



Barneys Reef Wind Farm

Scoping Report

JULY 2021





BARNEYS REEF WIND FARM

Scoping Report

FINAL

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
RES Pty Ltd

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1.0 Introduction

The proposed Barneys Reef Wind Farm (the Project) involves the construction and operation of approximately 63 wind turbines and associated infrastructure. The wind farm will have a capacity of approximately 441 megawatts (MW), with the potential to power ~265,000 homes. The proponent for the Project is RES Australia Pty Ltd (RES), an established operator of renewable energy projects in Australia.

The Project is located approximately 12 kilometres (km) north of Gulgong, approximately 40 km north of Mudgee and 80 km east of Dubbo. Accessed via the Golden and Castlereagh Highways, the Project Area is within the Mid-Western Region of New South Wales (NSW) (refer to **Figure 1.1**).

RES is also proposing the Tallawang Solar Farm Project (Tallawang Project) immediately south of the Project Area. The Tallawang Project is subject to a separate Development Application process. The Barneys Reef and Tallawang Project Areas overlap, with a proposed transmission line and substation for the Tallawang Project falling within the Barneys Reef Project Area (refer to **Figure 1.2**). The proposed transmission line will be subject to the assessment process for the Tallawang Solar Farm and does not form part of the Project. The proposed substation will be common infrastructure utilised by both Projects and covered in both assessment processes.

The Project Area is located within the Central West Orana Renewable Energy Zone (REZ) identified in the NSW Government's Electricity Strategy (refer to **Section 2.1**). The REZ is expected to play a vital role in delivery of affordable energy to the community across NSW. The Project is therefore strategically located within a broad area identified as suitable for renewable energy projects.

The Mid-Western Region has been identified as having high wind renewable energy resource potential. Preliminary wind monitoring undertaken by the Proponent has guided the development of the preliminary turbine layout for the Project and continued monitoring will inform the detailed assessments to be undertaken to support the EIS. The Project Area was selected as it is located within the Central West Orana REZ, with access to a strong wind resource and the proposed Central West Orana REZ Transmission Corridor crosses the north of the Project Area. Additionally, a 330-kilovolt transmission line is located to the south of the Project Area (refer to **Figure 1.2**).

In addition to the wind turbines, the Project involves construction and operation of associated infrastructure including battery storage, operation and maintenance buildings, internal access roads, civil works, and electrical infrastructure (including two substations) required to connect to the proposed electricity transmission network. The new substation locations are proposed to be constructed on the north west side of the Project Area and the point of connection into the grid is expected to be via the proposed Central West Orana REZ Transmission Corridor.

The Project Area encompasses 14 freehold properties and 4 parcels of Crown Land, covering approximately 7,548 hectares (ha). These properties are primarily utilised for cropping and sheep and cattle grazing. The preliminary layout for the Project (refer to **Section 3.0**) will be subject to further review and refinement as the environmental and social impact assessment progresses.

The Project is State significant development (SSD) as defined under State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP) and requires development consent under Part 4 of the *Environmental Planning & Assessment Act 1979* (EP&A Act).

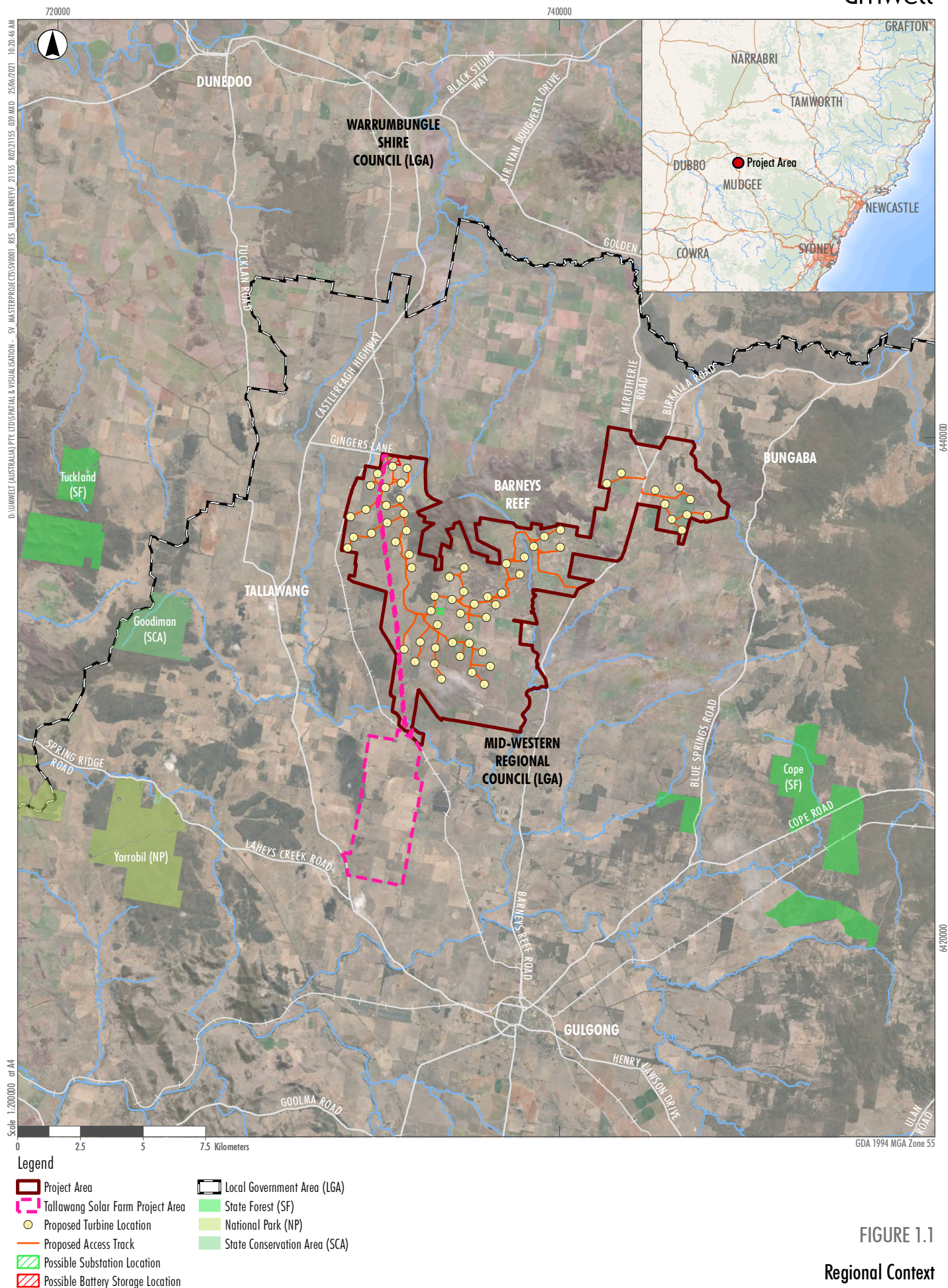
As SSD, an environmental impact statement (EIS) will be prepared to accompany the development application for the Project. This Scoping Report has been prepared to provide a description of the Project to key State regulatory agencies to inform the preparation of the Secretary's Environmental Assessment Requirements (SEARs) in accordance with clause 3 of Schedule 2 of the NSW *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation). In addition to matters prescribed for consideration by the EP&A Act, the SEARs will identify specific assessment considerations relevant to the Project that must be addressed in the EIS.

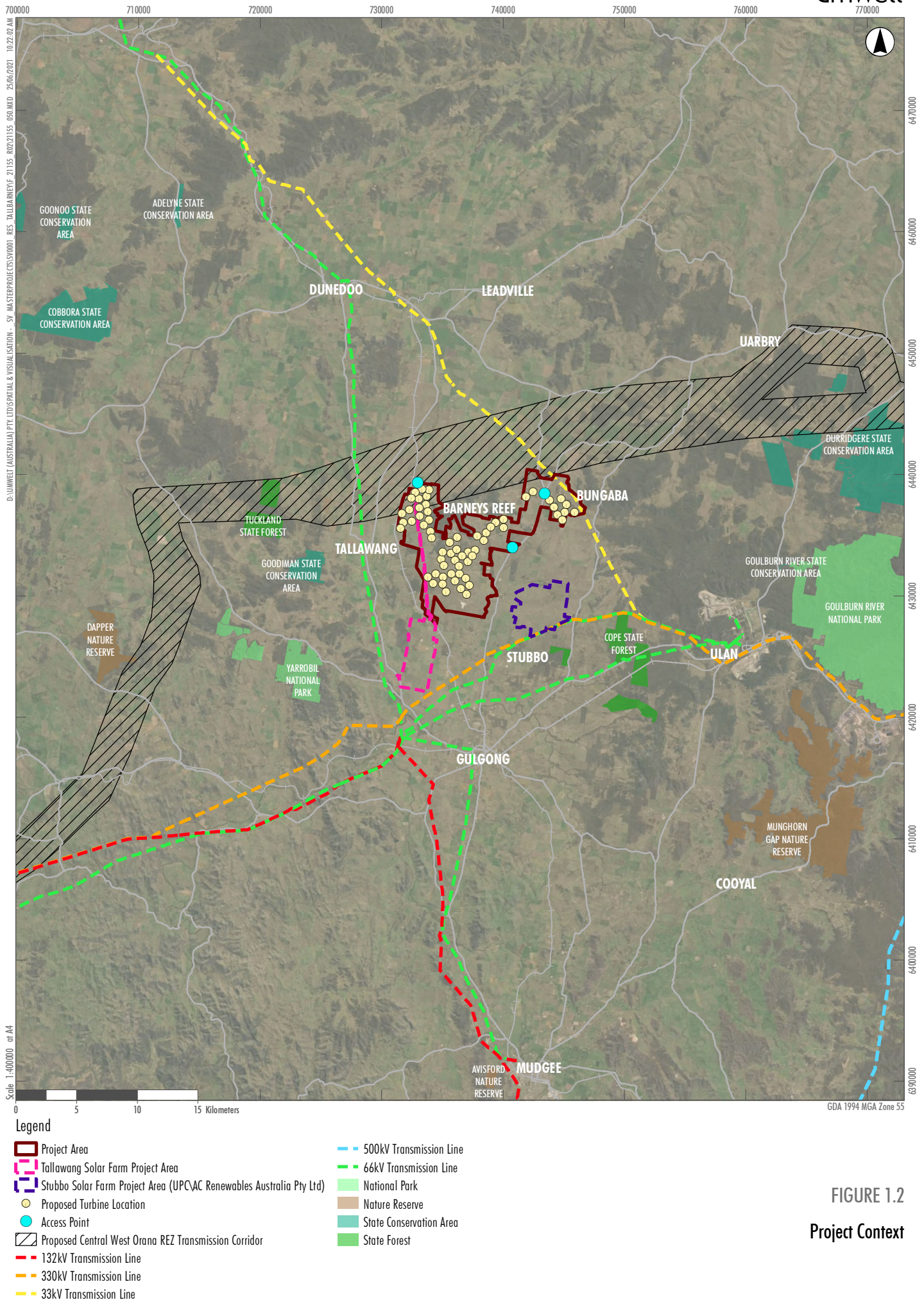
1.1 The Proponent

The proponent is RES Australia Pty Ltd (RES). RES (Renewable Energy Systems) was founded in the United Kingdom (UK) in 1981 and has since gone on to be the world's largest independent producer of renewable energy, active in both onshore and offshore wind, solar, energy storage and transmission and distribution.

RES has delivered over 21GW of renewable energy projects across the globe and supports an operational asset portfolio of 7GW worldwide for a large client base. RES has secured 1.5GW of power purchase agreements (PPAs) enabling access to energy at the lowest cost.

Since 2004, RES has a proud history of working with communities to develop projects in Australia, including the Taralga Wind Farm (NSW), Ararat Wind Farm (VIC), Murra Warra Wind Farm stage 1 and 2 (VIC), Emerald Solar Farm (QLD), the construction and asset management of the Lal Lal Wind Farm (VIC), and the Columboola Solar Farm (QLD). Currently the construction and asset management portfolio under management by RES in Australia is over 1.1GW. RES therefore has an established presence in Australia as a producer of renewable energy.





2.0 Strategic Context

2.1 Renewables Context

The development of renewable energy projects aligns with both Commonwealth and NSW government commitments to increase renewable energy generation and reduce carbon emissions across the NSW and Australian economies.

The proposed location of this Project is within the Central West Orana REZ (refer to **Figure 2.1**), being an area identified by the NSW government to be targeted for renewable energy development. The NSW government has indicated that the REZs will play a vital role in delivering affordable energy generation to help prepare the State for the expected retirement of thermal power stations over the coming decades. The government has also indicated that the REZs are expected to unlock a significant pipeline of large-scale renewable energy and storage projects, while supporting up to \$23 billion of private sector investment in NSW regions and up to 2,000 construction jobs each year.

The Project will contribute to meeting these Commonwealth and NSW government objectives and is located within a defined area planned for renewable energy development.

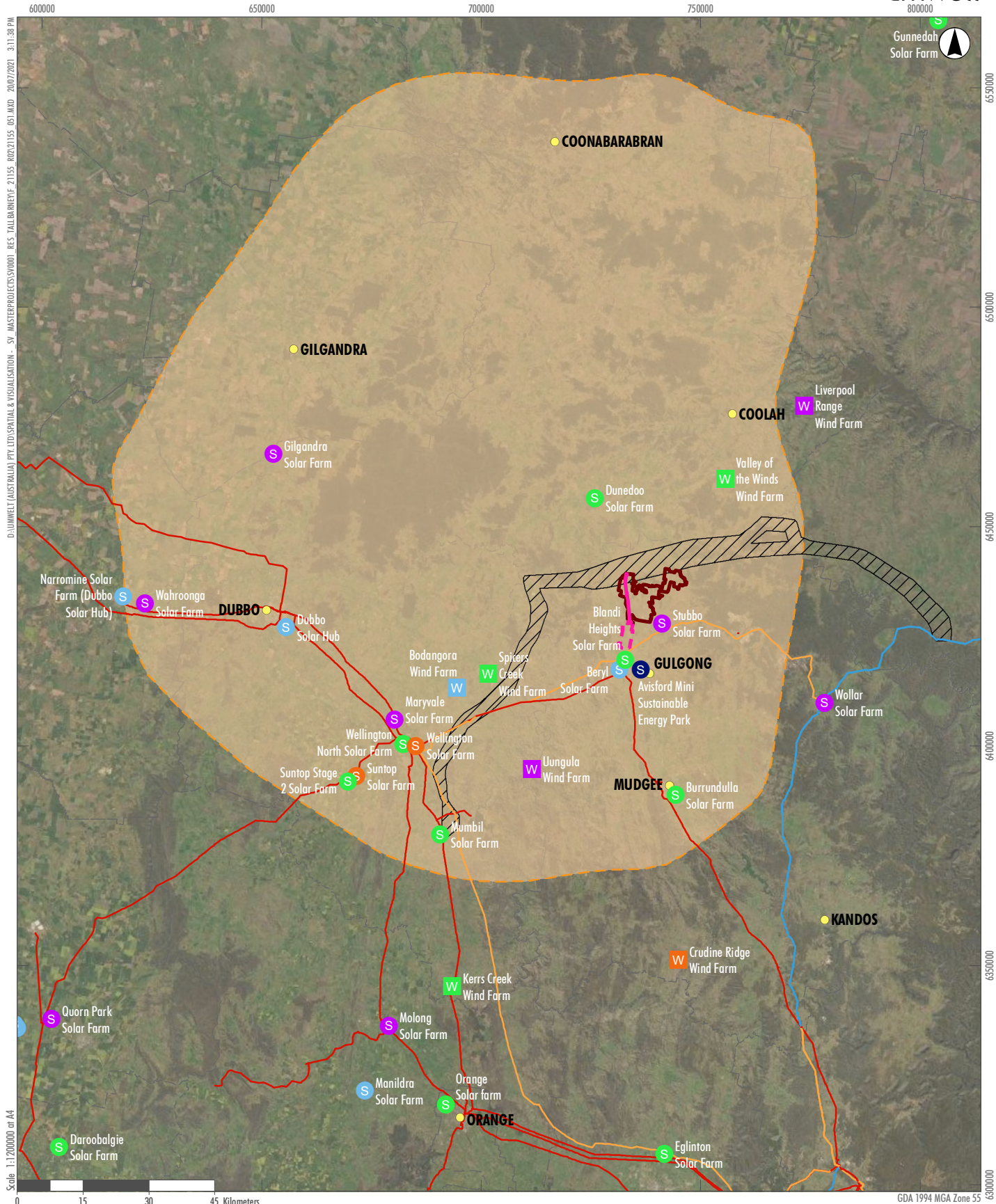
Further detail regarding the strategic context and benefits of the Project is provided in the following sections.

2.1.1 Electricity Generation Market

In Australia, total electricity generation in 2019 was approximately 265 Terawatt-hours (TWh). Based on 2019 data, coal (56%), gas (21%) and oil (2%) contributed approximately 79% of total electricity generation in 2019. Renewables contributed ~ 21% of total electricity generation with the share of renewable energy generation increasing from 19% in 2018. Approximately 14% of Australia's electricity was generated outside the electricity sector by business and households in 2018–19 (Australian Government, Department of Industry, Science, Energy and Resources, 2019). NSW is targeting 46% renewable energy generation by 2030 (Green Energy Markets, 2019).

Estimates indicate that three-quarters of Australia's coal fired power stations are operating beyond their original design life, with some receiving extensive 'life extension' refits (Department of Industry and Science, 2015) to continue operation. In NSW all five of the coal-fired power stations are scheduled to retire between 2022 and 2043 (AEMO, 2019) beginning with the Liddell Power Station (Hunter Valley) in 2023, increasing the demand for renewable energy.

The current energy mix in NSW includes coal fired power generation accounting for approximately 80% of electricity produced in NSW, renewable energy sources (wind, solar and hydro) accounting for approximately 16%, and gas and biomass accounting for approximately 4% (NSW Government 2019). The share of wind and solar has tripled in the five years to 2019, with the share of renewable electricity generation expected to increase to 57% by 2030 and 84% by 2050 (Energy Networks Australia, 2019).



Legend

- Project Area
- Tallawang Solar Farm Project Area
- Indicative Central-West Orana Renewable Energy Zone
- Proposed Central West Orana REZ Transmission Corridor
- Local Government Area (LGA)
- Roads
- Operating System Voltage (kV)**
- 132kV

- 330kV
- 500kV
- Solar Developments**
- S Operational
- S Approved
- S In Planning
- S Under Construction
- S Rejected

- Wind Developments**
- W Operational
- W Approved
- W In Planning
- W Under Construction

FIGURE 2.1

Central West Orana REZ and
Proposed Transmission Line Corridor

2.1.2 Federal and State Renewable Energy Commitments

Australia is one of the 195 countries from around the world signed to the international climate change agreement (the Paris Agreement). The Paris Agreement aims to:

- hold the increase in the global average temperature to below 2°C above pre-industrial levels, and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels
- increase the ability [of nations] to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production, and
- make finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.

Australia signed the Paris Agreement on 22 April 2016. The obligations under the Paris Agreement are expected to drive national greenhouse gas policy between 2020 and 2030. Under the Paris Agreement, Australia is obliged to:

- prepare, communicate and maintain a Nationally Determined Contribution (NDC). An NDC outlines the size and type of mitigation contribution each member state will make to the international effort
- pursue domestic mitigation measures, with the aim of achieving the objectives of its NDC
- communicate an NDC every 5 years, and
- quantify its NDC in accordance with Intergovernmental Panel on Climate Change (IPCC) methodologies, which promote transparency and avoid double counting.

Australia's commitment to the Paris Agreement includes reducing greenhouse gas emissions by 26 - 28 % on 2005 levels by 2030 (Commonwealth of Australia, 2015). Australia's NDC prescribes an unconditional economy-wide target to reduce greenhouse gas emissions and states that future policies will target emissions generated from energy use, industrial processes, agriculture, land-use, land-use change and forestry and waste.

The NSW Government has developed its NSW Climate Change Policy Framework, which aims to deliver net zero emissions by 2050, and a State that is more resilient and responsive to climate change (OEH 2016). Under the Framework, NSW has committed to both follow the Paris Agreement and to work to complement national action.

In 2013 the NSW Government released the Renewable Energy Action Plan (REAP) and the NSW Energy Efficiency Action Plan (EEAP). The REAP aimed to increase the generation, storage and use of renewable energy in NSW, at least cost to customers and with maximum benefits to NSW.

The three core goals of the REAP were to attract renewable energy investment, build community support for renewable energy and attract and grow expertise in renewable energy. Based on the implementation of the REAP, renewable energy is now well-placed to play a leading role in meeting NSW's energy needs into the future and has resulted in solar and wind generated electricity tripling during the five years the REAP was implemented.

2.1.3 Local and Regional Renewables Context

The Project Area is located within the Central West-Orana region which is identified as a REZ under the six-part NSW Electricity Strategy (the Strategy). The Strategy provides an overview of the current and projected electricity status in NSW and states the aims for the electricity system which is to provide reliable, affordable, and sustainable electricity.

There are a large number of renewable energy projects within 100km of the Project Area which are operational, under construction or at different stages of the approval process. These projects are shown on **Figure 2.1** and identified in **Table 2.1**.

Table 2.1 Surrounding Renewable Developments

Renewable Development	Status
Bodangora Wind Farm (39 km south west of the Project Area),	Operational
Beryl Solar Farm (15 km south of the Project Area)	Operational
Dubbo Solar Hub (76 km west of the Project Area).	Operational
Manildra Solar Farm (Manildra)	Operational
Crudine Ridge Wind Farm (between Mudgee and Bathurst)	Under construction
Wellington Solar Farm (Wellington)	Under construction
Suntop Solar Farm (near Wellington)	Under construction
Gilgandra Solar Farm (south of Gilgandra)	Approved
Liverpool Range Wind Farm (north west of Project Area, near Coolah)	Approved
Wahroonga Solar Farm (west of Dubbo)	Approved
Maryvale Solar Farm (slightly north of Wellington)	Approved
Wollar Solar Farm (east of Project Area)	Approved
Quorn Solar Park (north of Parkes)	Approved
Molong Solar Farm (Molong)	Approved
Uungula Wind Farm (located between Mudgee and Wellington)	Approved
Stubbo Solar Farm (immediately south east of Project Area)	Approved
Tallawang Solar Farm (south adjacent to the Project Area)	In Planning
Valley of the Winds Wind Farm (north east of Project Area)	In Planning
Dunedoo Solar Farm (north of the Project Area)	In Planning
Suntop Stage 2 Solar Farm (south west of Wellington)	In Planning
Wellington North Solar Farm (Wellington)	In Planning
Bunrundulla Solar Farm (slightly south of Mudgee)	In Planning
Mumbil Solar Farm (south of Wellington)	In Planning
Orange Solar Farm (Orange)	In Planning
Eglington Solar Farm (between Orange and Bathurst)	In Planning
Spicers Creek Wind Farm (immediately west of the Project Area)	In Planning

Wind energy is known to be one of the cheapest forms of new build large-scale energy generation. The east coast and regions along the higher exposed parts of New England, the Great Dividing Range and the Southern Highlands in NSW have been identified as some of Australia's best wind farm sites, with consistently high average wind speeds and are often closer to existing transmission infrastructure.

