



Burrendong Wind Farm - Scoping Report

Burrendong Wind Farm Pty Ltd

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Abbreviations

Abbreviation	Description
ABS	Australian Bureau of Statistics
ACHA	Aboriginal Cultural Heritage Assessment
AEMO	Australian Energy Market Operator
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
ALC	Aboriginal Land Council
APZ	Asset Protection Zone
AsA	Airservices Australia
ASS	Acid Sulphate Soils
BAM	Biodiversity Assessment Methodology
BBAMP	Bird and Bat Adaptive Management Plan
BC Act	<i>Biodiversity Conservation Act 2016</i>
BCD	Biodiversity Conservation Division
BDAR	Biodiversity Development Assessment Report
Biosecurity Act	<i>Biosecurity Act 2015</i>
BoM	Bureau of Meteorology
BVT	Biometric Vegetation Types
CASA	Civil Aviation Safety Authority
CCC	Community Consultation Committee
CEEC	Critically Endangered Ecological Community
CEMP	Construction Environmental Management Plan
CO ₂ -e	Carbon dioxide equivalent
CRN	Country Rail Network
DAWE	Commonwealth Department of Agriculture, Water and Environment
DCP	Development Control Plan
DEM	Digital Elevation Model
DoD	Department of Defence
DoEE	Department of the Environment and Energy
DPIE	Department of Planning, Industry and Environment (now Department of Planning and Environment)
DPE	Department of Planning and Environment
EDM	Electronic Distance Measuring
EEC	Endangered Ecological Community
EII Act	<i>Electricity Infrastructure Investment Act 2020</i>

Abbreviation	Description
EIS	Environmental Impact Statement
ELA	Eco Logical Australia
EPA	Environment Protection Authority
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EP&A Act	<i>Environmental Planning & Assessment Act 1979</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2021</i>
EPIs	Environmental Planning Instruments
EPL	Environment Protection Licence
Epuron	Epuron Projects Pty Ltd
FM Act	<i>Fisheries Management Act 1994</i>
FTE	Full-time equivalent
GDE	Groundwater Dependent Ecosystems
GIS	Geographic Information System
Heritage Act	<i>Heritage Act 1977</i>
IEA	International Energy Agency
IPC	Independent Planning Commission
IPCC	Intergovernmental Panel on Climate Change
IRENA	International Renewable Energy Agency
LCU	Landscape Character Unit
LEP	Local Environmental Plan
LGAs	Local Government Areas
LLS	Local Land Services
LSPS	Local Strategic Planning Statement
LUCRA	Land Use Conflict Risk Assessment
MEG	Mining, Exploration and Geoscience
Mining Act	<i>Mining Act 1992</i>
MNES	Matters of National Environmental Significance
MW	megawatts
NDC	Nationally Determined Contribution
NEM	National Electricity Market
NPfi	<i>Noise Policy for Industry (EPA 2017)</i>
NVIA	Noise and Vibration Impact Assessment
Noise Bulletin	<i>Wind Energy: Noise Assessment Bulletin (DPE 2016c)</i>
NPW Act	<i>National Parks and Wildlife Act 1974</i>
NSW	New South Wales

Abbreviation	Description
O & M	Operation and Maintenance Facility
OEMP	Operational Environmental Management Plan
OSOM	Over Size, Over Mass
OWID	Our World in Data
PAF	Potentially acid forming
PBP	<i>Planning for Bush Fire Protection 2019</i>
PCT	Plant Community Types
PVIA	Preliminary Visual Impact Assessment
Planning System SEPP	<i>Planning System State Environmental Impact Statement (DPE 2021)</i>
PNIA	Preliminary Noise Impact Assessment
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
PoN	Port of Newcastle
Project	Burrendong Wind Farm
Proponent	Burrendong Wind Farm Pty Ltd
RE Act	<i>Renewable Energy Act 2000</i>
RET	Renewable Energy Target
REZ	Renewable Energy Zones
RF Act	<i>Rural Fires Act 1997</i>
RFS	NSW Rural Fire Service
Roads Act	<i>Roads Act 1993</i>
SDG	Sustainable Development Goal
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SIA	Social Impact Assessment
SHR	State Heritage Register
SoHI	Statement of Heritage Impact
SSD	State Significant Development
TEC	Threatened Ecological Communities
TfNSW	Transport for NSW
TMP	Traffic Management Plan
Transport and Infrastructure SEPP	<i>State Environmental Planning Policy (Transport and Infrastructure) 2021</i>
TTIA	Traffic and Transport Impact Assessment
UGLRL	UGL Regional Linx
UNEP	United Nations Environment Programme

Abbreviation	Description
UNFCCC	United Nations Framework Convention on Climate Change
VIS	Vegetation Information System
Visual Bulletin	<i>Wind Energy: Visual Assessment Bulletin (DPE 2016b)</i>
WARR Act	<i>Waste Avoidance and Resource Recovery Act 2001</i>
Wind Guideline	<i>Wind Energy Guideline (DPE 2016a)</i>
WM Act	<i>Water Management Act 2000</i>
WTG	Wind Turbine Generators
ZVI	Zone of Visual Influence

1. Introduction

1.1. Background

The Burrendong Wind Farm (herein referred to as the 'Project'), will involve the construction, operation and decommissioning of up to 105 Wind Turbine Generators (WTGs) and associated ancillary infrastructure, with a total capacity around 650 MW. The Project Site is located approximately 30 km southeast of Wellington and to the east of Lake Burrendong (Figure 1-1) and is situated within two (2) Local Government Areas (LGAs), being:

- Dubbo Regional Council
- Mid-Western Regional Council.

The Project Site is currently primarily used for agriculture, including farming and grazing operations, and lies within the Lake Burrendong Catchment.

A preliminary Project Site layout comprising of up to 105 WTGs is provided in Figure 1-2 however, this will be further refined in response to identified environmental constraints and ongoing stakeholder consultation.

The Project will assist in the delivery of cheaper, cleaner, and more reliable electricity and assist New South Wales (NSW) in meeting the Energy Security Target established by the NSW Electricity Strategy (2019) and enacted in the *Electricity Infrastructure Investment Act 2020* (EII Act). The Project will have the potential to assist in delivering network benefits and renewable energy services to the recently declared Central West Orana Renewable Energy Zone (REZ), which aims to create targeted areas of combined renewable energy generators and is prioritised by the NSW Electricity infrastructure Roadmap (November 2020).

The capital value of the Project is valued at over \$600 million. The Project is therefore considered State Significant Development (SSD) under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and the *State Environmental Planning Policy (Planning Systems 2021)* (Planning Systems SEPP). The value of the Project will be refined over the assessment and design process.

Matters of National Environmental Significance (MNES) have been identified as potentially occurring within the Project Site. Accordingly, to satisfy the requirements of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), and given the likely impacts upon MNES, an EPBC referral has been prepared and submitted to the Commonwealth Department of Agriculture, Water, and the Environment (DAWE). It is anticipated that potential impacts to MNES will be assessed in accordance with the NSW Assessment Bilateral Agreement therefore, allowing the NSW Department of Planning and the Environment (DPE) to manage the assessment of the Project on behalf of the Commonwealth, including the issuing of the assessment requirements for the Environmental Impact Statement (EIS).

A Scoping Report for the Project was submitted to the Department of Planning, Industry and Environment (DPIE) in September 2020 and Secretary's Environmental Assessment Requirements (SEARs) for the Project were issued in October 2020. Throughout the technical studies and preparation

of the EIS to satisfy the SEARs, the Project development footprint corridor has been refined in certain areas to consider environmental constraints identified through the technical studies, however, has also increased in other areas to incorporate additional land owned by Water NSW. These changes, including the incorporation of additional land owned by Water NSW has resulted in an increase in the Project Site, increase in the number of WTGs and an increase in the supply capacity of the Project. A summary of the Project changes include:

- Project Site – the Project Site has increased from the Scoping Report (ELA 2020) to include the transmission line corridor, associated impacts along roads requiring improvement works for access, and expansion of the Project onto Water NSW land. The Project Site covers approximately 1,043 ha
- WTGs – 69 WTGs within the Scoping Report (ELA 2020) and has been revised up to 105 WTGs
- Supply capacity – 400 MW within the Scoping Report (ELA 2020) and has been revised to around 650 MW.

This revised Scoping Report has been prepared by Eco Logical Australia (ELA) on behalf of Burrendong Wind Farm Pty Ltd, the Proponent of the Project. It has been prepared in accordance with the *State Significant Development Guidelines – Preparing a Scoping Report (Appendix A)* (Department of Planning, Industry and Environment (DPIE) 2021a). The purpose of this Scoping Report is to request and inform the content of revised SEARs for the preparation of the EIS for the Project.

1.2. Project Overview

The Project comprises of a wind farm with up to 105 WTGs generating 650 MW of electricity to the national grid. It is located southeast of Wellington on predominately private land, as well as land owned by Water NSW. The main components of the Project include:

- **WTGs:** Up to 105 wind turbine generators, each with:
 - a capacity between 4 – 7 MW
 - a three-bladed rotor and nacelle mounted onto a tubular steel tower and concrete foundation
 - a crane hardstand and laydown area for assembly of the wind turbine generator
 - a wind turbine generator transformer located either in the nacelle or adjacent to the wind turbine generator
- **Road Upgrades:** Upgrades to the existing public road network to provide access to the project site and enable safe delivery of the oversize/overmass components from the Port of Newcastle
- **Access Tracks:** New access tracks within the Project Site providing access to the WTG locations and other infrastructure
- **Electrical infrastructure:** Medium voltage (usually 33 kV) electrical connections between the wind turbine generators and the collector substations, which will include a combination of underground cabling and overhead powerlines
- **Up to two wind farm collector substations:** The substations will include power transformers, switchgear, protection, communication, and ancillary facilities.

- A high voltage (330 kV) power line to connect the collector substations to a connection switchyard
- A connection switchyard to connect the wind farm powerline to the existing TransGrid 330 kV transmission network
- **Operation and Maintenance (O&M) Facility:** A permanent O&M facility.
- **Construction Facilities:** Various construction facilities including temporary concrete batching plants, rock crushing equipment, material stockpiles, temporary laydown facilities, and construction compounds
- **Wind Monitoring:** Two temporary wind monitoring masts (110 m tall) and the installation of up to four permanent wind monitoring masts (hub height) for wind speed verification, weather, and general monitoring purposes
- **Other Ancillary Infrastructure:** Minor works including fencing, gates, drainage structures, erosion & sediment control measures, rehabilitation works, boundary adjustments and land subdivision.

1.3. Proponent

The Proponent for the Project is Burrendong Wind Farm Pty Ltd. The ultimate holding company for the Proponent is Ark Energy Corporation Pty Ltd (Ark Energy), an Australian renewable energy company. Ark Energy, through its acquisition of Epuron in May 2022, is one of the most experienced wind energy development companies in NSW, as well as a significant developer of solar projects across Australia.

Ark Energy is a leader in its field, with 573 MW of wind turbines in operation or construction resulting from its development work, significantly more in NSW than any other developer. Ark Energy owns and operates more off-grid utility-scale solar power stations than any other Australian company. Further details can be found at our website at www.epuron.com.au and www.arkenergy.com.au.

Table 1-1: Proponent details

Document	Details
Proponent Name	Burrendong Wind Farm Pty Ltd
Postal Address	Level 2, 275 George St, Sydney NSW 2000
ABN	49 657 154 633
Project Contact	Andrew Wilson
Email	info@burrendongwindfarm.com.au

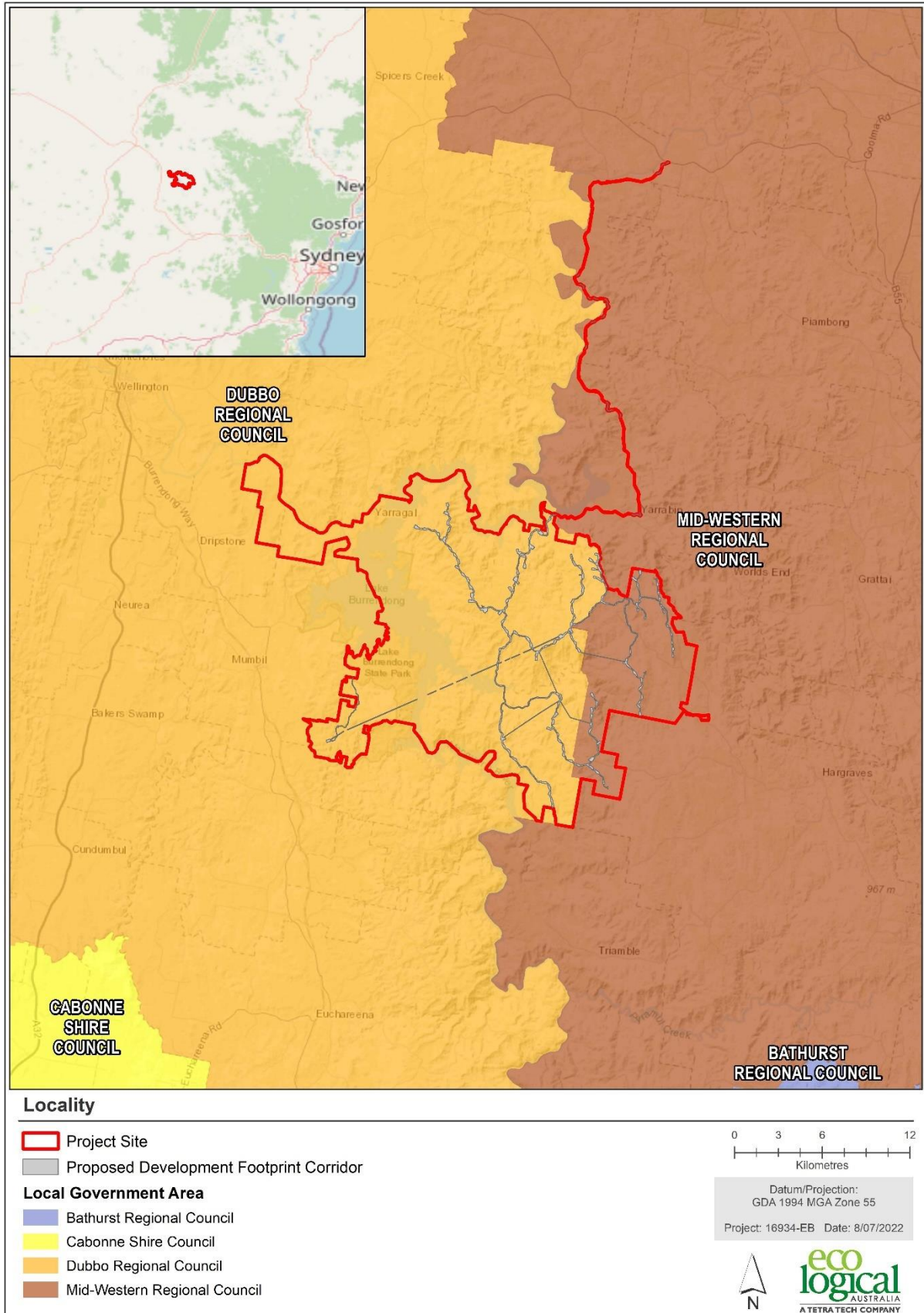


Figure 1-1: Regional context

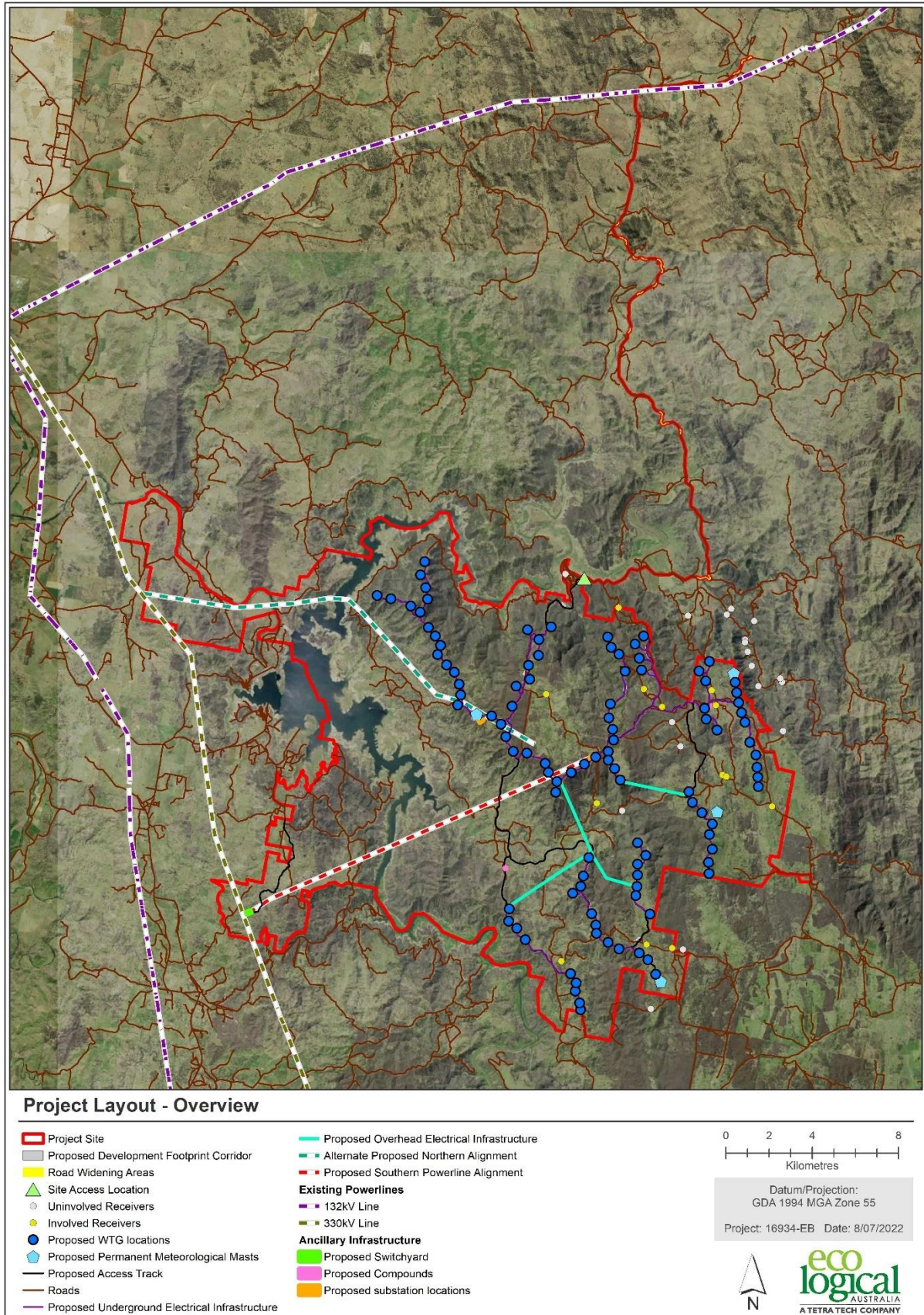


Figure 1-2: Preliminary Project layout

1.4. Document Purpose

This Scoping Report has been prepared by ELA to support an application to the Secretary of DPE for revised SEARs to guide the preparation of the EIS for the Project under Part 4 of the EP&A Act.

This Scoping Report has been prepared in accordance with the *State Significant Development Guidelines – Preparing a Scoping Report (Appendix A)* (DPIE 2021a), *Undertaking Engagement Guidelines for State Significant Projects* (DPIE 2021b) and the *Social Impact Assessment Guideline for State Significant Projects* (DPIE 2021c). Table 1-2 indicates where each requirement is addressed. Additionally, this Scoping Report has been prepared in consideration of the ‘NSW Wind Energy Framework’ which comprises:

- ‘Wind Energy Guideline’ (Wind Guideline) (DPE 2016a)
- ‘Wind Energy: Visual Assessment Bulletin’ (Visual Bulletin) (DPE 2016b)
- ‘Wind Energy: Noise Assessment Bulletin’ (Noise Bulletin) (DPE 2016c)
- ‘Standard SEARs’
- ‘Wind Energy Framework Q&As.’

Table 1-2: Summary of guideline requirements

Item	Section
State Significant Development Guidelines – Preparing a Scoping Report	
Describe the project in simple terms	Section 3
Include an analysis of feasible alternatives considered having regard to the objectives of the development, and identify the alternatives that will be investigated further in the EIS	Section 2.5
Give an early indication of community views on the project and identify what engagement will be carried out during the preparation of the EIS	Section 5
Identify the key matters requiring further assessment in the EIS and the proposed approach to assessing each of these matters having regard to any relevant Government legislation, plans, policies, or guidelines.	Section 6
Undertaking Engagement Guidelines for State Significant Projects	
<p>The Proponent must:</p> <ul style="list-style-type: none"> • Identify an early engagement that has been carried out that is relevant to the Project (i.e., engagement undertaken as part of a prior planning process) • Identify the key stakeholders for further engagement (i.e., individuals, special interest groups, councils, and government agencies with an interest in or likely to be affected by the project) • Plan how they intend to engage with the community, council, and government agencies, so that the engagement is proportionate to the scale and nature of the project and the likely level of community interest in the project <p>The community is able to:</p> <ul style="list-style-type: none"> • Take up any early engagement opportunities to understand the project • Provide feedback to the proponent about aspects of the project which they support, do not support, or wish to be adjusted • Provide clear reasons for any concerns to enable the proponent to consider possible alternative approaches to address the issues • Alert the proponent to any matters they feel have not been considered. 	Section 5 Section 6
Social Impact Assessment Guidelines (SIA) for State Significant Projects	
Gain an initial understanding of the project’s social locality	Section 6

Item	Section
Gain an initial understanding of the characteristics of the communities within the project's social locality	Section 6
Conduct an initial evaluation of the likely social impacts for different groups in the social locality and the level to which these impacts need to be assessed	Section 6
Consider potential refinements or approaches in response to likely social impacts	Section 6
Consider the remainder of the SIA tasks, including engagement	Section 6

This Scoping Report will use the following terminology:

- The Project – this is in reference to the proposed development, including the proposed WTGs and all associated ancillary infrastructure, as described in Section 3
- The Project Site – this includes the site areas for the WTGs, and all ancillary infrastructure (Figure 1-2)
- Involved Landholder – a landholder that is involved in the Project
- Non-Involved Landholder – a landholder that is not involved in the Project.

2. Strategic Context

2.1. Project Viability

Ark Energy has been developing wind energy projects in NSW for the past 15 years and over that period has developed considerable experience in site identification and selection. There are several key areas of consideration when selecting a site for development, including:

- **Wind Resource:** To confirm the viability of wind projects, Ark Energy has established a vast network of wind monitoring masts across NSW, which have confirmed that wind speeds at the Project Site are sufficient for a viable wind farm
- **Environmental Impacts:** The properties selected for involvement in the Project are generally used for agricultural purposes. Ridgelines where turbines are proposed are mostly cleared of vegetation
- **Access to Local Electricity Network:** The Project Site is located directly east of connection points to the electricity network which have sufficient capacity to export the design output from the Project
- **Local Communities:** The relatively low population density of the surrounding area will assist in reducing any residual noise or visual impacts from the Project
- **Proximity to resources:** During the construction phase it will be necessary to source water and materials for the construction of roads and turbine foundations. In the local area there are a number of active quarries and water sources that will be able to accommodate the requirements for construction of a project of this size
- **Economic impact:** The local population centres of Wellington and Mudgee are well established to cater for an increase in workforce having serviced the mining and energy industry.

2.2. Strategic Need for the Project

2.2.1. Greenhouse Gas Emissions and Climate Change

2.2.1.1. *The Energy Sector and Greenhouse Gas Emissions*

Climate change is increasingly affecting the way in which we live, with more frequent and severe weather events impacting our health, our agricultural systems, our communities, our economy and our natural ecosystems and wildlife (Climate Council 2020). The scientific consensus, along with global recognition, is that human activities are key drivers of climate change and global warming, requiring the urgent need to mitigate and alter the deleterious environmental impacts associated with fossil fuel energy generation.

The global and Australian energy sector has historically been dominated by fossil fuel generation, namely coal. This reliance on fossil fuel energy generation has been the primary driver of high carbon dioxide equivalent emissions (CO₂e) and has led to the energy sector contributing to two thirds of greenhouse gas emissions (Figure 2-1), demonstrating the need to transform the sector through a shift towards renewable energy and energy efficiency to slow the effects of climate change (International Renewable Energy Agency (IRENA) 2021). In the Australian context, the electricity sector contributed 33.2% of greenhouse gas emissions as of March 2021 (Australian Government Department of Industry, Science, Energy and Resources 2021) (Figure 2-2).

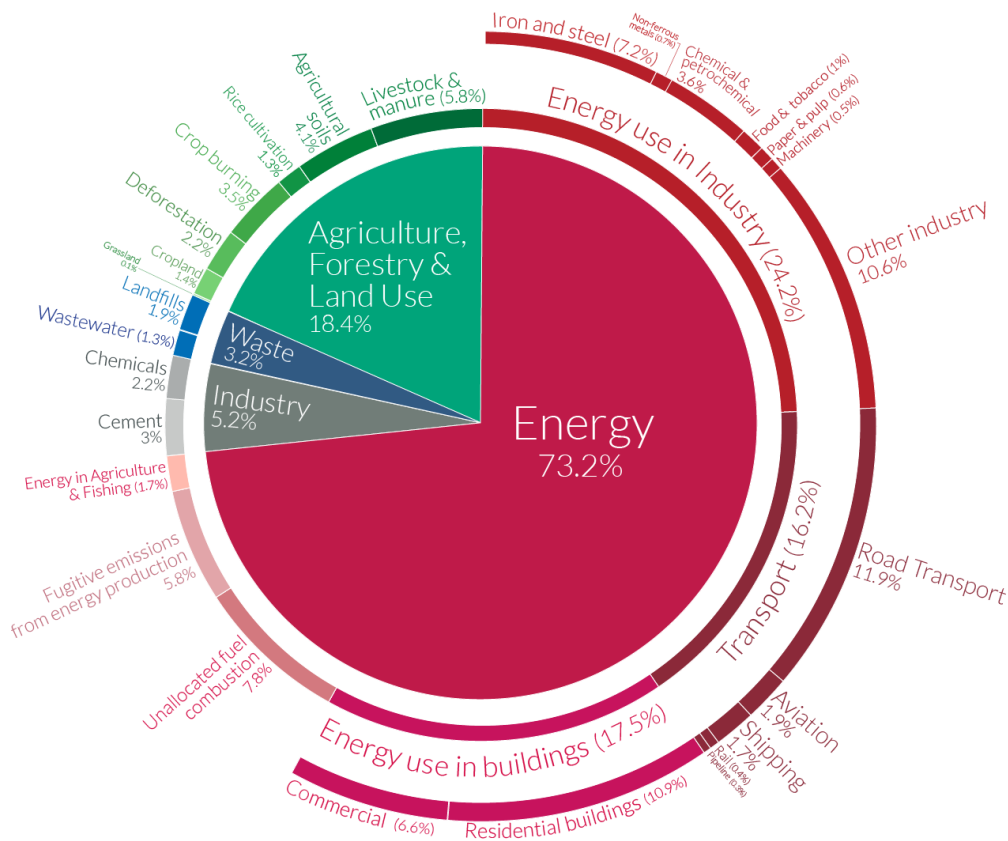


Figure 2-1: Global carbon dioxide emissions by sector / source in 2016 (Our World in Data (OWD) 2020)

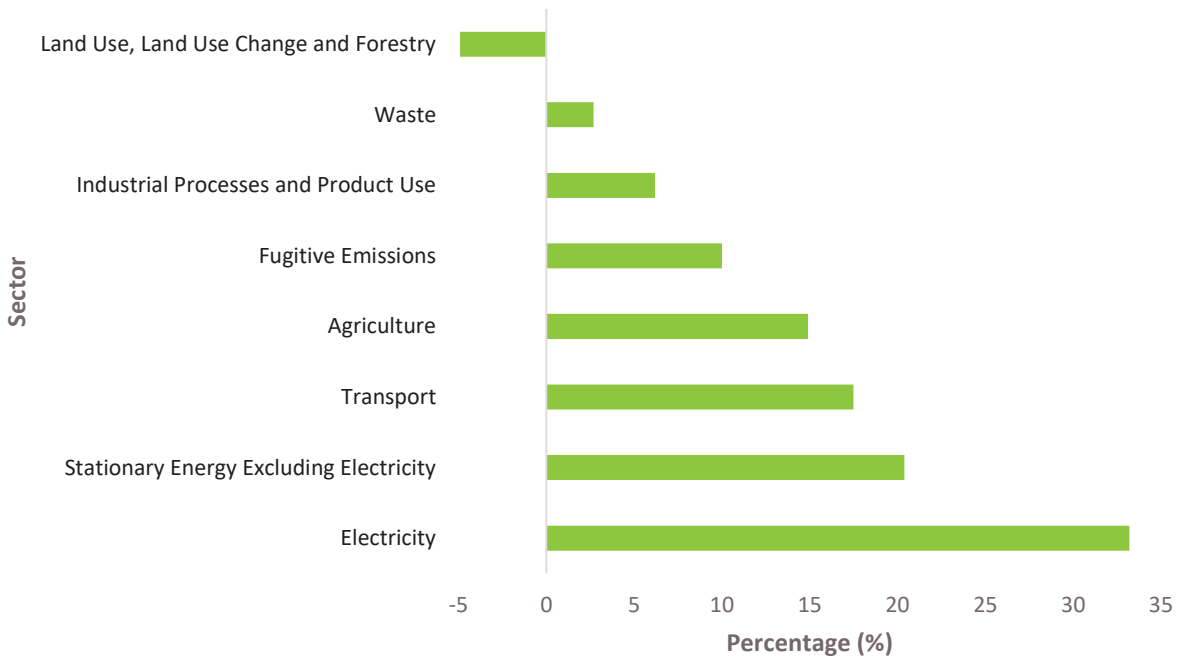


Figure 2-2: Greenhouse gas emissions in Australia by sector – March 2021 (Australian Government Department of Industry, Science, Energy and Resources 2021)

2.2.1.2. Global Climate Change Agreements and Policies

The impacts and future effects of anthropogenic climate change are well documented and globally recognised, with national and international commitments and agreements designed to limit human induced impacts being increasingly implemented. There is international consensus for the reduction of carbon usage and greenhouse gas emissions across the globe, reinforced by the Intergovernmental Panel on Climate Change (IPCC) with pathways implemented by the United Nations Framework Convention on Climate Change (UNFCCC) (referred to as the Paris Agreement and ratified by Australia in 2016).

