and refurbish the foundations of towers on Feeder 940 is subject to assessment under Division 5.1 of the EP&A Act. The REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

A number of potential environmental impacts from the project have been avoided or reduced during the concept design development and options assessment. The project as described in the REF best meets the project objectives but would still result in some impacts to water quality, noise, air quality and traffic. Safeguards and management measures as detailed in this REF would ameliorate or minimise these expected impacts. The project would also result in benefits to the community as it would reduce the risk of a tower failure which would potentially impact upon the supply of electricity.

The projects benefits are considered to outweigh any adverse environmental impacts which are minor and short term in nature.

On balance the project is considered justified, and the following conclusions are made.

### **Significance of impact under NSW legislation**

The project would be unlikely to cause a significant impact on the environment. Therefore, it is not necessary for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning and Public Spaces under Division 5.2 of the EP&A Act. A Biodiversity Development Assessment Report or Species Impact Statement is not required. The project is subject to assessment under Division 5.1 of the EP&A Act. Consent from Council is not required.

### **Significance of impact under Australian legislation**

The project is not likely to have a significant impact on matters of national environmental significance or the environment of Commonwealth land within the meaning of the *Environment Protection and Biodiversity Conservation Act 1999*. A referral to the Australian Department of Agriculture, Water and the Environment is not required.

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# Appendix A

Consideration of section 171(2) factors and matters of national environmental significance and Commonwealth land

## Section 171(2) Checklist

The following factors, listed in section 171(2) of the Environmental Planning and Assessment Regulation 2021, have also been considered to assess the impacts of the project on the natural and built environment.

Factor	Impact
<p><i>a. Any environmental impact on a community?</i> Construction of the project would result in short term noise, traffic, air quality and visual amenity impacts the duration of construction. Such impacts would be limited at any one location for up to four weeks before the works move to the next tower location. Any impacts would be limited to the standard construction hours. Any impacts would be minimised through the implementation of mitigation measures. The project would also provide a benefit to the community in that it would reduce the risk of a tower failure due to the poor condition of foundations. Any tower failure would have the potential to impact electricity supply.</p>	<p>Short term: Minor adverse Long term: Nil</p>
<p><i>b. Any transformation of a locality?</i> Construction of the project would result in some short-term transformation of the locality due to the presence of a small construction site at each tower location. The project would not result in any substantial change to the locality as the works are to refurbish the existing feeder towers which are at risk of failure. The locality would continue to be dominated by the existing environment including the surrounding National Park and other vegetated areas.</p>	<p>Short term: Minor adverse Long term: Nil</p>
<p><i>c. Any environmental impact on the ecosystems of the locality?</i> The project would not require the removal of any trees with only some minor trimming proposed of non-threatened vegetation. Due to the limited impacts the project is not expected to impact on the existing ecosystem of the locality.</p>	<p>Short term: Minor adverse Long term: Nil</p>
<p><i>d. Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?</i> During construction, the project would result in a reduction in the aesthetic quality of the locality because of dust generation, noise, visual and traffic movements. These impacts would be mitigated with the implementation of safeguards and management measures located in section 8.16. At completion the refurbished tower is expected to have minimal impact to the value of the locality.</p>	<p>Short term: Minor adverse Long term: Nil</p>
<p><i>e. Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations?</i> The project is located within the curtilage of a number of heritage items included the World and National Heritage Lists Greater Blue Mountains Area. As outlined in section 8.10, the project is not expected to impact any heritage listing as the works would only impact on existing infrastructure which is not considered to contribute to the significance of any heritage items.</p>	<p>Nil</p>
<p><i>f. Any impact on the habitat of protected fauna (within the meaning of the Biodiversity Conservation Act 2016)?</i> The project would involve removal of regrowth vegetation up to five metres from each tower leg to enable the foundation investigation works as well as any refurbishment works to occur. The vegetation removed would consist of non-</p>	<p>Short term: Nil Long term: Nil</p>

Factor	Impact
<p>threatened native and exotic grasses. Surveys identified no threatened flora at the bases of any towers or in the five metre disturbance area.</p> <p>One species of threatened fauna was identified during surveys. This was a pair of foraging Gang-gang Cockatoos located near tower 3. It is not anticipated this species, or any other threatened fauna, would be impacted during construction.</p>	
<p><i>g. Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?</i></p> <p>The removal of some intact vegetation has the potential to impact on local populations of fauna species. Such impacts are minimal as fauna is likely to vacate the proposed clearance area which consists of vegetation which is not likely to be key habitat for any species.</p>	<p>Short term: Minor adverse Long term: Nil</p>
<p><i>h. Any long-term effects on the environment?</i></p> <p>The project would not result in any long terms effects on the environment as following construction the feeder would continue to operate as it currently does. The project would however improve the structure integrity of the tower thus reducing any risk of a tower failure.</p>	<p>Long term: Minor benefit</p>
<p><i>i. Any degradation of the quality of the environment?</i></p> <p>Construction activities have the potential to result in impacts to water quality because of pollutants such as sediment, soil nutrients, waste, and fuels and chemicals entering the drainage lines. Potential impacts to water quality would be managed with the implementation of controls provided in section 8.16.</p>	<p>Short term: Minor adverse Long term: Nil</p>
<p><i>j. Any risk to the safety of the environment?</i></p> <p>The refurbishment works are proposed to improve safety and prevent risks of a tower failure which impact upon electricity supply.</p>	<p>Short term: Nil Long term: Minor benefit</p>
<p><i>k. Any reduction in the range of beneficial uses of the environment?</i></p> <p>Construction and operation of the project would not impact any use of the environment with operation of the feeder to continue as current following construction.</p>	<p>Short term: Nil Long term: Nil</p>
<p><i>l. Any pollution of the environment?</i></p> <p>The project could potentially result in water pollution from sediments, soil nutrients, waste, and spilt fuels and chemicals. Existing paint coating may contain lead that could become mobilised when removed. Management of water quality impacts would be undertaken in accordance with the safeguards and management measures summarised in section 8.16.</p>	<p>Short term: Minor adverse Long term: Nil</p>
<p><i>m. Any environmental problems associated with the disposal of waste?</i></p> <p>Waste would be generated and would be treated where relevant and disposed of appropriately</p>	<p>Short term: Minor adverse Long term: Nil</p>
<p><i>n. Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply?</i></p> <p>All resources required for the project are readily available and are not in short supply</p>	<p>Nil</p>
<p><i>o. Any cumulative environmental effect with other existing or likely future activities?</i></p> <p>There are no cumulative impacts associated with the project.</p>	<p>Nil</p>





