Mount Lambie Wind Farm

State Significant Development Scoping Report

Tetris Energy Pty Ltd as trustee for the Tetris Energy Unit Trust

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Executive summary

We acknowledge Aboriginal elders past and present and all members of the Aboriginal community, the original custodians of the land on which this Project resides.

Aurecon Australasia Pty Ltd (Aurecon) has been engaged by Tetris Energy Pty Ltd as trustee for the Tetris Energy Unit Trust (Tetris Energy) to assist with the environmental and planning approvals for the Mount Lambie Wind Farm.

The Project

Tetris Energy proposes to build the Mount Lambie Wind Farm, which would include the construction and operation of up to 20 wind turbine generators (WTGs) spread over an area of around 2,540 hectares about 12 kilometres (km) south-west of Wallerawang in the Central Tablelands of New South Wales (NSW) (the Project). The Project would be located within the Lithgow City Local Government Area (LGA) and is situated on 37 lots. The Project will be developed on land that is predominantly cleared and used for sheep and cattle grazing.

The Project is a renewable energy development with a capacity of up to 200 megawatts (MW), enough to power about 115,000 households per year. The Project is currently in the early stages of development, including stakeholder engagement and concept design.

The key components of the Project are as follows:

- Up to 20 WTGs, with blade-tip heights of between 250 and 285 metres (m) above ground level
- Up to two temporary meteorological masts
- One 100 MW capacity battery energy storage system (BESS) with duration of up to six hours.
- One or two substation and transmission connection points
- Temporary infrastructure areas, including construction compounds, a worker accommodation facility and laydown and stockpile areas
- Approximately 27 km of access tracks (combination of upgrades to existing tracks and construction of new tracks) throughout the Project area (minimum width of 5.5 m on straight tracks, widened to 6 m on corners)
- Internal collector cable network (electrical connections between the proposed WTGs and the substation/s), which is expected to be underground
- Site access, including access points from Great Western Highway and/or Curly Dick Road
- Public road upgrades to facilitate the delivery of WTG components to the development footprint (required upgrades will be determined during preparation of the environmental impact statement (EIS))
- Other operational and maintenance infrastructure, including site offices, parking, amenities, laydown areas, and operational and maintenance facilities such as storage and equipment sheds.

The Project is anticipated to be operational by 2028 and would operate for up to 35 years. There would be a peak construction workforce of around 150 people and around six to eight workers would be required for the ongoing operation and maintenance of the Project.

Need for the Project

The Project would contribute to the uptake of renewable energy generation required in NSW and Australia to reach the emissions reduction targets of a 43 per cent reduction in emissions by 2030 (compared with 2005 levels) and net zero by 2050 as legislated in the *Climate Change Act 2022*. The Project would also contribute to improved reliability, efficiency and security of electricity supply to NSW, including through the provision of a BESS. This, at a time when large thermal generators are progressively being retired, including the Liddell Power Station, which closed in 2023, the Eraring Power Station, which is scheduled for closure in 2027, and the remaining three power stations in NSW scheduled for closure by 2040, including the nearby Mt Piper coal-fired power station.

The Project supports the *Electricity Infrastructure Roadmap* (Department of Planning and Environment (DPE), 2020) through the provision of cheap and clean renewable energy within the Lithgow City LGA, which would contribute to sustainable outcomes across the community.

Overall, the Project is consistent with national, State, and local strategic planning objectives and would be positive for the NSW economy, environment, and society. The Project would allow for local construction and operational jobs to be created in the Lithgow City LGA, assisting with the regional industry transition from coal generation to renewable energy generation, and enable a greater share of the electricity supplied to the National Energy Market (NEM) to come from renewable sources in the context of progressively closing power stations in NSW.

Statutory framework

The Project is State Significant Development (SSD) as defined under State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP) and will require development consent under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

In accordance with Section 4.12(8) of the EP&A Act, an application for SSD is therefore required to be accompanied by an EIS that meets the requirements of Part 8, Division 5 of the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation) and any other relevant legislative requirements that relate to the EIS.

This scoping report has been prepared to request Secretary's Environmental Assessment Requirements (SEARs) for the Project. Once SEARs have been issued, an EIS will be prepared in accordance with the SEARs and the EP&A Act to accompany the development application for the Project for public exhibition.

Engagement

Tetris Energy has engaged with stakeholders about the Mount Lambie Wind Farm since August 2021 and with the community since October 2022, as part of its commitment to early, meaningful, respectful and effective engagement.

Key stakeholders who may have an interest in the Project have been identified through desktop research and stakeholder mapping of the local community, capturing those in geographical proximity to the Project. The Project team have engaged in a range of activities, including meeting with neighbouring landholders and local stakeholders in-person to build and maintain genuine, trusting relationships.

Engagement would remain a key focus and Tetris Energy would continue to engage potentially affected landholders, the community and key stakeholders to ensure they receive comprehensive updates about the Project and provide opportunities for feedback on the Project throughout the planning process.

Tetris Energy is committed to engaging with the Project's Aboriginal stakeholders and will ensure that engagement is pursued throughout the EIS process.

Environmental considerations

A preliminary environment assessment has been undertaken as part of this scoping report to determine the potential for the Project to result in environmental impacts and benefits, and to describe the proposed impact assessment approach that would be appropriate to undertake during the preparation of the EIS.

The aspects identified as requiring further assessment during the preparation of the EIS are landscape character and visual impact, biodiversity, noise and vibration, socio-economic and Aboriginal heritage. Aspects requiring standard assessment are historic heritage, traffic and transport, soils and contamination, water and hydrology, aviation, hazards and safety, and cumulative impacts. The EIS would also identify the mitigation and management measures to minimise impacts of the Project.

The final EIS assessment approach would be further informed by the SEARs and the requirements of the relevant agencies and stakeholders.

Next steps

This scoping report provides a high-level overview of the Project and outlines potential environmental impacts in support of an application for the Project SEARs. Once SEARs have been issued for the Project, they would then be addressed in an EIS, which would be publicly exhibited.

The EIS is required in accordance with Part 4, Division 4.36 of the EP&A Act and must comply with the requirements in Part 8, Division 5 of the EP&A Regulation and have regard to the *State significant development guidelines – preparing an environmental impact statement (Appendix B to the State Significant Development Guidelines)* (DPE, 2022a).

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Glossary and abbreviations

Acronym/ Term	Description
ABS	Australian Bureau of Statistics
ACHAR	Aboriginal Cultural Heritage Assessment Report
AEMO	Australian Energy Market Operator
AHIMS	Aboriginal Heritage Information Management System
ALA	Aircraft landing area
Associated receiver	A residence on privately owned land in respect of which the owner has reached an agreement with the applicant about the development and management of impacts (Department of Planning, Housing and Infrastructure, 2024b).
Associated receiver (under negotiation)	A residence on privately-owned land inside of the project area which the owner is currently under negotiation for an agreement with the applicant in relation to the development.
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator
BC Act	*Biodiversity Conservation Act 2016* (NSW)
BDAR	Biodiversity Development Assessment Report
BESS	Battery energy storage system
CASA	Civil Aviation Safety Authority
CBD	Central Business District
Climate Change Act	*Climate Change Act 2022*
Crown Land Act	*Crown Land Management Act 2016* (NSW)
CSEP	Community and Stakeholder Engagement Plan
dB	Decibel
DPE	Department of Planning and Environment
DPIE	Department of Planning, Industry and Environment
DPHI	NSW Department of Planning, Housing and Infrastructure (formerly the NSW Department of Planning and Environment (DPE))
EIS	Environmental Impact Statement. A document prepared by or on behalf of the applicant to accompany a development application that includes a comprehensive assessment of the environmental, social and economic impacts of the project (Department of Planning, Housing and Infrastructure, 2024b).
EMF	Electromagnetic field
EMI	Electromagnetic interference
EPA	Environment Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EP&A Regulation	Environmental Planning and Assessment Regulation 2021 (NSW)
GDE	Groundwater dependent ecosystem
GHG	Greenhouse gas
GW	Gigawatts
Infrastructure SEPP	*State Environmental Planning Policy (Transport and Infrastructure) 2021*
ISP	The 2024 Integrated System Plan
km	Kilometre
kV	Kilovolt

Acronym/ Term	Description
Landscape Character Study area	10 km, as identified within the Preliminary Landscape Character and Visual Impact Assessment. This distance provides a broad area preliminary analysis of the landscape surrounding the Project area to identify potential moderate to high landscape character impacts at the scoping report stage.
LCT	Landscape Character Types
LEP	Local Environmental Plan
LGA	Local Government Area
m	Metre
MNES	Matters of National Environmental Significance
MW	Megawatt
MWh	Megawatt hours
NEM	National electricity market
Non-associated receiver	A residence on privately-owned land in respect of which the owner has not reached an agreement with the applicant in relation to the development or A residence on privately-owned land in respect of which the owner has reached an agreement with the applicant in relation to the development, but the agreement does not cover the relevant impact or the performance measure under the agreement has been exceeded (Department of Planning, Housing and Infrastructure, 2024b).
Non-associated receiver (under negotiation)	A residence on privately-owned land outside of the project area which the owner is currently under negotiation for an agreement with the applicant in relation to the development.
NSW	New South Wales
OEH	Office of Environment and Heritage
OSOM	oversized and/or overmass
PCT	Plant community type
PLCVIA	Preliminary Landscape Character and Visual Impact Assessment
PMST	Protected Matters Search Tool
Planning Systems SEPP	State Environmental Planning Policy (Planning Systems) 2021
PSIA	Preliminary Social Impact Assessment
Representative viewpoint	Representative viewpoints at publicly accessible locations were selected in and around the Project area at different distances and viewing angles, to gain a preliminary understanding of visual impacts from the current Project layout.
REZ	Renewable Energy Zone
RFS	Rural Fire Service
SAII	Serious and irreversible impact
SEARs	Secretary's Environmental Assessment Requirements
SHR	State Heritage Register
SSD	State Significant Development
SVTM	State Vegetation Type Mapping
TEC	Threatened ecological community
Tetris Energy	Tetris Energy Unit Trust
the Project	The Mount Lambie Wind Farm, which would include the construction and operation of up to 20 wind turbine generators (WTGs) spread over an area of about 2,540 hectares and about 12 kilometres south-west of Wallerawang in the Central Tablelands of NSW
TWh	terawatt hours
UNFCCC	United Nations Framework Convention on Climate Change

Acronym/ Term	Description
Visual magnitude threshold	As defined in the Wind Energy: Visual Impact Assessment Bulletin (2016), visual magnitude threshold distances are guided by the height of the turbines and represent the area where potential impacts of the Project are likely to be more acute.
Visual setback threshold	1,570 metres for turbines at a height of 252 metres and 1,800 metres for turbines at a height of 285 metres, as defined in '*Wind Energy Guideline – Technical Supplement for Landscape and Visual Impact Assessment*' (NSW Department of Planning, Housing and Infrastructure, November 2024d). This is the minimum area required between a turbine and a dwelling. If a sensitive receiver is located within the setback threshold it will trigger a high visual impact unless the turbine(s) would be largely screened by topography or vegetation.
Visual Study area	7,200 metres (for turbines at 252 m height) and 8,100 metres (for turbines at 285 m height) from Project WTGs, as defined by '*Wind Energy Guideline – Technical Supplement for Landscape and Visual Impact Assessment*' (NSW Department of Planning, Housing and Infrastructure, November 2024d). The visual assessment identifies those dwellings or key public viewpoints that are within the visual magnitude threshold and therefore more likely to experience a higher magnitude of change in foreground and middle ground views.
WM Act	*Water Management Act 2000* (NSW)
WTGs	Wind turbine generators
ZTV	Zone of theoretical visibility

1 Introduction

1.1 Project overview

Tetris Energy Pty Ltd as trustee for the Tetris Energy Unit Trust (Tetris Energy) proposes to construct the Mount Lambie Wind Farm (the Project), which would include the construction and operation of up to 20 wind turbine generators (WTGs) spread over an area of around 2,540 hectares, with an indicative disturbance footprint[1] of about 125.1 hectares. The Project area is located within the Lithgow City Local Government Area (LGA) located about 12 kilometres (km) south-west of Wallerawang in the Central Tablelands of New South Wales (NSW). The Project is situated on land owned by Freehold Landholders, Local Government Authorities and Crown land, and will be developed on land that is predominantly cleared and used for sheep and cattle grazing. The location of the Project is shown in Figure 1-1 and Figure 1-2.

The Project is a renewable energy development with a generation capacity of up to 200 megawatts (MW), enough to power about 115,000 households per year. The Project would also include the installation of one battery energy storage system (BESS) with a duration of up to six hours (up to 600 megawatt hours (MWh)), and associated infrastructure within the Project area. The Project is currently in the early stages of development, including stakeholder engagement and concept design.

The Project is classified as State Significant Development (SSD) as defined under State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP) and would require development consent under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

1.2 The applicant

Tetris Energy Pty Ltd as trustee for the Tetris Energy Unit Trust (Tetris Energy) is the applicant for the Project and is an Australian renewable energy company developing a range of wind, solar and storage projects in Australia. Tetris Energy was established in 2018 and has a focus on the long-term viability of regional communities.

Tetris Energy's team have successfully delivered over 650 MW of renewable projects and have another 2,700 MW of wind projects under development in the Australian market.

The details for Tetris Energy are:

- Address: Level 3, 162 Collins Street, Melbourne, VIC 3000
- ABN: 81 625 741 399.

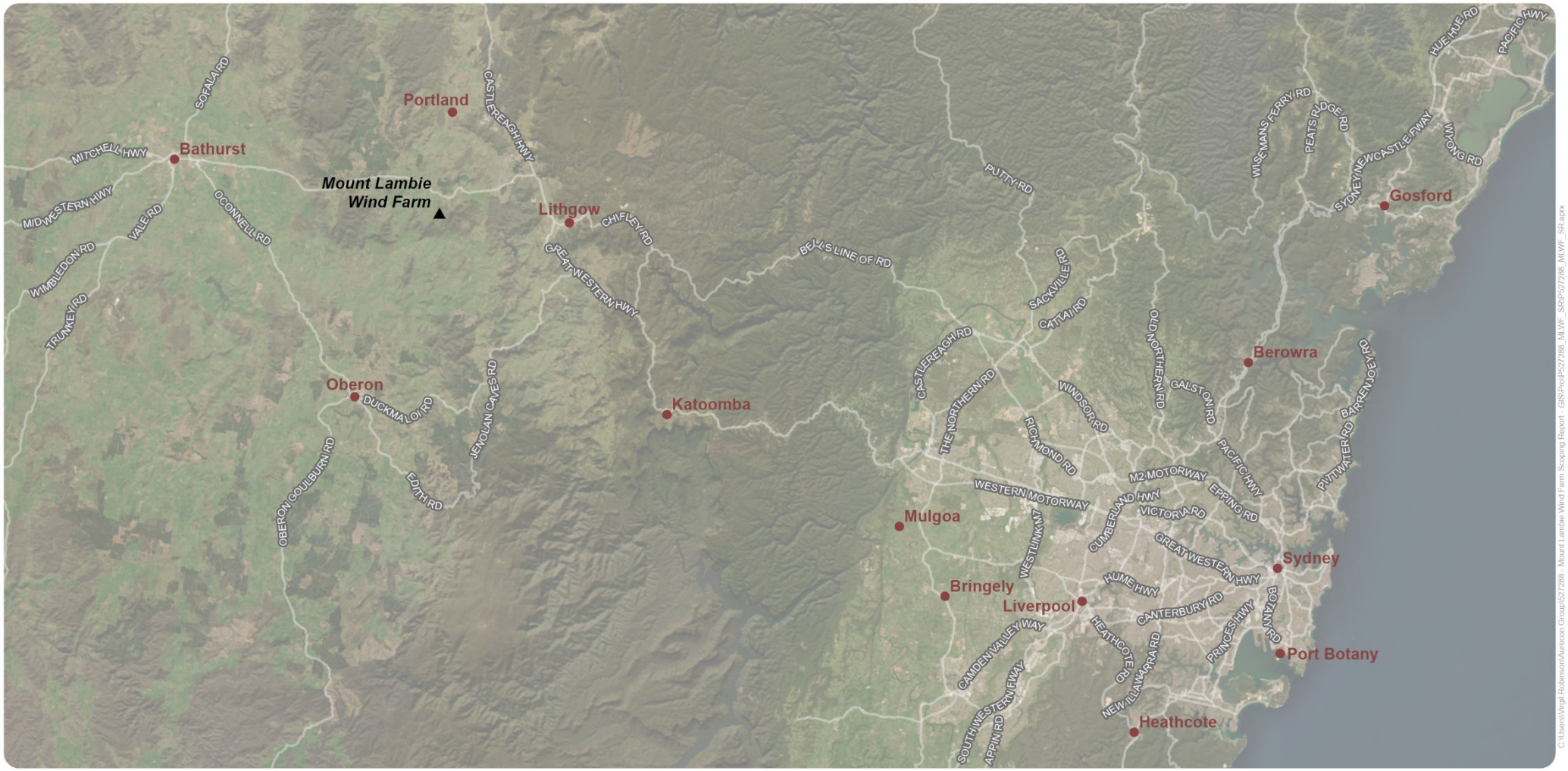
1.3 Project objectives

The objectives of the Project are to:

- Contribute to renewable energy generation and storage capacity in NSW through improving the security, stability and resilience of the National Energy Market (NEM).
- Support the transition to renewable energy through additional capacity of up to 200 MW and the potential to power over 115,000 homes.
- Contribute to the transition away from fossil fuels through emissions savings, including preserving the local skills within the Lithgow City LGA.
- Contribute to income for associated landholders and local community.

[1] The indicative disturbance footprint describes the area which is subject to detailed technical and field survey and impact assessment during the EIS phase. A development corridor would be established in the EIS which will include buffers around Project components to facilitate 'micro-siting'.

- Avoid, minimise and mitigate adverse impacts on the environment and community during construction and operation.
- Contribute to positive community and economic outcomes within the Lithgow City LGA.



▲ Mount Lambie Wind Farm

● City or town

Major road

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

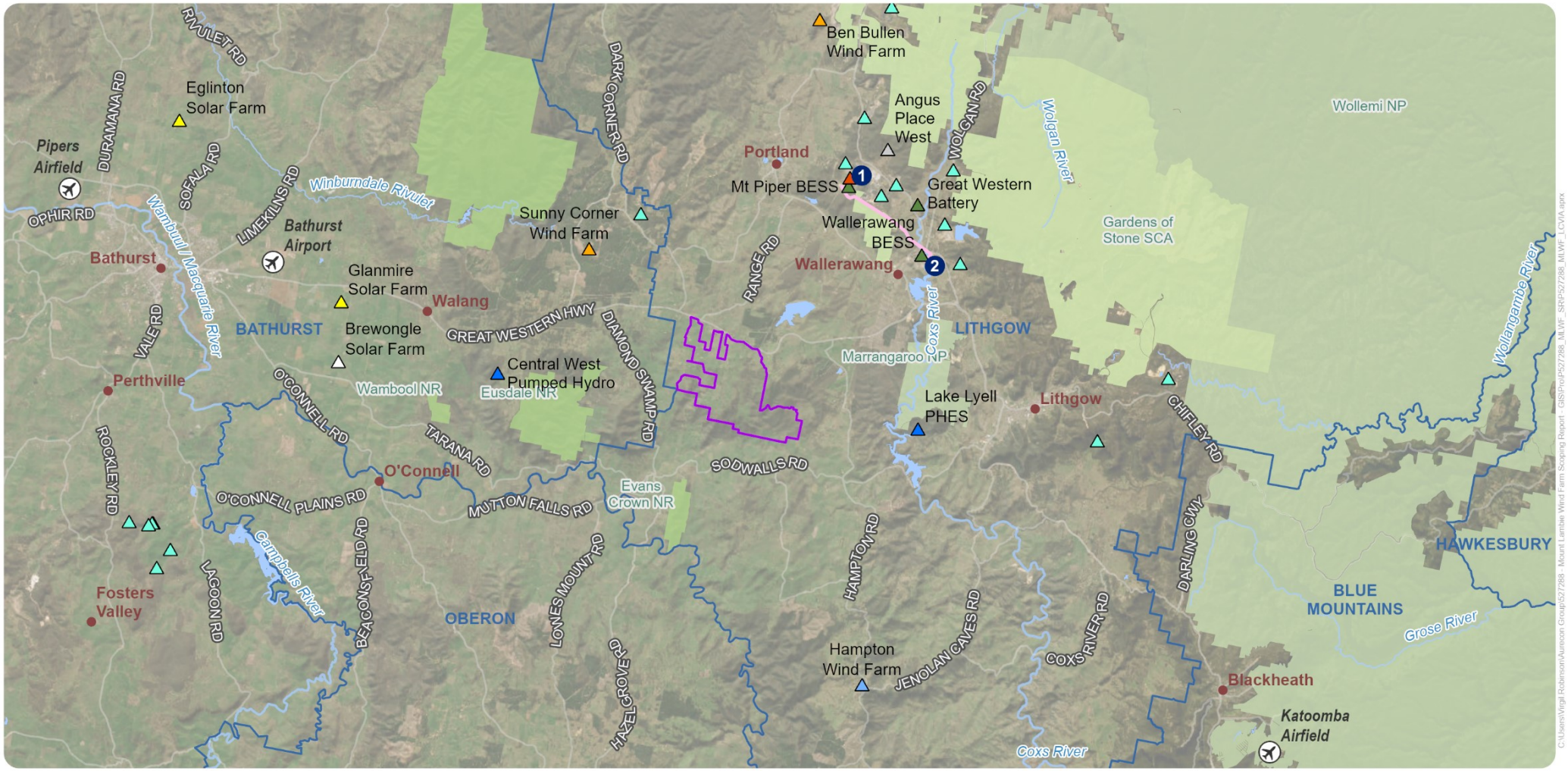
1:775,000

0 9.5 19 km

Projection: GDA2020 MGA Zone 55

Mount Lambie Wind Farm **Scoping Report**

Figure 1-1: Project location



Project area
Local Government Area
Waterbody
Waterway
Airport

Mount Piper to Wallerawang Transmission Line Upgrade

Major power stations
1 Mt Piper
2 Wallerawang

Underground mines
Existing
Proposed

Nearby energy projects
Battery - In Planning
Coal - Operational
Hydro - In Planning
Solar - In Planning
Solar - Withdrawn
Wind - In Planning
Wind - Operational

NPWS Estate
National Park
Nature Reserve
State Conservation Area

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:350,000
0 3.5 7 km

Projection: GDA2020 MGA Zone 55

Figure 1-2: Regional context and related development

1.4 Related development

There is no related development to the Project, i.e. either existing or approved development that would be incorporated into the Project or operated in conjunction with the Project, or development that is required for the Project but which would be subject to a separate assessment.

The Project is located in a region with a history of coal-fired electricity generation and is proposed to support the transition to renewables through the establishment of a wind farm, including a BESS. There are a number of proposed and approved renewable energy developments located near the Project, these include the Mount Piper BESS, Lake Lyell Pumped Hydro Energy Storage Project, Central West Pumped Hydro, Wallerawang BESS, Great Western BESS and Glanmire Solar Farm. Tetris Energy is also developing the Ben Bullen Wind Farm project located about 25 km to the north of the Project area (refer to Figure 1-3).