The Paris Agreement set out global commitments to address climate change and attempt to limit global warming to well below 2°C, and ideally to 1.5°C compared to pre-industrial levels (UNFCCC 2021). The Australian Government ratified the Paris Agreement in November 2016, committing to an unconditional Nationally Determined Contribution (NDC) to reduce emissions by 26-28% below 2005 levels by 2030. Following the COP26 Glasgow Climate Summit in 2021, Australia did not commit to updating the previously decided NDC to reflect increasing pressure to phase-out coal and other goals presented at the conference. Under current policy, Australia is not on track to achieve its 2030 NDC target, with emissions levels projected to be well above the target by 2030 due to lack of climate policy (United Nations Environment Programme (UNEP) 2018). Modelling from international bodies such as the International Energy Agency (IEA) and IPCC illustrate the scale of change required to achieve the global goals of the Paris Agreement and highlight the need for increased renewable energy projects. Following the release of the IPCC WGIII in 2022, the report found that “global GHG emissions in 2030 associated with the implementation of NDCs announced prior to COP26 would make it likely that warming will exceed 1.5C during the 21st century” (IPCC 2022) Using the model as part of the Sixth Assessment Report from the IPCC, the Climate Council concluded that Australia would need to reduce its emissions by 75% below 2005 levels by 2030 in order to achieve net zero emissions by 2035 (Climate Council 2021; Climate Action Tracker 2021). This is currently at odds with the Federal Governments current position that the technology road map will be sufficient to provide a pathway to net zero emissions by 2050. Low emissions technologies such as wind and solar power will need to contribute a rapidly increasing share of global electricity production in order to achieve net zero emissions.

In 2015, United Nations Member States (of which Australia is a member) adopted the Sustainable Development Goals (SDGs) set out by the United Nations Development Program. The seventeen goals focus global development directions and are integrated, meaning no goal operates independently to the others. Of specific relevance to the Project are the following SDGs:

- Goal 7: Affordable and clean energy
- Goal 11: Sustainable cities and communities
- Goal 13: Climate action.

The sixth IPCC report on global warming determined that human induced activities were unequivocally resulting in increased global land and sea temperature rise and estimate global surface temperatures will very likely increase by more than 1.5°C above pre-industrial levels between 2030-2052 if the current rate of global warming is sustained (IPCC 2021). Increased temperatures are directly related to increased climate risks to both human populations and the natural environment leading to the Paris Agreement seeking to stabilise global surface temperature rise to 1.5°C.

Most recently, countries gathered at the COP26 conference in Glasgow to commit to numerous climate change agreements and policies, including the Global Coal to Clean Power Transition Statement focused on shifting away from unabated coal power generation by 2040, signalling the growing acknowledgement of rapidly shifting energy generation to clean sources including wind, solar and hydro.

2.2.1.3. Australian Climate Change Agreements and Policies

The Climate Solutions Fund was established in February 2019 by the Department of the Environment and Energy (DoEE), which is designed to help achieve Australia's emissions reduction target of 5% below 2000 levels by 2020 and 26-28% below 2005 emissions by 2030. The fund will operate alongside existing programmes working to reduce Australia's emissions growth such as the Renewable Energy Target (RET).

The *Renewable Energy Act 2000* (RE Act) was passed by Federal Parliament in August 2009 and aims to acquire 45,000 GWh of Australia's electricity from renewable sources by 2020. However, this was then reduced to 37,000 GWh in 2015. To meet the RET, it is estimated that approximately 6,400 MW of new large-scale renewable energy capacity is required to be built and connected to the National Energy Market (NEM) by 2020, with wind power expected to form most of this new generation capacity. The Project will therefore contribute to both the increasing local and global need for such renewable projects, as well as aid in mitigating the issues of global warming and climate change.

Most recently, in April 2021, former Prime Minister Scott Morrison participated in the Virtual Leaders' Summit on Climate, hosted by United States President Joe Biden, providing an update on Australia's progress towards achieving commitments to reduce greenhouse gas emissions. In advance of the summit during a speech to the Business Council of Australia, the Prime Minister indicated a preference to achieving a net zero economy by 2050, noting that *'the key to meeting our climate change ambitions is commercialisation of low emissions technology'* (Glenday 2021). Whilst these statements are not mandated policies, they may indicate that Australia is on a path to committing to achieving net zero emissions by 2050.

2.2.1.4. New South Wales Climate Change Policies

The *Net Zero Plan Stage 1: 2020-2030* is the foundation for NSW's action on climate change and goal to reach net zero emissions by 2050. It outlines the NSW Government's plan to grow the economy, create jobs and reduce emissions over the next decade. The plan aims to enhance the prosperity and quality of life of the people of NSW, while helping the state to deliver a 35% cut in emissions by 2030 compared to 2005 levels (Figure 2-3) (DPIE 2020a). Currently the majority of emissions in NSW are derived from electricity generation. The plan will support a range of initiatives targeting electricity and energy efficiency, electric vehicles, hydrogen, primary industries, coal innovation, organic waste, and carbon financing.

The implementation of the Net Zero Plan, together with the NSW Electricity Strategy, will result in more than \$11.6 billion of new investment for NSW, including \$7 billion in regional NSW. This will support the creation of almost 2,400 new jobs, including 1,700 jobs located in the regions.

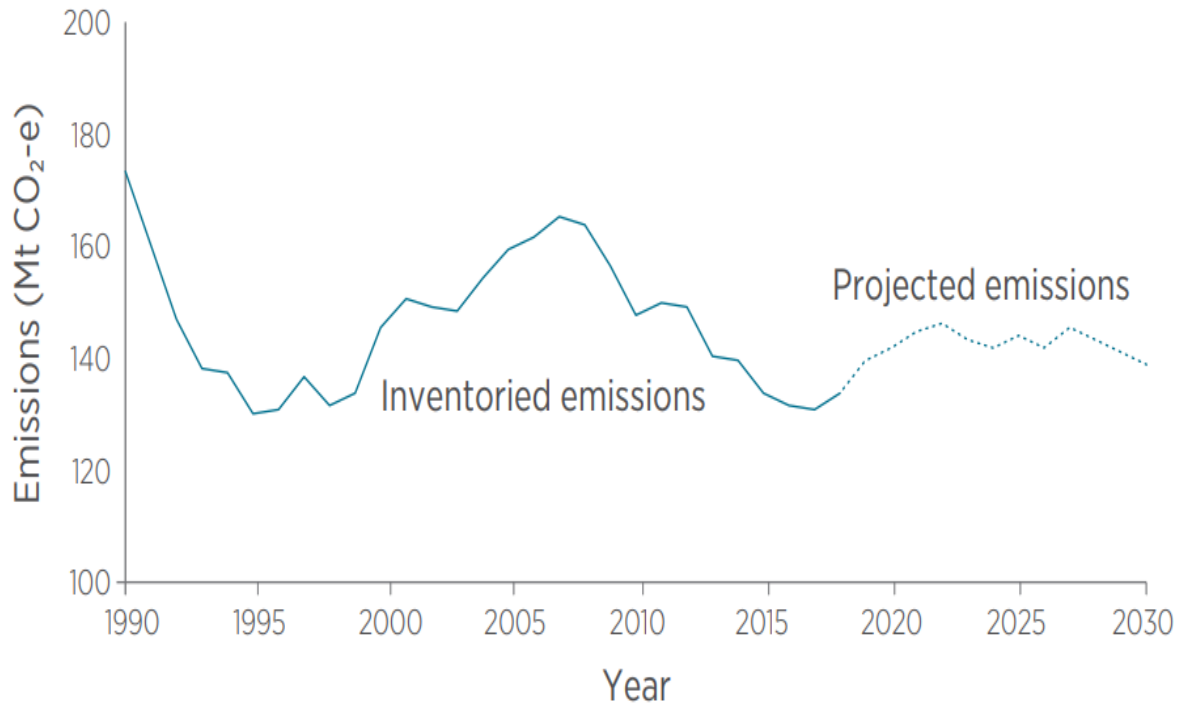


Figure 2-3: NSW total annual emissions to 2030. Note MtCO₂-e – Mega Tonnes of carbon dioxide equivalent (DPIE 2020a)

The NSW Electricity Strategy is the NSW Government’s plan for a reliable, affordable, and sustainable electricity future that supports a growing economy. The strategy encourages an estimated \$8 billion of new private investment in NSW’s electricity system over the next decade, including \$5.6 billion in regional NSW. It will also support an estimated 1,200 jobs, mostly in regional NSW. The strategy aligns closely with the NSW Government’s Net Zero Plan Stage 1: 2020 – 2030.

The NSW Government’s Electricity Strategy sets out a plan to deliver five REZs in the State’s Central-West Orana, New England, South-West, Hunter Central Coast, and Illawarra regions. These REZs will play a vital role in delivering affordable, reliable energy generation to help replace the State’s existing power stations as they come to their scheduled end of operational life.

The NSW Government is in the early stages of feasibility and planning for the state’s first REZ, the Central-West Orana REZ, in which the Project is located. This REZ will play a vital role in delivering affordable energy to help replace the state’s existing power stations as they retire over the coming decades. In particular, the Central-West Orana REZ will:

- unlock up to 3,000 MW of new generation by the mid-2020s
- be worth around \$4.4 billion in private sector investment once fully developed
- provide enough generation capacity to power approximately 1.3 million homes
- support 450 construction jobs within the local region.

The Central-West region is the planned location for the first REZ due to existing investment and interest, with around 4,500 MW of projects either approved or in the planning system. The REZs will play a vital

role in delivering affordable energy to help replace the state's existing power stations as they retire over the coming decades, as seen in Figure 2-4 demonstrating the projected reductions in emissions as a result of the Net Zero Plan.

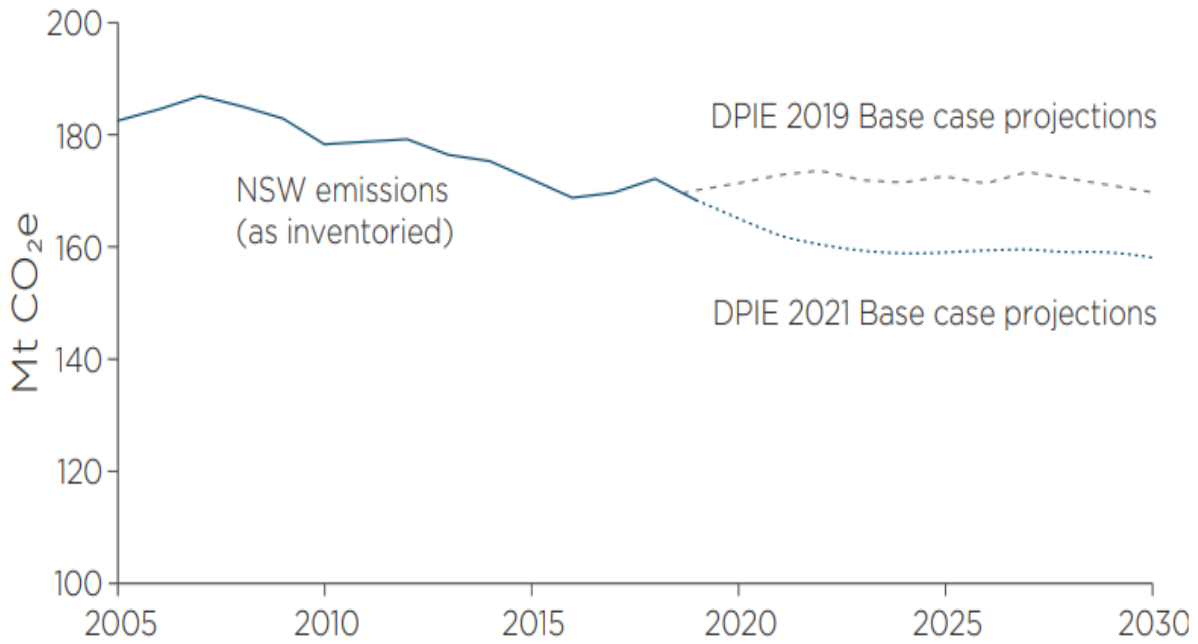


Figure 2-4: Comparison of 2019 and 2021 base case projections for NSW emissions (projected emissions without the Net Zero Plan) (DPIE 2021d)

2.2.2. Transition of the National Electricity Market

The increasing transition towards renewable energy systems in the NSW energy mix is primarily driven by large scale wind and solar projects. While these projects can efficiently generate large amounts of energy to be provided to the mix, they suffer intermittency issues because of variable natural energy sources from the sun and wind. The at-times unreliability of natural energy resources creates a need to firm up energy supply and guarantee dispatchable power using increasingly advanced battery storage systems to hold and distribute power back into the grid at periods of low renewable energy output.

To date, the majority of electricity in the NEM is generated through coal-fired sources, contributing significantly to the emissions intensity of the energy sector. The reliance on coal-fired generation presents a challenge in the coming years as the majority of NSW coal generators are set to retire, requiring an additional 19 GW of dispatchable energy to be supplied by alternative sources (Figure 2-5). The Project is well placed to help alleviate the oncoming shortfall in energy generation as the development of roughly 650 MW of generating capacity will provide energy to power in excess of 200,000 homes each year.

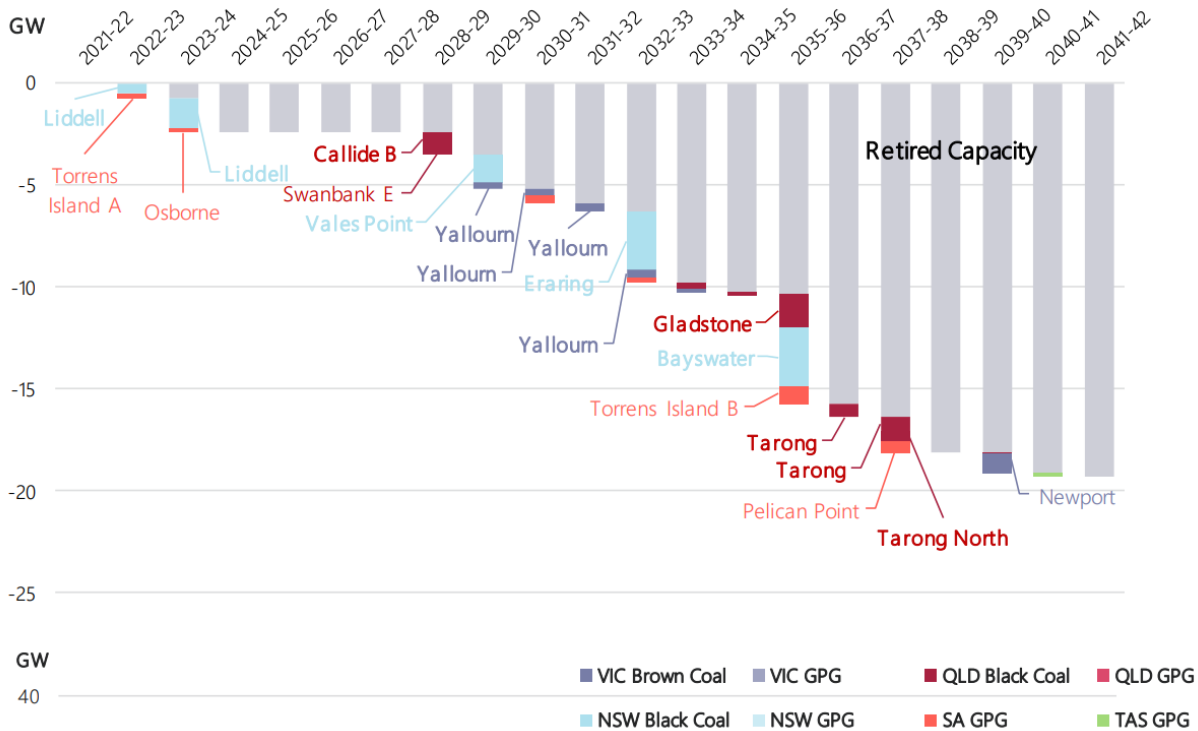


Figure 2-5: Coal-fired generation and GPG retirements (Australia-wide) (Australian Energy Market Operator (AEMO) 2020)

As the largest consumer of energy in the NEM, NSW faces a particular challenge in with the impending retirement of coal-plants such as Liddell, Vales Point and Eraring by or before 2033. The challenge similarly presents an outsized opportunity for NSW to develop an even greater, integrated renewable energy network. The NSW Electricity Infrastructure Roadmap plans on capitalising on that opportunity by ‘transforming the electricity system into one that is cheap, clean and reliable’ (DoE 2020). The implementation of the Road Map sets the foundation for considerable investment and job creation in NSW while also addressing electricity affordability. Complementing the delivery of the Road Map is the expansion of REZs in NSW used to integrate renewable energy generation, including wind, solar, battery storage and pumped hydro energy systems and deliver to homes, businesses, and industries. The Central West-Orana REZ, anticipated to contribute 3 GW of new renewable energy generation, will benefit from the increased generating capacity of the Project alongside the variable renewable energy assets elsewhere in the REZ.

Wind power is a mature technology that has seen a consistent uptake in production coupled with continually falling unit costs, with a 55% decrease from 2010 – 2020 (IPCC 2022). Wind power has demonstrated its impact in the energy mix, having generated approximately 1,592 TWh of electricity in 2020 (IEA 2021). By utilising the high wind energy potential of the region as well as targeted placement along elevated ridgelines, wind energy can provide efficient, reliable, and affordable energy to the grid over an operational lifespan of roughly 30 years. Additionally, the initial development of the Project is able to promote civil works for local and regional workers, stimulating the economy, while operationally, the Project Site will have a limited impact, often allowing for the continuation of other land uses such as agriculture.

As the NEM increasingly looks to integrated variable renewable energy solutions to supply the energy market, wind power will be required to efficiently generate and deploy energy within the REZs and provide system strength. With a generation capacity of approximately 650 MW, the Project is uniquely positioned to contribute to this need through its connection to the Central West-Orana REZ.

2.3. Project Location Context

The Project Site is located within both the Dubbo Regional Council and Mid-Western Regional Council LGAs. The Dubbo Regional Council was formed following the amalgamation of the Wellington and Dubbo Shire Councils in 2016. The land on which the Project is proposed to be located is within the former Wellington Council LGA to which the Wellington Local Environmental Plan (LEP) 2012 applies. Within the Mid-Western Regional Council LGA, the Mid-Western Regional LEP 2012 applies.

The Central West-Orana region of NSW is a highly productive agricultural region that also supports a range of diverse industries, including mining, horticulture, tourism, and people-related services. The region provides a range of natural landscapes including highlands, tablelands, and slopes in the east with fertile volcanic soils. The nearest large regional centre to the Project Site is Dubbo, approximately 75 km north-west, with the town of Wellington approximately 25 km northwest. As of June 2016, Dubbo had a population of 76,563 people, a workforce of 35,282 and a median age of 39 (Australian Bureau of Statistics (ABS) 2016). The town of Wellington had a population of 4,519, a workforce of 1,576 and a median age of 44 (ABS 2016).

The nearest community to the Project Site is Hargraves, with a number of localities also in proximity including Biara, Maitland Bar, Mookerawa, Yarrabin and Yarragal. In 2016, the town of Hargraves had a population of 270 people. The Hargraves community is dominated by rural residences and structures associated with agricultural land uses

The primary land uses within the Project Site are shown in Figure 2-6. Primary land uses are grazing on native pasture (Murphy 1998) and managed resource protection. Significant neighbouring land use is Burrendong Dam, which holds waters from the Macquarie River and its tributaries. The Project Site does incorporate a minor portion of the Burrendong dam (recreationally known as Burrendong Lake). The capacity of Burrendong dam is 1,190,000 ML and is located within the Murray-Darling basin. It is the only dam along the entire length of Macquarie River and is regulated by the Water Sharing Plan for the Macquarie and Cudgegong Regulated Rivers Water Source 2016 and Water NSW. Due to the size and accessibility of the dam, it is a popular recreation ground which is primarily accessed via Wellington, from the western flank of the dam.

The Project Site is comprised of several elevated ridges, with nearby land mainly used for sheep grazing and other agriculture activities the dominant land use. It is proposed that these existing uses will continue with minimal interruption from the Project's construction and operation.

Other mapped land use includes grazing on modified pastures, cropping in the northern extremity of the Project Site, residential and farm infrastructure in the eastern extremity, and other minimal use.

The Project Site is situated on land zoned as RU1 (Primary Production), E3 (Environmental Management), RE2 (Private Recreation) and W1 (Water) (Figure 2-7). Wind energy systems are prohibited under the Mid-Western Regional and Wellington LEPs in the RU1 Zone; however, pursuant

to clause 2.36(1b) of the *Transport and Infrastructure State Environmental Planning Policy* (Transport and Infrastructure SEPP), 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. Given that the Project is located on prescribed rural zone (RU1), and the proposed activity is to generate electricity from wind, the Project is defined as electricity generating works (wind energy systems) and is permissible with consent under clause 2.36(1b) of the Transport and Infrastructure SEPP.

In accordance with Clause 4.38(3) of the EP&A Act, development consent may be granted despite the development being partly prohibited by an environmental planning instrument. The EIS will therefore provide a merit-based assessment, addressing the objectives of the E3, RE2 and W1 zonings and providing justification for the Project.

The Project Site is subject to both the Wellington and Mid-Western Regional Development Control Plans (DCP). Both DCPs provide development standards and guides local development in terms of building design, landscaping, car parking, heritage, and stormwater management, among others, but does not contain any specific provisions relevant to large scale wind farm developments.

Section 3.42 (1) of the EP&A Act states the principal purpose of DCPs is to provide 'guidance' to development proponents and consent authorities and to assist 'facilitating development that is permissible'. Accordingly, local provisions under the relevant DCP are not statutory requirements.

No planning (or draft planning) agreements related to the Project have been (or may be) entered into under section 7.4 of the EP&A Act.

2.3.1. Key Landscape Features

In addition to the agricultural landscape, the region is characterised by scenic landscapes, natural environments, and large natural features. Desktop assessment of key landscape features has identified the following sites within a 25 km radius of the Project Site:

- Lake Burrendong
- Wellington Caves.

2.3.2. Key Transport and Infrastructure

The Project Site is in proximity to the major centres of Wellington (45 km by road to the northwest), Mudgee (40 km by road to the northeast and to Dubbo (75 km by road to the northwest) with access via local roads and benefitted by proximity to the Mitchell Highway.

2.3.3. Other Major Renewable Energy Projects in the Locality

The Project Site is located in proximity to several other renewable energy major projects as outlined in Table 2-1 and shown in Figure 2-8. The EIS will include an assessment of potential cumulative impacts relating to relevant projects within the region, including visual impacts, noise impacts, and traffic impacts. The defined study area for a given cumulative impact assessment will be determined based on the specific type of impact being assessed.

Table 2-1: Renewable energy major projects in the locality

Project	Location	Undergoing Approval Process	Approved	Under Construction / Operational
Burrendong Hydro Power Station	6 km north-west of Project Site			✓
Stubbo Solar Farm	50 km north-east of Project Site		✓	
Beryl Solar Farm	37 km north-east of Project Site			✓
Bodangora Wind Farm	27 km north-west of Project Site			✓
Maryvale Solar Farm	30 km west of Project Site		✓	
Wellington Solar Farm	22 km west of Project Site			✓
Uungula Wind Farm	9 km north of Project Site		✓	
Suntop Solar Farm	32 km west of Project Site		✓	
Wellington North Solar Farm	25 km west of Project Site		✓	
Suntop Solar Farm 2	34 km west of Project Site	✓		
Burrundulla Solar Farm	25 km east of Project Site	✓		
Crudine Ridge Wind Farm	34 km south-east of Project Site			✓
Molong Solar Farm	45 km south of Project Site			✓
Piambong Wind Farm	2 km north-east of Project Site	✓		

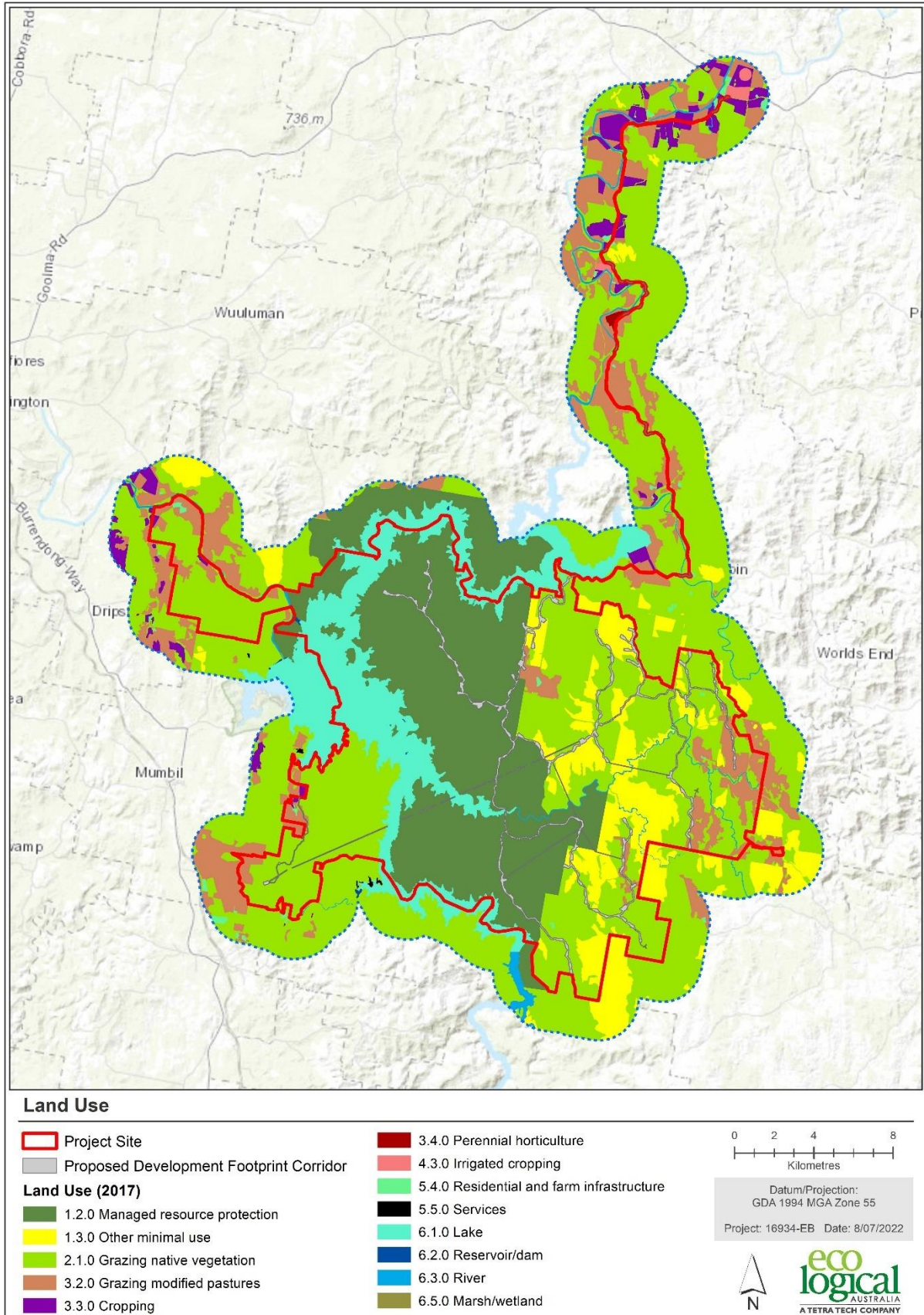


Figure 2-6: Existing land uses within the Project Site

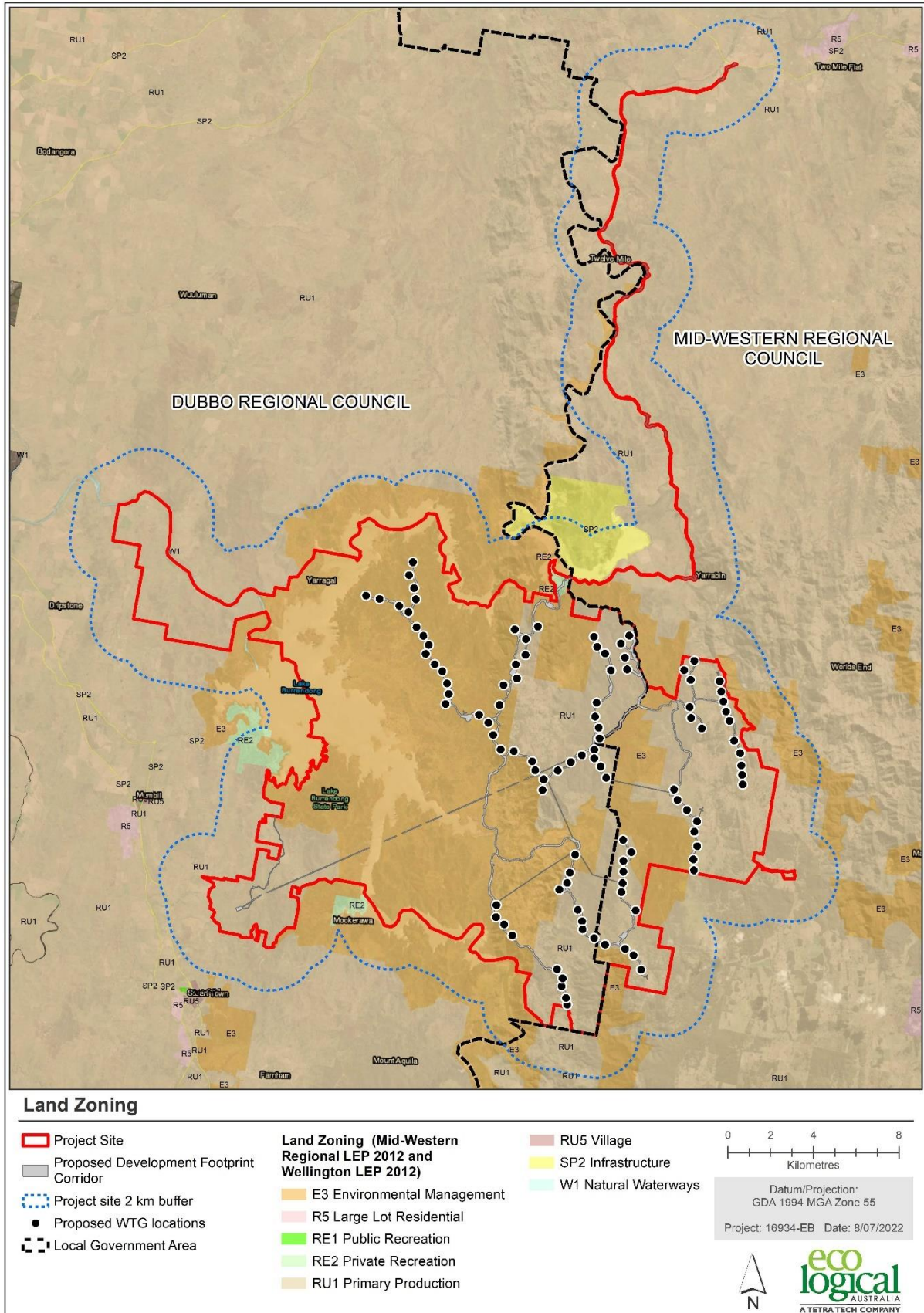


Figure 2-7: Land zoning within the Project Site

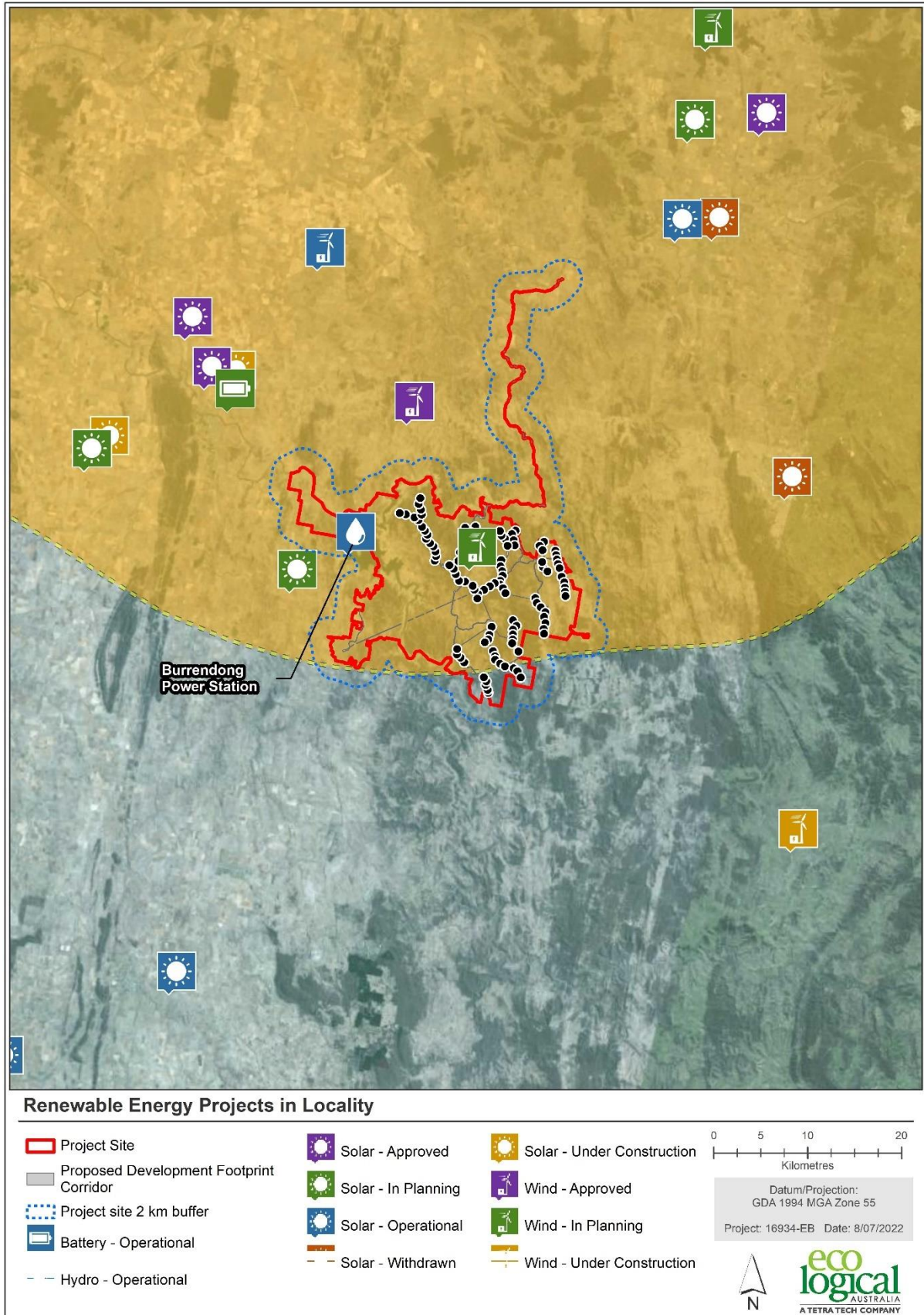


Figure 2-8: Determined or proposed renewable energy projects in proximity to the Project Site

