
# Valley of the Winds Wind Farm

## Amendment Report

October 2023

RAMBOLL

ACEN | Australia

Valley of the Winds
Renewable Energy from ACEN

# VALLEY OF THE WINDS WIND FARM AMENDMENT REPORT

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| Project no. | **318001172** |
| Recipient | **ACEN Renewables Australia Pty Ltd** |
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| Checked by | **Belinda Sinclair** |
| Approved by | **Belinda Sinclair** |
| Description | **Amendment Report for the Valley of the Winds Wind Farm project.** |

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# EXECUTIVE SUMMARY

**Introduction**

ACEN Australia Pty Ltd (ACEN) proposes to construct and operate the Valley of the Winds wind farm (the project) located between the townships of Coolah and Leadville NSW, within the Warrumbungle Shire Council Local Government Area. The wind farm site is located within the Central-West Orana Renewable Energy Zone, declared by the Minister for Energy and Environment in 2021 to help meet its objective to achieve net zero emissions by 2050. The project would connect with the CWO-REZ transmission line, supplying over 800 megawatts of electricity into the National Electricity Market.

The project is a 'controlled action' under section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* and therefore requires assessment and approval under the EPBC Act. This assessment has been undertaken under the Amended Bilateral Agreement between the Commonwealth Department of Climate Change, Energy, the Environment and Water and the New South Wales Department of Planning and Environment.

A State Significant Development application and accompanying environmental impact statement were submitted under Part 4, Division 4.7 of the Environmental Planning and Assessment Act 1979 in March 2022. The SSD application and EIS were placed on public exhibition from 23 May 2022 to 20 June 2022.

The Department of Planning and Environment received 110 submissions from the public, two submissions from interest groups and advice from 17 government agencies on the EIS. A separate response to submissions report has been prepared and submitted to Department of Planning and Environment in conjunction with this report, that responds to the matters raised in these submissions in accordance with clause 59(2) of the *Environmental Planning and Assessment Regulation 2021*.

This amendment report outlines the proposed amendments to the project that was included in the original development application and assesses the potential environmental, economic, and social impacts of the amended project. This report has been prepared in accordance with the requirements of the *NSW State Significant Development Guidelines – preparing an amendment report, October 2022*, and should be read in conjunction with all documentation that forms the environmental impact statement package.

**Project amendments and clarifications**

*Project amendments*

In response to matters raised in the submissions and further agency, community and stakeholder consultation, ACEN proposes to amend the project design to further mitigate environmental and social impacts associated with the proposed wind farm.

Proposed project amendments include the following:

- refinements to the wind farm layout to reduce environmental and social impacts, and improving the functional performance of the project:
  - removal of 17 wind turbines and associated access tracks to reduce residential and biodiversity impacts
  - further refinement of the layout and construction footprint to further avoid and minimise impacts to native vegetation
  - removal of three met masts and relocation of seven others to reduce biodiversity impacts

  - an additional substation included in the Mount Hope cluster to improve the electrical connectivity.
- removal of the overhead transmission line running south from the Girragulang Road and Leadville clusters. This infrastructure will now be delivered by EnergyCo as part of the EnergyCo CWO-REZ Transmission Line project and will be assessed as part of that project by EnergyCo
- updated project boundary to remove a property from the Mount Hope cluster
- access routes:
  - light vehicle access to the Mount Hope cluster via Neilrex Road removed – a single point of access from Black Stump Way is now proposed
  - light vehicle access to the Leadville cluster via the Leadville Stock Route and Wardens Road removed – a single point of access from the Golden Highway is now proposed
  - provision of an alternate access route option to the Girragulang Road cluster via the Golden Highway.

**Reduction of project footprint**

Removal of turbines and associated infrastructure, and other refinements to the layout to avoid both amenity and biodiversity impacts, have reduced the -project footprint of the project by 51% from 1,318 to 695 hectares.

**Reduced environmental and social impacts**

*Biodiversity*

The amendments to the project undertaken since the EIS have reduced the biodiversity impacts overall. Project amendments have been undertaken in consultation with the DPE and BCS regarding the extent of potential impact on threatened ecological communities and other native vegetation and the project's ability to demonstrate the principles of 'avoid and minimise' regarding impacts to biodiversity.

*Landscape and visual*

As a result of the amended layout, the number of visible turbines has been reduced for six non-associated dwellings compared to the layout presented in the EIS.

The amended project has resulted in a reduction of 21 non-associated dwellings within 4,950 metres (the blue line). The results of the amended 'visual catchment' tool are:

- 27 non-associated dwellings within 3,350 metres of the nearest project turbine (the black line)
- 64 non-associated dwellings between 3,350 - 4,950 metres of the nearest turbine (the blue line). This includes 25 dwellings in the settlement of Leadville (Dwellings 152 - 176).

Amendments to the project have also reduced the number of non-associated dwellings with turbines located within multiple 60-degree sectors. The multiple wind turbine tool identified a total of 25 non-associated dwellings with turbines located in more than two 60-degree sectors.

*Noise*

The refined wind turbine layout and increased number of dwellings that are associated with the project has resulted in a reduction in the number of non-associated dwellings within three kilometres from the nearest turbine. All non-associated dwellings remain compliant with the relevant noise criteria as outlined in the EIS.

*Clarifications to the EIS*

Clarifications to the information presented in the EIS are provided as follows:

- Dwelling 284 was previously identified as an 'associated' property in the EIS, and clarification is provided noting this property is 'non-associated'. It is noted however, that the assessment of potential impacts for the EIS was correctly applicable to a non-associated dwelling and the outcomes of the assessment undertaken and associated management measures remain consistent with the EIS for this property.
- since exhibition of the original DA, ACEN has progressed agreements with 13 nearby neighbours who are now associated with the project. Negotiations are also ongoing with various other landholders. An additional dwelling has also been added to the assessment of the amended project that was previously burnt down. One additional host dwelling has also been identified.
- the methodology for mapping the extent of Plant Community Types for Box Gum Woodland and associated Derived Native Grasslands has been updated following feedback from DPE's Biodiversity, Conservation and Science Directorate. Additional survey for Koalas has also been undertaken following release of new Koala Guidelines by BCS since the EIS. Further assessment and update to the biodiversity development assessment report (BDAR) has been undertaken.
- additional surveys have been undertaken to update the Aboriginal Cultural Heritage Assessment Report following feedback from Heritage NSW. No new items of heritage significance were found, and the updated ACHAR is provided as part of this amendment report.
- further information regarding the location and configuration of the battery energy storage system is provided in response to feedback from DPE's Hazards Assessment Team. An updated preliminary hazards assessment accompanies this amendment report.

**Additional assessments since the EIS**

Additional technical assessments have been undertaken since the EIS to consider potential impacts associated with the proposed amendments and clarifications outlined above. The following additional or updated assessments are provided as part of this amendment report and discussed in detail in Chapter 6:

- Landscape character and visual impact – updated landscape character and visual impact assessment (LVIA) to assess refined project layout and respond to matters raised in the submissions
- Noise and vibration – updated noise and vibration impact assessment to assess refined project layout and respond to matters raised in the submissions
- Biodiversity – updated BDAR to assess refined project layout and present updated PCT mapping and additional Koala surveys
- Hazards and risks – updated PHA to consider further information regarding location and configuration of the BESS
- Aboriginal heritage – updated ACHAR to consider refined project layout and record additional survey of previously unsurveyed areas.

A consolidated summary of management and mitigation measures has been provided following the above additional assessments, to address the refinements made to the project, and matters raised in the submissions.

**Conclusion**

The environmental impact assessment undertaken for the project as part of the EIS and the additional assessment of the proposed amended project undertaken as part of the amendment report, has determined that the project would not result in any significant adverse impacts to environmental, cultural, social and economic values. Any potential residual impacts can be suitably controlled with the management and mitigation measures proposed.

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# 1. INTRODUCTION

## 1.1 Overview

ACEN Australia Pty Ltd (ACEN) proposes to construct and operate the Valley of the Winds wind farm (the project) located between the townships of Coolah and Leadville NSW, within the Warrumbungle Shire Council Local Government Area. The wind farm site is located within the Central-West Orana Renewable Energy Zone (CWO-REZ), declared by the Minister for Energy and Environment in 2021 to help meet its objective to achieve net zero emissions by 2050. The project would connect up to 131 wind turbines, each up to 7.2 MW installed capacity, with the CWO-REZ transmission line, supplying over 800 megawatts of electricity into the National Electricity Market.

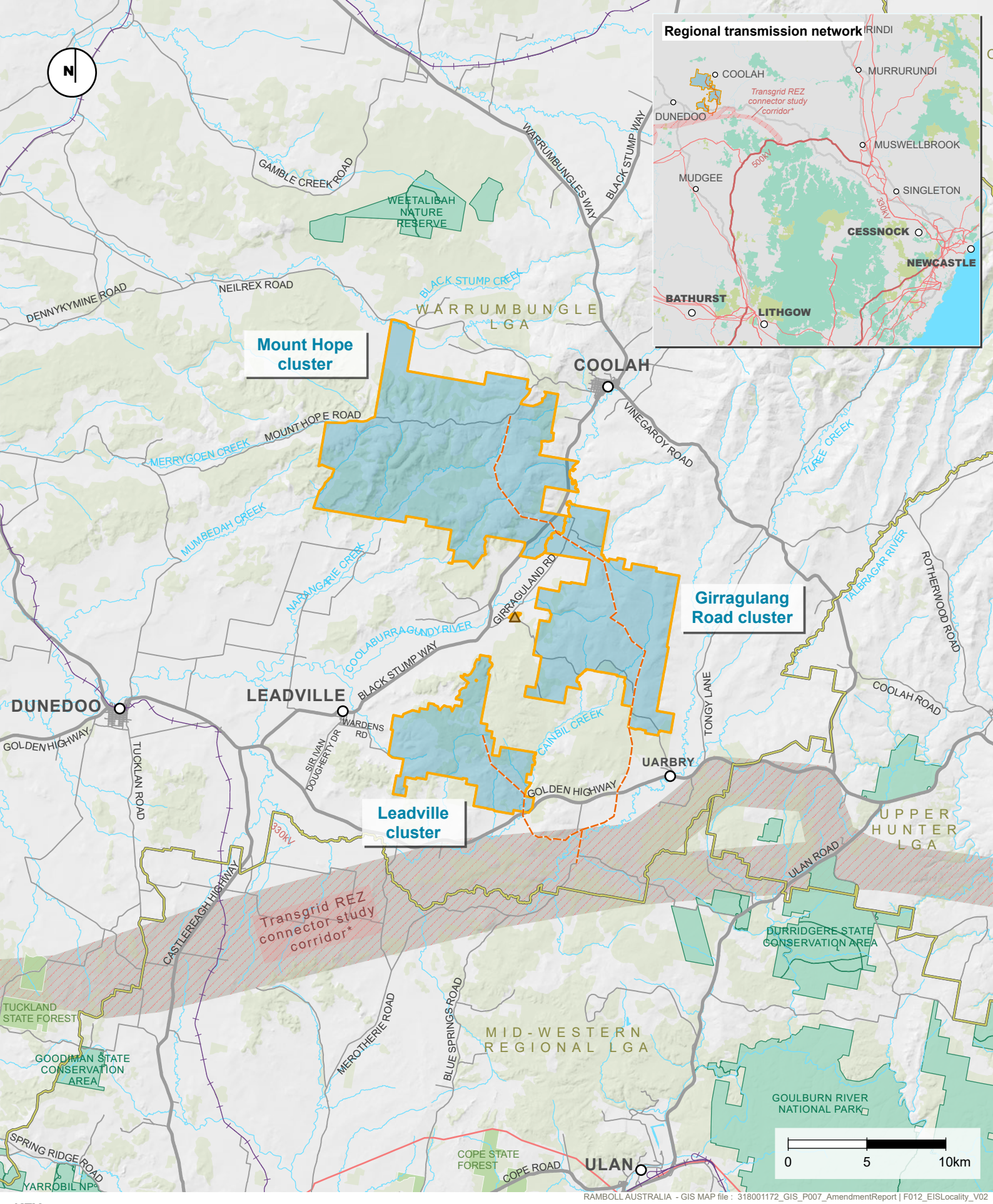
The project is a 'controlled action' under section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and therefore requires assessment and approval under the EPBC Act. This assessment has been undertaken under the Amended Bilateral Agreement between the Commonwealth Department of Climate Change, Energy, the Environment and Water and the New South Wales Department of Planning and Environment.

A State Significant Development (SSD) application and accompanying environmental impact statement were submitted under Part 4, Division 4.7 of the Environmental Planning and Assessment Act 1979 (EP&A Act) in March 2022. The SSD application and EIS were placed on public exhibition from 23 May 2022 to 20 June 2022.

The Department of Planning and Environment received 110 submissions from the public, two submissions from interest groups and advice from 17 government agencies on the EIS. A separate response to submissions report has been prepared and is submitted to Department of Planning and Environment in conjunction with this report, that responds to the matters raised in these submissions in accordance with clause 59(2) of the *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation).

This amendment report outlines the proposed amendments to the project and assesses the potential environmental, economic, and social impacts of the amended project. This report has been prepared in accordance with the requirements of the *NSW State Significant Development Guidelines – preparing an amendment report, October 2022*, and should be read in conjunction with all documentation that forms the environmental impact statement (EIS) package.

The project included in the original development application is shown in its regional context in **Figure 1-1**.




RAMBOLL AUSTRALIA - GIS MAP file : 318001172_GIS_P007_AmendmentReport | F012_EISLocality_V02

**KEY**

- Wind farm site
- Overhead transmission line
- Potential construction workforce accommodation
- Electricity transmission line
- Transgrid REZ connector study corridor*
- Railway
- LGA boundary
- National Parks and Reserves
- State forest
- Indicative vegetated area

**Transgrid REZ connector study corridor was current at EIS, 2022. This is now the EnergyCo CWO-REZ Transmission Project and the study area has been updated since the EIS.*

Figure 1-1 | Project site per the original development application - regional context

## 1.2 The project included in the original development application

The project assessed in the EIS accompanying the original development application included up to 148 turbines across three clusters, that would be connected electrically:

- Mount Hope cluster –76 turbines
- Girragulang Road cluster –51 turbines
- Leadville cluster –21 turbines.

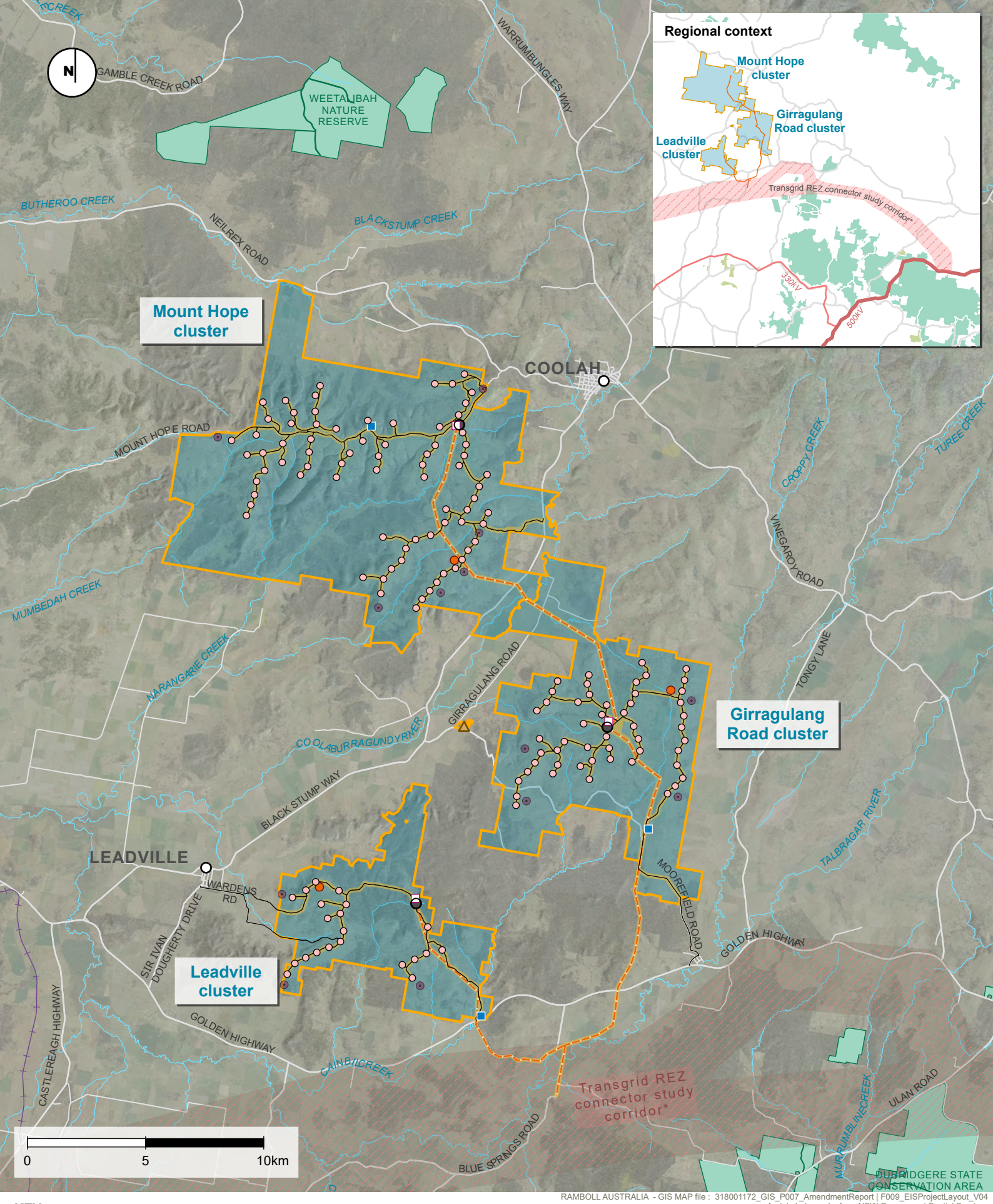
Key infrastructure for the project included:

- up to 148 wind turbines with a maximum tip height of 250 metres and a hardstand area at the base of each turbine
- electrical infrastructure, including:
  - substations in each cluster and a step-up facility at the connection to the CWO-REZ Transmission line
  - where possible, underground 33 kilovolt electrical reticulation connecting the turbines to the substations in each cluster
  - overhead transmission lines (220 kilovolt or 330 kilovolt) dispatching electricity from each cluster
  - other electrical infrastructure as required including a battery energy storage system (BESS) with a capacity of 320MW/640MWh
  - a high voltage transmission line (330 kilovolt or 500 kilovolt) connecting the wind farm to the CWO-REZ Transmission Line
- other permanent on-site ancillary infrastructure:
  - permanent operation and maintenance facilities
  - meteorological masts (up to thirteen)
- access track network:
  - access and egress points to each cluster from public roads
  - operational access tracks and associated infrastructure within each cluster on private property
- temporary construction ancillary facilities:
  - potential construction workforce accommodation on site
  - construction compounds
  - laydown areas
  - concrete batching plants
  - quarry sites for construction material (rock for access tracks and hardstands).

At the end of its practical life, the wind farm would be decommissioned, and the site returned to its pre-existing land use in consultation with the affected landholders.

The project is expected to require up to 400 full-time employees during peak construction and approximately 50 full-time employees during operation and ongoing maintenance of the wind farm.

An overview of the project included in the original development application is shown in **Figure 1-2**.




RAMBOLL AUSTRALIA - GIS MAP file : 318001172_GIS_P007_AmendmentReport | F009_EISProjectLayout_V04
Aerial photography from NSW Government Spatial Services

**KEY**

- Wind farm site
- Survey boundary
- Turbine location
- Access track
- Overhead transmission line
- Potential construction workforce accommodation
- Substation location
- Permanent operations and maintenance compound (also used during construction)
- Temporary construction compound
- Indicative quarry location
- Permanent meteorological mast location
- Railway
- National Parks and Reserves
- Transgrid REZ connector study corridor*

**Transgrid REZ connector study corridor was current at EIS, 2022. This is now the EnergyCo CWO-REZ Transmission Project and the study area has been updated since the EIS.*

Figure 1-2 | Project overview at EIS stage

## 1.3 Project amendments and clarifications

In response to matters raised in the submissions and further agency, community and stakeholder consultation, ACEN proposes to amend the project design to further mitigate environmental and social impacts associated with the proposed wind farm. Proposed project amendments include the following:

- refinements to the wind farm layout to reduce environmental and social impacts, and improving the functional performance of the project:
  - removal of 17 wind turbines and associated access tracks to reduce amenity impacts for nearby dwellings and biodiversity impacts
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  - removal of three met masts and relocation of seven others to reduce biodiversity impacts
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- the methodology for mapping the extent of Plant Community Types (PCT) for Box Gum Woodland and associated Derived Native Grasslands has been updated following feedback from DPE's Biodiversity, Conservation and Science Directorate (BCS). Additional survey for Koalas has also been undertaken following release of new Koala Guidelines by BCS since the EIS. Further assessment and update to the biodiversity development assessment report (BDAR) has been undertaken, and findings presented in **Section 6.3**.
- further detailed survey has been undertaken to assess previously unsurveyed areas of the project and update the Aboriginal cultural heritage assessment report (ACHAR) following feedback from Heritage NSW. No new items of heritage significance were found, and the updated ACHAR is provided as part of this amendment report.
- further information regarding the location and configuration of the potential battery energy storage system (BESS) is provided in response to feedback from DPE's Hazards Assessment Team. Further assessment has been undertaken and the findings are presented in **Section 6.5**.

The amended project layout is discussed further in **Chapter 3** and shown in **Figure 3-1**.

## 1.4 The proponent

The proponent for the project is ACEN Australia, formerly UPC\AC Renewables at the time of the EIS.

ACEN Australia has more than one gigawatt capacity in construction and more than eight gigawatts capacity in the development pipeline. Its renewable energy assets include solar, wind, battery and pumped hydro and energy storage projects across Australia. Besides New England Solar and Stubbo Solar, ACEN Australia's projects include New England Battery (NSW), Birriwa Solar (NSW), Valley of the Winds (NSW), Aquila Wind (NSW), Phoenix Pumped Hydro (NSW), Robbins Island and Jim's Plain Wind (TAS) and North East Wind (TAS).

ACEN Australia is a wholly owned subsidiary of ACEN (PSE: ACEN), the listed energy platform of the Ayala group. The company has ~4,200 megawatts of attributable capacity from owned facilities in the Philippines, Vietnam, Indonesia, India, and Australia, with a renewable share of 98%, which is among the highest in the region. ACEN's aspiration is to be the largest listed renewables platform in Southeast Asia, with a goal of reaching 20 gigawatts of renewables capacity by 2030. ACEN is committed to transition the company's generation portfolio to 100% renewable energy by 2025 and to become a Net Zero greenhouse gas emissions company by 2050.

# 2. STRATEGIC CONTEXT

## 2.1 Overview

A detailed discussion of the strategic context for the project is provided in Chapter 2 of the EIS and the strategic context has not changed since the EIS, nor do any of the proposed amendments alter the strategic justification for developing the project.

Several key policies support the development of the proposed wind farm, including:

- **The 2015 United Nations Framework Convention on Climate Change (UNFCCC) "Paris Agreement"**: the Australian Government is a signatory to the Paris Agreement (ratified November 2016) establishing a National commitment to combat climate change and to move towards a sustainable low carbon future
- **The Federal Government's Renewable Energy Target (RET) scheme**: The RET involves the generation of an additional 33,000 gigawatt hours of additional renewable energy annually under the *Renewable Energy (Electricity) Amendment Bill 2015* (Clean Energy Regulator, 2022)
- **2022 *Integrated System Plan***: The 2022 Integrated System Plan (ISP) sets out an optimal development path (ODP) and ISP projects that would meet the future needs of the NEM
- ***NSW Net Zero Plan Stage 1: 2020-2030***: outlines the proposed actions of the NSW Government to achieve its objective of net zero emissions by 2050
- ***NSW Renewable Energy Action Plan 2013* and *NSW Renewable Energy Action Plan Completion Report 2018***: includes 24 actions under three goals that detail the Government's intention to work closely with NSW communities and the renewable energy industry, to increase renewable energy generation in the state at the least cost to the consumer
- ***NSW Electricity Strategy 2019***: provides detailed strategy for electricity supply to NSW
- ***NSW Electricity Infrastructure Roadmap 2020***: outlines new policy measures to drive the transition of the state's electricity sector.

The proposed development is also supported by and consistent with strategic planning policies and agreements at a local level, which are discussed in the following sections.

## 2.2 National context

**Renewable Energy Target scheme**

The RET is an Australian Government policy aiming to ensure that at least 33,000 gigawatt hours of Australia's electricity comes from renewable sources by 2020 (Clean Energy Council, 2018).

The RET operates in two parts:

1. the Large-scale Renewable Energy Target (LRET)
2. the Small-scale Renewable Energy Scheme (SRES).

The LRET is most relevant to the project as it encourages the uptake of renewables through creation of a financial incentives for the establishment or expansion of renewable energy power stations, such as wind farms. This is done by legislating demand for large-scale generation certificates (LGCs), whereby one LGC is created for each megawatt per hour of eligible renewable electricity produced by an accredited power station.

The project would generate approximately 800 megawatts of electricity annually, which would contribute to assisting the RET through the generation of approximately 1 LGC for every

megawatt hour of electricity generated by the project via the LRET scheme. As an 800-megawatt wind farm, Valley of the Winds could be expected to generate around two million LGCs per annum.

**Closure of coal-fired generators**

Several major energy generators in NSW will reach the end of their lifespan and are scheduled to be retired in the coming decades. Four out of the five operating coal-fired generators in the State are scheduled for retirement by 2035. By 2043, all five coal-fired generators are expected to retire (NSW Department of Planning, Industry and Environment, 2019). This includes:

- Liddell Power Station which closed in 2023
- Vales Point Power Station (generating 1,320 megawatts) in 2029
- Eraring Power Station (generating 2,880 megawatts) in 2025
- Bayswater Power Station (2,640 megawatts) in 2035
- Mount Piper Power Station (1,400 megawatts) in 2043.

The project would contribute to security of the NEM through the generation of additional electricity to meet demand, thereby helping to avoid a shortfall that is currently expected in NSW following the closure of the existing coal-fired generators. Due to the long lead times in the development of a project, investment in energy is needed several years before retirement of existing energy generators.

**2022 Integrated System Plan and the CWO-REZ Transmission Line**

Renewable Energy Zones (REZ) were defined in the *Integrated System Plan Consultation 2017* as areas where clusters of large-scale renewable energy can be developed to promote economies of scale in higher-resource available areas and capture a diversity of technological and geographical renewable resources (Australian Energy Market Operator, 2017). It is expected that much of the 26 gigawatts of new renewable energy generation required for Australia's transition from fossil fuels will be built in REZs, and the CWO-REZ where the project is located, has been identified as a priority for development under the ISP.

Since the exhibition of the EIS, the Australian Energy Market Operator (AEMO) has released the 2022 Integrated System Plan (ISP), which sets out an optimal development path (ODP) and ISP projects that would meet the future needs of the NEM.

The Central West Orana REZ Transmission Line is one of the committed projects identified in the ISP. This transmission line will be delivered by the Energy Corporation of NSW (EnergyCo) and would distribute electricity between the CWO-REZ and major load centres in NSW and is due to be completed in 2024-2025 (Australian Energy Market Operator, 2019).

Given that the project is in the CWO-REZ, and close to the proposed CWO-REZ transmission line, this highlights the appropriate choice of location for the project and alignment with the market operator's thinking of where new generation capacity is likely to be located.

**ACEN as a Candidate Foundation Generator**

ACEN has been identified as a Candidate Foundation Generator (CFG) for the CWO-REZ and the project would connect directly to the proposed CWO-REZ transmission line. The transmission line runs north-west from the existing 500kV network near Merriwa, passing south of Dunedoo before connecting to the existing network east of Wellington. This line allows for the project's output to be transported to meet loads across the NEM. The project would therefore contribute to the security and reliability of the electricity system in the NEM.

## 2.3 Local and regional context

**Central West and Orana Regional Plan 2041**
Since the exhibition of the EIS, Central-West and Orana Regional Plan 2036 has been superseded by the Central-West and Orana Regional Plan 2041.

The Central-West and Orana Regional Plan guides NSW Government's land use planning priorities and decisions for the region through to 2041. The plan aims to "facilitate growth in a sustainable way by adapting to future challenges posed by changes in climate, housing markets and the economy". (Department of Planning and Environment, 2022).

The plan outlines five parts, each supported by objectives. The five parts are:

3. Region-shaping investment
4. A sustainable and resilient place
5. People, centres, housing and communities
6. Prosperity, productivity and innovation
7. Local government priorities.

The project directly aligns with Objective 2 of Part 1 to *"support the State's transition to Net Zero by 2050 and deliver the Central–West Orana Renewable Energy Zone".*

**Warrumbungle Shire Council Development Control Plan 2015**
The *Warrumbungle Shire Council – Development Control Plan 2015* (Warrumbungle Shire Council, 2015) (the Warrumbungle DCP) was adopted by Warrumbungle Shire Council on 17 September 2015 and subsequently amended on 16 February 2017 by Council Resolution 190/1617 then commenced operation 23 February 2017.

The Warrumbungle DCP compliments the *Warrumbungle Local Environmental Plan 2013* (Warrumbungle Shire Council, 2013) and provides detailed requirements to guide development in the Warrumbungle Shire Council LGA.

Section 5 of the Warrumbungle DCP applies to RU1 Primary Production Zones and R5 Large Lot Residential Zones. It is a requirement under Section 5 that *"Any new residence or residential accommodation should be located a minimum distance of 2km from any active or proposed wind turbine, unless suitable measures are taken in the design and construction of the dwelling to ameliorate any noise or other impacts.".*

Any future residential development applications near the wind farm would need to consider Section 5 of the Warrumbungle DCP.

# 3. DESCRIPTION OF AMENDMENTS AND CLARIFICATIONS

## 3.1 Overview

In response to matters raised in the submissions and further agency, community and stakeholder consultation, ACEN proposes to amend the project design to further mitigate environmental and social impacts associated with the proposed wind farm. Proposed project amendments include the following:

- refinements to the wind farm layout to reduce environmental and social impacts, and improving the functional performance of the project:
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  - provision of an alternate access route option to the Girragulang Road cluster via the Golden Highway.

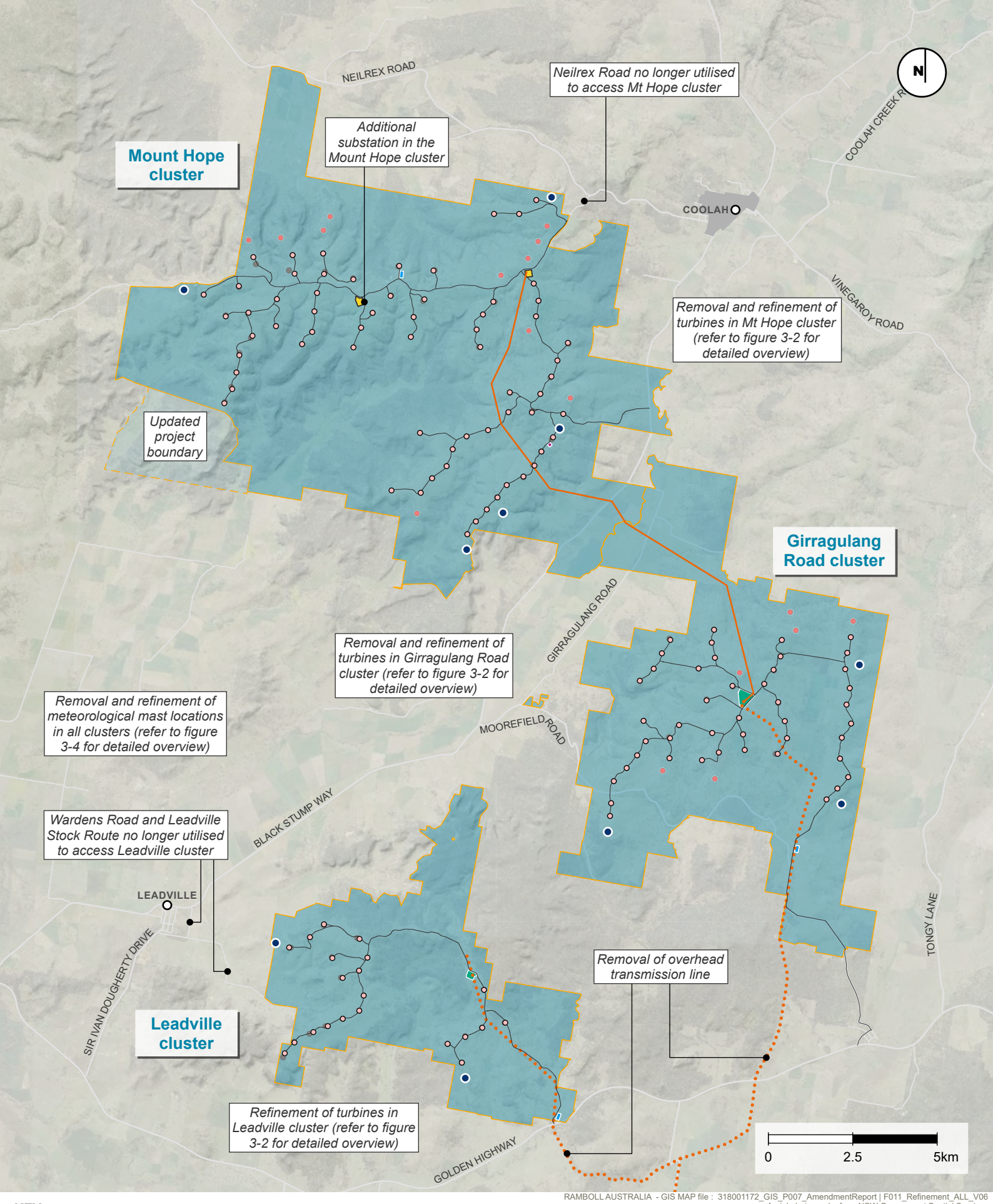
An overview of the amended project compared to the project included in the original development application is provided in **Table 3-1** and an indicative layout of the amended project is provided in **Figure 3-1**.

A consolidated description of the amended project is provided in **Appendix 1**.

**Table 3-1: Amended project summary table**

| Element | Original project | Amended project | Comment |
|---|---|---|---|
| **Project area** | | | |
| Windfarm area (project boundary) | 25,902.08 ha | 25,056.89 ha | Removal of one property |
| Construction footprint (disturbance area) | 1,318.08 ha | 695.00 ha | Reduction of 623.08 ha |
| **Operational infrastructure** | | | |
| Wind turbines | 148 | 131 | 17 turbines removed |
| Substations and step-up facilities | 1 x 'collector' substation in Mount Hope cluster | 2 | Additional substation in the Mount Hope cluster |
| | 1 x 'central' substation in the Girragulang Road cluster | 1 | Incorporation of step-up facility |
| | 1 x 'collector' substation in the Leadville cluster | 1 | No change |
| | 1 x step-up facility at the connection to the CWO-REZ Transmission line | 0 | Removal of separate step-up as to be incorporated into the central substation at Girragulang Road |
| Electrical reticulation | Underground cabling (up to 33kV) | Underground cabling (up to 33kV) | No change |
| | Up to 20m of overhead transmission for internal connections where required (up to 33kV) | Up to 20m | No change |
| | Up to 50m of overhead transmission connecting the clusters (up to 330kV) | Up to 50m | No change |

| Element | Original project | Amended project | Comment |
|---|---|---|---|
| | Up to 65m of overhead transmission connecting the wind farm to the CWO-REZ Transmission line (500kV) | 0 | Removal of transmission infrastructure from the project – to be developed by EnergyCo |
| Operation and maintenance compound | 1 | 1 | No change |
| Hardstand at each turbine location | 148 | 131 | Removal of 17 turbines and associated infrastructure |
| Meteorological masts | 13 | 10 | Removal of 3 |
| Access tracks (this accounts for both construction and operational access tracks) | 158.2km | 115.27km | 42.93 km reduction of access tracks associated with removal of 17 turbines |
| Potential battery energy storage system (BESS) | 1x decentralised or decentralised | 1x centralised | No change to number – additional information provided |
| Site access points | 6 (two for each cluster) | 4 | Removal of one light vehicle access at each of the Mount Hope and Leadville clusters, and inclusion of an additional access option at Girragulang (only one would be built) |
| **Temporary construction infrastructure** | | | |
| Potential construction workforce accommodation | 1 | 1 | No Change |
| Construction compounds | 3 | 3 | No change |
| Laydown areas | 3 | 3 | No Change |
| Batching plant | 3 | 3 | No change |
| Quarries | 3 | 3 | No change |




RAMBOLL AUSTRALIA - GIS MAP file : 318001172_GIS_P007_AmendmentReport | F011_Refinement_ALL_V06
Aerial photography from NSW Government Spatial Services

**KEY**

- Amended wind farm site
- Amended turbine location
- Amended access track
- Amended overhead transmission line
- Amended permanent meteorological mast location
- Amended substation, BESS and construction and permanent operation and maintenance compound area
- Amended substation area
- Amended construction and permanent operation and maintenance compound area
- Amended temporary construction compound area
- Wind farm site presented in EIS
- Turbine moved since EIS stage
- Turbine removed since EIS stage
- Overhead transmission line presented in EIS

Figure 3-1 | Amended project overview

## 3.2 Proposed amendments

### 3.2.1 Removal of turbines

ACEN proposes to remove 17 turbines from wind farm layout to reduce amenity impacts for nearby dwellings and biodiversity impacts.