The closest Renewable Energy Zone (REZ) is the Central West Orana REZ, which is centred near Dubbo and Dunedoo. The Project is located about 80 km south of this REZ. The closest renewable energy developments to the Project located in the Central West Orana REZ include the Crudine Ridge Wind Farm, Burrundulla Solar Farm, Blain Road Solar Farm and Burrendong Wind Farm, which would be located around 98 km, 105 km and 115 km north-west of the Project, respectively.

The location of the above projects, REZs and other relevant future projects detailed in Section 2.2.4 are included in Figure 1-3.

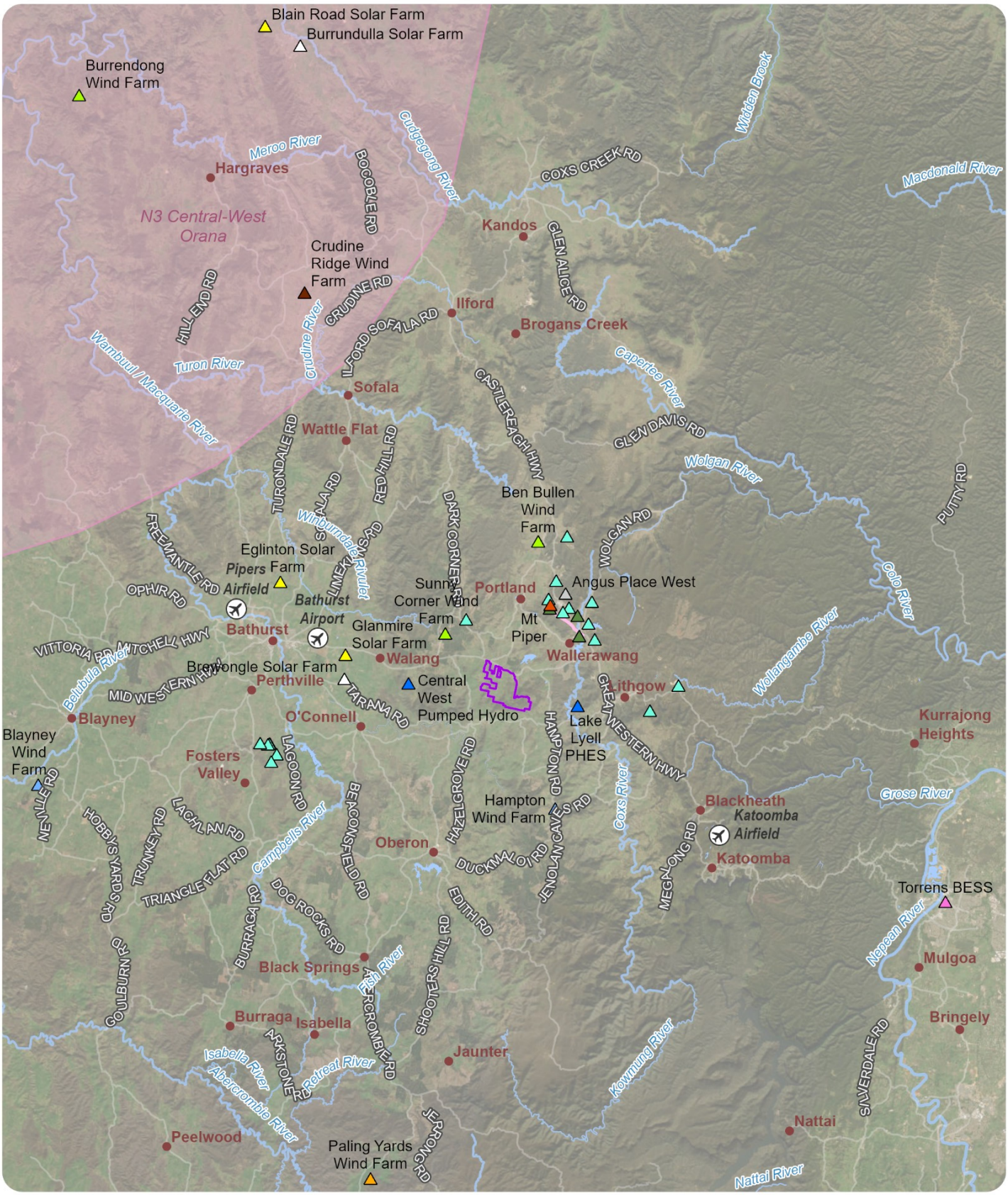
1.5 Purpose of this report

Tetris Energy is seeking approval for the Project via the SSD approval pathway, being electricity generating works with an estimated development cost of more than $30 million.

This scoping report has been prepared in accordance with the *'State significant development guidelines – preparing a scoping report' (Appendix A to the State significant development guidelines)* (Department of Planning and Environment (Department of Planning and Environment (DPE)), 2022a).

As required by the guidelines, this scoping report provides the following:

- A simple but accurate description of the Project (Chapter 3)
- The relevant strategic and statutory context (Chapter 2 and Chapter 4)
- A summary of the findings of any early community engagement and a description of the engagement that would be carried out during the preparation of the environmental impact statement (EIS) (Chapter 5)
- The identification of matters that would require further assessment in the EIS and how they would be assessed (Chapter 6).



Project area
Indicative Renewable Energy Zone 2021
Waterbody
Waterway
Airport

Mount Piper to Wallerawang Transmission Line Upgrade

Underground mines
Existing
Proposed

Nearby energy projects
Battery - Approved
Battery - In Planning
Coal - Operational
Hydro - In Planning
Solar - In Planning
Solar - Withdrawn
Wind - In Planning
Wind - Operational
Wind - Under Construction
Wind - Withdrawn

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:815,000
0 10 20 km

Projection: GDA2020 MGA Zone 55

Figure 1-3: Related development

2 Strategic context and need

2.1 Strategic planning and policy framework

2.1.1 National policy context

2.1.1.1 2015 Paris Agreement

On 12 December 2015, the Conference of the Parties adopted the Paris Agreement, made under the United Nations Framework Convention on Climate Change (also referred to as the UNFCCC) (UNFCCC, 2015) to strengthen the global response to climate change by:

- Keeping the increase in global average temperature to well below 2°C above pre-industrial levels
- Pursuing efforts to limit the temperature increase to 1.5°C.

Australia announced its ratification of the Paris Agreement on 10 November 2016. By 2030, the Commonwealth of Australia is committed to reducing emissions by 43 per cent below 2005 levels. In 2023, the Commonwealth of Australia released Australia's emissions projections 2023, outlining Australia's progress towards its Paris commitments. The report details how Australia is on track to reduce emissions by 37 per cent below 2005 levels by 2030 under the baseline scenario, and how improved energy efficiency and renewable uptake, including through the target of 82 per cent renewable energy in Australia's electricity grids, will allow Australia to exceed its Paris commitments.

Electricity generation contributes to about one-third of total carbon emissions in Australia, and improved efficiency in energy generation is crucial to achieving a low-emissions future and delivering on the Paris Agreement. The Project would contribute to the required renewable energy uptake to meet and exceed Australia's Paris commitments increasing renewable energy contribution to the NEM.

2.1.1.2 National Electricity Market

The National Electricity Market (NEM) in Australia operates as a wholesale market across NSW, the Australian Capital Territory, Queensland, South Australia, Victoria and Tasmania. It comprises a wholesale market for electricity sales and the physical system comprising transmission infrastructure. The Australian Energy Market Operator (AEMO) manages the NEM. AEMO is responsible for monitoring electricity consumption and energy flow across the electricity network. In 2023, renewables accounted for almost 40 per cent of the total electricity delivered through the NEM.

Consistent with global trends seen across developed nations, the NEM in Australia has experienced a notable increase in generation from renewable energy sources over the past decade. This includes increasing energy generation from wind and solar farms across a more distributed network in a shift away from the high-capacity point generation provided by traditional power stations.

This rise in energy generation from renewable sources is driven by policies and agreements regarding climate change and targets to reduce greenhouse gas emissions, as well as commercial drivers, as renewable energy generation has become increasingly cost-competitive. While energy generation from renewable sources is rising, multiple coal-fired power stations are planned to be progressively closed in Australia in the coming decades, including four power stations in NSW by 2040. To compensate for the loss of traditional baseload energy generation an increasing number of new generation resources, such as wind farms and battery storage, are required to meet market demands.

The Project would support the continued operation of the NEM by contributing to the security of energy supply across the network and through increasing the supply of renewable energy within the market.

2.1.1.3 2024 Integrated System Plan

The 2024 Integrated System Plan (ISP) (AEMO, 2024) provides a comprehensive roadmap for the NEM. The 2024 ISP and its optimal development path support Australia's highly complex and rapid energy transformation towards net zero emissions, enabling low-cost renewable energy and essential transmission to provide consumers with reliable, secure and affordable power. This plan is for a true transformation of the NEM, from fossil fuels to firmed renewables. It calls for levels of investment in generation, storage, transmission, and system services that exceed all previous efforts combined.

As of 2024, the NEM delivers just under 180 terawatt hours (TWh) of electricity to industry and homes per year. The 2024 ISP suggests that the NEM needs to double the electricity delivered to approximately 410 TWh per year by 2050 to serve the electrification of our transport, industry, homes, and offices. By 2034-35, the NEM is forecast to need approximately 83 gigawatts (GW) of utility-scale wind and solar, and 127 GW by 2049-50. This would be six times the current NEM capacity of 21 GW.

The 2024 ISP acknowledges that resource diversity across the NEM helps reduce the need for firming and dispatchable resources and the volatility associated with a weather-powered energy system. Both geographic spread and a mix of wind and solar technologies provide that diversity. The Project would contribute to this diversity within the NEM and would provide an additional source of wind energy to contribute to network security in an increasingly renewable market.

2.1.1.4 Climate Change Act 2022

In September 2022, the Commonwealth of Australia passed the *Climate Change Act 2022* (Climate Change Act) targeting a 43 per cent reduction in emissions by 2030 (compared with 2005 levels) and to reach net zero by 2050. The aim of the Climate Change Act is to advance an effective and progressive response to the urgent threat of climate change. By drawing on the best available scientific knowledge and setting a greenhouse gas emissions reduction target, these actions will contribute to global goals, such as those agreed under the Paris Agreement.

The Project would contribute to emissions reductions through increased uptake of renewable energy in the NEM. This would contribute to achieving the emissions reductions required for Australia's Paris commitments as legislated under the Climate Change Act.

2.1.2 NSW policy context

2.1.2.1 NSW Electricity Infrastructure Roadmap

The NSW Government's *Electricity Infrastructure Roadmap* (DPE, 2020a) aims to deliver energy infrastructure and secure NSW's future as an energy superpower. The *Electricity Infrastructure Roadmap* is a 20-year plan to transform our electricity system into one that is cheap, clean and reliable. As the world shifts towards a greener future in reducing its carbon emissions, the *Electricity Infrastructure Roadmap* identifies NSW as one of the best renewable energy resources in the world which can attract huge investments.

The *Electricity Infrastructure Roadmap* recognises that coal-fired power stations in NSW are progressively closing and that it is crucial that these power stations are replaced with new energy infrastructure to help support the network and protect consumers from substantial energy price rises.

It is expected that the *Electricity Infrastructure Roadmap* will deliver $32 billion in private sector investment by 2030 and support 6,300 construction jobs and 2,800 ongoing jobs, mostly in regional NSW in 2030.

The Project supports the *Electricity Infrastructure Roadmap* through the provision of cheap and clean renewable energy. The Project would allow for local construction and operational jobs to be created in the Lithgow City LGA and would enable a greater share of the electricity supplied to the NEM to come from renewable sources in the context of progressively closing power stations in NSW.

2.1.2.2 NSW Electricity Strategy

The *NSW Electricity Strategy* (DPE, 2019) is the NSW Government's plan for a reliable, affordable, and sustainable electricity future. The *NSW Electricity Strategy* aims to improve the efficiency and competitiveness of the NSW electricity market and encourage investment in new lower cost generation and energy saving technology.

The *NSW Electricity Strategy* has outlined a three-layered approach that aims to achieve the objectives outlined in the strategy. The NSW Government will:

- Support the market to deliver reliable electricity at the lowest price, while protecting the environment.
- Set an Energy Security Target to ensure that the State has sufficient generation capacity to cope with unexpected generator outages during periods of peak demand, such as during heatwaves.
- Ensure the State has sufficient powers to deal with an electricity emergency if one arises.

The NSW Electricity Strategy identifies 'delivering more resilient electricity supplies' as a key action towards supporting a competitive and low-cost electricity market. It plans to do so through initiatives such as setting an energy security target and avoiding electricity emergencies. The Project would increase the supply of electricity to the market and contribute to providing a more sustainable electricity future. Including a BESS in the Project would also improve the reliability of electricity supply in the context of increasing non-dispatchable energy sources.

2.1.2.3 NSW Net Zero Plan Stage 1: 2020 – 2030

The *Net Zero Plan Stage 1: 2020–2030* (Department of Planning, Industry and Environment (DPIE), 2020b) (Net Zero Plan) sets the foundation in NSW for action on climate change and the goal to reach net zero emissions by 2050. The Net Zero Plan identifies the economic opportunities presented by solar panels and wind turbines that – in combination with firming technologies, such as gas, batteries and pumped hydro – are now the cheapest forms of new, reliable electricity generation.

The Net Zero Plan outlines how the NSW Government will achieve net zero emissions by 2050. This includes investments in emissions reduction within regional NSW. In 2021, the NSW Government announced a new objective to deliver a 50 per cent reduction by 2030, in comparison to 2005 emissions levels.

The Project would contribute to the Net Zero Plan's goals by reducing greenhouse gas (GHG) emissions.

2.1.2.4 Renewable Energy Planning Framework 2024

The Renewable Energy Planning Framework 2024 (Department of Planning, Housing and Infrastructure (DPHI), 2024a) provides a suite of policies that will guide the planning and assessment process for renewable energy infrastructure and development and is applicable to SSD wind projects. The framework is designed to:

- Provide clearer, more transparent assessment to ensure the level of assessment matches the level of risk and to help speed up assessments
- Help the industry make informed investment decisions by providing more objective development standards
- Make sure that development is guided by meaningful consultation with affected communities
- Introduce clear setbacks and visual impact criteria to allow communities to anticipate change
- Provide more transparency about the likely costs of decommissioning solar and wind energy development so the industry and landholders can make more informed investment decisions
- Provide greater support to applicants and landholders entering into agreements to host infrastructure or manage the impacts of development
- Make sure the benefits of energy development are directly realised by the localities and regions that host the infrastructure.

The Wind Energy Guideline (DPHI, 2024b), implemented under the Renewable Energy Planning Framework, provides guidance on visual impacts, noise, decommissioning, biodiversity, aviation safety and other issues.

Site selection and impact assessment considerations within the Wind Energy Guideline and its technical supplements have been considered in the Project Scoping Report, including the preliminary noise and visual impact assessments. The Wind Energy Guideline will also be considered within the EIS.

2.1.3 Regional context

2.1.3.1 Central West and Orana Regional Plan 2041

The Central West and Orana Regional Plan 2041 (DPE, 2022b) is a 20-year vision for the Central Tablelands of NSW. The Plan recognises the value of landscapes and their important role in leveraging opportunities for new economic ventures and includes considerations to support a more sustainable and lower carbon future as well as steps to transition away from coal mining and coal-fired power generation in Lithgow.

The Plan is underpinned by five regionally focused Parts:

- Part 1: Region-shaping investment
- Part 2: A sustainable and resilient place
- Part 3: People, centres, housing and communities
- Part 4: Prosperity, productivity and innovation
- Part 5: Local government priorities.

Objective 2 of Part 1 involves supporting the State's transition to net zero by 2050 and delivering the Central-West Orana REZ. It is understood that within 15 years, 75 per cent of the State's coal-fired power generation is expected to reach the end of its technical life. Replacing these energy sources and building the infrastructure needed to connect new energy sources is essential. The Lithgow City LGA offers potential for renewable energy industries with vast open spaces, existing transmission assets and higher altitude tablelands suitable for wind power generation, large-scale solar energy, bioenergy generation and pumped hydro. Increasing renewable energy investment, the expected closing of coal mines and coal-fired power generation in the Lithgow area and investment in new technology such as green hydrogen, will contribute significantly to a reduction in emissions.

2.1.3.2 Lithgow Regional Economic Development Strategy – 2023 Update

The Lithgow Regional Economic Development Strategy – 2023 Update (Department of Regional NSW, 2023) is a blueprint to drive sustainable, long-term economic growth in regional NSW. The Strategy recognises the value of economic diversification and includes plans for regional NSW to support emerging trends, including renewable energy. The Strategy highlights that a shift towards net zero will present challenges and opportunities as part of the overall effort to promote diversification in the region's economy.

Electricity supply represents a specialisation for the Lithgow region, contributing $73 million to the region in 2020. Although this specialisation has historically been based on coal-fired power generation, the ongoing focus on exploring potential renewable energy opportunities, such as wind energy, battery storage and pumped-hydro generation, demonstrates that the sector can continue to play an important role in the Lithgow economy.

2.1.4 Local context

2.1.4.1 Lithgow 2040 Local Strategic Planning Statement

The Lithgow 2040 Local Strategic Planning Statement (Lithgow City Council, 2020) sets the land use directions and priorities for the future of Lithgow. It addresses the planning and development issues of strategic significance for Lithgow through planning priorities and actions, spatial land use direction and guidance. The Statement gives effect to the Central West and Orana Regional Plan 2041, implementing the directions and actions at a local level. It is also informed by other State-wide and regional policies.

Planning Priority 8 within the Statement relates to protecting the economic values of rural areas through managing land use conflict. Within the planning priority, the statement aims to diversify energy supply through renewable energy generation. The statement acknowledges the high wind speeds that exist in almost all areas outside of Newnes Plateau. The Project would contribute to the diversification of energy supply within the Lithgow City LGA through the construction of a wind farm at Mount Lambie. The statement also acknowledges that the Council's planning controls in conjunction with the *State Environmental Planning Policy (Transport and Infrastructure) 2021* (Infrastructure SEPP) identify minimal barriers in the approval of small-scale renewable energy projects across the LGA. The statement also acknowledges the need for provisions to support renewable energy projects from further encroaching residential accommodation forms. The Project would include the provision of a worker accommodation facility, however further consultation with community stakeholders, Council and unions would be required to determine the feasibility of this accommodation facility, including its capacity.

2.1.4.2 Lithgow City: Our Place Our Future (Community Strategic Plan 2035)

The Lithgow City: Our Place Our Future Community Strategic Plan 2035 (Lithgow City Council, 2024) outlines the future vision and strategic direction of the Lithgow City LGA. The Community Strategic Plan is divided into five key themes:

- Caring for our community
- Strengthening our economy
- Developing our built environment
- Enhancing our natural environment
- Responsible governance and civic leadership

The Community Strategic Plan describes the shift to energy efficiency and alternative energy, economic development and job opportunities as priority issues for the next 10 years by the community. The Project would establish renewable energy generation within the Lithgow City LGA which would contribute to sustainable outcomes across the community. Additionally, the construction and operation of the Project would potentially allow for increased local employment opportunities, thereby improving economic outcomes in the local community.

2.2 Site setting and features

2.2.1 Local and regional community

The Project is located over an area of around 2,540 hectares in the Lithgow City LGA. The Project area is located around 12 km south-west of Wallerawang township and 13 km west of Lithgow City.

From the 2021 census data (Australian Bureau of Statistics (ABS), 2021), the population of Mount Lambie is around 65 people, while the population of Wallerawang is around 2,000. Lithgow is the closest township to the Project area and has a population of 11,197. The closest regional city is Bathurst, which is located over 31 km west of the Project area with a population of 36,230.

The top industry of employment in the Lithgow City LGA from the 2021 Census was coal mining, followed by aged care residential services and supermarket and grocery stores.

2.2.2 Natural and built environment features

The Project area is located on land primarily used for agricultural purposes, and the landscape is comprised of plateaus, with areas of forest and woodland. The current proposed Project area includes eight residential dwellings, as well as farming infrastructure, including sheds, tanks, dirt roads and farming equipment. The Project area also contains a number of farm dams that provide a water resource to local fauna species.

Plant community types (PCTs) within the indicative disturbance footprint include PCT 3211 (Central Tableland Montane Wet Forest), PCT 3347 (Southern Tableland Creekflat Ribbon Gum Forest), PCT 3367 (Central Tableland Granites Grassy Box Woodland), PCT 3369 (Central Tableland Ranges Peppermint-Gum Grassy Forest), PCT 3735 (Central Tableland Peppermint Shrub-Grass Forest), PCT 3534 (Central West Stony Hills Stringybark Box Forest) and PCT 3747 (Southern Tableland Western Hills Scribbly Gum Forest), with surveyed PCTs in either low or moderate condition. None of the indicative disturbance footprint's PCTs are commensurate with any threatened ecological communities (TECs).

The Project area is in a mostly disturbed landscape with remnant isolated and highly disturbed patches of canopy and paddock trees potentially providing a stepping stone corridor for highly mobile species. However, the Project area provides low corridor value for small ground-dwelling animals, arboreal animals and low mobile fauna.

The Project area is located within the Murray-Darling Basin in the headwaters of the Macquarie River catchment, around 28 km east of the Macquarie River. Numerous watercourses run through the Project area including Deadmans Creek, Solitary Creek and Lawsons Creek. Thompsons Creek Dam is approximately 1.8 km north of the Project area, and Lake Lyell is a human-constructed lake located around 4 km east of the Project area, with both falling within the Hawkesbury-Nepean catchment.

The Great Western Highway runs along the northern boundary of the Project area, Sodwalls Road is south of the Project area, Sacks Road is east of the Project area and Curly Dick Road intersects the western boundary of the of the Project area. Primary access options to the Project area include off the Great Western Highway, Lawsons Lane, and/or Curly Dick Road.

Existing 500 kilovolt (kV) and 132 kV transmission lines run through the Project area. The Project is planning to connect to either or both of the existing 132 kV transmission lines which feed into Wallerawang substation. One is a Transgrid asset and the other is Essential Energy. The grid connection would not be envisaged to require development of further offsite transmission infrastructure other than what is outlined in the Scoping Report.

2.2.3 Key environmental risks and hazards

Prior to the assessment of impacts (refer to Chapter 6), potential key environmental risks and hazards for the Project have been identified. These include:

- Visual constraints – WTGs would extend between 250 metres (m) and 285 m in height. These would be visible from a number of receivers and viewpoints surrounding the Project and would potentially have a moderate visual impact.
- Biodiversity constraints – biodiversity mapping indicates the presence of various PCTs within the Project area. Protected bat and bird species have also been identified through desktop searches and during field visits.
- Noise constraints – as outlined in Section 6.3, the current WTG layout would result in noise impacts above the relevant noise criteria at two associated (under negotiation) receivers, one non-associated (under negotiation) receiver and two non-associated receivers. Should noise agreements not be reached during ongoing development of the Project, further design development would be required to make sure that noise impacts at these receivers are below the relevant noise criteria.

- Aboriginal heritage constraints - a search of the Aboriginal Heritage Information Management System (AHIMS) carried out on 4 December 2024 identified two Aboriginal heritage sites within the Project area (refer to Section 6.5). Design development would be required to take into account the locations of these Aboriginal sites and any sites identified during future site investigations.