Factor	Impact
<p><i>p. Any impact on coastal processes and coastal hazards, including those under projected climate change conditions?</i> The project is not located in a coastal area</p>	Nil

## Matters of National Environmental Significance and Commonwealth land

Factor	Impact
<p>a) <i>Any impact on a World Heritage property?</i>            The site is within the Greater Blue Mountains Area which is classified as a world heritage location. As the works involve works in areas disturbed as part of the establishment of the transmission line and its associated easement impact on this item are anticipated to be minimal. Further discussion of impacts on the World Heritage List are outlined in section 8.10.</p>	Minor
<p>b) <i>Any impact on a National Heritage place?</i>            Like the above, the Greater Blue Mountain Area is a national heritage place however impacts are considered minimal as outlined above. Further discussion of impacts on the World Heritage List are outlined in section 8.10.</p>	Minor
<p>c) <i>Any impact on a wetland of international importance?</i>            Four wetlands of international importance are identified in the project matters search. All these works are over 300 kilometres downstream of the project and therefore due to their proximity impacts are considered minimal.</p>	Nil
<p>d) <i>Any impact on a listed threatened species or communities?</i>            A number of threatened species or communities are identified as potentially occurring in the vicinity of the project. As the project does not propose to remove any vegetation with only minor trimming require impact on these species and communities is considered minimal. Further discussion of impacts on biodiversity is listed located in section 8.2.</p>	Nil
<p>e) <i>Any impacts on listed migratory species?</i>            15 migratory species may be present I the vicinity of the project. Due to the level of impacts on vegetation and works being constrained to existing disturbed areas impact on these species is considered unlikely.</p>	Nil
<p>f) <i>Any impact on a Commonwealth marine area?</i>            The project is not located within a Commonwealth marine area.</p>	Nil
<p>g) <i>Does the proposal involve a nuclear action (including uranium mining)?</i>            The project would not involve a nuclear action.</p>	Nil
<p>h) <i>Additionally, any impact (direct or indirect) on the environment of Commonwealth land?</i>            The project would not impact on any Commonwealth land directly and it not considered likely to impact on any such land indirectly.</p>	Nil



# Appendix B

Biodiversity



# Appendix C

- Neutral of Beneficial Effect Assessment

## Neutral of Beneficial Effect Assessment

Chapter 8 of State Environmental Planning Policy (Biodiversity and Conservation) 2021 relates to the use of land within the Sydney drinking water catchment. In accordance with section 8.11 of the SEPP, Transport for NSW is required to consider whether an activity to which Division 5.1 of the EP&A Act applies will have a neutral or beneficial effect on water quality before carrying out the activity.

Factor	Impact
<p>1. Are there any identifiable potential impacts on water quality?</p> <p>What pollutants are likely?</p> <p>During construction and/or post construction?</p>	<p>There is potential for pollutants such as sediment and construction waste to mobilise and enter drainage lines, particularly during high rainfall events. Likely pollutants range from oils/fuels to nitrogen, phosphorous or other chemicals that may be used to operate plant and equipment for the project.</p> <p>Water quality impacts could potentially occur during construction of the project. No water quality impacts would occur during operation.</p>
<p>2. For each pollutant, list the safeguards needed to prevent or mitigate potential impacts on water quality (these may be Water NSW endorsed current recommended practices and/or equally effective other practices)</p>	<p>Relevant safeguards to prevent pollutants entering the waterways have been provided in section 8.16.</p>
<p>3. Will the safeguards be adequate for the time required? How will they need to be maintained?</p>	<p>The safeguards provided in section 8.16 are adequate for the time required and identify specific mitigation to be implemented during rainfall events which may increase the potential for pollutants to enter the surrounding waterways.</p>
<p>4. Will all impacts on water quality be effectively contained on the site by the identified safeguards (above) and not reach any watercourse, waterbody or drainage depression?</p> <p>Or will impacts on water quality be transferred outside the site for treatment? How? Why?</p>	<p>The implementation of safeguards and mitigation measures identified in section 8.16 would effectively contain any water quality impacts resulting from the project. No additional water quality impacts downstream of the project site would occur with the implementation of the proposed mitigation measures.</p>
<p>5. Is it likely that a neutral or beneficial effect on water quality will occur? Why?</p>	<p>During construction, the project is considered to have a neutral effect on water quality as with the implementation of mitigation measures, impacts on water quality are manageable.</p> <p>Overall, the project is considered to have a neutral effect on water quality.</p>

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