The Project Area is mapped as an area with medium-high wind and medium-high solar renewable energy source potential under the NSW REAP, refer to **Section 2.2.1** for further detail.

The proposed Central West Orana REZ Transmission Line corridor (refer to **Figure 2.1**) traverses directly to the north of the Project Area, with the corridor passing through the north west and north east portions of the Project Area. This new transmission line corridor is proposed to better connect the REZ with the broader NSW electricity network.

2.2 Environmental Context

2.2.1 Climate

The Project Area is located at the eastern edge of the NSW South Western Slopes bioregion, specifically, the Inland Slopes sub-bioregion. This bioregion is characterised by hot summers and no dry season, with more temperate climates appearing at higher elevations. Meteorological data sourced from the nearest Bureau of Meteorology (BoM) site, the Gulgong Post Office (approximately 12 km south of the Project Area), identified a mean annual rainfall of 650.7 mm and a mean annual temperature of 23.2 °C (BoM, 2021) for the local area.

The Renewable Energy Resource Mapping (DPIE, 2019) is reproduced in **Figure 2.2** which indicates the existing wind resources applicable to the Project Area. The wind resources available in the Project Area are identified as greater than 6.3 metres/second (m/s) on average, which is considered to be appropriate for the development of a wind farm.

2.2.2 Topography

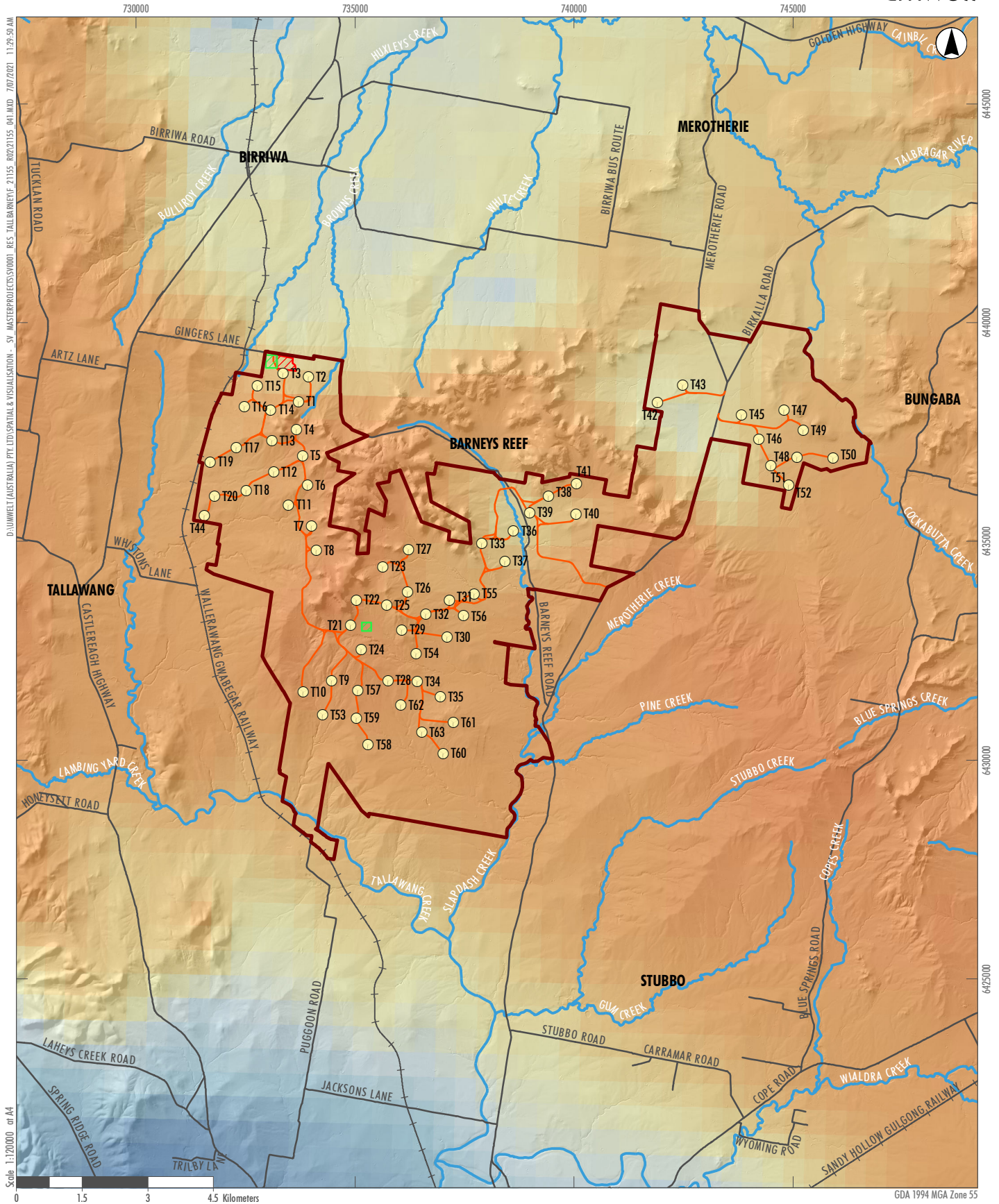
The topography of the Project Area (refer to **Figure 2.3**) is hilly to undulating and ranges in elevation from 434m AHD to 568m AHD.

Part of the northern portion of the Project Area is characterised by the elevated formation known as Barneys Reef. Barneys Reef comprises an extended ridgeline formation with steep drop offs that then give way to relatively gently inclined slopes. No development is proposed on elevated steep terrain within the Project Area.

2.2.3 Zoning

The Project Area is zoned as RU1 Primary Production (refer to **Figure 2.4**) under the Mid-Western Regional Council Local Environmental Plan (LEP).

Shown in **Figure 2.4**, Petroleum Exploration Licence (PEL) 456 applies to the eastern portion of the Project Area. This PEL is held by Hunter Gas Pty Ltd and Santos QNT Pty Ltd. The Project Area is not currently subject to any mineral titles.



- Legend**
- Project Area
 - Proposed Turbine Location
 - Proposed Access Track
 - Possible Substation Location
 - Possible Battery Storage Location

Wind speed (metres per second at 100m above ground level)

High : 10.2

Low : 2.4

FIGURE 2.2

Wind Resource Mapping

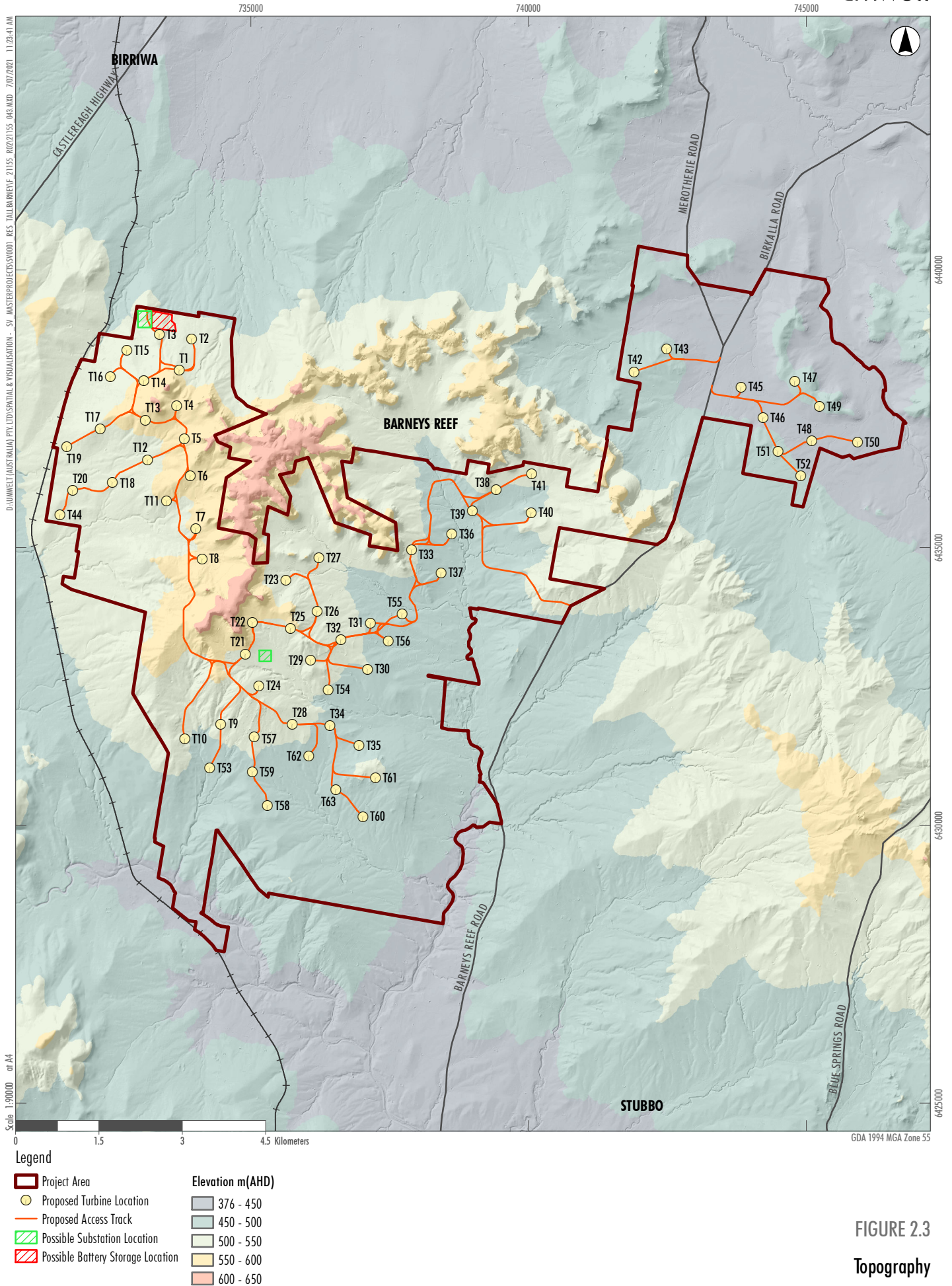


FIGURE 2.3
Topography

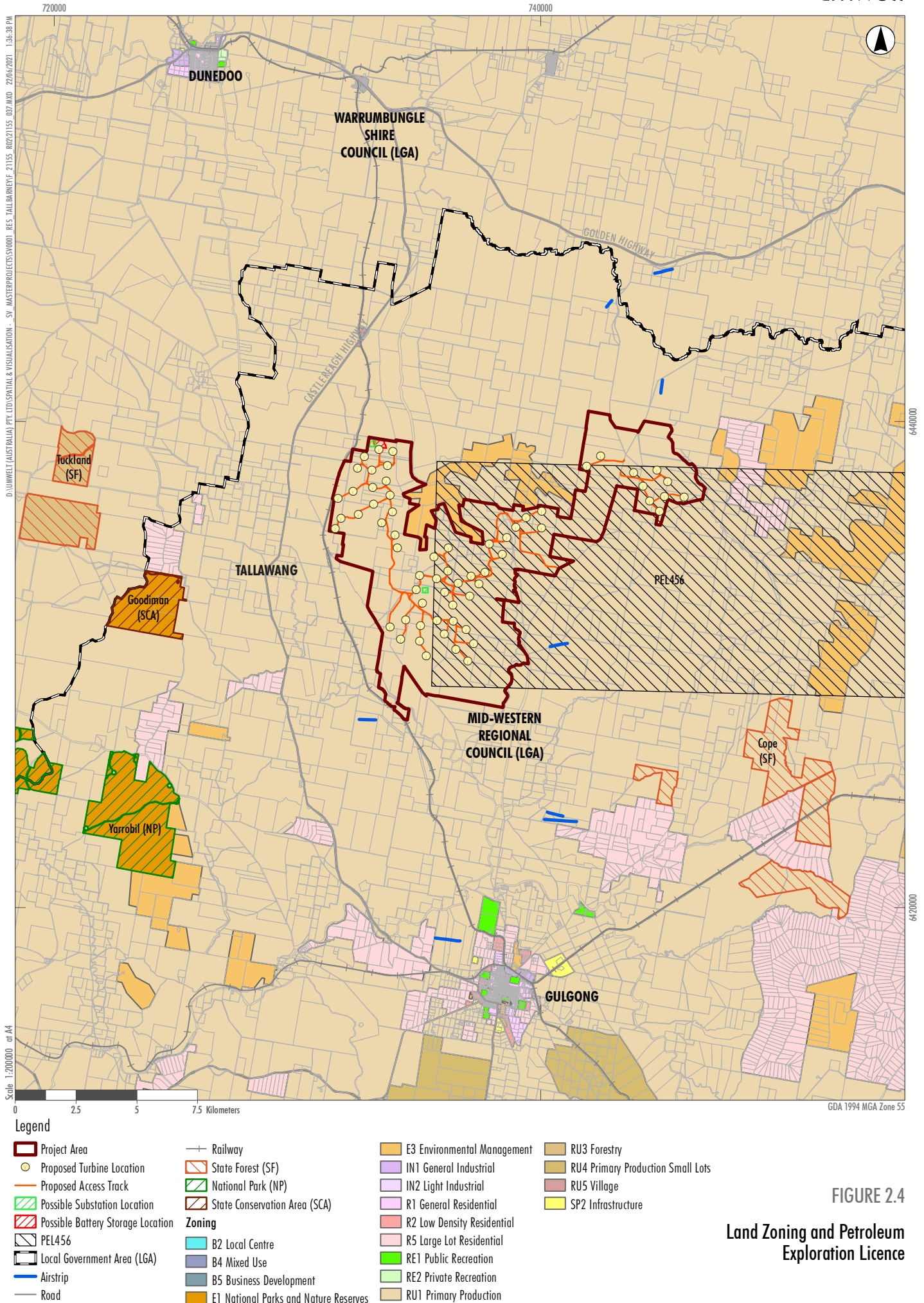


FIGURE 2.4

Land Zoning and Petroleum Exploration Licence

2.2.4 Hydrology and Soils

The land within the Project Area is variable in land capability with land classes 5 and 7 land and soil capability, which is described as moderate to low capability agricultural land (refer to **Figure 2.5**). None of the land within the Project Area is identified as Biophysical Strategic Agricultural Land (BSAL), refer to **Figure 2.5**.

The mapped soil landscapes (NSW DPIE, 2020) are shown on **Figure 2.6**. The Rouse soil landscape covers the majority of the Project Area, with sections of the Lees Pinch landscape primarily associated with areas of elevation and the Home Rule landscape present in the southern and northern extent of the Project Area only. The Turill and Bald Hill landscapes are present in relatively confined areas associated with Barneys Reef. Soils within the Project Area are classified as erodible Tenosols and Rudosols, and Sodosols.

The Project Area is located within the Macquarie-Bogan River Systems Hydrology (shown in **Figure 2.7**). The main watercourses across the Project Area include several minor 1st order watercourses, leading into 2nd order streams including Slapdash Creek, Browns Creek and White Creek. Merotherie Creek is located to the south east of the Project Area.

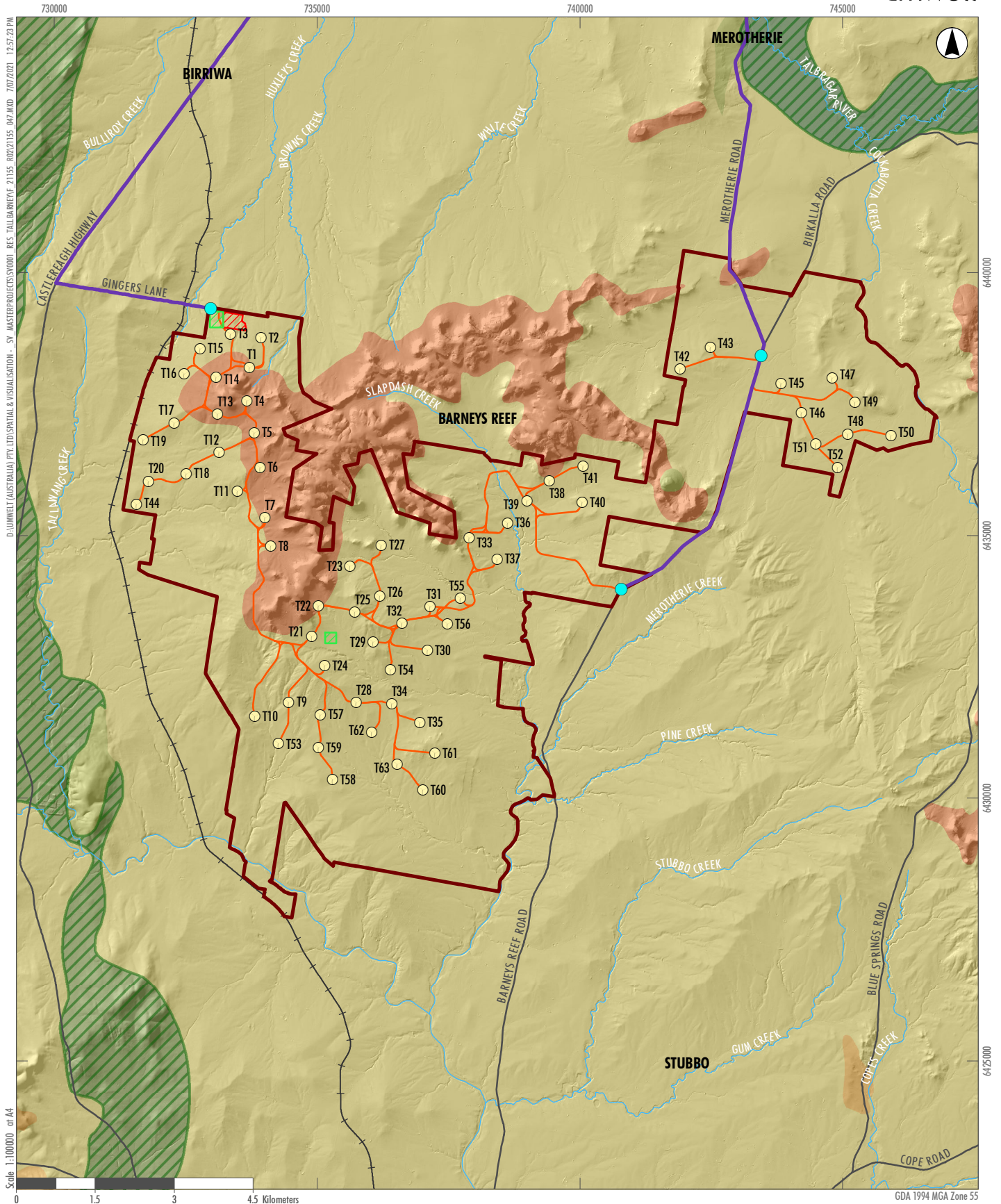
Drainage lines on the eastern side of Barneys Reef drain to Slapdash Creek, which runs approximately north-south through the central portion of the Project Area. The drainage lines on the western side eventually flow to join Tallawang Creek, which is predominantly located outside the boundaries of the Project Area but bisects the southern end of the Project Area in proximity to the Gwabegar-Wallerawang rail line.

Following a site inspection in March 2021, significant erosion was evident on sections of Slapdash Creek, located in the central section of the Project Area and flowing to the south east.

2.2.5 Ecology

The Project Area includes a variety of vegetation types including exotic pasture, derived native grassland, woodland and dry open forest. Barneys Reef, a complex of low, uncleared hills forms a continuous band of remnant vegetation north of the Project Area. This large, remnant patch exists as an isolated fragment surrounded by pastoral grassland, roads and farming infrastructure.

Further detail in relation to Ecology is discussed in **Section 6.1.3**.



- Legend**
- Project Area
 - Proposed Turbine Location
 - Proposed Access Track
 - Possible Substation Location
 - Possible Battery Storage Location
 - Proposed Access
 - Access Point
 - Biophysical Strategic Agricultural Land (BSAL)

- Land and Soil Capability**
- 2 - Slight but Significant Limitations
 - 3 - Moderate Limitations
 - 4 - Moderate to Severe Limitations
 - 5 - Severe Limitations
 - 6 - Very Severe Limitations
 - 7 - Extremely Severe Limitations