Further details on the anticipated impacts of the Project and the proposed assessment methodologies for the EIS stage can be found in Chapter 6.

2.2.4 Relevant future projects

The *Cumulative Impact Assessment Guidelines for State Significant Projects* (DPE, 2022c) guides the identification of relevant future projects and the assessment of potential cumulative impacts for SSD projects.

In applying the guidelines, a cumulative impact study area was identified based on the scale and nature of the Project's potential impacts, which may be combined with other relevant future projects. Accordingly, the Lithgow City LGA was selected for the cumulative impact study area.

Relevant future projects have been identified based on a search of the Lithgow City LGA in August 2024 using the following data sources:

- Department of Planning, Housing and Infrastructure's (DPHI) Major Projects register
- NSW Government's Western Regional Planning Panel project register
- *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) (EPBC Act) Public Portal
- Transport for NSW Projects Map
- Central West Orana Regional Plan 2041.

Relevant future projects that could have cumulative impacts when considered with the Project include:

- Sunny Corner Wind Farm, which is situated approximately 3.5 km north-west of the Project area within Sunny Corner State Forest, with an expected energy output of about 500 MW.
- Central West Pumped Hydro, which involves development of a reservoir with about three gigalitres in capacity in Yetholme (about 9.5 km west of the Project), with an output of about 325 MW and an eight hour, 2,600 MWh storage capacity.
- Mount Piper to Wallerawang Transmission Line Upgrade Project, which involves the delivery of a new 300 kV transmission line between the existing Mount Piper and Wallerawang substations.
- Angus Place West, which involves the development of bord and pillar mining in two new mining areas.
- Mount Piper Battery Energy Storage System, which will utilise nearby, existing electricity infrastructure to develop a grid-scale battery with the capacity to dispatch up to 500 MW of power to the network over a duration of four hours.
- Lake Lyell Pumped Hydro Energy Storage Project, which involves the use of water from the purpose-built Lake Lyell dam and a new purpose-built reservoir behind Mount Walker to operate a utility scale energy storage project.
- Wallerawang Battery Energy Storage System, which involves a transmission line connection between the BESS and the Wallerawang 330 kV substation.
- Great Western Battery Energy Storage System, which involves a 500 MW stand-alone battery.
- Glanmire Solar Farm, which involves the development of a 60 MW solar farm, associated infrastructure and battery storage.
- Ben Bullen Wind Farm, which will have a generation capacity of up to 500 MW, and includes development of a BESS.
- Paling Yards Wind Farm, which is a 310 MW wind farm consisting of 47 turbines WTGs about 70 km south of the Project.

- The Pines Wind Farm, which involves about 250 wind turbines and a switching station within the permit area of the State's softwood pine plantations, approximately 43 km south of the Project area.

2.3 Agreements with other parties

An agreement has been executed with one landholder within the Project area, and one landholder approximately 1.1 km to the south-east of the Project area. Tetris Energy continues to proactively engage with neighbouring properties that have expressed interest in being involved. These active negotiations currently involve six properties who could potentially join the Project for ancillary equipment or infrastructure hosting. Other neighbours in vicinity of the Project will benefit from the neighbour proximity payments.

2.4 Project justification

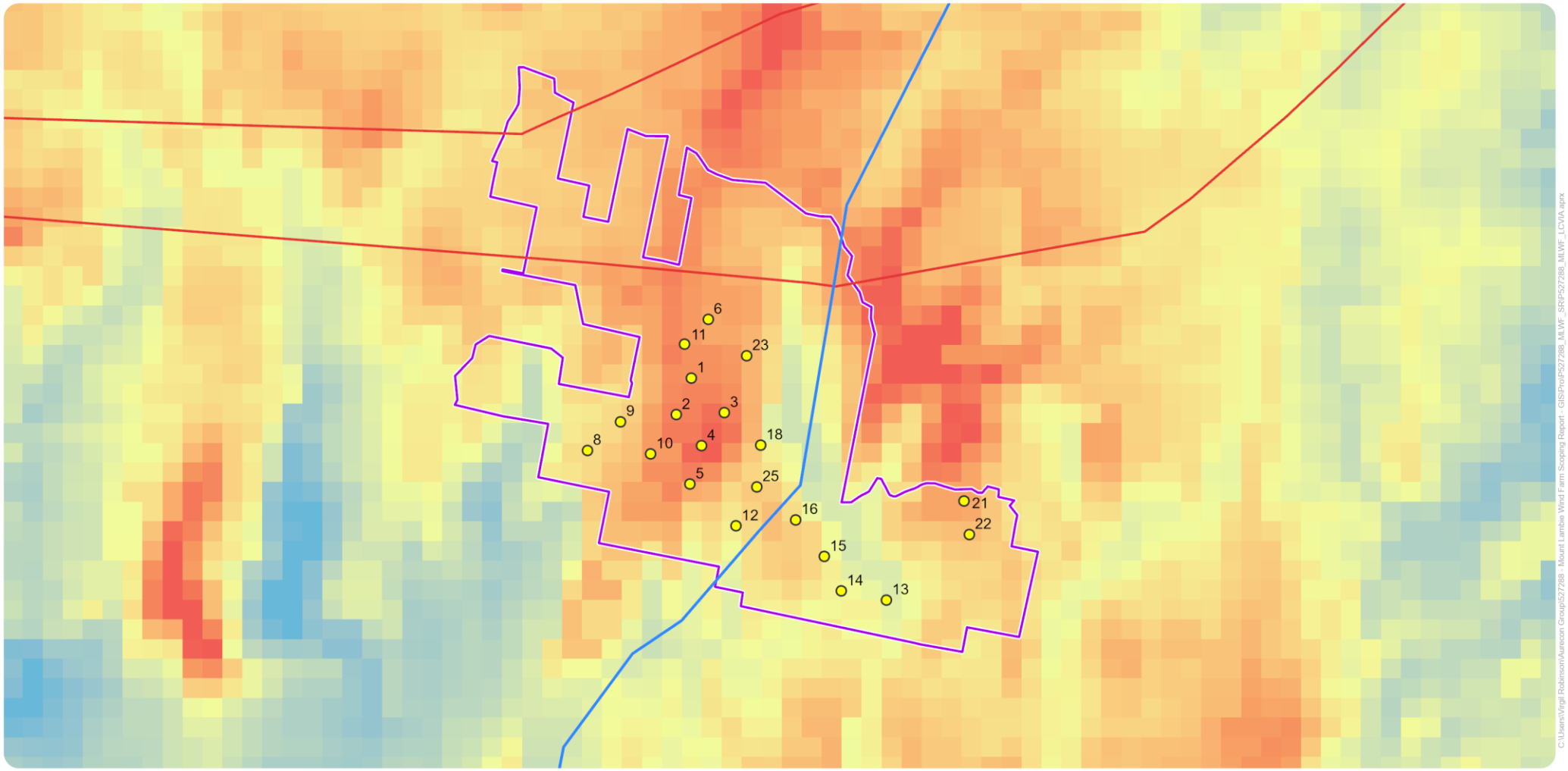
The Australian energy landscape is transitioning to a greater mix of low-emission renewable energy sources, such as wind and solar. Factors driving this transition include:

- Demand for more reliable energy supply
- Consumer demand for lower energy bills
- State and federal government commitments to reduce carbon emissions
- Scheduled closure of fossil-fuel generation sources such as coal.

The Project would contribute to the uptake of renewable energy generation required in NSW and Australia to reach the emissions reduction targets of a 43 per cent reduction in emissions by 2030 (compared with 2005 levels) and net zero by 2050 as legislated in the Climate Change Act. The Project would also contribute to improved reliability, efficiency and security of electricity supply to NSW, including through the provision of the BESS, at a time when large thermal generators are progressively being retired, including the Liddell Power Station, which closed in 2023, and the Eraring Power Station, which is scheduled for closure in 2027. At a regional level the Project would allow for local construction and operational jobs to be created in the Lithgow City LGA, assisting with the regional industry transition from thermal generation to renewable energy generation.

The Project is consistent with the ISP 2024, which states that resource diversity across the NEM helps to reduce the need for firming and dispatchable resources, as well as reduces the volatility associated with a weather-powered energy system. The Project would contribute to this diversity within the NEM and would provide an additional source of wind energy to contribute to network and NEM security. The BESS would allow for further weather-powered energy solutions to be implemented in the NEM through improved security of supply from dispatchable sources.

Wind resource mapping indicates that the Project area would be suitable for development of a wind farm (refer to Figure 2-1), with wind speeds between 5.2 and 9.9 m per second at 150 m above ground level.



Project area

Mount Lambie Wind Farm Infrastructure

Turbine location

Wind speed at 150m (m/s)

9.9

5.2

Existing transmission

132kV line

500kV line

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Global Wind Atlas, Esri Basemap

1:75,000

0 0.9 1.8 km

Projection: GDA2020 MGA Zone 55

Figure 2-1: Wind resource

3 The Project

This section provides an overview of the Project, including the following:

- Description of the site identified for development.
- High-level description of the key features of the Project.
- Anticipated Project staging and construction activities.
- Operational aspects of the Project.
- Project decommissioning.
- Alternative options considered.

3.1 Project area

The Project area (shown in Figure 3-1 and Figure 3-2) covers approximately 2,540 hectares in the Lithgow City LGA. The Project area includes one associated receiver and seven associated (under negotiation) receivers, and is located across the following 37 lots:

- Lot 3 DP1129492 – Freehold Land
- Lot 4 DP1129492 – Freehold Land
- Lot 2 DP1022552 – Local Government Authority
- Lot 204 DP755794 – Freehold Land
- Lot 22 DP1039032 – Freehold Land
- Lot 1 DP748805 – Freehold Land
- Lot 2 DP817970 – Freehold Land
- Lot 117 DP755794 – Freehold Land
- Lot 107 DP755794 – Freehold Land
- Lot 126 DP755794 – Freehold Land
- Lot 18 DP755794 – Freehold Land
- Lot 212 DP722328 – Freehold Land
- Lot 68 DP755794 – Freehold Land
- Lot 84 DP755794 – Freehold Land
- Lot 28 DP755794 – Freehold Land
- Lot 1 DP1134343 – Freehold Land
- Lot 7300 DP1133240 – Crown
- Lot 1 DP995950 – Freehold Land
- Lot 2 DP995950 – Freehold Land
- Lot 3 DP844060 – Freehold Land
- Lot 3 DP995950 – Freehold Land
- Lot 4 DP995950 – Freehold Land
- Lot 6 DP755794 – Freehold Land
- Lot 7 DP755794 – Freehold Land
- Lot 9 DP755794 – Freehold Land
- Lot 13 DP837978 – Freehold Land
- Lot 19 DP755794 – Freehold Land
- Lot 20 DP755794 – Freehold Land
- Lot 23 DP837978 – Freehold Land
- Lot 24 DP837978 – Freehold Land
- Lot 24 DP1067481 – Freehold Land
- Lot 25 DP755794 – Freehold Land
- Lot 25 DP837978 – Freehold Land
- Lot 31 DP837978 – Freehold Land
- Lot 32 DP837978 – Freehold Land
- Lot 98 DP755794 – Freehold Land
- Lot 99 DP755794 – Freehold Land.

3.2 Project components

The Project is seeking approval for up to 20 WTGs, as well as a BESS and associated infrastructure. The WTGs would have blade-tip heights of between 250 m and 285 m above ground level with a generating capacity of between 7 to 10 MW each. The BESS infrastructure would allow for the capture and storage of dispatchable energy to be distributed to the electricity grid as required. The power generated by the Project (from WTG or released from battery storage) would feed into the existing transmission network via the existing 132 kV overhead transmission lines.

The key components of the Project are as follows:

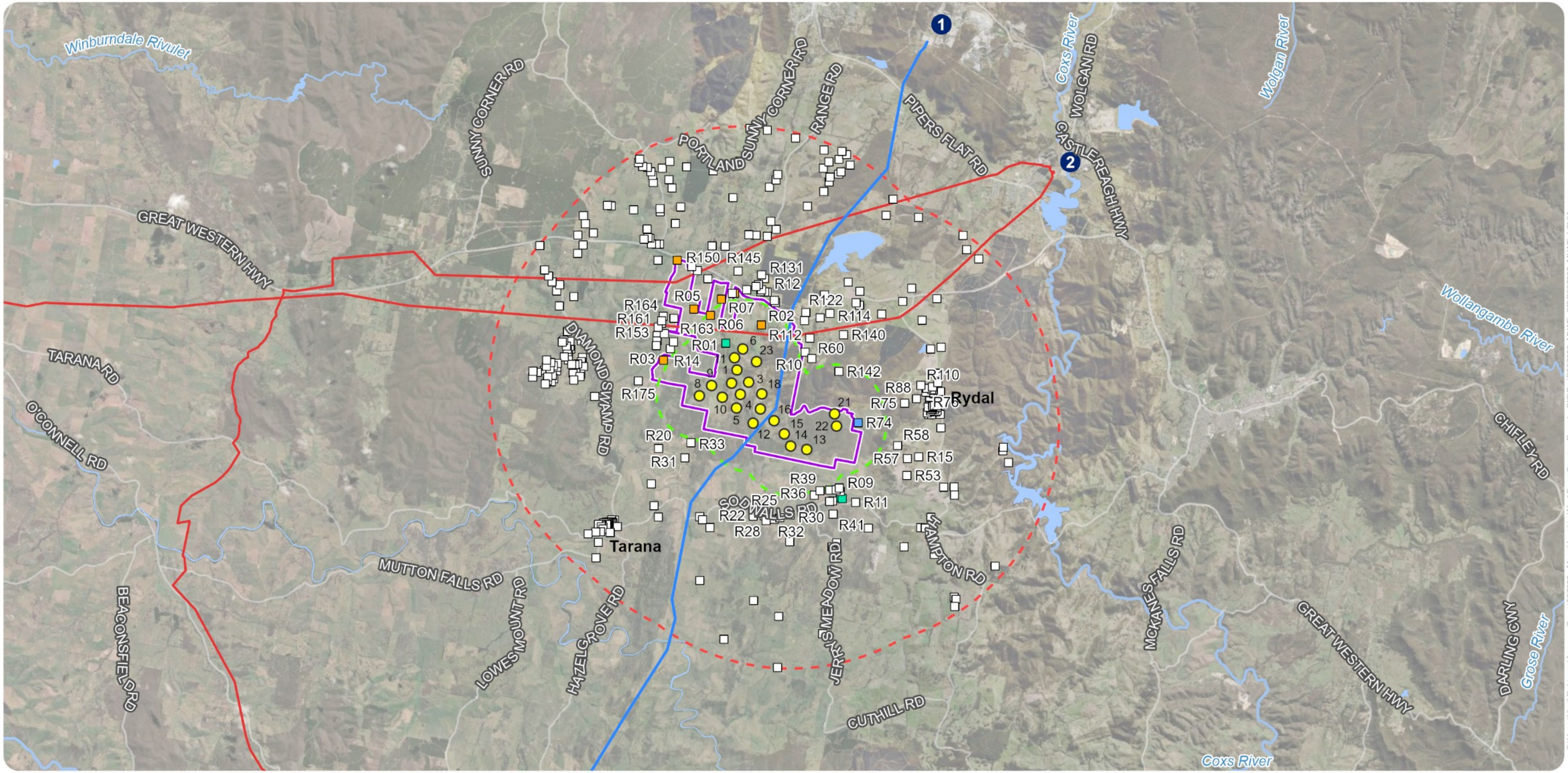
- Up to 20 WTGs, with blade-tip heights of between 250 m and 285 m above ground level
- Up to two temporary meteorological masts.
- One 100 MW capacity BESS with a duration of up to six hours.
- One or two substation and transmission connection points
- Temporary infrastructure areas, including construction compounds, a worker accommodation facility and laydown and stockpile areas
- Approximately 27 km of internal access tracks (combination of upgrades to existing tracks and construction of new tracks) throughout the Project area (minimum width of 5.5 m on straight tracks, widened to 6 m on corners)
- Internal collector cable network (electrical connections between the proposed WTGs and the substation/s), which is expected to be underground
- Site access, including access points from Great Western Highway and/or Curly Dick Road
- Public road upgrades to facilitate the delivery of WTG components to the development footprint (required upgrades will be determined during preparation of the EIS)
- Other operational and maintenance infrastructure including site offices, parking, amenities, laydown areas, and operational and maintenance facilities such as storage and equipment sheds.

Wherever possible, existing access tracks within the Project area would be used during the construction and operation of the Project to minimise environmental impacts that would be associated with the construction of new access tracks. It is expected that some vegetation clearing would be required to widen existing access tracks. New access tracks within the Project area would be constructed where there are no existing access tracks.

Existing 132 kV transmission lines run through the northern Project area. Connection to the Transgrid owned transmission line would be through the construction of the substation/s and connection point/s, which would be co-located with the BESS. An existing 500 kV transmission line runs through the centre of the Project area, however, no connection to this transmission line is proposed. Essential Energy also own and operate another 132 kV line which also connects into Wallerawang substation. This in an alternative connection point should it make sense to connect to both lines.

The preliminary layout of the Project is included in Figure 3-1 and Figure 3-2. The indicative Project components are provided in Table 3-1. All Project components would be subject to further refinement as part of ongoing design development, stakeholder consultation and the planning approvals process. The preferred access routes, BESS and substation location options would be confirmed based on ongoing property negotiations, and further design development as a result of technical assessments. The options identified have been located where possible in areas which limit environmental and social impacts, to the greatest extent possible.

The temporary construction facilities required for the Project are described in Section 3.4.



Project area
Visual Study area
Receiver setback
Waterbody

Dwellings within the Visual Study area

- Associated dwelling
- Associated (under negotiation)
- Non-associated (under negotiation)
- Non-associated dwelling

Major power stations

1. Mt Piper
2. Wallerawang

Mount Lambie Wind Farm Infrastructure

- Turbine location

Existing transmission

- 132kV line
- 500kV line

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

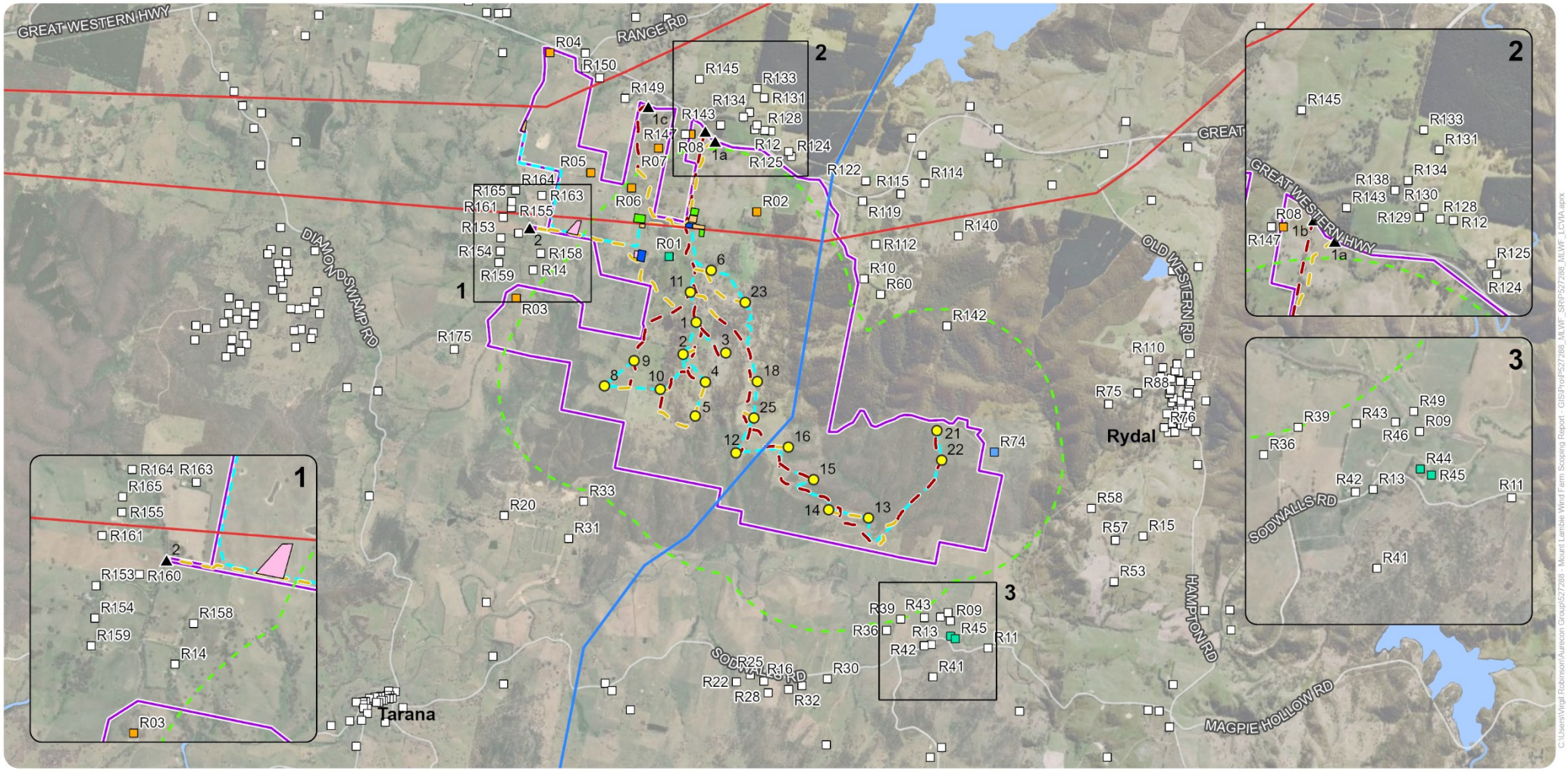
1:210,000

0 2.5 5 km

Projection: GDA2020 MGA Zone 55

C:\Users\Virgil Robinson\Aurecon Group\527288 - Mount Lambie Wind Farm Scoping Report - GIS\Pro\P527288_MLWF_SR\P527288_MLWF_LCVIA.aprx

Figure 3-1: Preliminary project layout



Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:85,000

0 1 2 km

Projection: GDA2020 MGA Zone 55

Figure 3-2: Preliminary project layout - detailed view

Table 3-1 Indicative operational components and approximate dimensions

Project component(s)	Approximate dimensions	Quantity
WTGs		
Rotor diameter	172 m (for WTGs 8, 13 and 23) or 202 m (all other WTGs)	Up to 20
Upper most blade tip	252 m (for WTGs 8, 13 and 23) or 285 m (all other WTGs)	
Lower most blade tip	80 m	
Hub height	166 m (for WTGs 8, 13 and 23) or 185 m (all other WTGs)	
WTG foundations	30 m diameter	
Ancillary infrastructure		
Operations and maintenance facility	O&M Option 1 - 100 m x 75 m O&M Option 2 - 160 m x 115 m	1
Main (on-site) 132 kV substation	Substation Option 1 - 180 m x 70 m Substation Option 2 - 80 m x 60 m Substation Option 3 - 115 m x 100 m Substation Option 4 - 170 m x 60 m	Up to 2
Internal cable network (33 kV)	19.21 km	NA
Internal access tracks	26.95 km (10.9 km of new access tracks and 16.06 km of existing access tracks)	NA
Primary site access points	Access points off the Great Western Highway and Curly Dick Road.	Number of access points to be determined as the design is developed
BESS		
Facility/compound	BESS Option 1 - 100 m x 70 m BESS Option 2 - 170 m x 130 m BESS Option 3 - 110 m x 100 m	1
Capacity	100 MW/ 2 to 6 hour (up to 600 MWh)	NA

The Project is anticipated to be operational by 2028 and would operate for up to 35 years. Around six to eight workers would be required for operation and maintenance of the Project.