This refinement follows extensive consultation with DPE and the Biodiversity Conservation and Science Directorate regarding the extent of potential impact on threatened ecological communities and other native vegetation and the project's ability to demonstrate the principles of 'avoid and minimise' regarding impacts to biodiversity.

Removal of the turbines and associated infrastructure, including access tracks and hardstands, have reduced the disturbance footprint of the project by 51% from 1,318 hectares to 695 hectares.

The amended turbine layout is shown in **Figure 3-2**, and a comparison of the disturbance footprint included in the original development application, against the disturbance footprint for the amended project is provided in **Figure 3-3**.

Discussion of the savings in potential biodiversity impacts is provided in **Section 6.3** and the findings of the amended landscape character and visual impact assessment is discussed in **Section 6.1**.

### 3.2.2 Further refinement of turbine layout

As part of the removal of the turbines outlined above, ACEN also undertook significant refinement of the wind farm layout to avoid and minimise impacts to biodiversity. These further refinements considered updated mapping of threatened ecological communities following consultation with DPE's Biodiversity, Conservation and Science Directorate. Further discussion on the updated mapping is provided as a project clarification in **Section 3.3.3**.

These additional refinements further demonstrate how ACEN have avoided and minimised biodiversity impacts wherever possible, whilst maintaining a viable wind farm.

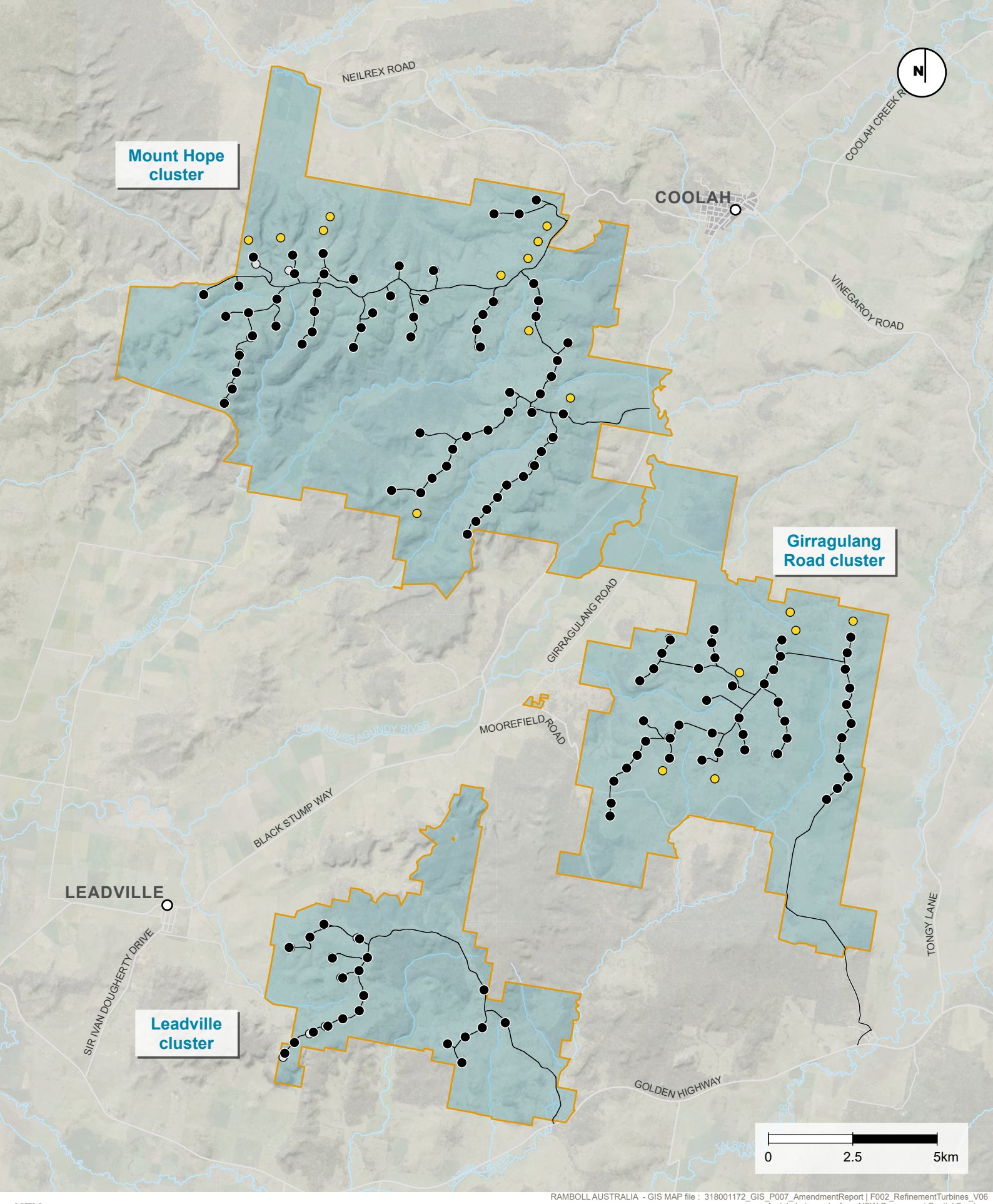
### 3.2.3 Removal and refinement of met mast locations

As part of the amended wind farm layout, ACEN have refined the proposed locations of the permanent met masts to further avoid and minimise potential impacts to biodiversity. Three permanent met masts have also been removed as part of this refinement and the amended locations are shown in **Figure 3-4**.

### 3.2.4 Additional substation in the Mount Hope cluster

An additional substation has been included following further review of the wind farm layout. The additional substation is required to improve the electrical connectivity of the Mount Hope cluster. The proposed substation would be of similar size and configuration as the existing Mount Hope substation and is expected to require an area of up to 100 metres by 200 metres (two hectares). It would be located close to Mount Hope Road, approximately five kilometres from the existing Mount Hope cluster substation and is shown in **Figure 3-5.**

The additional substation has been included in the updated assessments as part of this amendment report and the findings are presented in **Chapter 6**.

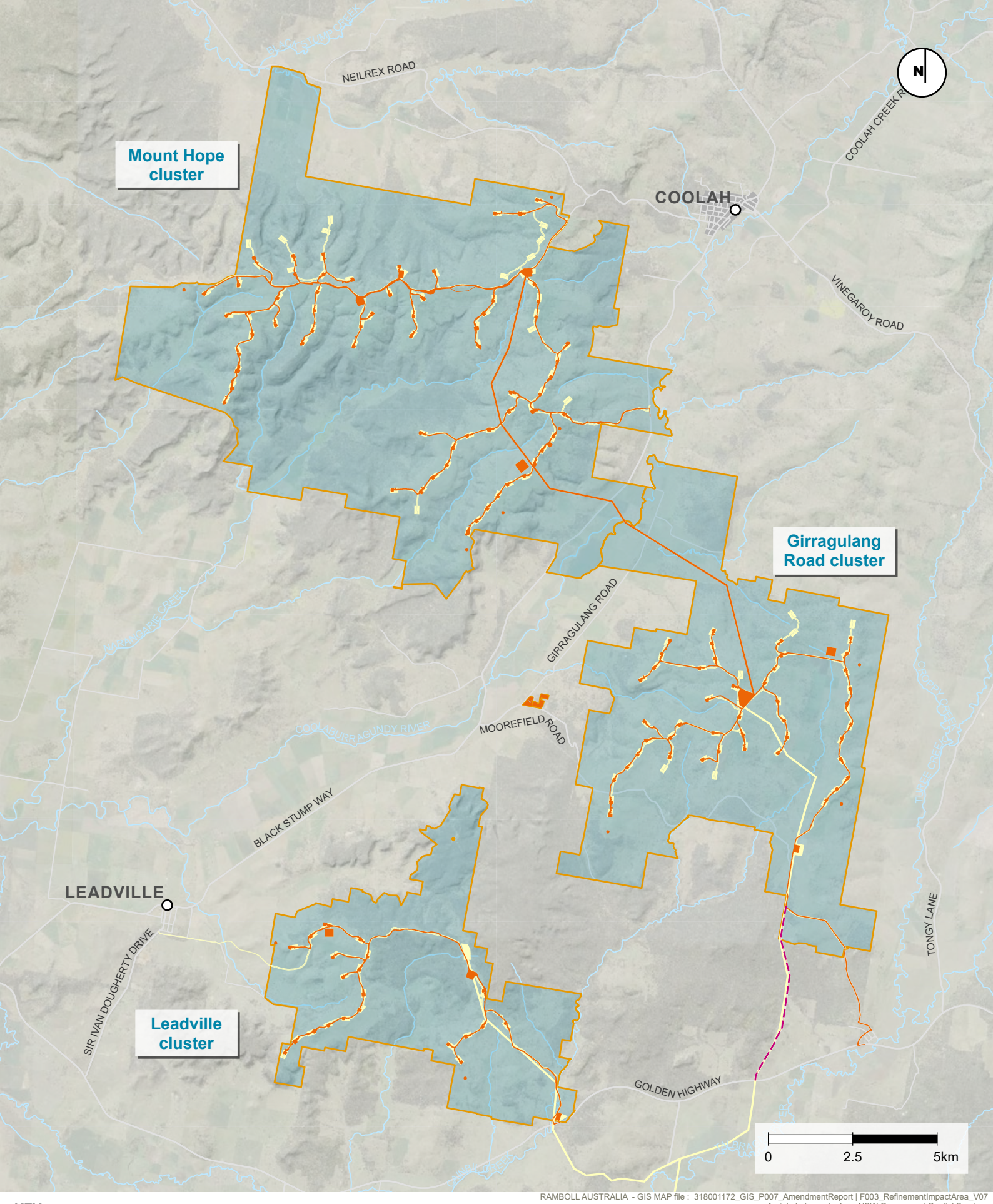



RAMBOLL AUSTRALIA - GIS MAP file : 318001172_GIS_P007_AmendmentReport | F002_RefinementTurbines_V06
Aerial photography from NSW Government Spatial Services

**KEY**

- Amended wind farm site
- Amended turbine layout
- Amended access track
- Turbine moved since EIS stage
- Turbine removed since EIS stage

Figure 3-2 | Amendments to the turbine layout

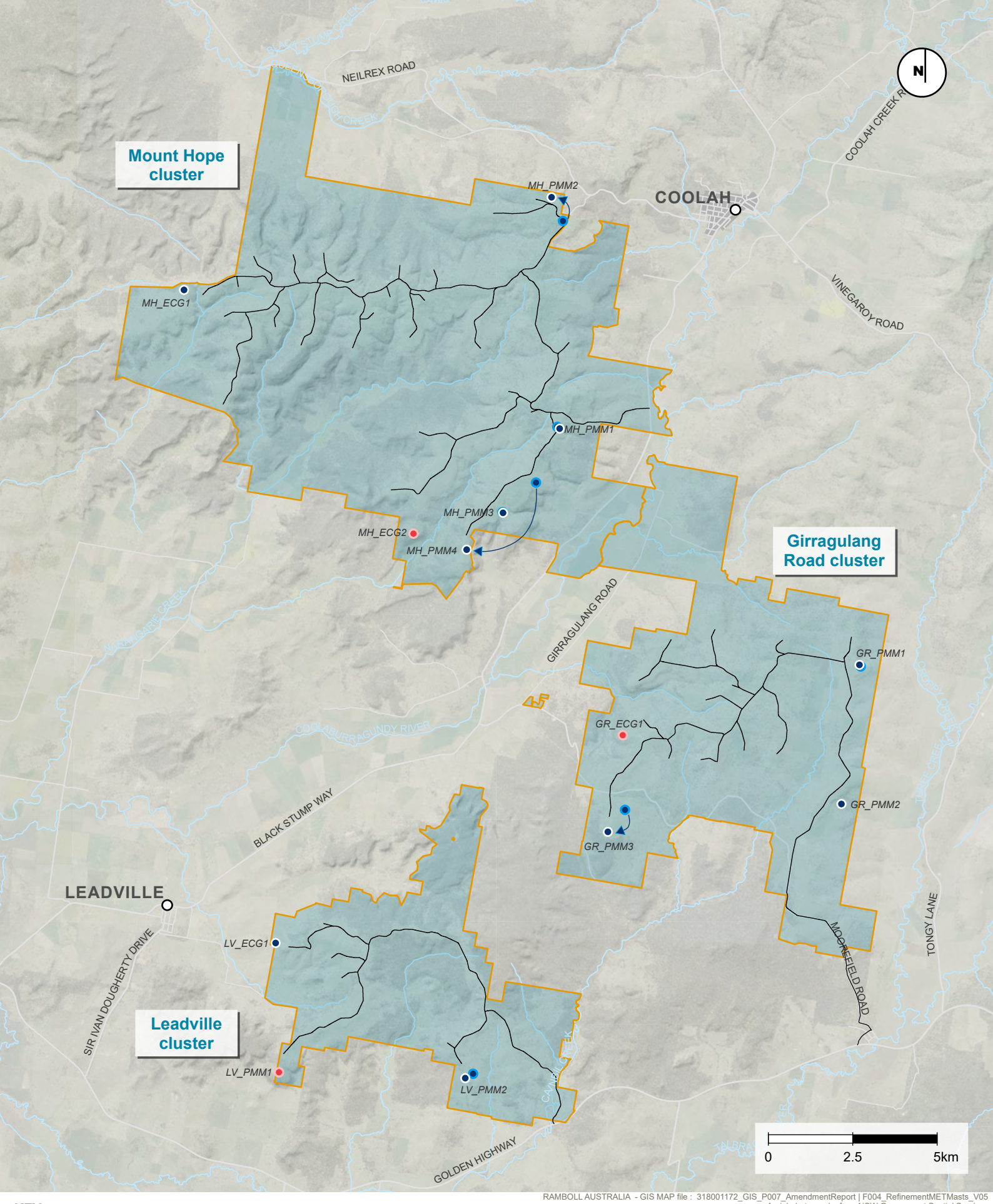



RAMBOLL AUSTRALIA - GIS MAP file : 318001172_GIS_P007_AmendmentReport | F003_RefinementImpactArea_V07
Aerial photography from NSW Government Spatial Services

**KEY**

- Amended wind farm site
- Amended disturbance footprint
- Disturbance footprint at EIS stage
- Alternative access to GR cluster

Figure 3-3 | Amendments to disturbance footprint




RAMBOLL AUSTRALIA - GIS MAP file : 318001172_GIS_P007_AmendmentReport | F004_RefinementMETMasts_V05
Aerial photography from NSW Government Spatial Services

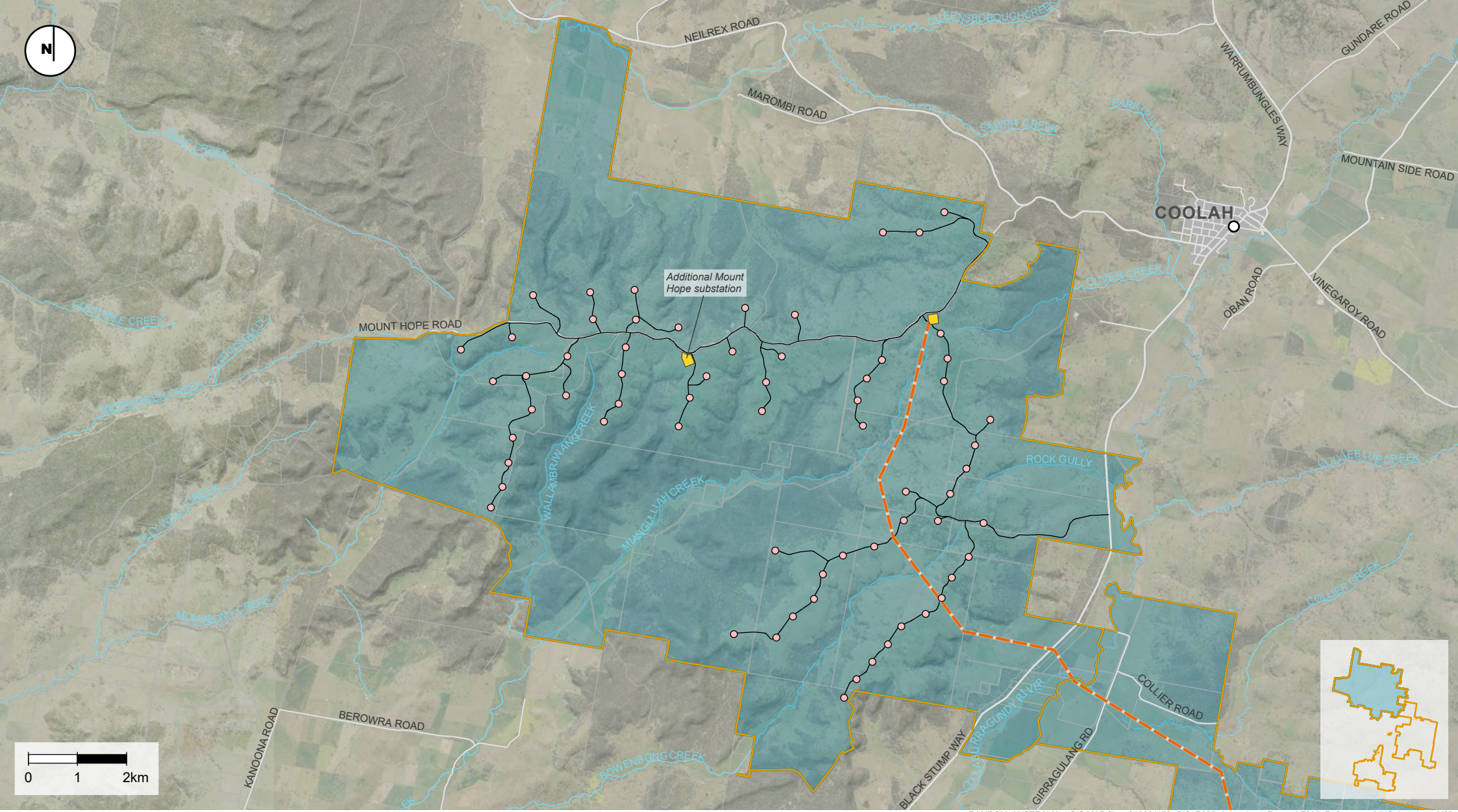
**KEY**

- Amended wind farm site
- Amended access track
- Amended permanent meteorological mast location

Permanent meteorological mast location at EIS stage

- Moved
- Removed

Figure 3-4 | Amendments to meteorological mast locations




RAMBOLL AUSTRALIA - GIS MAP file : 318001172_GIS_P007_AmendmentReport | F005_Refinement_MHSubstations_V03
Aerial photography from NSW Government Spatial Services

**KEY**

- Amended wind farm site
- Amended substation area
- Amended turbine location
- Amended access track
- Amended overhead transmission line

Figure 3-5 | Additional substation in Mount Hope cluster

### 3.2.5 Removal of overhead transmission line

Since the exhibition of the EIS ACEN has undertaken extensive consultation with EnergyCo regarding the proposed Central-West Orana Transmission Line and how the project would connect to that infrastructure. It is confirmed that the overhead transmission line running south from the Girragulang Road, and Leadville clusters will no longer form part of this project. This infrastructure and will be assessed as part of the CWO REZ transmission line extension project that is to be separately developed by EnergyCo. The section of overhead transmission line that has been removed from the project is shown in **Figure 3-6**.

The CWO-REZ Transmission Line runs north-west from the existing 500 kilovolt network near Merriwa, passing south of Dunedoo before connecting to the existing network east of Wellington. As a Candidate Foundation Generator (CFG) for the CWO-REZ, the project would connect directly to the proposed CWO-REZ transmission line, which will allow for the project's output to be transmitted across the NEM.

### 3.2.6 Updated project boundary

The project boundary has been updated following consultation, to remove a property from the Mount Hope cluster. This property is now non-associated and this is reflected in the updated technical assessments discussed in detail in **Chapter 3**. The amended project boundary is shown in **Figure 3-1**.

### 3.2.7 Access routes

Following consultation since the exhibition of the EIS, ACEN propose to remove two access points as follows:

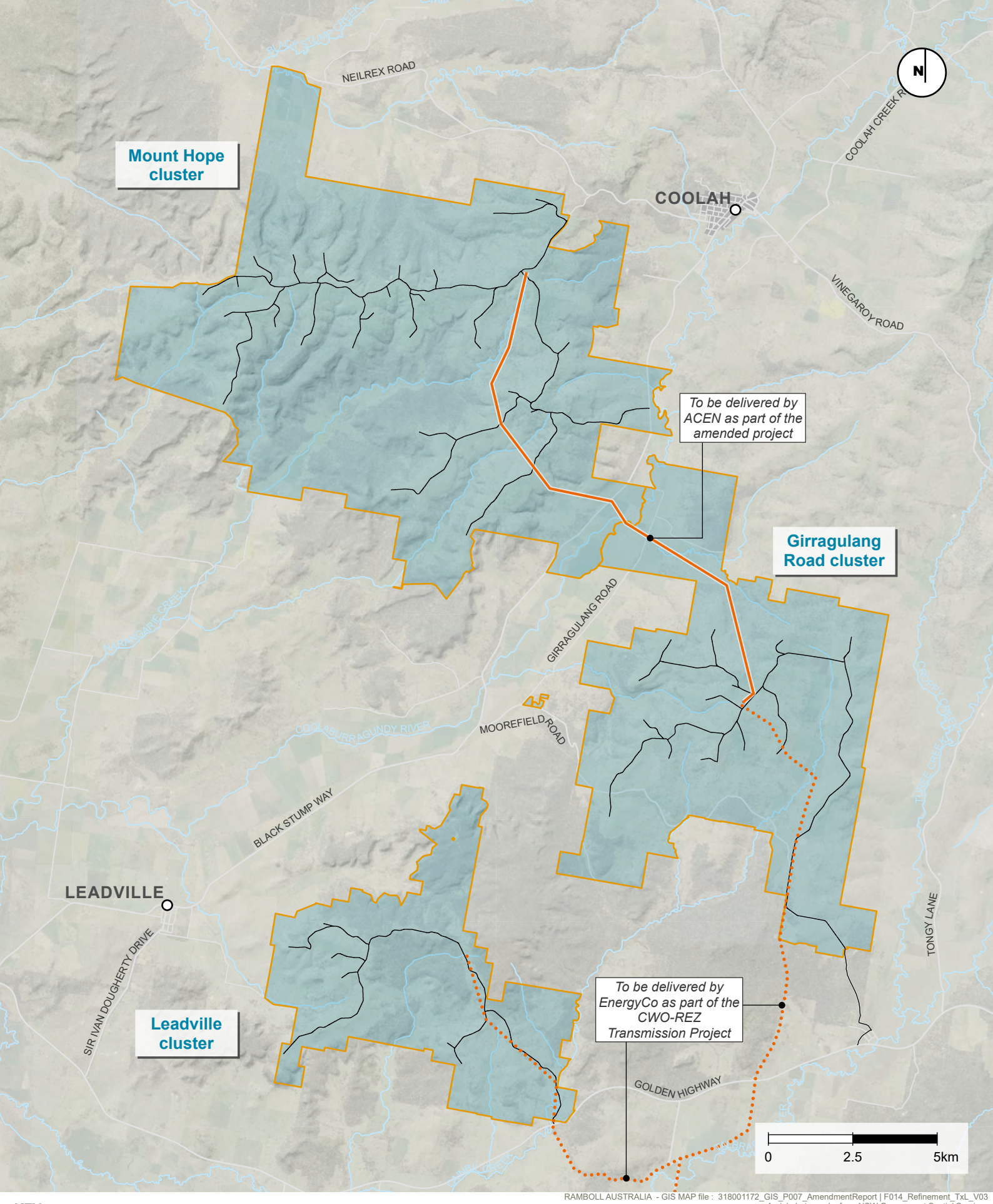
- removal of the proposed light vehicle access to the Mount Hope cluster via Neilrex Road removed – a single point of access from Black Stump Way is now proposed
- removal of the proposed light vehicle access to the Leadville cluster via the Leadville Stock Route and Wardens Road – a single point of access from the Golden Highway is now proposed.

Removal of the two access points outlined above has reduced the project disturbance footprint by 18.6 hectares, and reduction of potential impacts to biodiversity is discussed in **Section 6.3**.

An additional access option has also been included in response to consultation since the exhibition of the EIS. The proposed access would follow the alignment of the proposed CWO-REZ Transmission Line, from the Golden Highway to the Girragulang Road cluster.

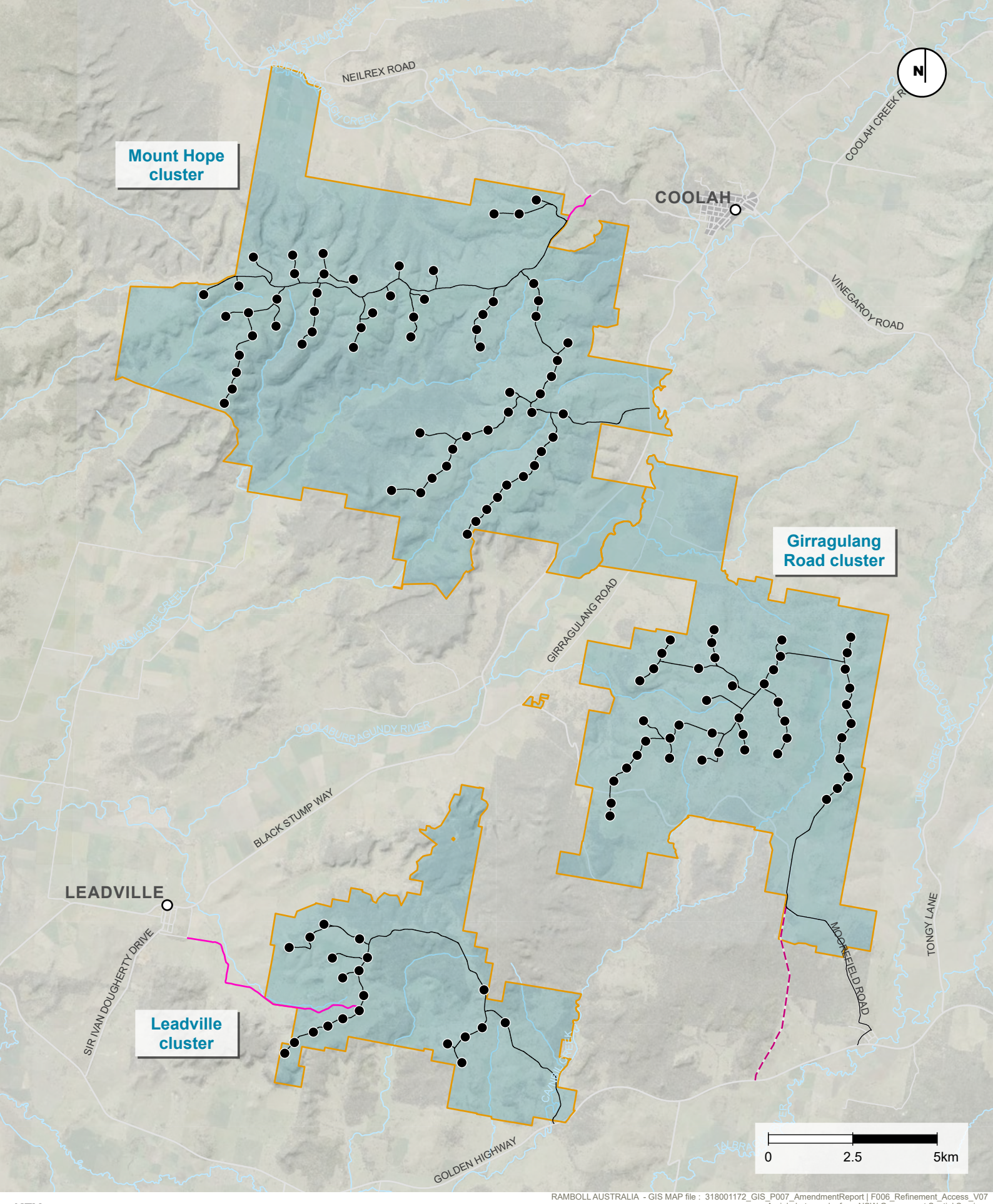
The additional disturbance footprint associated with the alternate access option is calculated to be 10.79 hectares. It is noted that only one access to the Girragulang Road cluster would be constructed, and the additional option is proposed as an alternate access point should the proposed access via Uarbry not proceed. The potential biodiversity impacts associated with the proposed alternate access option are discussed in **Section 6.3**, including a comparison between the two possible access options, noting that only one of the access points would be constructed. The areas presented in Section 3.1 incorporate the impact footprint area associated with the access via Uarbry which is 18.14 hectares.

Amendments to access routes are shown in **Figure 3-7**, and updates to the technical assessments as part of this amendment report are discussed in **Chapter 3**.




RAMBOLL AUSTRALIA - GIS MAP file : 318001172_GIS_P007_AmendmentReport | F014_Refinement_TxL_V03
Aerial photography from NSW Government Spatial Services

Figure 3-6 | Amendments to overhead transmission line




RAMBOLL AUSTRALIA - GIS MAP file : 318001172_GIS_P007_AmendmentReport | F006_Refinement_Access_V07
Aerial photography from NSW Government Spatial Services

**KEY**

- Amended wind farm site
- Amended turbine layout
- Amended access track
- Alternative access to GR cluster
- Access route no longer considered

Figure 3-7 | Amendments to proposed access routes

## 3.3 Clarifications to the EIS

### 3.3.1 Change to status of Dwelling 284

Dwelling 284 was mistakenly identified as an 'associated' property in the EIS, and clarification is provided noting this property correctly as 'non-associated'.

It is noted that the assessment of potential impacts to this property undertaken for the EIS were correctly applicable to a 'non-associated' dwelling and the outcomes of the assessment undertaken and associated management measures remain consistent with the EIS for this property.

### 3.3.2 Other dwelling status updates

Since exhibition of the original DA, ACEN has progressed agreements with 13 nearby neighbours who are now associated with the project. An additional dwelling has also been added to the assessment of the amended project that was previously burnt down and an additional host dwelling has been identified. All changes to dwelling status are shown in **Figure 3-8** which reflects the status of dwellings at 11 September 2023. Similarly, the technical assessments prepared for the amended project (refer to **Section 3.4**) are based on the status of dwellings at 11 September 2023. As this process will be ongoing, the point in time data reflected in this Amendment Report and associated technical assessments is to ensure consistency in assessment of the amended project.

ACEN is continuing negotiations with landholders who may become associated with the project following the publication of the Amendment Report.

### 3.3.3 Updated biodiversity mapping methodology

The methodology for mapping the extent of Plant Community Types (PCT) for Box Gum Woodland and associated Derived Native Grasslands has been updated following feedback from DPE's Biodiversity, Conservation and Science Directorate (BCS).

The revised mapping has been accounted for throughout the project amendments process as is discussed in more detail in **Section 3.2**.

Additional survey for Koalas has also been undertaken following release of new Koala Guidelines by BCS since the EIS was finalised and further consultation with BCS. This is discussed in more detail in **Section 6.3**.

### 3.3.4 Additional heritage survey

Further detailed survey has been undertaken to assess previously unsurveyed areas of the project and update the Aboriginal cultural heritage assessment report (ACHAR) following feedback from Heritage NSW. No new items of heritage significance were found, and the updated ACHAR is provided as part of this amendment report. This is discussed further in **Section 6.6**.

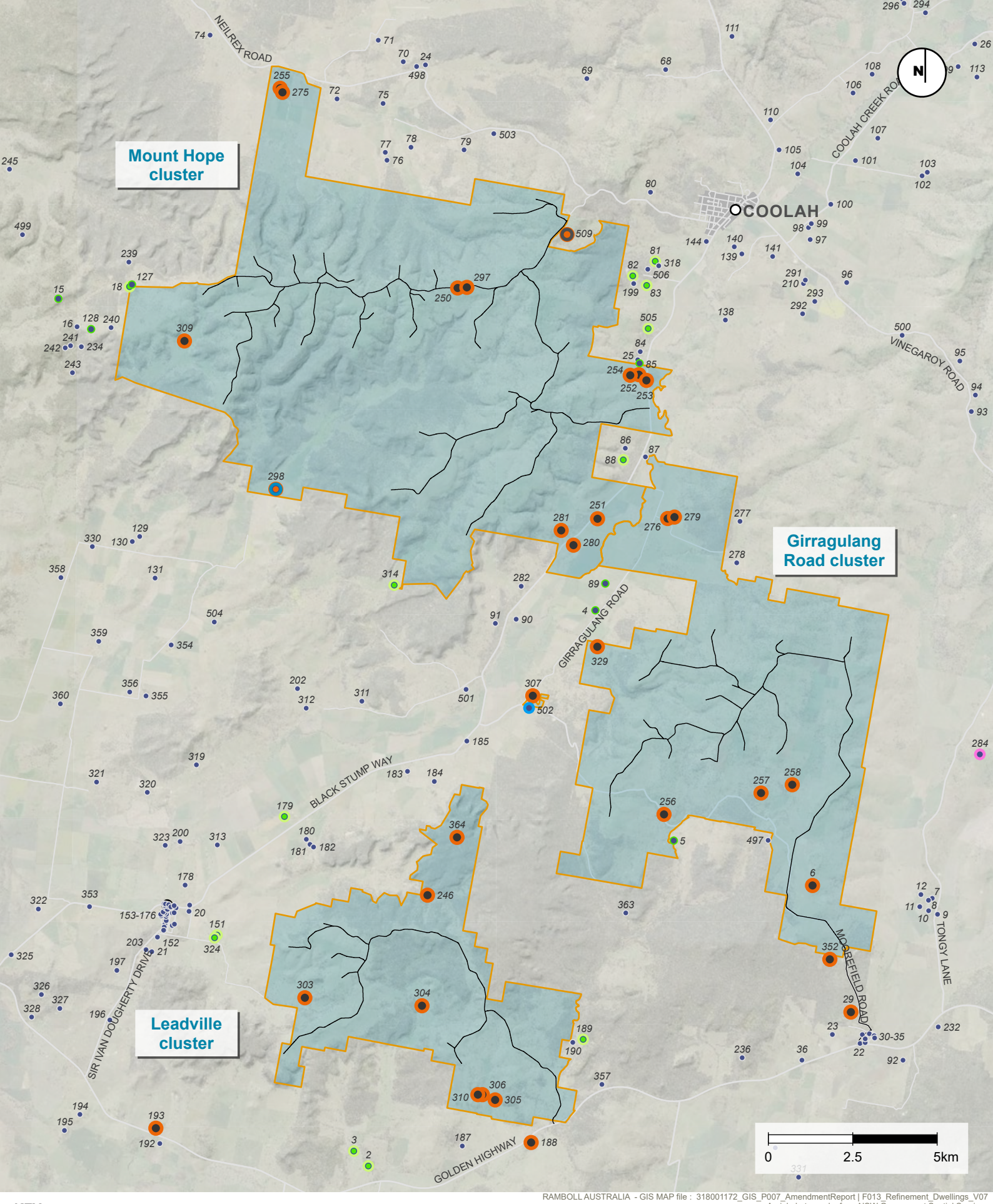
### 3.3.5 Additional information on the BESS

Additional information regarding the location and configuration of the BESS provided, and the PHA provided in the EIS has also been updated in response to feedback from DPE's Hazards Assessment Team. The BESS would be located at the Girragulang central substation, and it is clarified that it would be a centralised 'AC Coupled' BESS. The major components of the BESS are unchanged from the EIS, and would comprise:

- **Batteries** – most likely a lithium-ion technology type

- **Inverters** – convert the DC electricity generated by the wind farm into AC
- **Transformers** – low-voltage to medium-voltage and a medium-voltage to high-voltage
- **Heating ventilation air conditioning** (HVAC) – package units or liquid cooling
- **Fire protection** - active gas-based fire protection systems.