2.4. Local and Regional Plans

2.4.1. Central West Orana Regional Plan 2036

The Central West and Orana Regional Plan 2036 is a 20-year blueprint for the future of the Central West and Orana region. The Plan seeks to create a leading diverse regional economy in NSW, with a vibrant network of centres leveraging the opportunities of being at the heart of NSW. The 'vision' of the Regional Plan seeks, in part, to promote landmark solar, wind and bioenergy projects and distinguish the region as a leader in renewable energy development. The Plan identifies the Central West area has significant potential for renewable energy industries with vast open spaces and higher altitude tablelands. Areas in the Central West, including Blayney, Oberon, and Wellington, are suitable for wind farms and TransGrid's NSW Connection Opportunities identifies Parkes and Wellington as having capacity for renewable energy generation. Under the Plan, it is identified new renewable energy projects require a strategic approach and should, where possible, incorporate small-scale co-generation measures into their design.

The Project, which seeks consent for a wind farm using modern renewable energy technology, complies with the objectives set out in the Central West and Orana Regional Plan as outlined below:

Table 2-2: Relevant directions in the Central West and Orana Regional Plan

Direction	Project Context
Objective 3: Plan for resilient places and communities	The objective seeks to develop resilient communities and industries to prepare for the shocks and stresses associated with climate change. The Project will assist in shock proofing the region by establishing resilient and renewable energy to the wider community without generating emissions
Objective 20: Leverage the Central-West Orana Renewable Energy Zone to provide economic benefit to communities	The objective looks to leverage the anticipated economic and social benefits associated with the Central West-Orana REZ. The Project will assist in the delivery of an expected \$5.2 billion of private investment, as well as delivering temporary and full-time jobs, increased economic stimulus and provide clean, renewable energy for communities
Objective 22: Protect Australia's first Dark Sky Park	The Siding Springs Observatory is the first Dark Sky Park in Australia and objective 22 of the plan outlines the desire to protect the dark sky status, with guidelines on how to minimise and mitigate light pollution. The Project will undertake appropriate assessments of the impacts of lighting to the surrounding environment, in accordance with the Dark Sky Planning Guidelines. The Project is not expected to significantly impact the observing conditions of the night sky as a result of lighting requirements

2.4.2. Dubbo Regional Council Local Strategic Planning Statement

The Dubbo Regional Council Local Strategic Planning Statement (LSPS) plans for the economic, social, and environmental land use needs of the community over the next 20 years. It sets land use planning priorities to ensure that the future development within the LGA is appropriate for the local context. The LSPS is closely linked to both the Dubbo and Wellington LEPs and DCPs, as well as the Central West and Orana Regional Plan 2036. The LSPS acknowledges that renewable energy will play a key part in Dubbo's sustainable future, particularly as the Queensland-NSW Interconnector transmission lines are constructed, facilitating energy transfer to the north and south of the LGA. One of the key Planning

Priorities within the LSPS is to therefore promote renewable energy generation, in particularly, undertake the following actions:

- *Work together with neighbouring councils on cross-boundary issues concerning electricity generation and transmission*
- *Collaborate with State agencies and key landowners to deliver key infrastructure projects.*
- *Utilise the Department’s Large-Scale Energy Guideline to advise proponents on the optimum location of new renewable industries*

2.4.3. Mid-Western Regional Council Local Strategic Planning Statement

The Mid-Western Regional LSPS sets out the 20-year vision for land use planning within the LGA. The LSPS outlines land use planning priorities and sets short, medium- and long-term actions to deliver the Planning Priorities for the communities.

The Mid-Western Regional LRPS acknowledges that a major strength of the local economy is its diversity. The top four contributors to the Region’s economic value (mining, real estate, construction, and agriculture) each contribute more than \$100 million per annum to overall economic growth.

Job diversity remains a key feature of the local economy, with the labour force employed across 114 different industry sectors. The size of the labour force in the Mid-Western Region continues to increase in line with local economic opportunities. At the 2016 Census there were 10,372 people in the labour force, compared to 9,930 in 2011. Maintaining economic diversity and continuing to promote a range of employment and business opportunities across a range of industries is a key priority for MWRC as this will help foster a strong economic future for the region. One of the land use actions to support the attraction and retention of a diverse range of business and industries is to therefore consider renewable energy development in appropriate areas.

2.4.4. Dark Sky Planning Guideline

The Dark Sky Planning Guideline (DPE 2016) informs state and local governments as well as the private sector and communities about the management of light in the Dark Sky Region of NSW. The focus is to develop a framework to protect the Dark Sky status of the region and allow the continued operation of the Siding Springs Observatory to conduct scientific investigation. The guideline acknowledges the importance of the Observatory noting the attraction of over 24,000 visitors a year and the direct injection of over \$5 million dollars into the local economy.

The Dark Sky Guidelines (DPE 2016) is a matter for consideration for development under the EP&A Act before development consent can be granted. The consent authority must also consider the guideline under clause 61(3) of the *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation) and is assumed to influence the development of SEARs.

Table 2-3: Relevant directions of the Dark Sky Guidelines (2016)

Direction	Project Context
Principle 1 & 2: Eliminate upward spill light and Direct light downwards not upwards	While specific design measures have yet to be determined and the results of the Landscape and Visual Impact Assessment have yet to be conducted, based on similar wind farm projects it is likely that measures will be taken to direct light sources downward except in cases of Aviation Hazard Lighting (should it be required). The Project will seek to minimise

Direction	Project Context
	visual impacts to ensure appropriate light sources are used, including shielding where appropriate.
Principle 8: Ensure lights are not directed towards reflective surfaces	Following detailed design processes and the final selection of the candidate WTG, the Project will seek to minimise light sources directed towards reflective surfaces. Typically, WTG blades are painted in non-reflective coats of paint to help minimise the reflective potential of the blade and therefore reduce light reflection in the landscape.

2.5. Project Design Development and Alternatives

2.5.1. Do-Nothing Approach

As discussed previously in Section 2.2, there has been significant progress made by Australia towards establishing guidelines and targets to reduce carbon emissions and promote renewable energy generation. Therefore, without this Project, other projects will need to be developed to meet the National RET and NSW's target of net-zero emissions by 2050. Furthermore, the NSW Government could miss out on a significant investment into the Australian economy, with an expected capital investment value estimated to be greater than \$600 million, that the Project is expected to deliver.

Under the 'Do-Nothing' scenario, the Project would not take place and the following benefits resulting from the Project would not occur:

- Generation of additional renewable energy
- Reduction of more than one million tonnes of CO₂-e¹
- Support of approximately 250 Full-Time Equivalent (FTE) jobs during the construction period and approximately 12 FTE jobs during the operational period.

2.5.2. Alternative Locations

The Proponent has evaluated a range of sites within the Central-West Orana REZ to connect to the NEM for wind generation opportunities, which may be considered as alternatives to the Project. Some of these sites have progressed as they are deemed appropriate developments, whilst other prospective sites have been considered, but discarded owing to a range of reasons.

The current Project design has been developed to minimise as much as possible the environmental and social impacts while maintaining investment viability for the Project. The Project design will undergo further refinement post-approval during detailed design, with a view to further minimise environmental and social impacts where possible within the approved Development Corridor, while maintaining investment viability of the Project.

2.5.3. Design Principles

The Project Site was selected due to its suitability for a wind farm based upon the available wind resource within the Project Site and the initial environmental and social constraints identified through

¹ Based upon a large wind farm – 500 MW (DECCW 2010)

preliminary investigations. Through the design of the Project and assessment of impacts, the following design hierarchy was adopted (Figure 2-9).

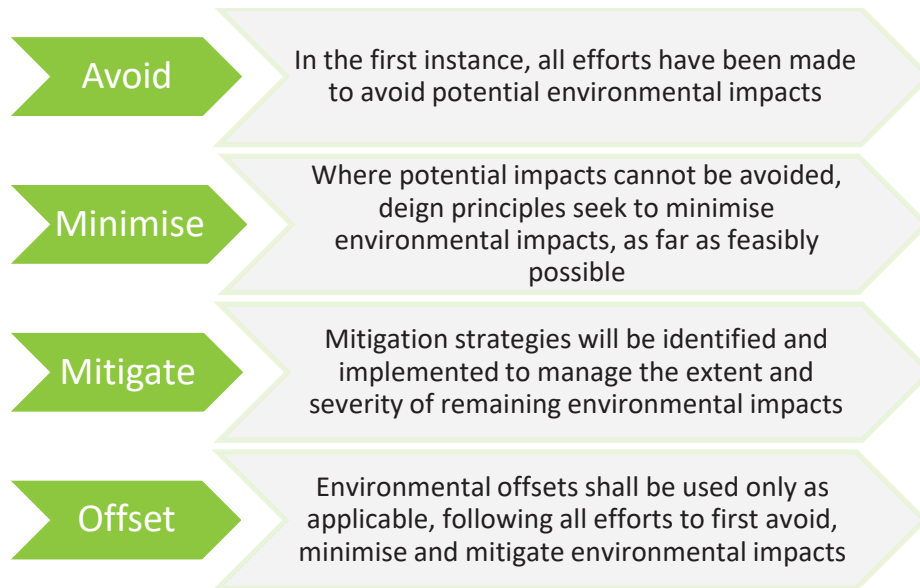


Figure 2-9: Adopted design hierarchy for the Project

In addition to the above design hierarchy, the following principles were also adopted through the Project design process:

- Minimise vegetation clearing – areas of high conservation value and/or native vegetation were strategically avoided where possible
- Minimise land disturbance – design footprints for Project elements, including WTGs, ancillary infrastructure, construction/temporary facilities, powerline easements, and external road upgrades were limited to the minimum area required
- Use previously disturbed land – as much as possible the Project was located on land previously modified by agricultural development, including cleared areas and established farm tracks/roads
- Protect cultural heritage values – through the identification and evaluation of cultural heritage assets at the Project Site
- Protect agricultural values – existing agricultural values will aim to be preserved, and a negotiated lease shall offset forgone landholder income while diversifying income streams for the duration of the Project life
- Minimise direct and indirect impacts – as far as practicable, infrastructure was located away from nearby residences and adjoining properties
- Adopt a flexible approach to design – the final Project design has responded to identified environmental impacts and constraints.

2.5.4. Site Selection and Design Development

In 2018 Ark Energy commenced discussions with landowners in relation to their interest in being involved in a wind energy project in the region. In 2019, Ark Energy commenced wind monitoring onsite

with portable SoDAR devices and since then has installed one wind monitoring mast as shown on Figure 2-10.

An early assessment of the wind resource identified an investigation area comprising several elevated ridgelines that had the potential for hosting WTGs. This investigation area was used as the basis for early consultation activities and to get feedback from the community and other stakeholders over the Project. This feedback has been considered in the design of the preliminary layout.

Using the investigation area as a starting point, a preliminary site layout comprising of 105 WTG was developed.

The Project has undertaken significant impact minimisation steps to reduce impacts raised during the environmental studies undertaken for the Project and consultation. The Proponent has been proactive in responding to the environmental studies and community feedback, with the Project design changing in response to community concerns, environmental constraints, market dynamics and WTG technological advancement. The Project Design evolution is summarised in Table 2-4.

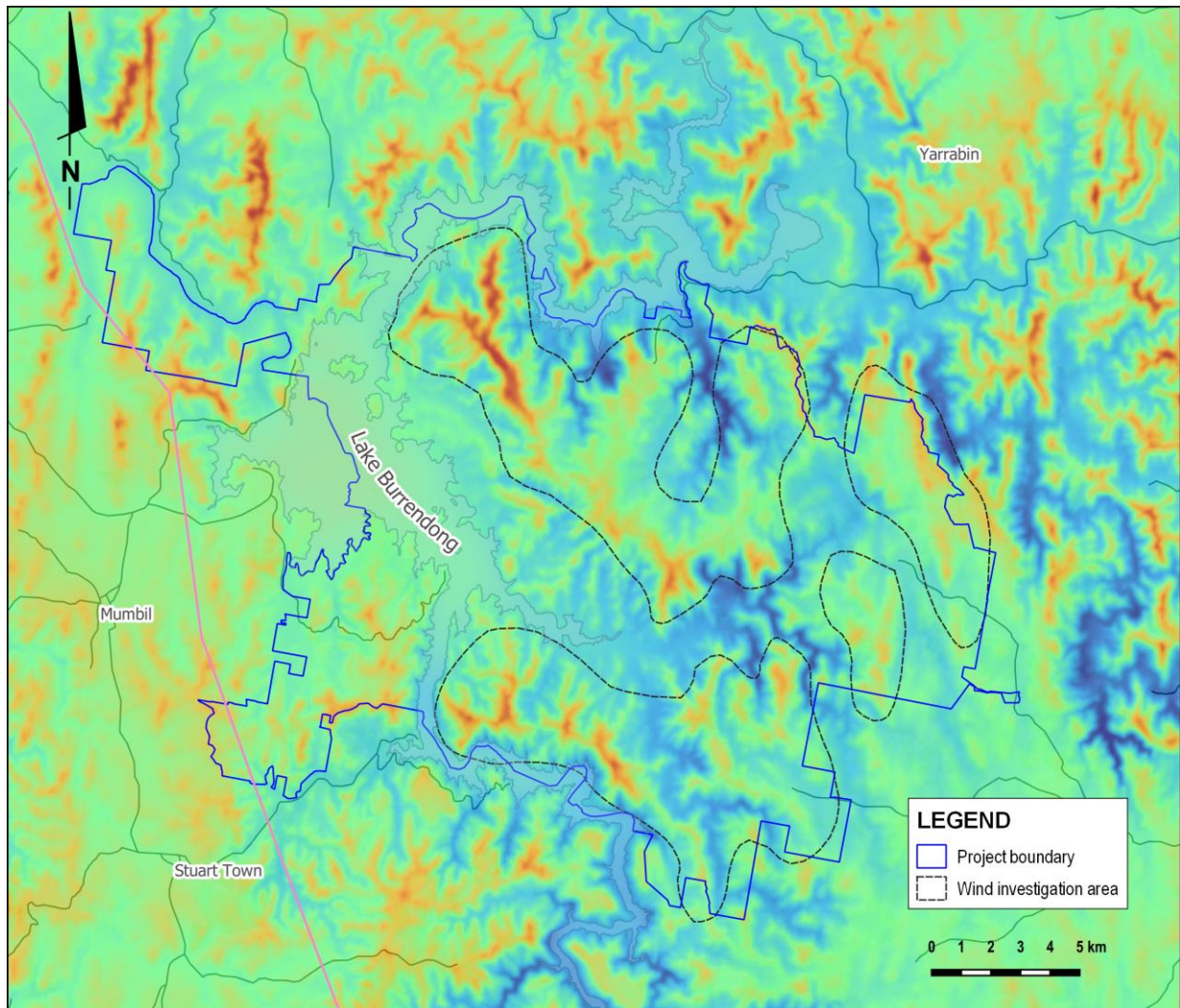


Figure 2-10: Project Site Wind Resources Map

Table 2-4: Project design evolution

Time Period	Project Design Development	Justification	Number of WTGs
December 2018	<ul style="list-style-type: none"> Site identification Landowner discussions First on-site SoDAR wind monitoring 	<ul style="list-style-type: none"> Initial site identification Preliminary wind farm feasibility assessment 	
October 2019 - December 2019	<ul style="list-style-type: none"> 110m tall wind monitoring mast installation Preliminary biodiversity assessment undertaken (Figure 2-11) Preliminary transport route study undertaken for two optional routes to the Project Site from Newcastle Port 	<ul style="list-style-type: none"> Ongoing feasibility assessment. 	
March 2020	<ul style="list-style-type: none"> Preliminary Project Design developed based upon preliminary biodiversity assessment and wind resource mapping (Figure 2-12) 	<ul style="list-style-type: none"> Preliminary Project design 	
May 2020	<ul style="list-style-type: none"> Identification of wind resource areas and target areas for location of WTGs 	<ul style="list-style-type: none"> Preliminary Project design development 	
September 2020	<ul style="list-style-type: none"> Preliminary design development including WTG locations and access track (Figure 2-13) 		69
December 2020	<ul style="list-style-type: none"> Community survey 	<ul style="list-style-type: none"> Input into visual impact assessment landscape values 	69
Dec 2020 - April 2021	<ul style="list-style-type: none"> Preliminary civil design, including updating WTG locations, hardstands, construction compounds, batch plants, access track centreline and expected construction footprint (Figure 2-14) External access route assessment Alternative or additional access route investigations 330kV connection Feasibility Study and preliminary powerline design 		69
September 2021	<ul style="list-style-type: none"> Updated Project Site layout including some additional WTG locations in north-east of the Project Site and removal of WTG locations along the western boundary. 	<ul style="list-style-type: none"> Design development incorporating input from landowners, wind resource assessments, civil engineering constraints and preliminary environmental impact assessments (including noise, visual, biodiversity, heritage constraints) 	72
November 2021	<ul style="list-style-type: none"> Ongoing environmental assessments, wind resource assessment and design optimisation 	<ul style="list-style-type: none"> Updates to community via CCC meetings and information session 	72
Dec 2021	<ul style="list-style-type: none"> Water NSW publicly announces Renewable Energy and Storage project seeking private sector 		72

Time Period	Project Design Development	Justification	Number of WTGs
	investment to develop renewable energy project on Water NSW land at Windamere Dam and Burrendong Dam ²		
March to September 2022	<ul style="list-style-type: none"> Updated Project Site layout and associated environmental assessments Revised project Scoping Report lodged with DPE 	<ul style="list-style-type: none"> Incorporating additional Water NSW land adjacent to initial WTG locations 	105

² See further at: <https://www.watnsw.com.au/about/renewable-energy-and-storage-program#:~:text=The%20WaterNSW%20Renewable%20Energy%20and,WaterNSW%20water%20and%20land%20assets>