3.3 Project staging and timing

Construction works will commence as soon as practicable following Project approval (estimated to be in 2026). The timing of construction would be driven by additional permits and authorisations, contractor selection, detailed design and procurement processes and a final investment decision.

The construction of the Project is anticipated to be 18 to 24 months. The Project has an operational life of up to 35 years after which it may be decommissioned or repowered. The anticipated timeframes for the Project are:

- Planning and approvals: in progress and aiming to be complete by 2026
- Detailed design and securing finance: 2027
- Construction and commissioning: planned to commence in 2027, for around 18 months
- Operation: planned to commence in 2028

Tetris Energy aims to construct the Project as a single development phase.

3.4 Construction

3.4.1 Construction features

Key components for Project construction are shown in Figure 3-1 and detailed in Table 3-2.

Table 3-2 Indicative construction compounds and approximate dimensions

Project component(s)	Approximate area (ha)	Quantity
Temporary worker accommodation facility	Subject to capacity requirements.	1
Construction compound/ laydown area	Option 1 - 0.53 Option 2 - 2.43	2
Stockpiles and materials storage compound	Subject to construction requirements	

Up to two temporary meteorological masts (up to 160 m high) would be used during construction of the Project.

3.4.2 Construction hours

Construction of the Project would take place during standard working hours as per the *Interim Construction Noise Guideline* (DECC, 2009). This includes:

- Monday to Friday: 7 am to 6 pm
- Saturday: 8 am to 1 pm
- Sunday and public holidays: no work.

3.4.3 Construction workforce

It is estimated that 150 full time equivalent workers would be required during the peak of construction activities. A temporary worker accommodation facility is anticipated to be required on-site. However, further consultation with community, Council and regulatory stakeholders would be required to determine the feasibility of an accommodation facility, including capacity. Other alternative existing accommodation options at Wallerawang, Lithgow and Bathurst would also be investigated during the preparation of the EIS.

3.4.4 Transport access routes

Wind turbines, BESS infrastructure and substation components would likely be delivered to the Port of Newcastle and then transported by oversized and/or overmass (OSOM) vehicles via the Golden Highway, Castlereagh Highway and Great Western Highway. Alternative routes are currently being investigated via a route survey assessment and may include Port Botany (Sydney) or Geelong (Victoria).

The main site access would be off the Great Western Highway and/or via Curly Dick Road.

The transport route of infrastructure components and other Project related materials would be investigated further during the preparation of the EIS with the outcomes considered as part of the traffic study described in Section 6.7. Indicative transport routes near the Project area are outlined in Figure 3-3.

Investigations into whether road upgrades would be required for the delivery of WTG and other infrastructure components, including swept path analyses, would be carried out during the EIS phase.

▲ Mount Lambie Wind Farm

● City or town

Major road

Indicative transport routes

Port of Newcastle to Mount Lambie

Port Botany to Mount Lambie

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:2,000,000

0 25 50 km

Projection: GDA2020 MGA Zone 55

Figure 3-3: Indicative transport routes

3.5 Decommissioning

Decommissioning of the Project would involve dismantling the WTGs, site office and any other ancillary infrastructure and transporting them offsite for disposal or reuse and ensuring the new access tracks and foundation pads are rehabilitated as required. In line with the indicative timeframes for the Project outlined in Section 3.3, this would occur after the estimated operational life of up to 35 years. Decommissioning activities may result in noise, dust and traffic impacts. However, these are anticipated to be minimal, given the location of the Project. The land for the Project would then be revegetated and returned to its previous condition as far as practicable.

Extensive and robust decommissioning obligations are provided in the conditions of the land agreements.

3.6 Project development and alternatives considered

During the scoping stage of the Project, consideration has been given to the 'do nothing' scenario and the 'Project scenario', as outlined below. In addition, other alternatives and Project refinements would be further considered in the EIS as identified within this section.

3.6.1 'Do nothing' scenario

The 'do nothing' scenario would mean that the 20 WTGs and BESS infrastructure would not be constructed at the proposed Project location, which would forego the benefits of the Project. The outcomes of the 'do nothing' scenario would include:

- Not supporting the transition from thermal generation to renewable energy in Lithgow City LGA
- Not contributing towards Australia's 2050 net zero targets, as legislated in the Climate Change Act
- Not providing economic benefits, including 150 construction and six to eight operational jobs that would be created as part of the Project
- Not supporting policies, such as the *NSW Electricity Strategy* and *2024 Integrated System Plan*, which aim to increase the uptake of renewable energy generation in NSW and Australia.

The 'do nothing' scenario is not the preferred option.

3.6.2 Project scenario

The Project would involve the establishment of up to 20 WTGs and BESS infrastructure at the proposed Project location south-west of Wallerawang in the Central Tablelands of NSW. This would increase the amount of renewable and dispatchable energy in the NEM in the context of the closure of coal-fired power stations across NSW and Australia. The Project scenario would have the following benefits:

- Supporting the transition from thermal generation to renewable energy in Lithgow City LGA
- Contribution towards Australia's 2050 net zero targets, as legislated in the Climate Change Act
- Providing economic benefits, including the creation of 150 construction and six to eight operational jobs as part of the Project
- Supporting policies, such as the *NSW Electricity Strategy* and *2024 Integrated System Plan*, which aim to increase the uptake of renewable energy generation in NSW and Australia
- Minimised environmental impacts as all proposed WTG locations were selected to avoid impacting native vegetation as far as practicable.

The Project location was selected due to the Project area's wind generation daily profile (refer to Figure 2-1), with wind speeds between 5.2 m and 9.9 m per second at 150 m above ground level.

Additionally, proximity to the existing transmission network was a key factor in the selection of the Project area. The Lithgow region has an extensive high voltage electricity network established due to its history of coal mining and power generation. Connecting directly into these existing lines takes advantage of existing assets and reduces potential environmental impacts by removing the need to build new transmission lines.

3.6.3 Other alternatives and Project refinements

No other alternative locations were considered for the Project.

The Project scenario (as represented in this scoping report) is proposed to be progressed to the EIS stage following the receipt of the Secretary's Environmental Assessment Requirements (SEARs), noting that the Project layout would be subject to further refinement during the EIS and ongoing design development to minimise impacts on the environment and community and to best address the Project objectives. This would be informed by further technical and environmental studies and continued community and stakeholder engagement.

The Project layout has already gone through a range of design amendments in response to the results of the preliminary landscape character and visual impact investigations, preliminary noise modelling and biodiversity surveys undertaken on the site, and community engagement. A summary of the design amendments is provided in Table 3-3.

Table 3-3 Summary of design changes to date

Version	Summary of changes
1	The preliminary layout of WTGs was designed to maximise optimal wind resources and utilise existing access tracks on site.
2	Minor relocations of WTGs to minimise visual impact to residences on Sodwalls Road and re-siting WTGs to reduce visual, noise and ecological impacts in response to preliminary specialist feedback, as well as neighbour feedback and landholder preference. Internal cable and road alignments were also adjusted to accommodate the revised WTG locations, noting key biodiversity constraints.
3	Alternative access tracks, three off the Great Western Highway, and one off of Curly Dick Road were included in the Project layout. Some of these may only be required for either construction and/or operation; this would be determined as the design is developed and in conjunction with landholder agreements.
4	Inclusion of alternative substation locations, operations and maintenance areas, and BESS location options in the Project area. Whilst it is likely that only up to two substations, one operations and maintenance area and one BESS and associated connection point will be required as part of the Project, this would be confirmed based on the outcome of further assessment.
5	Inclusion of two WTG heights, with the majority of WTGs modelled at 285 m blade-tip height to reflect the likely maximum blade-tip height for the Project, while WTGs 8, 13 and 23 have a lower blade-tip height of 252 m to reduce noise and visual impacts at nearby receivers.

Design modifications will continue through the EIS process as detailed impact assessments are undertaken, ensuring the final design avoids impacts to the greatest extent possible.

4 Statutory context

Legislation that is potentially relevant to the Project has been included in Table 4-1. These have been grouped according to the requirements of Table 1 of the *State significant development guidelines – preparing a scoping report* (DPE, 2022a).

Table 4-1 Potentially relevant legislation

Matter	Discussion
Power to grant consent	Part 4 of the EP&A Act establishes the framework for assessing development that is permissible with consent. Section 4.36 of the EP&A Act includes the following: 1. *For the purposes of this Act, State significant development is development that is declared under this section to be State significant development.* 2. *A State environmental planning policy may declare any development, or any class or description of development, to be State significant development.* In accordance with the above, the Planning Systems SEPP is used to declare a development as State significant development (SSD). Clause 2.6(1) of the Planning Systems SEPP notes: 1. *Development is declared to be State significant development for the purposes of the Act if* a. *the development on the land concerned is, by the operation of an environmental planning instrument, not permissible without development consent under Part 4 of the Act, and* b. *the development is specified in Schedule 1 or 2.* The Project is specified in Schedule 1 (Clause 20) of the Planning Systems SEPP, in that it is: *Development for the purpose of electricity generating works or heat or their co-generation (using any energy source, including gas, coal, biofuel, distillate, waste, hydro, wave, solar or wind power) that* a. *has a capital investment value of more than $30 million, or* b. *has a capital investment value of more than $10 million and is located in an environmentally sensitive area of State significance* The Project involves development for the purpose of electricity generating works using wind power and would have a capital investment value of more than $30 million. Therefore, the Project is classified as SSD under Part 4 of the EP&A Act. In accordance with section 4.12(8) of the EP&A Act, an application for SSD is required to be accompanied by an EIS that meets the requirements of Part 8, Division 5 of the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation) and any other relevant legislative requirements that relate to the EIS.
Permissibility	Clause 2.36(1)(b) of the 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 2.7(1) of the Infrastructure SEPP, the provisions prevail where there are inconsistencies with any other environmental planning instruments, including Local Environmental Plans (LEPs). The Project is contained within the Lithgow City LGA and is subject to the Lithgow Local Environmental Plan 2014. The Project is zoned RU1 – Primary production and RU2 – Rural landscape under the Lithgow Local Environmental Plan 2014. As RU1 and RU2 are a prescribed rural zone, the Project is permissible with consent under the provisions of Clause 2.36(1)(b) of the Infrastructure SEPP.
Other approvals – Approvals that are not required	Section 4.41 of the EP&A Act specifies authorisations which are not required for a SSD which has development consent granted, including: ■ a permit under section 201, 205 or 219 of the *Fisheries Management Act 1994* (NSW) to allow dredging or reclamation of a waterway, impact to marine vegetation or cause blockage in fish passage ■ an approval under Part 4, or an excavation permit under section 139 of the *Heritage Act 1977* (NSW) for any works which may impact an item of historic heritage ■ an Aboriginal heritage impact permit under section 90 of the *National Parks and Wildlife Act 1974* for any works which may impact an item of Aboriginal heritage ■ a bushfire safety authority under section 100B of the *Rural Fires Act 1997* (NSW) where a project requires subdivision for residential or rural residential development ■ 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* where a project involves the use or taking, capturing, conveying or impounding water from a water source, or is undertaken on waterfront land.

Matter	Discussion
Other approvals – Approvals that must be applied consistently	Section 4.42 of the EP&A Act requires that several approvals, if required for a SSD, cannot be refused if a development consent is granted and must be substantially consistent with the terms of any development consent granted for the development. Relevant approvals to the Project include: ■ consent under section 138 of the *Roads Act 1993* from the relevant roads authority for the erection of a structure, or the carrying out of work in, on or over a public road, or the digging up or disturbance of the surface of a road ■ consent under the *Protection of the Environment Operations Act 1997* (POEO Act) as wind farms are a scheduled activity (refer to Schedule 1, Clause 17 of POEO Act) and require an Environment Protection Licence.
Other approvals - *Water Management Act 2000*	The *Water Management Act 2000* (WM Act) aims to provide for the sustainable and integrated management of the water sources of the State for the benefit of both present and future generations. The WM Act is based on the principles of ecologically sustainable development, aiming to ensure the fundamental health of rivers, groundwater systems and associated wetlands, floodplains and estuaries are protected. The Project area intersects with Deadmans Creek and Solitary Creek. However, the Project would not involve work being carried out on waterfront land which means controlled activity approval is not required under section 91(2) of the WM Act. No aquifer interference activity would occur and as such section 91(3) would not apply to the Project.
Other approvals - *Crown Land Management Act 2016*	The *Crown Land Management Act 2016* (Crown Land Act) provides the legislative framework for the administration of land that is vested in the Crown 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 within the Project area and for any works proposed in these areas, an appropriate approval would be obtained. This would be further investigated in the EIS and DPHI would be consulted during the process.
Other approvals – EPBC Act approval	The proposal could potentially result in significant impacts on Matters of National Environmental Significance (MNES) protected under Division 1 of Part 3 of the EPBC Act. The MNES outlined under the EPBC Act include: ■ World Heritage properties ■ National Heritage places ■ Ramsar wetlands ■ EPBC Act listed threatened species, threatened ecological communities or their habitat ■ EPBC Act listed migratory species ■ Marine environment and the Great Barrier Reef Marine Park ■ Commonwealth land or actions by the Commonwealth agency ■ Proposed actions involving coal seam gas or large coal mining development or nuclear action. An EPBC referral, which would be informed by a Significant Impact Assessment to determine the likely impacts to MNES, is being developed for the Project, and would be submitted to DPHI under section 68 of the EPBC Act, seeking a determination as to whether: ■ the proposal is a controlled action within the meaning of section 67 of the EPBC Act, requiring approval under section 75 of that Act; and ■ Mount Lambie Wind Farm will be assessed by the relevant authorities in the NSW under the agreement titled “Agreement between the Commonwealth of Australia and the State of New South Wales relating to Environmental Assessment” and dated 26 February 2015 as amended by “Amending Agreement No 1” from 24 March 2020, (Assessment Bilateral Agreement), pursuant to Part 5 of the EPBC Act. Potential impacts of the proposal on MNES would be confirmed in the EIS. If the proposal is determined to be a controlled action, any associated Commonwealth assessment requirements would be considered during development of the EIS.
Other approvals – *Native Title Act 1993*	The *Native Title Act 1993* recognises the rights and interests of Indigenous people to land and aims to provide for the recognition and protection of common law native title rights. A search of the National Native Title Tribunal database found that there is one native Title claim currently registered in the Project area. The Warrabinga-Wiradjuri #7 Native Title Claim (Tribunal ID: NC2018/002) intersects the eastern boundary of the Project area. The claimant would be provided with all relevant documentation associated with the Project and would be consulted as part of the EIS stage.
Pre-conditions to exercising the power to grant consent	No pre-conditions to exercising the power to grant consent for the Project have been identified. An EIS would be prepared in accordance with the relevant legislative requirements and guidelines.

Matter	Discussion
Mandatory matters for consideration	Section 1.3 of the EP&A Act provides objects that would need to be considered during the preparation of the EIS and ongoing design development. The relevant objectives are: a. to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources, b. to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment, c. to promote the orderly and economic use and development of land, e. to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats, f. to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage), g. to promote good design and amenity of the built environment, j. to provide increased opportunity for community participation in environmental planning and assessment. The above will be considered in the EIS. In addition, 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. These matters would be considered during the preparation of the EIS and ongoing design development.

5 Engagement

5.1 Engagement approach and processes

A Community and Stakeholder Engagement Plan (CSEP) has been prepared for the Project Tetris Energy has been engaging with stakeholders about the Mount Lambie Wind Farm Project since August 2021 and with the community since October 2022, as part of its commitment to early, meaningful, respectful and effective engagement.

Tetris Energy's best practice approach is being planned and delivered in line with:

- *'Undertaking Engagement Guidelines for State Significant Projects'* (DPE, 2022d)
- *Community Participation Plan* (DPHI, 2024c)
- *Renewable Energy Planning Framework* (DPHI, 2024a)
- *State Significant Infrastructure Guidelines – Preparing a scoping report* (DPE, 2022a)
- *Clean Energy Council Community Engagement Guidelines for the Australian Wind Industry* (Clean Energy Council, 2018)
- International Association of Public Participation core values and public participation spectrum, as globally internationally recognised standards and tools.

The above guidelines and plans outline several objectives for engagement, including that it should be open and inclusive, easy to access, relevant, timely and meaningful. The *Undertaking Engagement Guidelines for State Significant Projects* (DPE, 2022d) also establish that at this stage of the Project, Tetris Energy is required to:

- Identify any early engagement that has been carried out that is relevant to the Project (addressed in Section 5.2)
- Identify the key stakeholders for further engagement (addressed in Section 5.2)
- Identify key feedback received from stakeholders, the community and landholders (addressed in Section 5.3)
- Plan how they intend to engage with the community, Council and government agencies, so that engagement is proportionate to the scale and nature of the Project and the likely level of community interest in the Project (addressed in Section 5.4).

Tetris Energy has prepared a CSEP for the Project to outline Tetris Energy's approach to community engagement, identify key communities and stakeholders, present current community and stakeholder feedback on the Project, and identify all future engagement mechanisms and activities as the Project is developed. The CSEP is a live document, which will be updated as required in response to stakeholder and community feedback.

5.2 Community and stakeholder engagement

Tetris Energy has a high-level Community and Stakeholder Engagement Framework for the delivery of community and stakeholder engagement which evolves based on stakeholder and community need throughout the planning and assessment process for each phase of the Project. Tetris Energy has commenced, and will continue to carry out, engagement that is meaningful, proportionate, and tailored to the needs of the community and stakeholders.

Engagement for the Project's scoping phase has included:

- Face-to-face meetings and briefings.
- Online meetings and briefings
- Phone calls and emails.

- Community fact sheet distribution via door knock delivery, mailbox drop, mail and local noticeboards.
- Individual introductory letters.
- An online community survey.
- Project-specific website launch.

Key stakeholders who may have an interest in the Project have been identified through desktop research and stakeholder mapping of the local community, capturing those in geographical proximity to the proposed Project. The Project team have engaged in a range of activities including meeting with neighbouring landholders and local stakeholders in-person to build and maintain genuine, trusting relationships. The overall approach to consultation with stakeholders and the community is to be flexible, inclusive, open and responsive.

Community and stakeholder engagement has been undertaken early in the scoping phase to:

- Proactively inform Project design and development
- Identify perceived issues/impacts to be addressed in the assessment process
- Establish relationships with landholders, the community and key stakeholders for the Project.

Tetris Energy commenced engagement with non-associated landholders in early 2023 and this engagement is ongoing. To date, there have been more than 300 interactions between non-associated landholders and Tetris Energy. Engagement with the community has intensified throughout the scoping phase.

Project details were initially made available on the Tetris Energy website (www.tetrisenergy.com) in early 2023, and on a dedicated Project website (www.mountlambiewindfarm.com) since late-2023. Both websites include an opportunity to contact the Project team, with emails received from interested community members since January 2023. The dedicated Project website also gives community members the opportunity to provide input into key landscape values via a feedback form. People interested in the Project can also sign up for Project updates as well as registering their interest in procurement opportunities.

Landholders within 2 km of a WTG have been either directly consulted with, or repeated attempts have been made to consult with, via a range of means including face-to-face meeting, phone calls, direct personalised mail, mailbox drop, door knock and email.

Where possible, a Project information sheet has been delivered to all non-associated landholders within setback thresholds of a proposed WTG. This information sheet includes a detailed Project overview, proposed development timeline and opportunities for consultation with the Tetris Energy development team.

Further detail and findings from Tetris Energy's engagement activities are reported in the following sections.

5.2.1 Engagement activities

A range of engagement activities have been implemented to identify, inform and consult stakeholders, landholders and the community about the Project, these activities are detailed in Table 5-1.

Table 5-1 Stakeholder engagement activities

Stakeholder	Description of engagement activities
Landholders within a 2 km radius of a WTG	Tetris Energy has consulted directly, or repeated attempts have been made to consult, with all landholders within a 2 km radius of a WTG. To date, four landholders have had meetings with Tetris Energy. All landholders were sent a personalised introductory letter providing the opportunity for a meeting. Where no response was received to letters, Tetris Energy followed up with phone calls. Discussions with landholders covered: ■ Proposed Project area, proposed preliminary turbine layouts, access routes and potential location of ancillary infrastructure ■ Noise and visual impacts ■ Proposed siting and alternatives ■ Conversations to understand potential issues ■ Benefits and opportunities

Stakeholder	Description of engagement activities
Landholders within a setback threshold of a WTG	Tetris Energy has consulted directly or attempted to consult directly with all landholders within setback thresholds of the Project WTGs, either via letter, phone call, face to face meeting or Project fact sheet distribution. Discussions with landholders to date has covered: ■ Proposed Project area, proposed preliminary turbine layouts, access routes and potential location of ancillary infrastructure ■ Noise and visual impacts ■ Proposed siting and alternatives. ■ Conversations to understand potential issues ■ Benefits and opportunities
Lithgow City Council	Tetris Energy has met with Lithgow City Council on six occasions to date, including with General Manager, Director of People & Places, Strategic Land Use Planner, as well as the elected Councillors. Briefings have covered introduction to the Project, approval pathways, early site investigations, Project updates, community benefits, LGA employment and skills opportunities.
General community and key stakeholders	Dedicated Mount Lambie Wind Farm website with Project information and enquiry channels. Since September 2023 a dedicated Project website has featured information about the Project, environmental and community benefits and a dedicated 'contact us' form. It also provides a link to the 'Mount Lambie community landscape values questionnaire', and the option to subscribe for Project updates. www.mountlambiewindfarm.com
Lithgow Environment Group	Tetris Energy has met directly with the Lithgow Environment Group to discuss the Project, including approval pathways and environmental and community benefits. This helped to establish community relationships and raise awareness of the Project.
NSW Department of Planning, Housing and Infrastructure	Tetris Energy provided an overview of the Project to DPHI via a Pre-Scoping meeting, including details of assessments undertaken to date and engagement outcomes. DPHI asked questions, including regarding the level of engagement with non-associated residences, potential impacts on serious and irreversible impact (SAII) entities, bird and bat utilisation survey planning, and site access.

5.3 Community and stakeholder feedback

Engagement activities in the local area have been promoted through direct engagement, with only a small proportion of the local community choosing to actively participate and provide direct feedback to date.

5.3.1 Community and landholder feedback

Feedback from the community has been varied and includes both positive and negative views on a range of topics.

Concerns about the Project have included perceived impacts on:

- rural lifestyle, including increased noise during construction and operation
- increased use of local roads, resulting in road traffic noise, dust and accessibility impacts
- bushfire risks
- neighbouring property values
- visual amenity
- turbine component recycling
- biodiversity (including impacts on flora and fauna during construction and operation).

Community members have also communicated their support for the Project, with interest in the employment opportunities the Project will generate and opportunities for benefit sharing at both neighbour and community levels. This is particularly noticeable in informal discussions held around opportunities for employment and skills transfer from the coal sector to renewables, as well as suggestions for community benefit sharing initiatives.