An indicative configuration for the BESS is provided in **Figure 3-9** and the updated preliminary hazards assessment is discussed in **Section 6.5**.




RAMBOLL AUSTRALIA - GIS MAP file : 318001172_GIS_P007_AmendmentReport | F013_Refinement_Dwellings_V07
Aerial photography from NSW Government Spatial Services

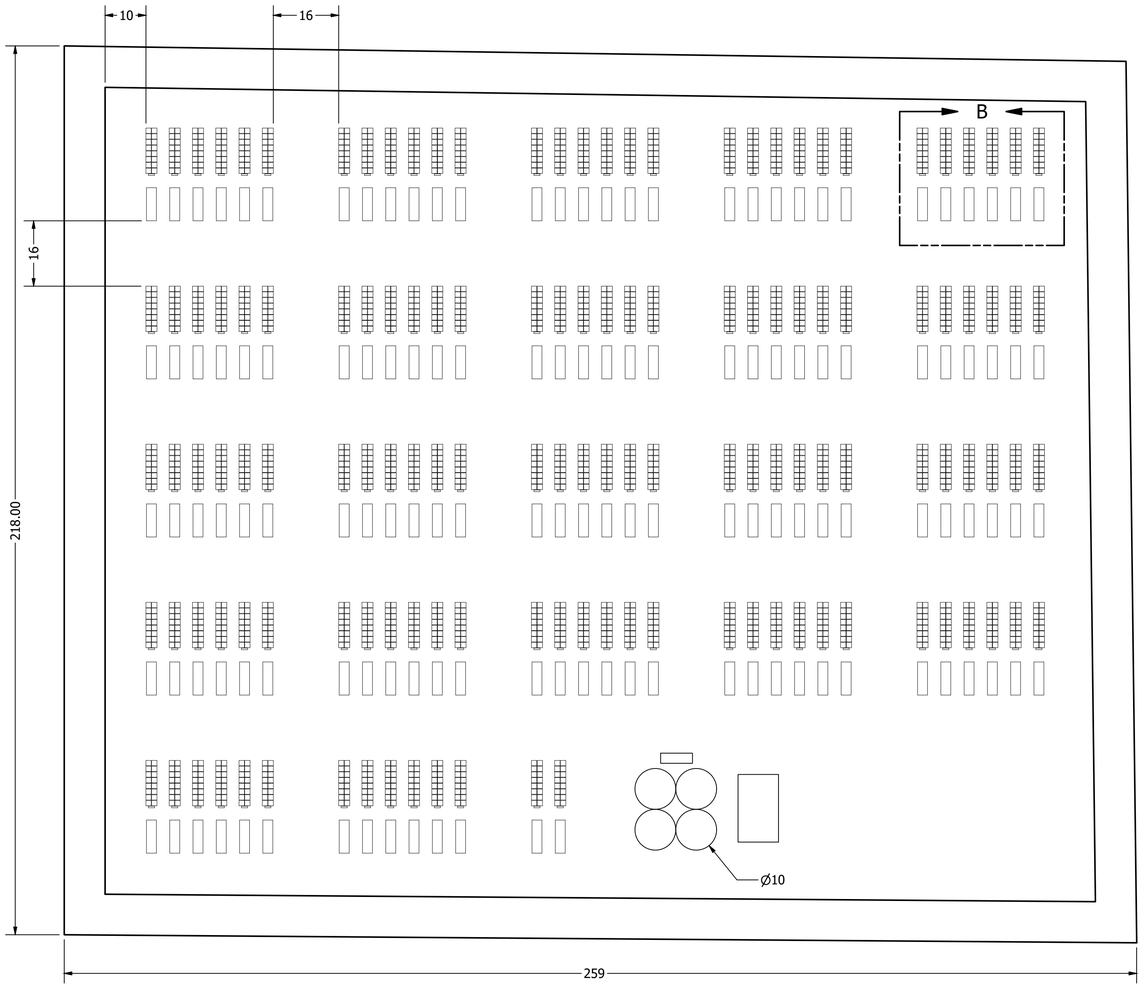
**KEY**

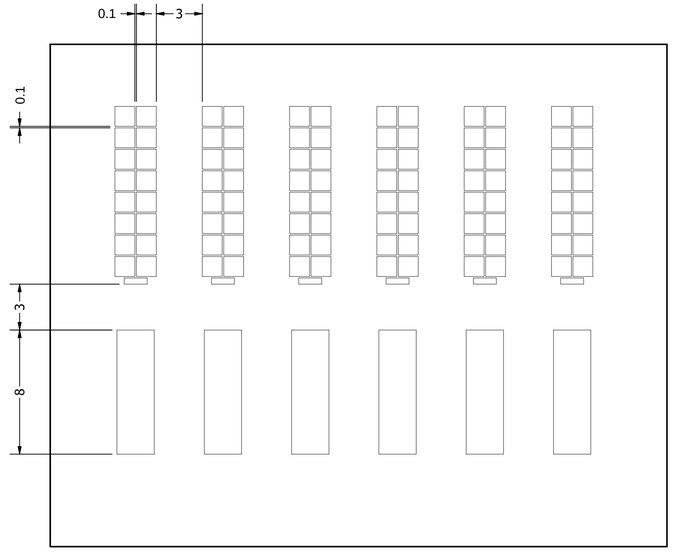
- Amended wind farm site
- Amended access track

Dwelling status

- Host
- Host (additional dwelling since EIS)
- Host (non-associated at EIS)
- Associated
- Associated (non-associated at EIS)
- Non-associated
- Non-associated (additional dwelling since EIS)
- Non-associated (associated at EIS)

Figure 3-8 | Amended dwelling status




DETAIL B
SCALE 1 / 200

| TOTAL SYSTEM RATING AT THE POC | |
|---|---|
| REAL POWER (MW) | 320 |
| APPARENT POWER (MVA) | 358 |
| ENERGY (HWH) | 651 |
| FEEDERS (6 PCU BLOCKS) | 22 |
| FEEDERS (2 PCU BLOCKS) | 1 |
| NUMBER OF RACKS | 2,151 |
| PCU SKIDS | 134 |

GENERAL NOTES:

1. THE TYPICAL LAYOUT IS INDICATIVE BASED ON CLEARANCES SET BY STANDARDS AND MANUFACTURERS RECOMMENDED PRACTICES FOR TYPICAL EQUIPMENT
2. AN ASSET PROTECTION ZONE OF AT LEAST 10m IS INCLUDED WITHIN THE GENERAL ARRANGEMENT
3. THE FIGURES PRESENTED IN THE RATING TABLE ARE THE EXPECTED VALUES AT THE POINT OF CONNECTION. THE GENERAL ARRANGEMENT SHOWN INCLUDES UP TO A 25% OVERBUILD TO ACCOUNT FOR LOSSES
4. THE GENERAL ARRANGEMENT IS A CONCEPT ONLY AND SUBJECT TO CHANGE AND APPROVAL IN THE FINAL DESIGN
5. THE 150,000 LITER FIRE WATER TANK LOCATIONS ARE INDICATIVE ONLY. FINAL LOCATIONS SUBJECT TO CHANGE AND APPROVAL FROM A FIRE ENGINEER AND THE STATE FIRE AUTHORITY
6. FIRE HYDRANTS AND RETICULATION WILL BE SPECIFICALLY CONSIDERED IN THE FIRE SAFETY STUDY AND ADOPTED WHERE NECESSARY

ALTERATIONS



REFERENCES

| | |
|---|---|
| DRAWN | KPAYNE |
| CHECKED | CBLANKSBY |
| DESIGNED | KPAYNE |
| CHECKED | CBLANKSBY |
| APPROVED | |
| DATE | 23/04/2023 |
| CLIENT APP'D | |
| DATE | |

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CLIENT: ACEN AUSTRALIA ENGAGEMENT No: ENT XXX

TITLE: VALLEY OF THE WINDS
BATTERY ENERGY STORAGE
GENERAL ARRANGEMENT
RACK OPTION

SCALE 1:750
SIZE A1
DRG No. 1 OF 1
SHT. 1
REV. 1

FILENAME: E:\VOTW\VOTW RACK.DWG



Figure 3-9: Indicative configuration of the potential BESS

## 3.4 Additional assessments since the EIS

Additional technical assessments have been undertaken since the EIS to consider potential impacts associated with the proposed amendments and clarifications outlined above.

The following additional or updated assessments are provided as part of this amendment report and discussed in detail in **Chapter 6**:

- Landscape character and visual impact – addendum landscape character and visual impact assessment (LVIA) to assess refined project layout and respond to matters raised in the submissions
- Noise and vibration – addendum noise and vibration impact assessment to assess refined project layout and respond to matters raised in the submissions
- Biodiversity – updated biodiversity development assessment report (BDAR) to assess refined project layout and present updated PCT mapping and additional Koala surveys
- Traffic and transport – traffic and transport assessment memo to consider the proposed alternate option for access to the Girragulang Road cluster.
- Hazards and risks – preliminary hazards assessment to assess additional detailed information regarding location and configuration of the potential BESS
- Aboriginal heritage – revised ACHAR to consider refined project layout and record additional survey of previously unsurveyed areas.

A consolidated summary of management and mitigation measures has been provided following the additional assessments outlined above, to address the refinements made to the project, and matters raised in the submissions.

# 4. STATUTORY CONTEXT

## 4.1 Overview

A detailed discussion of the statutory context for the project is provided in Chapter 3 of the EIS. None of the proposed amendments alter the statutory context or require additional licences, approvals, or permits over and above those outlined in the EIS. An updated statutory compliance table for the amended project is provided in **Appendix 2**.

## 4.2 Environmental Planning and Assessment Act 1979

The project is declared to be State significant development (SSD) by the provisions of the *State Environmental Planning Policy (Planning Systems) 2021* (Planning Systems SEPP).

Development consent is required under Part 4 of the EP&A Act for any project that is considered SSD by a SEPP. The project is therefore subject to assessment under Part 4, Division 4.7 of the EP&A Act. The project is also being assessed under the Commonwealth *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act) via the Amended Bilateral Agreement between the Australian Department of Agriculture, Water and the Environment and the New South Wales Department of Planning and Environment (DPE), due to potential impacts to listed threatened species and ecological communities, and migratory species.

## 4.3 Development application update

A State Significant Development (SSD) Application and accompanying EIS were submitted under Part 4, Division 4.7 of the EP&A Act in March 2022. The SSD application and EIS were placed on public exhibition from 23 May 2022 to 20 June 2022.

DPE has received 110 submissions from the public, two submissions from interest groups and advice from 17 government agencies on the EIS. This amendment report and accompanying response to submissions report is submitted to DPE to assess any proposed changes to the project and to respond to the matters raised in the submissions received in accordance with clause 59(2) of the EP&A Regulation.

### 4.3.1 Determination

Following receipt of this amendment report and the response to submissions report, DPE will prepare its assessment report considering the EIS, this amendment report, all submissions received during the exhibition process, and the responses provided by ACEN via the response to submissions report.

Under Section 4.38 of the EP&A Act, the NSW Minister for Planning is the consent authority for SSD. However, pursuant to Section 2.4 of the EP&A Act, the Minister may delegate the consent authority function to the Independent Planning Commission (IPC), the Secretary or to any other public authority. Additionally, in accordance with the Wind Guideline the IPC is the consent authority for SSD in the following circumstances:

- 50 or more unique public objections have been made to DPE
- the local council has objected to the application
- the applicant has disclosed a reportable political donation in connection with the application or a previous related application.

As DPE received over 50 unique public objections and Warrumbungle Shire Council objected to the application, the Independent Planning Commission is the consent authority for the application and will make a determination on the project.

### 4.3.2 Exempt approvals for State significant development

Clause 4.41 of the EP&A Act clarifies that development consent for SSD includes authorisations under the following statutory provisions, meaning that the following separate planning approval processes do not apply:

- A permit under section 201, 205 or 219 of the *Fisheries Management Act 1994*
- An approval under Part 4, or an excavation permit under section 139, of the *Heritage Act 1977* (Heritage Act)
- An Aboriginal heritage impact permit (AHIP) under section 90 of the *National Parks and Wildlife Act 1974* (NP&W Act)
- A bushfire safety authority under section 100B of the *Rural Fires Act 1997*
- A water use approval under section 89, a water management work approval under section 90 or an activity approval (other than an aquifer interference approval) under section 91 of the *Water Management Act 2000*.

## 4.4 State environmental planning policies

A summary of the SEPPs that are relevant to the project and how they are considered is provided in **Table 4-1**.

**Table 4-1: Applicable SEPPs**

| SEPP | Comment |
|---|---|
| *State Environmental Planning Policy (Planning Systems) 2021* (Planning Systems SEPP) | The project is a development for the purpose of electricity generation using a wind energy source consistent with the definitions under Clause 20 of Schedule 1 of the Planning Systems SEPP and has a capital investment value of more than $30 million and is therefore considered SSD for the purposes of the EP&A Act. |
| *State Environmental Planning Policy (Transport and Infrastructure) 2021* (Transport and Infrastructure SEPP) | Chapter 2 of the Transport and Infrastructure SEPP provides that development for the purpose of electricity generating works may be carried out by any person with consent on any land in a prescribed rural, industrial or special use zone. Under Clause 2.36(1) of the Transport and Infrastructure SEPP, the provisions of the SEPP prevail where there are inconsistencies with other environmental planning instruments, including local environmental plans. |

## 4.5 Local environmental plans

**Warrumbungle Shire Council Local Environmental Plan 2013**

The project is located within the Warrumbungle Shire Council Local Government Area and is subject to the Warrumbungle LEP 2013. A summary of the relevant aspects of the Warrumbungle LEP applicable to the project is provided in **Table 4-2**.

**Table 4-2: Summary of relevant Warrumbungle LEP provisions**

| Provision description | Relevance to the proposal |
|---|---|
| Clause 2.3 – Zone objectives and Land Use Table | The project is on land that is zoned RU1 – Primary Production. |

| Provision description | Relevance to the proposal |
|---|---|
| | '*Electricity generating works*' is prohibited in the RU1 zone. However, the project is a prescribed rural zone under the Transport and Infrastructure SEPP, which prevails over the inconsistency and permits the land use for the project. |
| Clause 4.1 – Minimum subdivision lot size | The land on which the substations are constructed is likely to require subdivision consistent with zone 'AG' (minimum lot size 600ha), but any proposed subdivision would be permissible under Section 4.38 of the EP&A Act, subject to the approval of the Minister for Planning. |
| Clause 5.10 – Heritage conservation | An Aboriginal cultural heritage assessment report (ACHAR) and a non-Aboriginal heritage impact assessment have been prepared and for the EIS and updated as part of this amendment report. Refer to **Appendix 8**. |
| Clause 6.2 – Flood planning | The project is not located within an identified flood planning area under the Warrumbungle LEP. |
| Clause 6.3 – Terrestrial biodiversity | The requirements of Clause 6.3 have been considered in the BDAR prepared for the EIS and updated as part of this amendment report (refer to **Appendix 6**) |
| Clause 6.4 – Groundwater vulnerability | The requirements under Clause 6.4 have been considered in Chapter 13 of the EIS. |
| Clause 6.5 – Riparian lands and watercourses | The requirements under Clause 6.5 have been considered in the BDAR (refer to **Appendix 6**) and Chapter 13 of the EIS. |

## 4.6 Commonwealth legislation

A summary of relevant Commonwealth legislation that is applicable to the proposal is provided in **Table 4-3.**

**Table 4-3: Commonwealth legislation**

| Legislation | Comment |
|---|---|
| *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) | A referral was submitted to the Australian Department of Agriculture, Water and the Environment in June 2020 (EPBC 2020/8668). The referral was required because the project is considered likely to have a significant impact on Matters of National Environmental Significance (MNES) due to potential impacts to listed threatened species and ecological communities, and migratory species. Each species has been considered throughout the development of this project.<br><br>On 13 July 2020, a delegate of the Federal Minister for the Department of Agriculture, Water and the Environment declared that the project was a controlled action under section 75 of the EPBC Act. The proposed action is being assessed in accordance with the bilateral assessment agreement Amending Agreement No. 1. |

Table 4-3: Commonwealth legislation

| Legislation | Comment |
|---|---|
| *Native Title Act 1993* | The study area includes land currently subject to Native Title Claim by the Gomeroi People (Tribunal File No. NC2011/006, Federal Court No. NSD2308/2011). Claim applicants were invited to participate in the Aboriginal community consultation undertaken for the EIS and were consulted as part of the ACHAR. Refer to **Appendix 9**. |
| *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (ATSIHP Act) | **Appendix 9** provides a discussion of relevant matters protected under the ATSIHP Act. |
| *Civil Aviation Regulations 1988* | The EIS has been referred to Civil Aviation Safety Authority (CASA) to assess potential impacts of the project. An application will be made to address the lowest safe altitude (LSALT) impact of air route W627 which will need to be raised. |
| Heavy Vehicle National Law | Relevant permits under the Heavy Vehicle National Law (NSW) for the use of OSOM vehicles will be sought by the construction contractor. |

## 4.7 Summary of licences, approvals and permits

A summary of the licences, approvals and permits that are likely to be required for the project is provided in **Table 4-4**. None of the proposed amendments require additional licences, approvals, or permits over and above those identified in the EIS and summarised below.

Table 4-4: Summary of licences, approvals and permits required for the project

| Legal instrument | Licence or approval requirement | Consent or approval authority |
|---|---|---|
| EP&A Act | Approval under Part 4 of the Act for SSD | Minister for Planning or delegate |
| EPBC Act | Controlled activity approval in accordance with the Amended Bilateral Agreement No 1 | Federal Minister for the Department of Agriculture, Water and the Environment |
| Crown Land Management Act 2016 | Part 5 Division 5.6 – Licences over Crown Land | Land Division, Department of Primary Industries |
| Protection of the Environment Operations Act 1997 | Section 48 Environment Protection Licence | NSW Environment Protection Authority |
| Roads Act 1993 | Section 138 permits for works involving a public road | Warrumbungle Shire Council |
| Civil Aviation Regulations 1988 | Approval to address the LSALT impact of air route W627 | CASA |

# 5. COMMUNITY AND STAKEHOLDER ENGAGEMENT

Since the submission of the development application and EIS and commencement of the exhibition period, community and stakeholder consultation has continued. Details of consultation undertaken is outlined in **Table 5-1**.

**Table 5-1: Summary of consultation undertaken**

| Stakeholder | Date | Method | Engagement activities |
|---|---|---|---|
| **Individuals** | | | |
| Host landowners | 31/07/2022 | Group meeting (face to face – site meeting) | General meeting to update host regarding the project progress and layout refinements |
| | 15/05/2023 | Group meeting (virtual) | General meeting to update host regarding the project progress and layout refinements |
| | Ongoing | Face-to-face / telephone / emails | Various individual communications with host landholders |
| Neighbours | Ongoing | Face-to-face / telephone / emails | Various individual communications with neighbouring property owners and general community |
| General community | 10/03/2023 | Group meeting (face to face) | Uarbry township discussing assessed impacts and mitigation measures |
| | Ongoing | Face-to-face / telephone / emails | Various individual communications including individual property impact reports and photomontages |
| **Local Indigenous groups** | | | |
| Registered Aboriginal Parties (RAPs) | 21/01/2023 | Letter | Project update letter was sent to all RAPs to inform them that additional survey was being undertaken across the survey boundary to address concerns raised by Heritage NSW received following public exhibition. |
| | 19/04/2023 | Letter | Letter sent to all RAPs advising that additional survey had been undertaken and no additional Aboriginal sites had been recorded. |
| **Local Councils** | | | |
| Warrumbungle Shire Council | 02/09/2022 | Meeting (virtual) | Targeted discussion on traffic and transport |
| | 07/11/2022 | Meeting (virtual) | Targeted discussion on waste management and resources |

**Table 5-1: Summary of consultation undertaken**

| Stakeholder | Date | Method | Engagement activities |
|---|---|---|---|
| | 21/11/2022 | Meeting (virtual) | ACEN led presentation and discussion at Emergency Response Forum |
| | 06/12/2022 | Meeting (face to face – site meeting) | Targeted meeting held on site to discuss road upgrades and intersection concept designs |
| | 17/05/2023 | In person meeting | Meeting at WSC offices to provide an update on project progress and commence VPA discussions |
| Mid-western Regional Council | 19/01/2023 | Meeting (Mudgee Office) | Accommodation strategy and legacy infrastructure options |
| **State Government Departments** | | | |
| DPE | 6/09/2022 | Meeting (virtual) | General project update, discussion on visual impact assessment and Box Gum Woodland |
| | 9/12/2022 | Meeting (virtual) | General project update including engagement activities, landowner agreements, PCT mapping, project design and forecasted timeframes |
| | 27/02/2023 | Meeting (virtual) | Project update including engagement, landowner agreements, biodiversity, visual, noise and layout |
| | 02/05/2023 | Site visit | Project site visit. DPE continued later without ACEN to meet independently with surrounding landowners |
| | 10/08/2023 | Meeting (virtual) | Targeted discussion on SAII and additional and appropriate mitigation as well as visual impacts on specific dwellings |
| | 12/09/2023 | Meeting (virtual) | Combined DPE & BCS meeting on SAII and additional and appropriate mitigation measures |
| BCD | 12/09/2022 | Meeting (face-to-face) | Targeted discussion on mapping of Box Gum Woodland |
| | 08/11/2022 | Meeting and site visit | Site visit led by project ecologist (ELA) to walk BCS assessing officer across site and discuss items raised in BCS submission |

**Table 5-1: Summary of consultation undertaken**

| Stakeholder | Date | Method | Engagement activities |
|---|---|---|---|
| | 21/08/2023 | Meeting (virtual) | Targeted discussion on SAII and additional and appropriate mitigation measures |
| | 12/09/2023 | Meeting (virtual) | Combined DPE & BCS meeting on SAII and additional and appropriate measures |
| Transport for NSW | 26/09/2022 | Meeting (virtual) | Targeted discussion on proposed road upgrades and requirements |
| | 21/11/2022 | Meeting (virtual) | TfNSW Emergency Response Forum |
| Heritage NSW | 2/12/2022 | Email / letter | OzArk, on behalf of ACEN provided further detail on the survey effort as raised in Heritage NSW submission. |
| EnergyCo | Various | Meeting (virtual) | Regular fortnightly meetings |
| **Other** | | | |
| Roy Butlers Office – Local MP | 7/11/2022 | Meeting (face-to-face) | Project update and discussion regarding legacy solutions |

# 6. ASSESSMENT OF IMPACTS

## 6.1 Landscape character and visual

### 6.1.1 Assessment approach

An addendum landscape character and visual impact assessment (addendum LVIA) has been prepared for the amended project. The findings of this assessment are summarised below and provided in full in **Appendix 4**.

The purpose of the addendum LVIA is to identify and assess the potential visual impacts of the amended project on private and public visual amenity receptors. The tools and assessments that have been used and/or prepared to provide the detailed assessment of the potential changes to visual impact associated with the amended project are:

- application of preliminary assessment tools, including visual magnitude and 2D multiple wind turbine tool, and zone of visual influence assessment
- dwelling assessments
- photomontages updated and provided with the contrasting wire frame overlayed to assist with the assessment process.

Additional field work and photographic survey work was undertaken on 30 June 2022 and 25 January 2023 to assess the amended project as well as respond to submissions received.

### 6.1.2 Statutory context, policy and guidelines

The addendum LVIA has been undertaken in accordance with the following documents:

- NSW Wind Energy: Visual Assessment Bulletin (The Bulletin) (Department of Planning and Environment, 2016)
- Visual Representation of Wind Farms - Good Practice Guidance (Scottish Natural Heritage, 2017)
- Draft National Wind Farm Development Guidelines (Environment Protection and Heritage Council (EPHC) (EPHC, 2010)
- Guidelines for Landscape and Visual Impact Assessment Third edition (Landscape Institute and Institute of Environmental Management and Assessment, 2013)
- Best Practice Guidelines for Wind Energy Development (Clean Energy Council, 2018)
- Warrumbungle Shire Local Environmental Plan 2012
- The Dark Sky Planning Guideline (2016).

### 6.1.3 Summary of further assessment

**Preliminary tools**

The preliminary assessment tools outlined in **Section 6.1.1** defined the 'visual catchment' and have been used to identify non-associated residences which require assessment for potential impacts.

The amended project has resulted in a reduction of 21 non-associated dwellings within 4,950 metres (the blue line). The results of the amended 'visual catchment' tool are:

- 27 non-associated dwellings within 3,350 metres of the nearest project turbine (the black line)
- 64 non-associated dwellings between 3,350 - 4,950 metres of the nearest turbine (the blue line). This includes 25 dwellings in the settlement of Leadville (Dwellings 152 - 176).

Amendments to the project have also reduced the number of non-associated dwellings with turbines located within multiple 60-degree sectors. The multiple wind turbine tool identified a total of 25 non-associated dwellings with turbines located in more than two 60-degree sectors.

The addendum LVIA has taken into consideration the recently proposed Barneys Reef Wind Farm. The introduction of Barneys Reef Wind Farm into the assessment has not resulted in additional non-associated dwellings with views to turbines in multiple 60-degree sectors. The changes to the multiple wind turbine tool results are presented in **Table 6-1.**

**Table 6-1: Results of application of multiple wind turbine tool to ammended layout**

| Number of 60-degree sectors with turbines: | EIS layout | Amended layout | Variation |
|---|---|---|---|
| | Number of non-associated dwellings | | |
| Three 60-degree Sectors<br>(Amended project only) | 14 | 17 | Increase of three[1] |
| Three 60-Degree Sectors<br>(Amended project and Liverpool Range Wind Farm) | 8 | 5 | Reduction of three |
| Four 60-degree sectors | 8 | 3 | Reduction of five |
| Five 60-degree sectors | 0 | 0 | No variation |
| Six 60-degree sectors | 0 | 0 | No variation |

[1] Note, this increase is due to dwellings that previously had turbines in four 60 degree sectors that reduced to three 60 degree sectors.

The zone of visual influence for the amended project has been prepared and is presented in Figure 7 of **Appendix 4**. Theoretically, the zone of visual influence indicates the following for the amended project:

- the extent of areas with visibility of the project has been reduced
- the number of visible turbines from Black Stump Road and the village of Leadville has been reduced
- the visibility of the project in its entirety remains limited due to undulating topography
- the areas with the highest level of visibility are within the wind farm site and along ridgelines. These landholdings are associated with the project.

As highlighted in the EIS, the zone of visual influence is a preliminary assessment tool used to identify areas that have potential to view the project. It does not consider the effect of the distance from turbines, or intervening elements such as vegetation and structures.

**Photomontages**

Photomontages were prepared to provide a representation of the view of the amended project from various viewpoints around the wind farm and up to a distance of 8,000 metres from a proposed turbine. The photomontages illustrate the viewpoints without the inclusion of the proposed mitigation measures for the amended project and are therefore considered a worst-case scenario.

Photomontages were prepared for 22 private dwelling locations and 10 public viewpoints to illustrate the view of the amended project once operational. These are provided in **Appendix 4**.

**Visual impact of amended turbine layout**

The visual impact rating for all non-associated residences within 4,950 metres of a project turbine are summarised in **Appendix 4**. For non-associated dwellings within 4,950 metres of the nearest turbine:

- 16 rated as nil / negligible visual impact rating
- 32 rated as having a low visual impact rating
- 42 were assessed as having a moderate visual impact rating
- one was assessed as having a high visual impact rating.

As a result of the amended layout, the number of visible turbines has been reduced for 89% of the non-associated dwellings compared to the layout presented in the EIS. The visual impact ratings have been reduced for a total of five dwellings (Dwellings 84, 90, 180, 190 and 199). The visual impact rating has increased for two dwellings (Dwellings 24 and 498), which is discussed below. An additional two dwellings that were not previously assessed have also been accounted for in the revised assessments (Dwellings 284 and 502).

Since the EIS, additional field work was undertaken (refer **Section 6.1.1**) where property access was available. Explanation of the increased visual impact rating for the four dwellings is provided in **Appendix 4** and summarised below:

- Dwelling 24 and dwelling 498: there is no variation in the distance to the nearest turbine, or the number of turbines within the black or the blue lines. There is no variation to the number of 60-degree sectors. Overall, there is an increase in the number of visible turbines. Visual impact rating has been re-assessed from 'nil' to 'low'.

One additional dwelling (Dwelling 502) has been included in the updated LVIA. This was identified during a site visit since the EIS, and it is noted as a burnt-out former dwelling location on the same property as Dwelling 185. The other additional dwelling described in Section 3.3.2 is an additional host dwelling and therefore no further visual impact assessment has been prepared for that dwelling.

A summary of the amended project visual impact rating for non-associated dwellings within 3,350 metres of project turbines is provided in **Table 6-2**. A summary of the project visual impact rating for non-associated residences between 3,350 metres and 4,950 metres is provided in **Table 6-3**. Where the visual impact rating has increased as a result of the amended project, mitigation measures are provided in **Section 6.1.4**.

Representative photomontages have been prepared for the townships of Coolah (Photomontage 04 in **Appendix 4**) and Leadville (Photomontage 02 in **Appendix 4**). Impacts associated with these locations from the amended project are expected to be similar or very slightly reduced compared to what was presented in the EIS. An additional photomontage has also been prepared from Tongy Lane (Photomontage 08 in **Appendix 4**).

Table 6-2: Summary of visual impact on non-associated residences within 3,350 metres of a project turbine

| Representative Dwelling | Linked Dwellings | Distance to nearest turbine (km) | Number of 60° sectors | Number of visible turbines (based on topography alone) | Visual Impact Rating |
|---|---|---|---|---|---|
| **Mount Hope Cluster** | | | | | |
| Dwelling 25 | | 2.10 | 2 | 64 turbines (17 at tip & 47 at hub) | Low |
| Dwelling 76 | | 3.15 | 3 | 44 turbines (12 at tip & 32 at hub) | Low |
| Dwelling 78 | | 3.15 | 3 | 46 turbines (14 at tip & 32 at hub) | Low |
| Dwelling 79 | | 2.09 | 2 | 37 turbines (5 at tip & 32 at hub) | Low |
| Dwelling 84 | | 2.15 | 2 | 59 turbines (11 at tip & 48 at hub) | Moderate |
| Dwelling 86 | | 2.10 | 3 | 58 turbines (4 at tip & 54 at hub) | Low |
| Dwelling 87 | | 2.74 | 3 | 82 turbines (17 at tip & 65 at hub) | Low |
| Dwelling 90 | | 2.90 | 3 | 89 turbines (16 at tip & 73 at hub) | Low |
| Dwelling 91 | | 2.76 | 2 | 87 turbines (11 at tip & 76 at hub) | Moderate |
| Dwelling 199 | | 2.86 | 2 | 38 turbines (11 at tip & 27 at hub) | Low |
| Dwelling 239 | | 2.42 | 1 | 86 turbines (30 at tip & 56 at hub) | Negligible |
| Dwelling 240 | | 2.91 | 1 | 19 turbines (11 at tip & 8 at hub) | Low |
| Dwelling 282 | | 2.22 | 4 | 81 turbines (10 at tip & 71 at hub) | Moderate |
| Dwelling 503 | | 2.33 | 2 | 1 turbine (At tip height) | Nil |

Table 6-2: Summary of visual impact on non-associated residences within 3,350 metres of a project turbine

| Representative Dwelling | Linked Dwellings | Distance to nearest turbine (km) | Number of 60° sectors | Number of visible turbines (based on topography alone) | Visual Impact Rating |
|---|---|---|---|---|---|
| Dwelling 506 | | 3.22 | 2 | 77 turbines (15 at tip & 62 at hub) | Nil |
| **Girragulang Road Cluster** | | | | | |
| Dwelling 277 | | 3.31 | 3 | 43 turbines (7 at tip & 36 at hub) | High |
| Dwelling 278 | | 2.10 | 4 | 74 turbines (27 at tip & 47 at hub) | Low |
| Dwelling 363 | | 2.92 | 3 | 28 turbines (19 at tip & 9 at hub) | Nil |
| Dwelling 497 | | 2.13 | 3 | 105 turbines (31 at tip & 74 at hub) | Low |
| Dwelling 502 | | 3.31 | 3 | 98 turbines (38 at tip & 60 at hub) | Moderate |
| **Leadville Cluster** | | | | | |
| Dwelling 20 | | 3.15 | 1 | 109 turbines (22 at tip & 87 at hub) | Low |
| Dwelling 177 | | 3.95 | 1 | 89 turbines (11 at tip & 78 at hub) | Low |
| Dwelling 180 | | 2.59 | 1 | 84 turbines (4 at tip & 80 at hub) | Low |
| Dwelling 181 | | 2.41 | 2 | 78 turbines (2 at tip & 76 at hub) | Moderate |
| Dwelling 182 | | 2.33 | 2 | 80 turbines (5 at tip & 75 at hub) | Moderate |
| Dwelling 187 | | 2.47 | 2 | 8 turbines (3 at tip & 5 at hub) | Low |
| Dwelling 190 | | 2.08 | 2 | 34 turbines (4 at tip & 30 at hub) | Negligible |

Table 6-3: Summary of visual impact on non-associated residences between 3,350 metres and 4,950 metres of a project turbine

| Representative Dwelling | Linked Dwellings | Distance to nearest turbine | Number of 60° sectors | Number of visible turbines (based on topography alone) | Visual Impact Rating |
|---|---|---|---|---|---|
| **Mount Hope Cluster** | | | | | |
| Dwelling 16 | | 384 | 1 | 15 turbines (8 at tip & 7 at hub) | Moderate |
| Dwelling 24 | | 4.86 | 2 | 56 turbines (15 at tip & 41 at hub) | Low |
| Dwelling 69 | | 3.90 | 1 | Nil | Nil |
| Dwelling 72 | | 4.60 | 2 | 51 turbines (11 at tip & 40 at hub) | Low |
| Dwelling 75 | | 3.64 | 2 | 51 turbines (10 at tip & 41 at hub) | Negligible |
| Dwelling 80 | | 3.38 | 2 | 84 turbines (10 at tip & 74 at hub) | Low |
| Dwelling 129 | | 4.69 | 1 | 38 turbines (21 at tip & 17 at hub) | Low |
| Dwelling 130 | | 4.95 | 1 | 59 turbines (21 at tip & 38 at hub) | Low |
| Dwelling 138 | | 4.70 | 2 | 33 turbines (12 at tip & 21 at hub) | Low |
| Dwelling 234 | | 3.94 | 1 | 2 turbines (Both at tip) | Nil |
| Dwelling 241 | | 4.19 | 1 | 4 turbines (3 at tip & 1 at hub) | Nil |
| Dwelling 242 | | 4.39 | 1 | 11 turbines (7 at tip & 4 at hub) | Nil |
| Dwelling 243 | | 4.52 | 1 | Nil | Nil |
| Dwelling 498 | | 4.92 | 2 | 67 turbines (20 at tip & 47 at hub) | Low |
| Dwelling 318 | | 3.52 | 1 | 3 turbines | Nil |

Table 6-3: Summary of visual impact on non-associated residences between 3,350 metres and 4,950 metres of a project turbine

| Representative Dwelling | Linked Dwellings | Distance to nearest turbine | Number of 60° sectors | Number of visible turbines (based on topography alone) | Visual Impact Rating |
|---|---|---|---|---|---|
| | | | | (1 at tip & 2 at hub) | |
| Dwelling 501 | | 4.61 | 3 | 84 turbines<br>(15 at tip & 69 at hub) | Low |
| **Girragulang Road Cluster** | | | | | |
| Dwelling 7 | | 4.29 | 1 | 45 turbines<br>(11 at tip & 34 at hub) | Moderate |
| Dwelling 8 | | 4.24 | 1 | 45 turbines<br>(12 at tip & 33 at hub) | Moderate |
| Dwelling 9 | | 4.72 | 1 | 46 turbines<br>(20 at tip & 26 at hub) | Moderate |
| Dwelling 10 | | 4.47 | 1 | 46 turbines<br>(12 at tip & 34 at hub) | Moderate |
| Dwelling 11 | | 4.21 | 1 | 43 turbines<br>(12 at tip & 31 at hub) | Low |
| Dwelling 12 | | 3.97 | 1 | 42 turbines<br>(11 at tip & 31 at hub) | Moderate |
| Dwelling 185 | | 4.51 | 4 | 86 turbines<br>(20 at tip & 66 at hub) | Moderate |
| Dwelling 283 | | 4.87 | 1 | 51 turbines<br>(20 at tip & 31 at hub) | Moderate |
| Dwelling 284 | | 3.91 | 1 | 70 turbines<br>(20 at tip & 50 at hub) | Low |
| Dwelling 285 | | 4.35 | 1 | 62 turbines<br>(25 at tip & 37 at hub) | Low |
| Dwelling 286 | | 4.74 | 1 | 60 turbines<br>(18 at tip & 42 at hub) | Low |
| Dwelling 287 | | 4.55 | 1 | 30 turbines<br>(7 at tip & 23 at hub) | Low |
| Dwelling 288 | | 4.54 | 1 | 21 turbines<br>(8 at tip & 13 at hub) | Low |
| Dwelling 289 | | 4.86 | 1 | 7 turbines<br>(5 at tip & 2 at hub) | Low |

Table 6-3: Summary of visual impact on non-associated residences between 3,350 metres and 4,950 metres of a project turbine

| Representative Dwelling | Linked Dwellings | Distance to nearest turbine | Number of 60° sectors | Number of visible turbines (based on topography alone) | Visual Impact Rating |
|---|---|---|---|---|---|
| **Leadville Cluster** | | | | | |
| Dwelling 21 | | 4.11 | 1 | 127 turbines (13 at tip & 114 at hub) | Moderate |
| Dwelling 154 | Dwellings 152-176 | 3.46 | 1 | 126 turbines (26 at tip & 100 at hub) | Moderate |
| Dwelling 178 | | 3.60 | 1 | 105 turbines (17 at tip & 88 at hub) | Low |
| Dwelling 313 | | 3.71 | 1 | 117 turbines (20 at tip & 97 at hub) | Moderate |
| Dwelling 323 | | 4.75 | 1 | 98 turbines (16 at tip & 82 at hub) | Nil |
| Dwelling 357 | | 3.39 | 2 | 58 turbines (27 at tip & 31 at hub) | Nil |
| Dwelling 203 | | 4.28 | 1 | 129 turbines (7 at tip & 122 at hub) | Moderate |
| Dwelling 192 | | 4.56 | 1 | 15 turbines (1 at tip & 14 at hub) | Nil |
| Dwelling 183 | | 5.17 | 3 | 114 turbines (25 at tip & 89 at hub) | Low |
| Dwelling 184 | | 5.17 | 3 | 109 turbines (18 at tip & 91 at hub) | Low |
| Dwelling 200 | | 4.50 | 1 | 102 turbines (14 at tip & 88 at hub) | Nil |
| Dwelling 311 | | 5.86 | 3 | 41 turbines (16 at tip & 25 at hub) | Low |

**Shadow flicker and blade glint**

A revised shadow flicker assessment has been undertaken in accordance with the Draft National Wind Energy Guidelines (EPHC, 2010) to determine the level of impact of shadow flicker from the amended project on non-associated dwellings.