FIGURE 2.5

Land and Soil Capability
and BSAL Use

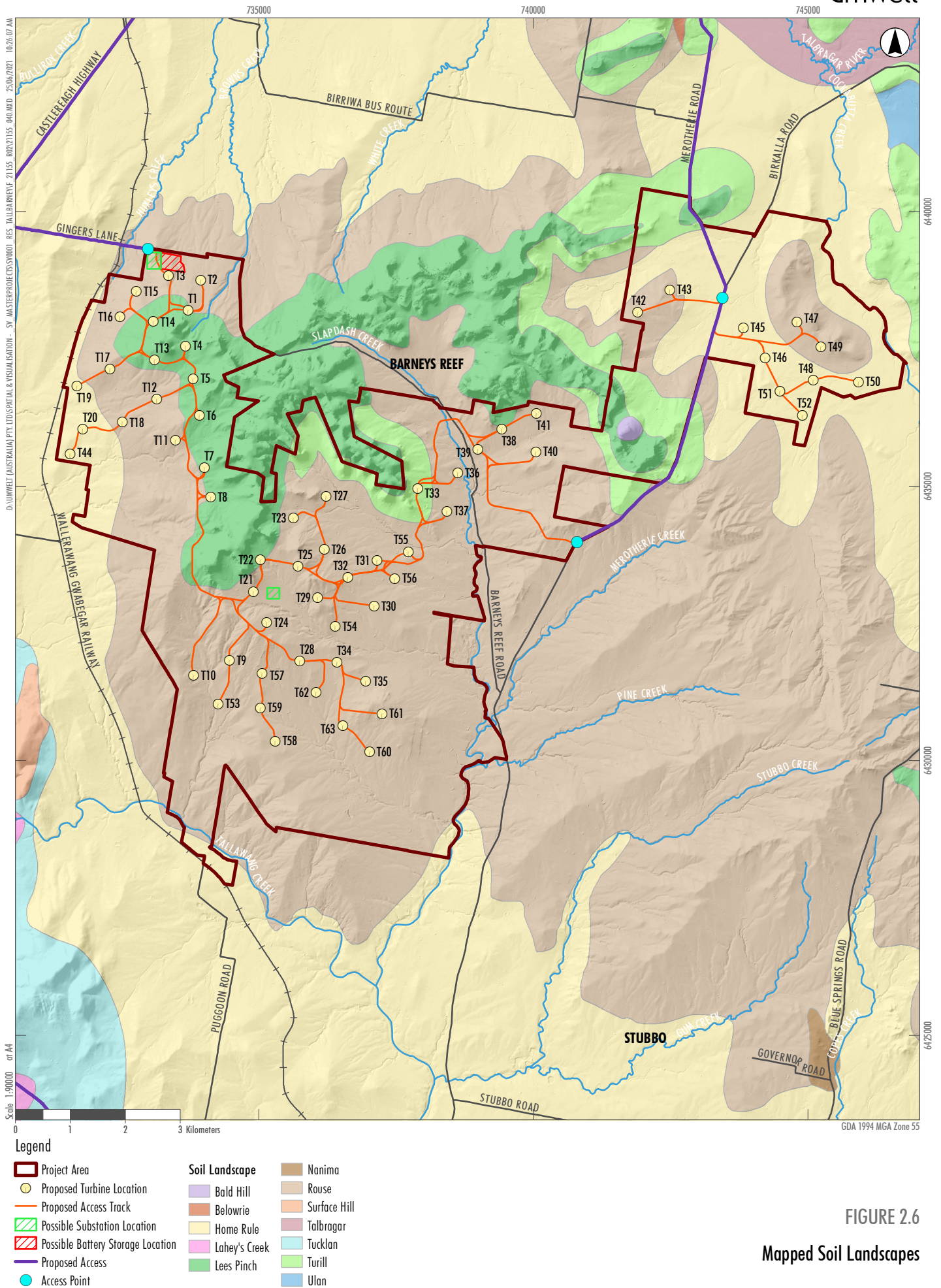


FIGURE 2.6

Mapped Soil Landscapes

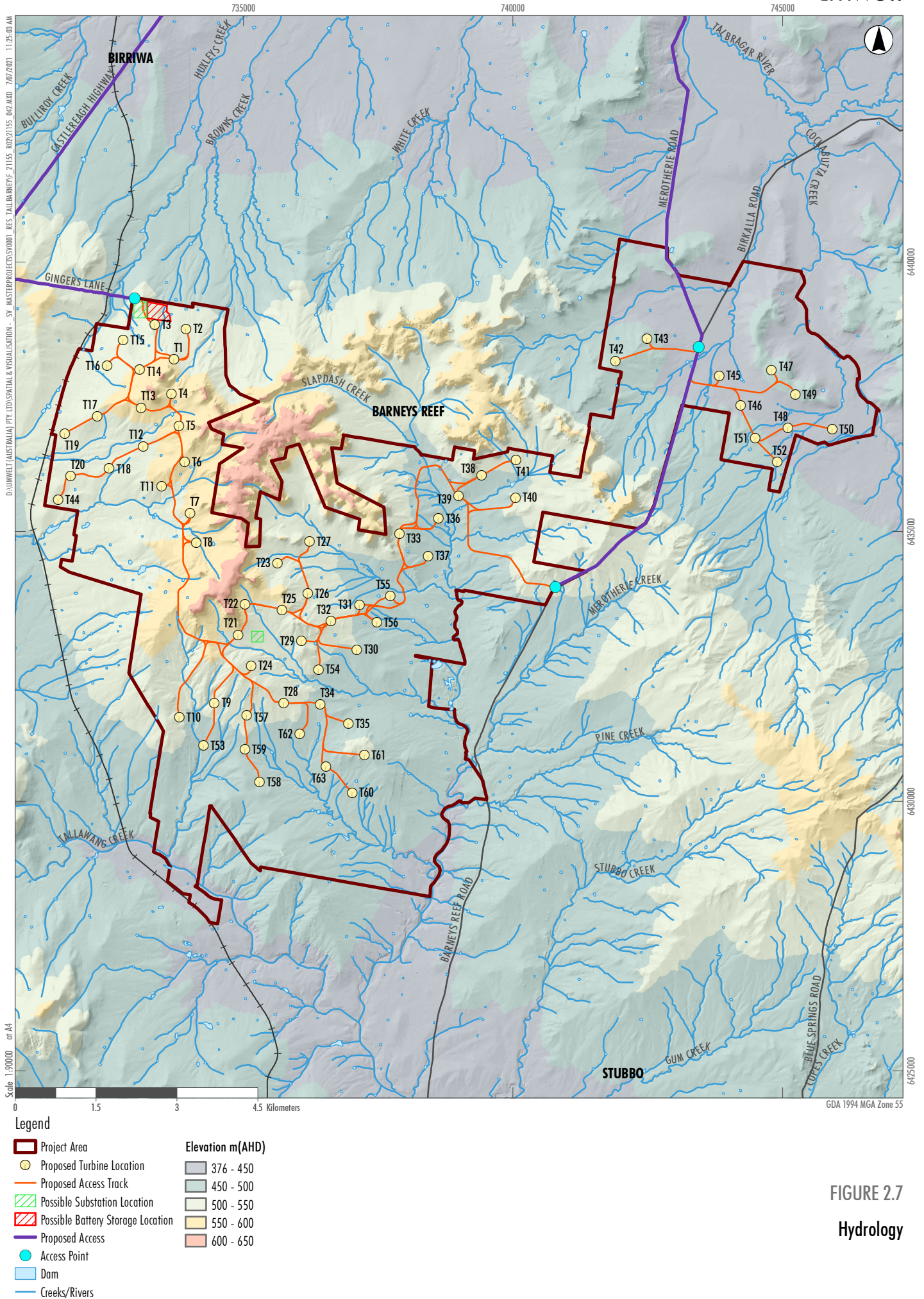


FIGURE 2.7
Hydrology

2.3 Social Context

The Project Area is located within a rural setting and covers approximately 7548 ha located within the Mid-Western Region Local Government Area (LGA). The Project Area is located approximately 12 km north of the township of Gulgong and approximately 16 km south of Dunedoo. The closest national park, state park or nature reserve is the Goodiman State Conservation Area, located approximately 8 km west (refer to **Figure 2.8**). The townships of Gulgong and Dunedoo have populations of 2,521 and 747 respectively. The Project Area can be accessed from a number of existing local roads via the Golden and Castlereagh Highways.

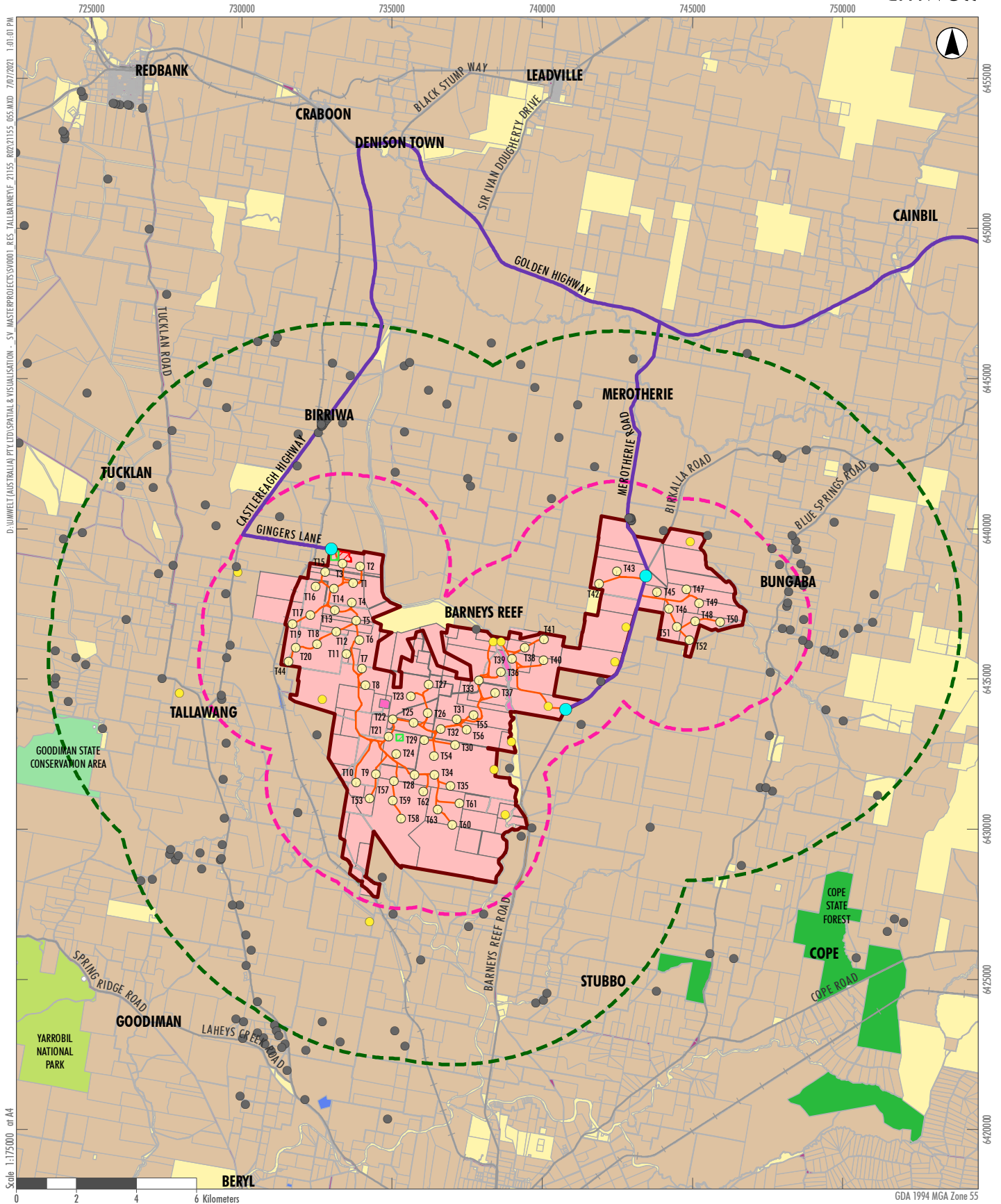
The land within the Project Area is owned by multiple landowners as well as Crown reserves and roads. Land within and surrounding the Project Area has been subject to extensive vegetation clearing associated with historic agricultural land uses and is predominately utilised for grazing activities, with some cropping, horticulture, forestry and areas of nature conservation. The key industries in the region include coal mining, agriculture, tourism, retail trade, forestry, fishing and manufacturing (NSW Government, 2018).

There are currently 34 non-involved residential dwellings located within approximately 3km of the proposed turbines (refer to **Figure 2.8**). RES has engaged with these near neighbours to discuss the potential impacts and benefits of the Project. RES is currently developing a shared benefit scheme to further the benefits of the Project to neighbours, and will further consult during the EIS phase regarding a shared benefit agreement.

2.3.1 Land Ownership

The Project Area encompasses 14 privately-owned properties, with 11 dwellings and within 93 land parcels (refer to **Figure 2.8**), all of which are primarily utilised for cropping, and sheep and cattle grazing.

Land surrounding the Project Area is also predominately utilised for agricultural purposes.



Legend

- Project Area
- Proposed Turbine Location
- Proposed Access Track
- Possible Substation Location
- Possible Battery Storage Location
- Proposed Access
- Access Point
- Involved Landholder Dwelling
- Non-involved Landholder Dwelling
- 3000 Buffer
- 8000m Buffer
- Private - Involved Landholder
- Crown Land
- Private
- Local Government Authority
- NSW Government
- The State of NSW
- Transport for NSW
- Shared Crown/Council
- National Park
- State Conservation Area
- StateForest

FIGURE 2.8
Site Context

3.0 The Project

The preliminary layout for the Project (refer to **Figure 3.1**) has been prepared in consideration of the ecological, archaeological and land use constraints (including setbacks from residences) while also maximising the placement of turbines within areas identified as having higher wind resources.

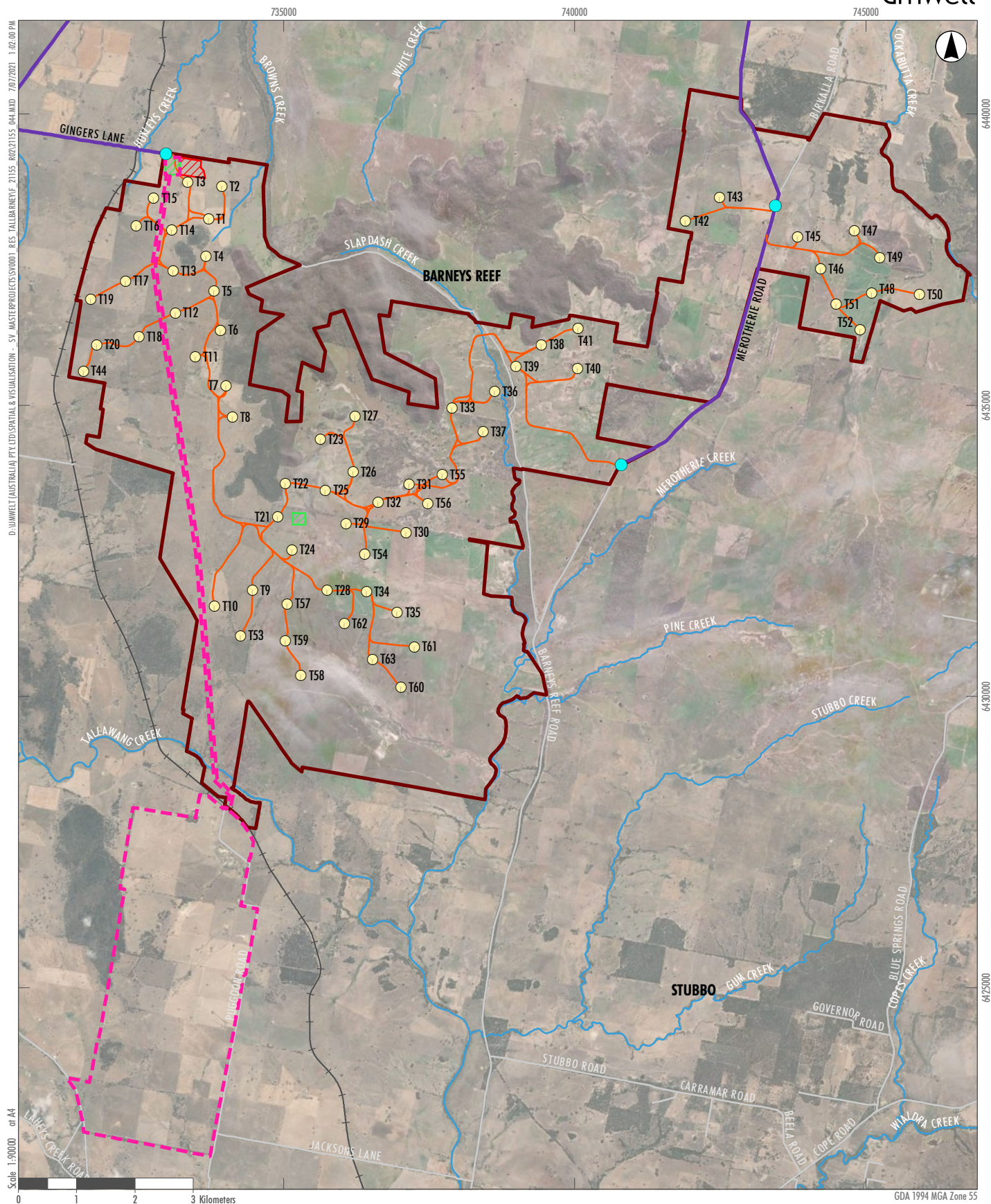
The Project includes the construction, operation and maintenance of approximately 63 turbines. Associated infrastructure includes internal access roads, operation and maintenance buildings, two substations, civil works and electrical infrastructure required to connect to the transmission network.

The key components of the Project include:

- approximately 63 (3 blade) wind turbines with a total height (tip height) of approximately 280 m
- electrical connections between the proposed wind turbines consisting of a combination of underground cables and overhead powerlines
- two new substations and a transmission connection to connect the proposed wind farm to the network
- other associated infrastructure including internal access roads and tracks, operation and maintenance buildings and construction facilities (all facilities subject to further detailed design)
- temporary on-site concrete batching plant during the construction phase
- Battery Storage - (441 MW AC Coupled System with 4h duration- 1764 MWh)
- targeted road network upgrades to facilitate delivery of wind turbine components to the site as required
- borrow pit to supply gravel for construction (subject to further assessment on suitability).

The proposed infrastructure would be contained within the Project Area including all turbine blades. The proposed layout will allow for micro-siting and will be subject to further detailed design as the environmental and social impact assessments progress.

The Project construction phase would be approximately 28 months with the peak construction period expected in months 7 – 14.



- Legend
- Project Area
 - Tallawang Solar Farm Project Area
 - Proposed Turbine Location
 - Proposed Access Track
 - Possible Substation Location
 - Possible Battery Storage Location
 - Proposed Access
 - Access Point

FIGURE 3.1

Conceptual Layout

3.1 Project Benefits

The Project will provide long-term, strategic benefits to the state of NSW, including:

- renewable energy supply to assist with fulfilling the current obligations under state and federal renewable energy targets
- providing for cleaner reliable electricity generation, assisting with meeting current load demand while reducing greenhouse gas emissions and the impacts of climate change
- providing regional investment in the NSW renewable energy sector.

The Project will also provide direct financial benefits to the regional and local community, including:

- infrastructure investment of approximately \$900 million
- employment generation creating approximately 340 jobs during the construction phase and approximately 10 jobs during the operational phase
- indirect benefits to local services through the construction and operation phases
- additional landowner income to involved landowners resulting in financial contributions to the local community
- local community benefits through the implementation of a proposed community benefit fund that will invest in local community projects and initiatives to provide a direct and targeted local benefit.

3.2 Project Alternatives

The Project Area was selected due to the area being identified as a REZ, having high wind renewable energy resource potential, proximity to the proposed transmission line corridor and in consideration of environmental values (much of the site has been historically cleared). A broader area was investigated prior to selecting the Project Area.

RES initially commenced consultation with potential involved landholders based on a larger study area. This larger area has been reduced to a Project Area of approximately 7,548 ha with the indicative turbine placement and infrastructure design being subject to a number of iterations during consultation with the landowners and neighbouring properties. The layout was further refined based on an initial environmental constraints analysis, including biodiversity, heritage and visual analysis and civil engineering considerations.

RES commenced consultation with the involved landholders in December 2019. This consultation included group workshops, face to face meetings and phone calls conducted by RES employees. This initial consultation process resulted in the current involved landholders confirming involvement in the Project.

The Project layout will be subject to further refinement and revision as more information is obtained through the proposed environmental studies and ongoing feedback from the consultation processes.

4.0 Statutory Context

4.1.1 NSW Planning Approval Pathway

There are several legislative instruments in NSW which regulate the planning and environmental impact of development. The primary instrument is the EP&A Act which regulates the environmental assessment and approval process for development in the State. The EP&A Act is supported by the Environmental Planning and Assessment Regulation 2000 (the Regulation).

4.1.1.1 NSW Environmental Planning and Assessment Act 1979

The Project will require development consent under Part 4 of the EP&A Act. The Project is classed as SSD under the provisions of the State Environmental Planning Policy (State and Regional Development) 2011 and is subject to the provisions of Division 4.7 of the EP&A Act. The Development Application will be lodged with the Planning Secretary of DPIE. This report accompanies the request for SEARs for the EIS.

Under Division 4.2, Section 4.5 of the EP&A Act the consent authority for SSD is the Independent Planning Commission (if the development is of a kind for which the Commission is declared the consent authority by an environmental planning instrument) or the Minister (if the development is not of that kind).

Section 4.15 of the EP&A Act describes the matters for consideration in assessing SSD, which includes the provisions of relevant environmental planning instruments, proposed instruments that have been the subject of public consultation, development control plans, planning agreements and statutory regulations. The assessment of SSD must also consider the likely impacts of the development, suitability of the site, any submissions received and the public interest.

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

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

4.1.1.2 State Environmental Planning Policy (State and Regional Development) 2011

Under the State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP), the Project is SSD as it is a development for the purpose of electricity generation and will have a capital investment value of greater than \$30 million.

4.1.1.3 Permissibility

Clause 34(1)(b) of State Environmental Planning Policy (Infrastructure) 2007 (Infrastructure SEPP) states that development for the purpose of electricity generating works may be carried out by any person with consent on any land in a prescribed rural, industrial or special use zone. Under Clause 8(1) of the Infrastructure SEPP, the provisions prevail where there are inconsistencies with any other environmental planning instruments, including local environmental plans.

The Project Area falls within the Mid-Western Regional Council LGA and is zoned RU1 – Primary Production under the LGA’s Local Environmental Plan 2012. Electricity generating works are permitted within the RU1 – Primary Production Zone, with development consent.

4.1.2 Other NSW Legislation

The other applicable State legislation in addition to the EP&A Act is outlined in **Table 4.1**.

Table 4.1 State Legislation

State Legislation	Description
<i>Biodiversity Conservation Act 2016</i> (BC Act)	Under the BC Act, biodiversity assessment in accordance with the Biodiversity Assessment Method (BAM) is required for any SSD project. The Project triggers the need to prepare a Biodiversity Development Assessment Report (BDAR) in accordance with the BAM. The EIS will include a BDAR.
<i>Protection of the Environment Operations Act 1997</i> (POEO Act)	The POEO Act regulates pollution to the environment and requires licences for environmental protection including waste, air, water and noise pollution control. Wind farms are a scheduled activity under the POEO Act and require an Environment Protection Licence (EPL). An EPL would be sought in relation to the construction and operation of the Project.
<i>Water Management Act 2000</i> (WM Act)	Any water extractions (take) from water sources (surface and groundwater) regulated by a Water Sharing Plan (WSP) required for construction purposes will require licensing under the WM Act. The potential water requirements during construction will be assessed as part of the Water and Soil Impact Assessment prepared as part of the EIS. Any necessary licences would be obtained for the Project.
<i>Roads Act 1993</i> (Roads Act)	A consent is required under section 138 to work on or above a road or to connect a road to a classified road. Consents under section 138 will be required for the proposed road works.
<i>Crown Land Management Act 2016</i> (Crown Land Act)	The Crown Land Act provides for the administration and management of Crown Land in NSW. Crown land may not be occupied, used, sold, leased, licensed, dedicated, reserved or otherwise dealt with unless authorised by the Crown Land Act. There are some areas of Crown Land (e.g. Crown road reserves) within the Project Area and should any works be proposed in these areas an approval would be obtained.
<i>Electricity Supply Act 1995 and Electricity Network Assets (Authorised Transactions) Act 2015</i>	Under these Acts, the transmission and distribution lines connecting a wind energy generating facility to the grid can be considered as a separate development from the generating facility given both the linear nature of transmission lines and the fact that they are usually owned and operated by an electricity transmission operator or distributor. If not and if they are sufficiently related to the wind energy generating facility, they should form part of the associated SSD (wind farm project) and be governed by Part 4 of the EP&A Act. Required transmission infrastructure will be confirmed during the EIS following further stakeholder consultation.

4.1.3 Regional Plans

4.1.3.1 Central West and Orana Regional Plan 2036

The Central West and Orana Regional Plan 2036 is the NSW Government's strategic long-term plan to guide land use decisions for the Central West and Orana region. The Plan sets out four regionally focused goals including:

- The most diverse regional economy in NSW.
- A stronger, healthier environment and diverse heritage.
- Quality freight, transport and infrastructure networks.
- Dynamic, vibrant and healthy communities.

The regional plan aims to strengthen the region's diverse regional economy, improve transport connections with metropolitan cities to the east to provide capacity and connectivity and to foster greater market and industry diversification. In particular, the Regional Plan acknowledges that recent landmark renewable projects distinguish the region as a leader in renewable energy development.

In addition to the four goals, the plan outlines 29 directions and 126 actions. The goals articulate the intended outcome, the directions identify the broad issues or policy areas that need focus and the actions represent the initiatives required to achieve the goals. The Project will contribute to achieving the overall goals of the plan particularly in relation to the following directions:

Direction 1: Protect the regions diverse and productive agricultural land – use of the land for renewable development, particularly wind farms, is compatible with continued agricultural use of the land.