A link to an online survey has also been distributed to over 60 landholders of associated and non-associated residences (including to receivers within setback thresholds of a WTG) as well as being publicly accessible online via the Project website. A link to the survey has also been available via Project flyers posted on local noticeboards in the villages of Tarana and Rydal. The survey includes questions on the different landscape features and places of interest within the Visual Study area.

Thirteen survey responses have been submitted, with most (38 per cent) survey participants being from Meadow Flat. Of note:

- Participants described the local landscape as natural and beautiful, and pristine agricultural land. Some observations were provided noting the previous industrialisation of the landscape including open-cut mining, and the active and retired power stations.
- Participants listed the most important elements of the surrounding landscape as views of nature, agricultural productivity, undulating hills, as well as the quiet, natural setting.
- Responses rating the scenic value of local landscape features rated grazing land, hills and ridgelines with highest value
- Views that participants enjoy the most included valleys and hills, farmland and native bushland. This included individual views from within their properties, including towards Mount Lambie.
- Key lookouts and public vantage points identified by participants included:
  - Long Swamp Trail (Lidsdale) (19 km north-east of Project area)
  - Maiyingu Marragu Aboriginal Place (19 km north-east of Project area)
  - Lowe's Mount Road view to Tarana Valley (10 km south-west of Project area)
  - Mount Olive Road to Mount Olive (14 km south of Project area)
  - State forests (native)
  - Fish River (15 km south-west of Project area)
  - Evans Crown Nature Reserve (5 km south of Project area)
  - Sodwalls-Tarana Road.

Feedback from the community was also gathered through informal discussions at local community events, including the Lithgow Climate Adaption's Jobs for Lithgow forum.

Feedback was positive, showing increasing community support and interest. Key feedback from the community includes:

- A general agreement that the energy transition was inevitable.
- That the selected site was ideal considering wind resource and transmission lines.

Local business owners felt mostly positive towards the Project with consensus that it would be stimulating for the local economy and job opportunities. Community engagement on these matters and others will continue as the Project continues to be developed.

Concerns raised during community engagement will be addressed during ongoing consultation and responses will be summarised in the EIS.

5.3.2 Lithgow City Council feedback

Lithgow City Council were supportive of the Project, and raised the following points for consideration:

- Support for renewable energy transition within the LGA to utilise the region's extensive existing transmission assets.
- Desire to ensure the community receives lasting benefits from hosting renewable energy projects associated with the existing transmission infrastructure.
- Interest in the skills and training opportunities offered by the Project, particularly for community members wishing to transition from coal-based mining and generation to renewables.
- A desire to see Lithgow City LGA positioned as a leader in green energy, celebrating the legacy of its coal-based industry and being at the forefront of the renewables transition, including hosting developments, skills and training centres and centralised maintenance hubs to service multiple renewable projects.
- Opportunity to drive migration to the Lithgow township where there is currently a higher rate of residential vacancies.

Tetris Energy will continue to consult with Lithgow City Council as the Project continues to be developed.

5.4 Planned engagement

During the preparation of the EIS, Tetris Energy will continue to consult with relevant local, State and Commonwealth Government authorities, infrastructure and service providers, community groups, First Nations communities, neighbours and affected landholders. Tetris Energy is committed to genuine and consistent engagement with the local community and stakeholders to support the building of strong relationships with stakeholders, foster existing connections, and establishing a socially sustainable Project. EIS phase consultation will be undertaken in accordance with *Undertaking Engagement Guidelines for State Significant Projects* (DPIE 2022d).

First Nations stakeholders will be identified and consulted with during the preparation of the EIS in accordance with the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010a) and be continuous in nature.

Electricity infrastructure owners, including Transgrid, will be consulted with in relation to activities impacting the transmission network and connection requirements, also planning insights from their local community consultation.

Consultation during the preparation of the EIS will aim to:

- Proactively inform, consult and involve stakeholders using clear and consistent key messages
- Continue to collaborate with key stakeholders to identify potential issues, impacts, opportunities and benefits
- Communicate the progress of the Project and key findings or outcomes of assessments
- Enable stakeholders to have input into the preparation of the EIS, project planning, investigate opportunities for visual treatment and identify opportunities for benefit sharing
- Implement response and feedback strategies to address stakeholder concerns and use these to inform the evolution of the Project.

A range of tools and methods will be used to communicate and engage with the community and other stakeholders during preparation of the EIS in accordance with the CSEP, with issues raised during engagement to be documented by the Project team to inform the Project design, environmental assessment and the preparation of the EIS.

6 Proposed assessment of impacts

6.1 Landscape character and visual impacts

A Preliminary Landscape Character and Visual Impact Assessment (PLCVIA) has been prepared for the Project (Aurecon, 2025a), which has been included in Appendix B. The assessment outlines the existing landscape and visual environment and assesses the potential for landscape character and visual impacts as a result of the Project. The PLCVIA responds to the requirements set out in the '*Wind Energy Guideline – Technical Supplement for Landscape and Visual Impact Assessment*' (the Technical Supplement for LVIA, DPHI 2024d) and the *Wind Energy Visual Impact Assessment Bulletin* (DPE, 2016) (VIA Bulletin).

6.1.1 Existing environment

6.1.1.1 Landscape context

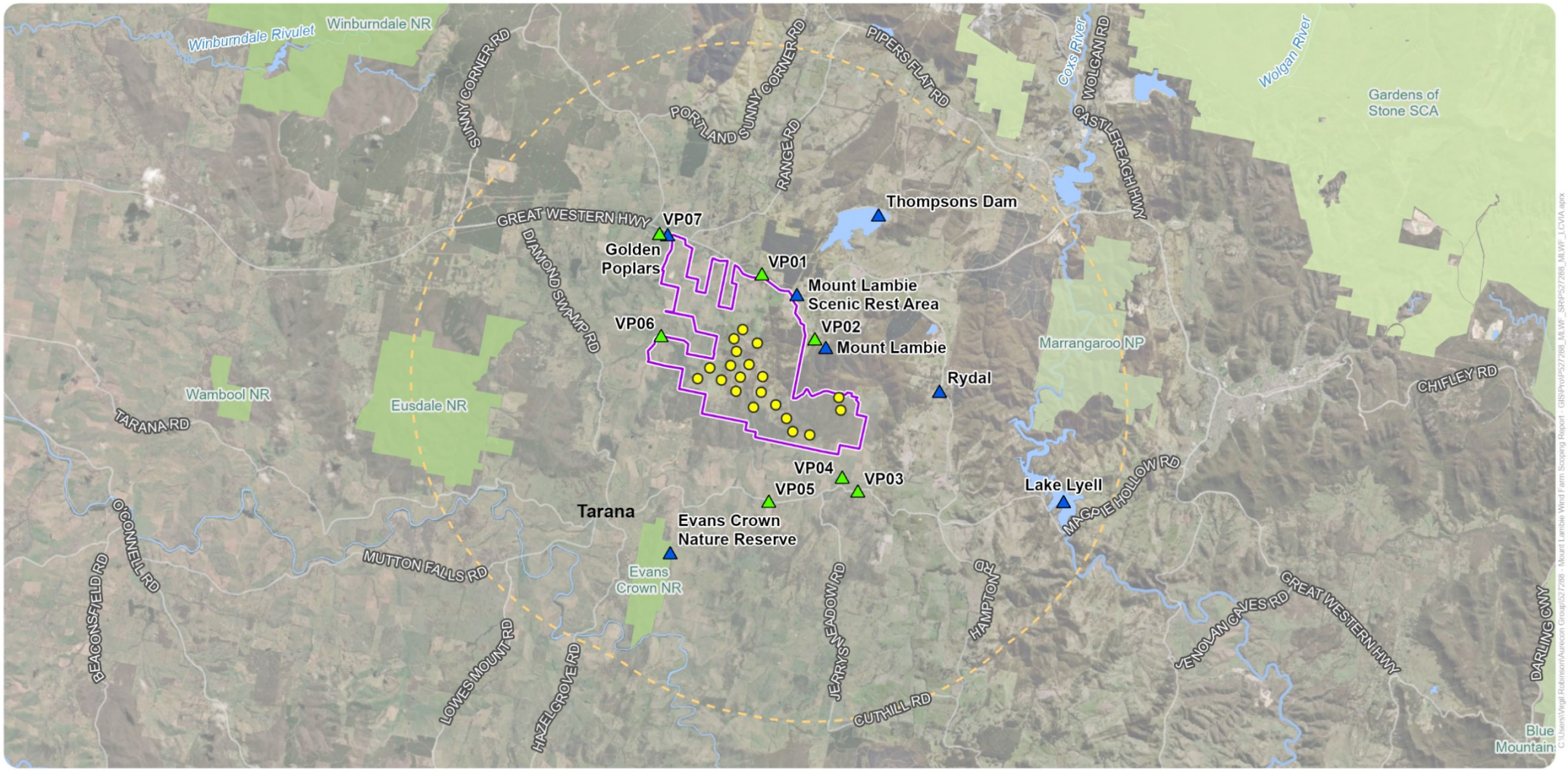
The Project is located within the South Eastern Highlands bioregion in eastern NSW. The bioregion is characterised by its varied topography, which includes rugged mountain ranges, rolling hills, and deep valleys.

Vegetation in the South Eastern Highlands bioregion is diverse and includes sclerophyll forests, woodlands, and grasslands. The area is home to significant stands of eucalypt species alongside a variety of understory plants and shrubs. The highlands provide critical habitats for a range of fauna, including marsupials like wombats and kangaroos, as well as numerous bird species. There are bush reserve areas within and at the perimeter of the 10 km Landscape Character Study area including Evans Crown and Eusdale Nature Reserves; Marrangaroo National Park and Lidsdale State Park. The Gardens of Stone National Park, which is part of the Greater Blue Mountains World Heritage Area, is approximately 23.6 km north-east of the Project area. The vegetation form within the Landscape Character Study area is typically Dry Sclerophyll Forests, with larger areas of native vegetation located on steeper hills such as those at Mount Lambie and to the west of Rydal.

Mount Lambie is a part of the Great Dividing Range and stands at an altitude of about 1,291 m above sea level. The surrounding area is hilly, with the most prominent peaks being Mount Tarana, Bald Ridge and Jerrys' Mountain. The area features a mix of prominent ridge lines, steep slopes, rolling hills, and deep valleys, all of which are influenced by historical volcanic activity and tectonic uplift associated with the Great Dividing Range.

The Project area is located within the Murray-Darling Basin in the headwaters of the Macquarie River catchment, around 28 km east of the Macquarie River. Streams and rivers originating in the Mount Lambie area often display strong seasonal variability. The Project area is bisected by a series of named and unnamed waterways including Deadmans Creek and Lawsons Creek; with Solitary Creek and Diamond Swamp Creek within the Landscape Character Study area (refer to Figure 6-4). These waterways flow to Fish River, which then flows to the Macquarie River near Bathurst. Lakes and dams within the Landscape Character Study area include Thompson Creek Dam and Lake Lyell, which provide recreational and natural amenity attractions for visitors and locals.

Key landscape features are included in Figure 6-1.



Project area
Landscape Character Study area (10km)
Waterbody

Key landscape features and public viewpoints
Viewpoint

Mount Lambie Wind Farm Infrastructure
Turbine location

NPWS Estate
National Park

Nature Reserve
State Conservation Area

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:200,000
0 2.5 5 km

Projection: GDA2020 MGA Zone 55

Mount Lambie Wind Farm **Scoping Report**

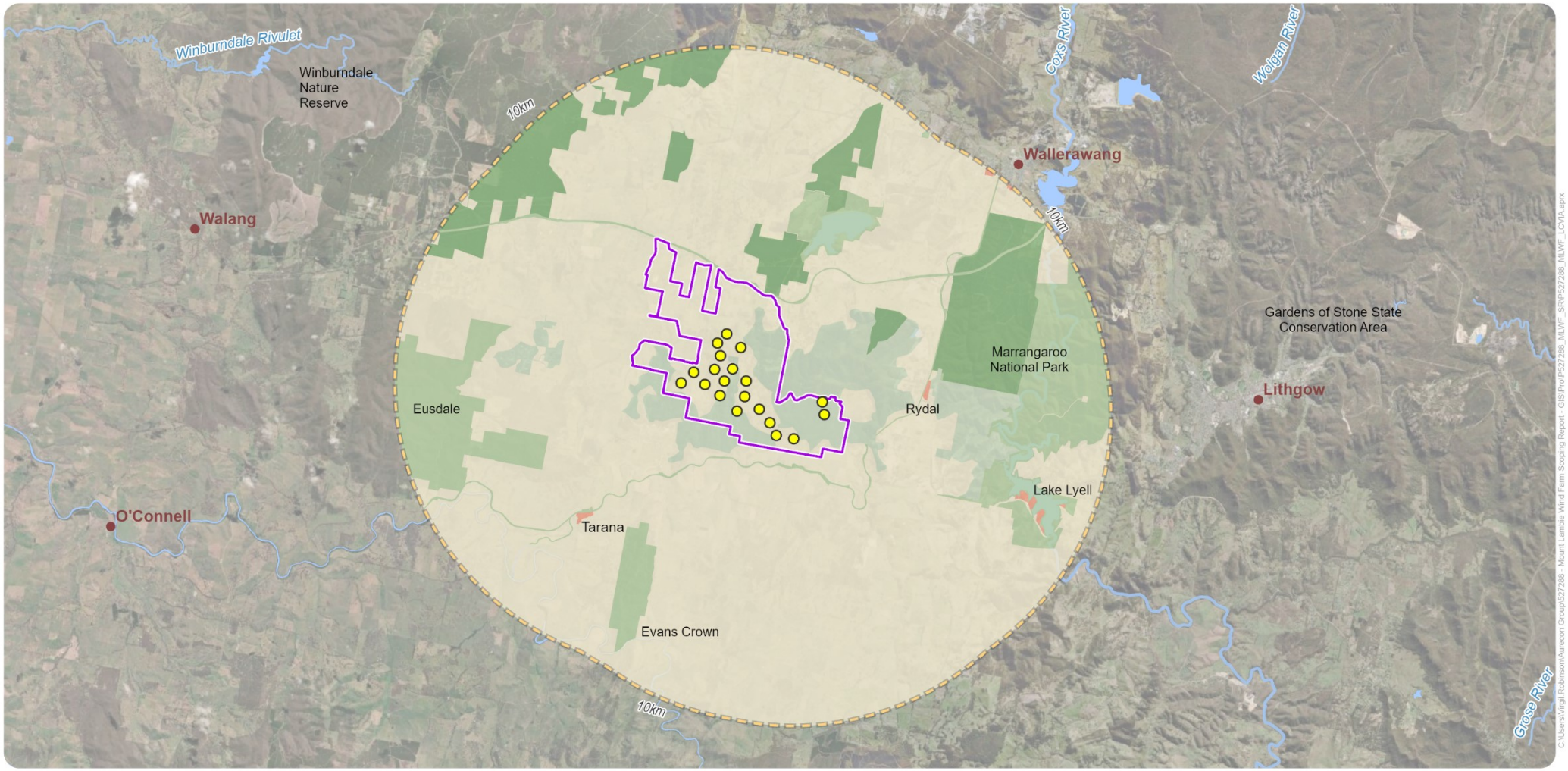
Figure 6-1: Key landscape features

6.1.1.2 Landscape character

Landscape character types (LCTs) help to identify unifying aspects of the landscape and distinguish why one landscape is visually distinct from another. The LCT zones have been established through desktop assessment and field analysis to determine if the Project has the potential to impact on the LCTs within and surrounding the Project area. Six LCTs have been identified within the 10 km Landscape Character Study area for the Project, including:

- LCT 1: Agricultural hills
- LCT 2: Native bushland
- LCT 3: Villages and rural settlements
- LCT 4: Forestry
- LCT 5: Lakes and dams
- LCT 6: Mining and power generation.

Roads are assumed to take on the character of adjacent LCTs. The location of LCTs used for the PLCVIA relative to the location of the Project are shown in Figure 6-2. Further details on each LCT are presented in Appendix B.



Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:200,000
0 2 4 km

Projection: GDA2020 MGA Zone 55

Figure 6-2: Landscape character zones

6.1.1.3 Visual catchment

Seven representative viewpoints, representative of private and public receivers, were identified within the Visual Study area based on the design, viewing distance, turbine visibility, aspect, and significant views. The locations of the assessed representative viewpoints are shown in Figure 6-1.

The assessed representative viewpoints were selected based on the following:

- Identification within the ZTV
- Desktop studies identifying places within close proximity of potential sensitive receivers
- Significant viewpoints
- Viewpoints that are publicly accessible.

Further details on each representative viewpoint are presented in Appendix B.

6.1.2 Potential impacts

6.1.2.1 Construction

Construction is anticipated to last for 18 to 24 months and would include civil works, mechanical and structural works, electrical works, testing and commissioning. Views of the Project area would be altered during construction through the presence of construction vehicles and equipment and through the establishment of temporary construction infrastructure and BESS and substation infrastructure. This would likely only impact views within and adjacent to the Project area, including from associated receivers and associated (under negotiation) receivers. Following this, the establishment of the WTGs throughout the Project area would be visible from each of the viewpoints outlined in Figure 6-1 given the WTGs would be constructed to their operational height during this phase.

6.1.2.2 Operation

Potential landscape character impacts

A summary of potential impacts to landscape character during the operation of the Project is included in Table 6-1.

The Project area lies within LCT 1 Agricultural hills and adjacent to LCT 2 Native bushland. Due to the visual influence dictated by the height of the turbines, there is a potential for landscape character impacts to adjacent LCTs, where the visual amenity is a part of the character.

Table 6-1 Summary of potential impacts to landscape character

LCT	Sensitivity	Potential magnitude	LCT impact
LCT 1 Agricultural hills	Low ■ Whilst it is not considered to be of any specific scenic value, some receivers likely place value upon its openness and typically low built form density. ■ There are no specific planning controls attributing special value to this landscape.	Low ■ Turbines located within this LCT have the potential to become the dominant visual feature in the landscape, however, will allow agricultural use to continue with the provision of access roads and additional infrastructure. ■ It is considered however that the ZTV is a relatively small portion of what is a widely distributed and expansive LCT.	**Low**

LCT	Sensitivity	Potential magnitude	LCT impact
LCT 2 Native bushland	Moderate ■ A high degree of perceived naturalness and providing ecological habitat. ■ There are some areas of regional importance.	Low ■ The vegetation removal is considered small in this expansive LCT and is subject to existing vegetation removal for agricultural purposes. ■ The impact is not to areas of regional importance. ■ The presence of turbines adjacent bushland, introduces built structures of high contrast.	**Low**
LCT 3 Villages and rural settlements	Low ■ The rural villages (Rydal and Tarana) have some historic features and a small community which would be more sensitive to change. ■ Towns and settlements have low residential numbers and are not considered primary tourist destinations.	Very low ■ The Project does not have a direct impact on this character, though its presence would be noticeable as a new feature in the region. ■ The villages of Rydal and Tarana are the closest villages, with residents regularly experiencing views of the turbines, typically outside of the village.	**Very low**
LCT 4 Forestry	Very low ■ A highly modified landscape, typically comprising mono-cultured tree species and subject to change through forest clearing and replanting.	Negligible ■ The Project has no direct impact on this LCT. ■ Changes are likely to be barely perceptible due to intervening topography and vegetation.	**Negligible**
LCT 5 Lakes and dams	Moderate ■ Though the large waterbodies are modified landscapes, they are attractive features valued for recreation.	Negligible ■ The Project has no direct impact on this LCT. ■ Changes are likely to be barely perceptible due to intervening topography and vegetation.	**Negligible**
LCT 6 Mining and power generation	Very low ■ Highly modified landscape with no landscape amenity.	Negligible ■ The Project is at a distance that is not immediately noticeable within this LCT.	**Negligible**

Potential visual impacts

Setback threshold

As is detailed in Section 6.1.1, the visual setback threshold is determined in the Technical Supplement for LVIA. There are five private receivers that are located within the setback threshold of the nearest turbine, including:

- One non-associated receiver (R142) located 1,557 m to the nearest turbine.
  - Receiver R142 has been conservatively classified as a dwelling for this preliminary assessment due to the property's inability to be accessed, however the characterisation of this receiver would be confirmed during the EIS stage.
- One non-associated (under negotiation) receiver (R74) located 792 m to the nearest turbine.
  - A preliminary visual assessment indicated that this residence may experience visual impacts, due to open views of up to nine turbines.
- Two associated (under negotiation) receivers including:
  - R02 located 1,100 m to the nearest turbine (WTG 13), is likely to experience visual impacts, with up to 13 visible turbines and intervening vegetation

- R06 located 1,697 m to the nearest turbines, is likely to experience visual impacts, with up to 11 visible turbines and intervening vegetation.

- One associated receiver (R01) located 615 m to the nearest turbine.

Representative viewpoint assessment

The preliminary assessment identified seven representative viewpoints within the Visual Study area; representative of visual receivers of higher sensitivity including from rural dwellings and community places of interest. The assessment considered the sensitivity of the viewpoint and the potential visual modification (as shown in Table 6-2), with the preliminary assessment of worst-case visual impacts showing low to moderate potential visual impacts (as outlined in Table 6-3).

Table 6-2 Visual impact determination matrix

Degree of modification	Sensitivity			
	High	**Moderate**	**Low**	**Very Low**
Very High	High	High	Moderate	Moderate
High	High	Moderate	Moderate	Low
Moderate	Moderate	Moderate	Low	Low
Low	Moderate	Low	Low	Very Low
Very Low	Low	Low	Very Low	Very Low

Table 6-3 Summary of potential visual impacts on representative viewpoints

Viewpoint no. and location	Visual sensitivity	Potential visual modification	Closest turbine distance	No. visible turbines	Degree of screening	Potential visual impact
VP1 Thorpes Pinch Road/ Great Western Highway	Moderate	Moderate degree of visual modification due to visibility of: - Turbines - BESS and substation	2,101 m to WTG 6	20	Low	**Moderate**
VP2 Bonaventure Road	Moderate	Moderate degree of visual modification due to visibility of turbines	1,801 m to WTG 23	18	High	**Moderate**
VP3 Sodwalls Road	Moderate	High degree of visual modification due to visibility of turbines	2,617 m to WTG 13	20	Low	**Moderate**
VP4 Sodwalls Station Road	Moderate	High degree of visual modification due to visibility of turbines	1,692 m to WTG 13	18	Low	**Moderate**
VP5 Sodwalls Road	Moderate	High degree of visual modification due to visibility of turbines	2,704 m to WTG 14	20	Low	**Moderate**
VP6 Curly Dick Road	Moderate	Low degree of visual modification due to visibility of: - Turbines - BESS and substation	2,009 m to WTG 9	15-18	High	**Low**
VP7 Sunny Corner Road, Meadow Flat	Moderate	Low degree of visual modification due to visibility of: - Turbines - BESS and substation	4,250 m to WTG 6	16	Moderate	**Low**

Cumulative impacts

A preliminary analysis of the cumulative impacts of the Project with other proposed wind farms, shows that there are approximately 157 private receivers with 8,000 m to the northwest of the Project that have potential to incur cumulative visual impacts with Sunny Corner Wind Farm. Further assessment is required at the next phase and when other proposed wind farm developments are confirmed.