In accordance with the Bulletin, shadow flicker at non-associated dwellings should not exceed 30 hours per year. A total of five non-associated dwellings were identified with potential shadow flicker hours. Of those, one dwelling (Dwelling 86) has the potential to experience 20 or more hours per year, however this has not increased as a result of the amended project and remains consistent with the results presented in the EIS and is less than the acceptable standard of 30 hours per year. Existing screen planting to the north and east of dwelling 86 is likely to reduce potential shadow flicker.

Short distances along Black Stump Way and Orana Road are likely to experience less than 10 hours of shadow flicker per year. There are no guidelines on acceptable shadow flicker along travel routes and public locations.

An updated shadow flicker diagram has been prepared for the amended project ad is presented in Figure 29 of **Appendix 4**.

**Assessment of amended associated infrastructure and ancillary structures**

<u>High Voltage transmission lines</u>

As described in **Section 3.2.5**, the high voltage overhead transmission line running south from the Girragulang Road, and Leadville clusters will no longer form part of the amended project. The visual impacts associated with this infrastructure will be assessed as part of the EnergyCo CWO-REZ Transmission Project.

The amended project includes overhead transmission lines (up to 220kV) dispatching electricity from each cluster and connecting the Mount Hope cluster to the Girragulang Road cluster. This section of transmission line would be largely located on uninhabited grazing land, within the wind farm site. Some publicly accessible land will have visibility of these overhead transmission lines.

Five non associated dwellings are located within three kilometres of the proposed transmission lines including Dwelling 86, Dwelling 87, Dwelling 282, Dwelling 277, and Dwelling 278. Views to the proposed transmission lines will be screened by vegetation from Dwelling 282, Dwelling 86, and Dwelling 87.

Photomontages have been prepared from Colliers Road northeast of the transmission line and from Black Stump Way to the southwest of the transmission line. These photomontages are presented in **Appendix 4**.

<u>Additional Mount Hope substation</u>

The additional Mount Hope Substation is approximately 10 kilometres west of Coolah, close to Mount Hope Road. A zone of visual influence has been prepared for the additional substation (refer to Figure 17 in **Appendix 4**). Mount Hope Road is a low trafficked road and there are no non-associated dwellings within three kilometres of the substation. Where there is the potential for visibility from Mount Hope Road, existing roadside vegetation would fragment views to the substation.

Potential obstacle lighting

Obstacle lighting (or night lighting) is not proposed as part of the project however ACEN will continue to consult with Civil Aviation Safety Authority (CASA) during detailed design. To ensure that the potential impacts of night lighting have been considered, a night lighting plan has been developed since the EIS and has been assessed as a worst-case assessment as part of the addendum LVIA. The night lighting plan has nominated that 92 of 131 turbines have lighting installed at hub height. This includes 17 of 21 turbines in the Leadville Road Cluster, 30 of 45 turbines in the Girragulang Road cluster and 45 of 65 turbines in the Mount Hope cluster.

A zone of visual influence has been prepared to illustrate the potential number of visible obstacle lights (installed at hub height) from surrounding land. This is presented in Figure 12 of **Appendix 4**. Most of the dwellings located to the north, northwest, east and south of the amended project (within 4,950 metres of the project) have the potential to see up to 44 obstacle lights.

The obstacle lighting assessment is based on topography alone and therefore represents the worst-case scenario. It is likely that the large distance and existing vegetation will mitigate clear visibility of turbines with night lighting. The nearest turbine in the Mount Hope Cluster is located approximately 11 kilometres, and the nearest turbine in the Girragulang Road cluster is located at a distance of approximately 10 kilometres from the dwellings in Leadville. The turbines with obstacle lighting installed in the Leadville cluster would be closer to the dwellings in the village of Leadville, therefore parts of Leadville are likely to experience higher visibility of turbines with obstacle lighting installed as well as viewpoints along Black Stump Way.

With the implementation of mitigation measures such as low-intensity lighting and shielding, the aviation lighting could be constructed with a negligible visual impact on the surrounding landscape. Although this is the case, ACEN has not committed to installation of obstacle lighting in effort to minimise light pollution.

**Cumulative visual impact**

Cumulative visual impacts across the CWO-REZ

Since the lodgement of the EIS in March 2022, DPE has adopted the *Cumulative Impact Assessment Guidelines for State Significant Projects* (DPIE, October 2022). These require an assessment of 'relevant future projects' during the process of preparing the EIS.

The project is located within the CWO-REZ and there are several proposed wind farms at varying stages of the development (refer to Figure 20 of **Appendix 4**). The amended project is located within eight kilometres of the proposed Liverpool Range Wind Farm (located to the northeast) and the proposed Barneys Reef Wind Farm (located south of the Golden Highway).

Cumulative visual impacts with Liverpool Range Wind Farm

Eight non-associated dwellings are located within eight kilometres of both the project and Liverpool Range Wind Farm. A zone of visual influence diagram for the project and Liverpool Range Wind Farm is provided in Figure 22 of **Appendix 4**.

Due to the undulating character of the landscape, there would be limited opportunities to view both the project and Liverpool Range Wind farm simultaneously from publicly accessible locations.

Views to both projects would be available from the town of Coolah and from dwellings scattered along Vinegaroy Road. Although Coolah is located at a higher elevation, the town's undulating character and dense vegetation corridors help screen many views towards both projects.

A wire frame diagram has been prepared (to illustrate a worst-case scenario without built form or vegetation considered). The wire frame diagram (refer to Figure 24 in **Appendix 4**) indicates the distance between the two projects limits the opportunity to view both projects concurrently in the one field of view.

Opportunities for sequential impacts were considered from the following routes in the LVIA:

- Black Stump Way
- Vinegaroy Road
- Tongy Lane.

Additional consideration of these routes and Coolah Creek Road have been provided in the addendum LVIA (Section 12.3 of **Appendix 4**), which also includes the wireframes for these locations.

Views from Black Stump Way heading into Coolah from the north, are likely to be distant and limited by topography. There would be limited opportunities to view the two projects from Vinegaroy Road due to the direction and speed of travel along this road.

Views would be available from parts of Tongy Lane but generally the views to Liverpool Range Wind Farm would be distant. Views to the project are likely to be available in the far distance when travelling on Coolah Creek Road towards Coolah.

Cumulative visual impact with Barneys Reef Wind Farm

Six non-associated dwellings are located within eight kilometres of both the project and Barneys Reef Wind Farm.

The zone of visual influence diagram (refer to Figure 21 of **Appendix 4**) indicates that both the project and Barneys Reef Wind Farm would be visible from Castlereagh Highway and Golden Highway. Views from Leadville Village and Black Stump Way to Barneys Reef Wind Farm would be screened by topography. There is potential to view both projects from dwellings to the southwest near the village of Birriwa.

### 6.1.4 Environmental management and mitigation measures

Based on the findings of the additional assessment undertaken for the amended project, the management measures proposed in the EIS are still considered adequate and no additional measures are warranted.

An updated mitigation measures table for the amended project is provided in **Appendix 3**.

## 6.2 Noise and vibration

### 6.2.1 Assessment approach

An addendum to the noise assessment has been prepared to assess the potential noise impacts associated with the amended project. The addendum is summarised below and provided in full in **Appendix 5**.

The addendum also provides additional clarification related to associated and non-associated receiver status (refer to clarification outlined in **Section 3.3.1** and **Section 3.3.2**) and public road upgrade construction noise.

Clarification has been made that although the public road upgrades are not explicitly referenced in the noise assessment presented in the EIS, the proposed extent of public road upgrades has been accounted for in the construction activity identified as 'access road construction' in Section 8.0 noise assessment presented in the EIS Noise Assessment.

The operational noise assessment provided in the addendum noise assessment analyses the sound power level data of three wind turbine models:

- Vestas V162-6.2 MW
- Siemens Gamesa SG 6.2-170
- General Electric GE 6.0-164.

These are the same wind turbine models as those considered in the EIS.

### 6.2.2 Statutory context, policy and guidelines

The noise and vibration assessment has been undertaken in accordance with the following documents:

- NSW Wind Energy: Noise Assessment Bulletin (Department of Planning and Environment, 2016c) (the Noise Assessment Bulletin)
- NSW Noise Policy for Industry (Environment Protection Authority, 2006)
- Interim Construction Noise Guideline (Department of Environment and Conservation, 2009) (ICNG)
- NSW Road Noise Policy (Department of Environment, Climate Change and Water, 2011) (RNP).

### 6.2.3 Summary of further assessment

**Construction noise**

Predicted noise levels have been calculated in accordance with the method detailed in Australian Standard 2436:2010 Guide to noise and vibration control on construction, demolition, and maintenance sites (AS 2436). Predicted noise level ranges at the nearest non-associated and associated receivers for each of the main construction tasks for the amended project are presented in **Table 6-4**.

Noise related to the construction of the additional Mount Hope substation is predicted to be below the noise affected management level. The predicted noise levels indicate the highly noise affected management levels would be exceeded at some of the nearest non-associated and associated receivers during the construction of access roads. This is consistent with the findings of the EIS. The predicted noise levels are comparable to, and typical of, noise levels produced by general road maintenance works and activity.

Exceedances above the highly noise-affected and noise affected management levels are not unique to this project and are characteristic of most construction noise impact assessments and typical for the construction of a wind farm.

Changes to the turbine layout is primarily related to removal of wind turbines (refer to **Section 3.2.2**). This means that construction noise associated with the revised layout is likely to be equivalent to, or lower than the predicted construction noise levels for receivers near where turbines have been removed as part of the amended project.

**Table 6-4: Indicative range of construction noise predictions, dB $L_{Aeq}$**

| Construction task | Nearest receiver | Predicted level range | Noise affected management level | Exceedance | Highly noise affected management level | Exceedance |
|---|---|---|---|---|---|---|
| **Non - associated receivers** | | | | | | |
| Access road construction* | 31 | 80-85 | 45 | 35-40 | 75 | 5-10 |
| Substation construction | 199 | 30-35 | 45 | - | - | - |
| Turbine foundations | 5 | 35-40 | 45 | - | 75 | - |
| Turbine assembly | 5 | 35-40 | 45 | - | 75 | - |
| **Associated receivers** | | | | | | |
| Access road construction* | 297 | 70-75 | 45 | 25-30 | 75 | - |
| Substation construction | 509 | 35-40 | 45 | - | - | - |
| Turbine foundations | 250 | 45-50 | 45 | 0-5 | 75 | - |
| Turbine assembly | 250 | 45-50 | 45 | 0-5 | 75 | - |

**Note: including public road upgrade*

**Operational noise**

Predicted wind turbine noise levels

Noise modelling has been updated to incorporate the revised turbine layout and reflect the updates to associated and non-associated receiver status. As detailed in the EIS, the minimum turbine noise limit applicable at non-associated receivers is 35 dB LAeq, and the reference level for associated receivers is 45 dB LAeq.

A total of 56 noise sensitive locations (sensitive receivers) have been identified within three kilometres of the amended project, of which 36 are associated dwellings and 20 are non-associated dwellings.

The non-associated receivers for which operational turbine noise levels are predicted to be higher than 30 dB $L_{Aeq}$ for the amended project, are listed in **Table 6-5**. The candidate turbine model with the highest predicted noise levels is GE 6.0-164. For all non-associated receivers, the predicted turbine noise levels from the amended project are below the noise limit for all candidate turbine models.

The sensitive receivers within three kilometres of a project turbine and the noise contours for the GE 6.0-164 are shown in Figure 4 of **Appendix 5**.

**Table 6-5: Highest predicted noise level at non-associated receivers with predicted levels above 30 dB $L_{Aeq}$**

| Receiver | SG 6.2-170 | GE 6.0-164 | V162-6.2 MW |
|---|---|---|---|
| 25 | 31.3 | 32.7 | 31.6 |
| 76[1] | 30.4 | 31.7 | 30.8 |
| 77[1] | 29.9 | 31.1 | 30.2 |
| 78[1] | 29.7 | 30.9 | 30.0 |
| 79 | 30.4 | 31.7 | 30.7 |
| 84 | 30.0 | 31.4 | 30.3 |
| 86 | 31.9 | 33.3 | 32.2 |
| 87 | 30.8 | 32.0 | 31.0 |
| 90 | 31.5 | 32.7 | 31.8 |
| 91 | 31.4 | 32.5 | 31.6 |
| 180 | 29.3 | 30.6 | 29.5 |
| 181 | 29.7 | 31.1 | 30.0 |
| 182 | 30 | 31.4 | 30.3 |
| 199 | 29.6 | 30.9 | 29.9 |
| 239 | 29.1 | 30.3 | 29.4 |
| 277[1] | 29.8 | 30.9 | 30.0 |
| 278 | 32.1 | 33.4 | 32.4 |

**Table 6-5: Highest predicted noise level at non-associated receivers with predicted levels above 30 dB $L_{Aeq}$**

| Receiver | SG 6.2-170 | GE 6.0-164 | V162-6.2 MW |
|---|---|---|---|
| 282 | 32.6 | 33.9 | 32.9 |
| 497 | 32.7 | 34.1 | 33.1 |
| 501[1] | 29.1 | 30.0 | 29.1 |
| 502[1] | 30.5 | 31.6 | 30.7 |
| 506[1] | 30.5 | 31.6 | 30.7 |

[1] These receivers are located more than 3 km from a turbine but have been included as predicted noise levels are above 30 dB $L_{Aeq}$ for at least one turbine model.

Additional Mount Hope substation

The amended project includes an additional substation within the Mount Hope cluster (as described in **Section 3.2.4**). The predicted noise levels for the operation of the additional Mount Hope substation at the nearest non-associated and associated receivers are listed in **Table 6-6**. For the purposes of assessment, the most stringent criterion applicable has been considered, being 35 dB $L_{Aeq}$, consistent with the EIS.

While the specific equipment selections would not be finalised until detailed design, noise levels from the operation of the additional Mount Hope substation are predicted to be substantially below the 35 dB $L_{Aeq}$ criterion applicable at the nearest non-associated and associated receivers.

**Table 6-6: Predicted operational noise levels at the nearest non-associated and associated receivers (including +5 dB tonality penalty) – additional Mount Hope substation, dB LAeq**

| Receiver | Distance (m) | $L_{Aeq}$ |
|---|---|---|
| 76 (non-associated) | 4,254 | <15 |
| 250 (associated) | 2,927 | 16 |

Prediction method and source noise levels for plant and equipment items associated with the construction of the additional Mount Hope Substation have been assumed to align with that for the construction of other substations in the project, which is consistent with the EIS. On this basis the predicted noise level ranges at the nearest non-associated and associated receivers are listed in **Table 6-7** and are below the noise affected management level.

**Table 6-7: Indicative range of construction noise predictions – additional Mount Hope substation, dB LAeq**

| Receiver | Predicted level range | Noise affected management level |
|---|---|---|
| 76 (non-associated) | 30-35 | 45 |
| 250 (associated) | 35-40 | 45 |

Cumulative noise

The amended project has been assessed with consideration of the potential cumulative noise impacts associated with the project and Liverpool Range Wind Farm. Only receivers with predicted noise levels from either wind farms higher than 32 dB $L_{Aeq}$ were included as relevant receivers for the cumulative assessment.

The predicted noise levels indicate that the compliance outcome due to cumulative effects for any relevant receiver of either wind farm does not change because of the amended project and remains compliant for all. The results for relevant non-associated receivers are presented in **Table 6-8** and are presented in full in **Appendix 5.**

**Table 6-8: Cumulative assessment for relevant non-associated receivers dB LAeq**

| Receiver | Liverpool Range Wind farm (GE 5.5 – 158) | Amended project (GE 6.0-164) | Cumulative |
|---|---|---|---|
| 25 | 21.2 | 32.7 | 33.0 |
| 86 | 20.5 | 33.3 | 33.5 |
| 87 | 19.7 | 32.0 | 32.2 |
| 90 | 17.2 | 32.7 | 32.8 |
| 91 | 17.8 | 32.5 | 32.6 |
| 278 | 18.2 | 33.4 | 33.5 |
| 282 | 17.7 | 33.9 | 34.0 |
| 497 | 19.4 | 34.1 | 34.2 |

Cumulative consideration has been given to the additional Mount Hope substation in conjunction with the other substations and the potential BESS, and the predicted noise would be below 35 dB LAeq.

### 6.2.4 Environmental management and mitigation measures

Based on the findings of the additional assessment undertaken for the amended project, the management measures proposed in the EIS are still considered adequate and no additional measures are warranted.

An updated mitigation measures table for the amended project is provided in **Appendix 3**.

## 6.3 Biodiversity

### 6.3.1 Assessment approach

An amended biodiversity development assessment report (BDAR) has been prepared to meet the requirements of the Biodiversity Assessment Method (BAM) established under Section 6.7 of the NSW BC Act. The accredited BAM assessor who prepared the assessment is Alex Pursche (BAAS17019). The amended BDAR assesses changes to the project since the EIS and aims to satisfy queries raised by both members of the public, as well as the advice received from the DPE's Biodiversity, Conservation and Science Directorate (BCS) in response to the original BDAR. The amended BDAR is included in **Appendix 6**.

The submission received from the BCS included a request to update Plant Community Type (PCT) mapping, in accordance with the 'BCS North West Branch – Woodland Mapping Guidance' (Woodland Mapping Guidance). Following receipt of the BCS submission, ELA and ACEN have considered the Woodland Mapping Guidance, and met with BCS on 12 September 2022 to discuss the implications of adopting the Woodland Mapping Guidance. ELA proposed an alternative woodland mapping methodology on 21 October, which is described in Section 3.4.2 of **Appendix 6**, and a site visit was undertaken on 8 November, to consider the proposed methodology 'on the ground' as it relates to the vegetation present on site.

The aim of this alternative method is to map grassy woodland appropriately, in line with available information at the time of preparation of the BDAR, to ensure that mapping aligns with the PCT benchmarks, as well as the Final Determination for the relevant threatened ecological communities (TECs). The proposed methodology was formally accepted by BCS on 16 November 2022 and the BDAR was updated applying the approved methodology.

### 6.3.2 Statutory context, policy and guidelines

The biodiversity assessment has been prepared in accordance with the following:

- EPBC Act
- EP&A Act
- BC Act
- LLS Act
- Planning Systems SEPP
- SEPP Infrastructure
- SEPP Koala Habitat
- NSW Fisheries Management Act 1994
- Guideline to the Biodiversity Assessment Method assessment
- Policy and Guidelines for Fish Friendly Waterway Crossings.

### 6.3.3 Summary of further assessment

**Avoidance of impacts**

Since the original development application, the amended project has taken steps to avoid, minimise and mitigate impacts to biodiversity values. An original larger investigation area was surveyed in 2019, and the site selected and refined over several iterations to avoid the areas of highest biodiversity value.

The amended BDAR provides an assessment of the refined footprint to that presented in the EIS. The removal of 17 1turbines (11% reduction in turbines) and associated infrastructure, including revised access tracks and hardstands, and removal of the electrical connectivity to the CWO-REZ transmission line, has resulted in a 51% reduction in the development site from 1,318 to 695 hectares.

This refinement follows extensive consultation with the DPE and BCS regarding the extent of potential impact on threatened ecological communities and other native vegetation and the project's ability to demonstrate the principles of 'avoid and minimise' regarding impacts to biodiversity.

**Direct and indirect impacts**

The development site, which includes both construction and operational footprints covers approximately 695 ha and is primarily used for sheep and cattle grazing and cropping. Most of the native vegetation is modified by both historical and ongoing farming practices and is generally restricted to isolated paddock trees or small patches of paddock trees with a modified understorey.

However, as discussed in the EIS, PCT 267 occurs within the development site and has been assessed to meet the threshold for Inland Grey Box Endangered Ecological Community (EEC) under both the BC Act and EPBC Act.

PCT 281 and PCT 483, also within the development site can conform to White Box - Yellow Box - Blakely's Red Gum Grassy Woodland, a Critically Endangered Ecological Community (CEEC) listed under the BC Act and EPBC Act. Within the development site 35.32 hectares was assessed as meeting the condition thresholds for the CEEC listed under the EPBC Act.

The main impact of the project on biodiversity values would result from the removal of vegetation required for the construction of access tracks, electrical reticulation and substations, turbine footings and pads, and operation and maintenance facilities. Disturbance and clearing of vegetation may also arise from additional footprint required for construction including lay down areas for turbine components and construction compounds.

The project may have direct impacts on:

- native vegetation and threatened ecological communities
- threatened species and threatened species habitat
- prescribed biodiversity impacts.

Potential indirect impacts associated with the project include:

- inadvertent impacts on adjacent habitat or vegetation such as trampling grass and ground cover by site vehicles during construction and decommissioning
- indirect impacts to adjacent fauna species and their habitat from noise, dust or light spill, predominantly during construction works and decommissioning but also noise generated daily throughout the operation of the project
- potential to transport weeds and pathogens from the site to adjacent vegetation during construction and decommissioning.

**Serious and irreversible impacts**

Box Gum Woodland SAII

One threatened ecological community, the White Box Yellow Box Blakely's Red Gum Grassy Woodland has been considered a potential entity to meet the serious and irreversible impacts principle. The development has candidate Serious and Irreversible Impacts (SAII) values as outlined in **Table 6-9**, and the rationale for listing that entity is provided in **Table 6-10**. Detailed consideration of whether impacts on TECs that are serious and irreversible is included in **Table 6-11.**

**Table 6-9: Serious and Irreversible Impacts Summary**

| Species / Community | Common Name | Direct impact individuals / area (ha) | Threshold |
|---|---|---|---|
| White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions | Box Gum Woodland | A total of 281 ha would be impacted within the development including 119 ha of woodland and 162 ha of derived grassland | No threshold identified. |

**Table 6-10: Determining whether impacts are serious and irreversible**

| Determining whether impacts are serious and irreversible | Assessment |
|---|---|
| **Principle 1** | |
| Does the proposal impact on a species, population or ecological community that is a candidate entity because it is in a rapid rate of decline? | Yes, the White Box Yellow Box Blakely's Red Gum Woodland is identified as potentially being SAII. |
| If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible? | There is no threshold for impacts that may trigger a serious and irreversible impact. Therefore, the determination of a serious and irreversible impact is to be assessed on a case-by-case basis |
| **Principle 2** | |
| Does the proposal impact on a species that is a candidate entity because it has been identified as having a very small population size? | Yes |
| If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible? Note: where candidate entities have no listed threshold, any impact is considered likely to be serious and irreversible | No threshold is identified, and the community is widespread in several bioregions NSW. Further consideration of potential serious and irreversible impacts is outlined in **Appendix 6.** |
| **Principle 3** | |
| Does the proposal impact on the habitat of a species or an area of an ecological community | No |

Table 6-10: Determining whether impacts are serious and irreversible

| Determining whether impacts are serious and irreversible | Assessment |
|---|---|
| that is a candidate entity because it has a very limited geographic distribution? | |
| If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible? Note: where candidate entities have no listed threshold, any impact is considered likely to be serious and irreversible. | N/A |
| **Principle 4** | |
| Does the proposal impact on a species, a component of species habitat or an ecological community that is a candidate entity because it is irreplaceable? | No |
| If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible? Note: where candidate entities have no listed threshold, any impact is considered likely to be serious and irreversible. | N/A |

Table 6-11: Evaluation of an impact on a TEC consistent with 9.1.1 of the BAM

| Impact Assessment Provisions | Assessment |
|---|---|
| 1. the action and measures taken to avoid the direct and indirect impact on the potential entity for an SAII | Measures to avoid direct and indirect impacts are detailed in Section 7 of **Appendix 6**. ACEN has removed turbines, removed overhead transmission line from the project and redesigned the project infrastructure to reduce the total project impacts by nearly 50%. Impacts to Woodland areas of Box Gum Woodland have been reduced by 50%. |
| 2a. evidence of reduction in geographic distribution (Principle 1, clause 6.7(2)(a) BC Regulation) as the current total geographic extent of the TEC in NSW AND the estimated reduction in geographic extent of the TEC since 1970 (not including impacts of the proposal) | The current total geographic extent of the TEC has been estimated by calculating the area of associated PCTs as mapped on the Brigalow Belt South – Nandewar, Central West – Lachlan, Upper Hunter, and Riverina PCT Maps (Figure 62 of **Appendix 6**). Based on this mapping, there is potentially 1,835,977 ha of the TEC currently in NSW.<br>The reduction of the TEC since 1970 is not known, however Section 8 of the Final Determination identified that:<br>*"White Box Yellow Box Blakely's Red Gum Woodland has been drastically reduced in area and highly fragmented because of clearance for cropping and pasture improvement. Austin et al. (2000) found the community had been* |

**Table 6-10: Determining whether impacts are serious and irreversible**

| Determining whether impacts are serious and irreversible | Assessment |
|---|---|
| | *reduced to less than 1% of its pre-European extent in the Central Lachlan region. Comparable degrees of reduction have been documented for NSW south western slopes and southern Tablelands (estimated <4% remaining, Thomas et. al. 2000), and for the Holbrook area (estimated <7% remaining, Gibbons and Boak (2000). Gibbons and Boak (2000) found remnants of woodlands dominated by Eucalyptus albens, E. melliodora and E. blakelyi were severely fragmented."* |
| 2b. extent of reduction in ecological function for the TEC using evidence that describes the degree of environmental degradation or disruption to biotic processes (Principle 2, clause 6.7(2)(b) BC Regulation) indicated by:<br>i. change in community structure<br>ii. change in species composition<br>iii. disruption of ecological processes<br>iv. invasion and establishment of exotic species<br>v. degradation of habitat, and<br>vi. fragmentation of habitat | Within the operational footprint of the development site, the community structure will be entirely removed. Within the construction footprint there will be removal of trees that interfere with construction activities. There may also be temporary disturbance to the ground layer in set down areas and temporary parking areas.<br>Species composition is expected to be reduced to zero, within all areas of the development footprint.<br>There is unlikely to be any invasion or establishment of exotic species, beyond those that already occur throughout the study area.<br>Habitats within the development site will be removed.<br>Habitats that occur outside the development site may be fragmented from each other, however most of the development site is located in an already fragmented landscape and is unlikely to further reduce connectivity of the TEC. |
| 2c. evidence of restricted geographic distribution (Principle 3, clause 6.7 (2) (c) BC Regulation), based on the TECs geographic range in NSW according to the:<br>i. extent of occurrence<br>ii. area of occupancy, and<br>iii. number of threat-defined locations. | This principle is not applicable to this TEC as it does not have a restricted geographic distribution.<br>The TECs geographic range in NSW includes the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions.<br>The current extent of occurrence based on the Brigalow Belt South – Nandewar, Central West – Lachlan, Upper Hunter, and Riverina PCT Maps (Figure 59 of **Appendix 6**) is potentially 1.8M ha of the TEC currently in NSW. |

**Table 6-10: Determining whether impacts are serious and irreversible**

| Determining whether impacts are serious and irreversible | Assessment |
|---|---|
| | There are no threat-defined locations for this TEC. |
| 2d. evidence that the TEC is unlikely to respond to management (Principle 4, clause 6.7 (2) (d) BC Regulation). | This principle is not applicable to this TEC. This TEC responds well to management. |
| 3. Where the TBDC indicated that data is 'unknown' or 'data deficient' for a TEC for a criterion listed in subsection 9.1.1(2), the assessor must record this in the BDAR or BCAR. | N/A |
| 4a. the impact on the geographic extent of the TEC (Principles 1 and 3) by estimating the total area of the TEC to be impacted by the proposal:<br>i. in hectares, and<br>ii. as a percentage of the current geographic extent of the TEC in NSW. | The total area of the TEC to be impacted by the proposal is 276 ha.<br>The percentage of impact to the TEC across the current geographic extent is 0.01%. |
| 4b. the extent that the proposed impacts are likely to contribute to further environmental degradation or the disruption of biotic processes (Principle 2) of the TEC by:<br>i. estimating the size of any remaining, but now isolated, areas of the TEC; including areas of the TEC within 500 m of the development footprint or equivalent area for other types of proposals<br>ii. describing the impacts on connectivity and fragmentation of the remaining areas of TEC measured by:<br>• distance between isolated areas of the TEC, presented as the average distance if the remnant is retained AND the average distance if the remnant is removed as proposed, and<br>• estimated maximum dispersal distance for native flora species characteristic of the TEC, and<br>• other information relevant to describing the impact on connectivity and fragmentation, such as the area to perimeter ratio for remaining areas of the TEC as a result of the development<br>iii. describing the condition of the TEC according to the vegetation integrity score for the relevant vegetation zone(s) (Section 4.3). The assessor must also include the relevant | The extent of the TEC within 500m of the development is shown on Figure 63 of **Appendix 6**.<br>The current connectivity and isolation of patches of the TEC was measured using Euclidean distance analysis between patches of the TEC. The change in the proportion of area between patches (i.e. future separation of the TEC) changed from an average separation of 52.1 m before development to 52.9 m after development.<br>The project is unlikely to isolate any patches of the TEC, as the extent of the TEC is so prevalent locally.<br>The maximum dispersal distance for native flora species before and after the development is unchanged.<br>The area to perimeter ratio before the development is 20.98 $m^2/m$.<br>The area to perimeter ratio after the development is 20.21 $m^2/m$.<br>The condition of the TEC according to the vegetation integrity score is provided in Table 14 of **Appendix 6**. |

Table 6-10: Determining whether impacts are serious and irreversible

| Determining whether impacts are serious and irreversible | Assessment |
|---|---|
| composition, structure and function condition scores for each vegetation zone. | |

Large-eared Pied Bat SAII

For large-eared Pied Bat an assessment has been undertaken against the provisions of 9.1.2 of the BAM. Breeding habitat is defined as PCTs associated with the species within 100 metres of rocky areas containing caves, or overhangs or crevices, cliffs or escarpments, or old mines, tunnels, culverts, derelict concrete buildings. No breeding habitat was identified for within the development site and the project has deliberately avoided all impacts to any potential breeding habitats.

Large Bentwing-Bat SAII

For Large Bentwing-Bat an assessment has been undertaken against the provisions of 9.1.2 of the BAM. Breeding habitat is defined as caves, tunnels, mines or other structures known or suspected to be used by *M. schreibersii oceanensis*. The project has deliberately avoided all impacts to any potential breeding habitats.

Evaluation of potential SAII for the large-eared Pied Bat and the Large Bentwing-Bat is provided in **Appendix 6**.

**Additional Koala survey**

The submission received from the BCS included a request to conduct a targeted survey to determine the presence or absence of the Koala in accordance with new Koala (Phascolarctos cinereus) Biodiversity Assessment Method Survey Guide (DPE, 2022).

The new guideline was published after the completion of the EIS and submission of the BDAR. Clarification was provided through Assessor update 36, in which item 4 describes the application of new or revised survey guidelines:

> *"Where survey has been completed prior to the publication of a survey guide, the Department expects the assessor (or surveyor) to have applied current best-practice in searching for the target species (in accordance with BAM s6.5.1.4). Assessors can use information from other published, peer-reviewed sources to guide survey technique and effort, but this must be clearly documented and justified in the BAR as well as indicating how this differs from our recently published guide."*

Based on the updated guidance, the level of survey effort presented in the BDAR, prior to any guideline existing, is considered adequate. However, in recognition of the importance of this species, a further 22 spot assessment technique (SAT) surveys were undertaken, increasing the survey undertaken for the EIS to a total of48 surveys and approximately 1,440 trees surveyed. This SAT effort is in addition to the 465 kilometres of spotlighting undertaken across the development site. Details of the results of this survey are provided in Chapter 4 the amended BDAR.

### 6.3.4 Impacts requiring offsets

The potential impacts of the project that would require offsets are discussed in detail in **Section 9-2** of the updated BDAR. A summary of the offsets required is provided in **Table 6-9** and **Table 6-10**.

Noting that only one access to the Girragulang Road cluster would be constructed, Table 69 in the updated BDAR includes a comparison of those offsets associated with the additional alternate access to the Girragulang Road cluster, should the proposed access via Uarbry not proceed.