Direction 9: Increase renewable energy generation – the project is addressing this direction.

Direction 12: Plan for greater land use compatibility – land use planning and conflict has been taken into consideration when selecting the Project Area.

Direction 13: Protect and manage environmental assets – refinement of the Project layout has been subject to environmental constraints analysis including biodiversity, heritage and visual impact.

Direction 15: Increase resilience to natural hazards and climate change – renewable energy projects support current climate change policy directions to prioritise investment to reduce carbon emissions.

Direction 16: Respect and protect Aboriginal heritage assets – the Project layout has been designed to avoid known Aboriginal sites within the Project Area, with survey planned to identify any further Aboriginal so that these can be considered in finalising the Project layout.

4.1.4 Commonwealth Legislation

4.1.4.1 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act provides a framework for protection of the Australian environment, including its biodiversity and its natural and culturally significant places.

Any action which could have a significant impact on a matter of national environmental significance (MNES) must be referred to the Minister for the Environment. MNES include:

- World heritage properties

- National heritage places
- Wetlands of international importance (listed under the Ramsar Convention)
- Listed threatened species and ecological communities
- Migratory species protected under international agreements
- Commonwealth marine areas
- The Great Barrier Reef Marine Park
- Nuclear actions (including uranium mines), and
- A water resource, in relation to coal seam gas development and large coal mining development.

The Project Area is not within a world heritage property or place, does not have wetlands of international importance, is not within either a Commonwealth marine area or the Great Barrier Reef Marine Park, and does not relate to a nuclear action, coal seam gas or coal mining development.

There is potential for the Project to impact on listed threatened species and ecological communities, and migratory species.

A Referral will be lodged to determine whether the Project requires formal assessment and approval under the EPBC Act as a Controlled Action. If deemed a Controlled Action, it is assumed that the Project would be assessed under a bilateral agreement between the NSW and Commonwealth governments.

4.1.4.2 Civil Aviation Regulation 1988

Reporting of tall structures to the Royal Australian Air Force (RAAF) is required under the Civil Aviation Regulations 1988. A detailed aviation safety assessment in accordance with the regulations and consultation with the relevant agencies will be undertaken as part of the preparation of the EIS.

4.1.4.3 Civil Aviation Safety Regulation 1998

Under Part 139, Subpart 139E “Obstacles and Hazards” the Regulation requires the Civil Aviation Safety Authority (CASA) to be informed of any proposal to build structures exceeding 110 m above ground level (AGL). This is conducted to determine if the wind turbines present a potential hazard to aircraft and provide mitigation measures. The detailed aviation assessment will include consultation with CASA as the proposed turbines will exceed 110 m in height.

4.1.4.4 Renewable Energy (Electricity) Act 2000 (RE Act)

The RE Act establishes large-scale and small-scale renewable energy schemes. The objects of the Act are achieved through certificate generation (for generation of electricity from renewable sources), the liability framework and administrative arrangements.

The Project will require accreditation as a Renewable Energy Generator to create Large Scale Generation Certificates (LGCs).

4.1.4.5 Radio Communications Act 1992 (RC Act)

Under Part 4.1 of the RC Act, a legislation framework has been established to regulate equipment that uses or is affected by radio emissions. Radio communications can be impacted by the proposed turbines through electromagnetic interference (EMI). A detailed EMI assessment will be undertaken as part of the EIS.

4.1.4.6 Hazardous Waste (Regulation of Exports and Imports) Act 1989 (Hazardous Waste Act)

The Hazardous Waste Act regulates hazardous waste export, import and transit ensuring human and environmental protection from the effects of these wastes. Hazardous wastes include lithium-ion batteries. A preliminary hazard analysis of the battery storage will be undertaken as part of the EIS.

4.1.4.7 Heavy Vehicle National Law

Approval will be required for the transportation of wind turbines and associated infrastructure by over size and over mass (OSOM) vehicles under the Heavy Vehicle National Law.

Consideration of offsite works required along the delivery route will be informed by a detailed Route Analysis and the Traffic and Transport Impact Assessment. This will address both near site works and works along the traffic route from Newcastle Port to the Project Area.

5.0 Engagement

5.1 Stakeholder Engagement Scoping and EIS Phase

A Social Impact Assessment (SIA) is being undertaken by Umwelt as part of the EIS process for the Project, with RES leading the consultation program. The initial stakeholder identification process was undertaken during the scoping phase for the Project to support the planning and delivery of community and stakeholder consultation to inform the SIA and EIS. This process involved identifying stakeholders with an interest in the Project, or those directly and indirectly affected by the Project. This included identifying any potentially vulnerable or marginalised groups within the community.

Key stakeholders who were consulted or engaged during the scoping phase (beginning March 2021) are outlined in **Figure 5.1**. Subsequent phases of the SIA will seek broader involvement across the stakeholder groupings identified and will include wider community involvement.



Figure 5.1 Key Stakeholder Groups

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RES has undertaken early community and stakeholder engagement to build relationships with near neighbours and key stakeholders in relation to the Project as well as to inform Project design and development. RES has led all engagement activities, with the objective that stakeholders and communities have direct interaction with the proponent and that RES can hear the input of stakeholders and members of the community firsthand.

A coordinated approach to community and stakeholder engagement for the Project with the adjacent Tallawang Solar Farm Project has been adopted due to:

- RES being the proponent for both the Barneys Reef Wind Farm and the Tallawang Solar Farm projects
- the projects being adjacent each other and in the same locality, and
- the projects being subject to parallel EIS programs.

The approach intends to streamline the two projects' consultation programs and integrate a common approach, aiming to:

- ensure the development and implementation of engagement that is transparent and provides clear and consistent information on the two projects
- reduce social risks associated with either project, including stakeholder confusion
- establish and develop trust with key stakeholders, and
- afford the opportunity for meaningful participation in the assessment phases for both projects.

Table 5.1 details the range of engagement mechanisms utilised to obtain input from various stakeholder groups to inform the scoping phase as well as mechanisms to be implemented during the EIS Phase of the assessment program.

Table 5.1 Engagement Mechanisms

Mechanisms	Description	First Round of Consultation (Scoping Phase)	Second Round of Consultation (EIS Phase)	Targeted Stakeholder Group
Website/hotline/email	Platforms and tools to provide opportunity for the wider community or public to engage with the Projects (information provision and feedback submission) outside of dedicated consultation periods	A website, hotline and email address were established in March 2021	The website, hotline and email address will be monitored and updated when required across subsequent phases	Traditional Owners Host landholders Neighbouring/proximal landholders Community groups Wider community Local businesses and service providers Local media
Media release	Holding statement outlining key messages in local media	The holding statement was developed in April 2021 and distributed to local media agencies in the first round of consultation	Subsequent media releases will be developed when required in the EIS phase	Local Government Traditional Owners Host landholders Neighbouring/proximal landholders Community groups Wider community Local businesses and service providers Local media
Project Information Sheet	Project information sheets to distribute information about the Project to the broader community	No. 1 – Project overview was distributed across March - May 2021	No. 2 – Project update and outcomes of scoping phase to be distributed in the assessment phase No. 3 – Project update and outcomes of technical studies to be distributed following the completion of the EIS and SIA reports	State Government Local Government Traditional Owners Host landholders Neighbouring/proximal landholders Community groups Wider community Local businesses and service providers Local media

Mechanisms	Description	First Round of Consultation (Scoping Phase)	Second Round of Consultation (EIS Phase)	Targeted Stakeholder Group
Project briefings	Formal briefings to key stakeholders and government agencies, with Project Information Sheet and/or slide deck to formally introduce the Projects	Initial Project briefings were undertaken in March and April 2021	Further Project briefings will be undertaken across subsequent phases of the Project	State Government Local Government Traditional Owners Community groups Local businesses and service providers
Personal meetings or interviews	Introductions to the Project, semi-structured discussion to listen to individual concerns, interests, and issues to gather preliminary feedback, including sensitivities and to understand future engagement preferences	One-on-one introductory meetings with nearby and adjacent landholders took place in March and April 2021	Follow up interviews and meetings will occur during the preparation of the EIS Interviews with local businesses and services providers will occur during the preparation of the EIS	Nearby or adjacent landholders and residents Local businesses and service providers Community groups Traditional Owners
Questionnaire/survey	Scope and assess potential issues, impacts and opportunities	Host landholders were provided with a questionnaire to complete in their own time and provide written response	Questionnaire or survey to be issued (either through phone interview, face-to-face, email or another mechanism) during preparation of EIS	Host landholders Nearby or adjacent landholders and residents Local businesses and service providers
Community information sessions	Informal public 'drop in' sessions in a community facility or venue to provide Project information and opportunity for the public to pose questions, provide feedback, Project team to visually share results of studies	N/A	To be scheduled in multiple locations/ towns following the issuance of SEARs Second round of sessions to be planned at subsequent Project phases as required (likely pre-EIS lodgement)	Wider community Local businesses and service providers

Table 5.2 outlines the stakeholders who have participated in the consultation process during the scoping phase as well as those who have been informed of the Report.

Table 5.2 Stakeholders Consulted during Scoping Phase

Stakeholder group	Mechanism used	Number contacted	Number engaged
Host Landholders	Written questionnaire	14 ¹	2
Proximal Landholders	Personal meeting	26	22
Traditional Owners	Project briefing and interview	1	1
State Government	Project briefing	2	2
Local Government	Project briefing	2	2
Community & Special Interest Groups	Project briefing and interview	8	4
Local Businesses & Service Providers	Personal meeting/interview	4	2
Local Community ²	Project Information Sheet mail drop	1,788	1,788
Broader Community	Project website	-	-
Local Media	Media Statement	4	2

The SIA scoping report (**Appendix 1**) provides a complete list of stakeholders consulted during this phase. Quantitative and qualitative information collected through these consultation and engagement activities has been analysed to inform the preliminary analysis of social impacts associated with the Project.

5.1.1 Agency and Service Provider Consultation

The engagement process with relevant government authorities and service providers included an initial briefing meeting to introduce the Project, discuss the approvals process and a request for feedback on the relevant issues to be considered in the EIS. Follow up meetings have also taken place with Mid-Western Regional Council and Warrumbungle Shire Council.

The following NSW Government agencies have been briefed on the Project with a brief overview of the key discussion points from each meeting. Ongoing consultation with TransGrid is also being undertaken regarding the electricity network relevant to the Project.

DPiE:

Scoping meeting held on 4 June 2021, key discussion points included:

- project and assessment process overview including key studies
- stakeholder engagement process
- project benefits and shared benefit scheme
- visual impact assessment requirements and results
- traffic impact assessment, route analysis and potential road upgrade works required
- assessment requirements and project timing

¹ Hosting landholders of ancillary infrastructure including any transmission lines associated with the Project have not been consulted during this phase of the Project.

² Including localities of Tallawang, Barneys Reef, Gulgong, Dunedoo, Goolma, Beryl, Leadville, Merotherie, Bungaba, Birrawa, Stubbo.

Biodiversity, Conservation & Science (BCS) – DPIE:

Project briefing held on 16 June 2021 – key discussion points included:

- biodiversity assessment work undertaken to date and the scope of the survey and assessment for the EIS phase
- Barneys Reef formation and potential habitat for microbats.

Since the meeting requested survey data has been shared with BCS and further discussions undertaken in relation to future survey requirements.

Mid Western Regional Council:

Project briefing held on 29 March 2021. Key discussion points included:

- potential land use conflicts
- project benefits and importance of local employment
- community consultation process
- project design and alignment with Council's design guidelines for wind farm projects.

Project Update held on 12 July 2021, key discussion points included:

- traffic and Transport assessment and potential upgrade requirements
- community engagement
- project benefits, share benefit scheme and VPA
- accommodation strategy for the construction phase
- project timing.

Warrumbungle Shire Council:

Project briefing held on 29 March 2021, key discussion points included:

- access and delivery route and use of roads within the Warrumbungle LGA
- request for information and further consultation on any Voluntary Planning Agreements that may apply to the Project
- request to be provided with regular updates as the project progresses.

Project Update held on 13 July 2021, key discussion points included:

- traffic and Transport assessment and potential upgrade requirements
- community engagement
- project benefits, shared benefit scheme and VPA
- accommodation strategy for the construction phase
- project timing.

Transgrid:

RES has submitted an Expression of Interest (EOI) to TransGrid and detailed consultation in relation to the Project has been ongoing since early 2020. RES is exploring possible land sharing options with TransGrid as part of its proposed augmentation of the Central West Orana grid.

5.1.2 Community Consultation

When community members were asked directly about perceived or potential impact categories of the Project, the key concerns included land use change and conflict and cumulative impacts. These key issues are associated with concern regarding land use conflict and the cumulative impact of multiple renewable energy projects within the REZ. Other impacts identified included visual amenity, noise, community investment and access and use of services and facilities, refer to **Figure 5.2**. Further detail is provided in **Appendix 1**.

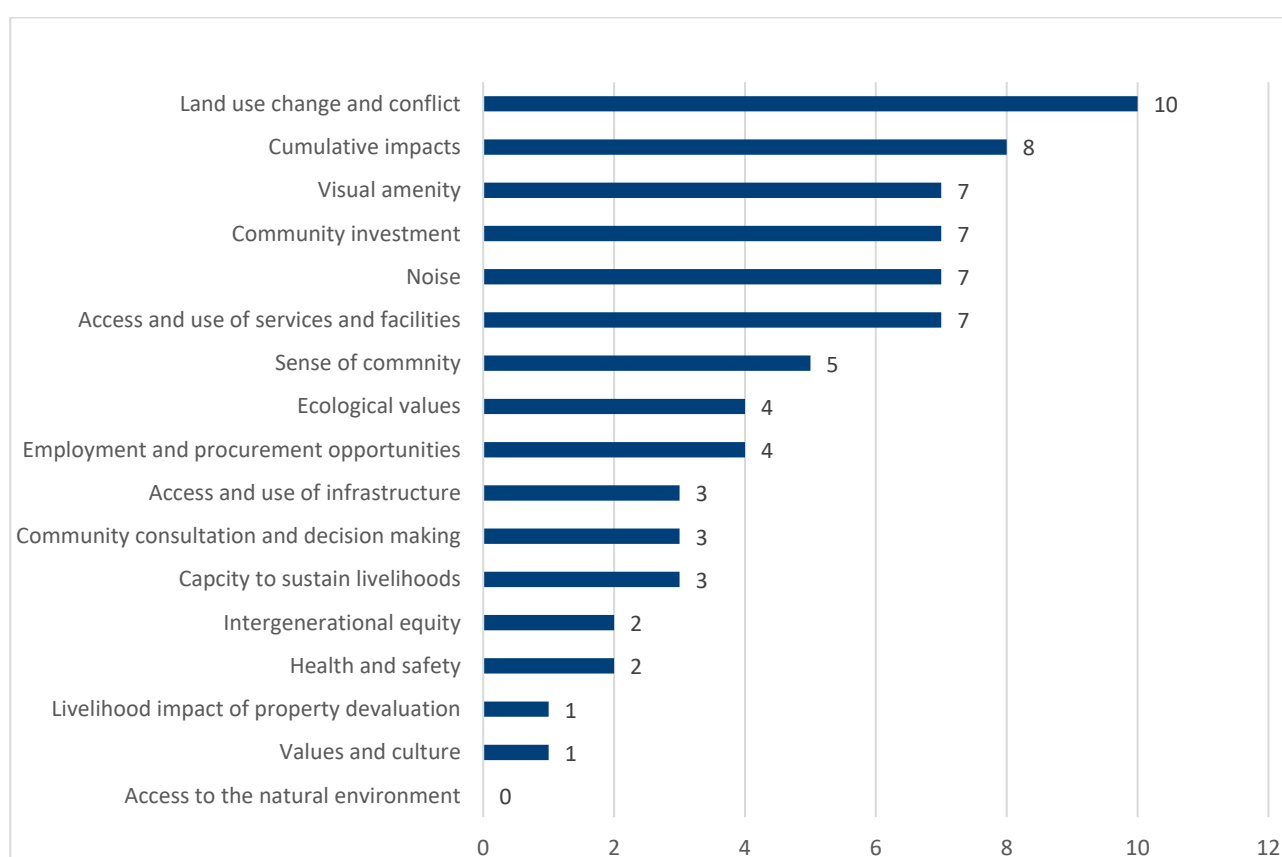


Figure 5.2 Perceived Issues and Impacts

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In relation to positive community impacts and benefits associated with the Project the key benefits associated with the Project as identified by the community is the benefit associated with community investment, economic benefits to local business, employment and training opportunities.

The scoping phase has identified key issues of relevance to near neighbours, local communities, and key stakeholders in relation to the Project. A preliminary evaluation of the likely social impacts has been developed and is outlined in **Appendix 1**, this will be explored further and confirmed during the detailed assessment to be undertaken as part of the EIS phase.

6.0 Proposed Assessment of Impacts

A preliminary environmental risk assessment has been undertaken for the Project which includes consideration of project specific and cumulative impacts. The identification of issues for consideration has been informed by the DPIE *Scoping an Environmental Impact Statement* guideline, the NSW Wind Energy guidelines and standard SEARs.

As part of the preliminary environmental and social assessment the potential project issues have been separated into 'Key Issues' and 'Other Issues'. Key issues are issues where there is a reasonable likelihood that the Project will have a material impact and detailed assessment is required to fully understand such impacts and identify project-specific mitigation. Other issues are issues which are not of particular concern and are unlikely to have a material impact and/or the measures to manage the impacts are well understood and routinely used on similar projects.

Table 6.1 provides a summary of the key and other issues, potential impacts, preliminary mitigation controls and proposed assessment approach. Further detail regarding the preliminary analysis and proposed scope of the detailed assessments to be prepared to support the EIS is provided in **Sections 6.1** and **6.2**.

Table 6.1 Preliminary Environmental Risk Assessment Overview

Issue	Potential Impacts	Preliminary Mitigation	Issue Level	Assessment approach
Visual Amenity	<ul style="list-style-type: none"> Impact to current scenic landscape/character of the locality Loss of visual amenity for nearby landholders Cumulative visual impacts Night lighting disturbance 	<ul style="list-style-type: none"> Detailed site-specific assessment Detailed project design to avoid and/or minimise impact where practicable Mitigation measures 	Key Issue	Specialist assessment
Noise and Vibration	<ul style="list-style-type: none"> Operational noise impacts on involved and non-involved landholders Noise disturbance associated with increased road traffic and construction works during construction phase Potential vibration disturbance to involved and non-involved landholders Cumulative noise impacts 	<ul style="list-style-type: none"> Detailed project design to avoid and/or minimise impact where practicable Implementation of appropriate mitigation (if required) Implementation of construction and operational noise management plans. 	Key Issue	Specialist Assessment
Biodiversity	<ul style="list-style-type: none"> Clearing of native vegetation including loss or modification of habitats Impact to threatened species or endangered ecological communities Bird and bat strike Spread of weeds across the Project Area due to construction activities Cumulative biodiversity impacts 	<ul style="list-style-type: none"> Detailed project design to avoid and/or minimise impact where practicable Biodiversity management and monitoring programs Construction environmental management plan Biodiversity offsets 	Key Issue	Specialist Assessment
Aboriginal Cultural and Historic Heritage	<ul style="list-style-type: none"> Potential impact to Aboriginal or historic heritage objects or Aboriginal cultural values or heritage values of the area 	<ul style="list-style-type: none"> Detailed project design to avoid and/or minimise impact where practicable Implementation of appropriate mitigation (if required) Implementation of construction and operational management plans. 	Key Issue	Specialist Assessment

Issue	Potential Impacts	Preliminary Mitigation	Issue Level	Assessment approach
Traffic and Transport	<ul style="list-style-type: none"> Increased traffic during construction phase Disruption to traffic due to delivery of construction materials Disruption to traffic due to road upgrade works Cumulative traffic and transport impacts 	<ul style="list-style-type: none"> Construction Traffic and Access Management Plan Potential targeted road upgrades where necessary along delivery route 	Key Issue	Specialist Assessment
Socio-Economic Impacts	<ul style="list-style-type: none"> Economic impacts locally and regionally Land use changes Perception about property valuation impacts Community consultation 	<ul style="list-style-type: none"> Stakeholder Engagement Strategy Environmental and social impact mitigation measures 	Key Issue	Specialist Assessment
Aviation Safety	<ul style="list-style-type: none"> Turbines potentially interacting with air traffic 	<ul style="list-style-type: none"> Installation of lighting and/or navigation aids Detailed project design to avoid and/or minimise impact 	Key issue	Specialist Assessment
Telecommunications EMF/EMI	<ul style="list-style-type: none"> Loss of telecommunication signals Interruption to (or loss of strength) of TV and radio signals Threat to human health 	<ul style="list-style-type: none"> Detailed project design to avoid and/or minimise impact where practicable Development of site-specific mitigation measures 	Key issue	Specialist Assessment
Blade Throw Shadow Flicker/Blade Glint	<ul style="list-style-type: none"> Blade throw risk to human health and nearby infrastructure Shadow flicker/blade glint disruption to nearby residents or motorists 	<ul style="list-style-type: none"> Detailed project/turbine design 	Key Issue	Specialist Assessment
Water and Soil Resources	<ul style="list-style-type: none"> Erosion and sediment control Water supply Flooding 	<ul style="list-style-type: none"> Construction Environmental Management Plan Detailed design to avoid and/or minimise impact 	Other Issue	Specialist Assessment/EIS Chapter
Bushfire	<ul style="list-style-type: none"> Risk to infrastructure and risk to human health 	<ul style="list-style-type: none"> Implementation of appropriate controls, emergency response management and management of infrastructure and surrounding land 	Key Issue	EIS Chapter

Issue	Potential Impacts	Preliminary Mitigation	Issue Level	Assessment approach
Land use conflict	<ul style="list-style-type: none"> Impact to agricultural land use Cumulative impacts associated with intensity of renewable development in the region 	<ul style="list-style-type: none"> Implementation of appropriate construction and operational management controls 	Other Issue	EIS chapter
Waste	<ul style="list-style-type: none"> Generation of waste associated with construction and operation 	<ul style="list-style-type: none"> Implementation of appropriate waste management plan 	Other Issue	EIS Chapter
Air Quality	<ul style="list-style-type: none"> Elevated dust levels associated with construction works 	<ul style="list-style-type: none"> Implementation of appropriate controls as part of Construction Environmental Management Plan 	Other Issue	EIS Chapter
Decommissioning and Rehabilitation	<ul style="list-style-type: none"> Decommissioning works Rehabilitation practices 	<ul style="list-style-type: none"> Commitments to appropriate decommissioning and rehabilitation following closure Implementation of best practice management during decommissioning works 	Other Issue	EIS chapter

6.1 Key Environmental and Social Issues

6.1.1 Visual Amenity

A Preliminary Visual Impact Analysis (PVIA) has been undertaken by Moir Landscape Architecture (Moir). This section provides a summary of the outcomes of the PVIA with the full report attached (refer to **Appendix 2**). The PVIA has been prepared to address the requirements of the DPIE Wind Energy Guideline and the Visual Assessment Bulletin (2016) (the Visual Bulletin).