Potential cumulative impacts from existing electrical infrastructure and Project electrical infrastructure (including BESS and substations) include a very low level of localised potential cumulative impacts along Curly Dick Road, Sunny Corner Road and Great Western Highway, located northwest of the Project, in close proximity to these components.

6.1.3 Assessment approach

The assessment is limited to representative viewpoints from public locations, and further ground-truthing of the visual conditions for private receivers which are not able to be accessed through adjacent public roads should be carried out at the EIS stage. Consultation with residents to undertake further visual assessment from selected sensitive viewpoints on private property would determine the viewpoints used for further assessment of landscape character and visual impacts at the EIS stage. It is recommended that consultation with potentially affected landholders be focused on private receivers which are within the visual setback threshold and receivers with potential moderate impacts.

As the Project progresses further, additional community consultation would be undertaken. Additional viewpoints and areas of sensitivity may be identified for detailed assessment, potentially including areas of cultural and local value identified during consultation with Aboriginal community stakeholders. Further assessment may be required for sensitive viewpoints and characteristics which have been or could be highlighted in community consultation sessions.

Assessment of landscape character at the EIS stage would be in line with the Technical Supplement for LVIA (DPHI, 2024d), which may include a broader Landscape Character Study area of 25 km. This would include consideration of the Greater Blue Mountains world heritage area.

Mitigation of potential visual impacts will be considered as the Project design progresses.

6.2 Biodiversity

A Preliminary Biodiversity Impact Assessment Report has been prepared for the Project (Aurecon, 2025b), which has been included in Appendix C. The objectives of the report are to identify the potential biodiversity values of the Project area, assess the likelihood of threatened and migratory biota occurring within the Project area, and provide recommendations for further assessment to inform a future EIS.

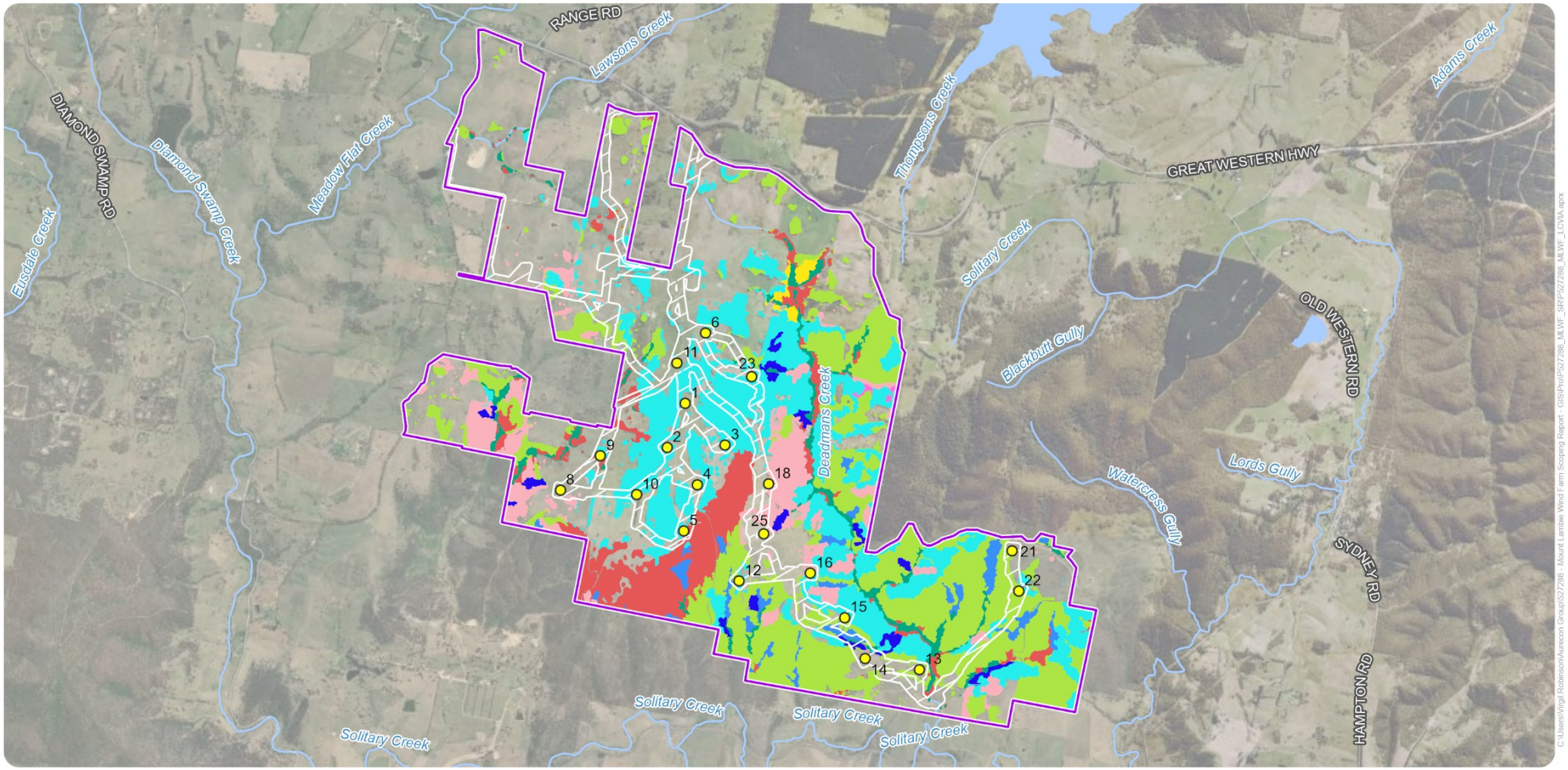
A field survey has been undertaken for the assessment between 19 and 23 August 2024 by suitably qualified ecologists. The Survey area is defined as the area within the Project area that has been ground-truthed and covers an area of 503.5 hectares. The Survey area was constrained by landholder access requirements and was based on the preliminary Project design as of August 2024. Following the field survey and draft preparation of the assessment report, feedback was provided to Tetris Energy on opportunities to avoid/minimise impacts to ecological values. The current Project layout therefore has changed since the field work was completed to avoid and minimise impacts to key biodiversity, visual and noise constraints. As a result, portions of the Project layout occur beyond the area ground-truthed in the field.

To assist in identifying potential biodiversity constraints and opportunities, an ‘indicative disturbance footprint’ was adopted for the purposes of the Preliminary Biodiversity Assessment Report. This is the proposed area for all associated Project infrastructure and is about 125.1 hectares. Ground-truthed vegetation data has been relied on where available within the indicative disturbance footprint, and vegetation in unsurveyed areas of the footprint is based on NSW State Vegetation Type Mapping (SVTM, DPHI 2024e).

6.2.1 Existing environment

6.2.1.1 Native vegetation

Native vegetation cover within the Project area was evaluated using the NSW SVTM (DPHI, 2024e). This mapping was then verified via a field survey. A total of 10 Plant Community Types (PCTs) were mapped within the Project area (refer to Figure 6-3), however the field survey confirmed only five of these PCTs are present within the indicative disturbance footprint, with a further two PCTs mapped (based on SVTM) within unsurveyed areas of the indicative disturbance footprint. There is 30.57 hectares of PCT areas within the indicative disturbance footprint, with non-native vegetation or highly disturbed/cleared land accounting for the remaining 93.44 hectares. PCT 3735 (Central Tableland Peppermint Shrub Grass Forest) and PCT 3369 (Central Tableland Ranges Peppermint-Gum Grassy Forest) are the most prominent PCTs, occupying 10.059 hectares and 10.037 hectares respectively of the indicative disturbance footprint.



Project area

Indicative disturbance footprint

Waterbody

Mount Lambie Wind Farm Infrastructure

Turbine location

NSW State Type Vegetation Mapping

PCT ID and Name (Mapped occurrence in the Project area (ha))

- 3211 - Central Tableland Montane Wet Forest (52.4ha)
- 3294 - Central Tableland Peppermint-Gum Montane Forest (3ha)
- 3303 - Central Tableland Ribbon Gum Sheltered Forest (10.5ha)
- 3347 - Southern Tableland Creekflat Ribbon Gum Forest (73.5ha)
- 3367 - Central Tableland Granites Grassy Box Woodland (173.9ha)
- 3369 - Central Tableland Ranges Peppermint-Gum Grassy Forest (554.3ha)
- 3534 - Central West Stony Hills Stringybark-Box Forest (22.8ha)
- 3735 - Central Tableland Peppermint Shrub-Grass Forest (408.4ha)
- 3747 - Southern Tableland Western Hills Scribbly Gum Forest (118.5ha)

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:62,500

0 0.8 1.6 km

Projection: GDA2020 MGA Zone 55

Figure 6-3: Plant Community Types within the Project area

6.2.1.2 Habitat and habitat connectivity

The Survey area contains several fauna habitat features including:

- Hollow bearing trees and stags, with hollows generally being small (less than 10 centimetre diameter) and medium (between 10 and 20 centimetre diameter)
- Stags
- Logs
- Rocky outcrops
- Leaf litter within remnant patches of native vegetation
- Decorticating bark on numerous gum trees and stags
- Burrows, nests and other fauna-made habitat, with numerous wombat burrows and termite mounds, and a small stick nest observed
- Aquatic habitat (refer to Section 6.2.1.3).

Mount Lambie mountain range is in a mostly disturbed landscape, where remnant native vegetation acts as a corridor for the movement of fauna and dispersion of flora species. Continuous remnant vegetation only remains on mountain ridges with steep slopes. Remnant isolated and highly disturbed patches of canopy and paddock trees provide a stepping stone corridor for highly mobile species between areas of remnant dense vegetated areas, but have low corridor value for small ground-dwelling animals, arboreal animals and low mobile fauna.

The land surrounding Mount Lambie is predominantly cleared, with roads and railways present, and does not offer connectivity value for low mobile fauna. Vegetated areas within three to 10 km from Mount Lambie, including State forests and nature reserves, have connectivity value for highly mobile fauna and flora species.

6.2.1.3 Aquatic habitat and groundwater dependent ecosystems

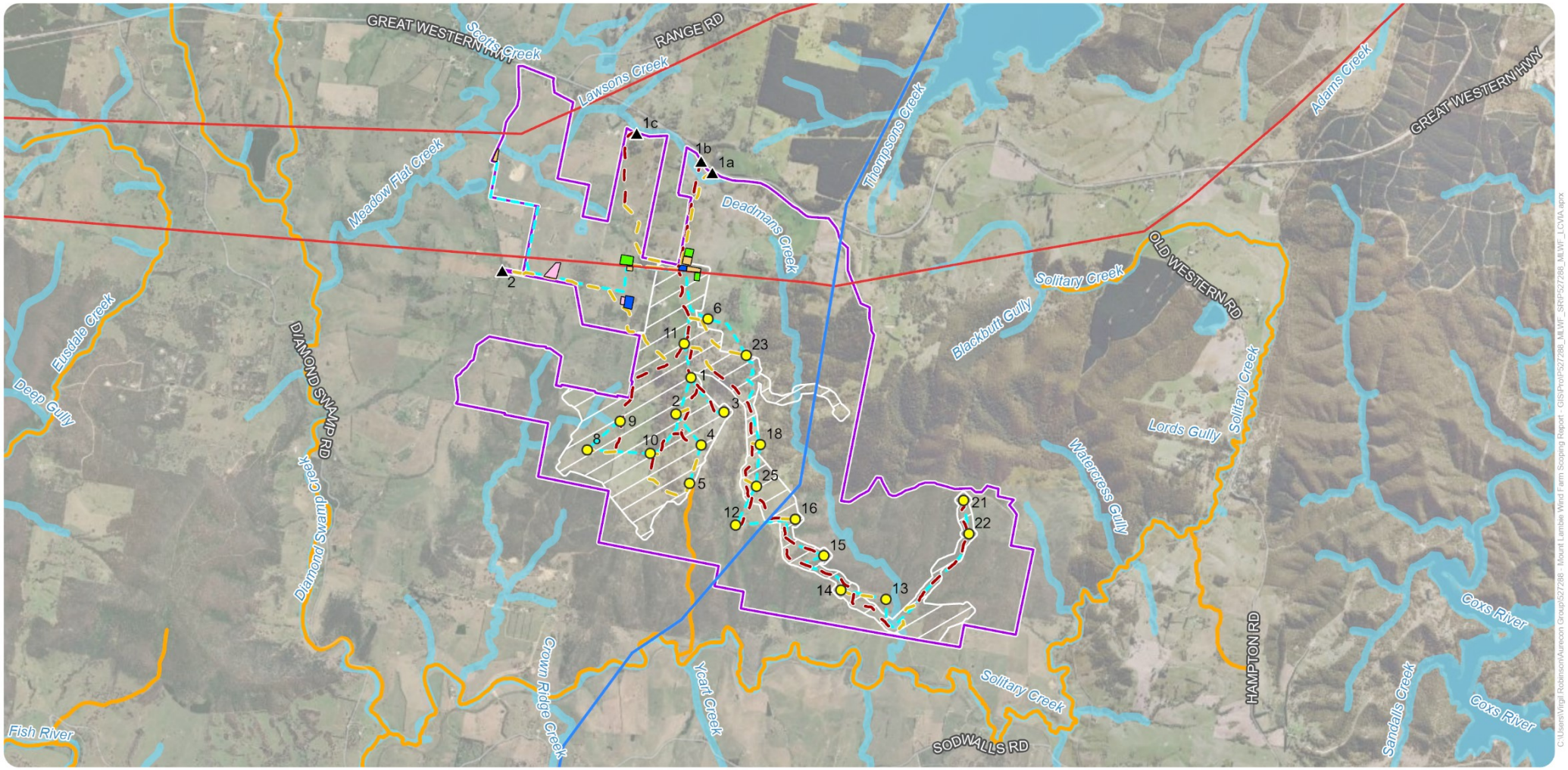
Key fish habitat has been identified the Project area, in Lawsons Creek, Deadmans Creek and Solitary Creek and their tributaries, as shown in Figure 6-4. Some farm dams are present across the Project area, and these are accessed by cattle and birds. A few of the dams have sparse fringing vegetation which can provide habitat for frogs and insects.

Aquatic habitats, including creeks and dams, can also be used by birds, insects, mammals and reptiles as a water source. The grey-headed flying fox (*Pteropus poliocephalus*) sources water from open water bodies, and the Project area is within foraging range of a flying-fox camp in Portland (approximately 12 km north-east of the Project area).

A search of the Bureau of Meteorology Groundwater Dependent Ecosystems Atlas indicated that:

- The Project area has a moderate and low potential for terrestrial groundwater dependent ecosystems (GDEs)
- Lawsons Creek, Deadmans Creek and Solitary Creek have high to moderate potential aquatic GDEs within the Project area.

The potential occurrence of GDEs should be investigated further as part of the EIS.



Project area
Biodiversity Survey Area
Key Fish Habitat
Southern Purple Spotted Gudgeon

Mount Lambie Wind Farm Infrastructure
Turbine location
Access point
New access track
Existing access track to be utilised
Underground cabling
Temporary construction compound / Laydown area
Operation and maintenance facility
Substation
BESS infrastructure

Existing transmission
132kV line
500kV line

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:75,000
0 1 2 km

Projection: GDA2020 MGA Zone 55

Figure 6-4: Key Fish Habitat and Fish Freshwater Threatened Species

6.2.1.4 Threatened ecological communities

Threatened Ecological Communities (TECs) were searched for using the Protected Matters Search Tool (PMST) (EPBC Act), NSW BioNet Atlas database (DEH 2024) NSW State Vegetation Type Map, and field surveys conducted by Aurecon (2024).

Three TECs were predicted to occur in the locality by the PMST:

- Natural Temperate Grassland of the South Eastern Highlands (Critically Endangered Ecological Community).
- Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion (Endangered Ecological Community).
- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Critically Endangered Ecological Community).

None of the TECs predicted to occur in the locality were identified within the Survey area during the field survey, and none of the PCTs identified are known to be associated with *Biodiversity Conservation Act 2016* (NSW) (BC Act) or EPBC Act listed TECs. Notwithstanding, further investigation, including detailed flora survey, would be required to confirm the presence or absence of TECs within the Project area.

6.2.1.5 Threatened and migratory species

A likelihood of occurrence analysis for threatened and migratory species revealed 20 threatened species that have a moderate or higher likelihood of occurrence within the Project area. No migratory species have a moderate or higher likelihood of occurrence.

During field surveys in August 2024, three threatened species were recorded within the Project area, as outlined in Table 6-4. This includes Gang-gang Cockatoos identified during the field survey, and two threatened microbat species identified via microbat call identification (balance! Environmental, 2024). One threatened tree, Black Gum (*Eucalyptus aggregata*), listed as Vulnerable, was recorded along Curly Dick Road and within five meters from the Project area.

Table 6-4 Threatened species with moderate or higher likelihood of occurrence

Common name	Scientific name	Listing status		Likelihood of occurrence
		BC Act	EPBC Act	
Bird				
Regent Honeyeater	*Anthochaera phrygia*	CE	CE	Moderate
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	V	-	Moderate
Gang-gang Cockatoo	*Callocephalon fimbriatum*	E	E	Known
South-eastern Glossy Black-Cockatoo	*Calyptorhynchus lathami lathami*	V	V	High
Varied Sittella	*Daphoenositta chrysoptera*	V	-	Moderate
Painted Honeyeater	*Grantiella picta*	V	V	Moderate
Powerful Owl	*Ninox strenua*	V	-	Moderate
Reptile				
Pink-tailed Worm-lizard	*Aprasia parapulchella*	V	V	Moderate
Broad-headed Snake	*Hoplocephalus bungaroides*	E	E	Moderate
Mammal				
Spotted-tailed Quoll	*Dasyurus maculatus*	V	E	Moderate
Grey-headed Flying-fox	*Pteropus poliocephalus*	V	V	Moderate
Eastern False Pipistrelle	*Falsistrellus tasmaniensis*	V	-	Known
Large Bent-winged Bat	*Miniopterus orianae oceanensis*	V	-	Known

Common name	Scientific name	Listing status		Likelihood of occurrence
		BC Act	EPBC Act	
Greater Glider (southern and central)	*Petauroides volans*	E	E	Moderate
Koala	*Phascolarctos cinereus*	E	E	Moderate
Insect				
Bathurst Copper Butterfly	*Paralucia spinifera*	E	V	Moderate
Plant				
Black Gum	Eucalyptus aggregata	V	V	High
Silver-leaved Mountain Gum	*Eucalyptus pulverulenta*	V	V	Moderate
a Guinea Flower	*Hibbertia accaulothrix*	E	E	Moderate
Basalt Peppercress	*Lepidium hyssopifolium*	E	E	Moderate

Table notes:
Listing Status: V = Vulnerable; E = Endangered; CE = Critically Endangered

6.2.1.6 Matters of National Environmental Significance

While EPBC Act listed threatened and migratory species and TECs have been considered above, other relevant MNES listed under the EPBC Act that require consideration for the Project include Wetlands of International Importance (Ramsar Wetlands). Ramsar Wetlands within proximity of the Project area are outlined in Table 6-5. As they are over 300 km from the Project area indirect impacts are considered unlikely.

Table 6-5 Ramsar wetlands within proximity of the Project area

Ramsar site name	Proximity of the Project area
Banrock Station Wetland Complex	The Project area is located 800 to 900 km upstream from the wetland.
Riverland	The Project area is located 800 to 900 km upstream from the wetland.
The Coorong, and Lakes Alexandriana and Albert Wetland	The Project area is located 900 to 1,000 km upstream from the wetland.
The Macquarie Marshes	The Project area is located 300 to 400 km upstream from the wetland.

6.2.2 Potential impacts

6.2.2.1 Construction

The Project would result in the removal or disturbance of up to 30.57 hectares of PCTs, based on the indicative disturbance footprint. Table 6-6 outlines the potential vegetation clearing impacts of the Project.

Table 6-6 Potential native vegetation impacts

PCT ID	PCT name	Area (ha) of PCT within the indicative disturbance footprint[1]
3211	Central Tableland Montane Wet Forest	0.6
3347	Southern Tableland Creekflat Ribbon Gum Forest	0.6
3367	Central Tableland Granites Grassy Box Woodland	7.7
3369	Central Tableland Ranges Peppermint-Gum Grassy Forest	10.0
3735	Central Tableland Peppermint Shrub-Grass Forest	10.1
3534	Central West Stony Hills Stringybark-Box Forest	0.3[2]

PCT ID	PCT name	Area (ha) of PCT within the indicative disturbance footprint[1]
3747	Southern Tableland Western Hills Scribbly Gum Forest	1.2[2]
Total native vegetation ground-truthed within the Project area		**30.57**

Table notes:

1 57.1% of the indicative disturbance footprint was surveyed. For areas not surveyed, PCT mapping has been used.
2 Inclusion of PCT 3534 and PCT 3735 is based on PCT mapping of areas within the indicative disturbance footprint that were not surveyed.

Other potential impacts on biodiversity include the following:

- Reduction in biodiverse riparian land mapped as high biodiversity value.
- Clearing of vegetation, including native trees, planted native trees, and PCTs, leading to habitat loss for flora and fauna, including threatened species.
- Increased risk of weed, pest, and disease incursion or spread.
- Further reduction in habitat connectivity, impacting species with low mobility or limited dispersal capacity.
- Habitat loss for threatened species, including roosting, feeding, and breeding areas (e.g. hollow-bearing trees).
- Increased mortality and injury risk for ground-dwelling fauna (e.g. wombats, reptiles) from vehicle collisions within internal wind farm access tracks during construction and/or operation.
- Indirect impacts on aquatic fauna (e.g. frogs) and water birds due to changes in hydrology, sediment runoff, and erosion affecting creeks and dams during construction.

Detailed biodiversity surveys would be required to quantify the existence of threatened species and species habitat across the assessment area as required by the NSW *Biodiversity Assessment Method* (BAM) (Department of Planning, Industry and Environment, 2020c).

6.2.2.2 Operation

The main potential impacts to biodiversity from the operation of the Project relate to bird and bat strike. Bird and bat strike involves either direct collision with WTG blades or barotrauma (rapid changes in air pressure associated with the movement of blades). The Project area contains potential habitat for several bird and microbat species that may be susceptible to collision or barotrauma impacts. Species deemed to be susceptible include those more likely to fly within or near the rotor sweep area height, such as raptors, migratory birds, larger waterbirds and insectivorous bats. Less is known about the flight patterns of microbats and thus all species should be considered at risk as a precautionary measure.

6.2.3 Assessment approach

The SEARs for the Project are likely to require a Biodiversity Development Assessment Report (BDAR) to be prepared in accordance with the BAM. The BDAR must:

- Demonstrate how impacts have been avoided, mitigated and offset as a last resort
- Consider SAII entities and how they could be impacted by the Project
- Consider prescribed impacts, which are impacts that cannot be quantified through the Biodiversity Assessment Method Calculator (BAM-C). Of relevance to this Project is “Wind Farm Collision Impacts”.