**Table 6-12: Ecosystem credits required**

| PCT Number | PCT Name | BC Act | EPBC Act | Area impacted | Credits required* |
|---|---|---|---|---|---|
| 84 | River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion | Not listed | Not listed | 1.14 | 12 |
| 267 | White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion | EEC | EEC | 4.48 | 77 |
| 281 | Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion | CEEC | CEEC (portions thereof) | 16.38 | 597 |
| 479 | Narrow-leaved Ironbark- Black Cypress Pine - stringybark +/- Grey Gum +/- Narrow-leaved Wattle shrubby open forest on sandstone hills in the southern Brigalow Belt South Bioregion and Sydney Basin Bioregion | Not listed | Not listed | 24.69 | 417 |
| 483 | Grey Box x White Box grassy open woodland on basalt hills in the Merriwa region, upper Hunter Valley | CEEC (portions thereof) | CEEC (portions thereof) | 593.01 | 5,294 |

*Refer to Table 69 in the updated BDAR for a detailed breakdown of credits, including offsets associated with the alternate access to Girragulang Road

**Table 6-13: Species credits required**

| Species | Common Name | Number of individuals / Habitat (ha) in development site | Credits required |
|---|---|---|---|
| *Dichanthium setosum* | Bluegrass | Species identified outside the development site. No impacts to this species will occur. | 0 – no individuals or habitats impacted |

**Table 6-13: Species credits required**

| Species | Common Name | Number of individuals / Habitat (ha) in development site | Credits required |
|---|---|---|---|
| *Chalinolobus dwyeri* | Large-eared Pied Bat | 0.0 ha of potential breeding habitat<br>3.94 ha of foraging habitats | 189 for foraging habitats. No breeding habitat impacted. |
| *Tyto novahollandiae* | Masked Owl | 9.95 ha (100 m buffer around potential nest trees) | 217 |
| *Ninox connivens* | Barking Owl | 130.37 ha (100 m buffer around potential nest trees) | 2,426 |
| *Ninox strenua* | Powerful owl | 9.95 ha (100 m buffer around potential nest trees) | 217 |
| *Petaurus norfolcensis* | Squirrel Glider | 14.12 ha | 446 |
| *Hoplocephalus bitorquatus* | Pale-headed Snake | 1.04 ha of habitat present | 15 credits |

The development site has been designed to avoid and minimise impacts and is predominately located in areas of low or no biodiversity value. The residual impact of the proposed development requires 6,357 ecosystem credits and 3,126 species credits.

### 6.3.5 Environmental management and mitigation measures

Based on the findings of the additional assessment undertaken for the amended project, and in response to the submission received from BCD and subsequent consultation, an additional and appropriate measure (AAM) (ID BS4) is included in the updated mitigation measures table for the amended project in **Appendix 3** as follows:

> *"In addition to the mandatory requirement for offsets under the BOS, an additional and appropriate measure (AAM) that ACEN commits to is:*
> - *within 5 years of Notice to Proceed (NtP), ACEN will establish a Conservation Agreement under Part 5 Division 3 of the BC Act over a parcel of land equivalent in size to the clearing of Box Gum Woodland associated with the project*
> - *the Conservation Agreement will include Native Vegetation Management and augmentation, to restore species composition to replicate the condition of Box Gum Woodland that was cleared*
> - *the priority location for delivering the AAM will be the Tomahawk property*
> - *if ACEN can further reduce impacts to Box Gum Woodland during the detailed design and construction phase, the area of restoration required can be amended to the final area of impact."*

An updated mitigation measures table for the amended project is provided in **Appendix 3**.

## 6.4 Traffic and transport

### 6.4.1 Assessment approach

A technical note has been prepared to assess the provision of an alternate access route option to the Girragulang Road cluster via the Golden Highway, noting that only one access to Girragulang Road would be constructed. The technical note is summarised below and provided in full in **Appendix 7**.

### 6.4.2 Statutory context, policy and guidelines

The technical note has been prepared in accordance with the following statutory documents and guidelines:

- Guide to Traffic Generating Developments version 2.2 (RTA, 2002)
- Austroads Guide to Road Design Part 3: Geometric Design (Austroads, 2016a)
- Austroads Guide to Road Design Part 4: Intersections and Crossings: General (Austroads, 2021)
- Austroads Guide to Traffic Management Part 12: Traffic Impacts of Development (Austroads, 2016b).

### 6.4.3 Summary of further assessment

**Heavy vehicle access routes**

Transportation of some project components, such as wind turbine blades, nacelles and transformers, would require OSOM vehicles that exceed the regulatory limits of standard vehicle dimensions. Large components, such as wind turbine blades, would be shipped to Australia from overseas and transported to the wind farm site from the Port of Newcastle, accessing the worksites by the following route:

- Industrial Drive
- Pacific Highway
- New England Highway
- Hunter Expressway
- New England Highway
- Golden Highway

The heavy vehicle access route for the amended project remains the same as that presented and assessed in the EIS, with access routes to the three clusters from the Golden Highway. These are presented below with the addition of the alternate access route for the Girragulang Road cluster noting that only one access to Girragulang Road would be constructed:

- **Mount Hope cluster**: OSOM access via Black Stump Way including a new access constructed on Black Stump Way, south of Coolah. The section of Mount Hope Road located within the Mount Hope cluster boundary would be used by heavy vehicles and OSOM vehicles to access the internal access tracks to the turbine locations.
- **Leadville cluster**: OSOM access via a new access on the Golden Highway.
- **Girragulang Road cluster**: OSOM access via Short Street, Turee Street and Moorefield Road from the Golden Highway OR via an alternate access route following the alignment of the proposed CWO-REZ Transmission Line, from the Golden Highway.

**Traffic generation**

The EIS identified that the construction phase is associated with the greatest traffic generation for the project, with traffic generation during the operations phase significantly lower.

The construction phase of the Girragulang Road cluster is expected to generate the following peak daily construction traffic demands:

- peak generation of 48 heavy vehicle trips per day (24 heavy vehicles to site and 24 heavy vehicles from site) equating to six heavy vehicle trips during the peak hour (three heavy vehicles to site and three heavy vehicles from site)
- Up to 400 employees per day, who would likely travel in a combination of individual vehicles and minivans or shuttle buses:
    - 128 light vehicles per day if the construction workforce were centralised in a construction workers accommodation
    - 506 light vehicles per day if the construction workforce were distributed regionally.

The alternative access route to Girragulang Road cluster does not result in a greater impact on the Golden Highway as the forecast volumes along the Golden Highway remain consistent with the EIS traffic assessment, regardless of which access option is constructed.

**Intersection warrants**

A new intersection with Golden Highway would be required for the alternative access route, and the forecast construction vehicle turning movements and through movements along Golden Highway in the peak hours were assessed against the *Austroads Guide to Traffic Management Part 6: Intersections, Interchanges and Crossings* intersection warrants.

The forecast turning movements (presented in Figure 5 and Figure 6 of **Appendix 7**) fall within the limits of the basic intersection arrangement. Therefore, no additional left or right turn turning lanes in either AM or PM peak flow periods are warranted. This is the case for both types of workforce distribution (regional or centralised workforce accommodation).

The new intersection required for the alternate access would be consistent with that which was presented in the EIS for the Golden Highway / Short Street intersection, to cater for OSOM vehicle movements (refer to Appendix A of the EIS traffic assessment), and would be designed to achieve safe intersection sight distance (SISD) in accordance with the requirements of *Austroads Guide to Road Design Part 4A* (AGRD04a) (Austroads, 2021).

The location of the new intersection would need to consider the limitation of the vertical road alignment of the Golden Highway. To the west of the alternative access location, the alignment of the Golden Highway has a vertical crest where the highway has been 'cut' into the terrain. This may limit the SISD for vehicles exiting from the new intersection if it is located within 284 metres of the crest. To the east of the alternative access location, there is sufficient sight distance of over 550 metres.

A vehicle access may be provided 284 metres east of the crest, towards Ross Crossing North Road, to satisfy the SISD for both directions of travel. Alternatively, a temporary reduction of the speed limit could be explored in in consultation with Transport for NSW and Warrumbungle Shire Council in the vicinity of the alternative access, to satisfy a lower SISD at the alternative access location.

The road and intersection upgrades that would be required by the amended project are detailed in **Table 6-14**, which is consistent with the discussion presented in Section 9.3.4 of the EIS, except where roads are no longer proposed to be used by the project (refer to **Section 3.2.7**).

**Table 6-14: Road upgrades and timing**

| Intersection / Road | | Proposed upgrade | Length (km) | Timing |
|---|---|---|---|---|
| **Road authority: Warrumbungle Shire Council** | | | | |
| 1 | Mount Hope Road | Within the Mount Hope cluster boundary, upgrade to the standard and satisfaction of Council for general construction traffic and OSOM vehicles. | 12.0 | Prior to commencing construction of the Mount Hope cluster |
| 2 | Black Stump Way / Mount Hope Access Road intersection | Extent of required works to allow access for OSOM vehicles. | N/A | Prior to commencing construction of the Mount Hope cluster |
| 3* | Short Street | From the Golden Highway to Church Street, upgrade to the standard and satisfaction of Council for general construction traffic and OSOM vehicles. ACEN is committed to paving this section of road in response to feedback from the local community. | 0.3 | Prior to commencing construction of the Girragulang Road cluster |
| 4* | Turee Street | From Short Street to Main Street, upgrade to the standard and satisfaction of Council for general construction traffic and OSOM vehicles. ACEN is committed to paving this section of road in response to feedback from the local community. | 0.3 | Prior to commencing construction of the Girragulang Road cluster |
| 5* | Main Street | From Turee Street to Wyaldra Street, upgrade to the standard and satisfaction of Council for general construction traffic and OSOM vehicles. | 0.1 | Prior to commencing construction of the Girragulang Road cluster |
| 6* | Wyaldra Street | From Main Street to Moorefield Road, upgrade to the standard and satisfaction of Council for general construction traffic and OSOM vehicles. | 0.3 | Prior to commencing construction of the Girragulang Road cluster |
| 7* | Moorefield Road (east) | From Wyaldra Street to Girragulang Road cluster boundary, upgrade to the standard and satisfaction of Council for general construction traffic and OSOM vehicles. | 2.2 | Prior to commencing construction of the Girragulang Road cluster |

**Table 6-14: Road upgrades and timing**

| Intersection / Road | | Proposed upgrade | Length (km) | Timing |
|---|---|---|---|---|
| 8* | Turee Street / Main Street intersection | Extent of required works to allow access for OSOM vehicles. | N/A | Prior to commencing construction of the Girragulang Road cluster |
| 9* | Wyaldra Street / Moorefield Road intersection | Extent of required works to allow access for OSOM vehicles. | N/A | Prior to commencing construction of the Girragulang Road cluster |
| 10 | Moorefield Road (west) | From Black Stump Way to Girragulang Road cluster boundary, upgrade to the standard and satisfaction of Council for general construction traffic. | 4.6 | Prior to commencing construction of the Girragulang Road cluster |
| **Road authority: Transport for NSW** | | | | |
| 11 | Golden Highway / Black Stump Way intersection | Extent of required works to allow access for OSOM vehicles. | N/A | Prior to commencing construction of the Mount Hope cluster |
| 12 | Golden Highway / Leadville Access Road intersection | Extent of required works to allow access for OSOM vehicles. | N/A | Prior to commencing construction of the Leadville cluster |
| 13 | Golden Highway / Short Street intersection | Extent of required works to allow access for OSOM vehicles. | N/A | Prior to commencing construction of the Girragulang Road cluster |

* Noting that only one access to the Girragulang Road cluster would be constructed, should the proposed access via Uarbry not proceed, these upgrades would not be required and a new intersection on the Golden Highway would be required.

### 6.4.4 Environmental management and mitigation measures

Based on the findings of the additional assessment undertaken for the amended project, one additional traffic and transport mitigation measure (ID TT5) is included in the updated mitigation measures table for the amended project in **Appendix 3** as follows:

> *"If the alternate access to the Girragulang Road cluster is constructed, the new intersection on the Golden Highway would be designed to achieve safe intersection sight distance (SISD) in accordance with the requirements of Austroads Guide to Road Design Part 4A (AGRD04a)* (Austroads, 2021)*. The location of the new intersection would need to consider the limitation of the vertical road alignment of the Golden Highway, such that the minimum SISD of 284m is provided for both directions of travel along the Golden Highway.*

*Alternatively, a temporary reduction of the speed limit could be explored in in consultation with Transport for NSW and Warrumbungle Shire Council in the vicinity of the alternative access, to satisfy a lower SISD at the alternative access location."*

## 6.5 Hazards and risks (battery storage preliminary hazards analysis)

### 6.5.1 Assessment approach

A preliminary hazards assessment (PHA) has been prepared by Sherpa to assess the additional detailed information regarding location and configuration of the potential BESS such as site-specific details, including the indicative BESS location and separation distance of battery units.

The PHA identifies the hazards and assess the risks associated with the proposed operations of the BESS to determine risk acceptability from land use safety planning perspective. The PHA was completed following the methodology specified in HIPAP No. 6 Guidelines for Hazard Analysis (NSW Department of Planning, 2011a) which is focused on off-site impacts.

### 6.5.2 Statutory context, policy and guidelines

The PHA has been prepared in accordance with the following statutory documents and guidelines:

- Hazardous Industry Planning Advisory Paper No 6 - Guidelines for Hazard Analysis (HIPAP No 6) (NSW Department of Planning, 2011a)
- Assessment Guideline: Multi-Level Risk Assessment (NSW Department of Planning, 2011b)
- Hazardous Industry Planning Advisory Paper No 4 - Risk Criteria for Land Use Planning (HIPAP No 4) (NSW Department of Planning, 2011c)
- Electrical installations - Safety of battery systems for use with power conversion unit (AS/NZS 5139:2019) (Standards Australia and Standards New Zealand, 2019).

### 6.5.3 Summary of further assessment

**Hazards and events**

The types of hazards and associated events for the amended project are presented in **Table 6-15**

**Table 6-15: Identified hazards and events**

| Hazard | Event |
|---|---|
| Electrical | Exposure to voltage |
| Arc flash | Release of energy |
| Fire | Infrastructure fire |
| Chemical | Release of hazardous materials |
| Explosive gas | Generation of explosive gas |
| Reaction | Battery thermal runaway |
| EMF | Exposure to Electric and Magnetic Fields (EMF) |
| External factors | Unauthorised access/trespasser, bushfire, lightning storm, blade throw, turbine collapse, water ingress (rain and flood) |

The identified hazards, events, applicable infrastructure and the relationships with causes, consequences and controls are summarised in the Hazard Identification (HAZID) register at **Appendix 8**. A summary of the HAZID is:

- a total of 16 hazardous events were identified

- some hazardous events with potential for escalated fire may extend beyond the BESS compound boundary (i.e. off-site impact in the context of HIPAP No. 6). However, the consequences from these events are not expected to result in significant off-site impact (serious injury and/or fatality to the public or off-site population) as:
  - the BESS will be situated in a rural area
  - the nearest sensitive receptor/non-associated residential dwelling (ID 278) is located at least 3,725 metres from the proposed BESS location.

**Risk analysis**

The qualitative risk results for the identified events are detailed in **Appendix 8** together with the detailed outcome of the hazard identification process. A summary of the key hazards and the associated risk levels assessed in **Appendix 8** are presented in **Table 6-16**.

The risk analysis found that the worst-case consequence for the identified events would be fire and/or explosive gas event at the BESS compound which may result from battery thermal runaway, encroachment from off-site bushfire or a substation fire.

All events were rated as 'Negligible' risks except for one 'Medium' risk event. This event is related to unauthorised person access to the development footprint, resulting in vandalism/asset damage to the infrastructure with the potential for self-injury during the act.

For all events, the consequence impacts are not expected to have substantial off-site impacts given the location of the proposed BESS (in a rural area) and the separation distance between the BESS and sensitive receptors (i.e. non-associated residential dwellings). The highest likelihood rating for the identified events is 'Very unlikely' (i.e. the event could occur but not expected).

The amended project meets the HIPAP No.4 qualitative risk criteria.

**Table 6-16: Hazard and risk analysis summary**

| Hazard | Event | Consequence | | Risk analysis (off-site and public impact) | | |
|---|---|---|---|---|---|---|
| | | Onsite | Off-site | Severity | Likelihood | Risk |
| Electrical | Exposure to voltage | • Electrocution<br>• Injury and/or fatality to onsite employees<br>• Injury and/or fatality to member of public due to touch and step potential | No off-site impact expected | Insignificant | Very Unlikely | Negligible |
| Arc flash | Arc flash | • Arc blasts and resulting heat, may result in fires and pressure waves<br>• Burns<br>• Exposure to intense light and noise<br>• Injury and/or fatality to onsite employees | No off-site impact expected | Insignificant | Very Unlikely | Negligible |
| Fire | BESS fire | • Release of toxic and/or explosive combustion products<br>• Escalation to the entire BESS | No off-site impact expected | Insignificant | Very Unlikely | Negligible |

**Table 6-16: Hazard and risk analysis summary**

| Hazard | Event | Consequence | | Risk analysis (off-site and public impact) | | |
|---|---|---|---|---|---|---|
| | | Onsite | Off-site | Severity | Likelihood | Risk |
| | | • Injury and/or Nil fatality to onsite employees | | | | |
| | Bushfire | • Escalation to adjacent infrastructure<br>• Injury and/or fatality to onsite employees | No off-site impact expected | Insignificant | Very Unlikely | Negligible |
| | Loss of containment of gasoline from storage tank or filling point | • Fire, if ignited.<br>• Injury to onsite employees | No off-site impact expected | Insignificant | Very Unlikely | Negligible |
| Chemical | Exposure to hazardous material (herbicide/ pesticide) | Irritation/injury for personnel on exposure. | No off-site impact expected | Insignificant | Very Unlikely | Negligible |
| | Release of battery electrolyte (liquid/vented gas) from the battery cell | • Release of flammable liquid electrolyte<br>• Vaporisation of liquid electrolyte | No off-site impact expected | Insignificant | Very Unlikely | Negligible |

Table 6-16: Hazard and risk analysis summary

| Hazard | Event | Consequence | | Risk analysis (off-site and public impact) | | |
|---|---|---|---|---|---|---|
| | | Onsite | Off-site | Severity | Likelihood | Risk |
| | | • Release of vented gas from cells<br>• Fire and/or explosion in battery enclosure<br>• Release of toxic combustion products<br>• Injury and/or fatality to onsite employees | | | | |
| | BESS coolant or refrigerant leak | • Irritation/injury to onsite employee on exposure to leak (e.g. inhalation and skin contact)<br>• Ingress of coolant or refrigerant to battery or other electrical components (battery enclosure) leading to short circuit, thermal runaway and fire/explosion, resulting in | No off-site impact expected | Insignificant | Very Unlikely | Negligible |

Table 6-16: Hazard and risk analysis summary

| Hazard | Event | Consequence | | Risk analysis (off-site and public impact) | | |
|---|---|---|---|---|---|---|
| | | Onsite | Off-site | Severity | Likelihood | Risk |
| | | injury and/or fatality to onsite employees | | | | |
| Explosive Gas | Generation of explosive gas | • Fire and/or explosion in battery enclosure<br>• Release of toxic combustion products<br>• Injury and/or fatality to onsite employees | No off-site impact expected | Insignificant | Very Unlikely | Negligible |
| Reaction | Thermal runaway in battery | • Fire and/or explosion in battery enclosure<br>• Escalation to the entire BESS<br>• Injury and/or fatality to onsite employees | No off-site impact expected | Insignificant | Very Unlikely | Negligible |
| Electromagnetic field (EMF) | Exposure to EMF | • High level exposure (i.e. exceeding the reference limits) may affect function of the nervous system<br>• Injury to onsite employees | No off-site impact expected | Insignificant | Extremely Unlikely | Negligible |

**Table 6-16: Hazard and risk analysis summary**

| Hazard | Event | Consequence | | Risk analysis (off-site and public impact) | | |
|---|---|---|---|---|---|---|
| | | Onsite | Off-site | Severity | Likelihood | Risk |
| External factors | Water ingress (e.g. rain, flood) | • Electrical fault/short circuit<br>• Fire<br>• Injury and/or fatality to onsite employees | No off-site impact expected | Insignificant | Very Unlikely | Negligible |
| | Vandalism due to unauthorised personnel access | Asset damage and potential hazard to unauthorised person (e.g. electrocution) | No off-site impact expected | Insignificant | Very Unlikely | Medium |
| | Blade throw | • Damage to BESS infrastructure and/or fire<br>• Injury and/or fatality to on-site employees | No off-site impact expected | Insignificant | Very Unlikely | Negligible |
| | Turbine collapse | • Damage to BESS infrastructure and/or fire<br>• Injury and/or fatality to on-site employees | No off-site impact expected | Insignificant | Very Unlikely | Negligible |
| | Lightning strike | • Fire<br>• Injury and/or fatality to onsite employees | No off-site impact expected | Insignificant | Very Unlikely | Negligible |

### 6.5.4 Environmental management and mitigation measures

Based on the findings of the additional assessment undertaken for the amended project, an additional battery storage mitigation measure (ID BS4) is included in the updated mitigation measures table for the amended project in **Appendix 3** as follows:

> *"ACEN will confirm with the BESS supplier that the BESS systems have been designed and/or improved to address the lessons learnt from the Victorian Big Battery fire incident in 2021. Additionally, ACEN to ensure that the BESS supplier's requirements on equipment clearances, installation, commissioning, operations and maintenance, and emergency response are met."*

## 6.6 Aboriginal heritage

### 6.6.1 Assessment approach

A revised Aboriginal cultural heritage assessment report (ACHAR) has been prepared for the amended project and is provided in full in **Appendix 9**.

Additional detailed survey has been undertaken to assess previously unsurveyed areas of the project and update the ACHAR following feedback from Heritage NSW. A one-day site inspection was completed by OzArk on 31 August 2021 and additional survey was completed by OzArk and RAPs on 19 April 2022 and 24 and 25 January 2023, to survey these previously unsurveyed areas.

As described in the EIS, the survey boundary for the project provides a 200-metre corridor around access tracks and turbines. This corridor ensures the assessment adequately identifies potential disturbance impacts, but also provides flexibility for the proposed layout to be refined within the surveyed area during detailed design.

The survey boundary in the amended ACHAR has been updated to reflect the amended project layout as described in **Section 3.2.1**.

The unsurveyed area associated with the EnergyCo CWO-REZ Transmission Project corridor (detailed in **Section 3.2.5**) has been removed from the study area, however, as a portion of the area previously surveyed is relevant to the alternative access route to the Girragulang Road Cluster (refer to **Section 3.2.7**), it has remained within the ACHAR survey boundary.

### 6.6.2 Statutory context, policy and guidelines

The additional assessment has been undertaken in accordance with the following statutory documents:

- Burra Charter 2013 (Australia International Council on Monuments and Sites (ICOMOS) 2013)
- Part 4 of the EP&A Act
- Part 6 of the NP&W Act
- the EPBC Act by way of the National Heritage List and Commonwealth Heritage List established under the Act
- Heritage Act.

The additional field survey followed the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (Code of Practice), (DECCW, 2010a) and the ACHAR followed the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH, 2011) and the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (ACHCRs) (DECCW, 2010b).

### 6.6.3 Summary of further assessment

**Survey results**

No new items of heritage significance were found as part of the amended project survey and the location of one previously recorded Aboriginal Heritage Information Management System (AHIMS) site, 36-3-0111, is no longer within the survey boundary as a result of the amended project.

Sites recorded in the EIS include:

- Orana OS-1
- Old Farm OS-1
- Kensington OS-1
- Cainbil Creek OS-1
- The Rock IF-1.

**Potential impacts**

Four of the five sites recorded in the EIS (all except for Kensington OS-1) are located within the survey boundary and therefore have the potential to be impacted by the project. However, ACEN has committed to avoiding impact to all sites within the survey boundary, except for Cainbil Creek-OS1 which will be partially impacted by the construction of an access track and The Rock IF-1 which will also be impacted by an access track (refer to **Section 6.6.4**).

The revised ACHAR also reiterates that as all potential archaeological deposit (PAD) are being avoided through detailed design and will be protected from inadvertent harm through fencing (consistent with the original DA) and test excavation is not warranted for the project. The amended ACHAR is provided at **Appendix 9**.

### 6.6.4 Environmental management and mitigation measures

Based on the findings of the additional assessment undertaken for the amended project, the management measures proposed in the EIS are still considered adequate and no additional measures are warranted.

An updated mitigation measures table for the amended project is provided in **Appendix 3**.

# 7. JUSTIFICATION OF AMENDED PROJECT

## 7.1 Overview

This amendment report has been prepared in accordance with the requirements of the *NSW State Significant Development Guidelines – preparing an amendment report, October 2022*, to consider and assess the potential environmental, economic, and social impacts associated with the proposed amended project and any clarifications where further assessment is warranted and should be read in conjunction with the EIS.

This report has been submitted to the DPE to consider, along with the EIS, the submissions received on the project and the response to submissions report to determine the project.

## 7.2 Project refinements

In response to matters raised in the submissions and further agency, community and stakeholder consultation, ACEN proposes to amend the project design to further mitigate environmental and social impacts associated with the proposed wind farm. Proposed project amendments include the following:

- refinements to the wind farm layout to reduce environmental and social impacts, and improving the functional performance of the project:
  - removal of 17 wind turbines and associated access tracks to reduce amenity impacts for nearby dwellings and biodiversity impacts
  - further refinement of the layout and construction footprint to further avoid and minimise impacts to Box Gum Woodland and other native vegetation
  - removal of three met masts and relocation of seven others to reduce biodiversity impacts
  - an additional substation included in the Mount Hope cluster to improve the electrical connectivity.
- removal of the overhead transmission line running south from the Girragulang Road and Leadville clusters. This infrastructure will now be delivered by EnergyCo as part of the EnergyCo CWO-REZ Transmission Line project and will be assessed as part of that project by EnergyCo.
- updated project boundary to remove a property from the Mount Hope cluster.
- access routes:
  - light vehicle access to the Mount Hope cluster via Neilrex Road removed – a single point of access from Black Stump Way is now proposed
  - light vehicle access to the Leadville cluster via the Leadville Stock Route and Wardens Road removed – a single point of access from the Golden Highway is now proposed
  - provision of an alternate access route option to the Girragulang Road cluster via the Golden Highway.

Clarifications to the information presented in the EIS are provided as follows:

- Dwelling 284 was mistakenly identified as an 'associated' property in the EIS, and clarification is provided noting this property correctly as 'non-associated'. It is noted however, that the assessment of potential impacts for the EIS was correctly applicable to a non-associated dwelling and the outcomes of the assessment undertaken and associated management measures remain consistent with the EIS for this property.
- since exhibition of the original DA, ACEN has progressed agreements with 13 nearby neighbours who are now associated with the project. An additional dwelling has also been added to the assessment of the amended project that was previously burnt down.
- the methodology for mapping the extent of Plant Community Types (PCT) for Box Gum Woodland and associated Derived Native Grasslands has been updated following feedback from

DPE's Biodiversity, Conservation and Science Directorate (BCS). Additional survey for Koalas has also been undertaken following release of new Koala Guidelines by BCS since the EIS. Further assessment and update to the biodiversity development assessment report (BDAR) has been undertaken, and findings presented in **Section 6.3**.

- further detailed survey has been undertaken to assess previously unsurveyed areas of the project and update the Aboriginal cultural heritage assessment report (ACHAR) following feedback from Heritage NSW. No new items of heritage significance were found, and the updated ACHAR is provided as part of this amendment report.
- further information regarding the location and configuration of the potential battery energy storage system (BESS) is provided in response to feedback from DPE's Hazards Assessment Team. Further assessment has been undertaken and the findings are presented in **Section 6.5**.

A revised summary of management and mitigation measures has been provided to address the refinements made to the project and to address matters raised in the submissions.

## 7.3 ACEN project commitments

As a signatory to the Clean Energy Council's *Best Practice Charter for Renewable Energy Developments*, ACEN has demonstrated their intention to:

- engage respectfully with the communities in which they plan and operate projects
- be sensitive to environmental and cultural values
- make a positive contribution to the regions in which they operate.

Stakeholder engagement on the Valley of the Winds Wind Farm has been comprehensive to date and reflects the importance ACEN places on this aspect of its business. ACEN will continue to work with all stakeholders as the approval process for the project progresses and detailed design and approval schedule for the project is better defined.

The environmental management strategy will govern the avoidance, minimisation and management of impacts during the construction and ongoing operation of the project and will be set out to ensure the responsibilities and accountabilities for environmental performance are clear.

Throughout community engagement undertaken to date, ACEN has also demonstrated their intention to establish a positive, long-term connection with the local community. As part of this, ACEN has already committed to develop a community benefit sharing model with local community and stakeholders, including TAFE and local business groups.

## 7.4 Conclusion and justification

The environmental assessment undertaken for the project as part of the EIS and the additional assessment undertaken for the subsequent amendments to the project as part of the amendment report, has determined that the project would not result in significant impacts to environmental, cultural, social and economic values and residual impacts can be managed with the management and mitigation measures in place. Furthermore, the project is consistent with the principles of ESD, and the objectives of the EP&A Act and therefore should be approved under the EP&A Act.

Throughout the project refinement process, ACEN has made considerable effort to avoid potential environmental impacts, where possible. In those instances where potential impacts cannot be avoided, ACEN's design principles have sought to avoid and minimise environmental impacts and/or implement mitigation measures to manage the extent and severity of any residual environmental impacts. During detailed design and prior to the commencement of construction,

the placement of infrastructure and extent of construction activities would be further refined to ensure avoidance and minimisation objectives are met.

The project forms an important part of Australia's transition to renewable energy generation and would positively contribute to meeting Commonwealth and State targets. The project would enhance the reliability and security of electricity supply by contributing to the anticipated capacity gaps in the electricity market following the closure of major coal-fired power generators within NSW.

Should the project not proceed, the potential project benefits described within the EIS would not be realised. In addition, it will be more difficult in the short-term for the Commonwealth and NSW Government to achieve their respective renewable energy and greenhouse gas emission reduction targets.

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Valley of the Winds
Renewable Energy from ACEN
Appendix 1
Amended project description
RAMBOLL
ACEN Australia

# AMENDED PROJECT DESCRIPTION

## 1.1 Overview of the project

The project would consist of up to 131 wind turbines, each up to 7.2 MW installed capacity, and supporting infrastructure. The project would supply approximately 800 megawatts (MW) of electricity into the National Electricity Market (NEM).

The wind farm would be located between the townships of Coolah and Leadville. The project would be entirely within the Warrumbungle Local Government Area (LGA).

The project would involve the construction, operation and decommissioning of three clusters of wind turbines, that would be connected electrically. These are:

- Mount Hope cluster – 65 turbines
- Girragulang Road cluster – 45 turbines
- Leadville cluster – 21 turbines.

The project includes the following key components:

- Up to 131 wind turbines with a maximum tip height of 250 metres and a hardstand area at the base of each turbine
- Electrical infrastructure, including:
    - substations in each cluster and a step-up facility at the Girragulang road central substation
    - underground and some overhead 33 kilovolt electrical reticulation connecting the turbines to the substations in each cluster
    - up to 330 kilovolt overhead transmission line connecting the two substations in the Mount Hope cluster
    - overhead transmission lines (up to 330 kilovolt) dispatching electricity from the Mount Hope cluster to the Girragulang Road cluster
    - other electrical infrastructure as required including a potential battery energy storage system (BESS) with a capacity of 320MW/640MWh
- Other permanent on-site ancillary infrastructure:
    - operation and maintenance facilities
    - meteorological masts (up to 10)
- Access track network:
    - access and egress points to each cluster from public roads including intersection and road upgrades
    - access tracks and associated infrastructure within each cluster on private property
- Temporary construction phase ancillary facilities:
    - potential construction workforce accommodation site
    - construction compounds
    - laydown areas
    - concrete batching plants
    - quarry sites for construction material (rock for access tracks and hardstands).

At the end of its practical life, the wind farm would be decommissioned, and the site returned to its pre-existing land use in consultation with the affected landholders. An indicative layout of the project is provided in **Figure A-1**, **Figure A-2**, **Figure A-3,** and **Figure A-4**.

## 1.2 Wind farm site boundary

The wind farm site boundary corresponds with the outer boundary of properties upon which the proposed wind farm is located. The wind farm site boundary includes the three clusters but

excludes the transmission line connecting to the CWO-REZ Transmission line. The potential construction workforce accommodation area is also not included in the wind farm site boundary, as it is temporary construction ancillary infrastructure and not part of the permanent wind farm site.

The project would involve (wholly or partly) 248 cadastral lots, and approximately 19 property owners within the wind farm site (including the potential workers accommodation site) and 10 cadastral lots with three property owners within the alternate access route to the Girragulang Road cluster.

The number and size of properties associated with each part of the wind farm is discussed in more detail in **Section 1.5**. The wind farm site boundary is shown in **Figure A-1**, **Figure A-2**, **Figure A-3,** and **Figure A-4**.

## 1.3 Survey boundary

A survey boundary has been developed within the wind farm site boundary, for the specialist environmental assessments in this EIS that consider the impacts of vegetation and ground disturbance. These assessments include:

- biodiversity assessment – quantified vegetation and ground disturbance impacts
- Aboriginal and non-Aboriginal heritage assessment – ground disturbance and impacts to heritage items and cultural significance
- land use and agricultural impacts assessment – ground disturbance and loss of agriculturally productive land.

A survey boundary that provides a 200-metre corridor around access tracks and turbines has been applied to these assessments. This corridor ensures the EIS adequately identifies potential disturbance impacts, but also provides flexibility for the proposed layout to be refined within the surveyed area during detailed design. The survey boundary is shown in **Figure A-1**, **Figure A-2**, **Figure A-3,** and **Figure A-4**.

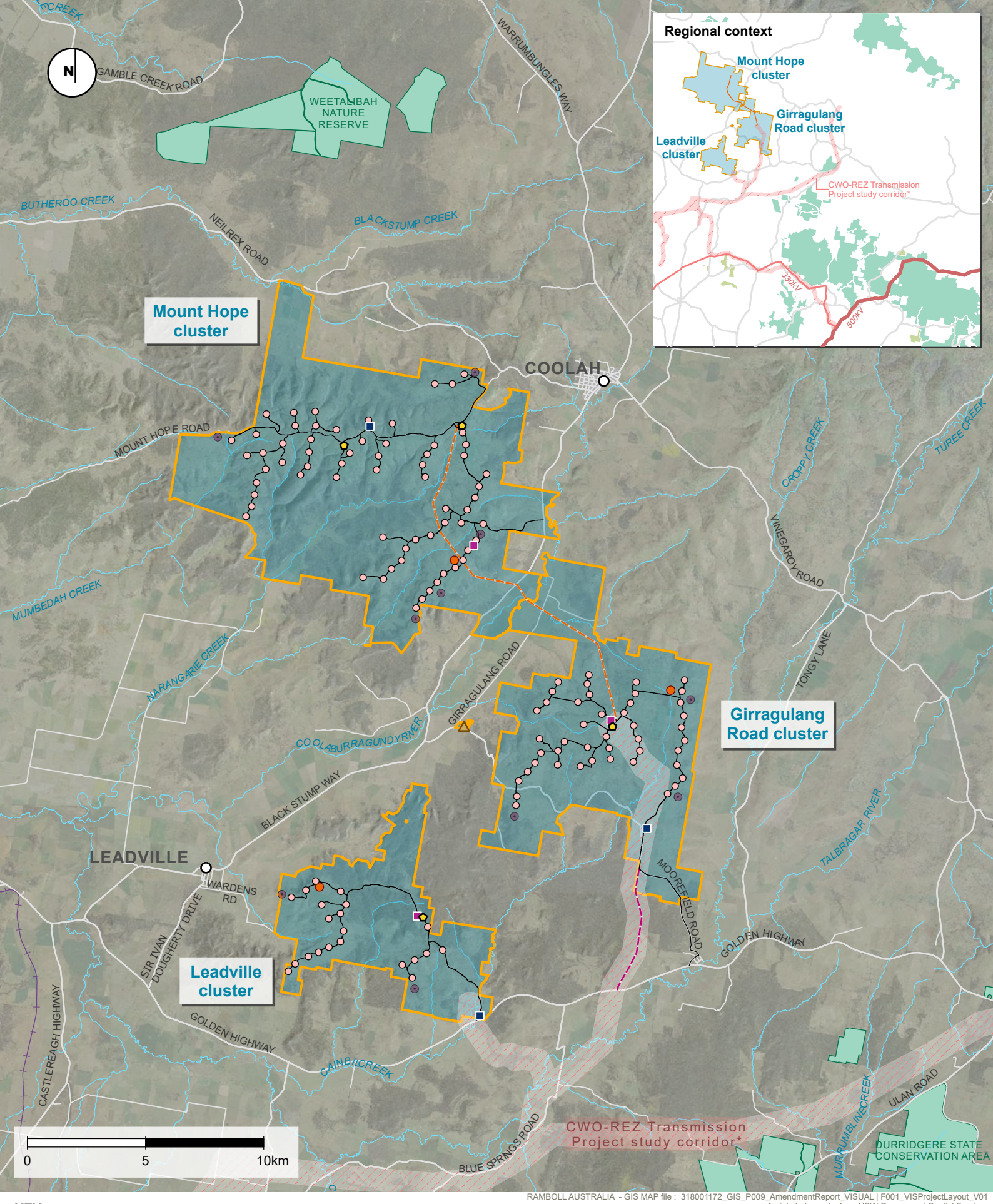
Specialist environmental assessments that consider potential impacts relating to a broader catchment area such as noise and visual amenity, have applied issue-specific study areas in accordance with relevant guidelines. These issue-specific study areas are discussed in more detail in the methodology sections in the key issues and non-key issues chapters.