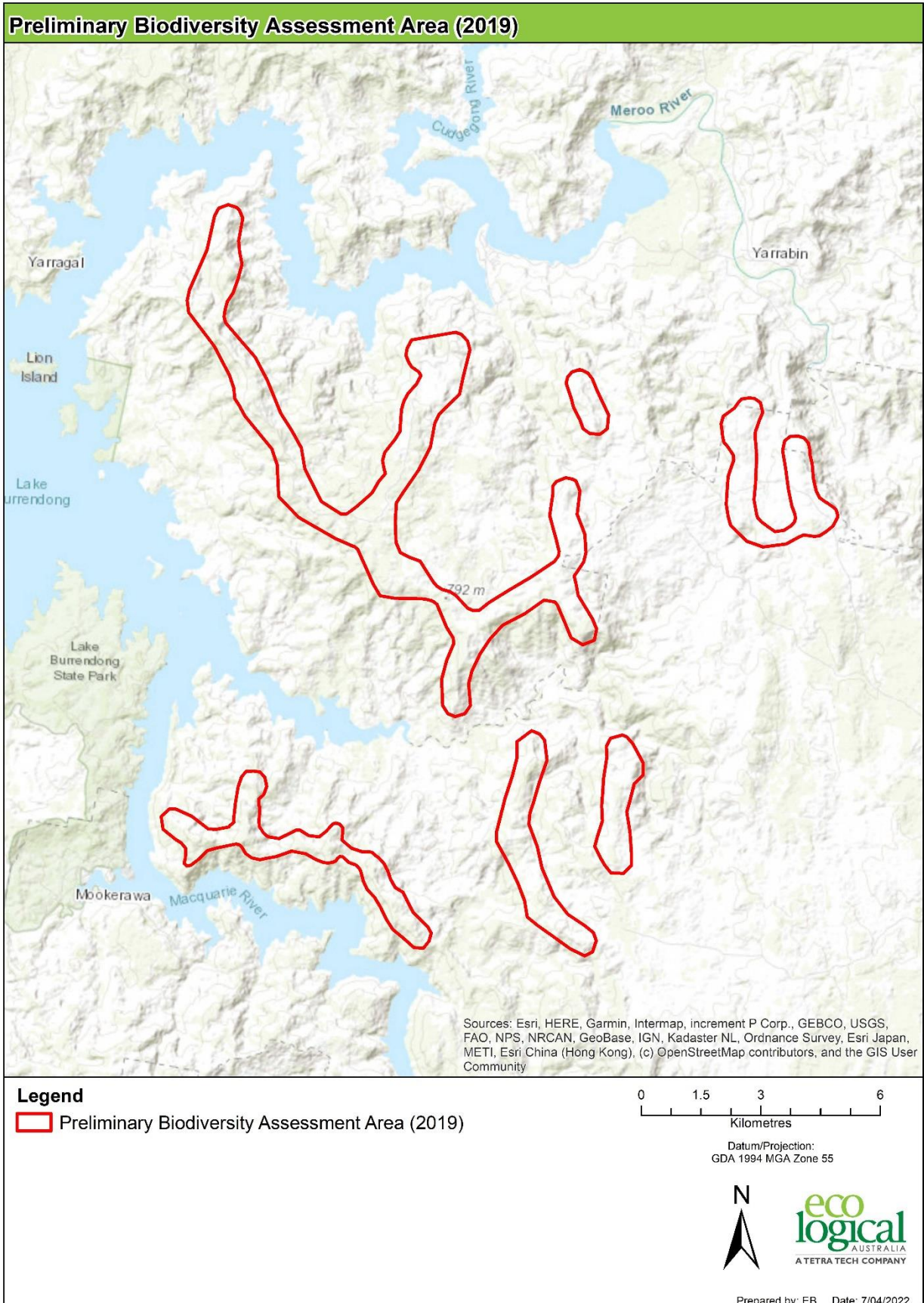


Figure 2-11: Preliminary biodiversity assessment area

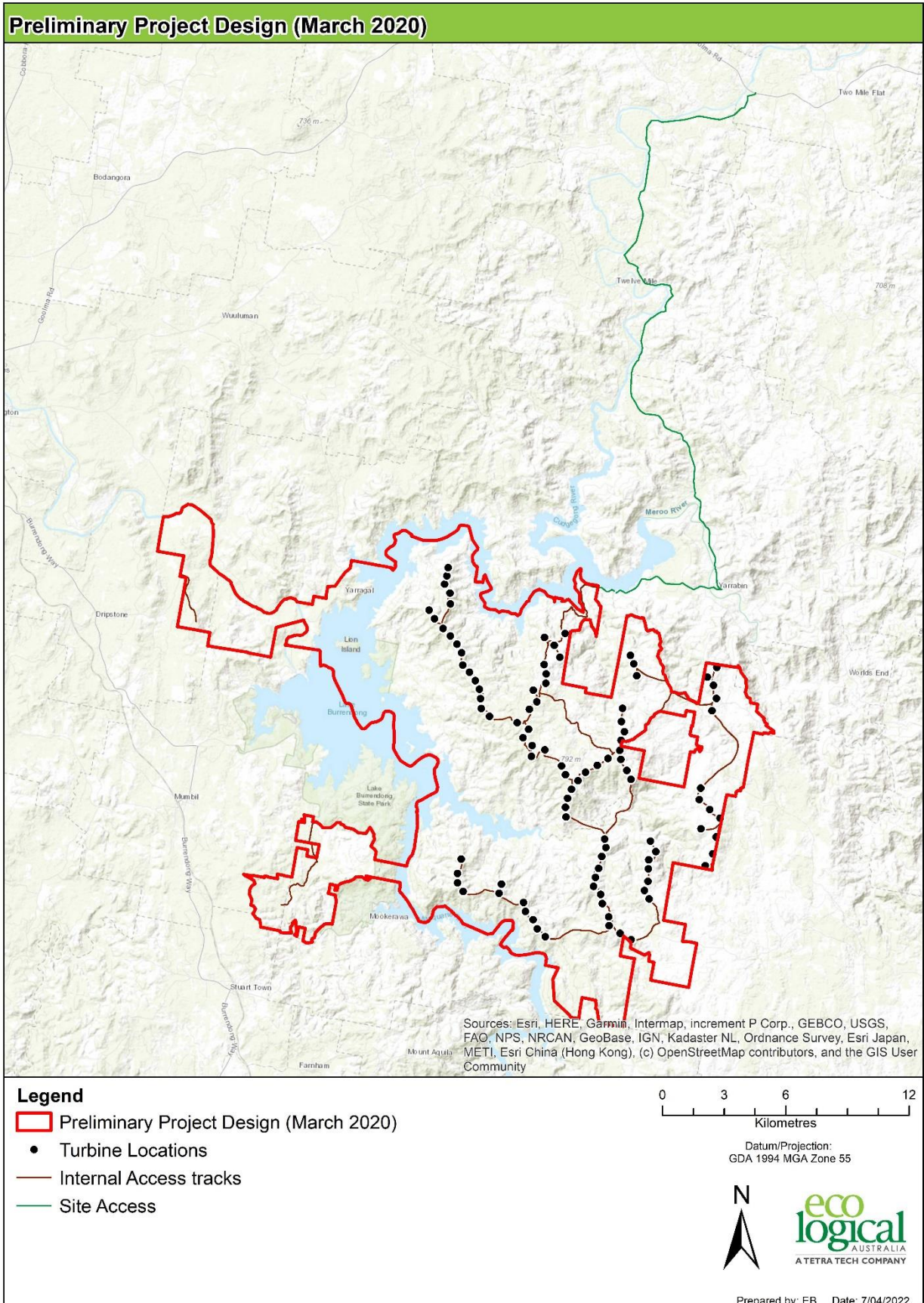


Figure 2-12: Preliminary Project design

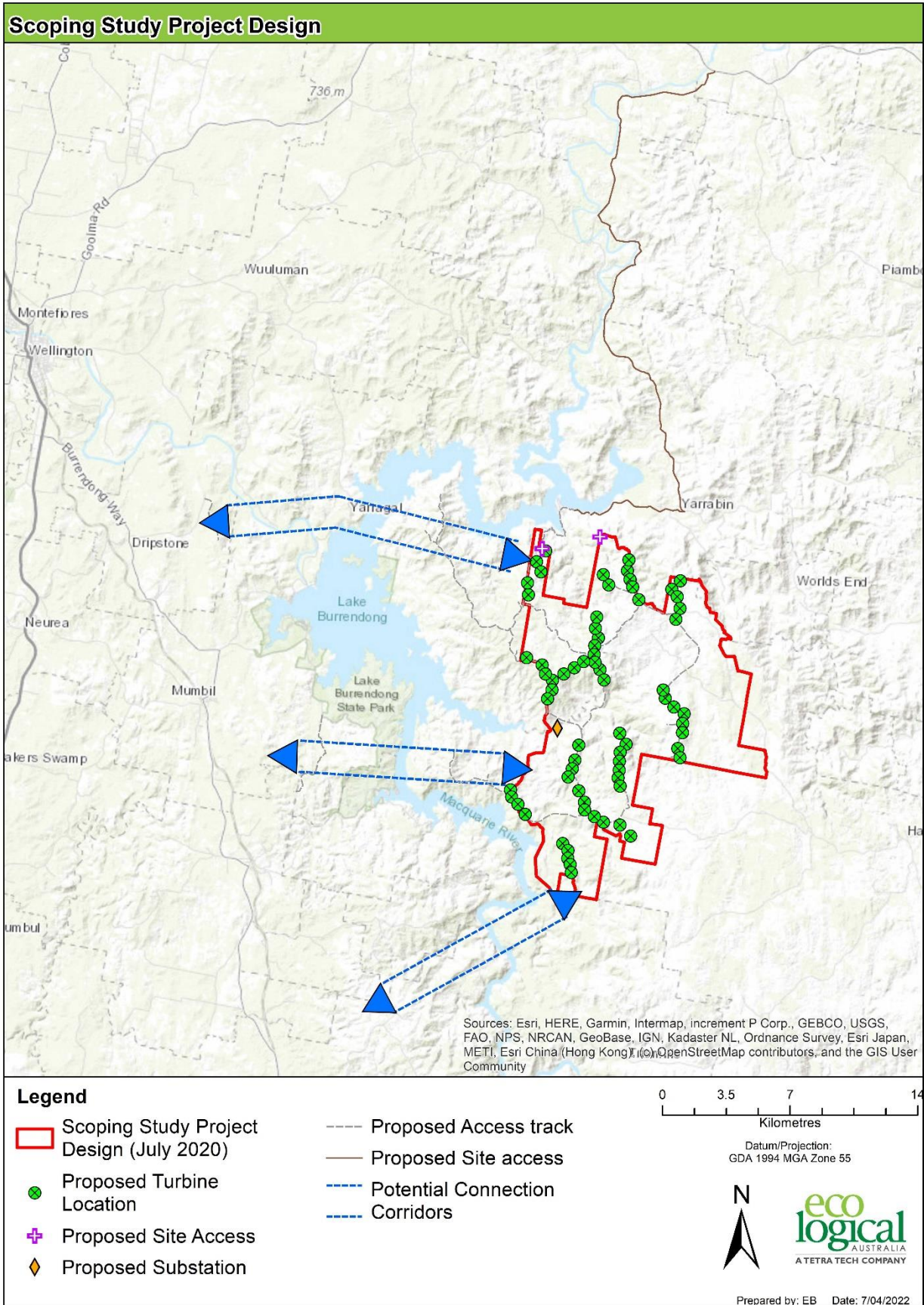


Figure 2-13: Scoping Study Project design

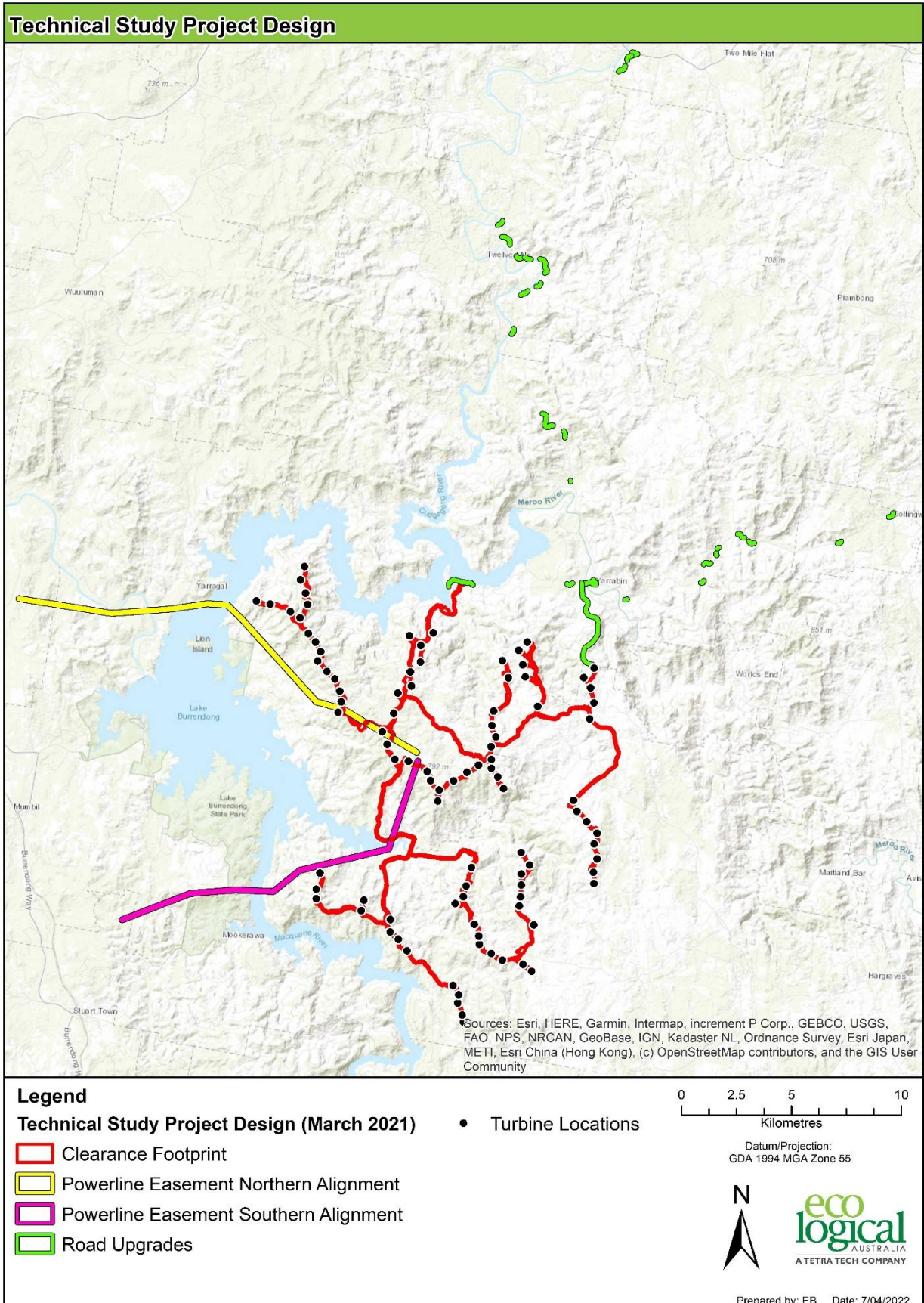


Figure 2-14: Technical Study Project Design

3. Project Description

3.1. Project Overview

3.1.1. Key project Elements

The Project will involve the construction, operation, maintenance and decommissioning of a commercial-scale wind farm, which will produce approximately 650 MW of clean energy to the NEM. The Project will comprise of the following elements:

- **WTGs:** Up to 105 wind turbine generators, each with:
 - a capacity between 4 – 7 MW
 - a three-bladed rotor and nacelle mounted onto a tubular steel tower and concrete foundation
 - a crane hardstand and laydown area for assembly of the wind turbine generator
 - a wind turbine generator transformer located either in the nacelle or adjacent to the wind turbine generator
- **Road Upgrades:** Upgrades to the existing public road network to provide access to the project site and enable safe delivery of the oversize/overmass components from the Port of Newcastle
- **Access Tracks:** New access tracks within the Project Site providing access to the WTG locations and other infrastructure
- **Electrical infrastructure:** Medium voltage (usually 33 kV) electrical connections between the wind turbine generators and the collector substations, which will include a combination of underground cabling and overhead powerlines
- **Up to two wind farm collector substations:** The substations will include power transformers, switchgear, protection, communication and ancillary facilities.
- A high voltage (330 kV) power line to connect the collector substations to a connection switchyard
- A connection switchyard to connect the wind farm powerline to the existing TransGrid 330 kV transmission network
- **Operation and Maintenance (O&M) Facility:** A permanent O&M facility.
- **Construction Facilities:** Various construction facilities including temporary concrete batching plants, rock crushing equipment, material stockpiles, temporary laydown facilities, and construction compounds
- **Wind Monitoring:** Two temporary wind monitoring masts (110 m tall) and the installation of up to four permanent wind monitoring masts (hub height) for wind speed verification, weather, and general monitoring purposes
- **Other Ancillary Infrastructure:** Minor works including fencing, gates, drainage structures, erosion & sediment control measures, rehabilitation works, boundary adjustments and land subdivision.

A detailed Project layout is shown in Figure 3-1, Figure 3-2, and Figure 3-3.

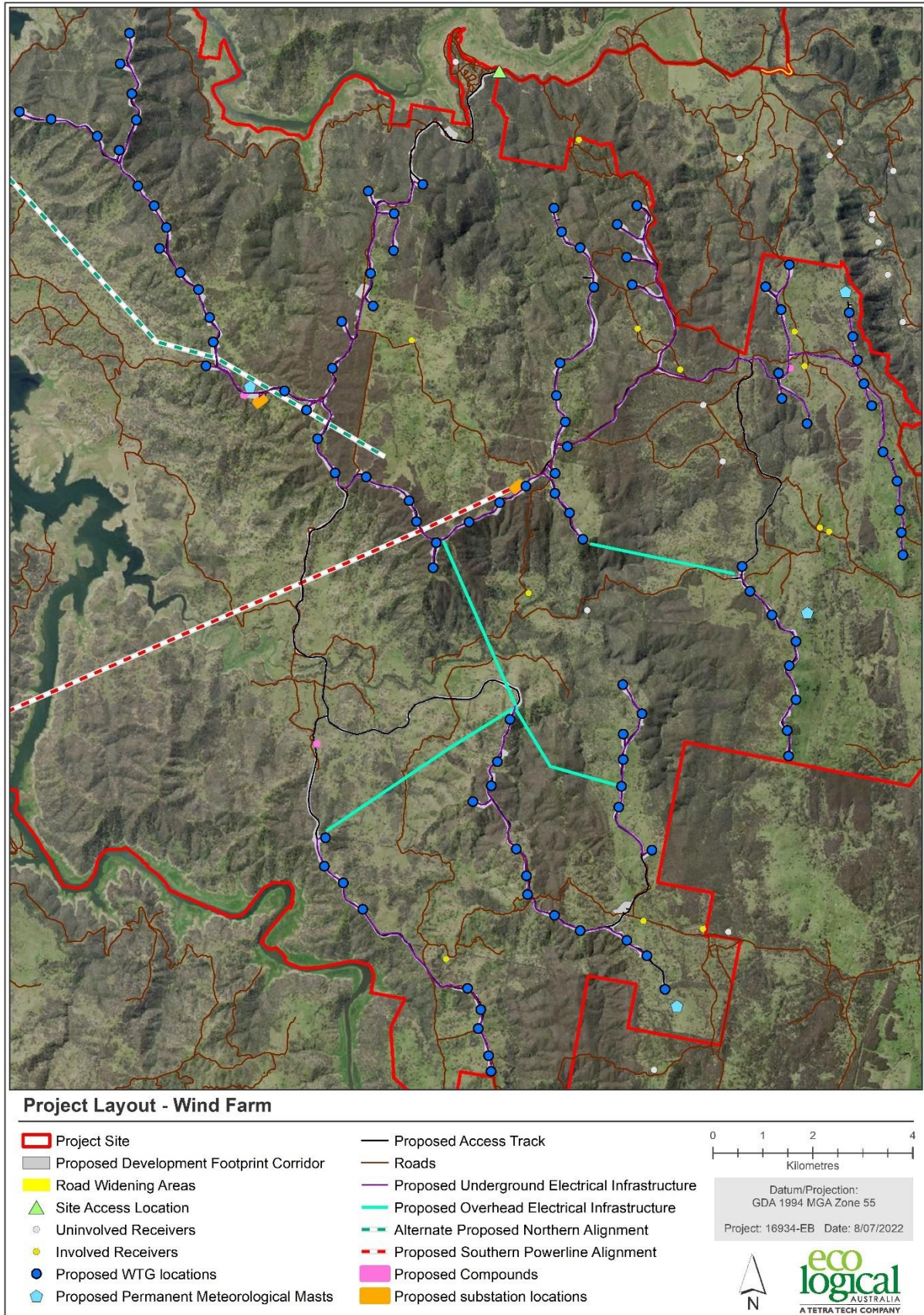


Figure 3-1: Project layout – wind farm

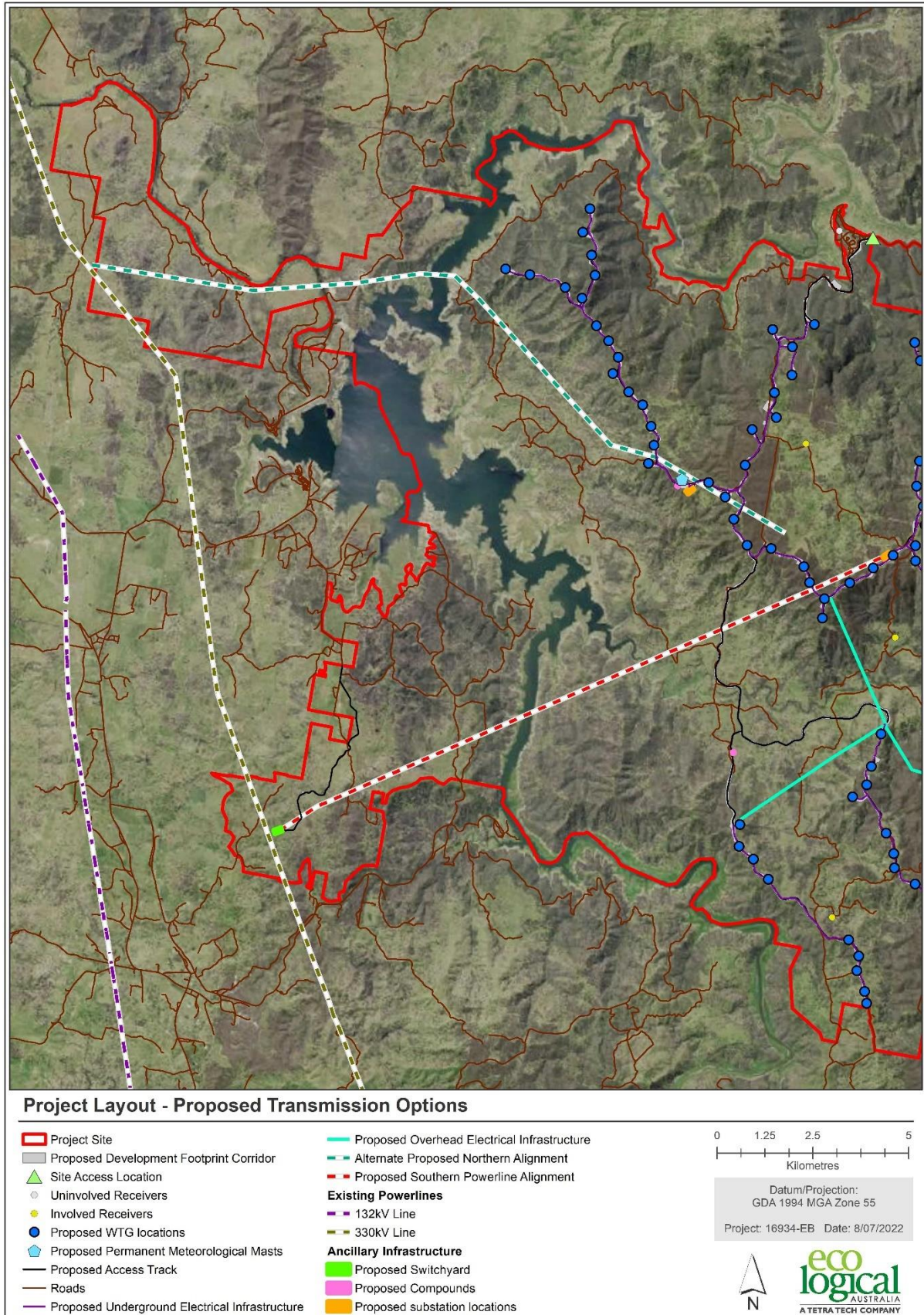


Figure 3-2: Project layout – transmission line options



Figure 3-3: Project layout – road access upgrades

3.1.1.1. Wind Turbines

Final WTG numbers and power output for the Project Site is dependent on the final geographic footprint as well as outcomes of the various engineering and environmental studies and is subject to change. It is expected that the Project could comprise up to 105 WTGs.

As WTG designs continue to evolve, trending towards larger WTGs that can lower levelised cost of energy, the Project is likely to be designed to accommodate WTGs entering the market between 200 m – 250 m from the ground to upper blade tip.

3.1.1.2. Electrical Connections

To export the electricity generated from the Project, a new physical connection to the existing electricity network will be required. Sufficient capacity exists within the existing network to transmit the electricity to the required load centres.

A new wind farm powerline is proposed to connect the Project to the TransGrid 330kV transmission network located on the western side of Lake Burrendong. Two potential connection corridors have been investigated as part of the environmental assessment process as shown in Figure 3-2.

Alternately, the Project may connect to new infrastructure established as part of the Central West Orana REZ depending on final decisions in relation to the location of the proposed new infrastructure.

3.1.1.3. Other Associated Infrastructure

Various ancillary infrastructure will be required for the Project including (but not limited to): onsite operations building, equipment storage facilities, concrete batching plant facilities, rock crushing, temporary and permanent laydown pads, construction compounds, access tracks to each turbine, temporary and permanent wind monitoring masts, communications equipment and other related facilities.

3.1.1.4. Minor Local Road Upgrades

Traffic associated with the construction phase of the Project will consist of both light vehicles for transporting workers and heavy and over-sized vehicles for delivery of plant and turbine components. The proposed access to the Project site is at the western end of Burrendong Dam Road as seen in Figure 3-3. The EIS will include an assessment of any upgrades required to the existing public road network.

Upgrades to the existing road network will be required where necessary to facilitate the construction, ongoing maintenance and decommissioning of the Project.

3.1.1.5. Ancillary Activities

Materials will need to be sourced for the construction, ongoing maintenance and decommissioning of the Project (including but not limited to): road and construction materials, water, and concrete.

Geotechnical assessments will be required to inform detailed engineering design in relation to the positioning of Project infrastructure. Boundary adjustments and subdivision may also be required to assist in detailed design for infrastructure.

3.1.1.6. Construction Infrastructure

Construction infrastructure may include laydown areas adjacent to WTG locations, site compounds and internal roads for the storage and assembly of WTG components and equipment, including batching

plant. Construction roads associated with providing temporary access to some parts of the Project, including the erection of transmission lines, work front construction and maintaining environmental management measures will be developed during the construction phase and be removed and rehabilitated once no longer required for the operation of the Project.

3.1.1.7. Rehabilitation and Decommissioning

Impacts during the construction phase will be temporary and effect relatively small areas (for example – trenching), allowing progressive rehabilitation to minimise erosion and sedimentation risk as soon as possible. The more permanent areas of disturbance, including WTG foundations, roads, laydown areas, and substation will be designed and constructed to minimise erosion and runoff.

At the end of its operational life, a commercial decision will be made to either repower the Project to extend the life of the Project (which will be subject to a modification to the Project approval) or decommission the Project and return land that is impacted by the Project to its pre-existing condition in consultation with the affected landholders.

3.1.2. Construction and Operation

Construction works will commence following provision of detailed design inputs, which may be staged. Construction includes all physical works to enable the operation, including, but not limited to, the construction and installation of WTGs, construction of Ancillary Infrastructure and establishment or construction of any Temporary Facilities which were not already established as part of the minor works.

The construction of the Project is expected to take 24 months but may take up to a maximum of 30 months. For the majority of the construction phase, it is anticipated that the average workforce on-site will be approximately 150 employees. During peak construction periods, this may increase up to a maximum of 250 employees.

The operational phase of the Project will be 50 years. Routine maintenance is likely to be carried out by 10-15 employees during Project operations, typically utilising local professionals or professionals relocating to the region to fill these roles.

3.1.3. Land Restrictions or Covenants

There are no known land restrictions or covenants that would prevent the development of a wind farm within the Project Site. The EIS will address current zoning and permissibility of a wind farm within the Project Site.

4. Statutory Context

The relevant statutory requirements for the Project are summarised in Table 4-1.

Table 4-1: Statutory requirements for the Project

Matter	Relevance to the Project
Power to Grant Approval	<p>In accordance with Part 2, Clause 6 of the Planning Systems SEPP, development is declared to be SSD for the purposes of the EP&A Act if:</p> <p>c) 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</p> <p>d) the development is specified in Schedule 1 or 2.</p> <p>Clause 20 of Schedule 1 of the Planning Systems SEPP states that “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 have a capital investment value of more than \$30 million” shall be classified as SSD under Division 4.7 of the EP&A Act.</p> <p>The Project has a capital investment value estimated to be greater than \$30 million, and therefore is deemed SSD.</p> <p>The Minister for Planning and Public Spaces is the consent authority for SSD applications. SSD applications are assessed by DPE, and in some cases the Minister may delegate decision making to Department staff. However, the Independent Planning Commission (IPC) is the consent authority for SSD applications where specific conditions occur.</p>
Permissibility	<p>The Project Site is primarily located within the Dubbo Regional Council LGA and is subject to the Wellington LEP 2012 and the Mid-Western LEP 2012.</p> <p>The Project Site is situated on land zoned as RU1 (Primary Production). Within this zone, Electricity Generation is not permitted. However, pursuant to clause 36(1b) of the Transport and Infrastructure SEPP, 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, which in this case is the RU1 (Primary Production zone). Given that the Project is located on prescribed rural land (RU1), and the proposed activity is to generate electricity using wind energy, the Project is permissible with consent under clause 36(1b) of the Transport and Infrastructure SEPP.</p>
Other Approvals	<p>Consistent Approvals</p> <p>In accordance with Section 4.42 of the EP&A Act, an authorisation of the following relevant approvals cannot be refused if it is necessary for carrying out SSD that is authorised by a development consent under this Division and is to be substantially consistent with the consent:</p> <ul style="list-style-type: none"> • An Environmental Protection Licence (EPL) under Chapter 3 of the <i>Protection of the Environment Operations Act 1997</i> (POEO Act) (for any of the purposes referred to in Section 43 of the Act) • A consent under Section 138 of the <i>Roads Act 1993</i> (Roads Act). <p>EPBC Act Approval</p> <p>The Project may have the potential to have a significant impact on EPBC listed threatened species and a Referral to DAWE has been undertaken concurrently with the submission of this Scoping Report. Some MNES have been identified as potentially occurring on or near the Project Site, including Threatened Ecological Communities (TEC). If the Commonwealth determine that the Project is likely to have a significant impact on a MNES, the Project will become a ‘Controlled Action’ and assessed under the recently signed NSW Bilateral Agreement with the Commonwealth.</p>

Matter	Relevance to the Project
	<p>Dark Sky Guidelines</p> <p>A consent authority must consider the Dark Sky Guidelines under Clause 61(3) of the EP&A Regulation for development described in Schedule 4A of the Act, SSD that is likely to impact the night sky and is within 200 km of the Siding Spring Observatory. The Guideline must also be a matter of consideration for development under the EP&A Act before development consent is granted within the Dubbo LGA.</p> <p>Other Approvals</p> <p>A summary of approvals and licences that may be required for the Project prior to construction include:</p> <ul style="list-style-type: none"> • Approval under Division 2 of the EP&A Regulation • Approval under Section 138 of the Roads Act to undertake upgrade works in, on or over a public road to allow for the transportation of infrastructure • A Licence in accordance with Part 5, Division 5.6 of the <i>Crown Land Management Act 2016</i> • An EPL under Section 48 of the POEO Act for the regulation of noise pollution during both the construction and operational phases of the Project. It is noted that an EPL may also be required during the construction phase for crushing, grinding, or separating if the activity has the capacity to process more than 150 tonnes of materials per day or 30,000 tonnes of materials per year. <p>Approvals Required if this was not an SSD Project</p> <p>Although all relevant environmental impacts will be assessed in the EIS for the Project, due to the Project’s nature and being SSD, there are several approvals and licences, as listed in Section 4.41 of the EP&A Act, that are not required. These include:</p> <ul style="list-style-type: none"> • Applications for separate permits under Sections 201, 205 or 219 of the <i>Fisheries Management Act 1994</i> (FM Act) however, the offset policy still applies • Applications for separate approvals under Sections 89, 90 and 91 (other than an aquifer interference policy) of the <i>Water Management Act 2000</i> (WM Act) • An Excavation Permit under Section 139 of the <i>Heritage Act 1977</i> (Heritage Act) • An Aboriginal Heritage Impact Permit (AHIP) under Section 90 of the <i>National Parks and Wildlife Act 1974</i> (NPW Act).
<p>Pre-Condition to Exercising the Power to Grant Approval</p>	<p>No pre-conditions to exercising the power to grant approval have been identified for the Project.</p>
<p>Mandatory Matters for Consideration</p>	<p>The following Acts, Regulations and Environmental Planning Instruments (EPIs) are applicable to the Project:</p> <p>Commonwealth Legislation</p> <ul style="list-style-type: none"> • EPBC Act • <i>Native Title Act 1993</i> • RE Act • <i>Crowns Land Management Act 2016</i> <p>State Legislation</p> <ul style="list-style-type: none"> • <i>Biodiversity Conservation Act 2016</i> (BC Act) • <i>Biosecurity Act 2015</i> (Biosecurity Act) • EP&A Act • FM Act • Heritage Act • <i>Mining Act 1992</i> (Mining Act) • NPW Act • POEO Act

Matter	Relevance to the Project
	<ul style="list-style-type: none"> • Roads Act • <i>Rural Fires Act 1997</i> (RF Act) • <i>Waste Avoidance and Resource Recovery Act 2001</i> (WARR Act) • WM Act <p>State Environmental Planning Policies:</p> <ul style="list-style-type: none"> • <i>Biodiversity and Conservation SEPP 2021</i> • <i>Primary Production SEPP 2021</i> • <i>Resilience and Hazards SEPP 2021</i> • Transport and Infrastructure SEPP • Planning Systems SEPP • EP&A Regulation <p>Planning Instruments:</p> <ul style="list-style-type: none"> • Dubbo Regional Council LSPS 2020 • Mid-Western Regional LSPS 2020 • Wellington LEP 2012 • Mid-Western LEP 2012

5. Engagement

5.1. Consultation Objectives

Due to the general requirements of wind farms, such as good wind speeds, elevated land and the need to be in proximity to transmission lines, they are generally situated within rural areas close to rural dwellings and regional communities. This is known to cause conflict with local communities, who may feel they are impacted by the development, however, do not directly benefit.

Accordingly, Ark Energy's stakeholder engagement for the Project is focused on mitigating direct impacts of the Project, while at the same time creating benefits for the local community. In particular, Ark Energy's consultation has the following objectives:

- Ensure the community is fully informed about the Project and provide multiple opportunities for dialogue in various forms and opportunities for feedback
- Engage with stakeholders to understand local views, concerns and impacts and ensure the Project team are fully aware
- Incorporate feedback into the design of the Project, where possible, and outline where such feedback has been incorporated
- Build and maintain positive relationships with local communities and other stakeholders.

The Project will likely require a Voluntary Planning Agreement (VPA) with each of the local councils. The Proponent expects to enter into benefit sharing agreements with the owners of dwellings in close proximity to the Project to mitigate the expected impacts at these dwelling locations. Further details will be provided in the EIS.

5.2. Consultation Approach

In undertaking consultation for the project Ark Energy has taken guidance from:

- *Wind Energy Guideline for State Significant Wind Energy Development* (Wind Energy Guideline) (DPE 2016a)
- *Wind Energy: Visual Assessment Bulletin for State Significant Wind Energy Development* (Visual Bulletin) (DPE 2016b)
- *Wind Energy: Noise Assessment Bulletin for State Significant Wind Energy Development* (Noise Bulletin) (DPE 2016c)
- *Undertaking Engagement Guidelines for State Significant Projects* (DPIE 2021b)
- *Social Impact Assessment Guideline for State Significant Projects* (DPIE 2021c)
- *Community Engagement Guidelines for the Australian Wind Industry* (Clean Energy Council 2018)
- Australian Energy Infrastructure Commissioner's Observations and Recommendations for Community Engagement (updated 2020).

5.3. Stakeholder Identification

Ark Energy identified and consulted with the following stakeholders (Figure 6-1):

- Nearby landowners and residents
- Residents and property owners within 5 km of proposed WTG (approximately 40 property owners, see Figure 6-1)
- Residents and property owners along the proposed transport route (approximately 35 property owners).

Traditional Owners and Custodians:

- Warrabinga-Wiradjuri #7 Native Title Claimant
- Gallangabang Aboriginal Corporation
- Mudgee Local Aboriginal Council
- Wellington Local Aboriginal Council.

Government Authorities and Agencies:

- Commonwealth DAWE
- Commonwealth Department of Defence (DoD)
- NSW DPE Biodiversity and Conservation Division (BCD)
- NSW Department of Premier and Cabinet – Heritage NSW
- NSW Aboriginal Land Council (ALC)
- NSW DPE Water Group
- Water NSW
- NSW Environment Protection Authority (EPA)
- NSW Crown Lands
- NSW Crown Holiday Park Land Manager (Reflections Holiday Parks)
- Regional NSW – Mining, Exploration and Geoscience (MEG)
- Transport for NSW (TfNSW)
- NSW DPI – Agriculture Land Use and Fisheries Divisions
- Mid-Western Regional Council
- Dubbo Regional Council
- Central West Local Land Services NSW (CWLLS)
- Fire & Rescue NSW
- NSW Rural Fire Service (RFS)
- NSW Spatial Services
- Civil Aviation Safety Authority (CASA)
- Bureau of Meteorology (BoM).

Other Organisations and Stakeholders

- Airservices Australia (AsA)
- John Holland Rail / UGL Regional Linx (UGLRL) - Country Regional Network (CRN)
- TransGrid

- Mining and exploration licence holders.

5.4. Consultation Methods

Ark Energy has utilised a variety of channels, methods and techniques for its stakeholder and community consultation.

5.4.1. Direct Correspondence

Ark Energy first commenced correspondence with landowners through letters in mid-2018. Since that time direct correspondence via telephone calls and emails has been ongoing with various stakeholders. The Project has a dedicated email address info@burrendongwindfarm.com.au.