The PVIA addresses the scoping phase requirements set out in the Visual Bulletin which includes:

- undertaking community consultation to establish key landscape features valued by the community, key viewpoints in the area (both public and private) along with information about the relative scenic quality of the area
- production of a map detailing the key landscape features (informed by community consultation and ground-truthing), the preliminary wind turbine layout, the location of dwellings and key public viewpoints and an overlay of the wind resource, and
- results of the application of the preliminary assessment tools for both the visual magnitude and multiple wind turbine parameters.

The Visual Bulletin indicates that consultation with the community during early stages of the assessment process may be broad, but should include discussions about the proposed Project Area, likely corridors for development, or preliminary turbine layouts and must involve people from the visual catchment.

Ongoing community consultation has been undertaken by RES, in accordance with the Bulletin, through face to face meetings and a questionnaire provided to both involved and non-involved landholders located within the vicinity of the Project Area. As of May 2021, a total of 30 questionnaires had been completed, the results of which are summarised below, with further detail provided in **Appendix 1**. Community engagement will continue through the EIS Phase and provide the community with further opportunities to provide input into the Visual Baseline Study of the detailed landscape and visual impact assessment (LVIA).

The visual changes to the landscape were raised as a concern during the community consultation. An increase of built infrastructure and associated changes to the rural character of the landscape was described as a concern by some respondents. This was raised particularly if the Project could impact upon natural features of the landscape that are of high community value, or upon people's continued ability to access these areas.

The community involved in the consultation were asked to complete a questionnaire which included the identification of key landscape features of importance to them. There were six responses (from the 30 completed questionnaires) to the question '*What are the key landscape features of importance to you in the area? Which of these features do you value most highly?*'. The following landscape features were identified:

- native vegetation
- grazing, bushland, rivers/creeks, vegetation, townships
- productive farming land
- grassy box woodlands
- Travelling Stock Routes (TSR)
- Adams Lead Reserve (Mudgee District Environmental Group (MDEG) run reserve)

- Goulburn River National Park (identified as a place with community value and is a sacred Aboriginal site, where local kids swim in the waterhole)
- a ridgeline (at the top of a private property)
- Flirtation Hill (Gulgong).

These key landscape features have informed the development of the existing landscape character (preliminary landscape character units), the key features informing the landscape character surrounding the Project Area include:

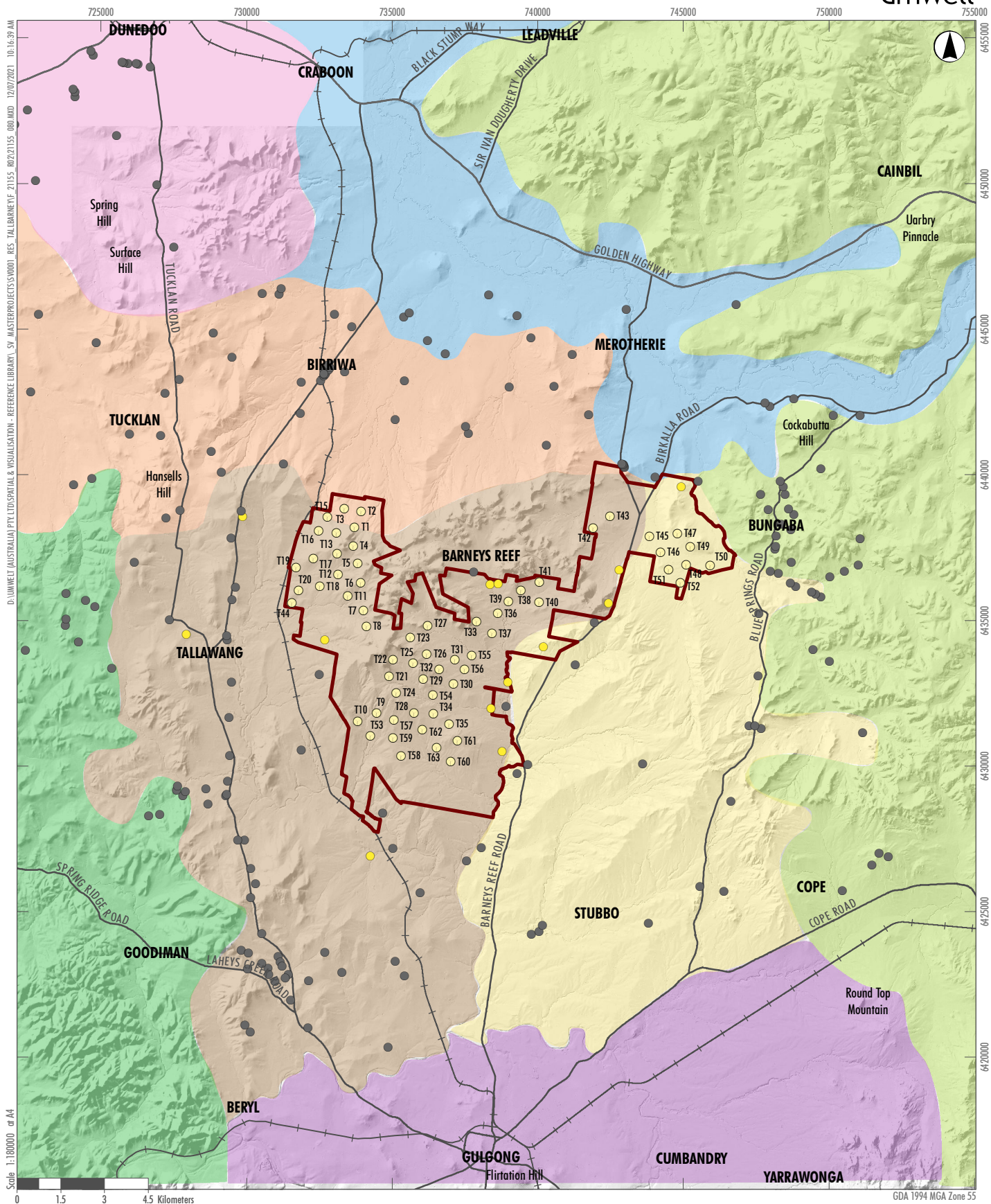
- **Rivers and Creeks** (particularly the Talbragar River)
- **Nature Reserves** (Goodiman State Conservation Area and Yarrobil National Park)
- **State Forests** (Cope State Forest and Tuckland State Forest)
- **Ridgelines** (Barneys Reef, steep slopes and rocky outcrops associated with National Parks and State Forests and foothills and ridgelines associated with the Great Dividing Range)
- **Scenic Lookouts and Points of Interest** (Flirtation Hill, Free Flight MX (popular motocross park), Gwabegar Railway Line)
- **Walking Tracks and Campgrounds** (Drip Gorge (walking track), State Forests and National Parks and private camp grounds).

The PVIA has identified eight key landscape typologies (Landscape Character Units). **Table 6.2** and **Figure 6.1** provides an overview of the landscape character units (LCU) and the relevant preliminary scenic quality rating. It should be noted that these ratings will be refined through the EIS assessment phase through continued community consultation and detailed assessment.

Table 6.2 Landscape Character Units

Landscape Character Unit	Name	General Character	Preliminary Scenic Quality Rating
LCU01	Gulgong	Gulgong Township and surrounding rural residential land to the south of the Project Area. Views from the Gulgong LCU are in excess of 10 km from the nearest proposed turbine. Views from within the township of Gulgong are generally contained by built form. There is potential to view the turbines from rural land to the north of Gulgong, however existing roadside vegetation and existing vegetation surrounding dwellings is likely to reduce visibility.	Moderate
LCU02	Dunedoo	Dunedoo Township and rural residential land to the south of the township. The preliminary visual assessment indicates views to the Project Area from the Dunedoo township will be screened by topography. Limited views of the Project Area from rural residential land to the south of Dunedoo may be available to the south.	Moderate
LCU03	Stubbo	Rural dwellings, predominately cleared grazing land and vegetated road corridors. Views from the Stubbo LCU will be available due to the close proximity to the Project Area. Existing roadside vegetation and planting surrounding dwellings is likely to reduce the visibility.	Moderate

Landscape Character Unit	Name	General Character	Preliminary Scenic Quality Rating
LCU04	Tallawang Vegetated Hills	<p>Vegetated hills to the west of the Project Area</p> <p>Views to the Project Area will be available to the east of the Tallawang Vegetated Hills LCU. Vegetation typical of the LCU is likely to reduce the potential visibility of the proposed turbines from a number of dwellings within the LCU.</p>	Moderate
LCU05	Barneys Reef	<p>Vegetated hills and undulating, cleared grazing land</p> <p>The Project is located within the Barneys Reef LCU and will be visible from the land within the LCU. Existing roadside vegetation and planting surrounding dwellings is likely to reduce the visibility.</p>	Moderate
LCU06	Alluvial Plains	<p>Alluvial plains associated with the Talbragar River to the north and north east of the Project Area.</p> <p>Views to the Project Area are likely to be available to the south of the Alluvial Plains LCU. Land in this area has a low number of residential dwellings.</p>	Low
LCU07	Birriwa Flats	<p>Cleared, primary production land to the north of the Project Area.</p> <p>Views to the Project Area are likely to be available to the south of the Birriwa Flats LCU.</p>	Low
LCU08	Talbragar Hills	<p>Vegetated hills to the west of the Project Area, including Ulan Mine.</p> <p>Due to the undulated topography and vegetation typical of the LCU, views to the Project Area are likely to be limited.</p>	Low/ Moderate



Legend

- Project Area
- Proposed Turbine Location
- Involved Landholder Dwelling
- Non-involved Landholder Dwelling

Preliminary Landscape Character Units

- LCU 01 Gulgong
- LCU02 Dunedoo
- LCU03 Stubbo
- LCU04 Tallawang Vegetated Hills
- LCU05 Barneys Reef
- LCU06 Alluvial Plains
- LCU07 Birriwa Flats
- Talbragar Hills

FIGURE 6.1

Preliminary Landscape
Character Units

6.1.1.1 Visual Magnitude Assessment

The visual magnitude threshold is based on the height of the proposed wind turbines to the tip of the blade and distance from dwellings or key public viewpoints.

In accordance with the Visual Bulletin *the proposed turbines below the black line must be identified along with the dwellings or key public viewpoints as part of the request for SEARs*. The proposed wind turbines are based on a worst-case scenario with a proposed tip height of 280 metres. The 'black line' is set at a distance of 3,750 m and the 'blue line' at 5,500 m.

45 non-involved dwellings have been identified within 3,750 metres of the proposed wind turbines (within the black line of visual magnitude) and 41 non-involved dwellings are located within 3,750 – 5,500 metres of the proposed wind turbines (within the blue line of visual magnitude). In relation to the identified dwellings within the black line of visual magnitude, further assessment identified:

- approximately 25 of the dwellings identified to the east of the Project Area are likely to have limited visibility of the proposed turbines due to topography and/or vegetation.
- the Zone of Visual Influence (ZVI) prepared for the Project, identified up to ten of these dwellings, located on Blue Springs Road will be screened from the proposed turbines by topography
- detailed assessment and field work identified vegetation would reduce visibility from approximately 15 of these identified dwellings located within the rural residential area associated with Wonga Roo Road.

Therefore, of the 45 identified dwellings the ZVI assessment indicates that views may be available from 20 dwellings. However, it should also be noted that the ZVI assessment is based on an assessment of topography alone and is subject to further detailed assessment undertaken during the EIS Phase of the assessment which will confirm the visibility and predicted visual impacts of the Project.

In addition, as discussed in **Section 2.3**, RES is currently developing a shared benefit scheme to the benefits of the Project with neighbours, and will further consult during the EIS phase regarding a shared benefit agreement to eligible landholders. This is expected to include consideration of visual impacts on proximal landholders.

The PVIA includes two ZVI diagrams to illustrate the theoretical visibility of the proposed turbines, one from hub height (182.5m), refer to **Figure 6.2**, and one from blade tip (280m) refer to **Figure 6.3**. The ZVI represents the area over which a development can theoretically be seen, based on a Digital Terrain Model (DTM). The ZVI presents a bare ground scenario (landscape without screening, structures or vegetation) and includes all land within approximately 10km of the Project Area. Although it is possible for the development to be visible from further than 10km away, it is generally accepted that beyond 10km visibility is significantly diminished.

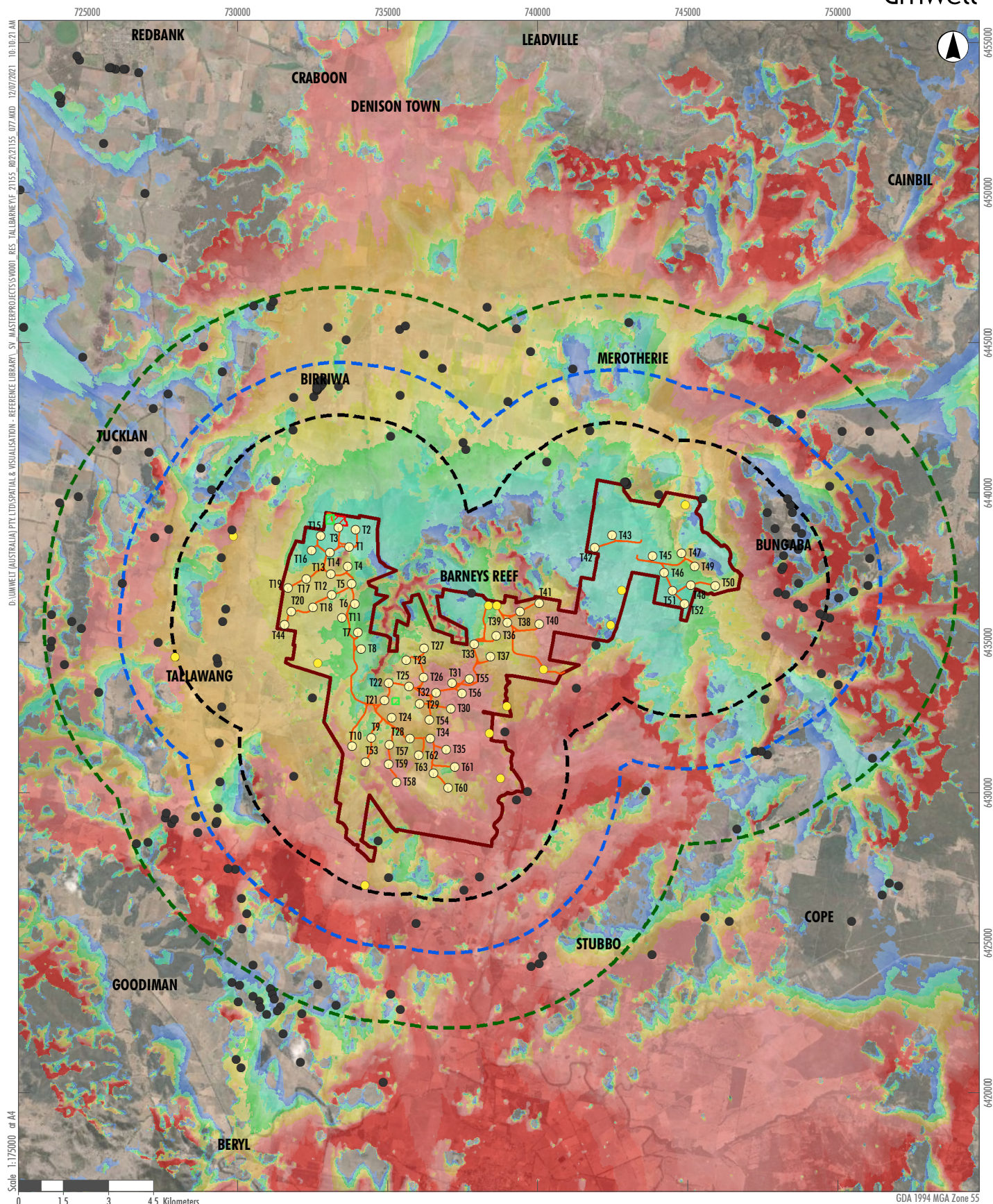
Based on the preliminary ZVI the following applies to the visibility of the proposed turbines:

- due to the location of the proposed turbines and the blade tip height of 280 m above ground level, the ZVI depicts a large percentage of land immediately surrounding the Project Area from which wind turbines would theoretically be visible.
- The ZVI indicates the town of Gulgong and its surrounds will have the potential to view the Project Area in its entirety. This is based on an assessment of topography alone and existing intervening elements such as vegetation and built form are expected to reduce the potential visibility.
- The ZVI indicates the highest level of visibility is likely to be experienced from land within close proximity to the Project Area, particularly to the south and east of the Project Area.

- The undulating topography that characterises the region results in large areas of land from which views of all or most of the proposed turbines would be obstructed, particularly to the north, east and west in excess of 8 kilometres from the Project Area.

Following the development of the ZVI, detailed site investigations (in the form of a viewpoint analysis inventory and dwelling assessments) were undertaken to ground truth the findings, these are presented in the PVIA (refer to **Appendix 2**).

Note the ZVI is based on an assessment of topography alone and existing intervening elements such as vegetation and built form may reduce the potential visibility. Further detailed assessment from areas identified in the ZVI will be undertaken in the EIS Phase of the assessment.



Legend

- Project Area
- Proposed Turbine Location
- Proposed Access Track
- Possible Substation Location
- Possible Battery Storage Location
- 3750m Buffer
- 5500m Buffer
- 8000m Buffer
- Involved Landholder Dwelling
- Non-involved Landholder Dwelling
- 1 - <10
- 10 - <20
- 20 - <30
- 30 - <40
- 40 - <50
- 50 - <=63

FIGURE 6.2

Zone of Visual Influence
Hub Height 182.5m

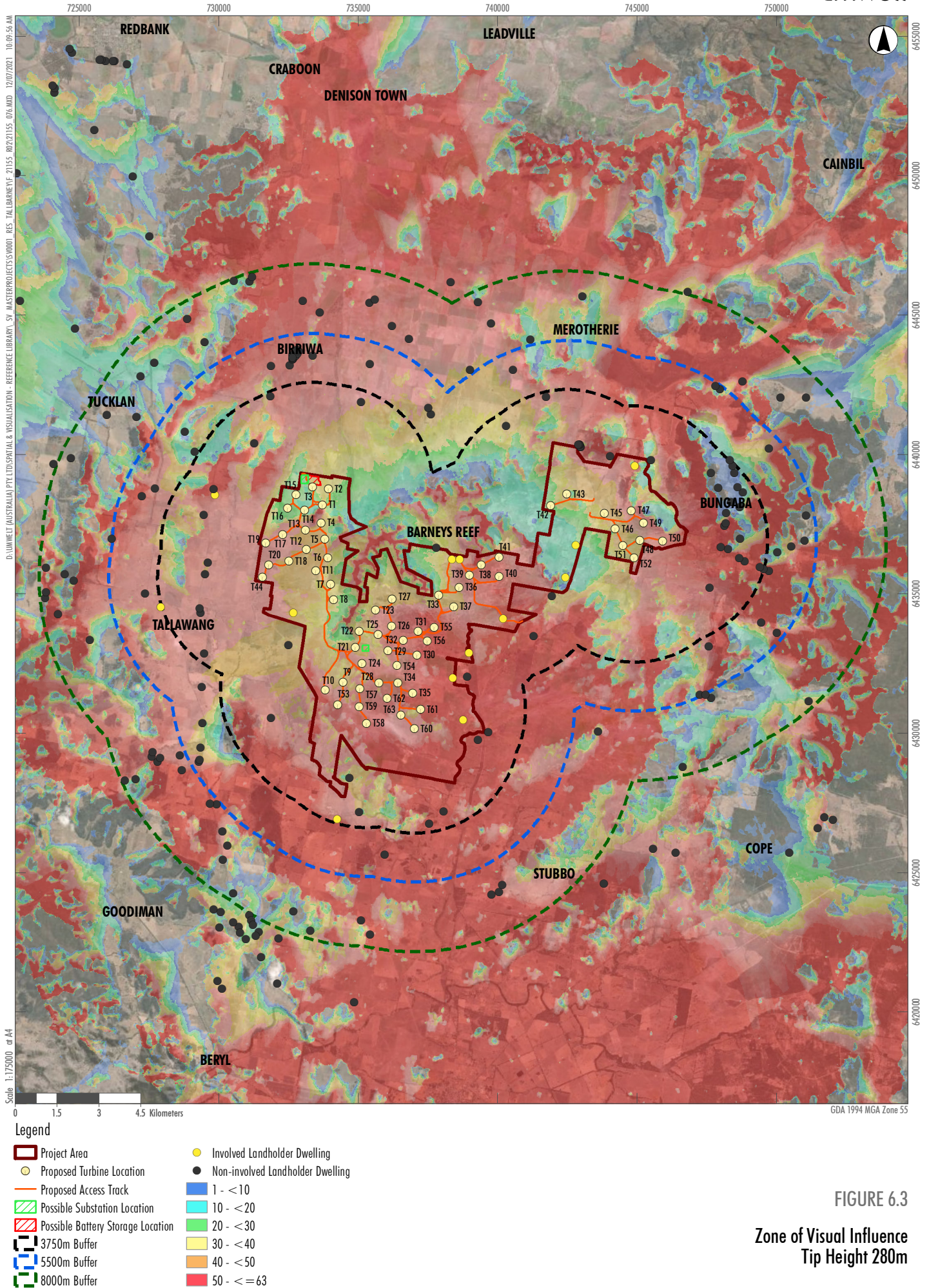


FIGURE 6.3

Zone of Visual Influence
Tip Height 280m

6.1.1.2 Multiple Wind Turbine Assessment

The Multiple Wind Turbine Tool provides a preliminary indication of potential cumulative impacts arising from the Project. To establish whether the degree to which dwellings or key public viewpoints may be impacted by multiple wind turbines, the assessment includes mapping into six sectors of 60° any proposed turbines, and any existing or approved turbines within 8km of each dwelling or key public viewpoint.

In accordance with the Bulletin where wind turbines are visible within the horizontal views of the dwelling or key public viewpoints in three or more 60° sectors, the proponents must identify the turbines, relative dwelling and key public viewpoint, along with the relative distance and submit these to the Department as part of the request for SEARs. These turbines will become a focus for assessment in the EIS.

When applied to the Project, the Multiple Wind Turbine Tool identified eight non-involved dwellings with more than two (2) sectors of turbines, this includes:

- four dwellings with turbines in three 60° sectors (up to 180°)
- four dwellings with four 60° sectors (up to 240°).