## 1.4 Impact footprint

Within the survey boundary shown in **Figure A-1**, there would be an expected impact footprint. The impact footprint represents the expected maximum extent of ground disturbing work and vegetation clearing associated with construction and operation of the project. All permanent and temporary project components would be located within the impact footprint.

Based on the concept design for the indicative layout presented, the project would require an impact footprint of approximately 695 hectares. This includes the potential construction workforce accommodation and the access tracks to the wind farm clusters.

A radius of 100 metres around each wind turbine is also required to allow for micro siting during detailed design.



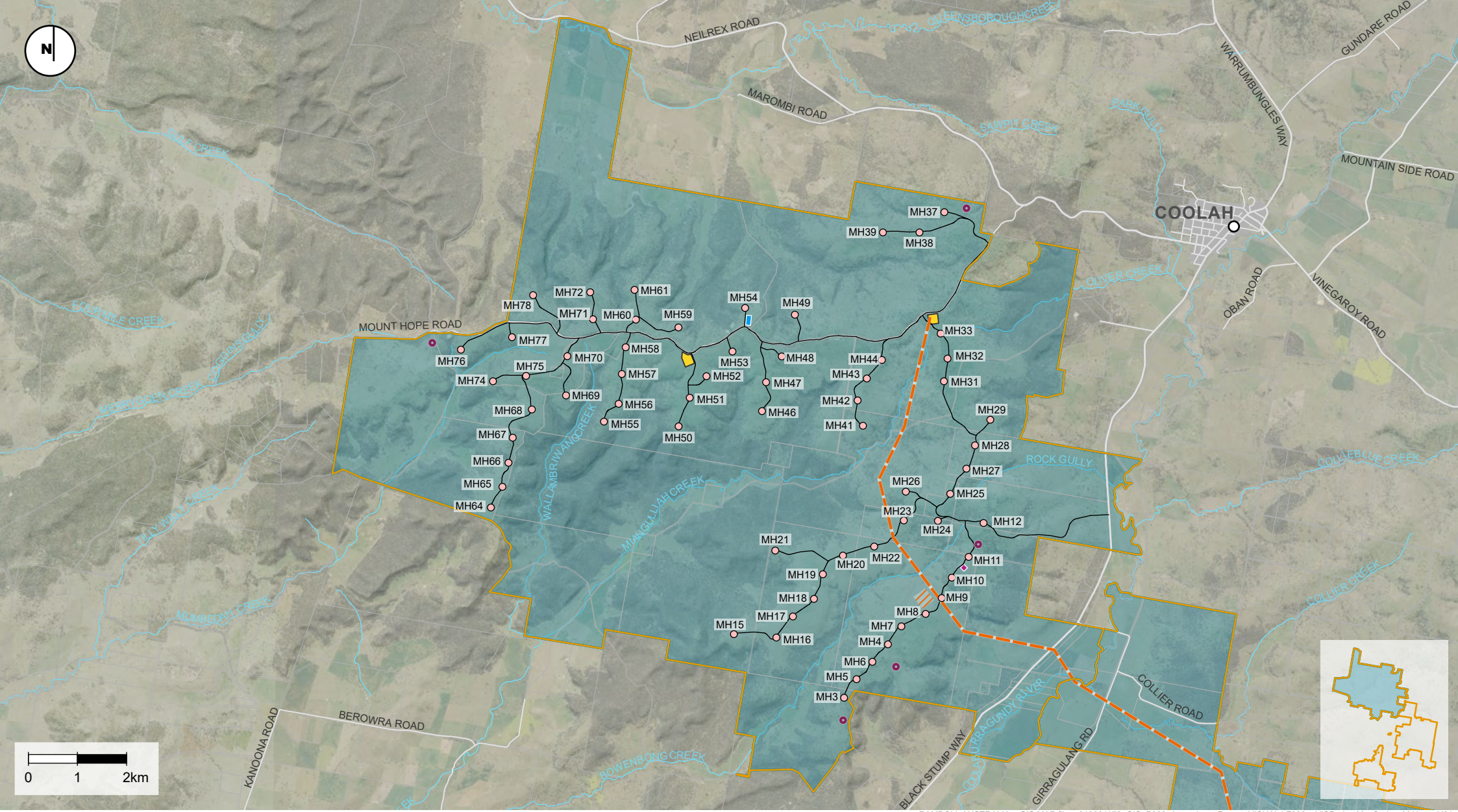

RAMBOLL AUSTRALIA - GIS MAP file : 318001172_GIS_P009_AmendmentReport_VISUAL | F001_VISProjectLayout_V01
Aerial photography from NSW Government Spatial Services

**KEY**

- Wind farm site
- Turbine location
- Access track
- Overhead transmission line
- Alternative access to GR cluster
- Permanent meteorological mast location
- Potential construction workforce accommodation
- Substation
- Construction and permanent operation and maintenance compound
- Temporary construction compound
- Indicative quarry location
- Railway
- National Parks and Reserves
- CWO-REZ Transmission Project study corridor*

*Approximate only

Figure A-1 | Amended project overview

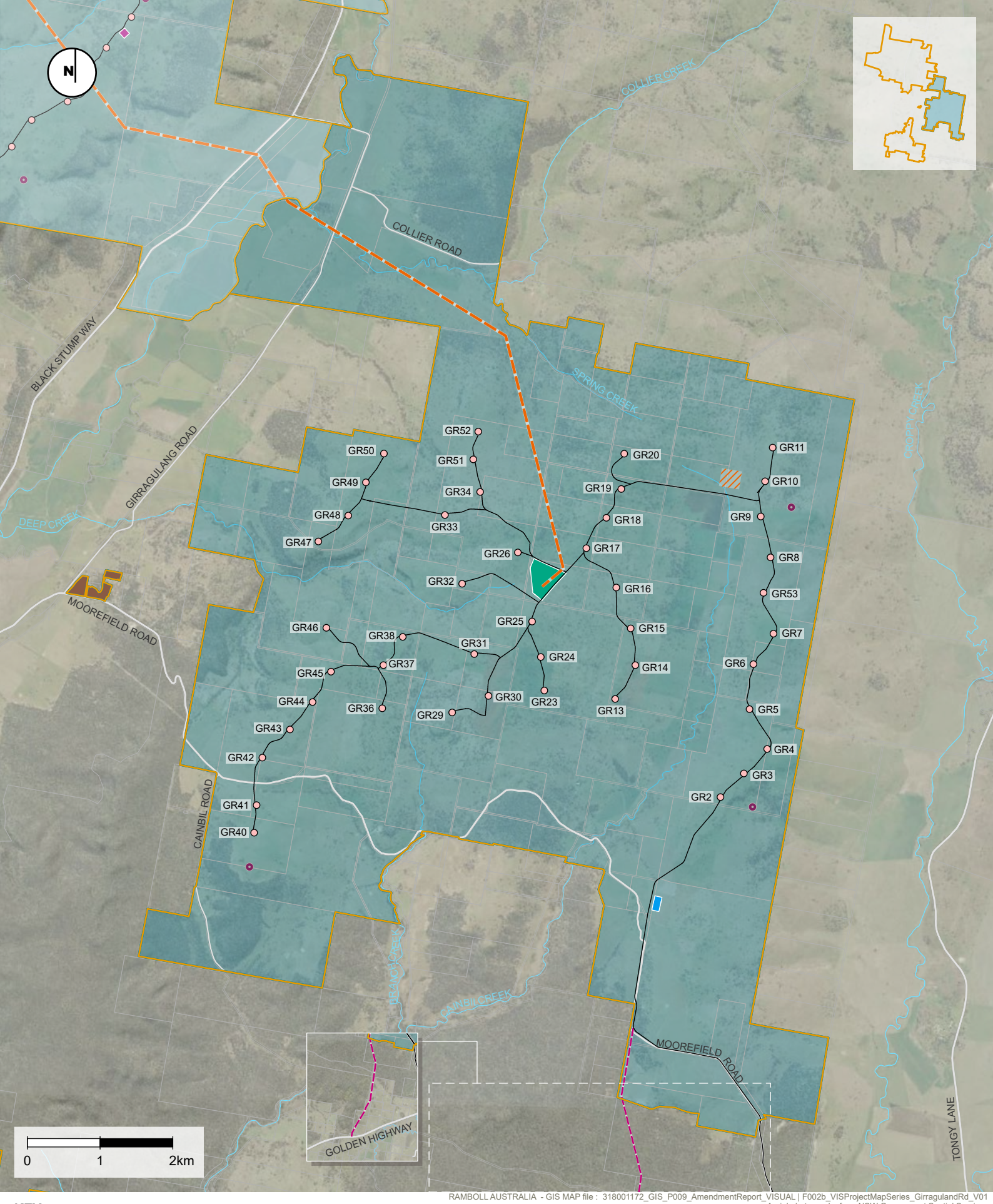



RAMBOLL AUSTRALIA - GIS MAP file : 318001172_GIS_P009_AmendmentReport_VISUAL | F002a_VISProjectMapSeries_MtHope_V01
Aerial photography from NSW Government Spatial Services

**KEY**

- Wind farm site
- Cadastral boundary
- Turbine location
- Access track
- Overhead transmission line
- Permanent meteorological mast location
- Quarry location (approximate)
- Substation area
- Construction and permanent operation and maintenance compound area
- Temporary construction compound area

Figure A-2 | Amended project layout at the Mount Hope cluster

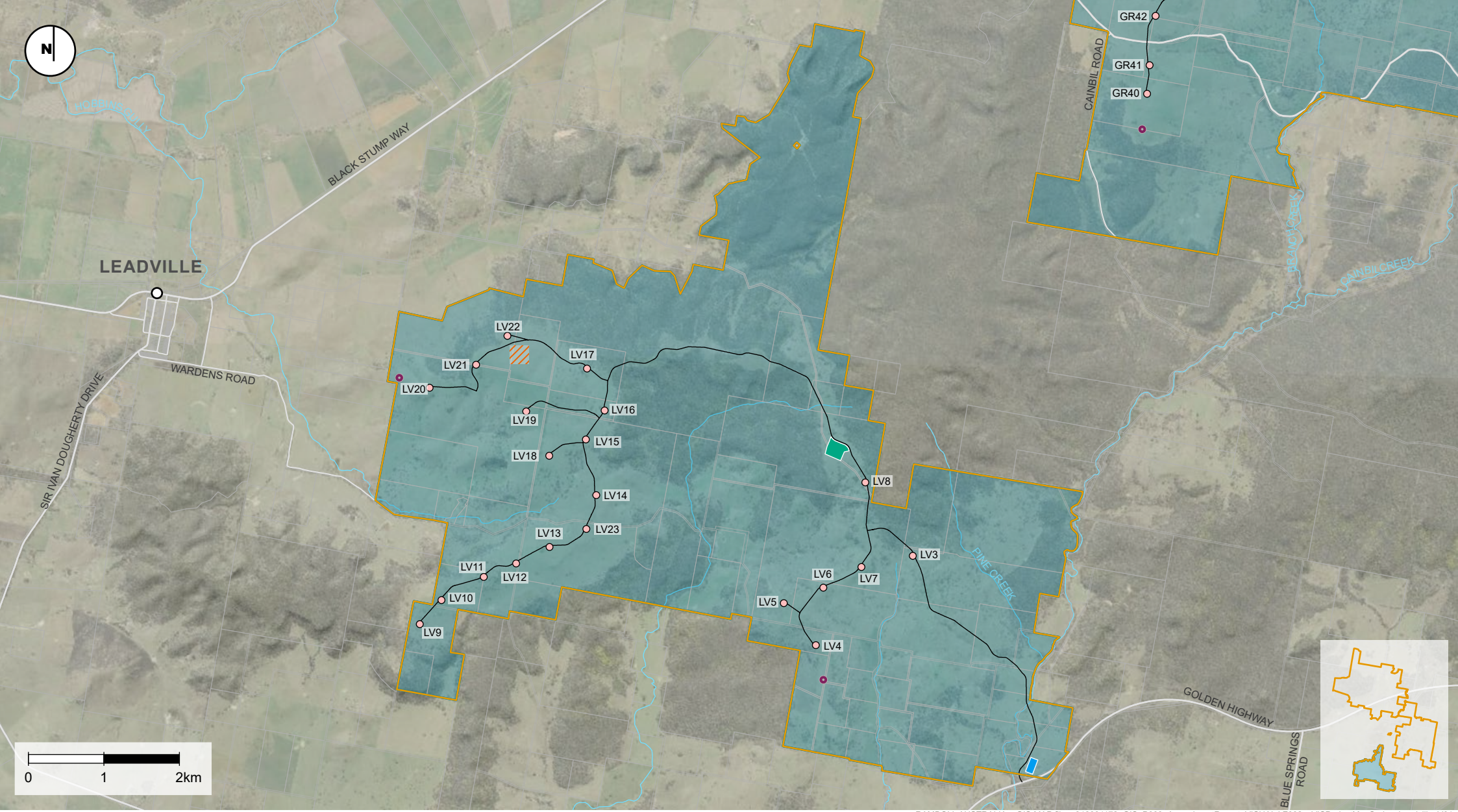



RAMBOLL AUSTRALIA - GIS MAP file : 318001172_GIS_P009_AmendmentReport_VISUAL | F002b_VISProjectMapSeries_GirragulandRd_V01
Aerial photography from NSW Government Spatial Services

**KEY**

- Wind farm site
- Cadastral boundary
- Turbine location
- Access track
- Alternative access to GR cluster
- Overhead transmission line
- Permanent meteorological mast location
- Quarry location (approximate)
- Substation, BESS and construction and permanent operation and maintenance compound area
- Construction and permanent operation and maintenance compound area
- Temporary construction compound area

Figure A-3 | Amended project layout at the Girragulang Road cluster




RAMBOLL AUSTRALIA - GIS MAP file : 318001172_GIS_P009_AmendmentReport_VISUAL | F002c_VISProjectMapSeries_Leadville_V01
Aerial photography from NSW Government Spatial Services

**KEY**

- Wind farm site
- Cadastral boundary
- Turbine location
- Access track
- Permanent meteorological mast location
- Quarry location (approximate)
- Substation, BESS and construction and permanent operation and maintenance compound area
- Temporary construction compound area

Figure A-4 | Amended project layout at the Leadville cluster

## 1.5 Property impacts

The project would involve (wholly or partly) 248 cadastral lots, and approximately 19 property owners within the wind farm site (including the potential workers accommodation site) and 10 cadastral lots with three property owners within the alternate access route. Cadastral lots are listed in **Table A-1** and property ownership is shown in **Figure A-5**.

Approximately an additional 12 Crown Lands lots would be affected by the proposed intersection upgrades. These lots are listed below:

- Lot 1 DP759014 Section 17
- Lot 1 DP759014 Section 3
- Lot 176 DP750772
- Lot 2 DP759014 Section 3
- Lot 2 DP759014 Section 5
- Lot 3 DP759014 Section 3
- Lot 6 DP759014 Section 16
- Lot 7 DP759014 Section 16
- Lot 7006 DP1068801
- Lot 7306 DP1141903
- Lot 7308 DP1150970
- Lot 7356 DP1179126.

ACEN have entered into access licence agreements with associated property owners (i.e. landholder agreements) allowing the option to lease the land for the construction, operation and decommissioning of the wind farm.

Lease arrangements have been agreed with property owners for the construction of all required overhead transmission lines, in accordance with TransGrid's requirements.

During operation, an easement (or other agreement) would be required for the ongoing operation and maintenance of the overhead transmission lines. These agreements would include certain limitations for landholders relating to the use of the land within the easement, to ensure the safe operation of the infrastructure and minimise risks to safety.

Upon cessation of any lease arrangement, easement, or other agreement, infrastructure would be decommissioned, and land would be returned to its pre-existing condition in consultation with the landholders and use would be returned to the landholder.

**Table A-1: Cadastral lots intersecting with the windfarm site boundary**

| Deposited Plan | Lot |
|---|---|
| DP1026530 | 7005 |
| DP1028362 | 7006 |
| DP1028400 | 7001 |
| DP1028425 | 7005 |
| DP1028426 | 7013 |
| DP1028426 | 7014 |
| DP1091571 | 1 |
| DP1091571 | 2 |
| DP1099077 | 58 |
| DP1105831 | 2 |
| DP1115849 | 49 |
| DP1187452 | 1 |
| DP1187452 | 2 |
| DP120973 | 1 |
| DP121325 | 1 |
| DP1214801 | 1 |
| DP1214808 | 1 |
| DP1227122 | 1 |
| DP1227122 | 2 |
| DP1238648 | 1 |
| DP1244975 | 5503 |
| DP1252803 | 1 |
| DP1253547 | 3 |
| DP1253559 | 1 |
| DP1253639 | 2 |
| DP1256557 | 4 |
| DP1257054 | 3 |
| DP132142 | 1 |
| DP132931 | 1 |
| DP132931 | 2 |
| DP132931 | 3 |
| DP132931 | 4 |
| DP132931 | 5 |
| DP132931 | 6 |
| DP132931 | 7 |
| DP133873 | 4 |
| DP217788 | 1 |
| DP256130 | 8 |
| DP256130 | 9 |
| DP256130 | 10 |
| DP256130 | 11 |
| DP378972 | 1 |
| DP382987 | 2 |
| DP430321 | A |
| DP512844 | 1 |
| DP512844 | 2 |
| DP596076 | 1 |
| DP631136 | 2 |
| DP661801 | 1 |
| DP720365 | 1 |
| DP721774 | 132 |
| DP746422 | 2 |
| DP750740 | 6 |
| DP750740 | 20 |
| DP750740 | 21 |
| DP750740 | 22 |
| DP750740 | 35 |
| DP750740 | 43 |
| DP750740 | 79 |
| DP750740 | 80 |
| DP750740 | 81 |
| DP750740 | 83 |
| DP750740 | 88 |
| DP750740 | 89 |
| DP750740 | 90 |
| DP750740 | 95 |
| DP750740 | 96 |
| DP750740 | 97 |
| DP750740 | 99 |
| DP750740 | 103 |
| DP750740 | 104 |
| DP750740 | 105 |
| DP750740 | 106 |
| DP750740 | 107 |
| DP750740 | 108 |
| DP750740 | 112 |
| DP750740 | 113 |
| DP750740 | 114 |
| DP750740 | 115 |
| DP750740 | 116 |
| DP750740 | 117 |
| DP750740 | 118 |
| DP750740 | 119 |
| DP750740 | 126 |
| DP750740 | 131 |
| DP750740 | 139 |
| DP750740 | 142 |
| DP750740 | 149 |
| DP750740 | 150 |
| DP750740 | 195 |

| Deposited Plan | Lot |
|---|---|
| DP750740 | 207 |
| DP750740 | 208 |
| DP750745 | 7 |
| DP750745 | 8 |
| DP750745 | 14 |
| DP750745 | 22 |
| DP750745 | 25 |
| DP750745 | 26 |
| DP750745 | 27 |
| DP750745 | 28 |
| DP750745 | 29 |
| DP750745 | 30 |
| DP750745 | 31 |
| DP750745 | 32 |
| DP750745 | 36 |
| DP750745 | 37 |
| DP750745 | 42 |
| DP750745 | 48 |
| DP750745 | 49 |
| DP750745 | 51 |
| DP750745 | 52 |
| DP750745 | 53 |
| DP750745 | 54 |
| DP750745 | 55 |
| DP750745 | 56 |
| DP750745 | 57 |
| DP750745 | 59 |
| DP750745 | 61 |
| DP750745 | 62 |
| DP750745 | 63 |
| DP750745 | 64 |

| Deposited Plan | Lot |
|---|---|
| DP750745 | 65 |
| DP750745 | 66 |
| DP750745 | 67 |
| DP750745 | 68 |
| DP750745 | 73 |
| DP750745 | 74 |
| DP750745 | 75 |
| DP750745 | 76 |
| DP750745 | 77 |
| DP750745 | 78 |
| DP750745 | 79 |
| DP750745 | 80 |
| DP750745 | 81 |
| DP750745 | 82 |
| DP750745 | 83 |
| DP750745 | 84 |
| DP750745 | 85 |
| DP750745 | 86 |
| DP750745 | 87 |
| DP750745 | 88 |
| DP750745 | 89 |
| DP750745 | 90 |
| DP750745 | 91 |
| DP750745 | 92 |
| DP750745 | 93 |
| DP750745 | 94 |
| DP750745 | 95 |
| DP750745 | 96 |
| DP750745 | 97 |
| DP750745 | 98 |
| DP750745 | 99 |

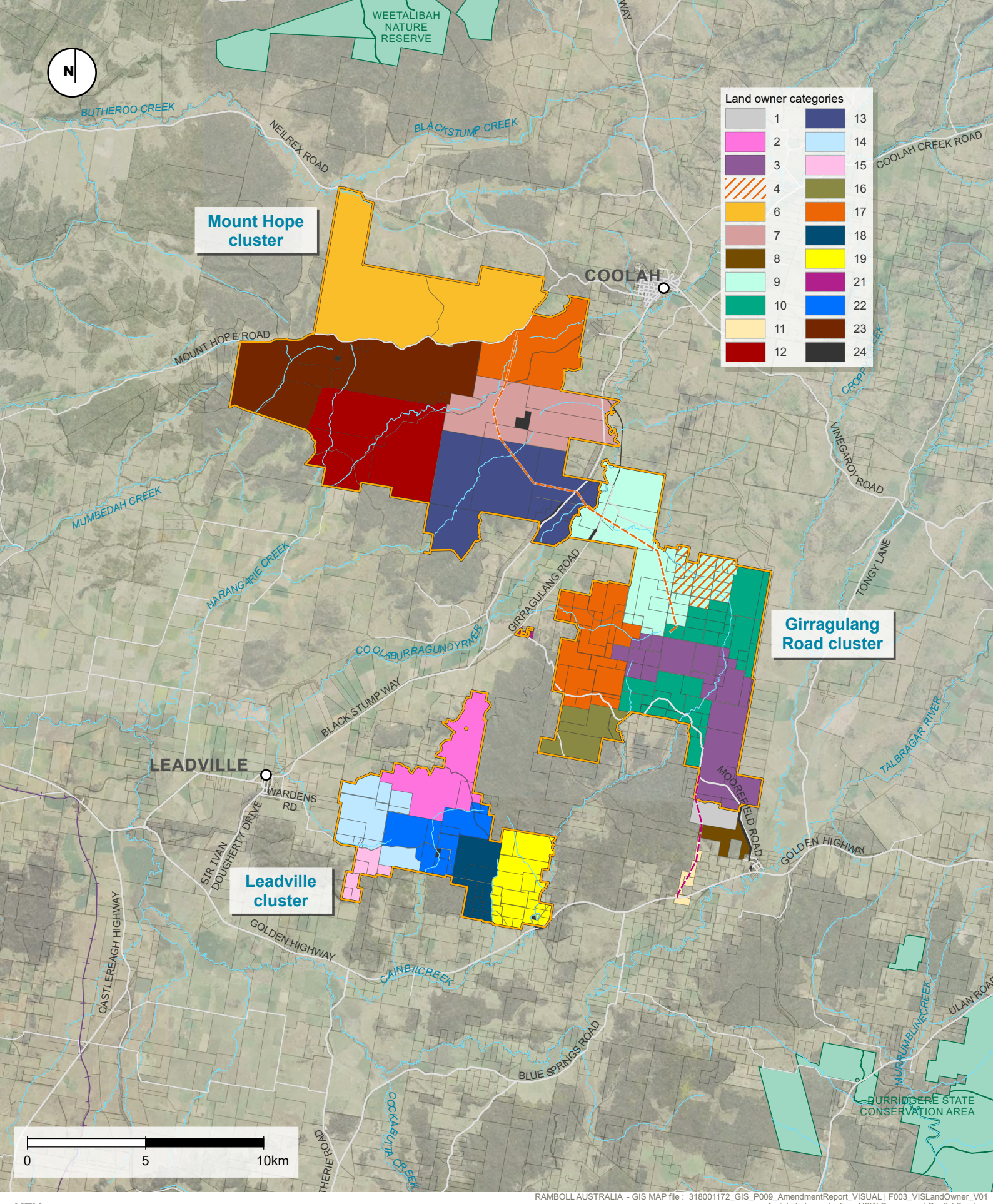
| Deposited Plan | Lot |
|---|---|
| DP750745 | 100 |
| DP750745 | 101 |
| DP750745 | 104 |
| DP750745 | 105 |
| DP750745 | 106 |
| DP750745 | 107 |
| DP750745 | 108 |
| DP750745 | 109 |
| DP750745 | 113 |
| DP750745 | 120 |
| DP750745 | 126 |
| DP750745 | 128 |
| DP750745 | 129 |
| DP750745 | 132 |
| DP750768 | 4 |
| DP750768 | 5 |
| DP750768 | 6 |
| DP750768 | 12 |
| DP750768 | 14 |
| DP750768 | 23 |
| DP750768 | 24 |
| DP750768 | 33 |
| DP750768 | 35 |
| DP750768 | 38 |
| DP750768 | 39 |
| DP750768 | 41 |
| DP750768 | 42 |
| DP750768 | 43 |
| DP750768 | 44 |
| DP750768 | 47 |
| DP750768 | 48 |

| Deposited Plan | Lot |
|---|---|
| DP750768 | 53 |
| DP750768 | 54 |
| DP750768 | 57 |
| DP750768 | 58 |
| DP750768 | 61 |
| DP750768 | 67 |
| DP750768 | 68 |
| DP750768 | 69 |
| DP750768 | 71 |
| DP750768 | 73 |
| DP750768 | 115 |
| DP750768 | 123 |
| DP750772 | 43 |
| DP750772 | 45 |
| DP750772 | 46 |
| DP750772 | 108 |
| DP750772 | 110 |
| DP750772 | 111 |
| DP750772 | 112 |
| DP750772 | 116 |
| DP750772 | 140 |
| DP750772 | 142 |
| DP750772 | 151 |
| DP750772 | 152 |
| DP750772 | 154 |
| DP750772 | 155 |
| DP750772 | 177 |
| DP754966 | 5 |
| DP754966 | 19 |
| DP754966 | 47 |
| DP754966 | 48 |

| Deposited Plan | Lot |
|---|---|
| DP754966 | 50 |
| DP754966 | 63 |
| DP754966 | 65 |
| DP754966 | 69 |
| DP754966 | 76 |
| DP754966 | 78 |
| DP754966 | 81 |
| DP754966 | 82 |
| DP754966 | 88 |
| DP754966 | 92 |
| DP754966 | 96 |
| DP754966 | 98 |
| DP754967 | 13 |
| DP754967 | 14 |
| DP754975 | 1 |
| DP754975 | 2 |
| DP754975 | 3 |
| DP754975 | 4 |
| DP754975 | 5 |
| DP754975 | 9 |
| DP754975 | 10 |
| DP754975 | 11 |
| DP754975 | 12 |
| DP820719 | 4 |
| DP820719 | 11 |
| DP820719 | 12 |
| DP820719 | 13 |
| DP824118 | 136 |
| DP824118 | 137 |
| DP876041 | 1 |
| DP876041 | 2 |

| Deposited Plan | Lot |
|---|---|
| DP96946 | 7002 |
| DP750768 | 113 |
| DP812579 | 1 |
| DP132925 | 10 |
| DP132925 | 11 |
| DP244310 | 2 |
| DP750772 | 65 |
| DP750772 | 76 |
| DP750772 | 91 |
| DP750772 | 96 |
| DP750772 | 115 |
| DP750772 | 143 |
| DP750772 | 157 |

*Note: parcels highlighted in grey are subject to the alternate access route to Girragulang Road cluster.*




RAMBOLL AUSTRALIA - GIS MAP file : 318001172_GIS_P009_AmendmentReport_VISUAL | F003_VISLandOwner_V01
Aerial photography from NSW Government Spatial Services

**KEY**

- Wind farm site
- Overhead transmission line
- Alternative access to GR cluster
- Cadastral boundary
- National Parks and Reserves

*Land owner categories are as per EIS. Categories 5, 20 and 25 have been removed.*

Figure A-5 | Land ownership

## 1.6 Summary of built features

The built features of the various infrastructure components are summarised in **Table A-2**.

**Table A-2: Project infrastructure - built features**

| Infrastructure | Quantity | Indicative height | Approximate footprint |
|---|---|---|---|
| **Operational infrastructure** | | | |
| Wind turbines (up to 7.2 MW installed capacity each) | 131 | Maximum tip height of 250m | turbine foundation – approximately 27m in diameter (pending geotechnical assessment and detailed design) |
| Substations and step-up facilities | 2 x 'collector' substation in Mount Hope cluster | Up to 20m high (subject to lightning protection study / requirements) | 2x 200m x 100m (4ha) |
| | 1 x 'central' substation in the Girragulang Road cluster including step-up facility | Up to 20m high (Subject to lightning protection study / requirements) | 200m x 100m (2ha) |
| | 1 x 'collector' substation in Leadville cluster | Up to 20m high (Subject to lightning protection study / requirements) | 100m x 100m (1ha) |
| Electrical reticulation | Underground cabling (up to 33kV) | n/a | Up to 240,000m |
| | Overhead transmission for internal connections where required (up to 33kV) | Up to 20m | Up to 20m wide easement |
| | Overhead transmission connecting the clusters (up to 330kV) | Up to 50m | Up to 60m wide easement |
| Operation and maintenance compound | 1 | Up to 5m high | 100m x 100m (1ha) |

| Infrastructure | Quantity | Indicative height | Approximate footprint |
|---|---|---|---|
| Hardstand at each turbine location | 131 | Ground level | 80m x 40m (3200m$^2$) |
| Meteorological masts | 10 permanent masts | Maximum height of 150m | 1.5m x 1.5m footing per mast |
| Access tracks | 115.27km | Ground level | 6m wide x 115.27km total length (total footprint of 95ha) |
| **Temporary construction infrastructure** | | | |
| Potential construction workforce accommodation | Up to 400 rooms, with supporting amenities, dining facilities and common areas | Generally up to 5m high (excluding lightning protection) | A total area of up to 5ha |
| Construction compounds | 3 | Up to 10m high | 100m x 200m (2ha) |
| Laydown areas | 3 | Ground level | 100m x 100m (1ha) |
| Batching plant | 3 | Up to 15m high | 100m x 100m (1ha) |
| Quarries | 3 (1 in each cluster) | n/a | Up to 8ha per quarry |
| Access tracks (construction access tracks would remain as the permanent access tracks noted above) | 115.27km | Ground level | 6m wide x 115.27km total length (total footprint of 95ha) |
| **Total footprint of temporary construction infrastructure** | | | **695 ha** |

## 1.7 Permanent operational infrastructure

### 1.1.1 Wind turbines

**Arrangement**
The project would include approximately 131 turbines arranged in three clusters, all connected electrically. The number of turbines within each cluster includes:

- Mount Hope – approximately 65 turbines
- Girragulang Road – approximately 45 turbines
- Leadville – approximately 21 turbines.

The indicative layout of the turbines is shown in **Figure A-1**. Collectively, the turbines would have a total energy generation capacity of up to 800 megawatts.

Micro-siting of the wind turbines would be determined during detailed design of the project and would consider:

- environmental and social constraints
- wind conditions
- building requirements (e.g. distances to residences)
- ownership structure of the area
- accessibility (existing roads)
- influence of the wind turbine on the environment (e.g. shadow flickering, noise emission)
- distances between the individual turbines.

Any micro-siting of the turbines would not increase the environmental impacts of the project and minor adjustments in locations have been allowed for by assessing a buffer within the survey boundary as discussed in **Section 1.3**.

**Components**

The wind turbines would have a maximum tip height of 250 metres and comprise:

- **blades** – which cause the rotor to spin
- **tower** – the support shaft for the wind turbine
- **nacelle** – a cover that houses the generating components of the wind turbine
- **hub** – connects the blades to the shaft
- **rotor** – made up of the hub and blades
- **step-up transformer** – convert low voltage electricity produced by the wind turbine to medium voltage electricity
- **footings** – assist in the stability of the wind turbine foundation.

Examples of the key features of the turbines are shown in **Figure A-6**, whilst a typical turbine elevation is shown in **Figure A-7.**

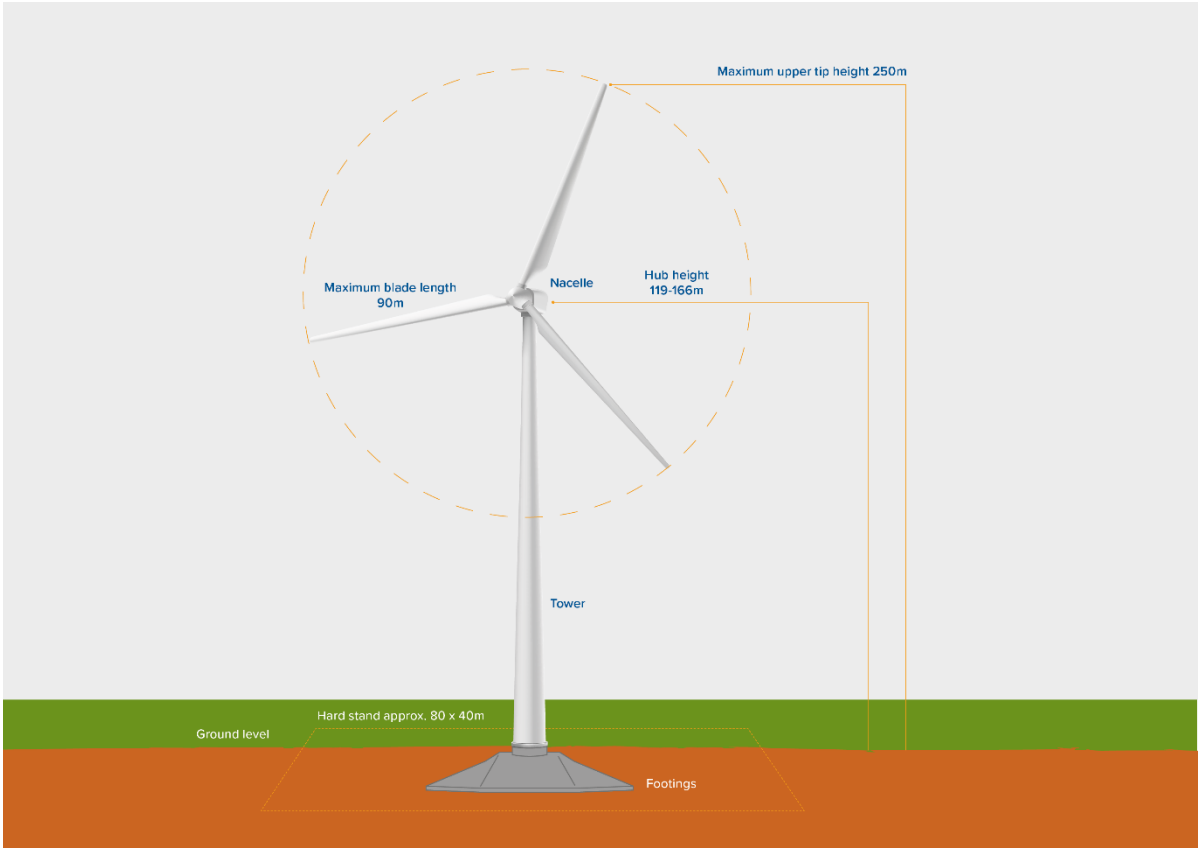


**Figure A-6: Typical turbine components**

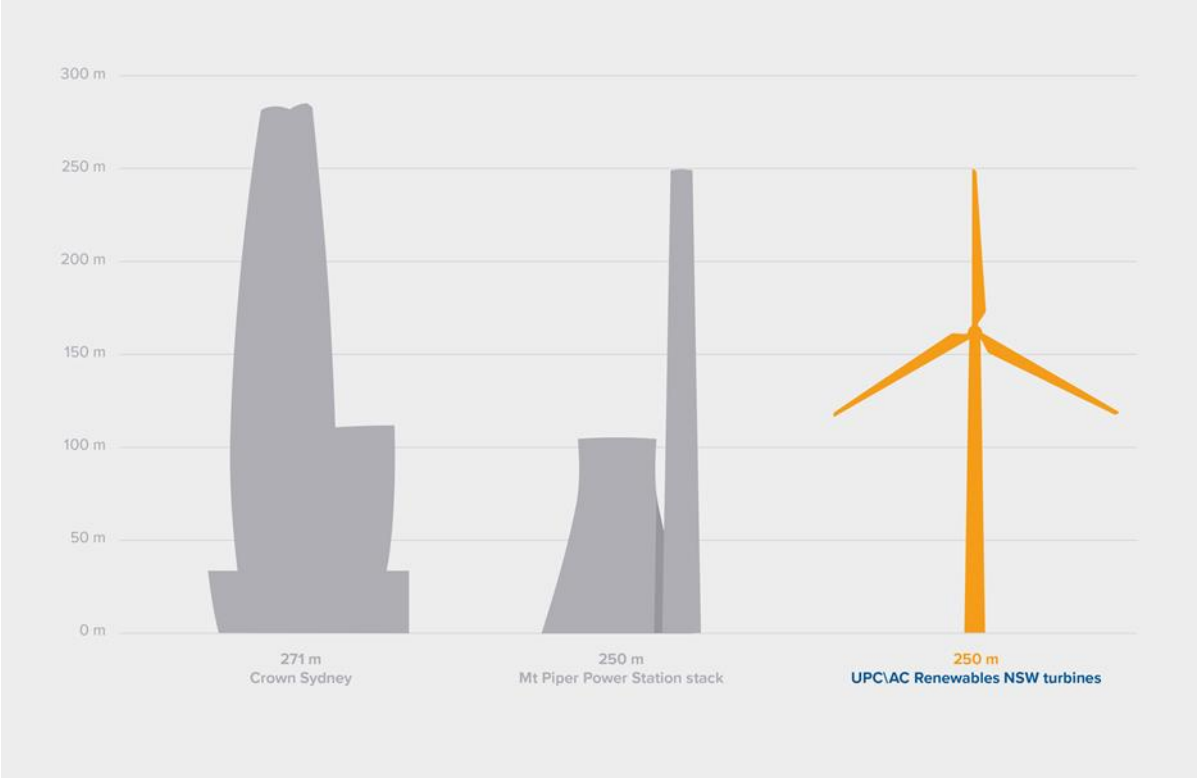



**Figure A-7: Typical turbine elevation**

**Blades**

Electricity is generated by highly aerodynamic Wind Turbine Generator (WTG) blades being propelled by the natural power of the wind. The blades rotate a centrally geared drive shaft which feeds into an electrical generator within the turbine nacelle. This action produces electricity, which is transported via underground cables to a substation within each cluster.