The BDAR would also need to meet the Stage 1 and Stage 2 requirements of the BAM which include, but are not limited to, the following:

- Threatened species and TEC impact assessment including:
  - Biodiversity Values Mapping
  - Seasonal flora and fauna surveys for candidate species (once identified by the BDAR)

  - Targeted surveys for threatened species that have the potential to be impacted by the Project
  - Bird and bat collision risk assessment
  - Recommendations for avoiding, limiting and mitigating impacts to threatened species and TECs
  - Biodiversity offset credit calculations to determine the credit obligations of the Project.
- Considerations for serious and irreversible impacts of the Project on biodiversity including but not limited to:
  - Long term impacts from blade strike or barotrauma
  - Loss of small population due to localised impacts
  - Loss of important breeding habitat.

The BAM would need to be implemented and the BDAR prepared by an accredited assessor. It is expected that credit obligations would be generated from the above outputs, which can be met through several avenues such as contributing to the Biodiversity Conservation Fund, the establishment of a stewardship site or acquiring credits from the Biodiversity Credit Market. A combination of the above could also be implemented. Further analysis of biodiversity values within the Project area is required to determine outcomes for credit and offset obligations.

In addition, due to the potential presence of threatened species within the Project area (as identified in Section 6.2.1), an EPBC referral is being developed for the Project. This would be informed by Significant Impact Assessments to determine the likely impacts to MNES.

6.3 Noise and vibration

A Preliminary Environmental Noise Assessment has been prepared for the Project (SLR, 2025), which is included in Appendix D. The assessment has been developed in accordance with *Wind Energy Guideline: Technical Supplement for Noise Assessment* (NSW Wind Energy Guideline, DPHI 2024f).

6.3.1 Existing environment

The assessment locations for noise and vibration impacts include all receivers located within around 5 km of a proposed WTG. Three associated receivers, seven associated (under negotiation) receivers, one non-associated (under negotiation) and 165 non-associated receivers were assessed as part of the noise and vibration assessment. The Great Western Highway is at the north of the Project area and Curly Dick Road to the west. Elevation across the Project area ranges between around 800 to 1,300 m above sea level. The surrounding region is primarily used for agricultural purposes, with nearby landscape comprised of plateaus, with areas of forest and woodland. Mount Lambie has a temperate climate with mild to warm summers and cold winters. It has a mean annual rainfall of around 710 millimetres and wind speeds of 5.2 to 9.9 m per second at 150 m above ground level. All receivers surrounding the Project area are anticipated to have an ambient background noise environment that may include traffic, industry, lawnmowers, and natural noises including animal noises.

6.3.2 Potential impacts

6.3.2.1 Construction

Potential noise and vibration impacts during construction would be associated with construction work such as:

- Clearing and grubbing
- Earthworks and excavation
- Rock hammering and crushing

- Hauling material
- Transporting equipment
- Parts assembly
- Concrete formwork and associated activities
- Building of permanent structures.
- Maintenance and refuelling.

Noise would be generated by mobile plant such as excavators, bulldozers, mobile cranes, and the movement of heavy vehicles. It is expected that the following typical equipment would be used:

- Site mobilisation – road loaders, graders, backhoes, trucks, small crane and generators
- Access tracks and hardstands – road loaders, bulldozers, excavators, graders, scrapers, rollers, articulated dump trucks, belly dumper trucks, rock crushing plant, semi-trailers, tractors, water carts and hydroseed trucks
- Wind turbines – excavators, rock breaker, concrete trucks, flat-bed trucks, vacuum trucks, large crawler/all-terrain heavy lift cranes, small/medium crawler cranes, generators, telehandlers, elevated work platforms
- Electrical reticulation works – trenchers, backhoes, excavators, graders, tractors, cable laying machines, and small terrain cranes
- Site services – option for vans or buses to transport staff around site and water delivery and effluent removal trucks
- Transmission line and towers – earthmoving equipment, elevated work platforms, concrete trucks, borers, cranes and other heavy machinery

Construction noise and vibration would be assessed as the Project progresses through later planning stages. Given the distance between the Project area and the nearest sensitive receivers, it is expected that construction noise and vibration from the Project area, including noise and vibration during decommissioning works, will be able to be appropriately controlled to minimise any impacts to an acceptable level.

6.3.2.2 Operation

The *Wind Energy Guideline: Technical Supplement for Noise Assessment* (NSW Wind Energy Guideline, DPHI 2024f) provides a baseline noise criterion of 35 decibels (dB(A)) or 5 dB(A) above the background noise level at each integer wind speed for non-associated receivers (whichever is greater). The 2009 SA Guidelines provides a baseline noise criterion of 45 dB(A) or 5 dB(A) above the background noise level at each integer wind speed (whichever is greater) for residential receivers associated with the wind farm (with a suitable noise agreement in place). The preliminary noise assessment has been conducted against the minimum applicable noise criteria 35 dB for noise-sensitive non-associated receivers outside of the Project area and 45 dB for associated or associated (under negotiation) dwellings within the Project area. The selected WTG for the preliminary noise assessment is a Vestas EnVentus 172 wind turbine with serrated trailing edges on blades. The sound power levels for operation include standard operation mode (sound power level of 107.8 dB L_{WA}) and a sound optimised mode (sound power level 105 dB L_{WA}), as some turbines could potentially operate with a sound optimised mode to reduce noise levels at the nearby sensitive receivers. The modelled operation mode and height for each turbine is detailed in Table 4 of Appendix D. Noise modelling of the WTG layout was completed using SoundPLAN version 9.0 environmental noise prediction software, implementing the ISO 9613-2:2024 prediction algorithm. The noise prediction methodology adopted is expected to result in wind turbine noise predictions that are approximately 1.5 to 2 dB higher than would be measured when applying the wind turbine noise measurement methodology specified by the NSW Wind Energy Guideline.

This conservative assessment indicates that the wind farm is predicted to be below the minimum criteria at all identified receivers, except for:

- Two associated (under negotiation) receivers (R02 and R03) which were modelled at 37 and 36 dB L_{Aeq} respectively. Compliance would be achieved if these receivers became associated landholders with noise agreements.
- One non-associated (under negotiation) receiver, R74, which was modelled at 40 dB L_{Aeq}. Compliance would be achieved if a noise agreement was in place.
- Two non-associated receivers, R10 and R60, which were modelled at 38 and 37 dB L_{Aeq} respectively. Compliance would be achieved if a noise agreement was in place.

This outcome is based on modelling of sound power levels as outlined above, with no mitigation applied. A number of options have been identified to assist in achieving the non-associated residence criteria at these receivers, where an agreement is not entered into by the landholder, including background noise monitoring to better establish noise criteria appropriate WTG selections to reduce noise emissions, refinements to the Project design or further modifications to operating settings of the wind farm. It is anticipated that remaining exceedances of the criterion at receivers can be readily mitigated or managed if required.

6.3.3 Assessment approach

A detailed noise and vibration impact assessment would be prepared as part of the EIS in accordance with *Wind Energy Guideline: Technical Supplement for Noise Assessment* (DPHI, 2024f), *Wind farms environmental noise guidelines* (South Australia EPA, 2009) *Interim Construction Noise Guideline* (DECC, 2009), *Road Noise Policy* (DECCW, 2011), and *Assessing Vibration – A Technical Guideline* (DEC, 2006).

The Noise and Vibration Impact Assessment would include:

- Background noise monitoring at the receiver to assess whether the background noise level-adjusted criteria are sufficiently high to allow for wind turbine noise levels in excess of 35 dB at higher wind speeds.
- Refinement of noise model input assumptions (e.g. WTG model specification and WTG sound power levels)
- Refinement to the Project design, including consideration of turbine locations and hub heights, to ensure predicted noise levels comply with the applicable criteria.
- Assessment of the BESS and substation/s.

Where predicted exceedances are identified, they would be resolved through potential design refinement and mitigation and management measures, as identified during the preparation of the EIS. This would include the predicted exceedances for two associated (under negotiation) receivers and one non-associated (under negotiation) receiver if noise agreements are not in place, and for two non-associated receivers.

6.4 Socio-economic

A Preliminary Social Impact Assessment (PSIA) has been prepared to identify and define the Project's social locality, provide an initial evaluation of social impacts and contribute to potential Project refinement (Aurecon, 2025c). This is the first phase of the social impact assessment process and involves scoping and initial assessment of the social environment and impacts of the Project area in accordance with the *Social Impact Assessment Guideline for State Significant projects* (DPE, 2023b). The PSIA is provided in Appendix E.

6.4.1 Existing environment

6.4.1.1 Social baseline

The social baseline for the Project has been established based on Australian Bureau of Statistics (ABS) 2021 Census data (ABS, 2021). Table 6-7 outlines data for the Project area and surrounds to establish this social baseline.

Table 6-7 Social baseline for the Project based on ABS 2021 Census data

Location	State	2021 ABS Census data reference	Description
Project area	NSW	■ Lot 3 DP1129492 – Freehold Land ■ Lot 4 DP1129492 – Freehold Land ■ Lot 2 DP1022552 – Local Government Authority ■ Lot 204 DP755794 – Freehold Land ■ Lot 22 DP1039032 – Freehold Land ■ Lot 1 DP748805 – Freehold Land ■ Lot 2 DP817970 – Freehold Land ■ Lot 117 DP755794 – Freehold Land ■ Lot 107 DP755794 – Freehold Land ■ Lot 126 DP755794 – Freehold Land ■ Lot 18 DP755794 – Freehold Land ■ Lot 212 DP722328 – Freehold Land ■ Lot 68 DP755794 – Freehold Land ■ Lot 84 DP755794 – Freehold Land ■ Lot 28 DP755794 – Freehold Land ■ Lot 1 DP1134343 – Freehold Land ■ Lot 7300 DP1133240 – Crown ■ Lot 1 DP995950 – Freehold Land ■ Lot 2 DP995950 – Freehold Land ■ Lot 3 DP844060 – Freehold Land ■ Lot 3 DP995950 – Freehold Land ■ Lot 4 DP995950 – Freehold Land ■ Lot 6 DP755794 – Freehold Land ■ Lot 7 DP755794 – Freehold Land ■ Lot 9 DP755794 – Freehold Land ■ Lot 13 DP837978 – Freehold Land ■ Lot 19 DP755794 – Freehold Land ■ Lot 20 DP755794 – Freehold Land ■ Lot 23 DP837978 – Freehold Land ■ Lot 24 DP837978 – Freehold Land ■ Lot 24 DP1067481 – Freehold Land ■ Lot 25 DP755794 – Freehold Land ■ Lot 25 DP837978 – Freehold Land ■ Lot 31 DP837978 – Freehold Land ■ Lot 32 DP837978 – Freehold Land ■ Lot 84 DP755794 – Freehold Land ■ Lot 98 DP755794 – Freehold Land ■ Lot 99 DP755794 – Freehold Land	The Project area is comprised of 37 separate lots. One lot is Crown land, and one is owned by the Lithgow Local Government Authority. The remaining 35 lots are all freehold. The area is 2,540 ha in size and is predominantly rural residential.
Mount Lambie, Tarana and Meadow Flat	NSW	SAL12784 (Mount Lambie), SAL13775 (Tarana) and SAL12559 (Meadow Flat)	The Project area spans three suburbs: Mount Lambie, Tarana and Meadow Flat. The suburbs are predominantly zoned as rural land and are populated by 608 people (2.9% of the Lithgow City LGA population).

Location	State	2021 ABS Census data reference	Description
Rydal and Sodwalls	NSW	SAL 13467 (Rydal) and SAL 13584 (Sodwalls)	The Project area is within proximity to two suburb boundaries: Rydal and Sodwalls. The suburbs, similar to those encompassing the Project boundary, is predominantly zoned as rural agricultural production. It is populated by a total of 257 people, or 1.2% of the Lithgow City LGA.
Wallerawang	NSW	UCL115151	Wallerawang is the closest urban centre to the Project area and is populated by 2079 people. Wallerawang sits at the intersection of the Castlereagh Highway and the Great Western Highway. The Main Western railway line intersects the town of Wallerawang and splits to the north and south.
Lithgow City LGA	NSW	LGA14870	The Lithgow City LGA is located roughly 140 km west of the Sydney Central Business District (CBD) and is approximately 4,551 square km in size. The local government area is populated by 20,842 people, with the majority of its population living in the town of Lithgow (11,197). The LGA contains rail infrastructure and public transport via bus routes.
Regional social locality	NSW	LGA14870 (Lithgow) LGA10470 (Bathurst) LGA16100 (Oberon)	The regional social locality is comprised of three local government areas. These local government areas are the Lithgow City LGA (20,842 people), Bathurst Regional LGA (43,567 people) and Oberon LGA (5,580 people). It is anticipated that much of the construction resources and many of the workers would likely be sourced from the regional social locality. Within this regional social locality, there are several notable key communities: ■ Lithgow - 11,197 ■ Bathurst - 36,230 ■ Oberon - 2,540 ■ Portland - 1,841

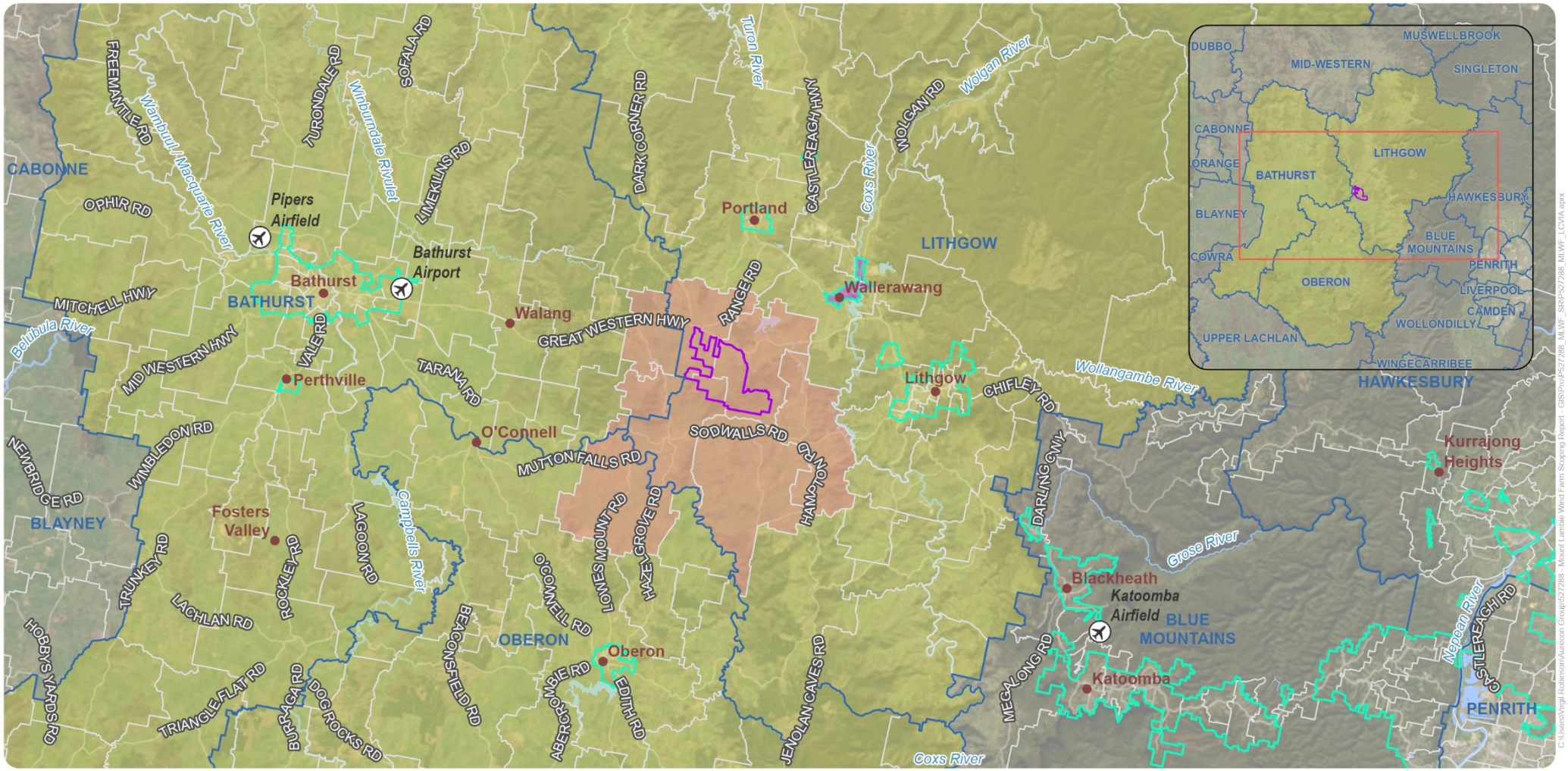
6.4.1.2 Social locality

The Project's social locality includes the suburbs of:

- Mount Lambie
- Meadow Flat
- Rydal
- Sodwalls
- Tarana.

The social locality may extend beyond these areas as the Project planning progresses to include places of residence of the future construction and operational workforce and where materials may be sourced for the Project. The social locality would be further refined as required during the EIS assessment phase.

The social locality is shown in Figure 6-5.



Project area
Waterbody
Waterway
Airport
Local Government Area (LGA)
Urban Centre and Locality (UCL)
Suburb and Locality (SAL)

Project social locality

Wallerwang UCL
Mount Lambie SAL. Meadow Flats SAL, Tarana SAL, Rydal SAL, Sodwalls SAL
Lithgow LGA, Bathurst Regional LGA, Oberon LGA

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:500,000
0 5 10 km

Projection: GDA2020 MGA Zone 55

Figure 6-5: Project social locality

6.4.1.3 Land use context

The Project area is located on land primarily used for agricultural and farming purposes. The Project area landscape is scattered with native vegetation, riparian lands and watercourses. Early desktop investigations of the area indicate potential constraints for development due biodiverse riparian land, potential for clearing of native vegetation and removal of threatened fauna habitat (i.e. tree hollows). The Project area includes one associated dwelling and seven associated (under negotiation) dwellings, as well as farming infrastructure, including sheds, tanks, access tracks and farming equipment.

6.4.1.4 Demographic overview

An overview of the demographics of the Project's social locality is presented in Table 6-8.

Table 6-8 Demographics of the Project's social locality

Topic	Insights into demographics
Population size	▪ The Lithgow City LGA has a significantly higher population (20,842) than the closest urban centre to the Project site (Wallerawang - 2079). This indicates that the population is dispersed across multiple urban centres within the LGA. The suburbs of Mount Lambie, Tarana, and Meadow Flat which intersect the Project area, have small population counts (65, 187 and 356 respectively). The suburbs of Rydal and Sodwalls, where the Project social locality extends to, also have small population counts (163 and 94, respectively). This reflects the rural nature of the Project area.
Older and ageing population	▪ The median age in the Wallerawang (38) is considerably lower when compared to the Lithgow City LGA (46), Mount Lambie (55), Tarana (48), Meadow Flat (45), Rydal (53), or Sodwalls (52). This suggests the closest urban centre to the Project site has a younger demographic when compared to NSW (39), while the Project area and LGA has an aging population. ▪ These median ages are reflected in the proportion of the population over 65 years of age. There is 25% of the Lithgow City LGA population with an age of 65 years or over, this is higher than NSW (18%), Wallerawang (18%), Mount Lambie (17%), Tarana (23%) or Meadow Flat (16%), Rydal (31%), or Sodwalls (16%). This indicates that the suburb of Tarana has the highest proportion of aged residents within the Project area, while Rydal has the highest proportion of aged residents within the Project social locality area.
Aboriginal and Torres Strait Islander population	▪ The Aboriginal and Torres Strait Islander population is notable at 8% for the Lithgow City LGA, compared to NSW (3.4%). Therefore, Aboriginal perspectives and interests should be considered in making planning decisions that influence the Project area (refer to Section 5 for further detail on Aboriginal community engagement to date). ▪ Due to the small population sizes of the suburbs, the proportion of Aboriginal and Torres Strait Islander population can significantly differ. The Mount Lambie proportion is 0%, while the Tarana and Meadow Flat proportions are 2% and 7% respectively. Rydal's Aboriginal and Torres Strait Islander population is around 6%, while Sodwalls is around 3%. 10% of the Wallerawang population is comprised of Aboriginal and Torres Strait Islander people.
Overseas born population	▪ The population in the Lithgow City LGA is predominantly of Australian descent. While there is some cultural diversity, with 18% of the population born overseas, the Lithgow population is less culturally diverse than NSW (34.6% of the population born overseas). The population born overseas is the lowest in Mount Lambie (5%). ▪ The top languages besides English include Italian, Mandarin, Thai, Cantonese and German.
Long-term health conditions	▪ The percentage of people with long-term health conditions is 39% in the Lithgow City LGA, significantly more than in NSW (27%). Conversely, 15% of people have long-term health conditions in the Mount Lambie, 31% in the Tarana and 32% in the Meadow Flat, suggesting that this vulnerable group is more densely situated in the town or other suburbs within the LGA. Thirty-nine per cent of Rydal's population have long-term health conditions, while 32% of Sodwalls' population have long-term health impacts, suggesting this group, while outside the Project area, is still vulnerable within the social locality. There may be a prevalence of sensitivity to external factors that are perceived to cause or contribute to adverse health and well-being impacts.

Topic	Insights into demographics
Employment	▪ The most common industries of employment in the Lithgow City LGA include coal mining (6.9%), aged care residential services (3.4%), supermarket and grocery stores (3.1%), State Government administration (3%) and Local Government administration (2.9%). The high proportion of mining industries likely indicates there is a significant transient workforce established within the LGA. Refer to Appendix E for more information on occupations and employment industries. ▪ The unemployment rate of 6% in the Lithgow City LGA is marginally higher than that of NSW (4.9%), suggesting that there is likely to be more disadvantage in the community. There are no unemployed residents within the Project area and a high rate of volunteering for each of the Project suburbs (77% for Mount Lambie, 30% for Tarana and 20% for Meadow Flat). Sodwalls also has a 0% unemployment rate, however 6% of Rydal's population is unemployed. ▪ The proportion of people who travelled to work by car as driver or passenger is substantially higher within the study area compared to NSW. For comparison, 47% of the workforce in NSW travel to work by car as driver or passenger, compared to 68% for the Lithgow LGA.
Median weekly household income	▪ The median weekly household income is highest in the Meadow Flat ($2,083), followed by Sodwalls, Tarana and Mount Lambie ($1,937, $1,875 and $1,874 respectively). Rydal's weekly household income is slightly lower ($1,325). The NSW median ($1,829) is higher than the median for the Wallerawang and Lithgow City LGA ($1,441 and $1,196, respectively). This suggests that the Project area and NSW median are relatively economically advantaged compared to the Lithgow City LGA and Wallerawang.

6.4.1.5 Economic overview

Of the 20,842 residents in the Lithgow City LGA, the labour force accounts for 50.4 per cent and 6 per cent of the labour force is unemployed. The most common occupations are technicians and trades workers (16.6 per cent), community and personal services workers (14 per cent), professionals (13.4 per cent), clerical and administrative workers (12.8 per cent) and labourers (11.4 per cent). The top industries of employment include coal mining (6.9 per cent), aged care residential services (3.4 per cent), supermarket and grocery stores (2.9 per cent), State government administration (3 per cent) and local government administration (2.9 per cent).

6.4.1.6 Social infrastructure overview

Most of the social infrastructure near the Project area is in Lithgow. Education institutions include two public primary schools, two public secondary schools and two Catholic schools (St Patrick's Primary School and La Salle Academy Secondary School). There is also a TAFE vocational college and Western Sydney University has a campus located in Lithgow.