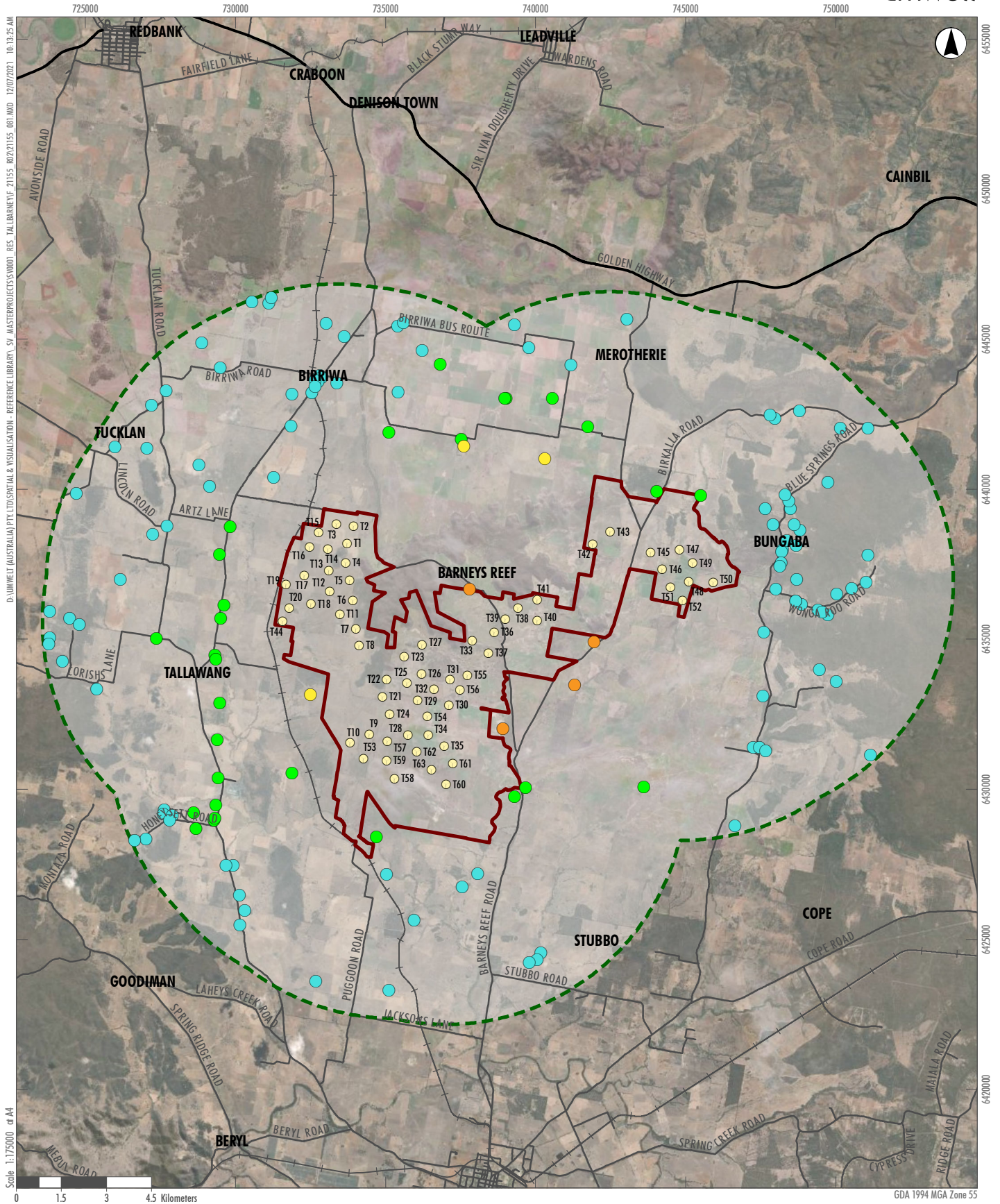
Figure 6.4 provides an overview of the number of 60° sectors visible from each of the dwellings identified within 8 km of the Project Area.

6.1.1.3 Landscape and Visual Impact Assessment

A detailed LVIA will be undertaken as part of the EIS in accordance with the requirements of the DPIE Wind Energy Guideline and the Visual Assessment Bulletin (2016) (the Visual Bulletin). The LVIA will require further detailed assessment from areas identified as having potential visibility in the Preliminary ZVIs, the LVIA will also include wire frame diagrams and photomontages.

The LVIA will include the following:

- continued community consultation and fieldwork/groundtruthing
- visual baseline study Including regional and local context, landscape character of the site, and scenic quality class ratings
- Visual Catchment Assessment – ZVI and outcomes from application of Preliminary Assessment Tools
- Viewpoint Analysis Detailed assessment and rating of key viewpoints within the visual catchment
- photomontages in accordance with the Scottish Natural Heritage Visual Representation of Wind Farms
- cumulative visual impact assessment of the Project in relation to any approved/constructed Wind Farms in the area
- blade glint and night lighting
- evaluation of visual performance in accordance with the Visual Bulletin and identification of relevant mitigation measures.



- Legend**
- Project Area
 - Proposed Turbine Location
 - 8000m Buffer
 - One 60° Sector (60°)
 - Up to 2 60° Sectors (120°)
 - Up to 3 60° Sectors (180°)
 - Up to 4 60° Sectors (240°)

FIGURE 6.4

Multiple Wind Turbine Assessment

6.1.2 Noise

A preliminary noise impact assessment has been undertaken by Sonus Pty Ltd in accordance with the NSW DPIE Wind Energy: Noise Assessment Bulletin 2016 (Noise Bulletin). The results of the preliminary noise assessment are summarised below, with the full report attached (refer to **Appendix 3**).

6.1.2.1 Preliminary Noise Impact Assessment Methodology

Preliminary noise predictions have been made using the CONCAWE noise propagation model and SoundPLAN noise modelling software. The CONCAWE system divides meteorological conditions into six separate weather categories, depending on wind speed, wind direction, time of day and level of cloud cover.

The modelling is based on Weather Category 6 provides “worst-case” (i.e. highest noise level) conditions which are conducive to the propagation of the turbine noise. The following input conditions were also applied:

- atmospheric conditions at 10°C and 80% relative humidity (representing conditions that result in low levels of noise absorption from the atmosphere)
- wind direction from all noise sources to the particular residence under consideration, even in circumstances where sources are located in opposite directions from the residence (representing the worst-case noise propagation due to wind)
- acoustically soft ground (representing the pastoral nature of the land)
- maximum barrier attenuation from topography of 2 dB(A) (representing a conservative assessment of any shielding provided by topography).

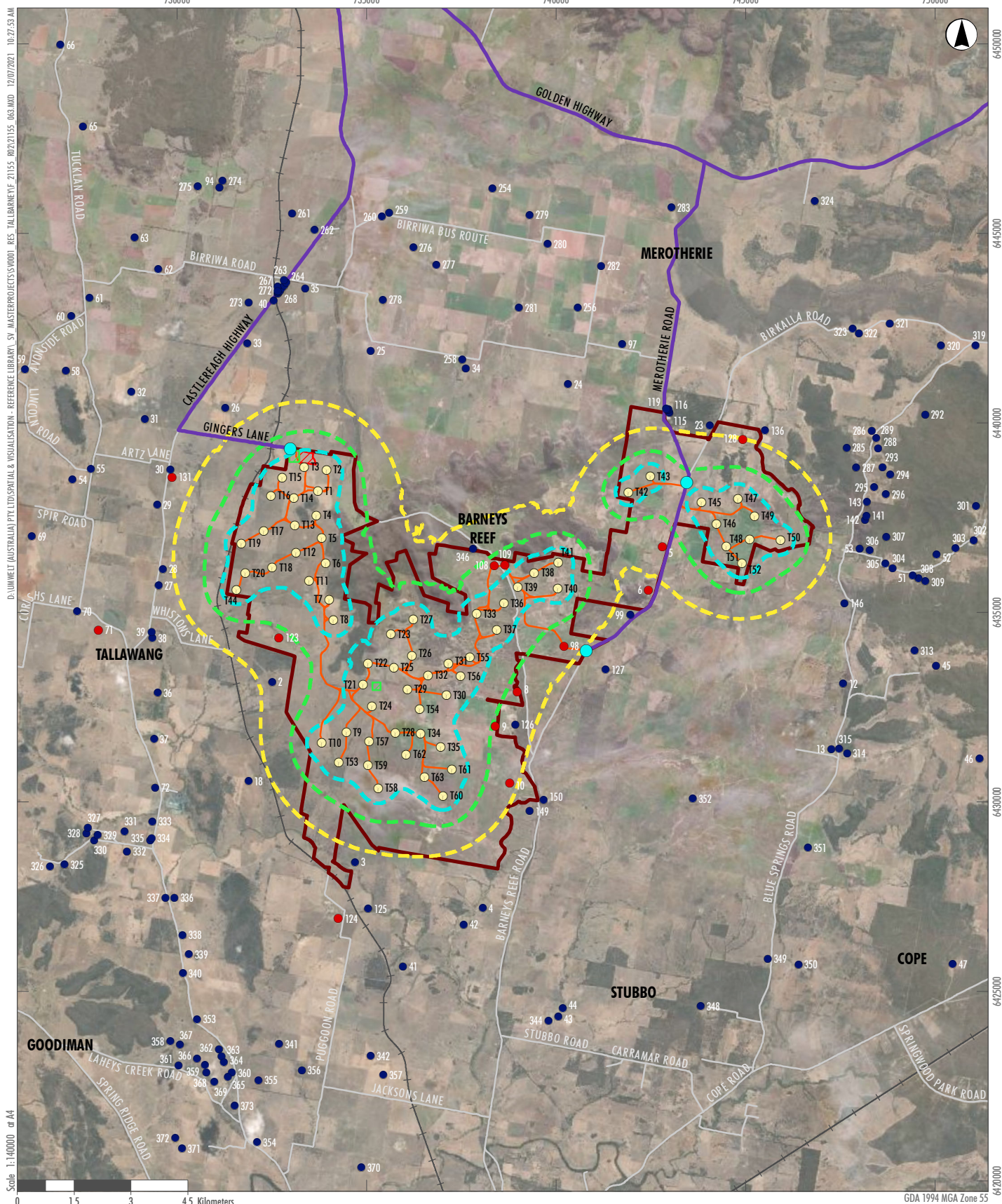
The preliminary noise impact assessment has also considered the sound power levels and turbine location (subject to further refinement as part of EIS phase) and the separation distances between turbines and surrounding non-associated residences.

6.1.2.2 Potential Noise Impacts

The Noise Bulletin requires a baseline noise criterion of 35 dB(A) be applied to the preliminary noise assessment at all non-involved dwellings. The 35 dB(A) noise contour and the involved and non-involved dwellings are shown **Figure 6.5** for the scenario of every turbine in the preliminary Project layout concurrently producing the highest level of noise (corresponding to hub height wind speeds of 11m/s and above).

Based on the preliminary modelling, the baseline criterion of 35 dB(A) is predicted to be achieved at all non-involved dwellings with the exception of dwellings 2, 126 and 346.

Background noise level monitoring and further detailed modelling and assessment will be undertaken as part of the EIS to further inform the detailed design of the Project to seek to minimise any significant noise impacts. This may include measures such as modifications to the turbine layout or the development of a mitigation strategy for affected non-involved dwellings.



Legend

- Project Area
- Proposed Turbine Location
- Proposed Access Track
- Possible Substation Location
- Possible Battery Storage Location
- Proposed Access
- Access Point
- Involved Landholder Dwelling
- Non-involved Landholder Dwelling
- Predicted Noise Level in dB(A)**
 - 35 dB(A)
 - 40 dB(A)
 - 45 dB(A)

FIGURE 6.5

Preliminary Noise Impact Assessment Results

6.1.2.3 Noise Impact Assessment Methodology

A detailed noise impact assessment will be prepared to support the EIS in accordance with the requirements of the Noise Bulletin (2016), the NSW Noise Policy for Industry (NPfI) (2017), the Interim Construction Noise Guideline (2009), the NSW Road Noise Policy (2011) and Assessing Vibration: A Technical Guideline (2006).

The noise impact assessment will include:

- background noise monitoring and establishment of criteria in accordance with the background noise monitoring results
- predictions which account for the sound power levels and locations of turbines and ancillary infrastructure
- a construction noise assessment and framework for a construction noise management plan
- a traffic noise assessment and required management/mitigation measures where required
- assessment of vibration impacts
- noise reduction measures (including modifying the turbine layout and/or applying a curtailment strategy) where the relevant operational or construction assessment criteria cannot be achieved.

6.1.3 Biodiversity

The biodiversity assessment for the Project will be undertaken following the NSW Biodiversity Assessment Method (BAM). The assessment has been commenced including desktop analysis and field survey to inform the detailed design for the Project.

Three rounds of seasonal surveys have been undertaken to date including:

- Spring threatened flora surveys
- Summer Bird and Bus Utilisation Surveys (BBUS)
- Summer threatened flora surveys and vegetation integrity plots work (consistent with the BAM).

On all surveys field teams undertook opportunistic surveys for raptor nests and hollow bearing trees. Further seasonal survey will be undertaken during Autumn, Spring and Summer 2021.

6.1.3.1 Desktop Searches

A search of the DAWE EPBC Act Protected Matters Search Tool (PMST) and the DPIE BioNet Atlas Search Tool was undertaken to determine the likelihood of occurrence of threatened species listed under the EPBC Act and the BC Act in the Project Area. Additionally, regional vegetation community mapping and the Biodiversity Assessment Method Calculator (BAM-C) were also used to gain an understanding of the potential ecological values of the Project Area.

Table 6.3 documents the threatened species recorded in the Project Area to date and includes results from the ecological surveys completed across the area as well as any species identified within the Project Area during the database searches.

Table 6.3 Threatened Species Recorded within Project Area

Species Name	Common Name	BC Act	EPBC Act	Credit Type
<i>Artamus cyanopterus</i>	Dusky Woodswallow	V		Ecosystem
<i>Epthianura albifrons</i>	White-fronted Chat	V		Ecosystem
<i>Hieraaetus morphnoides</i>	Little Eagle	V		Species/Ecosystem
<i>Falco subniger</i>	Black Falcon	V		Ecosystem
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	V	Species
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheathtail-bat	V		Ecosystem

* V denotes a Vulnerable listing status.

Table 6.4 provides a list of threatened species (species credit species and dual credit species) that are considered to have some potential to occur in the Project Area.

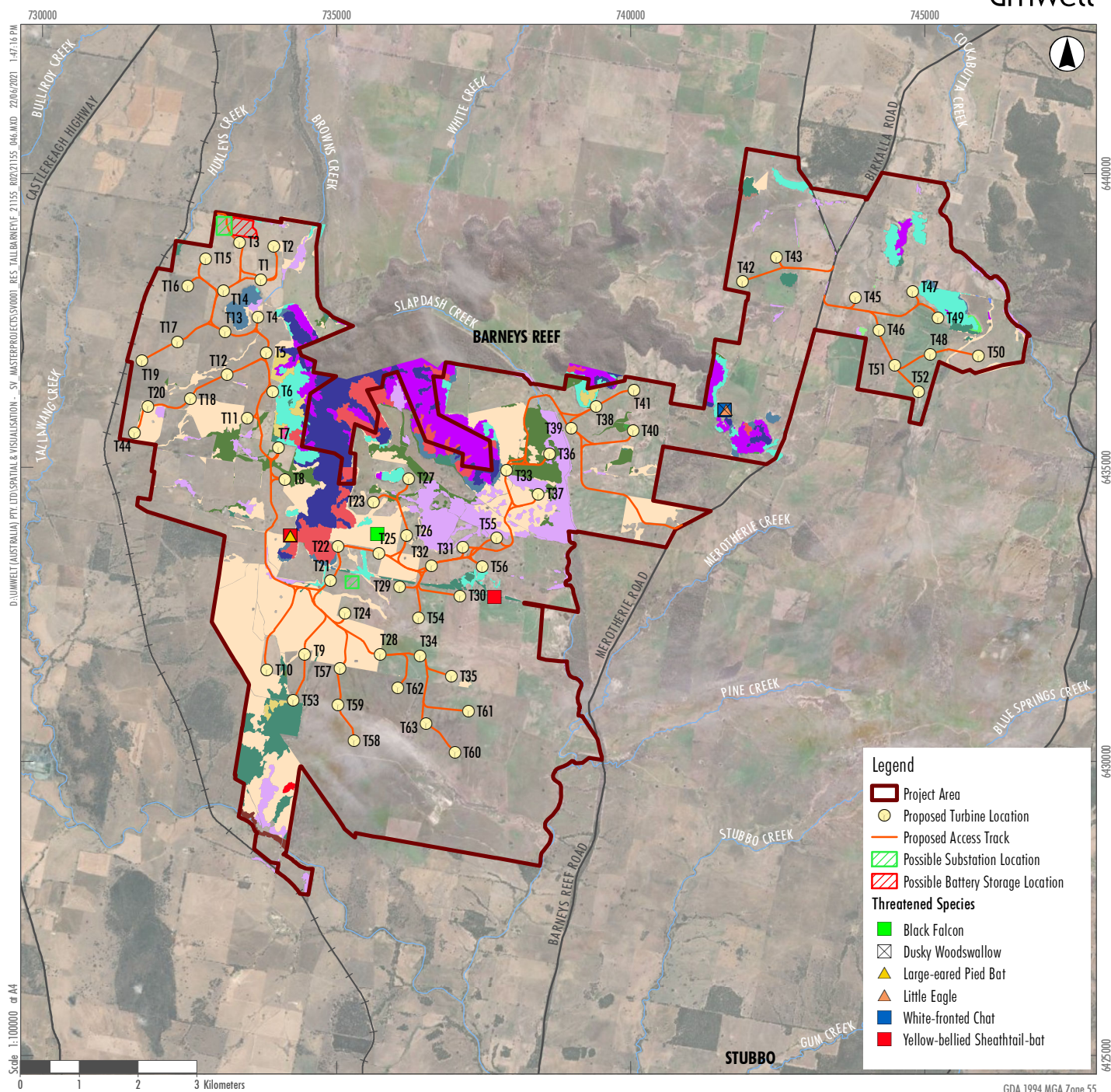
Table 6.4 Threatened Species with the Potential to Occur in the Project Area

Species Name	Common Name	BC Act	EPBC Act	Credit Type
<i>Burhinus grallarius</i>	Bush Stone-curlew	V		Species
<i>Lophoictinia isura</i>	Square-tailed Kite (breeding)			Species/Ecosystem
<i>Tyto novaehollandiae</i>	Masked Owl (breeding)	V		Species/Ecosystem
<i>Anthochaera phrygia</i>	Regent Honeyeater	V		Species/Ecosystem
<i>Acacia ausfeldii</i>	Ausfeld's Wattle	V		Species
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo (breeding)	V	V	Species/Ecosystem
<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo (breeding)	V		Species/Ecosystem
<i>Ninox strenua</i>	Powerful Owl (breeding)			Species/Ecosystem
<i>Swainsona sericea</i>	Silky Swainson-pea			Species
<i>Hirundapus caudacutus</i>	White-throated Needletail	V	MIG	Species
<i>Phascolarctos cinereus</i>	koala	V	V	Species/Ecosystem

6.1.3.2 Preliminary Vegetation Mapping

A preliminary vegetation map has been prepared which utilises the results from the floristic surveys completed in February 2021 and the regional vegetation mapping, namely the State Vegetation Type Map – Central West/Lachlan Region: Version 1.4, VIS-ID 4468 (DPIE, 2016) (refer to **Figure 6.6**). Through this process, a total of 20 PCTs have been mapped across the Project Area. The preliminary vegetation mapping has identified TECs potentially cover approximately 460 hectares of the Project Area with the balance being non-native vegetation associated with agricultural land uses.

The preliminary vegetation mapping will be further refined as further survey work is completed.



Legend

- | | | | |
|--|--|---|---|
| 272 - White Box - Black Cypress Pine - red gum +/- Mugga Ironbark shrubby woodland in hills of the NSW central western slopes | 435 - White Box - White Cypress Pine shrub grass hills woodland in the Brigalow Belt South Bioregion and Nandewar Bioregion | 470 - Mugga Ironbark - Narrow-leaved Ironbark - Buloke - Black Cypress Pine shrub grass open forest in the Goonoo forests and surrounding region, southern Brigalow Belt South Bioregion | 511 - Queensland Bluegrass - Redleg Grass - Rats Tail Grass - spear grass - panic grass derived grassland of the Nandewar Bioregion and Brigalow Belt South Bioregion |
| 280 - Red Stringybark - Blakelys Red Gum +/- Long-leaved Box shrub/grass hill woodland of the NSW South Western Slopes Bioregion | 437 - Yellow Box grassy woodland on lower hillslopes and valley flats in the southern NSW Brigalow Belt South Bioregion | 477 - Inland Scribbly Gum - Red Stringybark - Black Cypress Pine - Red Ironbark open forest on sandstone hills in the southern Brigalow Belt South Bioregion and northern NSW South Western Slopes Bioregion | 76 - Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions |
| 281 - Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion | 440 - Red Stringybark - Narrow-leaved Ironbark - Black Cypress Pine - hill red gum sandstone woodland of southern NSW Brigalow Belt South Bioregion | 478 - Red Ironbark - Black Cypress Pine - stringybark +/- Narrow-leaved Wattle shrubby open forest on sandstone in the Gulgong - Mendooran region, southern Brigalow Belt South Bioregion | 78 - River Red Gum riparian tall woodland / open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion |
| 381 - Rough-barked Apple - Yellow Box grass/shrub footslope open forest, Brigalow Belt South Bioregion | 461 - Tumbledown Gum woodland on hills in the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion | 479 - Narrow-leaved Ironbark - Black Cypress Pine - stringybark +/- Grey Gum +/- Narrow-leaved Wattle shrubby open forest on sandstone hills in the southern Brigalow Belt South Bioregion and Sydney Basin Bioregion | 796 - Derived grassland of the NSW South Western Slopes |
| 403 - Dapper Mugga Ironbark - Western Grey Box - Blakelys Red Gum - Black Cypress Pine grass shrub hill woodland (southern Brigalow Belt South Bioregion) | 468 - Narrow-leaved Ironbark - Black Cypress Pine +/- Blakelys Red Gum shrubby open forest on sandstone low hills in the southern Brigalow Belt South Bioregion (including Goonoo) | | 81 - Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion |
| 433 - White Box grassy woodland to open woodland on basalt flats and rises in the Liverpool Plains sub-region, BBS Bioregion | | | |

GDA 1994 MGA Zone 55

FIGURE 6.6
Preliminary PCT Mapping and Threatened Species

6.1.3.3 Large-eared Pied Bat

BBUS surveys have recorded the Large-eared Pied Bat (*Chalinolobus dwyeri*) within the Project Area. This species is listed as Vulnerable under both BC and EPBC Acts, within the BAM it is recognised as a species credit species and therefore will require specific assessment.

As part of the preliminary constraint's analysis, a review of the habitat features of the Project Area was undertaken. This considered the location of the records of this species and their proximity to potential breeding habitat which is represented by caves or similar. A review of the habitat constraints listed within the NSW Threatened Biodiversity Data Collection (TBDC) was also completed.

The habitat assessment completed for this species included:

- General habitat PCTs linked to the Large-eared Pied Bat as identified within the TBDC within 2 km of rocky areas containing caves or similar)
- Potential breeding habitat (PCTs linked to the Large-eared Pied Bat as identified within the TBDC within 100 m of rocky areas containing caves or similar)

The TBDC identifies breeding habitat as PCTs associated with the species within 100 m of rocky areas containing caves, or overhangs or crevices, cliffs or escarpments, or old mines, tunnels, culverts, derelict concrete buildings and any impacts on this habitat could be considered Serious and Irreversible. This habitat was a line following the ridges in the north-west of the Project Area where the ridge lines appear to be relatively steep. A total area of approximately 1,260 ha currently forms the extent of habitat for this species within the Project Area. The project has been designed to avoid disturbance to this area and the BDAR will include further investigation of the ridges and rocky areas of the Project Area to refine the habitat areas for the large-eared pied bat.