The blades would be up to 90metres long and made from glass fibre reinforced with epoxy or plastic attached to a steel hub and include lightning rods for the entire length of the blade.

**Tower**

The tower is the supporting structure of the WTG and is typically comprised of a reducing cylindrical tower made from either a welded steel shell or a concrete steel hybrid, fitted with an internal ladder and lift.

Each tower would be up to 160 metres tall. Due to the large size, the towers would be manufactured and transported to the project site in sections for onsite assembly.

**Nacelle and hub**

The nacelle is mounted on top of the tower and houses the generating components of the WTG, including the generator, gearbox, drive train, and brake assembly. Weather monitoring equipment would be located on top of the nacelle to provide data on wind speed and direction for the automatic operation of the WTG.

The hub connects the three blades to the tower of the wind turbine. The hub is mounted to the nacelle.

**Rotor**
The rotor is made up of the hub and blades. It drives the generator within the nacelle producing electrical output and is generally selected based on site specific wind conditions to optimise performance of the turbines.

**Step-up transformer**
The WTGs produce electricity at low voltage which is 'stepped up' to medium voltage by a transformer located either in the nacelle, within the base of the tower, or adjacent to the base of the tower on a concrete pad.

The step-up transformer may be oil-filled or a dry type depending on the turbine design. Where oil-filled transformers are used, appropriate measures will be incorporated to prevent any oil loss and contain any spill within a bunded area.

**Footings**
Footings are typically a mass concrete footing of approximately 3.5 metres in depth and 20 metres in diameter. Generally, the concrete footing is then backfilled with engineered fill to 1.5 metres deep, assisting in the stability of the wind turbine foundation.

The specific footing requirements would be refined during detailed design depending on geotechnical conditions. If rock anchors are required to provided additional stability based on ground conditions, construction would include drilling and piling to a depth which would be determined during detailed design.

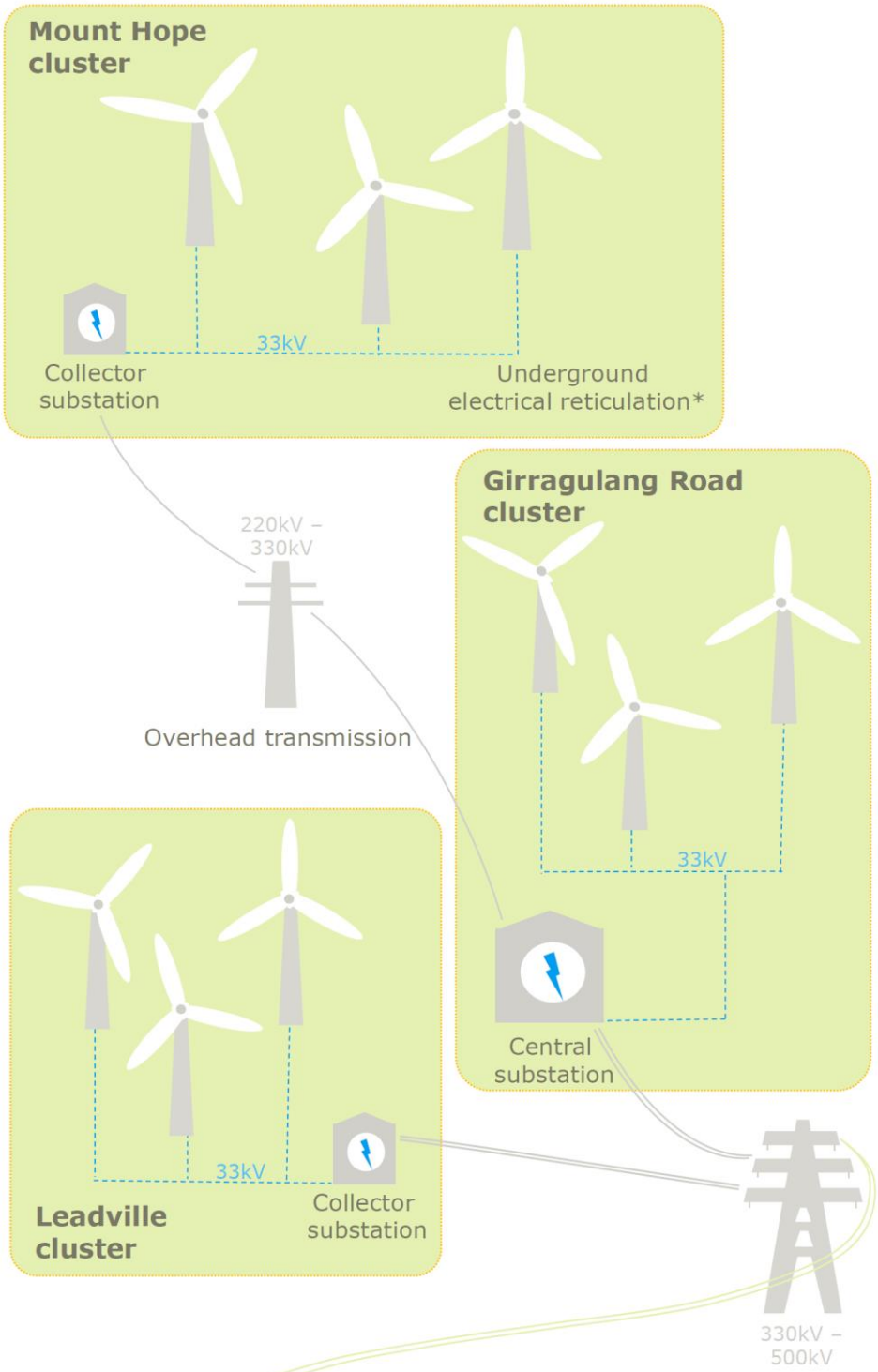
**Lighting**
Aviation Projects has undertaken a safety risk assessment of the project and based on the risk assessment set out in **Chapter 10** of the EIS it has been concluded that aviation lighting is not required for WTGs.

### 1.1.2 Electrical infrastructure

Electrical infrastructure associated with the project includes:

- **Substations and step-up facility** – to transform the electricity generated by the turbines into a higher voltage. There would be 'collector' substations in each of the Mount Hope and Leadville clusters, and one 'central' substation within the Girragulang Road cluster.
- **underground electrical reticulation** – (up to 33kV) to connect the turbines to the substations in each cluster
- **overhead transmission lines** – (up to 330kV) connecting the two substations in the Mount Hope cluster and dispatching electricity from each cluster and connecting the Mount Hope cluster to the Girragulang Road cluster
- **potential battery energy storage system** – with a capacity of 320MW/640MWh to store generated electricity and dispatch it to the NEM to meet demands
- **control cables and earthing** – to monitor winds conditions and energy output.

A detailed electrical design will be undertaken by an appointed contractor and delivered in accordance with relevant electrical standards in consultation with TransGrid and other relevant authorities. An illustration of an indicative electrical infrastructure arrangement is presented in **Figure A-8**.




* Underground except where site constraints require aboveground reticulation



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**Figure A-8: Indicative electrical infrastructure arrangement**

**Substations**

The project would require several electrical substations to transform the electricity generated by each turbine into a higher voltage, allowing it to be dispatched from each cluster and on to the NEM via the CWO-REZ transmission line. The substations required would include:

- 'Collector' substation in both the Mount Hope and Leadville clusters (two in Mount Hope and one in Leadville), converting electricity from 33 kilovolts to 220 kilovolts for dispatch
    - The Mount Hope collector substations would dispatch electricity to a 'central' substation in the Girragulang Road cluster
    - the Leadville substation would dispatch electricity directly to the CWO-REZ Transmission line via a step-up facility at the connection point.
- A larger 'central' substation located in the Girragulang Road cluster, which would both collect the electricity generated in the Girragulang Road cluster and the Mount Hope cluster; and include a step-up facility to increase the collected electricity from 220 kilovolts, up to 330 kilovolts for export to the CWO-REZ Transmission line.

The substations would typically require an area of up to 100 metres by 200 metres (two hectares), and would consist of the following as a minimum:

- indoor switch room to house the medium voltage switchboard and circuit breakers
- outdoor switch yard to house the transformer(s)
- gantries and associated infrastructure
- buried earth grid
- operational facilities building
- lighting
- lightening protection
- on-site diesel generator and/or batteries to maintain network communications and electrical protection
- crushed rock and concrete slab ground cover
- parking
- security fence around the substation to maintain site security, public safety and exclude livestock.

The transformer(s) within the substations would likely contain upwards of 50,000 litres of oil. The substation design would include provisions for containment of oil spills or leaks, including constructed concrete bunds around each transformer and a spill oil retention basin or oil / water separator outside the substations compound.

The locations of the substation would be confirmed to minimise access distance and electrical losses, to reduce their visibility from surrounding public viewpoints, and to allow the provision for a 20-metre asset protection zone (APZ) surrounding the infrastructure.

**Underground electrical reticulation**

The turbines would be connected to the collector substation within each cluster via a series of underground cables that would be co-located with access tracks where possible, to minimise the need for additional vegetation clearing. The underground cables would have a maximum capacity of up to 33 kilovolts and would be installed with the relevant Australian Standard *AS/NZS 3000:2018, Electrical installations* and would be at a depth of at least 600 millimetres below ground. Location markers would be placed along the route of the underground transmission lines for safety reasons.

The final electrical layout will depend on the ease of excavation, ground stability and cost. Where ground conditions or localised topography mean that undergrounding the reticulation is not feasible, consideration would be given to including some sections of overhead transmission lines for the internal reticulation. This would be determined during detailed design.

**Overhead transmission lines**

The following overhead transmission lines would be required:

- transmission line(s) of up to 330 kilovolts, that would dispatch electricity from the collector substation in the Mount Hope cluster and connect it to the central substation in the Girragulang Road cluster

New transmission poles would be timber, steel or concrete construction with single poles used for lower voltage overhead lines (under 330 kilovolts) and larger steel lattice-type towers used for the higher voltage transmission lines (330 kilovolt kV).

Indicative specifications of the overhead transmission lines required for the project are outlined in **Table A-3**. The final designs for poles or towers, numbers, spacing and locations; would be determined during the detailed design.

**Table A-3: Indicative overhead transmission line specifications**

| Voltage | Approximate easement | Approximate height of tower/pole | Typical distance between towers/poles (span) |
|---|---|---|---|
| 330 kV | 60 | 35-50m | 200-300m |

Lease arrangements have been agreed with property owners for the construction of all required overhead transmission lines, in accordance with TransGrid's requirements.

During operation, an easement (or other agreement) would be required for the ongoing operation and maintenance of the overhead transmission lines. These agreements would include certain limitations for landholders relating to the use of the land within the easement, to ensure the safe operation of the infrastructure and minimise risks to safety.

Upon cessation of any lease arrangement, easement, or other agreement, infrastructure would be decommissioned, and land would be returned to its pre-existing condition in consultation with the landholders and use would be returned to the landholder.

**Battery energy storage system**

The battery energy storage system (BESS) would have a capacity of 320MW/640MWh and would likely be a centralised 'AC Coupled' BESS near the connection to the Central West Orana REZ Transmission line.

The centralised BESS would be housed in a secure compound adjacent to the substation at the central substation in the Girragulang Road cluster.

The major components of the BESS would comprise:

- **Batteries** – most likely a lithium-ion technology type
- **Inverters** – convert the DC electricity generated by the wind farm into AC
- **Transformers** – there would be two types of transformers within the centralised AC Coupled BESS, including a low-voltage to medium-voltage transformer and a medium-voltage to high-voltage transformer if a separate grid connection for the BESS is required.

- **Heating ventilation air conditioning** (HVAC) – the HVAC would maintain the batteries at a temperature to optimise their lifetime and performance. This would include small package units and large chillers or a liquid cooling system.
- **Fire protection** - active gas-based fire protection systems would be installed within the BESS enclosure. Thermal sensors and smoke/gas detectors would be installed and connected to a fire control panel.

If an AC Coupled BESS is adopted, one option is for a large building to house the inverters that would use materials similar in appearance and construction to agricultural sheds prevalent across the study area. An alternative is a compound housing the BESS comprising modified shipping containers, prefabricated switch room structures, or smaller outdoor-rated cabinets. The modified shipping containers and prefabricated switch rooms would likely be mounted on concrete footings, while the cabinets would be mounted on concrete slabs.

This infrastructure component would likely be in the order of 3.8 metres high.

**Control cables and earthing**
Operational controls monitor and manage the operation of the turbines in response to the wind conditions to optimise the output of the wind farm. The control cables connect the turbines to the cluster substations and the operational facilities in each of the clusters. Control cables generally consist of optic fibre, twisted pair or multi-core cable and will run underground or be attached to the overhead transmission lines.

All metal project infrastructure will require suitable earthing to ensure safety and protection, this includes met masts, wind turbines, electrical balance of plant, control buildings, overhead lines and fencing. An earthing / soil resistivity study will be conducted for Valley of the Winds, to inform appropriate earthing arrangements for each unique project infrastructure, but may include:

- 70mm – 95mm bare earthing conductor
- 70mm – 95mm insulated earthing conductor (for footings)
- grounding electrode rods
- Flat earthing bar (required for transformers, and other electrical components and supporting infrastructure).

The specific earthing requirements will be assessed and adhere to international standards for lighting protection (IEC 62305-3) and wind turbine generator systems (IEC 61400-24), and Australian earthing standards.

### 1.1.3 Permanent onsite ancillary infrastructure

**Components**
The permanent onsite ancillary infrastructure that would be required for the project includes:

- an operation and maintenance facility
- meteorological masts.

**Operation and maintenance facility**
Operation and maintenance facilities would be required for the whole of the project's operational life. The facility would be expected to be approximately 100 metres by 100 metres (one hectare in area) and there would be one located in each cluster. Indicative locations are provided in **Figure A-1**.

Each operation and maintenance facility would generally comprise a control room (offices, monitoring equipment, stores and amenities), storage and maintenance facilities, laydown areas, and parking.

**Meteorological masts**

Up to 10 permanent meteorological masts have been included in the current indicative wind farm layout and assessed as part of the aviation risk assessment. The meteorological masts comprise free standing towers at hub height support equipment allowing for continuous monitoring of meteorological conditions. An example of a meteorological mast is provided in **Figure A-9** and indicative locations are shown in **Figure A-1**, **Figure A-2**, **Figure A-3** and **Figure A-4.**

The aviation safety risk assessment set out in **Chapter 10** of the EIS has concluded that aviation lighting is not required for meteorological masts to maintain an acceptable level of safety to aircraft and 'as constructed' details of the meteorological masts, including coordinates and elevations would be provided to Airservices Australia. The following markings would be considered during detailed design for the meteorological masts in accordance with the requirements set out in MOS 139 and NASF Guideline D:

- marker balls or high visibility flags or high visibility sleeves placed on the outside guy wires
- paint markings applied in alternating contrasting bands of colour to at least the top third of the masts
- ensuring the guy wire ground attachment points have contrasting colours to the surrounding ground/vegetation
- a flashing strobe light during daylight hours if appropriate.

Some temporary meteorological masts would be required to monitor ongoing wind and weather conditions during the detailed design phase. These temporary masts would be up to 110 metres high and would be removed no later than 30 months after their erection is completed. In accordance with the general requirements outlined under clause 2.20(2) of the Transport and Infrastructure SEPP, the proposed temporary masts would be exempt development (and therefore separate to the SSD and Commonwealth referral outlined in this EIS) for the following reasons:

- the masts would meet the relevant deemed-to-satisfy provisions of the Building Code of Australia and would be structurally adequate and installed in accordance with the manufacturer's specifications
- they would be installed in accordance with all relevant requirements of the Blue Book,
- they would not be designated development
- they would not impact any heritage items or involve any pruning or other vegetation removal
- would not involve the removal of asbestos.

Figure A-9: Example of a meteorological mast

### 1.1.4 Access track network

The project would require an internal access track network connecting the turbines and associated infrastructure. The access tracks would be established for construction and maintained for use as operational access tracks. The proposed access track arrangement is shown in **Figure A-1**.

The access track network would be appropriately designed, constructed, and maintained to allow access to all turbine componentry and electrical infrastructure throughout the site. This would include the construction of gates and fencing as required.

Tracks would comprise of an engineered gravel road with an approximate width of 6 metres, excluding drainage structures, cut and fill batters and suitable erosion and sediments control structures, as required. The detailed engineering of the access track network, access points from public roads, and construction methodology would be developed by the preferred EPC contractor during the detailed design phase.

## 1.8 Construction

### 1.1.5 Overview of construction phases

Construction of the project would be delivered in the following phases:

- **Phase 1 – Detailed design and site investigations**: Detailed design, including the design of electrical reticulation, geotechnical design, micro siting of turbines, and all supporting ancillary infrastructure. Initial investigations (e.g. geotechnical investigations) would also be undertaken during this phase to inform design and site preparations
- **Phase 2 – Site preparation and temporary construction facilities**: Pre-construction activities such as site preparation, utility adjustments, erection of site and workers compounds and accommodation as required; and upgrades to public roads required to facilitate construction
- **Phase 3 – Main construction works**: Onsite civil works, wind turbine construction and electrical reticulation
- **Phase 4 – Commissioning**: Activities to be undertaken prior to operation such as testing of turbines and energising substations.

The construction of each wind farm cluster (Girragulang Road, Mount Hope and Leadville) may be constructed concurrently, or as three distinct stages of the development. It is requested that any conditions of consent would facilitate the option of staging the construction activities for each cluster.

Phase 1 also includes the undertaking of all post-approval and pre-construction additional survey commitments and the preparation of all management plans required to adequately manage potential environmental and social impacts as outlined in **Chapter 19** of the EIS.

A description of Phase 2 to Phase 4 is provided below.

### 1.1.6 Phase 2 - Site preparation and temporary construction ancillary facilities

Prior to commencement of construction activities, the following works would be undertaken:

- detailed geotechnical investigations to confirm the ground conditions
- installation of temporary construction fencing around work areas, where required
- utilities survey and safety marking of any existing overhead transmission lines
- site survey and pegging to confirm infrastructure positioning and placement
- establishment of temporary construction compounds and workforce accommodation (as required) and site facilities including concrete batch plants and quarry sites
- establishment of laydown areas for construction materials and equipment
- preliminary earthworks and installation of environmental controls including erosion and sediment management structures
- identification and establishment of no-go zones around trees, vegetation, and culturally significant areas to be retained.

Earthworks would be limited to the locations requiring resurfacing activities for temporary construction facilities (including access tracks, laydown areas, construction compounds and carparking areas) and permanent operational infrastructure.

The need for heavy earthworks such as grading/levelling and compaction will be minimised as much as practicable during this phase and undertaken as part of phase 3.

The extent of excavations and volume of fill required for the project would depend on the geotechnical conditions and the final locations for infrastructure. These details would be determined during detailed design of the project.

**Site offices and compounds**
Site offices and compounds will be established in this phase of construction and will include:

- offices and meeting facilities
- amenities
- car parking
- construction compound including delivery and laydown areas
- bunded equipment maintenance and refuelling areas.

Temporary construction offices and compounds would be required in each cluster and would be expected to require an area of up to 100 metres by 200 metres (two hectares in area). The areas would be fenced for security and to allow safe movement of vehicles and storage of equipment. Indicative locations for the temporary construction facilities are provided in **Figure A-1**. Building fit outs would include power, lighting, air-conditioning, security, fire detection, and communications.

An area approximately 100 metres by 100 metres would be retained at each location for permanent use as an operation and maintenance facility as described in **Section 1.1.3**. This would include a site office, workshop, storage, parking and facilities for operational staff.

Smaller satellite construction facilities would also be required in other locations throughout each cluster to facilitate construction. These would include amenities, laydown and storage areas. The locations of these smaller satellite facilities would be confirmed by the preferred EPC contractor to suit the construction schedule.

The final locations will be determined in accordance with the Development Consent conditions and subsequent management plans and shown on the Final Layout Plans.

**Construction workforce accommodation**
ACEN are considering two options for the accommodation of the required construction workforce. The first option is a regional distribution of the peak workforce with accommodation sourced from surrounding towns. The second option is to accommodate the entire workforce in purpose-built workforce accommodation. These two options are discussed in more detail in **Section 1.1.10** and the environmental and social impacts and benefits associated with each option are considered in the relevant impact assessment chapters.

Should a purpose-built workforce accommodation area be required, it would include rooms and amenities for up to 400 workers (the expected peak workforce), and supporting facilities such as car parking, a dining hall, gym, library, and other recreational facilities.

The location of the potential construction workforce accommodation area is shown on **Figure A-1**. this location has been discussed with the relevant landholder and should the proposed accommodation area be required, ACEN would enter into a lease agreement with this landholder for the duration of the construction period.

The accommodation would consist of prefabricated demountable units, that would be delivered to site and installed during the Phase 2 construction activities. An example layout from another current ACEN project, is included in **Figure A-10**, to provide an indication of a typical layout and

footprint for a project of a similar scale. An indication of the typical form of the accommodation area is provided in **Figure A-12**.

A hardstand area of up to five hectares would be required for the workforce accommodation and supporting facilities and this area would be located within the nominated parcel of land, such that vegetation clearance and other environmental and social impacts are minimised.

It is expected that the workforce accommodation area would be serviced by a pump-out sewerage system and potable water would be imported by truck. Water supply and sewerage treatment is discussed further in **Section 1.12**.

The electricity required for the construction workforce accommodation would be supplied by up to six diesel generators. Each generator would be expected to consume up to 500 litres of diesel per day.

Storage of diesel and other flammable liquids and hazardous materials required for the for the project would be within appropriately bunded stores, designed in accordance with the relevant standards and to the satisfaction of DPIE and NSW EPA.

The construction accommodation village would be managed by an experienced operator engaged by the EPC contractor. Provided appropriate reliability, quality and financial competitiveness can be satisfied, local businesses would be engaged wherever possible to service the proposed workforce accommodation. This would typically include maintenance, laundry, cleaning, catering, security, and shuttle bus services and waste management.

Following construction of the project and cessation of the lease agreement, the workforce accommodation area would be dismantled, and the land would be returned to its pre-existing condition in consultation with the landholders.

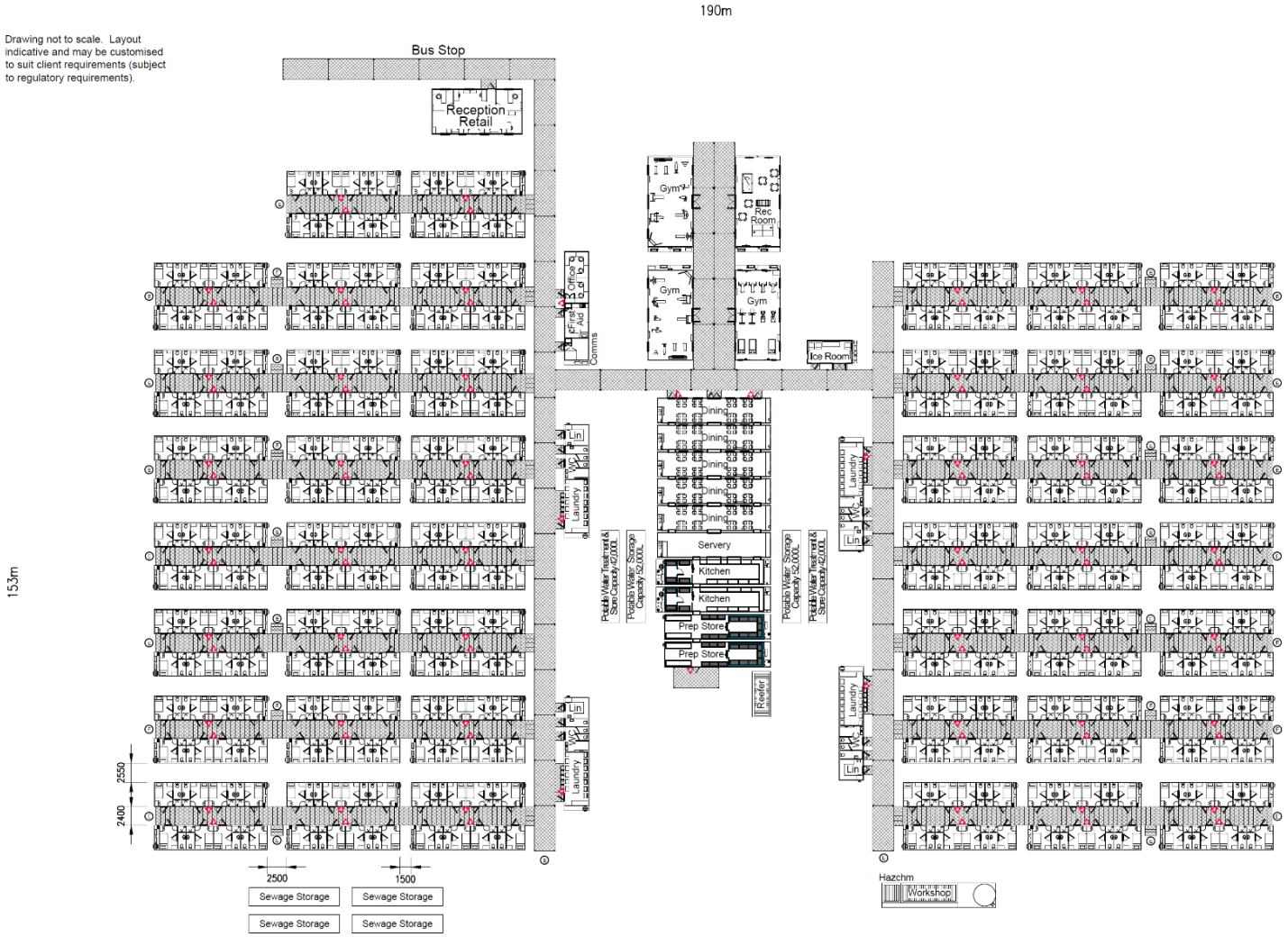


**Figure A-10: Example layout for a typical construction workforce accommodation area**

Figure A-11: Example of a typical construction workforce accommodation

**Upgrades to public roads**

A transport and logistics assessment has been undertaken to consider the need for upgrades to the public road network, including any structures, to facilitate construction and particularly the delivery of the turbine blades from the Port of Newcastle to site using over size-over mass (OSOM) vehicles under police escort. Discussion of this assessment is provided in **Section** Error! Reference source not found. a nd **Chapter 9** of the EIS.

The logistics assessment based on the transport routes outlined in **Section 1.1.11,** identified that the following road upgrades summarised in **Table A-4** would be required prior to construction:

Table A-4: Schedule of proposed road upgrades

| Intersection / Road | | Proposed upgrade | Length (km) | Timing |
|---|---|---|---|---|
| **Road authority: Warrumbungle Shire Council** | | | | |
| 1 | Mount Hope Road | Within the Mount Hope cluster boundary, upgrade to the standard and satisfaction of Council for general construction traffic and OSOM vehicles. | 12.0 | Prior to commencing construction of the Mount Hope cluster |
| 2 | Black Stump Way / Mount Hope Access Road intersection | Extent of required works to allow access for OSOM vehicles. | N/A | Prior to commencing construction of the Mount Hope cluster |

| Intersection / Road | | Proposed upgrade | Length (km) | Timing |
|---|---|---|---|---|
| 3* | Short Street | From the Golden Highway to Church Street, upgrade to the standard and satisfaction of Council for general construction traffic and OSOM vehicles. ACEN is committed to paving this section of road in response to feedback from the local community. | 0.3 | Prior to commencing construction of the Girragulang Road cluster |
| 4* | Turee Street | From Short Street to Main Street, upgrade to the standard and satisfaction of Council for general construction traffic and OSOM vehicles. ACEN is committed to paving this section of road in response to feedback from the local community. | 0.3 | Prior to commencing construction of the Girragulang Road cluster |
| 5* | Main Street | From Turee Street to Wyaldra Street, upgrade to the standard and satisfaction of Council for general construction traffic and OSOM vehicles. | 0.1 | Prior to commencing construction of the Girragulang Road cluster |
| 6* | Wyaldra Street | From Main Street to Moorefield Road, upgrade to the standard and satisfaction of Council for general construction traffic and OSOM vehicles. | 0.3 | Prior to commencing construction of the Girragulang Road cluster |
| 7* | Moorefield Road (east) | From Wyaldra Street to Girragulang Road cluster boundary, upgrade to the standard and satisfaction of Council for general construction traffic and OSOM vehicles. | 2.2 | Prior to commencing construction of the Girragulang Road cluster |
| 8* | Turee Street / Main Street intersection | Extent of required works to allow access for OSOM vehicles. | N/A | Prior to commencing construction of the Girragulang Road cluster |
| 9* | Wyaldra Street / Moorefield Road intersection | Extent of required works to allow access for OSOM vehicles. | N/A | Prior to commencing construction of the Girragulang Road cluster |
| 10 | Moorefield Road (west) | From Black Stump Way to Girragulang Road cluster boundary, upgrade to the standard and satisfaction of Council for general construction traffic. | 4.6 | Prior to commencing construction of the Girragulang Road cluster |

| Intersection / Road | | Proposed upgrade | Length (km) | Timing |
|---|---|---|---|---|
| **Road authority: Transport for NSW** | | | | |
| 11 | Golden Highway / Black Stump Way intersection | Extent of required works to allow access for OSOM vehicles. | N/A | Prior to commencing construction of the Mount Hope cluster |
| 12 | Golden Highway / Leadville Access Road intersection | Extent of required works to allow access for OSOM vehicles. | N/A | Prior to commencing construction of the Leadville cluster |
| 13 | Golden Highway / Short Street intersection | Extent of required works to allow access for OSOM vehicles. | N/A | Prior to commencing construction of the Girragulang Road cluster |

* Noting that only one access to the Girragulang Road cluster would be constructed, should the proposed access via Uarbry not proceed, these upgrades would not be required and a new intersection on the Golden Highway would be required.

Proposed road upgrades would be undertaken as outlined in **Table A-4** to facilitate component deliveries and would be designed and constructed to the satisfaction of the relevant roads' authorities for the locations of the upgrades. Further details about the proposed road upgrades are provided in **Chapter 9** of the EIS.

Potential environmental impacts associated with the proposed road upgrades have been assessed and discussed in the relevant sections of this EIS. This includes any additional vegetation clearing that will be required due to the swept paths of the oversized trucks.

**Quarrying activities**

Depending on the quality of material available on site, the project would require some on-site quarrying to source material that would typically be used for road base for access tracks and hardstand areas. On site quarrying is the preferred way to source materials required for construction as it would significantly reduce the potential traffic impacts to the surrounding road network that would otherwise be associated with the haulage of materials.

Boreholes would also be required to determine the suitability and availability of the material on site for use and the depth of bedrock as part of design development. Depending on the quality and quantity of available material, at least one quarrying area is proposed in each cluster and indicative locations are shown in **Figure A-1**, **Figure A-2**, **Figure A-3** and **Figure A-4**.

The size and location of these quarry locations would be confirmed by the preferred EPC contractor following detailed geotechnical investigations prior to construction. Any variations in the indicative locations would be developed in accordance with the proposed management measures outlined in **Appendix 3.**

**Rock crushing and concrete batching plants**
Temporary rock crushing and concrete batching plants would be required to process rock, aggregate and concrete for the WTG foundations, electrical infrastructure (footings for towers and poles, substations etc.) and other minor works such as site office and compound foundations.

The temporary rock crushing and concrete batching facilities would be located within the site compounds in each cluster to minimise material handling. Indicative locations are shown in **Figure A-1**, **Figure A-2**, **Figure A-3** and **Figure A-4**.

Detailed design and layout of the proposed facilities would be undertaken by the preferred EPC contractor, but it is expected that the temporary rock crushing facility would need an area of approximately 50 metres by 100 metres to accommodate a tracked mobile crushing unit, conveyor belts, feeder and engine. The area would also include capacity for safe vehicle movement and storage for materials required for up to five days of concrete batching.

Some temporary rock crushing may occur throughout each cluster using mobile plant if required following excavation of rock material to reuse in the immediate area and minimise haulage of materials around site.

The temporary concrete batching facility would require a larger area of up to 100 metres by 100 metres to accommodate a trailer-mounted concrete mixer, cement bins, sand, and aggregate stockpiles and storage container for equipment and tools.

Detailed estimates of the volumes of materials to be processed by the proposed facilities would be confirmed by the preferred EPC contractor following detailed geotechnical investigations and when the final wind farm layout is confirmed. If the extraction and processing thresholds exceed Schedule 1 of the Protection of the Environment Operations Act 1997 (POEO Act), an Environmental Protection Licence (EPL) would be obtained from the EPA for the operation of rock crushing or concrete batching facilities.

### 1.1.7 Phase 3 – Main construction works

Following site preparation, construction of the project would commence which would include:

- civil works for access tracks
- construction of the WTGs
- construction of electrical infrastructure including the overhead transmission lines
- construction of permanent onsite ancillary infrastructure.

The construction methodology would be determined by the preferred EPC contractor when the final wind farm layout is confirmed. It is expected that some of these construction tasks would occur concurrently.

**Civil works for access tracks**
Construction of the access track network would be the first major civil works package to be delivered as part of the Phase 3 main construction works and would provide durable and reliable access to the turbine locations in each cluster for the delivery of major components.

Based on the indicative layout shown in **Figure A-1**, up to about 150 kilometres of access track would be required across the whole wind farm area to provide access to the turbine locations and all

electrical infrastructure throughout the wind farm. The access tracks would be appropriately designed and established during this stage of construction and maintained for use as operational access tracks.