5.4.2. In Person Meetings

Dedicated meetings for key stakeholders and stakeholder groups.

5.4.3. Project Website

In early 2020 in preparation for broader community engagement Ark Energy added the Project to its website, set up dedicated web pages and acquired the domain name www.burrendongwindfarm.com.au for the Project website (Figure 5-1). The website is promoted through all communications and provides:

- Project overview and location
- Maps
- Newsletters and key documents
- Opportunity to register interest for updates via mail or email.

The website also provides a feedback form. To date eight feedback forms have been received.

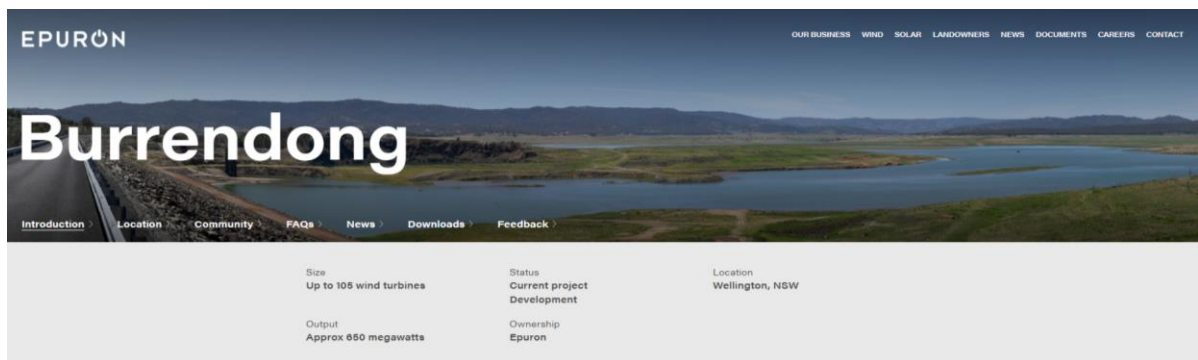


Figure 5-1: Project website landing page

5.4.4. Newsletter Updates

Produced in both print and digital formats, updates are sent to approximately 125 stakeholders and community members via mail and email, and 410 subscribers to Ark Energy's e-news via an electronic direct mail (EDM).

Content provides:

- Latest developments and project status
- Maps to show location and design
- Planning and assessment process
- Opportunities to provide input
- Project website address and contact details
- Outline of anticipated benefits.

In mid-2020 a Stakeholder and Community Engagement Plan was developed, to outline plans for broader community engagement. The Project was introduced to the broader community via a newsletter in May 2020 and subsequent updates were issued at key points in the process:

- [Burrendong Wind Farm Project Introduction, May 2020 – project description, area map, development process](#)
- [Burrendong Wind Farm Update - September 2020](#) -Scoping report lodgement, updated map with indicative layout
- [Burrendong Wind Farm Update – December 2020](#) – SEARs issued, establishment of Community Consultative Committee
- [Burrendong Wind Farm Update – September 2021](#) – Assessment work, EPBC Act decision, CCC meeting
- [Burrendong Wind Farm Update – November 2021](#) – Information sessions.

Links to download issued newsletters are available on the 'Community' page of the Project website.

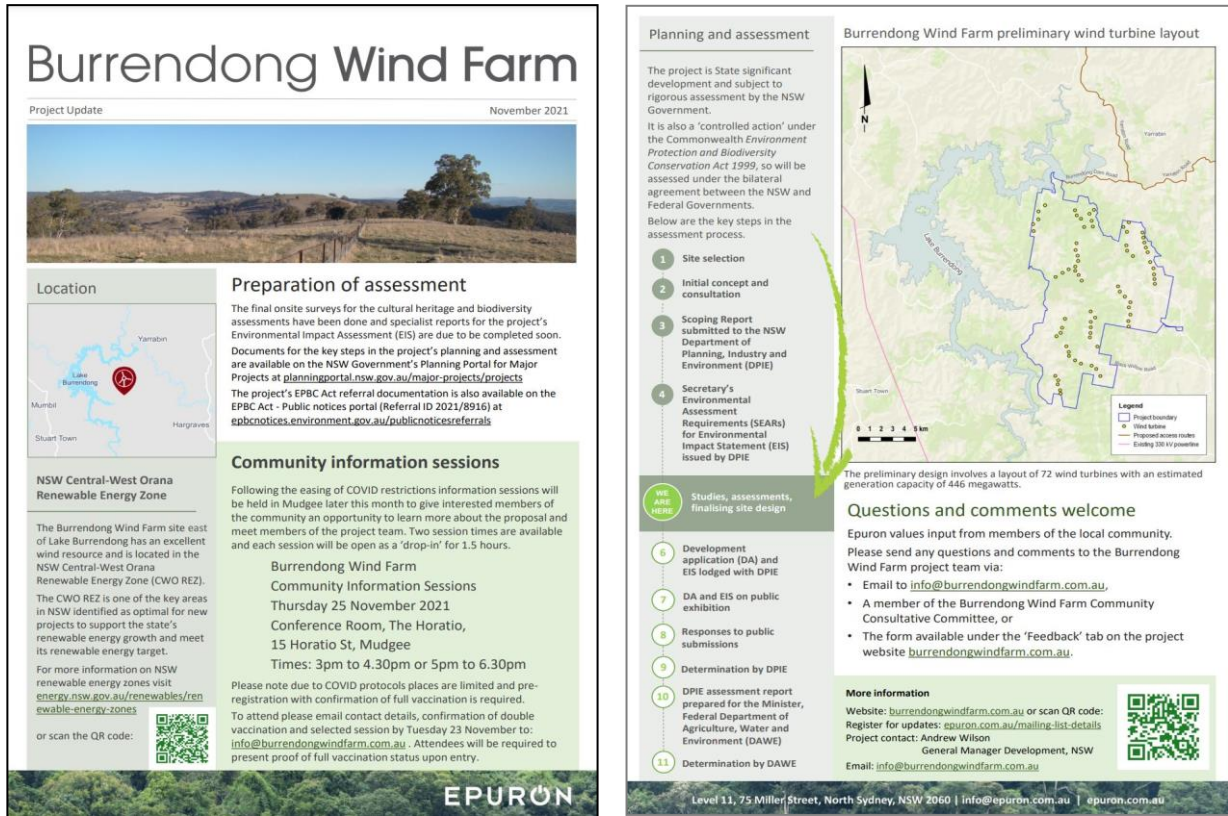


Figure 5-2: Burrendong Wind Farm update (November 2021)

5.4.5. Community Consultative Committee

Independent Chair for the Burrendong Wind Farm Community Consultative Committee (CCC) Garry West was appointed in November 2020 and Expressions of Interest for membership were invited through local newspaper advertising in the *Daily Liberal* and *Mudgee Guardian* (Figure 5-3) and the November 2020 newsletter. Members of the CCC were subsequently appointed. Members of the CCC are:

- Garry West, independent chairperson
- Bradley Bliss, stakeholder representative
- Chris Pilley, stakeholder representative
- Cr Sam Paine, Mid-Western Regional Council representative
- Heather Gough-Fuller, community member
- Jacqui Coates, community member
- James Mort, community member
- Justin Gard, community member.

The CCC has met twice in Mudgee:

- Friday 28 May 2021
- Thursday 25 November 2021.

CCC member contact details, meeting presentations and minutes are published on the 'Community' page of the Project website.

Burrendong Wind Farm

**Community Consultative Committee
Call for Expressions of Interest**

Epuron is establishing a Community Consultative Committee (CCC) for the proposed Burrendong Wind Farm, 30km south-east of Wellington.

The Burrendong Wind Farm CCC will provide an important forum for discussion between the project team and the local community, and help to ensure local residents and stakeholders are kept informed and consulted.

The NSW Department of Planning, Industry and Environment has appointed Garry West as independent chair for the committee. Mr West will oversee the member selection process and is now inviting expressions of interest from those who would like to represent the community as a member of the Burrendong Wind Farm CCC.

Interested individuals who live locally or are members of a stakeholder group (community, environment, Aboriginal or industry) are invited to apply. The role of a committee member is voluntary and members will be expected to contribute constructively to committee discussions, attend around four meetings a year, and share information on the project with the broader community.

For further information and to apply please contact Garry West for a nomination form and a copy of the CCC Guideline: 0418 215 059 or garrybwest@bigpond.com

Nominations must be received by 5pm Monday, 1 February 2021

For more information on this project visit burrendongwindfarm.com.au

EPURON

Figure 5-3: Advertisement in Daily Liberal and Mudgee Guardian (December 2021)

5.4.6. Local Infrastructure Sessions

Local drop-in information sessions were held in Mudgee on 25 November 2021 to update the community, address concerns and collect feedback (Figure 5-4). Additional information materials were developed for the session including a project backgrounder, photomontages from public viewpoints and a variety of maps. Following the sessions, the presentation, information materials and maps shared were uploaded to the project website.

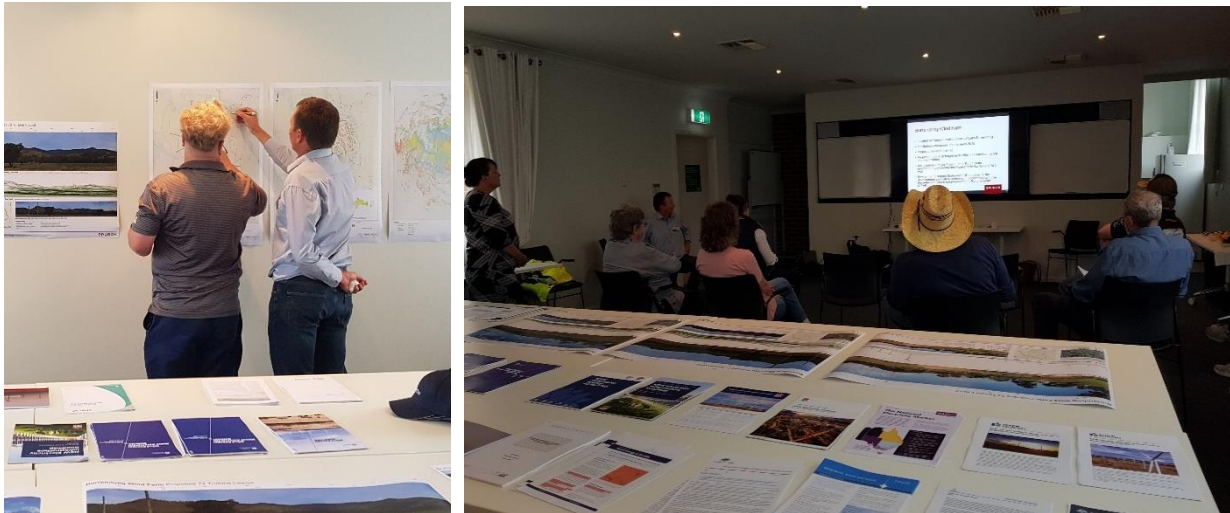


Figure 5-4: Photos from local drop-in session (25 November 2021)

5.5. Consultation and Issues Raised

Further consultation and engagement with all Project stakeholders will be ongoing during the preparation of the EIS, exhibition of the EIS and the planning assessment process. Ark Energy and its representatives have consulted and addressed the concerns of key stakeholders as set out below.

5.5.1. Landowners and Residents

A summary of the consultation undertaken to date with relevant landowners and neighbours is provided in Table 5-1.

Table 5-1: Summary of consultation undertaken to date with landowners and residents

Stakeholder	Consultation	Issues Raised
Residents and property owners with a dwelling located within 2 km of a WTG (~ 11)	<ul style="list-style-type: none"> • Phone calls • Letters • Emails • Meetings 	<ul style="list-style-type: none"> • Visual impact • Noise • Property values
Residents and property owners with a dwelling 2 to 5 km of a WTG (~33)	<ul style="list-style-type: none"> • Phone calls • Letters • Emails • Meetings 	<ul style="list-style-type: none"> • Visual impact • Property values
Residents and property owners along the proposed transport route (~34)	<ul style="list-style-type: none"> • Letters • Phone calls • Meetings 	<ul style="list-style-type: none"> • Road design • Dust • Transport times

5.5.2. Traditional Owners and Custodians

A summary of the consultation undertaken to date with relevant traditional owners and custodians is provided in Table 5-2.

Table 5-2: Summary of consultation undertaken to date with traditional owners and custodians

Stakeholder	Consultation	Issues Raised
Warrabinga-Wiradjuri #7 Native Title Claimant	<ul style="list-style-type: none"> • Emails • Phone call 	<ul style="list-style-type: none"> • Land claim

Stakeholder	Consultation	Issues Raised
Gallangabang Aboriginal Corporation	<ul style="list-style-type: none"> • Emails • Phone calls • Meeting 	<ul style="list-style-type: none"> • Heritage field survey
Mudgee Local Aboriginal Council	<ul style="list-style-type: none"> • Email • Meeting 	<ul style="list-style-type: none"> • Heritage field survey • Land claims
Wellington Local Aboriginal Council	<ul style="list-style-type: none"> • Email 	<ul style="list-style-type: none"> • Heritage field survey

5.5.3. Government Authorities and Agencies

In accordance with the SEARs, the following Government agencies were required to be consulted with:

- Dubbo Regional Council
- Mid-Western Regional Council
- DPE – BCD
- Department of Premier and Cabinet - Heritage
- DPE – Water Group
- WaterNSW
- EPA
- Crown Lands
- Regional NSW –MEG
- DPI – Agriculture and Fisheries divisions
- John Holland Rail
- TfNSW
- TransGrid
- Department of Finance, Services, and Innovation – Telco Authority
- CWLLS
- Fire & Rescue NSW
- NSW RFS
- DoD
- CASA
- AsA.

A summary of the outcomes of all consultation undertaken to date is outlined in Table 5-3 and Table 5-4.

Table 5-3: Consultation to date with government authorities and agencies

Stakeholder	Consultation	Issues Raised
Commonwealth DAWE	Meetings, emails	Controlled Action
Commonwealth DoD	Email	WTG lighting
NSW DPE	Scoping meeting on 10 Dec 2019 Phone calls	Zoning Cumulative impacts

Stakeholder	Consultation	Issues Raised
		Access routes & road upgrades
DPE - BCD	Meetings	SEARs requirements for hydrology and biodiversity
WaterNSW	Correspondence Emails	Dwelling locations
NSW Crown Lands	Meetings	Access & Land tenure
NSW Crown Holiday Park Land Manager - Reflections Holiday Parks	Meetings, phone calls	Land tenure Worker accommodation
NSW ALC	Phone call	Land claims process
Regional NSW – MEG	Current mining & exploration licences in the area	Consultation with licence holders
TfNSW	Emails	Traffic and transport
MWRC	Meeting Emails	Transportation route Socio-economic impacts Water consumption Neighbour engagement Dwelling Das Aerodrome operations
DRC	Meeting Emails	Zoning Aerodrome operations
NSW RFS	Email	Aerial firefighting.
NSW Spatial Services	Meeting & emails regarding trig stations	Physical impacts
CASA	Email	Aviation
BoM	Email	Weather radar

Table 5-4: Consultation to date with other organisations and stakeholders

Stakeholder	Consultation	Issues Raised
AsA	Email	Airspace procedures Communication with Mudgee Airport Operator
TransGrid	Preliminary connection enquiry June 2018 Updated connection enquiry Sep 2021	-
Mining and exploration licence holders	Correspondence sent 17 Aug 2021	Nil

5.5.4. Other Feedback

During consultation activities, in particular direct correspondence, online feedback forms, local information sessions and through the CCC, the project team has received feedback from community members on several issues.

5.5.4.1. Roads, Modifications and Traffic Management

Interest regarding the transport route, road upgrades required and concerns about dust and traffic management during construction.

5.5.4.2. Noise

Queries about the audibility of WTGs during operation. A noise contour map was produced and shared with the community.

5.5.4.3. Landscape and Visual Amenity

Concerns about changes to views.

5.5.4.4. Aboriginal and Cultural Heritage

Early concerns that areas were adequately assessed and emphasis on the importance of comprehensive assessment.

5.5.4.5. Property Values

Concerns about whether the proposal may affect the resale value of property.

5.5.4.6. Community Benefits

Opportunities for broader community benefits and how they might be administered.

6. Proposed Assessment of Impacts

6.1. Preliminary Environmental Risk Assessment

A preliminary environmental risk assessment has been undertaken for all potential environmental impacts that may need to be considered within the EIS for the Project. The preliminary risk rating is the risk rating prior to detailed assessment, or any mitigation being applied and is therefore precautionary and worst-case for the purposes of this Scoping Report. The preliminary environmental risk assessment has been based upon experience with other wind farm approvals, together with a preliminary assessment of the Project Site, to identify the key issues to be assessed in relation to the Project. The preliminary environmental risk assessment also included a review of the SEARs for wind farm projects.

Table 6-1 summarises the results of the preliminary environmental risk assessment, and outlines the potential impacts and risks, as well as all assessments (including specialist assessments) that will be completed to assess and minimise environmental risk during the completion of the EIS. Furthermore, Section 6.2 provides further details with respect to the environmental and social matters and associated receptors that could be potentially impacted by the Project, as well as providing a preliminary assessment of the scale of impacts, nature of impacts and sensitivity of the receiving environment.

Table 6-1: Preliminary risk assessment summary

Environmental Factor	Phase (construction, operation)	Potential Impact	Likelihood ³	Consequence ⁴	Risk ⁵	Further studies required / Potential mitigation measures
Biodiversity	Construction	Disturbance of terrestrial and aquatic vegetation	Almost certain	Moderate	Moderate	Further studies required: <ul style="list-style-type: none"> During the EIS, undertake assessment in accordance with the Biodiversity Assessment Methodology (BAM) including offsetting, if required. Potential mitigation measures: <ul style="list-style-type: none"> Develop a Biodiversity Management Plan for the Project. Undertake pre-clearance surveys by a suitably qualified ecologist. Avoid where possible areas of high ecological sensitivity
		Disturbance/loss of habitat	Almost certain	Moderate	Moderate	
		Indirect impacts of the Project e.g., light, noise, spread of weeds/pests	Almost certain	Moderate	Moderate	
Aboriginal heritage	Construction	Potential to impact on previously unrecorded Aboriginal objects, sites, or culturally modified trees.	Possible	Moderate	Moderate	Further studies required: <ul style="list-style-type: none"> During the EIS, undertake an Aboriginal Cultural Heritage Assessment (ACHA) in accordance with the <i>Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW</i> (OEH 2011), the <i>Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales</i> (DECCW 2010a), and the <i>Aboriginal cultural heritage consultation requirements for proponents</i> (DECCW 2010b). The ACHA should be conducted by a qualified archaeologist. Potential mitigation measures: <ul style="list-style-type: none"> Design and ground disturbance will be undertaken to minimise impact to heritage items if identified within the Project Site. Develop an unexpected finds protocol for Aboriginal artefacts to be incorporated into the Construction Environmental Management Plan (CEMP) for the Project.
Historic heritage	Construction	Potential to impact on previously unknown historical archaeological relics.	Unlikely	Minor	Minor	Further studies required: <ul style="list-style-type: none"> A preliminary Historic Heritage assessment should be conducted during the EIS to establish the potential impacts and likelihood of previously unidentified historical archaeological relics being present within the Project Site. This should include a review of historic aerial images, parish maps, and relevant reports of the area. Potential mitigation measures: <ul style="list-style-type: none"> Develop an unexpected finds protocol for historical heritage items to be incorporated into the CEMP for the Project.
Visual amenity	Construction and Operation	Reduction in visual amenity from visible WTGs	Almost certain	Moderate	Moderate	Further studies required: <ul style="list-style-type: none"> Undertake Landscape and Visual Impact Assessment as part of the EIS in accordance with the Visual Bulletin (DPE 2016b). Potential mitigation measures: <ul style="list-style-type: none"> Concept design to minimise visual impact. Establish vegetation planting to provide visual screening.
		Impact on scenic/landscape character	Likely	Minor	Moderate	
		Shadow Flicker Disturbance	Possible	Minor	Minor	

³Likelihood – Unlikely, possible, likely, almost certain⁴Consequence – Negligible, minor, moderate, high, extreme⁵Risk – Negligible, minor, moderate, extreme

Environmental Factor	Phase (construction, operation)	Potential Impact	Likelihood ³	Consequence ⁴	Risk ⁵	Further studies required / Potential mitigation measures
Water and Soil	Construction and Operation	Reduction in water quantity, flooding, and disturbance to waterways	Almost certain	Minor	Minor	<p>Further studies required:</p> <ul style="list-style-type: none"> Undertake a water quality and aquatic ecology assessment as part of the EIS. <p>Potential mitigation measures:</p> <ul style="list-style-type: none"> If creek lines within the Project Site require crossing for infrastructure, Project design will consider <i>DPI Guidelines for Controlled Activities on Waterfront Land (2018)</i>, <i>Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (DPI 2003)</i>, and <i>Policy & Guidelines for Fish Habitat Conservation & Management (DPI 2013)</i>. Prepare a CEMP prior to any construction works to address measures to be adopted to minimise impacts on the environment as a result of the construction works, including soil erosion and compaction and the protection of water resources. Implement sediment and erosion control measures prior any construction work. Acquire water access licence if necessary. Inspect erosion controls regularly and after rainfall. Fix damaged controls immediately.
Bushfire	Construction and Operation	Potential for bushfire starting from construction activities or potential for construction to be affected by an external bushfire. Potential for bushfire starting within the Site due to vegetation or electrical malfunction or to be affected by an external bushfire.	Possible	High	Moderate	<p>Further studies required:</p> <ul style="list-style-type: none"> Undertake a Bushfire Risk Assessment during the EIS in accordance with <i>Planning for Bush Fire Protection (PBP), A guide for councils, planners, fire authorities and developers 2019 (NSW RFS 2019)</i> <p>Potential mitigation measures:</p> <ul style="list-style-type: none"> Development of a Bushfire Management Plan. Incorporate appropriate emergency vehicle access into Project design. Incorporate infrastructure setbacks from the Project Site boundary that will form APZ.
Aviation	Operation	Potential for WTGs to impact flight paths and aerial operations including aerial firefighting operations	Possible	Moderate	Minor	<p>Further studies required:</p> <ul style="list-style-type: none"> Undertake an Aviation Impact Assessment during the EIS phase <p>Potential mitigation measures:</p> <ul style="list-style-type: none"> Consult with AsA to determine changes required to allow aircraft operations remain safely above the Project Provide details of the Project to AsA to allow confirmation that the Project does not interfere with communication, surveillance, or navigation systems Publish the layout of the Project in aeronautical publications and charts to ensure pilots consider the layout in their flight planning Install obstacle marking and lighting on WTGs where required
Telecommunications		Potential to impact on point-to-point communication links through near-field effects, diffraction, and reflection or scattering effects	Possible	Minor	Minor	<p>Further studies required:</p> <ul style="list-style-type: none"> Undertake a Telecommunications Impact Assessment during the EIS phase <p>Potential mitigation measures:</p> <ul style="list-style-type: none"> Avoid locating construction equipment closer than 500 m from dwellings Prior to construction, locate all survey marks and establish no-go areas Prepare contingency plan for emergency communications in the vicinity of the WTGs
Noise	Construction and Operation	Noise impacts during the construction and operational phase.	Likely	Negligible	Minor	<p>Further studies required:</p> <ul style="list-style-type: none"> Undertake a Noise and Vibration Impact Assessment as part of the EIS. <p>Potential mitigation measures:</p> <ul style="list-style-type: none"> The construction work hours will be in accordance with the Interim Construction Noise Guideline (DECC 2009): <ul style="list-style-type: none"> Monday to Friday 7.00am to 6.00pm. Saturday 8.00am to 1.00pm; and

Environmental Factor	Phase (construction, operation)	Potential Impact	Likelihood ³	Consequence ⁴	Risk ⁵	Further studies required / Potential mitigation measures
		Increased traffic noise are a result of the construction and operation phases	Likely	Minor	Minor	<ul style="list-style-type: none"> ○ No work on Sunday or public holidays. • Should construction work be proposed outside of these hours, consultation with affected residents will be undertaken. • Equipment will be well maintained and will have noise mufflers if appropriate. • Orient equipment such that offensive noise carries away from residential receivers. • Implement all feasible and reasonable work practices to minimise construction noise impacts. • Maintain complaints line. • Design should ensure that noise levels will be acceptable at sensitive receptors during the operational phase of the Project.
Traffic and access	Construction	Additional vehicles on local roads	Almost certain	Moderate	Moderate	<p>Further studies required:</p> <ul style="list-style-type: none"> • Undertake a Traffic and Transport Impact Assessment as part of the EIS. <p>Potential mitigation measures:</p> <ul style="list-style-type: none"> • Prepare of a Traffic Management Plan (TMP).
Land use and soils	Construction and Operation	Soil erosion of the Project Site as a result of exposure of soils during the construction phase. Soil erosion of the Project Site as a result of exposure of soils due to poor vegetation management during the operational phase.	Possible	Minor	Minor	<p>Further studies required:</p> <ul style="list-style-type: none"> • Undertake a soils and land use impact assessment as part of the EIS. • Undertake a Land Use Conflict Risk Assessment (LUCRA) during the EIS. <p>Potential mitigation measures:</p> <ul style="list-style-type: none"> • Prepare a CEMP prior to any construction works to establish measures to be adopted to minimise impacts on the environment as a result of the construction works, including soil erosion and compaction. • Implement sediment and erosion control measures prior to any construction work. • Inspect erosion controls regularly and after rainfall. Fix damaged controls immediately. • During construction, stockpiling of materials will be carried out away from any waterways and sensitive areas. • Where appropriate, revegetate with fast growing ground cover species to stabilise the soil immediately after construction ceases. • Stabilise disturbed areas such as stockpiles as soon as possible using geotextile fabric if they are to be exposed for extended periods of times. • Re-schedule construction work as appropriate during periods of heavy rain. • Prepare an Operational Environmental Management Plan (OEMP) prior to operations to be adopted to minimise impacts on the environment as a result the Projects operational activities including soil erosion and compaction.
	Construction	Incidental discovery of soil contamination	Unlikely	Minor	Minor	<ul style="list-style-type: none"> • If potential contamination is discovered stop work and inform the project manager. • Any soils identified during construction work that are discoloured or odorous, include asbestos or other anthropogenic materials should be segregated for further assessment and characterisation by an appropriately experienced environmental consultant.
	Construction and Operation	Accidental contamination of soil as a result of a chemical spill	Possible	Minor	Minor	<ul style="list-style-type: none"> • Keep a functioning 'spill kit' on site at all times for clean-up of accidental spills. • Include a spill response process within the CEMP and OEMP. • If storage of chemicals and fuels are required these should be stored within designated bunded areas, identified with appropriate signage. • Record all stored chemicals on a register with their MSDS's. • Ensure all tools and machinery are in good working order and without fuel, oil, or hydraulic leaks. Repair or remove equipment immediately.
	Construction and Operation	Land use capability – loss of productive soils during construction and use of and removal of rural land for the Project	Almost certain	Minor	Minor	<ul style="list-style-type: none"> • Develop a Decommissioning Management Plan that will have an objective of returning the land capability to its pre-existing agricultural capacity.

Environmental Factor	Phase (construction, operation)	Potential Impact	Likelihood ³	Consequence ⁴	Risk ⁵	Further studies required / Potential mitigation measures
Social	Construction	Localised impacts on physical and mental health from air pollution, water pollution and noise during construction.	Possible	Minor	Minor	Further studies required: <ul style="list-style-type: none"> • Undertake a Social Impact Assessment as part of the EIS. • Undertake a Traffic and Transport Assessment as part of the EIS. • Undertake a Bushfire Risk Assessment during the EIS. • Potential mitigation measures: • Development of a Consultation Strategy.
	Construction and Operation	Safety impacts through increased traffic on local roads during construction, and potential for bushfire during construction and operation	Almost certain	Moderate	Moderate	
Economic	Construction	Use of local natural resources during construction	Unlikely	Minor	Minor	Further studies required: <ul style="list-style-type: none"> • Undertake an Economic Assessment as part of the EIS. • Potential mitigation measures: • Implement a 'buy local' practice where goods and services can be purchased from local businesses. • Advertise construction jobs locally.
	Construction and Operation	Decreased land value as a result of the Project	Possible	Minor	Minor	
Air quality	Construction	Dust and exhaust emissions during the construction.	Almost certain	Minor	Minor	Potential mitigation measures: <ul style="list-style-type: none"> • Prepare a CEMP prior to any construction works to establish measures to be adopted to minimise impacts on the environment as a result of the construction works, including dust and exhaust emissions. • Monitor work areas for dust generation and spray water to suppress dust if required. • Minimise use of machinery for required activity only. • Ensure all plant and equipment used for the project are maintained regularly and operated in a proper and efficient manner.

6.2. Preliminary Environmental Assessment

A preliminary environmental assessment has been carried out in conjunction with the preliminary environmental risk assessment (Section 6.1) to identify the environmental and social matters that will require further assessment during the EIS. The level of assessment that will be carried out for each environmental and social matter as part of the EIS has also been identified. In accordance with the *State Significant Development Guidelines – Preparing a Scoping Report (Appendix A)* (DPIE 2021a), the following factors have been considered in the identification of environmental and social matters needing further assessment for the Project:

- The scale and nature of the likely impact of the Project and the sensitivity of the receiving environment (including the likely receptors to be potentially impacted)
- Whether the Project is likely to generate cumulative impacts with other relevant future projects in the locality
- The ability to avoid, minimise and/or offset the impacts of the Project, to the extent currently investigated through the preliminary assessment.

This Section presents the identified environmental and social matters requiring further assessment and the proposed approach for further assessment within the EIS. The environmental and social matters have been categorised as per the categories identified in the *State Significant Development Guidelines – Preparing a Scoping Report (Appendix A)* (DPIE 2021a).

The level of assessment required for each environmental and social matter, as per Appendix D of the *State Significant Development Guidelines – Preparing a Scoping Report (Appendix A)* (DPIE 2021a) is outlined in Table 6-2.