6.1.3.4 Biodiversity Development Assessment

Further detailed biodiversity survey will be undertaken within the Project Area with a focus on a development corridor (buffered 25 m either side of access road centrelines and 100 m from turbines) this approach will allow for flexibility in design and micro-siting of turbines. Following the completion of the surveys, a Biodiversity Development Assessment Report (BDAR) will be prepared. The BDAR will include:

- field surveys and GIS mapping:
 - PCT survey and GIS mapping
 - targeted species-credit survey
 - bird and bat utilisation survey
- preparation the BDAR including:
 - results of the previous literature review
 - methods and results of vegetation surveys including a vegetation community map (based on PCTs and including TECs)
 - methods and results of surveys targeting species-credit species
 - assessment of prescribed impacts
 - outcomes of the calculator assessment identifying the credits generated by the PCTs (and ecosystem-credit species) and species-credit species
 - relevant data and mapping for agency submission including field sheets, figures and associated GIS files.

6.1.4 Heritage

6.1.4.1 Aboriginal Heritage

The Project Area falls wholly within the Mudgee Local Aboriginal Land Council (LALC) area and the Warrabinga-Wiradjuri #7 registered Native Title claim (NC2018/002). Search of the Aboriginal Heritage Information Management System (AHIMS) identified 68 registered Aboriginal sites located within or within proximity of the Project Area (refer to **Figure 6.7**). The majority of registered sites comprise stone artefacts (either as isolated artefacts or as artefact scatters) with 56 sites containing stone artefacts. Of the registered sites, 12 are located within the Project Area. **Table 6.5** provides a summary of the available information on these registered sites.

Table 6.5 AHIMS Registered Sites Within the Project Area

AHIMS	Site Name	Site Type	Recording Information	Description (from site card information)
36-3-0035	Puggoon; Nagundie;	Shelter with Deposit	Recorded in 1980 and coordinates subsequently translated from map grid reference. On this basis, coordinates may be inaccurate. There is no map on site card to allow for comparison	Site card specifies that the site does not contain any archaeological evidence and is not an archaeological site. The site card references artefacts being 'found in the vicinity' but that these were not within the rock overhang
36-3-0029	Nagundie, Dubbo	Axe Grinding Groove	Recorded in 1976 and coordinates subsequently translated from map grid reference. On this basis, coordinates may be inaccurate. There is no map on site card to allow for comparison	The site is described as 27 axe grinding grooves on edge of waterhole on top of a 'sandstone residual' approximately 2.8 m above ground level. There are 9 more grooves described as being at the base of the outcrop and 13 grooves on the cliff edge.
36-3-0031	Puggoon; Nagundie;	Shelter with Deposit	Recorded in 1980 and coordinates subsequently translated from map grid reference. On this basis, coordinates may be inaccurate. There is no map on site card to allow for comparison	The site card includes the same descriptive information as for 36-3-0035 but within different coordinates. The photos included with the site card imply that these two sites are different.
36-3-0032	Puggoon; Nagundie;	Stone Arrangement	Recorded in 1980 and coordinates translated from map grid reference. On this basis, coordinates may be inaccurate. A map provided as part of the site card shows indicative site locations but sites are not labelled	The site card contains very little information but the attached photographs show small mound of stones in paddock
36-3-0033	Puggoon; Nagundie;	Axe Grinding Groove	Recorded in 1980 and coordinates translated from map grid reference. On this basis, coordinates may be inaccurate. A map provided as part of the site card shows indicative site locations but sites are not labelled	The site card contains limited written information but provides photographs that show grinding grooves on loose boulders and rock outcrops
36-3-0034	Puggoon; Nagundie;	Water Hole/Well	Recorded in 1980 and coordinates translated from map grid reference. On this basis, coordinates may be inaccurate. A map provided as part of the site card shows indicative site locations but sites are not labelled	The waterhole is described as being located on a large sandstone rock on the eastern side of hill at the top of a large rock (8m, 9m wide by 4m). The hole is reported to contain water year round
36-3-0036	Puggoon; Nagundie;	Burial/s	Recorded in 1980 and coordinates translated from map grid reference. On this basis, coordinates may be inaccurate. A map provided as part of the site card shows indicative site locations but sites are not labelled	The site card references the presence of 14 or more graves in a lower section of the hill below site 36-3-0034. It states that some of the graves are well defined but that generally the site is in poor condition. Based on the photos included in the site card, the graves comprise small stone mounds/cairns

AHIMS	Site Name	Site Type	Recording Information	Description (from site card information)
36-3-0013	Tallawang;	Axe Grinding Groove, Water Hole/Well	Site card states that the site coordinates were 'recorded from old map'. This implies that they may not be accurate	No further information on site card
36-3-1429	SAC 49	Artefact scatter	Site recorded 2009 using standard GPS technology so likely to be accurate	The site is described as a scatter of over 100 stone artefacts distributed over an area of approximately 180m by 75m on a lower slope above a creek (based on mapping this is a tributary of Slapdash Creek). The site is assessed as having moderate potential
36-3-1430	SAC 50	Artefact scatter	Site recorded 2009 using standard GPS technology so likely to be accurate	The site is described as a scatter of 15 artefacts in an area 140 by 77m on a lower slope adjacent to Slapdash Creek. The site was assessed as having moderate archaeological potential
36-3-1419	IF 19	Isolated artefact	Site recorded 2009 using standard GPS technology so likely to be accurate	The site contains a quartz artefact. No further information was provided
36-3-1427	IF 27	Isolated artefact	Site recorded 2009 using standard GPS technology so likely to be accurate	The site contains a quartzite grinding stone and was assessed as having low archaeological potential

The registered sites located within the Project Area can be grouped into those associated with Barneys Reef (being sites typically associated with sandstone geology) and artefact scatters/isolated artefacts, which have been identified in association with Slapdash Creek and its tributaries. Based on the AHIMS search results, stone artefact scatters and isolated artefacts are relatively common in the local area. However, the presence of recorded multiple burials in association with a complex of sites including stone arrangements and grinding grooves is relatively unusual. The proposed infrastructure has been designed to avoid these registered sites and further detailed assessment will be undertaken.

An Aboriginal Cultural Heritage Assessment (ACHA) will be undertaken following the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, 2011) and the *Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW* (DECCW, 2010). The ACHA will include consultation with the registered Aboriginal parties for the Project in determining and assessing impacts, developing and selecting options and mitigation measures, having regard to the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010). The ACHA will include undertaking an archaeological survey of the Project development corridor in partnership with the registered Aboriginal parties for the Project.

6.1.4.2 Historic Heritage

There are no Commonwealth or World heritage listed places located within or in close proximity to the Project Area. There are also no State listed or Locally listed heritage places or items located within the Project Area. The closest State listed heritage sites are the 'Spring Ridge Homestead' and 'Niven's Springridge Hotel', both located approximately 7 km to the west of the Project Area (refer to **Figure 6.7**). The curtilage of both of these items is well defined, with no potential for them to extend into the current Project Area. No other listed heritage items are located in the vicinity of the Project Area.

There are numerous local heritage sites located in proximity to the Project Area. The historic township of Gulgong is located 12 km south of the of the Project Area. No locally listed heritage sites are expected to be impacted by the Project.

Three previous assessments for SSD projects in the vicinity of the Project Area have considered historical heritage. These studies indicated the potential for unlisted buildings, structures and infrastructure of historical heritage significance to be present in the wider local area and within the Project Area. Items of potential historical heritage significance identified within the Project Area included homesteads that date from the late 1800s through to the 1930s, railway lines (Wallerawang – Gwabegar Railway Line), ancillary buildings and structures such as sheds and yards, and agricultural equipment and miscellanea.

These findings are generally consistent with the historical context of the area, which is heavily characterised by agricultural and farming activities from the mid to late 1800s onwards, along with distinct periods of prosperity and development associated with mining (both gold and ore).

The EIS will be supported by a historical heritage assessment (HHA) which will be prepared with reference to the NSW Heritage Manual, relevant Heritage Council of NSW guidelines and with consideration of the principles contained in the Burra Charter: the Australia ICOMOS Charter for Places of Cultural Significance (Australia ICOMOS 2013).

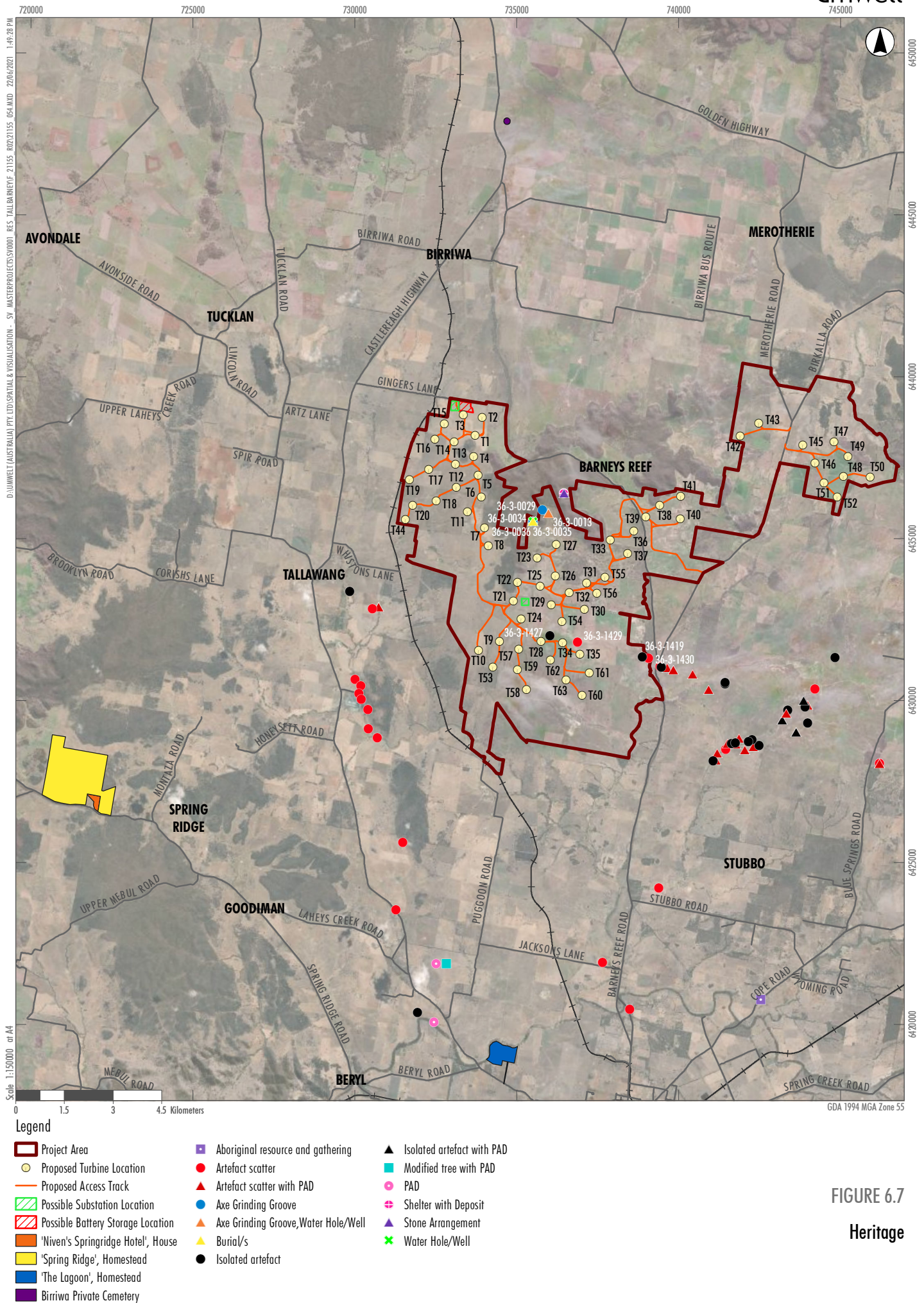


FIGURE 6.7
Heritage

6.1.5 Traffic and Transport

The construction phase of the Project will result in increased traffic movements by both light vehicles transporting construction personnel and minor light construction materials, and heavy vehicle movements transporting the turbine towers, blades and other large/heavy equipment required for construction purposes. Traffic associated with the operational phase of the Project will be minimal and will generally only involve the movement of light vehicles transporting operational staff to and from and around the site.

The proposed transportation route for the turbine components from Newcastle Port includes the New England and Golden Highways. Initial desktop analysis of existing vertical clearance and road width indicates the transport route may be constrained in some locations and require works in order to cater for the required over-mass transport vehicles. Any works required will be subject to detailed assessment during the EIS phase.

Preliminary analysis of four local access options for the delivery of turbine components has been undertaken for the oversized transportation of turbines to the Project Area. All options will include the New England Highway and Golden Highway as primary access routes (refer to **Figure 6.8**). Potential local access points to the site include Merotherie Road (from the Golden Highway), Gingers Lane (from the Castlereagh Highway), Barneys Reef Road (from the Castlereagh Highway) and Whistons Lane (from the Castlereagh Highway).

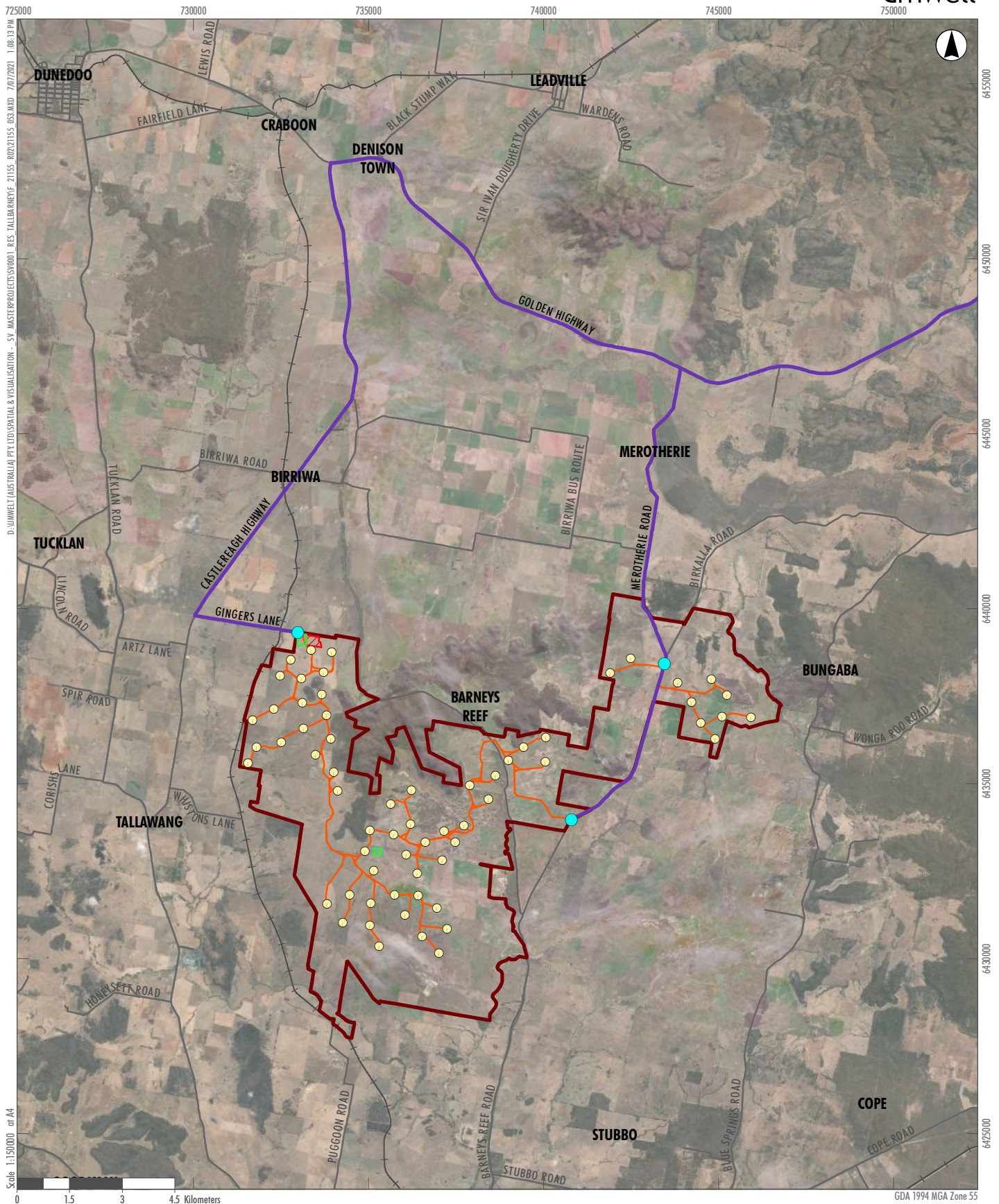
Based on the preliminary analysis, access to the site will be provided via two potential access points on Merotherie Road (from the Golden Highway) and via Gingers Lane (from the Castlereagh Highway). Barneys Reef Road and Whistons Lanes were found to be generally unsuitable. Gingers Lane is currently intended to provide access for the delivery of the Battery Storage System and substations with all points providing access for turbine component delivery. Access to the site will be subject to further assessment and confirmation during the EIS phase following further stakeholder engagement.

It is expected that upgrades to local roads and intersections (secondary access routes) to allow access for heavy vehicles will be required (where considered suitable) prior to any deliveries occurring as part of the construction phase of the Project. Existing access tracks within the Project Area will also be upgraded (if required) or created to allow the delivery of the turbines and for ongoing access during operations, with the preliminary internal access layout provided on **Figure 6.8**. Local access roads and tracks will be maintained during the construction phase of the Project.

A Traffic and Transport Impact Assessment (TTIA) will be undertaken to assess the potential transport routes required for the construction of the Project and any potential impact to the road network. The TTIA will be undertaken following relevant NSW Government guidelines and assessment standards including the Guide to Traffic Generating Developments (RTA, 2002), Road Design Guide and relevant Austroads Standards and Austroads Guide to Traffic management.

The TTIA will include:

- a review and assessment of the existing road network
- a review of any previous traffic impact assessments undertaken for the surrounding area
- traffic counts in selected areas along the proposed traffic routes (if data is not readily available)
- a detailed assessment of the likely Project-alone and cumulative traffic impacts during the construction and operational phases of the Project (including intersection performance, capacity, safety and site access), and
- consultation with relevant roads authorities
- identification of any road upgrade works and mitigation and management measures that may be required.



- Legend**
- Project Area
 - Proposed Turbine Location
 - Proposed Access Track
 - Possible Substation Location
 - Possible Battery Storage Location
 - Proposed Access
 - Access Point

FIGURE 6.8

Access

6.1.6 Socio-Economic Impacts

The SIA includes the development of a social baseline profile of the communities in and surrounding the Project Area. The social baseline provides initial analysis of the defining characteristics of the communities considering demographic, social and economic indicators. Further, it considers the natural and physical attributes of the area of social influence in understanding how people currently live, work and recreate in the area.

The Central West-Orana Region is a diverse and productive region with good connectivity to Sydney, Canberra and Newcastle. The key regional cities include Bathurst, Orange, and Dubbo, with increasingly popular centres of Lithgow, Mudgee, and Cowra. The Castlereagh Highway and the Golden Highway give the local area access to the Hunter region, the major metropolitan centre of Newcastle as well as inland road links to south-east Queensland.

The population of the region is expected to reach 300,000 people by 2036, and as such, there has been a strong focus from the NSW Government to develop the region into 'the most diverse regional economy in NSW with a vibrant network of centres leveraging the opportunities of being at the heart of NSW' (NSW Government, 2016), capitalising on the historic towns and centres for tourism, agricultural heritage and food production in the agricultural industry. Significant industries of employment in the region include the agriculture, health and social care sectors and mining.

The townships of Gulgong and Dunedoo are key communities of interest for the Project given their proximity to the Project Area. Gulgong, home to 2,521 people as at the 2016 census, can be characterised by its history and heritage buildings and streetscapes that act as a tourist attraction in the region, whereas Dunedoo is home to approximately half the number of residents as Gulgong and is classified as a small rural town that acts as a centre for the surrounding rural community.

Within the region, there is a strong history of viticulture, with winemaking dating back to the 1850s. Mudgee is a well-known food and wine destination amongst tourists and features an annual Food and Wine Festival. The primary agricultural industries in the Mid-Western Regional LGA are wool, cereal crops and cattle. The region is also rich in minerals, with mining (predominantly coal mining) contributing \$270 million to the local economy. The State of the Environment Report (2017-18) suggests there has been no loss of primary agricultural land through rezoning in the period between 2014 -2018 and an increase in the area covered by mining and exploration titles.

Water supply deficiencies (of more than 50% by 2036) are forecast for the Mid-Western Region. New water security projects and water management initiatives, such as stormwater harvesting and innovative water management approaches, are currently being employed to improve water security (NSW Government, 2016). Above-average rainfall in March 2021 has eased long-term rainfall deficiencies and encouraged optimism in agricultural communities in the region. Extended drought conditions had negatively affected agricultural communities, particularly between 2017 – 2019.

The agricultural industry is currently the top employer in the region, with the exception of Gulgong (where mining is the top employer). The closure of several resource extraction Projects in surrounding communities has created key changes in the regional communities. Specifically, the closure of the Sibelco Tallawang magnetite mine in 2016 led to a reduction in the availability of mining jobs in the Mid-Western Regional LGA.

The Mid-Western Regional LGA attracts over 573,000 visitors each year through its viticulture, food, sport and cultural events (Mid-Western Regional Council, 2019). Deemed the gateway to the Central West and Far West regions of the State, and 3-4 hours' drive from Sydney and Newcastle, Mudgee is also easily accessible from the surrounding regional centres. According to Tourism Research Australia, visitors to the Mid-Western Regional LGA spent on average three nights in the area, with a total annual spend of \$148 million dollars (Tourism Research Australia, 2017). According to the Mudgee Region Annual Report (2018), the tourism industry in the Mudgee tourism region generated \$924,083 in revenue for the year 2018. This was an increase of \$44,116 (5%) from 2017 (\$879,967 revenue).

Given the location of the Project Area in the Central-West Orana REZ, there have been a number of other renewable energy projects that are operating, under construction or are currently being planned. The scoping phase SIA includes the review of a select number of comparable projects in the region to identify how relevant stakeholders and communities have responded to these proposed developments and inform an understanding of the potential cumulative impact associated with multiple nearby projects. This review included Valley of the Winds Wind Farm (planning phase), Bodangora Wind Farm (Operational), Liverpool Range Wind Farm (approved) and Hills of Gold Wind Farm (response to submissions phase). A review of publicly available documentation and media of these projects highlighted key community sentiments including concerns regarding:

- unequal distribution of benefits between host landholders and nearby or proximal residents
- disruption to agricultural activity including aerial tasks (e.g. spraying)
- possible land devaluation
- loss of accessible agricultural land
- local road disruptions and decrease in road safety during construction
- noise disturbance from construction, traffic, and operation of the wind farm
- visual impacts to the landscape's amenity, including shadow flicker, increase of built infrastructure and construction activities causing light pollution
- concern for the harm caused to birds.

These sentiments are consistent with some of the key concerns raised by community members in relation to the Project.