The access tracks would comprise a six-metre-wide engineered gravel road surface, with drainage structures, cut and fill batters, and sediment and erosion controls as required, extending beyond the six-metre engineered road surface. Fencing, gates, and cattle grids would also be included where required.

An indicative cross-section of the proposed access tracks is provided in **Figure A-12**.

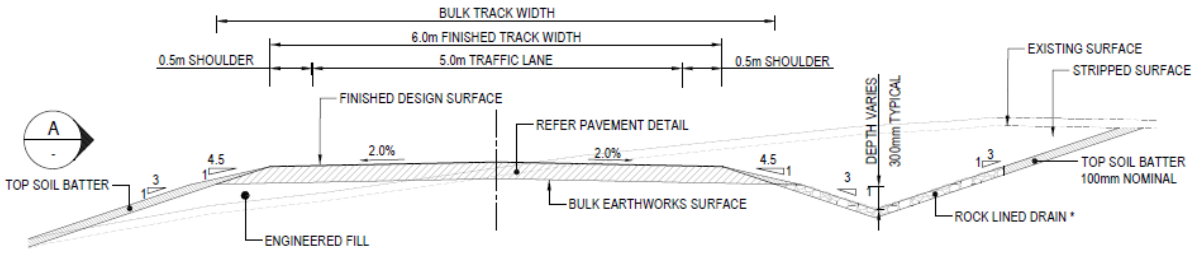


**Figure A-12:Indicative cross-section for the proposed access tracks**

A typical construction sequence for the access tracks would include the following:

- topsoil stripping and stockpiling
- bulk earthworks including cut and fill, batter stabilisation and subgrade improvement where soft/wet soils require. Subgrade improvement may include any of the following:
    - stabilisation
    - geotextile strengthening
    - coarse rockfill strengthening
    - subgrade replacement
- installation of drainage structures including:
    - cross drainage
    - longitudinal drainage including rock-lined drains or vegetated swales
    - waterway crossings where required
- surfacing and compaction
- revegetation of batter slopes where required
- installation of fencing, gates, and cattle grids as required in consultation with the landholder.

As the access track formation is being constructed, drainage structures such as culverts and pipes would be installed to enable natural flows to be maintained. If any temporary diversion channels are required to enable the installation of culverts and pipes., appropriate controls would be implemented for the diversion channels to minimise the potential for scour. After the culvert or pipe is installed, the drainage line would be reinstated, and the temporary channels removed.
The design of any drainage structures would depend on the topography and expected flow of water. Rock-lined drainage would be used for longitudinal drainage where the topography is steep and erosion potential is high, and topsoil and vegetated swales or channels would be used where gradients are lesser, and the erosion potential is reduced.

The design of cross drainage, including the need for rock stabilisation and/or headwalls at the inlets and outlets of culverts and pipes would depend on flow rates and expected volumes of water during

flood events. All drainage requirements would be modelled during the detailed design, and all creek crossings required for the access tracks would be designed and constructed in accordance with the following where appropriate:

- Managing Urban Stormwater: Soils and Construction (Landcom, 2004) manual, or its latest version
- Policy and Guidelines for Fish Friendly Waterway Crossings (NSW DPI, 2004)
- Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (Fairfull and Witheridge, 2003).

A temporary disturbance footprint of about 15 metres would be considered reasonable to construct the access tracks, to allow for the co-location of trenched electrical reticulation, although this would vary depending on the topography and the amount of cut and fill required.

To allow for flexibility in the design process, a buffer of up to 50 metres on either side of the centreline of the proposed access tracks has been applied to the impact assessment for this EIS. This buffer zone provides adequate space beyond the typical construction zone of the formation for the following:

- implementation of sediment and erosion control measures
- safe and efficient circulation of construction vehicles and earthmoving plant
- temporary storage of topsoil materials, close to final placement position
- underground cabling alignments
- drainage inlet and outlet stabilisation or headwalls where required.

The detailed engineering of the access track network, access points from public roads, and construction methodology would be developed by the preferred EPC contractor during the detailed design phase.

**Wind turbines**

Preparation for construction of each turbine would include the development of a suitable foundation and laydown/hardstand area. This area would be large enough to provide a level working space for the required construction machinery, a permanent foundation pad, and to lay down the individual turbine and tower components during construction. Hardstands would be paved to required load-bearing specifications and would be maintained throughout construction and to facilitate ongoing maintenance and access to the WTGs during operation.

The total area required for each turbine site would be dependent on the turbine size, but it is expected that a hardstand area of approximately 80 metres by 40 metres would be required for each wind turbine location, with several configurations of this area possible.

**Overhead transmission lines**

Construction methods will be developed would consider site conditions, topography, accessibility, and the proposed voltage. Generally, the following indicative activities are likely to be required:

- site establishment and clearing for access provisions
- survey and mark out
- establishment of required easements, including vegetation clearing and trimming where impacts are unavoidable
- excavation for footings and installation of towers/poles
- stringing of the lines and earthing.

It is expected that most of the proposed overhead transmission lines would be easily accessible from the ground and construction could be undertaken using ground-based equipment.

Some temporary laydown areas would be required along the alignment of the transmission lines for the storage of equipment, transmission tower components/poles and conductors.

The final construction methods for the proposed overhead transmission lines would be developed by the preferred EPC contractor when the final wind farm layout is confirmed and in consultation with TransGrid and in accordance with the relevant TransGrid transmission construction guidelines.

**Underground electrical reticulation**
Generally, the underground electrical reticulation would be co-located with the proposed access track network to minimise the need for additional ground disturbance during construction. Where possible the cabling would be laid during the earthworks for the access tracks and would involve the following indicative construction activities:

- site establishment, including temporary fencing for safety reasons and to exclude livestock
- temporary removal of existing fences if required and establishment of access controls to manage livestock in consultation with the property owner
- excavation of trenches and stockpiling of material next to the trench
- laying bedding sand
- laying cabling and services notification indicators
- backfilling (previously stockpiled material), compaction and rehabilitation in consultation with the landowner.

The locations and alignment of all underground electrical reticulation would be marked with marker posts, which would be maintained during operation of the wind farm and until the preferred decommissioning is agreed with the landowner. Decommissioning is discussed further in **Section 1.10**.

**Other electrical infrastructure**
Other electrical infrastructure including the substations and the BESS would be constructed together and where relevant, would be co-located in the same compound.

The substations will be designed and constructed in accordance with TransGrid requirements and other relevant technical, electrical and planning standards. Construction would require clearing and excavations for the reinforced concrete foundations and the compound areas around the switch room, control building and other components would be surfaced with course gravel and stone material.

### 1.1.8 Phase 4 – Commissioning

Following the completion of the main construction works, the site would be commissioned suitable for operations. Commissioning works would include:

- testing and commissioning of infrastructure
- removal of temporary construction facilities
- revegetation of disturbed areas.

It is expected that some of these tasks would occur concurrently.

### 1.1.9 Plant and equipment

Typical machinery and equipment required for construction of wind farms of this scale are listed in **Table A-5**.

**Table A-5: Anticipated construction machinery and equipment**

| Plant | Plant |
|---|---|
| Cranes of varying size and lifting capacity | Grader |
| Drum rollers | Compactor |
| Dump truck | Small pile driving rig |
| Road truck | Water truck |
| Concrete truck | Cable trenching and laying equipment |
| Excavators | Generators |
| Scraper | Mobile crushing and screening plant |
| Forklifts | Light vehicles |
| Heavy vehicles for deliveries and materials haulage | Transmission pole borers |
| Elevated work platforms | Wire spoolers |
| Handheld power tools | Front-end loaders |

### 1.1.10 Construction hours, program, and workforce

**Construction hours**

Standard daytime construction hours consistent with the *Interim Construction Noise Guideline* (Department of Environment and Climate Change 2009) (ICNG) are as follows:

- 7am to 6pm Monday to Friday
- 8am to 1pm on Saturdays
- No works on Sunday or public holidays

ACEN is seeking approval for standard construction hours, plus additional time at the start and end of each day (Monday to Saturday) and Saturday afternoon, referred to as 'extended construction hours'. The extended working hours would maximise construction efficiency, maintain flexibility for large concrete pours and curing cycles and reduce the overall construction program. The proposed working hours would be:

- 6am to 6pm Monday to Friday
- 6am to 6pm on Saturdays
- No works on Sunday or public holidays.

The proposed extended hours would represent one hour at the start of each day (Monday to Friday), two hours at the start of the day on Saturdays, and five hours on Saturday afternoons in addition to the standard daytime working hours. Where possible, activities conducted within the extended hours period will be inaudible at noise sensitive receivers. High noise level activities, such as those involving noisy machinery, would be deferred to standard working hours where possible.

Out of hours work would also be required on limited occasions such as when transporting large components including turbine blades, nacelles, and transformers to site, using over-size over-mass vehicles under police escort; or to facilitate large concrete pours and curing cycles that can't be undertaken during the extended working hours. Some staff arrival/departure movements and emergency response may also be required from time to time.

The Secretary, Warrumbungle Shire Council and surrounding landholders would be notified of any planned out of hours works.

The timing of construction would be dependent on project approval however, it is expected to commence in the first quarter of 2024 and would run for a period of approximately 24 to 42 months.

**Expected workforce**

The project would likely require up to 400 workers during peak construction, subject to detailed design, construction methodology and scheduling.

ACEN will engage with Warrumbungle Shire Council and the preferred EPC contractor through detailed design to investigate options for prioritising local workers where feasible. For example, this would include introducing local workers and sub-contractors that have expressed an interest in the project during development and through an online construction register, which has already been established, to assist in maximising the local work force onsite.

**Workforce accommodation**

ACEN are considering two options for the accommodation of the required construction workforce. The first option is a regional distribution of the peak workforce with accommodation sourced from surrounding towns. The second option is to accommodate the entire workforce in purpose-built workforce accommodation.

The regional distribution of workforce option assumes that construction workers would be distributed across six localities, including the townships of Coolah, Dunedoo, Cassilis, Coonabarabran, Gulgong and Mudgee and travel to site from established accommodation facilities in these towns.

Based on feedback from Warrumbungle Shire Council and the approximate size of the closest surrounding towns, the distribution of workers for construction is expected to be close to the indicative estimates provided in **Table A-6**. These workforce location assumptions are subject to ongoing consultation with Warrumbungle Shire Council.

**Table A-6: Indicative distribution of construction workers**

| Town | Percentage of workforce | Total |
|---|---|---|
| **Coolah** | 15 | 60 |
| **Dunedoo** | 15 | 60 |
| **Cassilis** | 5 | 20 |
| **Gulgong** | 15 | 60 |
| **Coonabarabran** | 30 | 120 |
| **Mudgee** | 20 | 80 |
| **Total** | **100%** | **400** |

The centralised workforce option assumes the bulk of the construction workforce would be accommodated at a purpose-built construction workforce accommodation area located on site.

The environmental and social impacts and benefits associated with each option are considered in the relevant impact assessment chapters. However, key findings from the social impact assessment survey undertaken as part of this EIS suggest that one of the major recurring issues raised by the community is the difficulty of accommodating a large workforce within the surrounding towns. Issues raised in the survey include shortages of appropriate accommodation in surrounding towns and potential impacts on tourism and local housing associated with an increased pressure on available accommodation.

It would also be expected that a centralised accommodation option would result in reduced traffic impacts on the surrounding road network as the bulk of the construction workforce would be centrally located and therefore not travelling to and from site daily, using the local road network.

Noting that Warrumbungle Shire Council have expressed a preference for the construction workforce to be spread out around the nearby towns and not to be focussed in one centralised area, ACEN will continue to work with Warrumbungle Shire Council and the preferred EPC contractor to develop an accommodation and employment strategy, which will consider various workforce requirement scenarios for the duration of construction and propose measures to manage workforce accommodation either in surrounding towns, or at a centralised workforce accommodation area.

To the extent possible, this would include the consideration of the potential cumulative effects of other major projects and nearby mines in the area and consider measures to manage potential impacts of workforce on short-term accommodation availability and the local housing market.

### 1.1.11 Transport routes and traffic movements

**Heavy vehicle transport routes**
It is expected that many of the wind turbine components and other large components such as the electrical plant would be manufactured off-site and transported to site in sections.

Transporting large components, such as turbine blades, by road is a very complex undertaking and the final transport routes, will be confirmed by the preferred EPC contractor based on the final

procurement and origin of the wind farm components. However, it is expected that some components will be delivered by ship to Newcastle Port prior to transportation to site by road.

The expected delivery route from Newcastle Port to the Golden Highway near the wind farm site would be approximately 280 kilometres, and would likely comprise the following roads:

- Bourke Street from Newcastle Port
- Hannell Street
- Industrial Drive
- Pacific Highway
- New England Highway
- Golden Highway.

From the Golden Highway, access to each turbine cluster would need to be via the local road network. Proposed access routes to each cluster are shown in **Figure A-1**. Detailed discussion of the potential impacts to the regional and local road networks associated with heavy vehicle access to site, is provided in **Chapter 9** of the EIS.

**Light vehicle movements**

Most light vehicles trips would be associated with workers travelling to and from each cluster to work each day. The associated impacts on the local road network would be dependent on the workforce accommodation option developed for the project, as discussed in **Section 1.1.10**.

Under both assessment scenarios for the construction workforce, construction activities at the three clusters were assumed to be undertaken sequentially, with construction vehicle movements associated with one cluster at a given time. Although there may be some overlap in construction activities, this assumption provides a representative worst-case assessment for each cluster. Detailed discussion of the potential impacts to the regional and local road networks associated with light vehicle access to site during construction and operation, is provided in **Chapter 9** of the EIS.

## 1.9 Operation and maintenance

The operational lifespan of the project would be around 30 years unless the facility is re-powered at the end of its operational life.

The project would operate 24 hours per day, seven days per week with the operations and maintenance team attending site typically five days a week during normal hours unless responding to an alarm or fault or major maintenance works.

Ongoing monitoring and maintenance would be required, including maintenance of the turbines, associated infrastructure, and access tracks. Typical activities to be undertaken during operations include:

- infrastructure and equipment maintenance and replacement as required
- site maintenance including vegetation management, weed and pest management, fence and access road maintenance and remediation of drainage channels if required
- general security and housekeeping.

Approximately 50 full time employees would be required to operate and maintain the wind farm.

Regular light vehicle access will be required throughout operations. Heavy vehicles would be required occasionally for replacing larger components of project infrastructure including inverters, transformers, or components of the BESS.

## 1.10 Decommissioning

Near the end of the wind farm's operational life, a decommissioning and rehabilitation plan will be prepared that outlines the rehabilitation objectives and strategies to return the wind farm site to its pre-existing condition for agricultural land use. The decommissioning and rehabilitation plan will be prepared in consultation with Warrumbungle Shire Council and landholders.

At the end of its operational life, the project would be decommissioned and land that is impacted by the project would be rehabilitated in consultation with the affected landholders.

ACEN or its contractors will attempt to recycle all dismantled and decommissioned infrastructure and equipment, where possible. Structures and equipment that cannot be recycled would be disposed of at an approved waste management facility. Further details on waste management for the project are included in **Chapter 9** of the EIS.

Most of the cabling will be buried between 600mm to 1000mm below ground. This will be removed as part of the decommission process. Any underground cabling below 1000 millimetres is proposed to remain in-situ following project decommissioning as this would not interfere with safe farming practices and would reduce the impact on soils during decommissioning.

Personnel numbers required for decommissioning of the wind farm are expected to be equal to or less than those estimated for construction.

## 1.11 Subdivision

The land on which the substations are constructed would likely require subdivision (if required by TransGrid). However, the development footprint is located within zone 'AG' for subdivision, and under Clause 4.1 of the Warrumbungle LEP, the size of any lot resulting from a subdivision of land in zone AG is not to be less than 600 hectares.

The subdivision of one or more lots may be required for any of the substations, resulting in lots that are less than the minimum 600 hectares. However, the proposed subdivision would be permissible under Section 4.38 of the EP&A Act subject to the approval of the Minister for Planning.

Following decommissioning of the project, the subdivided lots would be reconsolidated back into the original lot. Consultation would be undertaken with Warrumbungle Shire Council, DPIE and the associated landholders once the final location of the substation was determined.

## 1.12 Service and utility supply arrangements

### 1.1.12 Water supply

Water required for construction would be preferentially sourced from:

- commercial suppliers of treated wastewater in the region
- groundwater bores and farm dams located in the region
- town water purchased from Warrumbungle or other surrounding LGA's as available.

Water sources would be determined in consultation with suppliers, landholders and council subject to availability. During drought conditions, it is likely that most of the water will be sourced from commercial suppliers or treated wastewater.

Anticipated water-use estimates are presented in **Table A-7**.

**Table A-7: Construction activities and associated water requirements**

| Resource | Description | Indicative quantity | Potential source/s |
|---|---|---|---|
| **Potable water** | | | |
| Water - Amenities | Assume 400 persons peak workforce, 180L/day/person, 78-weeks* duration | 33,696 kilolitres (for the construction period) | Option 1 – groundwater bore and on-site treatment<br>Option 2 – truck in from external supplier. |
| Water - Potential workers accommodation facility | | | |
| **Non-potable water** | | | |
| Water - Dust suppression (incl. concrete batching plant) | Assume 45km track length at once, 8m application width application rate 2.5L/m2/day, 78-weeks* duration = 900 kilolitres per day | 421,200 kilolitres | Dust suppression water to be sourced onsite for as much as possible or from existing locally contracted groundwater sources |
| Water - Pavements | Access tracks, wind turbine hardstands, internal substation benches, O&M facilities, concrete batching plant, construction compounds | 647,464 kilolitres | 5-10% supply from recycled water from within batching plant<br>Remainder to be sourced from existing surface or groundwater allocations within and / or surrounding the site or external supplier |
| Water -Wind turbine foundations | Concrete and binding | 27,612 kilolitres | 5-10% supply from recycled water from within batching plant<br>Remainder to be sourced from existing surface or groundwater allocations within and / or surrounding the site or external supplier |

* Consistent with the EIS, a period of 78 weeks has been used to calculate water usage volumes. This is based on the expected period that the peak workforce of 400 people would be on site over the duration of the 24 to 42-month construction period. This assumption has been used to account for peaks and troughs in workforce on site at different times during construction.

Water would primarily be used for dust suppression during construction and decommissioning activities and would likely be in the order of 900 kilolitres of non-potable water per day (the volume of approximately 45 water trucks with a capacity of 20,000 litres). An additional 40 litres of potable water would be required to service construction compounds per day.

Water use during the operational phase of the project would be negligible and sourced from suitable and appropriately licenced water sources. Water required for staff amenities would be sourced from onsite rainwater tanks or delivered to site as potable water. Groundwater will not be used during the operational phase for the project staff.

Water for maintenance activities would be sourced from water trucks, opportunistically from groundwater bores and farm dams located in the region or from treated wastewater if available in the nearby region; or would be sourced using town water where appropriate and available. Water used for staff amenities would be sourced from treated wastewater where available or from the town water supply.

### 1.1.13 Electricity

Access to electricity during construction activities would be via the local distribution network where available and via diesel generators where access to the grid is unavailable.

Electricity requirements during operation would include lighting, staff computers, domestic appliances and onsite security systems during operations. Electricity generated by the wind farm would be used for most activities during operations.

### 1.1.14 Telecommunications

Telecommunication utilities are not available within the study area. As such, the cellular network would be used during construction. During operations connection to telecommunications would be via optical fibre with cellular backup.

### 1.1.15 Sewer

Estimated quantities of sewerage would be approximately 220 litres per day per person, which equates to 88,000 litres per day for the peak workforce of 400 workers.

ACEN have undertaken additional consultation with providers of similar workforce accommodation facilities in the area and the revised estimate of 88,000 litres per day is expected to be reasonable.

ACEN are currently working with providers of workforce accommodation facilities and options for the treatment and disposal of sewage associated with the workforce accommodation area are currently being investigated further and would include onsite treatment and ‘treat and suck’ for disposal offsite.

ACEN will continue to consult with Warrumbungle Shire Council as the proposed potential workforce accommodation area is developed further regarding options for the disposal of sewage waste within the LGA.

## 1.13 Environmental management

A description of the proposed environmental management framework that will be implemented for the project is provided in **Chapter 19** of the EIS and a consolidated summary of the management

measures identified within this EIS is also provided. Some of these management measures will be detailed further prior to commencement of construction and/or operation.


Valley of the Winds
Renewable Energy from ACEN
Appendix 2
Updated statutory compliance table
RAMBOLL
ACEN Australia

## STATUTORY COMPLIANCE TABLE

The key statutory considerations for the project under the EP&A Act and other relevant NSW and Commonwealth legislation are outlined in **Table 8-1**. **Table 8-1** also indicates where relevant statutory requirements for the amended project have been addressed either in the amendment report or the associated EIS.

**Table 8-1: Statutory compliance table**

| Matter | Compliance | Where addressed |
|---|---|---|
| **Power to grant consent** | The project meets the threshold for State Significant Development and is subject to assessment under Part 4 of the EP&A Act. Approval for the project would be sought under Part 4, Division 4.7 of the EP&A Act.<br>Under Section 4.36(2) of the EP&A Act, a State Environmental Planning Policy (SEPP) may declare any development, or any class or description of development, to be SSD. Under the provisions of Clause 2.6(1) of the Planning Systems SEPP, a development is classified as SSD if:<br>*(a) the development on the land concerned is, by the operation of an environmental planning instrument, not permissible without development consent under Part 4 of the Act, and*<br>*(b) the development is specified in Schedule 1 or 2.*<br>Schedule 1, Clause 20 of the Planning Systems SEPP determines 'electricity generating works' to be SSD if it meets the following criteria:<br>*Development for the purpose of electricity generating works or heat or their co-generation (using any energy source, including gas, coal, biofuel, distillate, waste, hydro, wave, solar or wind power) that:*<br>*(a) has a capital investment value of more than $30 million.*<br>The project is a development for the purpose of electricity generation and exceeds the threshold for SSD with a capital investment value of more than $30 million.<br>Following receipt of this amendment report and the response to submissions report, DPE will prepare its assessment report considering the EIS, this amendment report, all submissions received during the exhibition process, and the responses provided by ACEN via the response to submissions report.<br><br>Under Section 4.38 of the EP&A Act, the NSW Minister for Planning is the consent authority for SSD. However, pursuant to Section 2.4 of the EP&A Act, the Minister may delegate the consent authority | **The EIS** |

| Matter | Compliance | Where addressed |
|---|---|---|
| | function to the Office of the Independent Planning Commission (OIPC), the Secretary or to any other public authority. Additionally, in accordance with the Wind Guideline the OIPC is the consent authority for SSD in the following circumstances:<br>• 25 or more people have objected to the application<br>• the local council has objected to the application<br>• the applicant has disclosed a reportable political donation in connection with the application or a previous related application.<br><br>As the EIS for the project received greater than 50 unique public objections and was not supported by Warrumbungle Shire Council in its current form, the Independent Planning Commission is the consent authority for the application and will make a determination on the project. | |
| **Permissibility** | The permissibility of wind farm developments in NSW is determined by the Transport and Infrastructure SEPP.<br>Clause 2.36(1) of the Transport and Infrastructure SEPP provides that development for the purpose of electricity generating works may be carried out by any person with consent on any land in a prescribed rural, industrial or special use zone (including RU1 Primary Production zone).<br>The project site is on land zoned RU1 – Primary Production under the Warrumbungle LEP and is permitted with consent through the provisions of Transport and Infrastructure SEPP.<br>Under Clause 2.7(1) of the Transport and Infrastructure SEPP, the provisions of the SEPP prevail where there are inconsistencies with other environmental planning instruments, including local environmental plans. | **Appendix C of the EIS** |
| **Other approvals** | **Approvals not required for SSD**<br>Clause 4.41 of the EP&A Act clarifies that development consent for SSD includes authorisations under the following statutory provisions, meaning that separate planning approval processes do not apply for:<br>• a permit under section 201, 205 or 219 of the *Fisheries Management Act 1994* (FM Act)<br>• an approval under Part 4, or an excavation permit under section 139, of the *Heritage Act 1977* | **The EIS** |

| Matter | Compliance | Where addressed |
|---|---|---|
| | • an Aboriginal Heritage Impact Permit (AHIP) under section 90 of the *National Parks and Wildlife Act 1974*<br>• a bushfire safety authority under section 100B of the *Rural Fires Act 1997*<br>• a water use approval under section 89, a water management work approval under section 90 or an activity approval (other than an aquifer interference approval) under section 91 of the *Water Management Act 2000.* | |
| | **EPBC Act Approval**<br>Under the EPBC Act, a referral is required to be submitted to the Department of Agriculture, Water and the Environment for any 'action' that is considered likely to have a significant impact on any Matters of National Environmental Significance (MNES) and Commonwealth land.<br><br>A referral under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) was submitted to the Australian Department of Agriculture, Water and the Environment in June 2020 (EPBC 2020/8668). The referral was required because the project is considered likely to have a significant impact on Matters of National Environmental Significance (MNES) due to potential impacts to listed threatened species and ecological communities, and migratory species. Each species has been considered throughout the development of this project.<br><br>On 13 July 2020, a delegate of the Federal Minister for the Department of Agriculture, Water and the Environment declared that the project was a controlled action under section 75 of the EPBC Act.<br><br>The proposed action is being assessed in accordance with the bilateral assessment agreement Amending Agreement No. 1. | **Section 6.3 and Appendix 6** |

| Matter | Compliance | Where addressed |
|---|---|---|
| | **Environmental protection licence**<br>Under Section 48 of the *Protection of Environment Operations Act 1997* (POEO Act), an Environment Protection Licence (EPL) from the NSW Environmental Protection Authority (EPA) is required for scheduled activities listed in Schedule 1.<br>Schedule 1, Clause 17 of the POEO Act lists includes "electricity works (wind farms)". The project requires and EPL.<br>The project may also require an EPL during the construction phase for crushing, grinding or separating concrete if the activity has the capacity to process more than 150 tonnes of materials per day or 30,000 tonnes of materials per year.<br>Part 5.7 of the POEO Act provides a duty to notify the relevant authority of pollution incidents, and under section 120 it is an offence to pollute waters.<br>The project will be managed to ensure pollution risks are avoided or minimised. In the event of a pollution incident that causes or threatens material harm to the environment, the NSW EPA would be notified.<br>It is an offence under section 143, to unlawfully transport and dispose of waste. | **Chapter 14 of the EIS** |
| | **Road approvals**<br>An approval is required under Section 138 of the *Roads Act 1993* to permit the erection of a structure or carry out a work in, on or over a public road.<br>Section 138 approval would be needed for approval of physical works on public roads. | **Section 6.4**Error! Reference source not found. **and Appendix 7 and Chapter 9 and Appendix H of the EIS** |
| | **Biodiversity Offsets Scheme**<br>Entry into the Biodiversity Offset Scheme (BOS) is automatically triggered for SSD projects.<br><br>A BDAR has been undertaken in accordance with the Biodiversity Assessment Methodology (BAM). The project has been located to avoid and minimises impacts to biodiversity values. | **Section 6.3 and Appendix 6** |

| Matter | Compliance | Where addressed |
|---|---|---|
| | **Water access licences**<br>The NSW *Water Management Act 2000* (WM Act) regulates the use and interference of surface and groundwater in NSW where a water sharing plan has been implemented.<br><br>A water use approval under Section 89 of the WM Act, a water management work approval under section 90, or a controlled activity approval (other than an aquifer interference approval) under section 91 of the WM Act, are not required for SSD by virtue of Section 4.41 of the EP&A Act. | **Chapter 13 of the EIS** |
| | **Native title**<br>Under the *Native Title Act 1993* (Native Title Act), native title claimants can make an application to the Federal Court to have their native title recognised by Australian law. The study area includes land currently subject to Native Title Claim by the Gomeroi People (Tribunal File No. NC2011/006, Federal Court No. NSD2308/2011).<br><br>Concurrence with the NSW Aboriginal Land Council (NSWALC) would be required for the project. Additionally, a tenure will be required to authorise any use of and/or access to these lots, which may be subject to Native Title. This will need to occur prior to the commencement of any works. | **Appendix 3 and Section 17.1 of the EIS** |
| | **Crown land**<br>Under the *Crown Land Management Act 2016*, consent from the Land Division, Department of Primary Industries (DPI) is required for works over Crown Land.<br>The project includes multiple landholdings associated with Crown Land including existing Crown Enclosure Permits, Crown Licences, Crown leases and Crown reserves. | **Appendix 3 and Section 17.1 of the EIS** |
| | **Lease of premises and subdivision**<br>The project would require a lease from the owners of the affected land. Lease of a wind farm site is treated as a lease of premises regardless of whether the lease would be for more or less than 25 years. Subdivision consent is not required under Section 23G of the *Conveyancing Act 1919*. However, Section 23G of the Conveyancing Act 1919 may apply if subdivision for the purpose of construction, operation and maintenance of a substation is required. | **Section 17.1 of the EIS** |

| Matter | Compliance | Where addressed |
|---|---|---|
| | **Dangerous Goods**<br>Dangerous goods transportation licences would be required under the *Dangerous Goods (Road and Rail Transport Act) 2008* for vehicles and drivers if more than 500 litres or 500 kilograms of dangerous goods are required to be delivered to the wind farm site.<br><br>Controls for transport and use of dangerous goods would be included in the CEMP. | **Appendix 3** |
| | **Heavy vehicle law**<br>Relevant permits under the Heavy Vehicle National Law (NSW) for the use of OSOM vehicles will be sought by the construction contractor. | **Section 6.4 and Appendix 7** |
| | **Civil Aviation Regulations 1988**<br>The EIS was referred to the Civil Aviation Safety Authority (CASA) to assess potential impacts of the project and to address the lowest safe altitude (LSALT) impact of air route W627 which will need to be raised.<br>Approval would be required to address the LSALT. An application will be made to amend air route W627. | **Chapter 10 of the EIS** |
| **Pre-conditions to exercising the power to grant consent** | No pre-conditions to exercising the power to grant approval have been identified for the project. | |
| **Mandatory matters for consideration** | **Environmental Planning and Assessment Act 1979**<br>The project is consistent with the Section 1.3 objectives of the EP&A Act, which are:<br>*a) to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources,*<br>*b) to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment,*<br>*c) to promote the orderly and economic use and development of land,*<br>*d) to promote the delivery and maintenance of affordable housing,*<br>*e) to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats,* | **The EIS, the Response to Submission Report and this Amendment Report** |

| Matter | Compliance | Where addressed |
|---|---|---|
| | *f) to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage),*<br>*g) to promote good design and amenity of the built environment,*<br>*h) to promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants,*<br>*i) to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State,*<br>*j) to provide increased opportunity for community participation in environmental planning and assessment.*<br>Section 4.15 of the EP&A Act describes the matters for consideration in assessing SSD, which includes the provisions of relevant environmental planning instruments, proposed instruments that have been the subject of public consultation, development control plans, planning agreements and statutory regulations. The assessment of SSD must also consider the likely impacts of the development, suitability of the wind farm site, any submissions received, and the public interest. | |
| | **Biodiversity Conservation Act 2016**<br>The Minister for Planning and Homes is required to take into account the impact of the development on biodiversity values as assessed in the BDAR. The Minister may (but is not required to) further consider under the Act the likely impact of the proposed development on biodiversity values.<br>The NSW *Biodiversity Conservation Act 2016* (BC Act) establishes the regulatory framework for assessing and offsetting biodiversity impacts for proposed developments.<br>A total of 6,352 ecosystem credits and 3,126 species credits are required to offset the above impacts of the project. This has been reduced through by the amendments to the project. | **Section 6.3 and Appendix 6** |
| | **National Parks and Wildfire Act 1974**<br>Governance, care, control and management of national parks, nature reserves, Aboriginal areas and historic sites are detailed under the *National Parks and Wildlife Act 1974* (NPW Act). The objectives of the NPW Act include the conservation of nature, objects, places or features such as habitats, biological diversity, landforms and places of Aboriginal, social or historical value. These objectives | **Section 6.6 and Appendix 9** |

| Matter | Compliance | Where addressed |
|---|---|---|
| | are achieved by applying principles of ecologically sustainable development.<br>An ACHAR has been prepared and found that three Aboriginal cultural sites may be directly impacted by the project. | |
| | **Heritage Act 1977**<br>The *Heritage Act 1977* (Heritage Act) provides for the conservation of environmental heritage items in NSW. It is used to regulate the impacts of development on the State's European and Aboriginal heritage assets. Administered by the NSW Heritage Office, the Heritage Act details the statutory requirements for protecting historic buildings and places and includes any place, building, work, relic, movable object or precinct, which may be of historic, scientific, cultural, social, archaeological, natural or aesthetic value.<br>The site is not listed on the State Heritage Register (SHR), nor is it in the immediate vicinity of any SHR items.<br>Approvals under Part 4 or an excavation permit under section 139 of the Heritage Act are not required for SSD by virtue of Section 4.41 of the EP&A Act. | **Chapter 12 of the EIS** |
| | **Fisheries Management Act 1994**<br>The FM Act is in place to conserve fish stocks, habitats and threatened species, populations and communities, to preserve fishery resources for future generations. The FM Act requires consideration of proposed construction and operation of the project which may affect fish passage or cause adverse impact to threatened fish species.<br>Direct impacts to aquatic habitats is associated primarily with the transmission line crossings of the Coolaburragundy Creek and Talbragar River which have been assessed as both of these waterways are identified as Key Fish Habitat (KFH). Given the degraded nature of the aquatic habitat present and mitigation measures proposed for the project, the direct impacts to aquatic habitat are unlikely to be significant. | **Section 6.3 and Appendix 6** |
| | **Rural Fires Act 1997**<br>The *Rural Fires Act 1997* aims to prevent, mitigate and supress bush and other fires whilst protecting people, property and infrastructure from damage and having regard to the principles of ecological sustainable development. Bushfires are a known hazard with most of the project located in Vegetation 1 and 2 category bushfire prone land. | **Chapter 10 and Appendix L of the EIS** |

| Matter | Compliance | Where addressed |
|---|---|---|
| | **Contaminated Land Management Act 1997**<br>The *Contaminated Land Management Act 1997* establishes a process for investigating and where appropriate, remediating land that the EPA considers to be contaminated significantly enough to require regulation under Division 2 of Part 3. Under Section 60, a person whose activities have contaminated land or a landowner whose land has been contaminated is required to notify the EPA when they become aware of the contamination.<br>The project does not contain land listed on the Contaminated Lands Register. | **Chapter 13 of the EIS** |
| | **Soil Conservation Act 1938**<br>The *Soil Conservation Act 1938* allows for conservation of soil resources and erosion management. Notices can be issued under Section 15A to control erosion or degradation. The construction of the project would follow best practice methods and a CEMP will be in place to guide soil management during construction to minimise sedimentation of downstream waterways. | **Chapter 13 of the EIS** |
| | **State Environmental Planning Policy (Resilience and Hazards) 2021**<br>Part 3 of Chapter 3, 'Hazardous and Offensive Development', applies to any development which falls under the policy's definition of 'potentially hazardous industry' or 'potentially offensive industry'.<br>As the project would include a BESS facility A PHA has been prepared. The PHA shows the materials and chemicals used in the BESS infrastructure do not exceed the threshold for the preliminary risk screening, and therefore the BESS infrastructure would not be a potentially hazardous development. | **Section 6.5 and Appendix 7** |
| | **State Environmental Planning Policy (Biodiversity and Conservation) 2021**<br>The *State Environmental Planning Policy (Biodiversity and Conservation) 2021* (Biodiversity and Conservation SEPP) consolidates *State Environmental Planning Policy (Koala Habitat Protection) 2020* and *State Environmental Planning Policy (Koala Habitat Protection) 2021*. Warrumbungle Shire LGA is listed under Schedule 1 of *State Environmental Planning Policy (Koala Habitat Protection) 2020* as areas to which the SEPP applies. | **Section 6.3 and Appendix 6** |

| Matter | Compliance | Where addressed |
|---|---|---|
| | **Warrumbungle Shire Local Environmental Plan 2013**<br>The relevant provisions of the Warrumbungle Shire LEP for consideration include:<br>• Clause 2.3 – Zone objectives and land use table<br>• Clause 4.1 – Minimum subdivision lot size<br>• Clause 5.10 – Heritage conservation<br>• Clause 6.3 – Terrestrial biodiversity<br>• Clause 6.4 – Groundwater vulnerability<br>• Clause 6.5 – Riparian lands and watercourses. | **Section 4.5** |