Table 6-2: Level of assessment required for each environmental / social matter

Level of Assessment	Environmental / Social Matter
Detailed	<ul style="list-style-type: none"> • Biodiversity (Native Vegetation, Fauna and Aquatic Ecology) • Heritage (Aboriginal and Historic) • Water (Hydrological Flows, Surface and Groundwater Quality and Water Availability) • Amenity (Landscape and Visual and Noise and Vibration) • Traffic and Transport (Property Access and Road Network) • Hazards (Bushfire, Aviation and Telecommunications) • Social (Health, Safety, Housing Availability and Community Benefits) • Economic (Natural Resource Use, Livelihood, Opportunity Cost and Economic Benefits)
Standard	<ul style="list-style-type: none"> • Air (Particulate Matter, Gases and Atmospheric Emissions) • Land (Stability, Topography, Geology and Land Capability) • Hazards (Climate Change, Public Health and Blade Throw) • Waste (Resource Use and Waste Management)

6.2.1. Landscape and Visual Amenity

A Preliminary Visual Impact Assessment (PVIA) has been prepared by Moir Landscape Architects (Moir 2022) in accordance with the Visual Bulletin and is provided in Appendix A. Preliminary assessment tools have been used to provide an early indication of where WTGs require careful consideration because of potential visual impacts. The tools apply to both dwellings and key public viewpoints in the study area. The tools are not determinative and are not designed to provide a ‘yes’ or ‘no’ answer as to whether particular WTGs are acceptable. Rather the tools provide an early indication of where placement of WTGs will require further assessment and justification, and where consultation with potentially affected landowners needs to be focused – including discussions for landholder agreements.

6.2.1.1. Existing Environment

The Project is located approximately 30 km southeast of Wellington and 75km southeast of Dubbo, within the Central West Orana region of NSW. The landscape is generally undulating, rolling hills to steep, rocky slopes.

Landscape Values

A Community Survey of Landscape Values was undertaken to assist in identifying key landscape values. The survey was included within a newsletter for the Project, which was circulated to 82 Project stakeholders by letter or email including neighbouring landowners with dwellings located within 3.35 km, and was also available on the Project website.

Five responses were received to the landscape value survey. The landscape value survey sought to gauge what is most valued in the local area, and to gain an understanding of the community’s perception of key landscape features, areas of scenic quality and key public viewpoints within the study area.

The three most highly valued aspects associated with the landscape from the local community, in order of importance, were:

1. Community and people
2. Farming and agriculture
3. Landforms and terrain.

Respondents overwhelmingly supported renewable energy investment in the local area and when asked about what impact the Project was perceived to have on the visual landscape within the area, most respondents felt the impacts would be positive or neutral.

There were a number of important public viewpoints within the local area that were listed in the responses, including:

- Likely the higher “tops” west of the village of Hargraves, Burrendong recreation / Arboretum areas and within the lake
- Wilderness landscape without wind farms
- The scenic drives of Hill end road, Black Willow Road, Wallawaugh Road and Gundowda Road
- From the high country looking west and from the Dam looking east
- Foreshores of Burrendong dam.

Landscape Character Unit Classification

The Project has a similar landscape character throughout, with subtle variations in the landscapes geology, topography, land use and vegetation. As part of the Preliminary Landscape Character Assessment and assisted by the landscape value survey (through assigning visual significance to local landscape features and areas), the landscape has been classified into seven (7) key landscape typologies. In accordance with the Visual Bulleting (DPE 2016b), each Landscape Character Unit (LCU) was also assigned a scenic quality rating of low, moderate, or high to assist in defining the Visual Influence Zones (VIZ).

Scenic Quality Class Rating

Table 6-3 summarises the Scenic Quality Class Ratings determined by Moir Landscape Architecture (2022) across seven LCUs following consultation with the community. The Scenic Quality Class rankings were determined following community input on the importance of key landscape features within the area.

Table 6-3: Summary description of LCUs within Study area (Moir 2022)

LCU Number	Landscape Character Unit (LCU)	Description	Scenic Quality Class
LCU01	1. Yarrabin / Hargrave Hills	Steep ridgelines with vegetated hill slopes that span across the Study Area associated with Yarrabin and Hargraves. The Project Site is located within this LCU.	Moderate
LCU02	2. Yarrabin / Hargrave Farmlands	Gently undulating landscapes associated with Yarrabin and Hargraves that have been cleared for grazing pastures and other agricultural activity.	Low – Moderate
LCU03	3. Lake Burrendong	Lake Burrendong LCU is defined as the waterway and foreshore associated with Lake Burrendong.	Moderate
LCU04	4. Cudgegong River Valley	Cudgegong River Valley includes the Cudgegong River and associated valley, typically to the north of Lake Burrendong.	Moderate
LCU05	5. Yarragal / Twelve Mile	Yarragal / Twelve Mile is generally defined as the largely uninhabited hills to the north of the Project Site associated with Yarragal and Twelve Mile. Land in this area is associated within the visual catchment of the approved Ungula Wind Farm (UWF).	Moderate
LCU06	6. Mumbil	Typically the vegetated hills to the west of Lake Burrendong. Land is largely uninhabited with the exception of small settlements at Mumbil and Stuart Town.	Low
LCU07	7. Worlds End	Worlds End is a small LCU defined by the valley defined as Worlds End. Land is typically characterised by a valley floor with dwelling utilised as weekenders.	Moderate

6.2.1.2. Potential Impacts

Table 6-4: Potential landscape and visual amenity impacts as a result of the Project

Project Phase	Potential Impact	Receptor(s)	Does the Impact Need Assessment in the EIS?	Consultation Required?
Construction	Visible construction to potential nearby receivers, including private dwellings, in particular the construction of WTGs	Residences and Community	Yes	Yes
	Visible construction to potential nearby receivers, including private dwellings, in particular the construction of access roads to the Project site	Residences and Community	Yes	Yes
Operation	Development of permanent above ground structures, primarily WTGs, as well as internal roads, substations, and ancillary infrastructure, altering the existing landscape views and settings	Residences and Community	Yes	
Cumulative	The Project is located within the New England REZ with multiple other renewable energy projects within XX km, with the potential of multiple wind farms to alter the overall landscape character.	Residences and Community	No	No
	Potential for a number of renewable energy projects to be viewed in succession as travellers move through the landscape	Community and General Public	Yes	No

6.2.1.3. Preliminary Assessment

The preliminary assessment involves analysis of two key visual parameters:

- Visual Magnitude Assessment (Preliminary Assessment Tool 1)
- Multiple Wind Turbine Tool (Preliminary Assessment Tool 2)

Visual Magnitude Assessment (Preliminary Assessment Tool 1)

The Visual Magnitude threshold is based on the height of the proposed WTGs to the tip of the blade and distance from dwellings or key public viewpoints. The proposed WTGs are based on a worst-case scenario with a tip height of 250 metres. For the purpose of the PVIA, the Visual Magnitude thresholds are based on a 2D assessment of the Project alone. Further assessment may indicate factors such as topography, relative distance and existing vegetation may minimise or eliminate the impacts of the Project from residences (Moir 2022).

Based upon the preliminary Visual Magnitude assessment, 23 non-involved dwellings have been identified within 3,350 m of a proposed WTG location, and 21 non-involved dwellings are located within 3,350 - 4,950 m of a proposed WTG. Ground truthing of dwellings and discussions with landowners have identified seven (7) of the identified dwellings are unoccupied shacks, huts or weekenders. For the purpose of the PVIA, these are referred to as 'weekenders' (Moir 2022).

Figure 6-1 identifies the proposed WTG locations, receptors locations, and illustrates the results of the visual magnitude assessment.

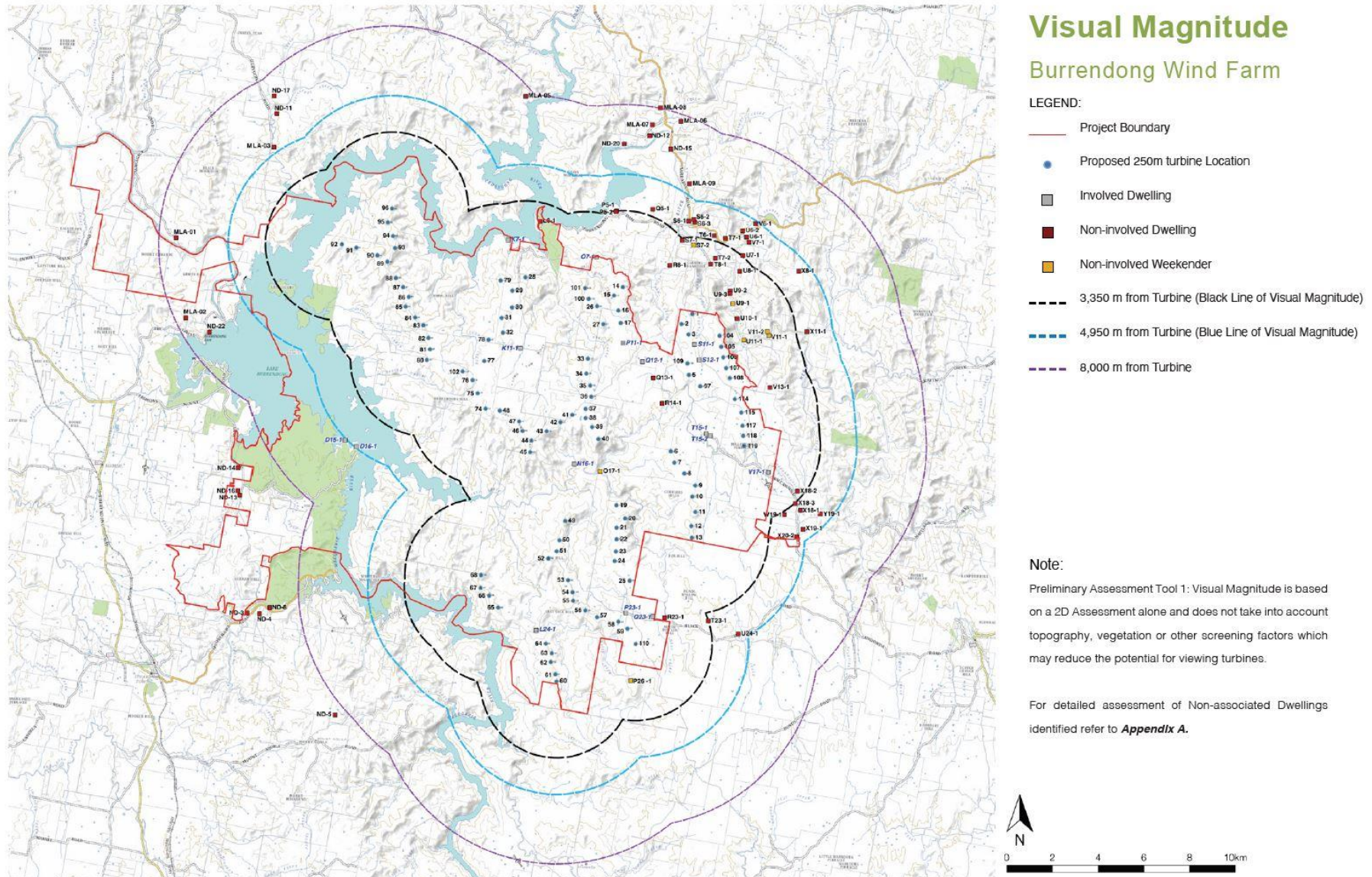


Figure 6-1: Visual magnitude analysis (Moir 2022)

Multiple Wind Turbine Assessment (Preliminary Assessment Tool 2)

This assessment provides a preliminary indication of potential cumulative impacts arising from the proposed wind turbines on the non-associated dwellings and key public viewpoints located within 3,350 m of the proposed WTG locations. The Multiple Wind Turbine Tool considers turbines visible within 60° view sectors and located within a distance of 3,350 m of the receptor location.

The 2D Multiple Wind Turbine Tool identified 11 non-associated dwellings with WTGs located in three (3) or more 60° sectors. The assessment has taken into account the WTGs associated with the approved UWF.

The PVIA has determined that ten (10) non-associated receptors may have views towards WTGs within three (3) or more 60° sectors. These include:

- Four (4) non-involved dwellings had WTGs located within up to three (3) 60° sectors (one of these dwellings takes into account WTGs associated with UWF)
- Four (4) non-involved dwellings had WTGs located within up to four (4) 60° sectors (all four take into account WTGs associated with UWF)
- Two (2) dwellings had WTGs located within up to six (6) 60° sectors.

In addition to the ten (10) non-associated receptors, one (1) weekender had WTGs within up to five (5) 60° sectors.

Table 6-5: Non-involved dwellings identified as having WTGs in multiple 60° sectors by the Multiple Wind Turbine Tool

ID	Distance to Nearest WTG	Number of 60° Sectors	Notes
Non-involved dwellings with WTGs in up to three (3) 60° Sectors (up to 180°) (Based on 2D Assessment)			
R23-1	1.692 km	Nil	Screened by vegetation.
MLA-05	7.648 km	One	Takes into account UWF WTGs. The Project WTGs within 8 km are screened by vegetation.
R8-1	2.259 km	One	Turbines screened by topography.
T23-2	3.55 km	Two	Turbines screened by topography.
Non-involved dwellings with WTGs in up to four (4) 60° Sectors (up to 240°) (Based on 2D Assessment)			
L6-1	2.646 km	Three	Takes into account UWF WTGs and is likely to be reduced by vegetation.
ND-11	6.43 km	Three	Takes into account UWF WTGs.
ND-17	7.15 km	Three	Takes into account UWF WTGs.
MLA-03	5.203 km	Two	Takes into account UWF WTGs.
Non-involved dwellings with WTGs in up to five (5) 60° Sectors (up to 300°) (Based on 2D Assessment)			
O17-1 ⁶	1.423 km	One	Topography reduces visible WTGs to one (1) sector.
Non-involved dwellings with WTGs in up to six (6) 60° Sectors (up to 360°) (Based on 2D Assessment)			
Q13-1	1.586 km	Three	WTGs screened by topography and vegetation.

⁶ Denotes weekender / hut accommodation

ID	Distance to Nearest WTG	Number of 60° Sectors	Notes
R14-1	1.964 km	Three	WTGs screened by vegetation.

Detailed assessment of dwellings with turbines in multiple 60° sectors associated with the Project will be undertaken within the EIS.

Zone of Visual Influence

Although not stipulated as a preliminary assessment tool (DPE 2016b) a preliminary Zone of Visual Influence (ZVI) was computed for the Project to visualise the potential number of WTGs that may be visible from dwellings and key public viewpoints.

ZVI mapping is based on a locally available Digital Elevation Model (DEM) provided by the NSW Government, comprising a mosaic of 1m, 2m and 5m cell resolution. The ZVI mapping assumes a bare-earth model (where buildings, infrastructure, and vegetation does not obscure views). Figure 6-2 shows the result of the analysis.

Cumulative Visual Impacts

The Project is located within the Central-West Orana REZ, and there are seven (7) proposed, approved and constructed wind farms within 100 kilometres of the Project. The approved UWF is the closed approved wind farm, and gained development consent in May 2021, for 97 WTGs with a blade tip height of up to 250 metres. The UWF is sited north of the Cudgegong River, the nearest WTG is 3.86 km north of the Projects northern most WTG (WTG 96). Due to the relatively close proximity of the approved UWF to the Project, a detailed assessment of the potential cumulative visual impact has been undertaken.

To assist in the cumulative visual impact assessment, a ZVI has been prepared to illustrate areas from which there is the potential to view both Projects (based on topography alone). The ZVI demonstrates areas of land from which WTGs associated with the UWF and the Project or potential to view both Projects simultaneously (Figure 6-3).

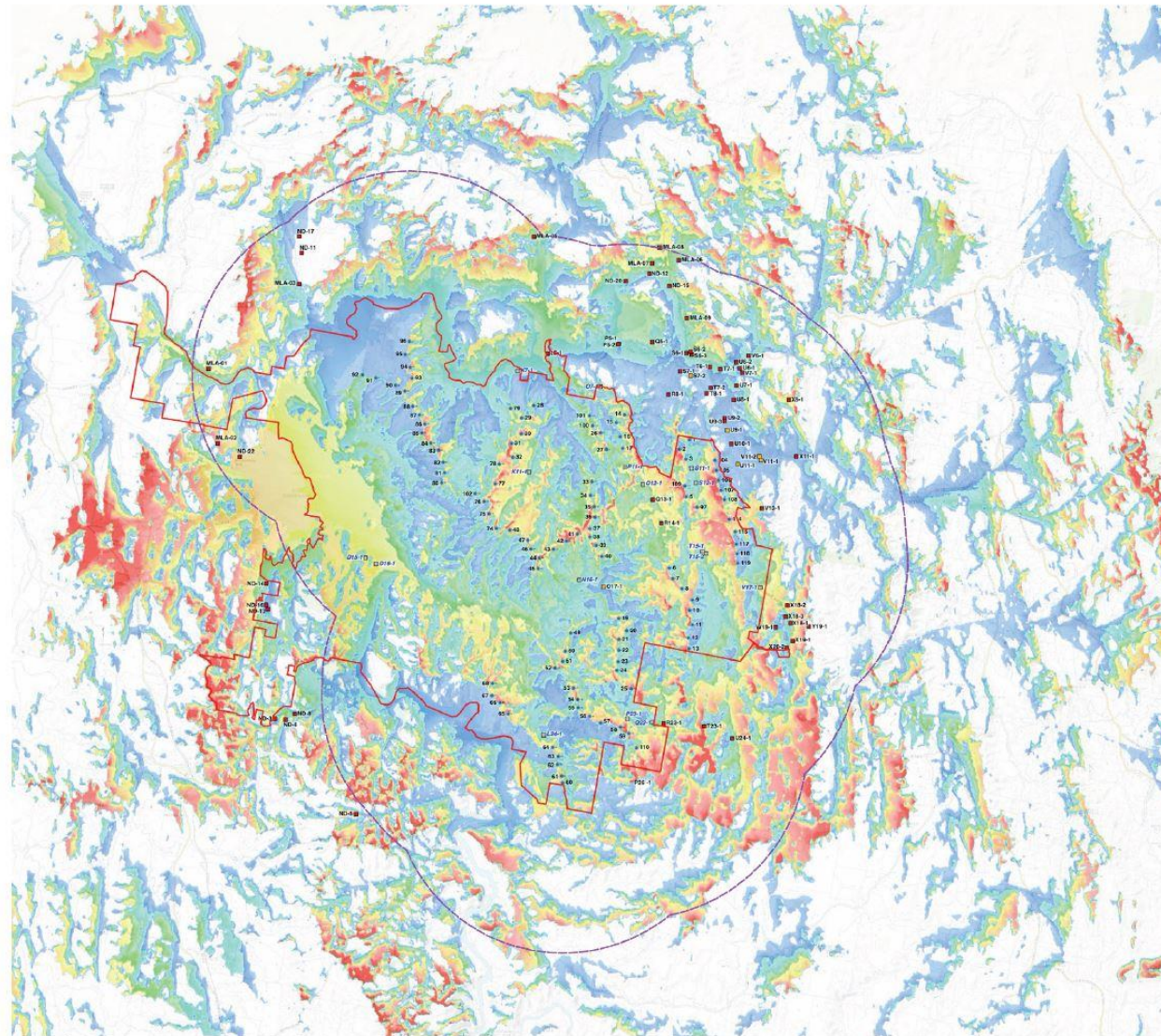
In accordance with the Preliminary Assessment Tool: 2 Multiple Wind Turbine Tool, an 8 km radius has been applied to each Project to identify dwellings and viewpoints within 8 km of both Projects. Six (6) non-involved dwellings are located within 8 km of both the UWF and the Project.

The ZVI indicates that of the six (6) non-involved dwellings identified, only three (3) dwellings have the potential to view both Projects (L6-1, MLA-03 and MLA-05). A detailed assessment of these dwellings will be undertaken in the EIS Phase of the Project.

6.2.1.4. EIS Assessment Approach

A Landscape and Visual Impact Assessment will be undertaken in accordance with the Visual Bulletin (DPE 2016) and prepared and included in the EIS to address impacts to non-involved dwellings and the broader community. The assessment will include a baseline study, establish visual influence zones from viewpoints, assess the proposed layout against visual performance objectives and provide a justification for the final proposed layout along with mitigation measures that can be undertaken to minimise potential visual impacts as a result of the Project.

Zone of Visual Influence Blade Tip Height: 250 m Burrendong Wind Farm



LEGEND

- Project Boundary
- Proposed Turbine Location
- Involved Dwelling
- Non-involved Dwelling
- 8,000 m from nearest turbine

ZVI Legend:

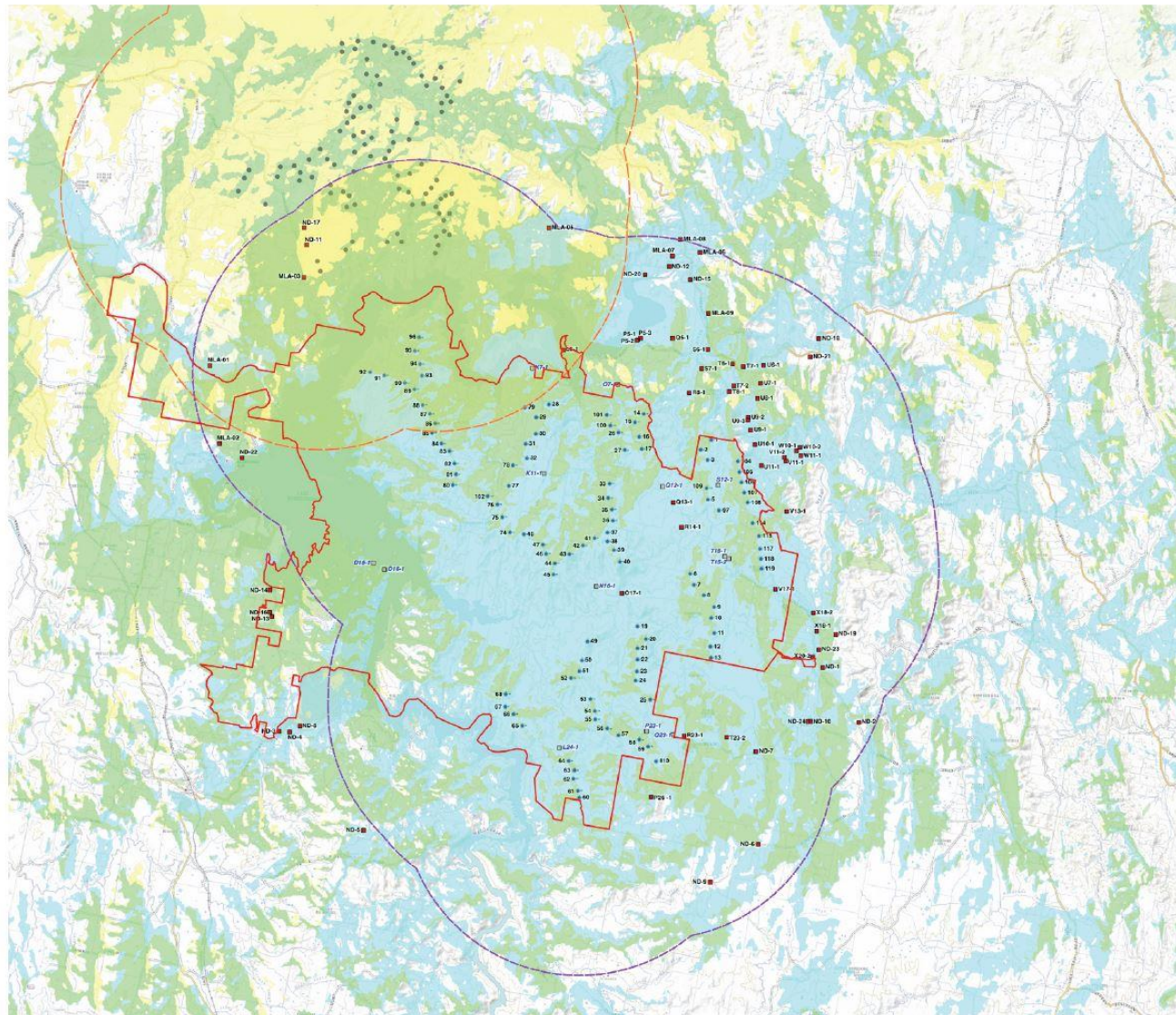
	1 - 17
	18 - 35
	36 - 53
	54 - 71
	72 - 89
	90 - 105

Note:

The ZVI is a preliminary assessment tool that represents a bare ground scenario - i.e. a landscape without screening, structures or vegetation. As accurate information on the height and coverage of vegetation and buildings is unavailable, it is important to note the ZVI is based solely on topographic information. Therefore this form of mapping should be acknowledged as representing the worst case scenario.



Figure 6-2: Zone of visual influence (Moir 2022)



Cumulative Zone of Visual Influence

Burrendong & Uungula Wind Farms

LEGEND

- Project Boundary
- Proposed Burrendong Turbine Location
- Proposed Uungula Turbine Location
- Involved Dwelling
- Non-involved Dwelling
- 8,000 m from nearest Burrendong turbine
- 8,000 m from nearest Approved Uungula turbine

ZVI Legend:

- Approved Uungula turbine visible
- Proposed Burrendong turbine visible
- Turbines associated with Uungula Wind Farm (UWF) and Burrendong Wind Farm (BWF) visible.

Note:

The ZVI is a preliminary assessment tool that represents a bare ground scenario - ie. a landscape without screening, structures or vegetation. As accurate information on the height and coverage of vegetation and buildings is unavailable, it is important to note the ZVI is based solely on topographic information. Therefore this form of mapping should be acknowledged as representing the worst case scenario.



Figure 6-3: Cumulative Zone of visual influence (Moir 2022)

6.2.2. Noise and Vibration

Burrendong Wind Farm have undertaken a Preliminary Noise Impact Assessment (PNIA) in accordance with the Noise Bulletin (DPE 2016c) and has been based on:

- The minimum (base) operational noise limit determined in accordance the Noise Bulletin (DPE 2016c)
- Preliminary noise modelling using windPRO software for the preliminary turbine layout and a representative WTG model
- A comparison of the predicted noise levels with the base noise criteria
- Construction noise and cumulative noise impacts were not assessed as part of the preliminary Noise Assessment, however, will be completed as part of the EIS.

6.2.2.1. Existing Environment

The Project area is located in a predominantly agricultural landscape, characterised by low background noise levels. The rural nature of the Project site and limited human activity within the general landscape defines the ambient noise environment in the Project Area. The PNIA will establish whether the minimum rating background noise levels (RBLs) as outlined in the NSW EPA *Noise Policy for Industry* (NPfI 2017) could reasonably be adopted. Potential noise and vibration sources associated with the Project include those generated during construction activities, including construction traffic, temporary infrastructure, as well as operational phases through WTG noise, noise associated with the operation of Ancillary Infrastructure, and routine on-site activities. The construction of a wind farm project will generate noise and vibration as a result of activities occurring both on and off the site of the proposed development.

A total of 23 potential noise sensitive receivers (non-involved dwellings) were identified within 3 km of the proposed WTG locations. The number and location of potential receivers will be confirmed during the EIS phase. The representative WTG selected is the Vestas V162-6.2 MW.

6.2.2.2. Potential Impacts

Table 6-6: Potential noise and vibration impacts as a result of the Project

Project Phase	Potential Impact	Receptor(s)	Does the Impact Need Assessment in the EIS?	Consultation Required?
Construction	Construction noise impacts on nearest noise sensitive receivers such as dwellings and buildings surrounding the Project area	Private Dwellings, Community	Yes	Yes
	Out of hours construction due to factors outside of Proponents control (emergency works, deliveries, and weather/time specific works)	Private Dwellings, Community	Yes	Yes
	Vibration impacts from construction plant and equipment on existing infrastructure	Private Dwellings	Yes	Yes
	Road traffic noise impacts on public roads due to Project-related traffic	Private Dwellings, Community	Yes	Yes

Project Phase	Potential Impact	Receptor(s)	Does the Impact Need Assessment in the EIS?	Consultation Required?
Operation	Potential for operational noise as a result of turbine function and ancillary infrastructure noise such as substations	Residences and Community	Yes	Yes
Cumulative	Cumulative impacts are not anticipated for the Project			

A Wind Turbine Model was developed using a Vestas V126-5.6 MW turbine to be representative of the proposed WTGs and determine the predicted noise levels for the Project. In accordance with the Noise Bulletin (DPE 2016c), the predicted equivalent noise level (LAeq,10 minute) should not exceed 35 dB(A) or the background noise (LA90(10 minute)) by more than 5 dB(A), whichever is the greater, at all relevant non-associated receivers.

As shown in Table 6-7, the predicted noise levels for the Project are below this criteria for all non-associated receivers. These results confirm that the project can be designed and operated to comply with the operational noise requirements.

Table 6-7: Predicted noise levels for 10m/s wind speed at hub height

Receiver	Distance to nearest turbine (m)	Predicted noise dB(A)	Criteria dB(A)	Compliance
O17-1	1,426	35.2	35	No
R23-1	1,703	32.8	35	Yes
U9-1	1,533	32.3	35	Yes
U9-2	1,951	30.4	35	Yes
U9-3	1,882	30.9	35	Yes
U10-1	1,093	34.6	35	Yes
R8-1	2,266	30.1	35	Yes
R14-1	1,726	36.5	35	No
U11-1	1,053	36.5	35	No
L6-1	2,539	31.2	35	Yes
P26-1	1,625	33.6	35	Yes
Q13-1	1,581	36	35	No
V11-1	2,161	33.1	35	Yes
V11-2	2,106	33.2	35	Yes
V13-1	1,631	34.7	35	Yes

The results shown in Table 6-7 indicate that noise levels associated with the WTG model for the Project, non-associated receivers O17-1, Q13-1, R14-1 and U11-1 are predicted to be above 35 dB LAeq. The criteria and compliance at each non-associated receiver location will be determined following

assessment of background noise levels. The location of the total predicted 30 dB, 35 dB, 40 dB and 45 dB L_{Aeq} noise contours are illustrated in Figure 6-4.

Further noise modelling and assessment works are to be undertaken to accompany the EIS. This is expected to include an assessment of other noise considerations including background noise levels (if monitoring is required), special noise characteristics, construction and ancillary infrastructure, and review of cumulative noise considerations if required.

6.2.2.3. EIS Assessment Approach

A noise and vibration impact assessment (NVIA) will be completed to support the EIS. This is expected to include an assessment of other noise considerations including background noise levels (if monitoring is required), special noise characteristics, construction, and ancillary infrastructure as well as a review of cumulative noise considerations if required. Construction noise and cumulative noise impacts were not assessed as part of the Preliminary Noise Assessment, however, will be completed as part of the EIS.

The noise levels from proposed construction and operational activities would be predicted using a computer-generated model using DGMR Software's proprietary modelling software, iNoise (the model). The model allows predictions under the ISO9613-2 "*Acoustics – Attenuation of Sound during Propagation Outdoors – general method*" algorithm. This algorithm is accepted by the EPA. There are multiple features which affect the predicted noise level that are considered in the noise modelling, they include:

- Equipment sound power levels and locations
- Screening from structures
- Receiver locations
- Ground topography
- Noise attenuation due to geometric spreading
- Ground absorption
- Atmospheric absorption.