There are several other projects which are recently developed, or currently being considered, which could cause changes to the community or which may have further cumulative effects across the region particularly in relation to impacts associated with concurrent construction activities. Major projects in other sectors that could affect social change include:

- the Tallawang Solar Farm, also proposed by RES and adjacent to the Barneys Reef Wind Farm
- a \$70.7 million upgrade to Mudgee Hospital including a new emergency department, inpatient unit, operating theatres, maternity unit and outpatient services (NSW Health, 2021)
- a \$1.3 million upgrade to the Castlereagh Highway near Capertee to improve road safety (Lithgow Mercury, 2020)
- Melbourne – Brisbane Inland Rail Project, traversing the Mid-Western Regional LGA (NSW Government, 2016)
- an extension to Peabody Energy's Wilpinjong Coal Mine near the small community of Wollar – approved in 2017
- the Mid Western Regional Council has noted there are currently nine State Significant Development Applications within the LGA, three of which are coal mine developments or expansions.

Such project developments, in combination with the number of renewable projects approved or in the planning phase, may further intensify impacts experienced by local communities across the region.

Further detail in relation to the social baseline is provided in the scoping phase SIA report (refer to **Appendix 1**).

6.1.6.1 Local Challenges and Opportunities

Through review of local, regional and state government reports, strategies and plans, ABS Census data and other secondary sources of data, local media and community consultation the SIA has developed the key challenges and opportunities currently applicable to the Mid-Western LGA.

The key challenges faced by the Mid-Western Regional LGA include the need to provide for an ageing population with limited health services and addressing the existing strain on short-stay accommodation provision. The redevelopment of Mudgee Hospital is a response in place to partially overcome this issue. The abundant natural resources and strong tourism sector, combined with the growth in renewable energy projects, put the LGA in a good position to further diversify the local and regional economy.

The increasing number of transient workforces caused by multiple major projects either in construction, or proposed in the area of social influence, results in some flow-on challenges for the region in maintaining an existing strong sense of community and decreasing anti-social behaviour. However, the low mobility of the community is suggestive of a sustained sense of community, and the high rate of volunteerism indicates that the community is willing to participate in community initiatives. This coupled with Council's plans to increase housing provision, will likely result in positive social development for the community more broadly.

To further support regional development, issues such as traffic congestion and the emerging strain on local service provision need to be addressed, as well as upgrades needed to road infrastructure and the mobile network. Some of these identified constraints are already being considered by Council.

Community identified strategies to mitigate or respond to issues and impacts, as well as opportunities for the Project and ways in which the proponent could positively contribute to the local community have been considered during the development of the scoping phase SIA. As part of the EIS, future stages of SIA for this Project will include a comprehensive prediction and assessment of social impacts and development of relevant strategies to mitigate negative and enhance positive impacts associated with the Project. Further detail is provided in the SIA (refer to **Appendix 1**).

6.1.6.2 Social Impact Assessment

The scoping phase SIA (refer to **Appendix 1**) includes the compilation of a social baseline profile for the Project, early-stage community and stakeholder consultation to inform the scoping of Project-related social impacts and opportunities, and a preliminary social impact prediction and evaluation. The preliminary impact evaluation can support the refinement of Project design and plans to reduce negative project impacts and achieve greater positive Project outcomes.

As part of the EIS, further SIA and technical environmental impact studies will address perceptions of impacts raised by key stakeholders during the EIS phase.

Subsequent phases of the SIA program will involve the following key activities:

- a detailed update of the baseline social profile to ensure that baseline data relevant to the impacts identified is obtained
- further validation of the area of social influence and identification of affected communities and vulnerable groups
- provision of feedback to near neighbours, community members and key stakeholders on the outcomes of the issues raised in the scoping phase and communication of the Project's SEARs (once issued) and an outline of the next steps in the assessment process

- further engagement with near neighbours, community members and other key stakeholders on key impact areas as noted above. This will involve feedback on the outcomes of EIS technical studies and will provide opportunities for input to the development of appropriate mitigation and enhancement measures to address social impacts and residual effects
- a comprehensive assessment and evaluation of social impacts against existing baseline conditions.

6.1.7 Hazard and Safety

The following section addresses the proposed approach to assessing potential hazard and safety impacts associated with the Project including aviation safety, health impacts, impacts to telecommunications, blade throw, shadow flicker, blade glint and bushfire threat.

6.1.7.1 Aviation Safety

The Project will need to consider the potential for the interaction of the proposed turbines with air services. Wind turbine height and placement will consider potential safety hazards for aircraft through intrusion of the airspace and the potential effects on the associated navigation instruments.

Mudgee Airport (YMDG) is located 20.5 nautical miles (nm) south of the Project Area, within the 30 nm buffer zone of the Project Area. Other nearby aircraft landing areas (ALAs) were also identified including Dunedoo ALA, Merotherie Crossing ALA, Ulan ALA and Gulgong ALA. Merotherie is the only ALA within the identified area of interest for the assessment and is within 3 nm of the proposed turbines. It was concluded that the proposed wind farm is unlikely to adversely impact the operation of the Merotherie Crossing ALA, however, the preliminary assessment has identified potential considerations for use of the ALA under certain wind conditions. Further assessment and consultation with Air Services Australia and the relevant ALA operators will be undertaken as part of the detailed assessment as part of the EIS.

The EIS will include an Aviation Impact Assessment (AIA) which will include the following specific requirements as advised by Airservices Australia:

Aerodromes:

- specify all registered/certified aerodromes that are located within 30 nm (55.56 km) of the Project Area
- nominate all instrument approach and landing procedures at these aerodromes
- review the potential effect of the Project on the operational airspace of the aerodromes.

Air Routes:

- nominate air routes published in ERC-L & ERC-H which are located near/over the Project Area and review potential impacts of the Project on aircraft using those air routes.

Airspace:

- nominate the airspace classification where the Project Area is located.

Navigation/Radar:

- nominate radar navigation systems with coverage overlapping the Project Area.

A risk assessment in relation to night lighting of the wind turbines will also be undertaken in accordance with Australian Standard AS/NZS ISO 31000:2018 Risk Management – Guidelines.

During the development of the AIA, consultation will be undertaken with Airservices Australia, Department of Defence, applicable local Councils and aerodrome operators.

6.1.7.2 Health

Electromagnetic fields (EMF) are present where electric current flows, including overhead and underground transmission lines and substations and electrical appliances. The standard SEARs for wind farm developments require proponents to *“consider and document any health issues having regard to the latest advice of the National Health and Medical Research Council, and identify potential hazards and risks associated with electric and magnetic fields and demonstrate the application of the principles of prudent avoidance.”*

The EIS will include an EMF assessment which will consider potential health issues and risks associated with EMF produced by the wind farm and associated electrical infrastructure within the Project Area in accordance with the ICNIRP Guidelines for Limiting Exposure to Time-varying Electric, Magnetic and Electromagnetic Fields (1998).

6.1.7.3 Telecommunications

Telecommunications and radar services (civil and meteorological) can be impacted by wind turbines through electromagnetic interference (EMI). The EIS will include an EMI Assessment which will address any impact to radiocommunication services within the Project Area as a result of the Project and any required mitigation measures.

6.1.7.4 Blade Throw

Blade throw typically involves the failure of the turbine rotor which has the potential to result in the turbine blade becoming detached from the turbine. This risk is addressed by the turbine design, however, an assessment will be undertaken for the Project. The blade throw assessment will consider the potential risk of blade throw associated with the proposed turbine layout. The assessment will include:

- general review and assessment of the likelihood of blade throw occurring and typical blade throw distances
- calculation of the separation distance between turbines and neighbouring dwellings and property boundaries
- consideration of mechanisms to reduce the likelihood of blade throw occurring, including:
 - relevant standards against which turbines should be certified
 - typical overspeed and failsafe protection mechanisms
 - management and maintenance procedures, including regular inspections, and
 - provisions for blade replacement.

6.1.7.5 Shadow Flicker and Blade Glint

Shadow flicker is a moving shadow cast by the blades of a wind turbine from the sun which can cause a nuisance to surrounding landowners and in rare cases can cause health impacts such as photosensitive epilepsy or motion sickness. Blade glint can result from sunlight reflecting off the white components of the turbines. The risk of blade glint from wind turbines is low given majority of manufacturers treat the turbines with non-reflective finishes to reduce the risk of this occurring.

The EIS will include a Shadow Flicker Assessment which will:

- review sensitive receiver locations (involved and non-involved dwellings)
- estimate the annual hours of shadow flicker received at each dwelling

- identification of any dwellings where there is potential for the shadow flicker duration to exceed the limits specified in the relevant guidelines
- identify the specific turbines contributing to the shadow flicker for each dwelling
- assess the likely reduction in shadow flicker duration due to turbine orientation and cloud cover
- generate maps of theoretical and predicted actual shadow flicker duration, and
- consider the potential sources of conservatism in the assessment.

The Shadow Flicker Assessment will also address the potential for impacts associated with blade glint.

6.1.7.6 Bushfire Hazard

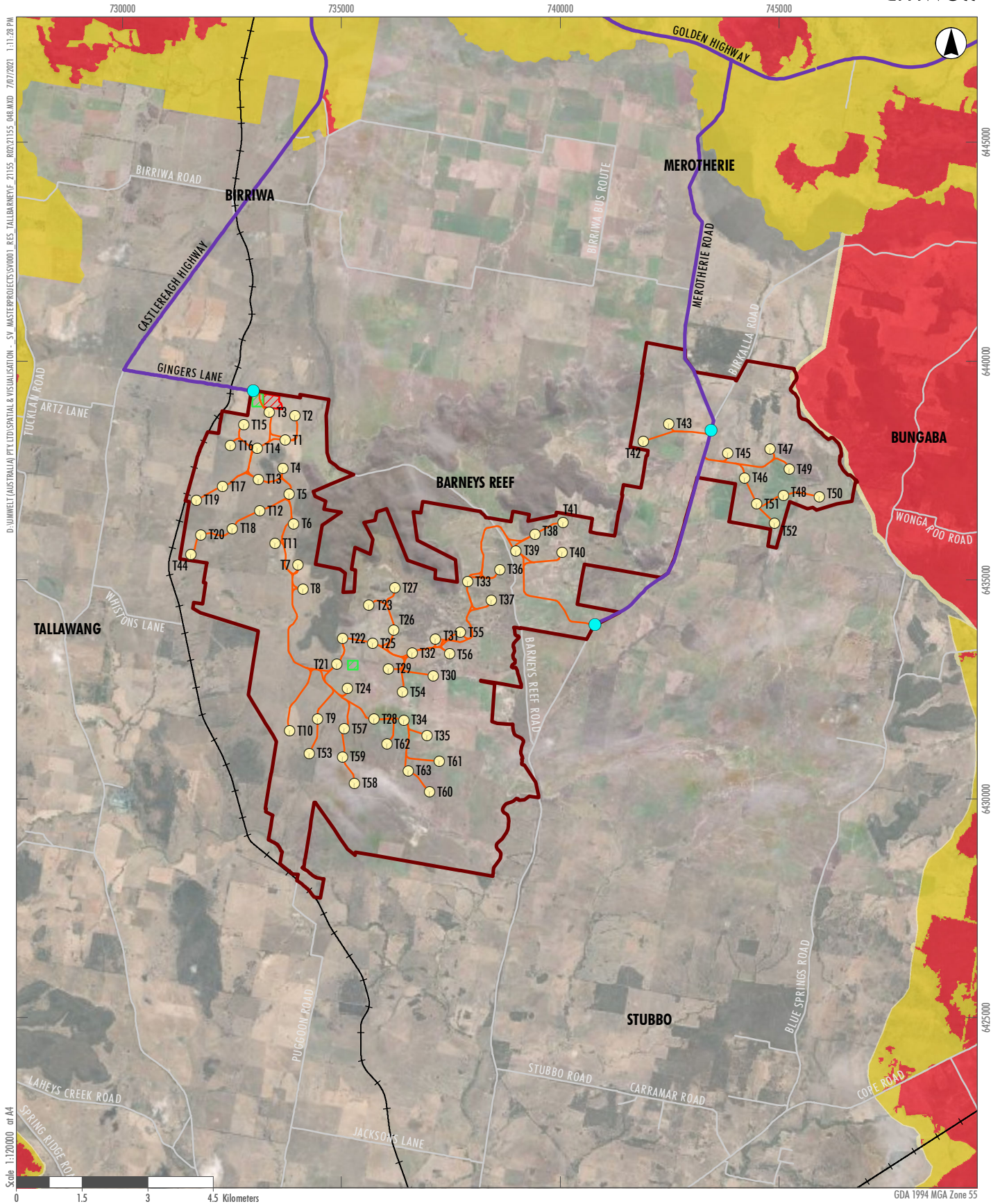
The Project Area is not currently identified as bushfire prone land by the Mid-Western Regional Council's Bushfire Prone Land Mapping (refer to **Figure 6.9**), however, it adjoins land that is mapped and identified as being bushfire prone. Although the Project Area has been subject to extensive clearing associated with agricultural land use there are areas of remnant vegetation mostly associated with Barneys Reef, which form a potentially significant fuel load capable of sustaining and spreading bushfire. Areas of vegetation within the Project Area also represent a potential linkage between vegetated areas within and adjoining the Project Area, with the potential to support the spread of bushfire. Given the bushfire threat applicable to the adjoining land and vegetation present within the Project Area it is likely that part of the Project Area will be mapped as bushfire prone once regional mapping is updated.

A bushfire threat assessment will be undertaken in accordance with the requirements of Planning for Bushfire Protection (PBP) 2019. Consultation with the Rural Fire Service (RFS) will also be undertaken during the preparation of the EIS.

6.1.7.7 Preliminary Hazard Analysis

The location of the proposed battery storage infrastructure will be subject to further assessment, including a preliminary hazard analysis (PHA) in accordance with State Environmental Planning Policy No 33 – Hazardous and Offensive Development. The PHA will involve the following components of work:

- screening of preliminary risks for all hazardous materials and dangerous goods to be stored and transported to/from the Project Area
- classifying and prioritising risks, and estimating societal risk, in accordance with the NSW Multi-level Risk Assessment Guideline (DPI, 2011)
- analysing consequence and frequency for hazard scenarios identified as requiring further assessment in the qualitative risk assessment, undertaken in accordance with the NSW Risk Criteria for Land Use Safety Planning (Department of Planning, 2011)



- Legend**
- Project Area
 - Proposed Turbine Location
 - Proposed Access Track
 - Possible Substation Location
 - Possible Battery Storage Location
 - Proposed Access
 - Access Point
- Bushfire Prone Land Mapping**
- Vegetation Buffer
 - Vegetation Category 1
 - Vegetation Category 2

FIGURE 6.9

Bushfire Prone Land Map

6.1.8 Water and Soil Resources

The Project Area falls within the Macquarie - Bogan catchments. There are several minor creeks that traverse the Project Area (refer to **Figure 6.10**), however, the Project Area is not prone to flooding. As discussed in **Section 2.2.4**, the land within the Project Area is variable in land capability with land classes 5 and 7 land and soil capability, which is described as moderate to low capability agricultural land.

A Water and Soils Impact Assessment (WRIA) will be undertaken as part of the EIS that will consider potential impacts on water resources and the catchment, including flooding, erosion and sediment control, water quality, water users, water sourcing and licence, and any required management and mitigation measures to minimise the potential impacts of the Project on water and soil resources.

6.1.9 Cumulative Impacts

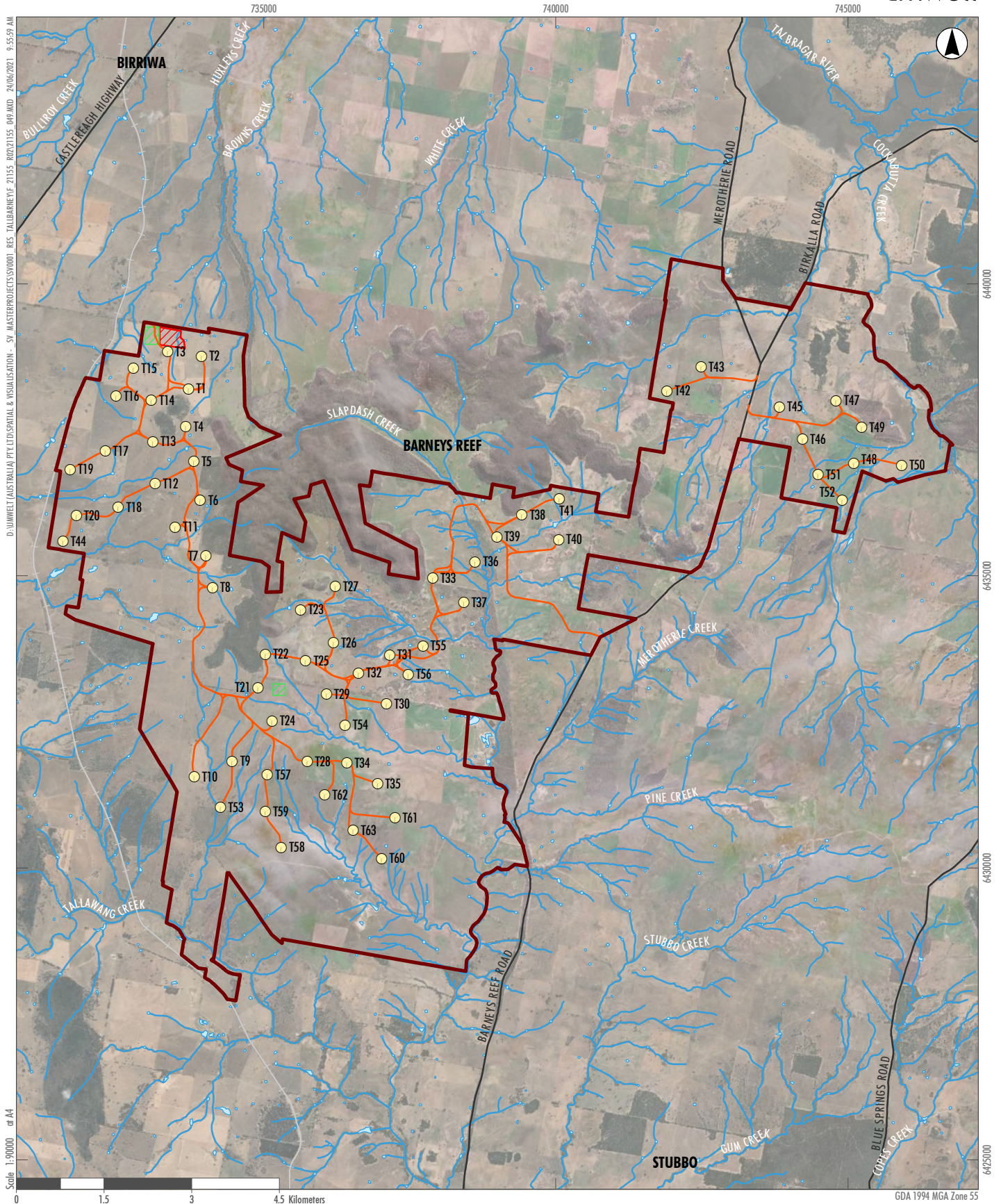
The wind energy guideline identifies the requirement to address cumulative impacts in relation to any other proposed, approved or operating wind energy projects in the vicinity particularly with regard to landscape, noise, biodiversity and traffic impacts.

As discussed in **Section 2.2.3**, the Project Area is located within a REZ and therefore there are a number of other existing and proposed renewable energy projects within the region (refer to **Figure 2.1**). The relevant detailed environmental assessments will include an assessment of the potential cumulative impacts associated with the Project.

6.2 Other Issues

The EIS will also address other issues relating to:

- Land use – the EIS will assess the potential interactions of the Project with other land uses, including agriculture. This assessment will draw on the findings of other related assessments including impacts on visual amenity, water, soil, noise, air quality, traffic, hazard and safety.
- Waste – the EIS will classify and quantify the likely waste streams to be generated during construction and operation and describe measures to manage, reuse, recycle and dispose of this waste in accordance with relevant guidelines.
- Air quality – in accordance with relevant NSW guidelines in relation to construction.
- Decommissioning and rehabilitation.



- Legend**
- Project Area
 - Proposed Turbine Location
 - Proposed Access Track
 - Possible Substation Location
 - Possible Battery Storage Location

FIGURE 6.10

Drainage Lines

7.0 Conclusion

The Project Area is located within the Central West Orana REZ under the NSW Government's Electricity Strategy. The REZ has been identified as a suitable location for renewable energy projects. The Project will contribute to achieving the objective set by the NSW and Commonwealth governments of increasing renewable energy capacity.

The preliminary Project layout will be subject to further analysis and refinement as part of the detailed specialist studies to be undertaken to inform the EIS and as an outcome of the ongoing stakeholder engagement program. The key issues relevant to the Project include:

- Visual Amenity
- Noise and Vibration
- Biodiversity
- Heritage
- Traffic and Transport
- Socio-Economic Opportunities and Impacts
- Hazard and Safety
- Water and Soils
- Cumulative impacts.

All identified issues will be subject to assessment as part of the EIS as detailed in **Section 6.0** and in accordance with the SEARs.

In addition to providing long-term, strategic benefits to the State of NSW through providing regional investment and cleaner electricity generation, the Project will also provide direct financial benefits to the regional and local community, including:

- infrastructure investment of approximately \$900 million
- employment generation creating approximately 340 jobs during the construction phase and approximately 10 jobs during the operational phase
- indirect benefits to local services through the construction and operation phases
- additional landowner income to involved landowners resulting in financial contributions to the local community
- local community benefits through developer contributions that will invest in local community project and initiatives to provide a direct and targeted local benefit

8.0 References

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NSW Office of Environment and Heritage, State Heritage Register

9.0 Glossary and Abbreviations

Term/Abbreviation	Definition
AHIMS	Aboriginal Heritage Information Management System
BAM	Biodiversity Assessment Methodology
BC Act	NSW Biodiversity Conservation Act 2016
BSAL	Biophysical Strategic Agricultural Land
CEEC	Critically Endangered Ecological Community
CEMP	Construction Environmental Management Plan
DAWE	Commonwealth Department of Agriculture, Water and the Environment
DPIE	NSW Department of Planning, Industry and Environment
EEAP	NSW Energy Efficiency Action Plan
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement
EMI	Electromagnetic Interference
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
EPL	Environment Protection Licence
EP&A Act	NSW Environmental Planning and Assessment Act 1979
GW	Gigawatts
Involved Dwellings	Dwellings located on land owned by landholders involved in the project
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan
LGA	Local Government Area
MSA	Minimum Safe Altitude
MOC	Minimum Obstacle Clearance
MW	Megawatts
MNES	Matter of National Environmental Significance
NDC	Nationally Determined Contribution
Non-involved dwellings	Dwellings located on land owned by landholders not involved in the Project
OEMP	Operational Environmental Management Plan
OSOM	Over size and over mass vehicles
PCT	Plant community type
Project	Refers to the total area of the proposed wind farm
Proponent	RES Australia PTY Limited
REAP	Renewable Energy Action Plan
REZ	Renewable Energy Zone
SEARs	Secretary's Environmental Assessment Requirements
SSD	State Significant Development
TEC	Threatened ecological communities
VPA	Voluntary Planning Agreement
WTG	Wind Turbine Generator