The model would assess prevailing adverse weather conditions including temperature inversions in accordance with the requirements of the NPfl. The model would be populated with topography of the Project area and surrounds, extending out to include the nearest assessment locations. Following a review of the proposed methodology, construction and operational plant and equipment would be placed at various locations throughout the Project which would represent the worst-case noise levels of a range of construction and operation scenarios.

The literature provides little evidence on the direct impacts of noise and vibration on fauna populations. It is assumed however, that if levels are suitable for humans, it is likely they would be tolerable to a large extent for fauna. While impacts to fauna may occur, given the uncertain nature of the effects of noise and vibration, the impacts from construction would be temporary in nature. Studies referenced in other noise assessments undertaken in and around conservation areas, including State and National Parks, would be reviewed in terms of noise impacts on fauna.

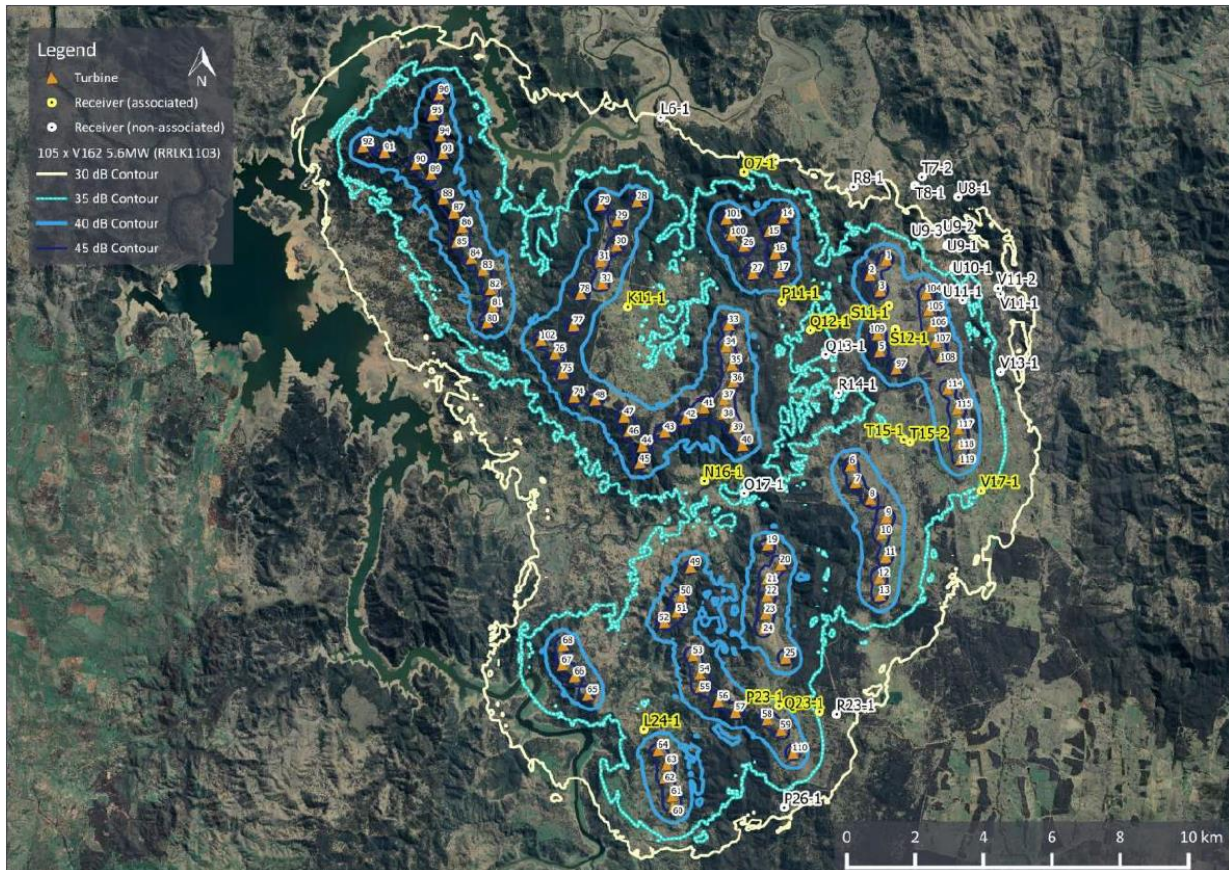


Figure 6-4: Predicted noise level contours

6.2.3. Biodiversity

6.2.3.1. Existing Environment

A desktop literature review and data audit was undertaken to identify the potential presence of any threatened species, populations and ecological communities listed under BC Act and the EPBC Act within the Project Site and surrounds which could be affected by the Project. Additional species were added to the list based on ELA databases and local knowledge.

The results of the desktop assessment were combined to produce a list of threatened and migratory species and ecological communities, listed under the BC Act and/or EPBC Act, that could potentially occur within the Project Site.

A one-day field survey was undertaken by ELA Senior Botanist David Allworth on 25 October 2019. The field survey was to enable:

- initial determinations of vegetation communities present, where possible assigning Plant Community Types (PCT) in accordance with the PCT criteria set out in the Vegetation Information System (VIS) database (OEH 2019)
- preliminary assessment of the potential habitat for threatened flora and fauna (including records of hollow-bearing trees, rocky outcrops)
- preliminary determination of the potential for vegetation communities identified to meet the listing criteria of Endangered Ecological Community (EEC) under the BC Act and/or Critically Endangered Ecological Community (CEEC) under the EPBC Act

- record opportunistic fauna observations.

Plant Community Types and Threatened Ecological Communities

The desktop assessment identified a list of vegetation communities that may potentially occur within the Project Site based on SEED vegetation (DPIE 2019a) mapping (Appendix B). There is currently no mapping available of PCTs for the central part of the Project Site although older mapping using the NSW Biometric Vegetation Types (BVT) (DPIE 2019b) covers the full Project Site.

The vegetation communities that have been observed in the Project Site are not always consistent with the SEED vegetation mapping. In particular, the widely mapped areas of Tumbledown Red Gum on hills, shown in Appendix B, was not observed during the field survey.

The Project Site is in South Western Slopes bioregion within the Central Tablelands of NSW; however, the vegetation of the Project Site is more consistent with the bordering South-East Highlands bioregion. This is probably due to the altitude of area.

Five vegetation communities were identified in the Project Site during the field survey. These communities are described as they were seen in the field and the best fit PCT(s) allocated (Table 6-8). These vegetation communities were identified through preliminary observations and no rapid or full floristic plot data was collected. Further field survey, in accordance with the BAM will be undertaken to accompany a Biodiversity Development Assessment Report (BDAR) and the EIS.

Table 6-8: Initial PCTs validated within the Project Site

Vegetation Community	Plant Community Type	BC Status	EPBC Status	Vegetation Description
White Box Grassy Woodland (Figure 6-5)	PCT 266: White Box Grassy Woodland in the upper slopes sub-region of the NSW South-Western Slopes Bioregion.	E	CE	This vegetation community commonly occurs on areas of Red Podzolic soils (Murphy & Lawrie 1998) but is not restricted to this soil type. The understorey species include <i>Brachychiton populneus</i> (Kurrajong), <i>Olearia sp.</i> (Sticky Daisy) and <i>Cassinia sp.</i> (Sifton Bush). Ground layer is dominated by <i>Austrostipa sp.</i> (Speargrass) and <i>Rytidosperma sp.</i> (Wallaby Grass). This community is represented within the study area as both a remnant woodland and in its derived native grassland form. Occasionally <i>Eucalyptus melliodora</i> (Yellow Box) is seen as a component of this community. Much of this community exists in a cleared or part-cleared condition due to growing on the more fertile parts of the study area.
White Box shrubby woodland/open forest	PCT 273: White Box shrubby open forest on fine grained sediments in the Mudgee region of the central western slopes of NSW PCT 268: White Box - Blakely's Red Gum - Long-leaved Box - Nortons Box - Red Stringybark grass-shrub woodland on shallow soils on hills in the NSW South Western Slopes Bioregion.	E (PCT 268)	CE (PCT 268)	These vegetation communities often occur on stony ridge tops. The dominant tree is <i>Eucalyptus albens</i> (White Box), other canopy species occur such as <i>Eucalyptus macrorhyncha</i> (Red Stringybark), <i>Eucalyptus blakelyi</i> (Blakely's Red Gum) and <i>Eucalyptus melliodora</i> , with an understorey dominated by <i>Olearia sp.</i> and groundcover of <i>Stypantra glauca</i> (Nodding Blue Lily), <i>Austrostipa sp.</i> and <i>Rytidosperma sp.</i>
Long-leaved Box (<i>Eucalyptus goniocalyx</i>) on rocky outcrops	PCT 268: White Box - Blakely's Red Gum - Long-leaved Box - Nortons Box - Red Stringybark grass-shrub woodland on shallow soils on hills in the NSW South Western Slopes Bioregion.	-	-	This vegetation community features low growing <i>Eucalyptus goniocalyx</i> (Long-leaved Box) in pure stands on rock outcrops. There is a sparse understorey of <i>Stypantra glauca</i> and occasional grasses in the ground layer.
Red Box (<i>Eucalyptus polyanthemos</i>) and Mugga Ironbark (<i>Eucalyptus sideroxylon</i>) on shallow soils	PCT 358: Mugga Ironbark - Red Box - White Box - Black Cypress Pine tall woodland on rises and hills in the northern NSW South Western Slopes Bioregion.	-	-	This community occurs with very sparse understorey and large amounts of ground litter. Occasional <i>Acacia paradoxa</i> (Kangaroo Thorn) and <i>Stypantra glauca</i> are seen.
<i>Eucalyptus polyanthemos</i> (Red Box) – <i>Eucalyptus macrorhyncha</i> – <i>Eucalyptus goniocalyx</i> – <i>Eucalyptus dives</i> (Peppermint) on shallow soil	PCT 287: Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion.	-	-	The understorey had <i>Stypantra glauca</i> (Nodding Blue Lily), <i>Olearia sp.</i> (Sticky Daisy) and a few grasses amongst a thick cover of litter. Surface rock was common.

E = Endangered; CE = Critically Endangered



Figure 6-5: *Eucalyptus albens* grassy woodland

Threatened Flora and Fauna

The desktop assessment identified three TECs, 39 threatened fauna species and nine threatened flora species that may potentially occur within a 10 km radius of the Project Site and surrounding area. Records of koala, *Pachycephala inornata* (Gilbert's Whistler), Spotted-tailed Quoll and Swift Parrot are located near the Project Site (Appendix B), indicating the potential for these species within the Project Site.

Habitat features were identified in the preliminary study area that would provide suitable habitat for a number of threatened species. Along the ridge lines rocky outcrops were observed which may provide habitat for threatened reptile species such as *Aprasia parapulchella* (Pink-tailed Legless Lizard), and threatened cave dependent microbats including the *Chalinolobus dwyeri* (Large-eared Pied Bat). An abundance of tree hollows was noted providing potential habitat for hollow dependant species which may include *Calyptorhynchus lathami* (Glossy Black-Cockatoo), *Nyctophilus corbeni* (Corben's Long-eared Bat) and threatened owls such as the *Ninox connivens* (Barking Owl). Large woody debris scattered across the Project Site may provide suitable foraging habitat for a variety of threatened woodland birds. The Project Site also contains an abundance of the Koala feed trees *Eucalyptus albens* (White Box).

Further targeted surveys will be undertaken in accordance with the BAM during the preparation of the BDAR and EIS to determine the presence of these threatened species as well as impact avoidance, mitigation and offset obligations, if required.

Other Considerations

If required, a Bird and Bat Adaptive Management Plan (BBAMP) will be prepared as a condition of approval. This is to provide an overall strategy for managing and mitigating any significant bird and bat strikes arising from operations of the wind energy facility. Studies have shown that ‘at-risk’ species such as *Aquila audax* (Wedge-tailed Eagles), *Haliaeetus leucogaster* (White-Bellied Sea Eagles), *Pteropus poliocephalus* (Grey Headed Flying foxes) and microbats can be impacted by blade strike or barotrauma. Pre-construction surveys will need to be implemented to provide baseline data on bird and bat populations with ongoing monitoring during the operational phase.

The final Project layout will represent all areas that will be directly impacted by the works, including, but not limited to the building envelope, any clearing for bushfire asset protection zones (APZs), access tracks, driveways and construction areas. Access, including upgrading public roads to facilitate the movement of turbines onto the Project Site, might require road widening, realignment and track clearing and could impact on the extent of areas to be included in the BDAR.

Additional TECs such as *Eucalyptus microcarpa* (Grey Box) Grassy Woodlands or *Eucalyptus conica* (Fuzzy Box) Woodlands which occur in neighbouring areas could be impacted in obtaining access to the Project area. Potential impacts to these vegetation communities may also add additional plant and animal species that will be included in the targeted surveys, if required.

Several threatened and/or migratory species listed under the EPBC Act potentially occur within the preliminary study area. Whether or not the final Project layout will have a significant impact on MNES will be identified during the preparation of the BDAR and consideration of additional approval pathways (e.g. Referral to the Commonwealth), will be undertaken, if required.

6.2.3.2. Potential Impacts

Impacts on native vegetation, native fauna and aquatic and terrestrial ecosystems are likely to occur as a result of the Project. Direct and indirect impacts during the construction phase may include clearing, sedimentation, dust deposition, erosion, weed introduction and/or spread, introduction of competitive feral fauna, vehicle/machinery strike, bird and bat WTG strike, light and noise pollution, and vibration from the movement of equipment and vehicles. Indirect impacts during the operational phase of the Project may include a continuation of indirect impacts associated with weed spread.

The key receptors for these potential impacts are nearby National Parks, State Forest lands, ecosystems, vegetation communities, flora, and fauna. Table 6-9 outlines the potential biodiversity impacts that could occur as a consequence of the Project.

Table 6-9: Potential biodiversity impacts as a result of the Project

Project Phase	Potential Impact	Receptor(s)	Does the Impact Need Assessment in the EIS?	Consultation Required?
Construction	Disturbance/loss of vegetation during construction, including potential direct (clearing) and indirect impacts (sedimentation, dust deposition, erosion, weed introduction and/or spread, soil	Native Vegetation Communities and Flora	Yes	Yes (DPE – BCD, DAWE and Community)

Project Phase	Potential Impact	Receptor(s)	Does the Impact Need Assessment in the EIS?	Consultation Required?
	and/or water pollution) to TECs and threatened flora species.			
	Direct impacts including disturbance / loss of habitat, injury and mortality from vehicle strike, and loss of wildlife corridors. Indirect impacts including impacts resulting from light, noise, and dust.	Native Fauna	Yes	Yes (DPE – BCD, DAWE and Community)
	Potential direct impacts on terrestrial ecosystems including loss or modification of habitat for aquatic and terrestrial species. Potential indirect impacts through the introduction and spread of weeds and pests, sedimentation and erosion, soil and water pollution, light, noise, and dust.	Ecosystems and Native Habitat	Yes	Yes (DPE – BCD, DAWE and Community)
Operation	Potential direct impacts due to traffic and maintenance activities (though significantly less than the construction phase), as well as potential visitation by tourists	Native Vegetation Communities and Flora	Yes	Yes (DPE – BCD, DAWE and Community)
Cumulative	The transmission line from the Project site may result in cumulative biodiversity impacts in context to the Project area.	Native Vegetation Communities and Flora	Yes	Yes (DPE – BCD, DAWE and Community)

6.2.3.1. EIS Assessment Approach

An assessment under the Biodiversity Offset Scheme using the BAM will be undertaken and a BDAR will be prepared and included in the EIS to address impacts to threatened ecological communities and species protected by the BC Act.

Some MNES under the Commonwealth EPBC Act have been identified as potentially occurring on or near the Project Site, including TECs and nationally threatened species. An assessment of impacts upon MNES will be undertaken during the preparation of the BDAR for the Project. To satisfy the requirements of the EPBC Act, the Proponent has referred the Project to the Commonwealth Minister for the Environment and nominated that there is potential to have a significant impact on MNES. It is anticipated that potential impacts to MNES will be assessed in accordance with the NSW Assessment Bilateral Agreement therefore, allowing DPE to manage the assessment of the Project on behalf of the Commonwealth, including the issuing of the assessment requirements for the EIS.

If required, a BBAMP will be prepared as a condition of approval. This is to provide an overall strategy for managing and mitigating any significant bird and bat strikes arising from operations of the wind energy facility. Studies have shown that ‘at-risk’ species such as *Aquila audax* (Wedge-tailed Eagles), *Haliaeetus leucogaster* (White-Bellied Sea Eagles), *Pteropus poliocephalus* (Grey Headed Flying foxes) and microbats can be impacted by blade strike or barotrauma. Pre-construction surveys will need to be

implemented to provide baseline data on bird and bat populations with ongoing monitoring during the operational phase.

6.2.4. Traffic and Transport

6.2.4.1. Existing Environment

The Project Site is located within the Mid-Western and Dubbo LGAs with access via the Yarrabin Road and Burrendong Dam Road. A preliminary Route Study (Rex J. Andrews 2019) was undertaken to determine the most appropriate route to transport the oversize wind turbine components to site. The two likely potential transport routes for accessing the Project Site are both via Yarrabin Road through Mudgee to the east and through Wellington and Goolma to the West (Figure 6-6 and Figure 6-7). The viability of the potential transport routes will be assessed following a detailed Traffic and Transport Impact Assessment (TTIA). The highway in either direction of the Project Site is a sealed two lane rural highway, providing adequate level of service for the delivery of light, heavy and Over-Size Over Mass (OSOM) vehicles throughout the construction period.

The WTG equipment is likely to be imported from various countries and will arrive on ships into the PoN. Two potential routes that were considered are:

1. PoN to Yarrabin via Mudgee (Figure 6-6)
2. PoN to Yarrabin via Wellington and Goolma (Figure 6-7).

The closest roads to the Project that are classified as State Roads are Goolma Road and the Castlereagh Highway. Regional Roads and Local Roads that may be used to access the Project from the State Road network are:

- Hill End Road
- Twelve Mile Road
- Yarrabin Road
- Burrendong Dam Road.

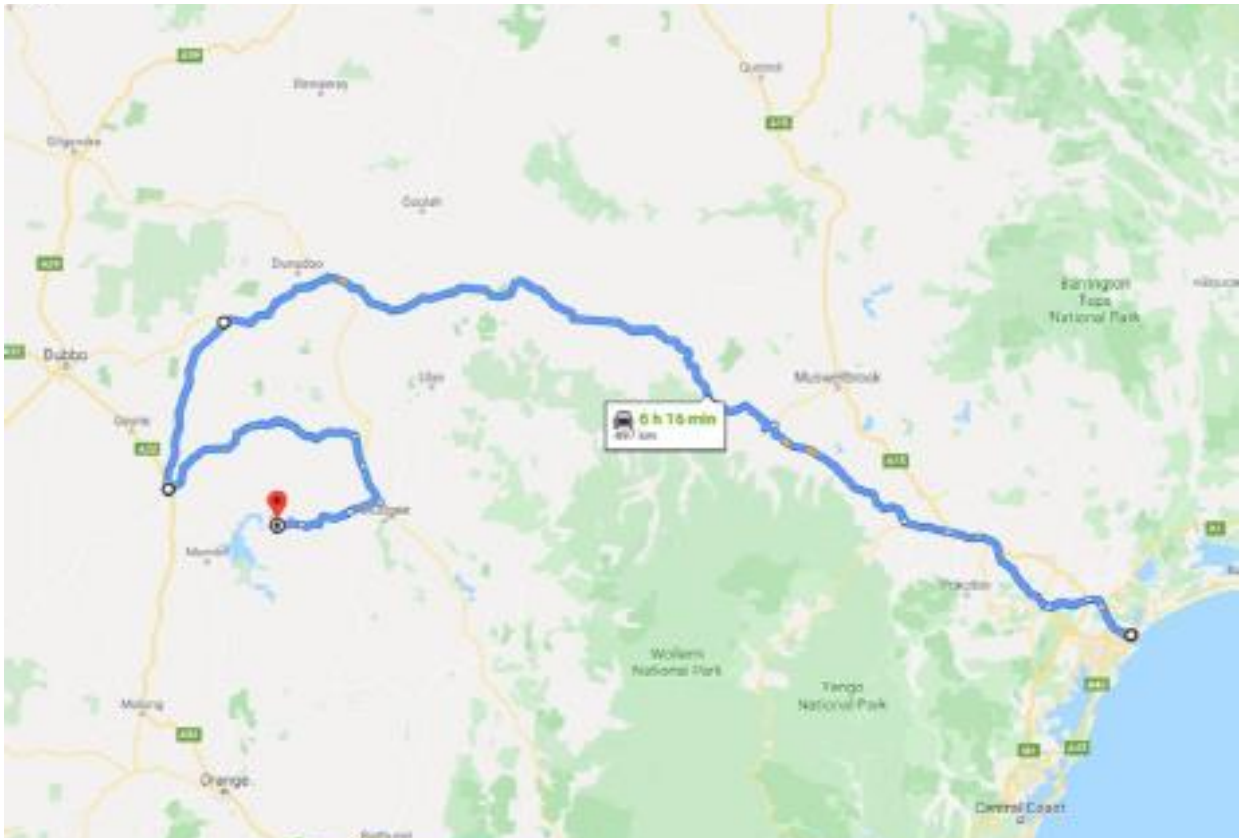


Figure 6-6: Option 1 - Port of Newcastle to Yarrabin via Mudgee (Rex J. Andrews 2019)

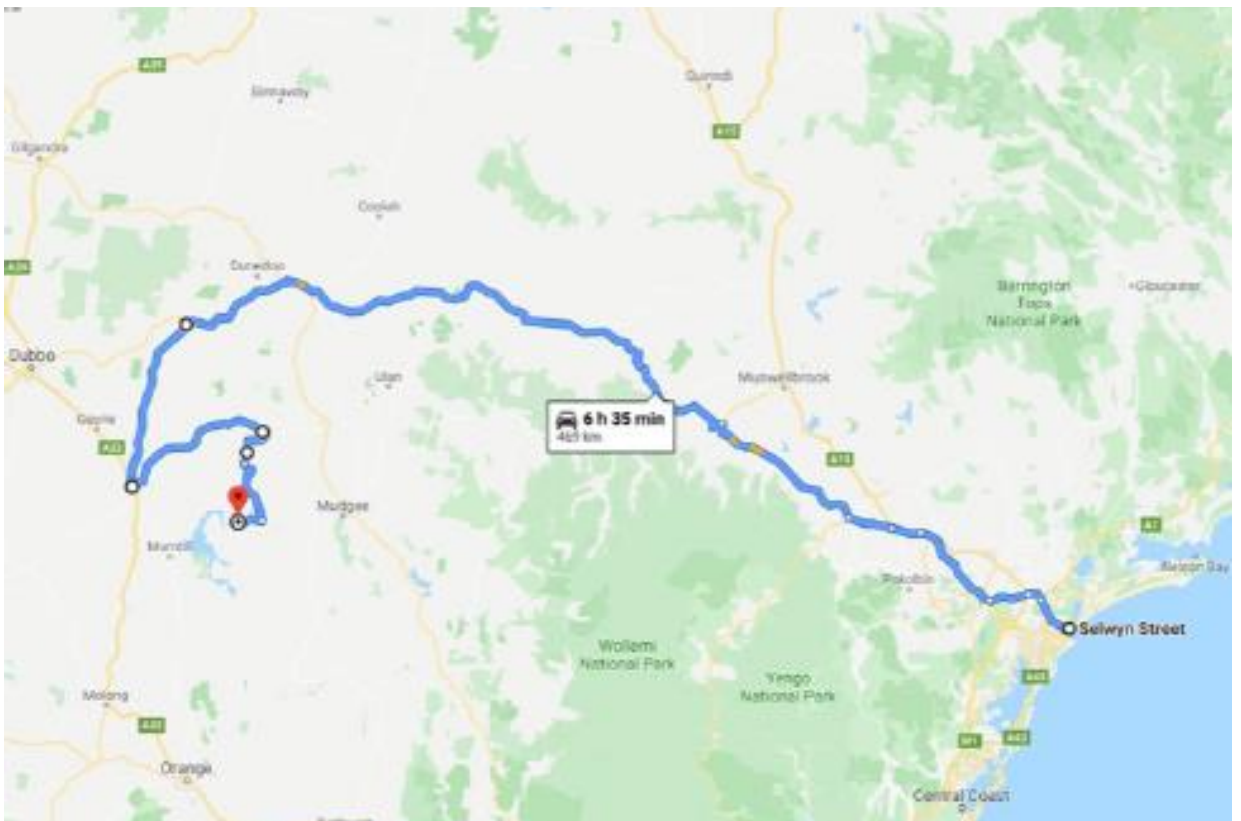


Figure 6-7: Option 2 - Port of Newcastle to Yarrabin via Wellington and Goolma (Rex J. Andrews 2019)

The Route Study identified the route via Wellington and Goolma as the preferred option and noted that extensive upgrades to the existing gravel road would be required. Table 6-10 summarises the pros and cons of the preferred route.

Table 6-10: Pros and cons of the second option route studied (Rex J. Andrews 2019)

Option Two: Via Twelve Mile	
Pros	
<ul style="list-style-type: none"> • Shortest distance • Considerably less vegetation removal than Option One, however the route still requires a large amount of tree removal and trimming. • Less number of bridges than Option One. • Less road modifications on corners than Option One. • Less impact to local traffic than Option One. 	
Cons	
<ul style="list-style-type: none"> • road widening is required along Twelve Mile Road, Yarrabin Road & Burrendong Dam Road. • Gravel Road for the majority of the route. • Replacement of a bridge over Piambong Road would be required. • Many crests are unlikely to have adequate clearance for the trailers to traverse Yarrabin and Burrendong Dam Road. • Several floodways and culverts will need to be modified. 	

6.2.4.2. Potential Impacts

Table 6-11: Potential traffic and transport impacts as a result of the Project

Project Phase	Potential Impact	Receptor(s)	Does the Impact Need Assessment in the EIS?	Consultation Required?
Construction	Upgrades to existing road network at particular junctions are likely to be required during the construction phase	Residences and Community	Yes	TfNSW, Council
	Likely increase in traffic on external road network is anticipated during the construction phase of the Project, with varying degrees of increase dependant on the phase of construction. During peak construction periods, an increased volume of both employees and materials will generate increased traffic.	Residences and Community	Yes	TfNSW, Council
	Increased one-way vehicle trips per day during construction will range during phases of construction from a likely minimum of 100 vehicles per day (based on daily vehicle trips for projects of a similar size and scope)	Residences and Community	Yes	TfNSW, Council
	Increased traffic during peak hours may impact local traffic routines such as school bus routes	Residences and Community	Yes	TfNSW, Council
Operation	No significant increase to traffic movements are expected during operation, although vehicle access to the Project area for plant	None	Yes	TfNSW, Council

Project Phase	Potential Impact	Receptor(s)	Does the Impact Need Assessment in the EIS?	Consultation Required?
	management and maintenance will be ongoing			
	Potential for implementation of road upgrades leading to long term benefits to local residents and road users	Residences and community	Yes	TfNSW, Council
Cumulative	Potential for cumulative impacts as a result of multiple developments using the Oxley Highway to transport material and personnel	Residences and Community	Yes	No

6.2.4.3. EIS Assessment Approach

A detailed TTIA will be undertaken as part of the EIS and focus primarily on the preferred transportation route for construction traffic generally in accordance with the 'Guide to Traffic Generating Developments' (RTA 2002), Road Design Guide and relevant Austroads Standards and 'Austroads Guide to Traffic management' (Austroads No Date). The assessment will also provide important data and analysis on the existing road network, anticipated traffic volumes, accident history and school bus routes to inform the development of the Project. The TTIA will also provide a framework for how to manage and mitigate traffic impacts as a result of the proposed development.

6.2.5. Hazards and Risks - Aviation

6.2.5.1. Existing Environment

Mudgee Airport and Dubbo Airport, Wellington Aerodrome (Bodangora aerodrome), and the Gulgong Aero Park are all located within 30 nautical miles (nm) to the Project Site. There is also a probability for other aviation activities as unlicensed private air strips exist within proximity to the Project Site.

6.2.5.2. Potential Impacts

Table 6-12: Potential aviation impacts as a result of the Project

Project Phase	Potential Impact	Receptor(s)	Does the Impact Need Assessment in the EIS?	Consultation Required?
Construction	Impacts to aeronautical activities around the Project Area are not anticipated during the construction period, though will require consultation with various aviation bodies	Aerodromes	Yes	CASA, RFS
Operation	Potential to infringe on Optical Landing Systems if an aerodrome is within 8.1 nm or 15 km of a WTG.	Aerodromes	Yes	No
	Potential for the Project to affect established air routes Minimum Obstacle Clearance of 1,000 ft below the published flight path, though given the topography of the Project Site, this is unlikely	Flightpaths	Yes	No
Cumulative	It is unlikely that cumulative impacts as a result of the Project will impact	n/a	n/a	n/a

Project Phase	Potential Impact	Receptor(s)	Does the Impact Need Assessment in the EIS?	Consultation Required?
	stakeholders involved with aviation in the area			

6.2.5.3. EIS Assessment Approach

An Aeronautical Impact Assessment will be undertaken in accordance with the National Airports Safeguarding Framework Guideline D: Managing Wind Turbine Risk to Aircraft (DIRDC 2012). The assessment will assist in determining potential impacts of the development and provide critical information regarding height and co-ordinates of the Project as well as mitigation measures to reduce potential impacts of the Project on aerial operations within the area.

6.2.6. Hazards and Risks - Telecommunications and Electromagnetic Interference

6.2.6.1. Existing Environment

Large structures, such as wind turbines can cause interference when located close to or within telecommunication signal pathways, degrading the performance of the signals. Electromagnetic emissions can also be produced from mechanical generators and machinery, also having the potential to affect signals.

6.2.6.2. Potential Impacts

Table 6-13: Potential electromagnetic interference impacts as a result of the Project

Project Phase	Potential Impact	Receptor(s)	Does the Impact Need Assessment in the EIS?	Consultation Required?
Construction	Unlikely for impacts to telecommunication infrastructure as a result of construction	n/a	n/a	n/a
Operation	Potential impacts on point-to-point communication links as a result of near field effects, diffraction or reflection or scattering effects	ACMA	Yes	No
	Wind turbines have the potential to appear on meteorological radars as static echoes if sited within 5 km of a meteorological radar, impacting radars ability to detect rain and thunderstorm events	Meteorology Stations	Yes	No
	Potential impact on AM signals if AM transmitters are located with 2 km of WTG location	AM Transmitter	Yes	No
Cumulative	Potential for cumulative impacts to communication links as a result of multiple developments within the New England REZ, though unlikely	ACMA	Yes	No

6.2.6.3. EIS Assessment Approach

A Telecommunications and Electromagnetic Interference Assessment will be undertaken to identify all telecommunication infrastructure in proximity to the Project site. The assessment will be prepared by Middleton Group in accordance with the SEARs which, with regard to similar projects seek to identify

possible effects on telecommunication systems, assess impacts on telecommunications infrastructure and propose mitigation measures to minimise impacts as a result of the Project.

6.2.7. Hazards and Risks - Bushfire and Electrical Fire

6.2.7.1. Existing Environment

The area surrounding the Project Site is modified agricultural land utilised primarily for cattle and sheep grazing and cropping for stock feed. The vegetation hazard in proximity to the proposed infrastructure is predominately modified grassland with scattered trees and woodland as well as some isolated areas of forest vegetation. The topography of the Project Site is undulating, varying from approximately 360 m to 785 m in elevation across the Project Site. Given the large expanse of the Project Site and the variation within it, it is expected that a range of slope classifications affect the 105 WTG sites, from upslope to >20 degrees downslope. The usage of the area surrounding the Project Site is mostly limited to landowners, who are predominately farmers, and the operator of the Project Site.

6.2.7.2. Potential Impacts

Table 6-14: Potential bushfire and electrical fire impacts as a result of the Project

Project Phase	Potential Impact	Receptor(s)	Does the Impact Need Assessment in the EIS?	Consultation Required?
Construction	Potential for plant and construction equipment (welders, grinders, etc) to ignite bushfires on site under certain conditions	Project Site, surrounding landholders	Yes	RFS, Council
	Potential for misplaced/errant fuels to ignite and create a fire hazard to the Project site	Project Site, surrounding landholders	Yes	RFS, Contractors
	Construction of internal routes within the Project Site can create additional infrastructure for use in firefighting operations and also act as fire breaks within the Project Site	Project Site, surrounding landholders	Yes	RFS, Council
Operation	Potential for fire ignition as a result of WTG fires where inadequate fire detection systems are in place	Project Site, surrounding landholders	Yes	RFS, Council
	Maintenance of APZs and internal roads may assist in fire suppression efforts in the event of a bushfire within the Project Site	Project Site, surrounding landholders	Yes	RFS, Council
	Development of WTGs may become aerial hazards that risk aerial firefighting suppression operations in the event of fire within the Project site	Project Site, surrounding landholders	Yes	RFS, Council
Cumulative	Unlikely potential for cumulative impacts	n/a	n/a	n/a

6.2.7.3. EIS Assessment Approach

The Project has the potential to be exposed to bushfire risk from grasslands and nearby areas of dense vegetation as well as carrying the risk of a potential fire starting within the Project Site. To ensure there is minimal risk of the Project causing a bushfire and that the Project doesn't impact on aerial fighting of bushfires, a Bushfire Risk Assessment will be undertaken in accordance with the PBP, A guide for councils, planners, fire authorities and developers 2019 (NSW RFS 2019). Similarly, a Preliminary Hazard Assessment will be undertaken to determine potential risks of electrical fires and other hazards caused by the operation of the Wind Farm

6.2.8. Hazards and Risks - Other

Other potential hazards and risks such as public health regarding electromagnetic fields, low frequency and noise infrasound and shadow flicker will also be assessed, as well as blade throw.

6.2.9. Aboriginal Heritage

6.2.9.1. Existing Environment

An Aboriginal Heritage Information Management System (AHIMS) database search was undertaken on 29 April 2020 for the area containing and surrounding the Project Boundary.

The AHIMS search did not identify any Aboriginal sites/places recorded within the Project sit boundary (Figure 6-8).

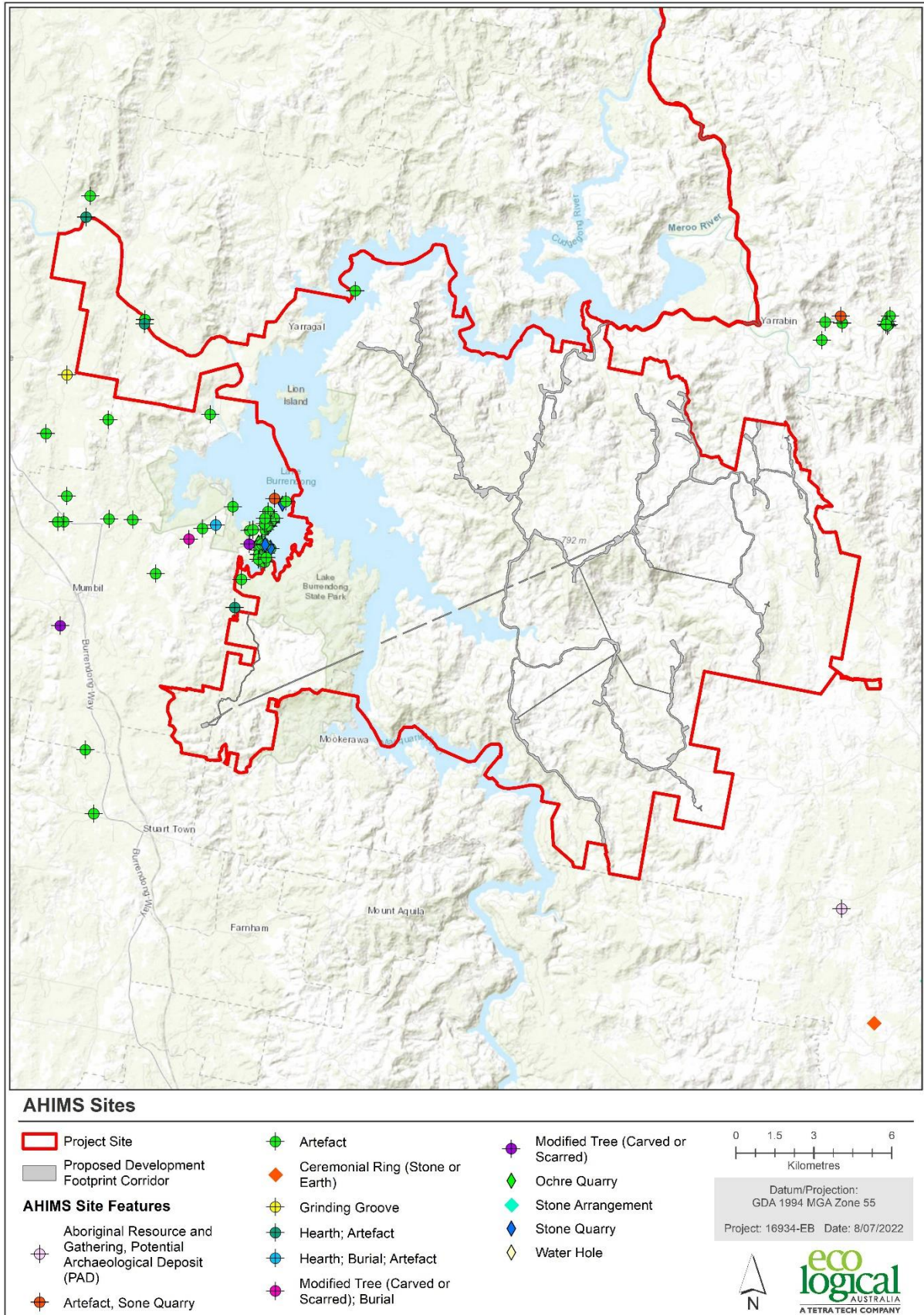


Figure 6-8: AHIMS sites within and in proximity to the Project Site

6.2.9.2. Potential Impacts

Table 6-15: Potential Aboriginal heritage impacts as a result of the Project

Project Phase	Potential Impact	Receptor(s)	Does the Impact Need Assessment in the EIS?	Consultation Required?
Construction	Excavation and access road construction has the potential to impact on unknown artefacts/values. This could include impacts to natural heritage items or places listed on LEP schedules, the State Heritage Register, the Aboriginal Heritage Information Management System (AHIMS), the National Heritage List, the World Heritage List, or objects and places not listed of heritage value.	Aboriginal people and community.	Yes	Yes Aboriginal people and Heritage NSW
Operation	Permanent change to potentially sacred and cultural landscapes and places for Aboriginal people.	Aboriginal people and community.	Yes	Yes Aboriginal people and Heritage NSW
Cumulative	Potential for cumulative impacts to Aboriginal heritage	Aboriginal people and community	Yes	Yes Aboriginal people and Heritage NSW

6.2.9.3. EIS Assessment Approach

Based on the size of the Project site and the potential for archaeologically sensitive landscape features, an ACHA for the proposed Project will be required to be prepared in accordance with the requirements of the NPW Act.

As a component of the ACHA process, consultation with the Aboriginal Community will be undertaken in accordance with the *'Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010'* (DECCW 2010a). In addition, it is likely that archaeological test excavation will be required in accordance with the *'Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW'* (OEH 2011), the *'Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW'* (DECCW 2010b). The scope of the ACHA will include:

- Desktop review, including an extensive AHIMS database search, Native Title Search, and a review of previously completed studies conducted in the area to assist in the development of a predictive model
- Aboriginal stakeholder consultation in line with the *'Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010'* (DECCW 2010a)
- A comprehensive site inspection with members of the local Aboriginal community to identify and record any sites of Aboriginal Cultural Heritage (social, historical, scientific and aesthetic values) within the project boundary, specifically within areas proposed to be impacted by the proposed windfarm, as well as relocating and rerecording existing sites registered on the AHIMS database within the Project Site

- Archaeological test excavation of areas of archaeological potential identified during desktop and field assessment, undertaken in partnership with members of the local Aboriginal community
- Preparation of an ACHA to meet the DPIE guidelines and provide to the local Aboriginal community for comment
- This will include an assessment of any additional Aboriginal Cultural Heritage issues or places identified during the field work
- Development of appropriate management and mitigation strategies for any Aboriginal sites or areas identified as culturally significant by the located Aboriginal community that are identified to be directly or indirectly impacted by the proposed Project.

6.2.10. Historic Heritage

6.2.10.1. Existing Environment

A search of available historic heritage registers was undertaken within 5 km of the Project Boundary (heritage search area) including:

- Commonwealth Heritage List
- National Heritage List
- NSW State Heritage Register (SHR)
- Dubbo LEP 2011
- Wellington LEP 2012
- Mid-Western Regional LEP 2012.

There were no World, Commonwealth, National, State, or locally listed heritage items identified as being within the Project Site. The two closest heritage items to the study area is listed on the Wellington LEP and are located approximately 4.9 km and 7.1 km from the Project Site at their closest points respectively (Figure 6-9).

- Item Number: I979 (Wingvee Homestead and Woolshed and Quartz Roasting)
- Item Number: I976 (Triamble Homestead and Woolshed).

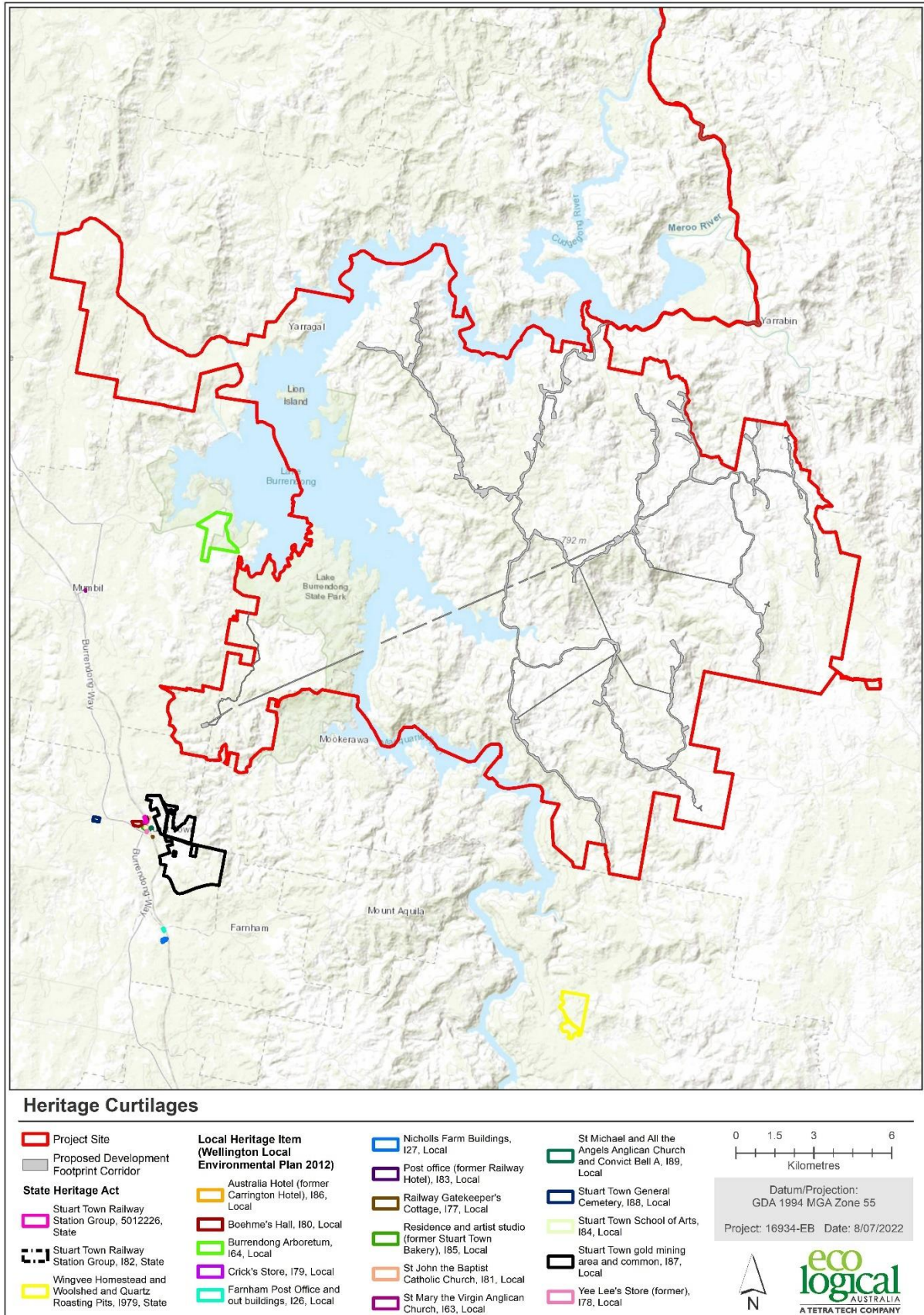


Figure 6-9: Heritage curtilages in proximity to the Project Site

6.2.10.2. Potential Impacts

Table 6-16: Potential historic heritage impacts as a result of the Project

Project Phase	Potential Impact	Receptor(s)	Does the Impact Need Assessment in the EIS?	Consultation Required?
Construction	Excavation and access road construction has the potential to impact on unknown artefacts/values. This could include impacts to natural heritage items or places listed on LEP schedules, the State Heritage Register, the Aboriginal Heritage Information Management System (AHIMS), the National Heritage List, the World Heritage List, or objects and places not listed of heritage value.	Community.	Yes	Yes Heritage NSW
Operation	Permanent change to potentially sacred and cultural landscapes and places for Aboriginal people.	Community	Yes	Yes Heritage NSW
Cumulative	Potential for cumulative impacts to Aboriginal heritage	Community	Yes	Yes Heritage NSW

6.2.10.3. EIS Assessment Approach

If required, a Statement of Heritage Impact (SoHI) will be completed for the Project in accordance with the NSW Heritage Council *Statements of Heritage Impact Guidelines 2002*. The scope of the SoHI will include:

- A review of any relevant existing heritage assessment reports and other sources of information regarding heritage items in the region
- A field survey of the Project site in conjunction with the Aboriginal heritage survey, with an emphasis on sites identified during preliminary research and areas with archaeological potential and the recording of any items located
- Preparation of a SoHI which considers the potential for impacts on any significant adjacent heritage items
- Identification of any necessary impact mitigation and management measures.

A historical heritage assessment will likely be required to be completed with regard to the *NSW Heritage Manual* under the assumption that the SEARs will require assessment.

6.2.11. Soils and Land Use

6.2.11.1. Existing Environment

The Project is located within the NSW South Western Slopes Bioregion. The climate is dominated by sub-humid with warm to hot dry summers and cold winters, dictated by the topographic gradients of the foothills of the Lachlan Fold Belt (NSW Environment 2016). A summary of the Soil Landscape Types and Classifications within the Project Site can be found in Appendix C.

6.2.11.2. Potential Impacts

Table 6-17: Potential soil and land use impacts as a result of the Project

Project Phase	Potential Impact	Receptor(s)	Does the Impact Need Assessment in the EIS?	Consultation Required?
Construction	The exposure of natural ground surface and subsurface through vegetation removal and soil excavation for infrastructure works (access roads, construction yards, equipment laydown areas, ancillary works)	Project Site, Adjacent Landholders, Local ecosystem	Yes	No
	Successful rehabilitation and revegetation efforts will be dependent on suitable soil resources and will be impacted by the mixing of subsoils and/or lower-class topsoils, soil compaction by vehicles and earthmoving plan, and long-term stockpiling	Project Site, Adjacent Landholders, Local ecosystem	Yes	No
	The management and storage of material quantities of excavated materials generated through construction of the Project, particularly from WTG foundations, to be used in construction and ground cover rehabilitation	Project Site, Adjacent Landholders, Local ecosystem	Yes	No
	Potential erosion with soils on steep slopes more susceptible to erosion given their thin nature and lesser vegetation cover. Sediments eroded from soil material at higher elevations can be deposited in habitat zones and waterways further downslope, potentially impacting ecosystem functions of terrestrial vegetation communities and receiving waters	Project Site, Adjacent Landholders, Local ecosystem	Yes	No
	Contamination of land and soils can occur during construction works as a result of spills and leaks from vehicles, plant, and equipment; stored fuels and hazardous materials; and the inappropriate disposal of waste	Project Site, Adjacent Landholders, Local ecosystem	Yes	No
	The disturbance of acid sulfate soils (ASS) and/or potentially acid forming (PAF) bedrock material during the excavation phase may occur. The presence of these materials will be identified prior to and during excavation activities, and mitigation plans developed to ensure appropriate re-use or disposal	Project Site, Adjacent Landholders, Local ecosystem	Yes	No
	Operation	The Project is likely to have limited potential impact on soil and land resources during the operational phase. The primary impact would be run off of spills and leaks	Project Site, Adjacent Landholders,	Yes

Project Phase	Potential Impact	Receptor(s)	Does the Impact Need Assessment in the EIS?	Consultation Required?
	from vehicles, plant and equipment, stored fuels and hazardous materials, and the inappropriate disposal of waste if appropriate controls are not implemented and undertaken.	Local ecosystem		
	Provided the appropriate erosion and sediment controls, designed, and constructed to suit the properties of site soils and climatic conditions during the construction phase are implemented, there will be a low potential for soil erosion and sediment	Project Site, Adjacent Landholders, Local ecosystem	Yes	No
	Disturbance during the removal of infrastructure and temporary landforms may have similar impacts to those described in the construction and operation phases above. The construction of safe, stable, and non-polluting final landforms during decommissioning may be impacted if not sympathetic to the properties of the soils and any waste rock/spoil used	Project Site, Adjacent Landholders, Local ecosystem	Yes	No
Cumulative	Project expansion and enhancement would likely result in further land clearing at WTG sites, contamination events and increased potential of weed migration and colonisation in the area	Project Site, Adjacent Landholders, Local ecosystem	Yes	No
	Unexpected finds or uncontrolled contamination events may contribute to land contamination if not adequately identified and appropriately disposed of	Project Site, Adjacent Landholders, Local ecosystem	Yes	No
	Inadequate or failed rehabilitation efforts could lead to unfavourable ecological outcomes and visual amenity impacts in the broader community	Project Site, Adjacent Landholders, Local ecosystem	Yes	No

6.2.11.3. EIS Assessment Approach

A soils and land use assessment will be undertaken by ELA as part of the EIS. The assessment will provide a detailed assessment on the climate, topography, Mitchell landscapes, geology, soil landscapes, soil erodibility and dispersibility, erosion hazards and erosion potential of the Project Site and surrounding area. The assessment will describe mitigation measures aimed to minimise the potential for soil erosion and negative land use impacts, including invasive weed mitigation and contamination controls.

6.2.12. Surface Water, Groundwater and Aquatic Habitat

This desktop assessment characterises the groundwater and surface water environment across the site, including quality and quantity aspects and potential receptors (environmental and third-party water users). This information is used to identify and describe any potential impacts on surface water or

groundwater that may result from the proposed project. The assessment considers both construction and operational activities involved in the proposed project. The scope of the water assessment includes:

- Reviewing available information regarding geology, surface hydrology, hydrogeology and water quality within the study area and surrounding area
- Characterisation of the existing surface water environment in the study area including a description of the nature, quality, and processes and land uses affecting runoff, the river system, and wetlands (if present)
- Characterisation of the existing groundwater environment in the study area, including description of the nature, quality and processes affecting local hydrogeology and water quality, potential groundwater dependent ecosystems (GDEs) and existing groundwater users and uses
- Determining potential impacts on surface water and/or groundwater to be assessed that may result from the proposed project.

Sufficient detail has been provided to inform development of the Project SEARs.

6.2.12.1. Existing Environment

The Project site is within the Macquarie River catchment area. The Macquarie River runs through the Project Site with several smaller tributaries running through the landscape comprising 1st, 2nd, 3rd and 4th order Strahler streams and ephemeral creeks.

The Burrendong Dam is also located within the Project Site, which is managed by the Water Sharing Plan for the Macquarie and Cudgegong Regulated Rivers Water Source 2016 and the NSW Government, who manages licensed water for the environment. Lake Burrendong, which was created with the construction of Burrendong Dam, is one of the largest inland dams in NSW and the most prominent water body of the region.

Water will be required as part of construction activities, primarily in batching materials for the WTG foundations and internal roads and will be sourced from appropriate water providers within the local area where possible.

6.2.12.2. Potential Impacts

Table 6-18: Potential surface water, groundwater and aquatic habitat impacts as a result of the Project

Project Phase	Potential Impact	Receptor(s)	Does the Impact Need Assessment in the EIS?	Consultation Required?
Construction	Pre-construction and construction impacts may impact water quality associated with erosion and sedimentation.	Aquatic habitat, flora, and fauna	Yes	Yes (DPIE – BCD, DPI – Fisheries, DAWE and Community)
	The potential for changes to downstream flood extents because of the temporary works.	Aquatic habitat, flora, and fauna	Yes	Yes (DPIE – BCD, DPI – Fisheries, DAWE and Community)
	Contamination of surface water and groundwater may occur during	Aquatic habitat, flora, and fauna	Yes	Yes (DPIE – BCD, DPI –

Project Phase	Potential Impact	Receptor(s)	Does the Impact Need Assessment in the EIS?	Consultation Required?
	construction works as a result of spills and leaks from vehicles, plant, and equipment; stored fuels and hazardous materials; and the inappropriate disposal of waste			Fisheries, DAWE and Community
	Impacts to aquatic ecosystems as a result of WTG, access track and ancillary infrastructure construction, where activities cross or are constructed within close vicinity to waterways	Aquatic habitat, flora, and fauna	Yes	Yes (DPIE – BCD, DPI – Fisheries, DAWE and Community)
	Removal of riparian vegetation for the construction of watercourse crossings may destabilise sections of creek banks and potentially lead to erosion of adjacent banks and cause subsequent sedimentation of the water	Aquatic habitat, flora, and fauna	Yes	Yes (DPIE – BCD, DPI – Fisheries, DAWE and Community)
Operation	Management of temporary sewage systems established onsite for the duration of the Project pose potential risk to surface water quality should spills occur	Aquatic habitat, flora, and fauna	Yes	Yes (DPIE – BCD, DPI – Fisheries, DAWE and Community)
Cumulative	Cumulative impacts to watercourses and aquatic habitats are not anticipated as a result of the Project.	n/a	n/a	n/a

6.2.12.3. EIS Assessment Approach

Several creeks and drainage lines, which occur in or around the Project Site have been identified as Key Fish Habitat. These are aquatic areas that have been identified as important to the sustainability of the maintenance of fish populations. Access tracks may traverse some of these areas and will be further assessed as part of the EIS.

A water impact assessment will be undertaken as part of the EIS and will include, but not be limited to:

- Quantification of water demand and identification of both surface and groundwater sources and potential impacts regarding water usage and water quality
- Flood modelling
- Assessment of potential impacts to riparian land and aquatic habitat.

6.2.13. Social and Economic Factors

A Social and Economic Assessment will review the impacts and benefits of the Project for the region and State as a whole, including consideration of any increase in demand for local services such as accommodation.

6.2.13.1. Existing Environment

The closest township to the Project Site is Hargraves, a regional town of roughly 270 people in the Central West-Orana Region of NSW with the over 45% of industry managerial and community and personal services work (ABS 2016). Dubbo is the major regional centre of the Dubbo Regional Council LGA. The other large regional towns in proximity to Project are Wellington and Mudgee.

In 2016, the Dubbo LGA had a population of 38,943 of which 51.4% were aged 20-59 and the unemployment rate was 5.5% compared to the NSW average of 6.3% (ABS 2016). Mudgee LGA had a population of 10,923, of which 44.4% were aged 20-59 and the unemployment rate was 3.2% compared to the NSW average of 6.3% (ABS 2016). Wellington had a population of 4,519, of which 44.4% were aged 20-59 and the unemployment rate was 3.2% compared to the NSW average of 6.3% (ABS 2016).

Employment and Economics

The largest employment industries within Dubbo are Professionals (18.2%), Technicians and Trades Workers (14.5%) and Clerical and Administrative Workers (13.5%). Within Mudgee, the largest employment industries are coal mining (15.9%), supermarket and grocery stores (2.9%) and primary education (2.8%). In Wellington, the largest employment industries include aged care residential services (6.1%), correctional and detention services (5.5%) and takeaway food services (5.3%).

Education

Of people aged 15 and over in Dubbo, 11.7%, 11.3% of people in Mudgee and 10.1% of people in Wellington reported having completed Year 12 as their highest level of education attained.

Social baseline

The social baseline presents some of the strengths and challenges facing communities in the locality and it has been used as a basis, where possible to assess the social impacts of the Project.

Inherent within the SIA process is the need to identify and empower vulnerable groups who typically include “Indigenous peoples, ethnic minorities, migrants, disabled people, the homeless, the poor, those struggling with substance abuse, and isolated elderly people” (Vanclay 2015). An assessment of key areas of community resilience and risk in the LGA was undertaken with the key findings summarised in Table 6-19. The findings identify several population groups as potentially having vulnerability to the social or economic changes that the Project, and the cumulative effects of other developments, may bring.

6.2.13.2. Potential Impacts

The scoping checklist identified the following potential key impacts (assessed as moderate or high) (Table 6-19).

Table 6-19: Social scoping checklist

Impact	Description and Rationale	Likely Scale	Likely Experience
Development Phase			
Threat or expectation of change to way of life	Concerns that everyday life is going to change due to this development and construction impacts, and then wind farm operation. Equally, some people may be excited by possibilities of employment opportunities, renewable energy supply.	Moderate	Negative (may be positive for some)
Impacts to wellbeing, such as fear, anger, anxiety	The unknowns and changes proposed may create a variety of feelings, exacerbated by conflict if there is strong opposition. Some residents may have positive wellbeing impacts due to belief they will benefit from employment or business opportunities.	Moderate	Negative (may be positive for some)

Impact	Description and Rationale	Likely Scale	Likely Experience
Social conflict, rivalry, and feelings of envy, which disrupt the community cohesion	Development may drive conflict in community, with some supporting and others opposing, creating community groups on opposite sides of spectrum.	Moderate	Negative
Social exclusion and powerlessness in decision making	Local stakeholders feeling that their possibilities to participate meaningfully in the consultation and decision-making process were limited. Possible for perception in some local community members that they are not able to influence decisions about their community.	Moderate	Negative
Construction Phase			
Decreased accessibility due to damage to local roads	Heavy vehicles damage roads local users rely on, impacts how people can get about and the ability of farmers to move farming vehicles.	Moderate	Negative
Changes to the size and composition of the community	Changes to the size and composition of the community, based on the size of the construction workforce	Moderate	Negative
Disturbance of cultural heritage	Work crews could accidentally discover or damage cultural artifacts during works, leading to feelings of loss	Moderate (to high, depending on event)	Negative
Changes to vegetation cover and impacts on fauna	Local biodiversity and ecosystems may be impacted due to land clearing for construction, loss of trees and greenery and potentially some animal species. Concern from community about impact on local species, such as birds.	Moderate	Negative
Increased employment opportunities	Increased employment opportunities in the area for local and regional workers	Moderate to high	Positive
Increased patronage for local businesses	Construction workers spend their income in local businesses (e.g., cafés, petrol station, retail) and accommodation	Moderate to high	Positive
Stimulated regional socioeconomic and infrastructure development	Investment and potential multiplier effects of project, leading to socioeconomic and regional infrastructure development	Moderate	Positive
Creation of business opportunities for local economy	Creation of business opportunities for local economy - creating an improved socio-economic situation	Moderate to high	Positive
Operational Phase			
Changed sense of community	Due to long term conflict if divisions were created in the community due to some supporting and some opposing the wind farm. Alternatively, conflict is mitigated during development and construction, and community cohesion is ensured, resulted in strengthening of the community	Moderate	Negative or positive
Diminished ability to Connect with Country	Aboriginal and Torres Strait Islander peoples may have diminished ability to gain sustenance (spiritual or otherwise) from the land.	Moderate	Negative

Impact	Description and Rationale	Likely Scale	Likely Experience
Changed amenity and visual impacts	Changed amenity and visual impacts (look and feel) - associated with operation of wind farm. Some community members may believe amenity impacts during operation would include noise and/or vibration impacts.	Moderate to high	Negative

6.2.13.3. EIS Assessment Approach

A Social Impact Assessment (SIA) is an important technical study that will form part of the EIS. The final version of the Social Impact Assessment Guideline for State Significant Projects (SIA Guideline) was released by the DPIE in July 2021. This guidance has been produced to provide a consistent framework and approach to the assessment of social impacts for SSD projects. In the majority of cases, the SIA process includes two phases that will form the process of analysing and responding to likely social impacts. The SIA for the Project will be delivered in line with the DPIE's Guideline (2021) and provide mitigation measures to address potential social challenges associated with the Project.

6.2.14. Minor Issues

Additional consideration will be given to the following potential impacts within the EIS:

- Resource requirements and waste
- Public health impacts regarding infrasound and Electromagnetic Fields
- Air quality impacts in regarding construction dust
- Decommissioning.

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