Lithgow is well serviced by health facilities. Lithgow Hospital is the leading medical centre in town. It has a 24-hour emergency department and 46 inpatient beds. It provides a range of allied health, medical, surgical, antenatal care and other health care services. Regarding emergency services, in addition to the Lithgow Hospital for medical emergencies, Lithgow houses the NSW Rural Fire Service, two Lithgow Fire and Rescue Stations, and the Lithgow Police Station.

Recreational facilities in Lithgow include the JM Robson Aquatic Centre, a skate park, paintballing, go-karting, national parks, a range of sporting fields and picnic areas, theatres, galleries, historical attractions, public parks, and a Bowling Club. Water recreation can be found at both Lake Lyell and Lake Wallace. The Lithgow City LGA includes World Heritage-listed National Parks and State Forests, making it an important leisure destination for Sydney residents.

6.4.2 Potential impacts

6.4.2.1 Construction

A number of potential construction impacts also relate to operation but would commence during construction. These are discussed in the lists below.

Potential positive impacts during construction of the Project would include:

- Improved livelihoods of local business owners due to increased economic activity from the temporary increase in construction worker numbers.
- With an increase in employment in the renewable energy sector, there may be a positive shift towards a more sustainable and resilient community which may change the way the community interacts.
- Improved livelihoods due to increased job opportunities and training for local workers, including for vulnerable groups.

Potential negative impacts during construction of the Project would include:

- Potential increases in stress and anxiety in the community regarding the scale of development and change, including added pressure to access affordable housing, accommodation and community services (including medical facilities) due to the temporary increase in population. It should be noted that, should the proposed worker accommodation facility be constructed following appropriate consultation, this would reduce the pressure on local accommodation and housing.
- Potential impacts to the existing community dynamics and social networks due to an influx of workers, which has the potential to affect community perceptions about what this may mean for the long-term composition and cohesiveness of the community.
- Temporary reduction in social amenity during construction from dust, noise and vibration impacts may result in health impacts on vulnerable community members.
- Temporary impacts on visual aesthetics due to construction activities, increased traffic, potential hoarding on access roads (refer to Section 6.1 for the anticipated visual impacts of the Project).
- Perceived impacts and concerns about changes to rural amenity due to new infrastructure development impacting people's sense of place (refer to Section 6.1 for the anticipated visual impacts of the Project).
- Temporary increased public safety risks due to increased heavy vehicles on the local road network and changed road conditions (refer to Section 6.7 for the anticipated traffic and transport impacts of the Project).
- Impact to the accessibility of social infrastructure and availability of services due to increased population/demand for services.
- Temporary increased travel times causing day-to-day disruption due to increased traffic and potential road closures or detours.
- Potential access disruptions for traffic moving through the Wallerawang and Lithgow urban centres and localities which may affect local amenity.
- Increased perceived impacts to Aboriginal cultural heritage items due to the Project (refer to Section 6.5 for the anticipated Aboriginal heritage impacts of the Project).
- Perceived reduction in local biodiversity values, threatened species, native flora and hollow-bearing trees due to construction activities (refer to Section 6.2 for the anticipated biodiversity impacts of the Project).
- Impacts on social licence due to community engagement activities being perceived as tokenistic by community members.

6.4.2.2 Operation

Potential positive operational impacts of the Project would include:

- Improved sustainability and enhanced resilience due to community investment initiatives as part of the Project. The Project would contribute to the emissions reductions required to support those being affected by climate change.
- Improved intergenerational equity due to wind farms being used as an alternate energy source resulting in community cohesion and renewable energy solutions.
- A potential positive shift towards a more sustainable and resilient community which may change the way the community interacts.
- Improved resilience of the regions electrical supply and infrastructure network leading to an improved quality of life.

Potential negative operational impacts of the Project would include:

- Negative perceptions regarding Project opportunities and increased risk of distributive inequity perceptions. Differing perceptions on renewable energy and Project benefits and resident population changes can create distributive inequity perceptions where stakeholders believe that landholders who host turbines are compensated while neighbouring landholders must experience the Project impacts with no compensation.
- Impacted visual aesthetics due to WTGs as part of landscape and reduced local amenity with changes in how people experience their surroundings (refer to Section 6.1 for the anticipated visual impacts of the Project).
- Perceived negative impacts to local biodiversity values and threatened species due to the operation of WTGs (refer to Section 6.2 for the anticipated biodiversity impacts of the Project).
- Increased potential of and perceived impacts to telecommunications, navigation, radar services, health and wellbeing, including electromagnetic interference, blade throw and noise due to operation of WTGs.
- Potential for stakeholders to question the scale of benefit likely to be experienced locally given the expected small operational worker numbers.
- Increased concern that decommissioning activities may result in noise, dust, traffic impacts, and waste production, resulting in environmental impacts.

6.4.3 Assessment approach

A detailed assessment of social impacts in accordance with the *Social Impact Assessment Guideline* (NSW Department of Planning and Environment, 2023b) would be required as part of the EIS which would need to consider the outcomes of community and stakeholder engagement. As part of the EIS, future stages of the socio-economic impact assessment for the Project would include a detailed prediction and assessment of positive and negative impacts. Informed by community and stakeholder engagement, a detailed social impact assessment would identify relevant strategies to mitigate the Project's negative impacts and opportunities to enhance its positive impacts. Further community and stakeholder engagement and technical and environmental studies would provide evidence to inform the detailed assessment of the Project's positive and negative impacts.

Opportunities and issues for further assessment include:

- Proactively addressing the potential for negative community perceptions, including as a result of the influx of transient workers within the region
- Identifying benefit sharing initiatives or potential neighbour programs (including financial compensation) within the community
- Providing opportunities to improve social outcomes, including through engagement with the Aboriginal community to incorporate their views on the Project design, delivery and potential local community benefits

- Assessing appropriate accommodation facilities or temporary housing options for the influx of workers during the construction and operation phases through the engagement of community members and service providers
- Informing the design of a local employment and procurement plan.

6.5 Aboriginal heritage

6.5.1 Existing environment

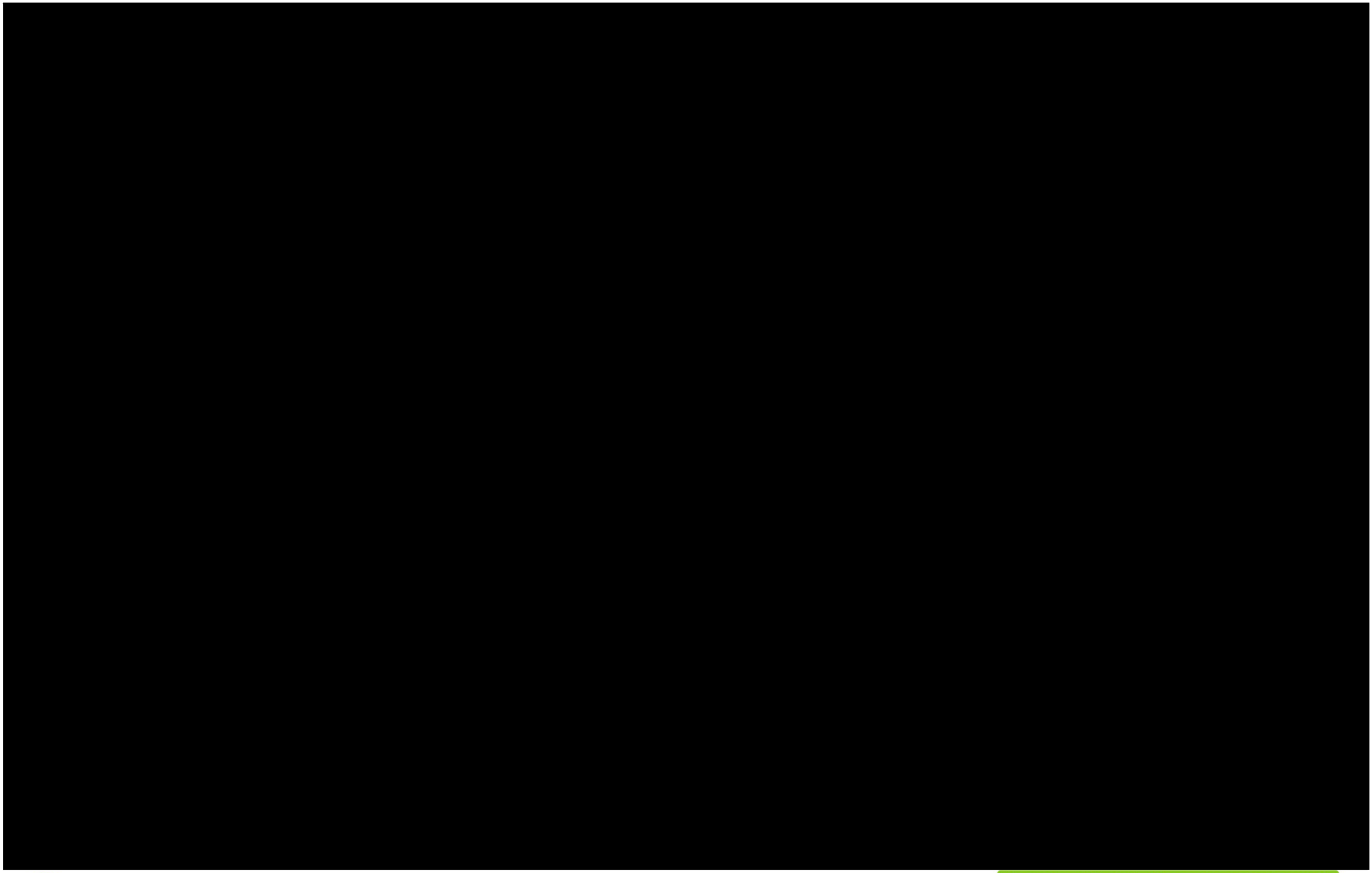
The Project area falls within the eastern extent of the lands occupied by the Wiradjuri Nation. Due to the location of the Project area at the western base of the Blue Mountains it has often been referred to as a zone of interaction between the Wiradjuri, the Dharug to the east and the Gundungurra people to the south (Bowdler, 1983). The Wiradjuri Nation was known as the land of the three rivers, including the Wambool (now known as the Macquarie River), the Kalare (now known as the Lachlan River) and the Murrumbidjeri (modern spelling - Murrumbidgee). A search of the registers maintained by the National Native Title Tribunal indicates that the Warrabinga-Wiradjuri #7 Native Title Claim (Tribunal ID: NC2018/002) is about 500 m east of the Project area.

Bathurst Local Aboriginal Land Council is the Local Aboriginal Land Council for the Project area.

The Blue Mountains offered a variety of resources to Aboriginal people, including plants, animals and stone material. Gunyahs or bark huts were usually made from the broad-leafed paperbark, box or stringybark trees and were constructed mostly by women. They were generally located close to a reliable water source or opportunistically situated on trade routes. Rock shelters are common in the Blue Mountains region and would likely have been occupied periodically as shelter or in association with camp sites, and were commonly used for sleeping, eating, tool making, social activity and as a base for hunting and gathering.

A search of the Aboriginal Heritage Information Management System (AHIMS) carried out on 4 December 2024 identified seven Aboriginal sites located within 1 km of the Project area (refer to Figure 6-6). [redacted]

The Project area is located within the Central Tablelands region which is defined by a flat plain elevated by uplift. The topography of the Project area is typified by a hilly landscape, with slopes rising between 1,000 and 1,200 m in the east towards the summit of Mount Lambie. Within the Project area there are a number of permanent sources of water which would have led to a range of different environmental contexts and a diversity of available resources for the local Aboriginal groups. Therefore, the topography of the Project area and its distance to reliable water sources (including Native Dog Creek, Watercress Gully, Deadmans Creek and Lawsons Creek) indicate it is likely to have been used for camping activities and a resource gathering area. Therefore, there is a high likelihood that archaeological material or sites reflecting intensive use by Aboriginal people would be located in the Project area.



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(Image redacted to protect sensitive site locations)

Projection: GDA2020 MGA Zone 55

Figure 6-6: AHIMS search results of the Project area

6.5.2 Potential impacts

6.5.2.1 Construction

There are several known areas of archaeological sensitivity, such as registered Aboriginal sites and waterways present within the Project area. Specifically, there is an increased potential for Aboriginal sites to occur within 50 m of registered Aboriginal sites and 200 m either side of waterways. There is a moderate potential for Aboriginal cultural heritage sites to occur adjacent to these areas of increased archaeological sensitivity, and a low potential for Aboriginal cultural material to occur further away from known Aboriginal sites and sensitive landforms. [redacted]

The construction of the Project would involve ground disturbance for the establishment of Project infrastructure and temporary construction infrastructure. Given the above, there is increased potential for unidentified Aboriginal sites to be impacted during construction.

6.5.2.2 Operation

Operation of the Project is unlikely to impact on Aboriginal cultural heritage. Operational activities would involve traversing the Project area on already disturbed access tracks, meaning minimal soil disturbance or impacts to the landscape would occur.

6.5.3 Assessment approach

An Aboriginal Cultural Heritage Assessment Report (ACHAR) would address the assessment of Aboriginal cultural heritage values potentially impacted by the Project. Preparation of the ACHAR would include consultation with Registered Aboriginal Parties, along with Elders and Knowledge Holders of the region.

The ACHAR would be prepared in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010a), the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (Office of Environment and Heritage (OEH), 2011) and the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010b). The preparation of the ACHAR would include, but not be limited to, further background research to formulate a predicative model for the Project area, field surveys, and assessment of the significance of any recorded Aboriginal sites, objects, or places likely to be impacted by the Project, in consultation with Registered Aboriginal Parties, Elders and Knowledge Holders of the region.

Additionally, design development may be required to relocate WTGs or other Project infrastructure should they intersect with areas containing Aboriginal heritage in the current layout.

6.6 Historic heritage

6.6.1 Existing environment

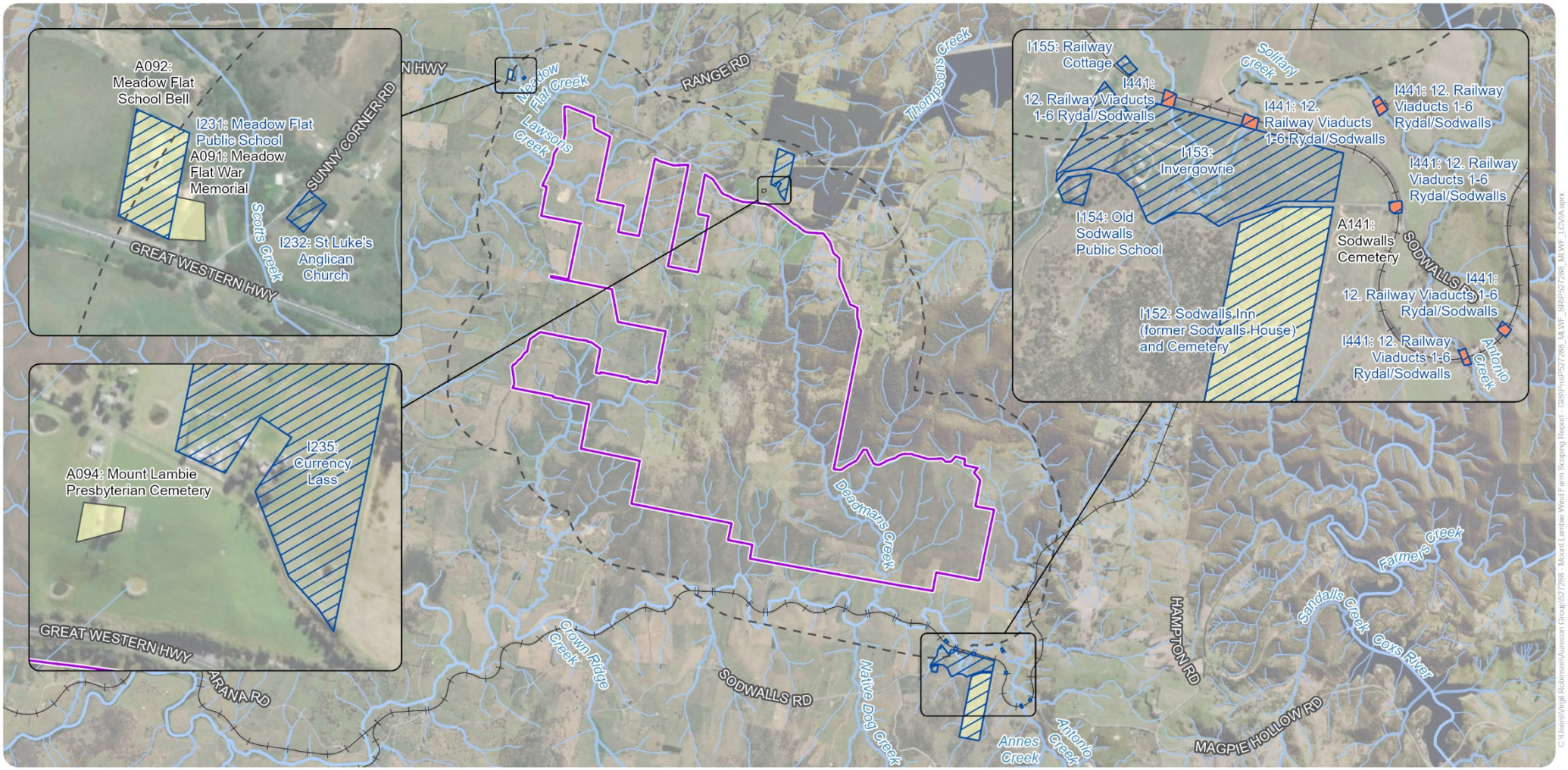
Non-Aboriginal land use of the greater Lithgow region was driven by the increasing need for new grazing land as settlement expanded in the Cumberland Plain and Hawkesbury region. In the late 1830s, pastoralism had become the dominant economic activity in the greater Lithgow region, which led to the construction of essential infrastructure such as stockyards, shearing sheds and homesteads which became essential for the rural economy to grow. Mount Lambie served as a critical junction for stock routes which led to Mount Lambie's emergence as a key location for pastoralism, transport, and mining.

A desktop search of relevant historic heritage registers was undertaken on 5 December 2024. The following historic heritage registers were searched:

- World Heritage List
- State Heritage Register (SHR)
- Lithgow Local Environmental Plan (LEP)
- National Heritage List
- Commonwealth Heritage List
- Register of the National Estate
- National Trust Register.

A search of the relevant registers indicated that there are no historic heritage items in the Project area. However, 12 heritage items are located within 1 km of the Project area, refer to Figure 6-7. These include the following:

- Rydal rail underbridges (SHR #01053, LEP #I441), which are noted for their engineering and historical value and located about 900 m south of the Project area
- Sodwalls Cemetery (LEP #A141) which is located 350 m south of the Project area
- Railway Cottage (LEP #I155) which is located about 900 m south of the Project area
- Invergowrie (LEP #I153) which is located about 900 m south of the Project area (receiver R44)
- the Old Sodwalls Public School (LEP #I154) which is located about 1 km south of the Project area
- Sodwalls Inn (former Sodwalls House) and Cemetery (LEP #152), located about 1.4 km south of the Project area
- Meadow Flat School Bell (LEP #A092), located approximately 950 m north-west of the Project area
- Meadow Flat Public School (LEP #I231), located approximately 950 m north-west of the Project area
- Meadow Flat War Memorial (LEP #A091), located approximately 950 m north-west of the Project area
- St Luke's Anglican Church (LEP #I232), located approximately 750 m north-west of the Project area
- Mount Lambie Presbyterian Cemetery (LEP #A094), located approximately 200 m north of the Project area
- Currency Lass (LEP #I235), located about 160 m north of the Project area.



Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

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Projection: GDA2020 MGA Zone 55

Figure 6-7: Historic heritage listings within and nearby the Project area

6.6.2 Potential impacts

6.6.2.1 Construction

The presence of the nearby heritage-listed railway infrastructure and the area's history of agricultural use suggests that subsurface archaeological deposits or remnants of historical buildings could be present, even if not immediately visible in the current landscape. It is not likely impacts would result to any known heritage sites. However, given there is the potential for remnant historic heritage sites or areas of archaeological potential to be present within the Project area, it is anticipated that the construction of the Project could result in historic heritage impacts. Ground disturbance activities would relate to the construction of WTGs, access tracks, the BESS, substation/s and construction compounds/laydown areas.

6.6.2.2 Operation

The operation of the Project is unlikely to result in historic heritage impacts. Ongoing access to the Project area and the WTGs would be via the proposed access tracks, which would not impact any areas of known historic heritage or archaeological potential.

6.6.3 Assessment approach

There are no recorded historic heritage sites or areas of historic archaeological potential within the Project area. However, it is recommended that an Historic Heritage Assessment of the Project area be undertaken to ground truth the presence or absence of historic heritage sites during the EIS. The assessment would be undertaken in accordance with the *Historical Archaeology Code of Practice* (Heritage Council, 2006).

6.7 Traffic and transport

6.7.1 Existing environment

The Great Western Highway runs along the north of the Project area, Sodwalls Road is south of the Project area, Stacks Road is east of the Project area and Curly Dick Road intersects the western boundary of the Project area. Both ends of Lawsons Lane connect to the Great Western Highway at the north of the Project area.

Primary access options to the Project area include from the Great Western Highway, Lawsons Lane, or Curly Dick Road (refer to Figure 3-2). The Great Western Highway is a two to three lane sealed road with an average daily traffic count of 8,457 vehicles at Meadow Flat (78 per cent light vehicles and 22 per cent heavy vehicles). Curly Dick Road is a two lane sealed road. Lawsons Lane is a single lane sealed road.

Four site access options have been identified to provide access to the Project area, with the final number of access points to be determined as the detailed design is developed. Access point options include:

- A new access track off the Great Western Highway to the east of the unnamed Crown access road, situated on predominantly cleared land.
- An existing privately owned, unnamed Crown access road. Vegetation clearing and widening of the Crown access road would be required. The Crown road is a one-lane unsealed road.
- A track from Lawsons Lane, which connects to the Great Western Highway. This may include utilising part of an existing unsealed access track, as well as construction of new sections of track.
- Construction of a new access track connecting to an existing driveway off Curly Dick Road.

Existing access tracks within the Project area connect existing dwellings, farmland and associated infrastructure with the Great Western Highway (via the unnamed Crown road). New access tracks would be constructed on predominantly cleared land to connect Project area access points to the existing access track network and Project infrastructure.

OSOM deliveries to the Project area would likely be from the Port of Newcastle (via Golden Highway, Castlereagh Highway and Great Western Highway). Other delivery routes may be from Port Botany (via Great Western Highway) or Port of Geelong (via Princes Highway, Hume Highway, Olympic Highway, Great Western Highway).

6.7.2 Potential impacts

6.7.2.1 Construction

As discussed in Section 3.4.4, the WTG components would likely be transported to the Project area via the Port of Newcastle. The transportation of WTGs would impact the road network from the nominated port to the Project area given the size of the WTGs (up to about 100 m long). OSOM vehicles would be required for the transportation of the WTGs, meaning the road network between the nominated port and the Project area would need to be able to cater for vehicles of this size. Figure 3-3 shows the possible access routes to the Project area. A traffic and transport impact assessment would be carried out during the preparation of the EIS. This would consider the transport route for the WTGs, including swept path analysis to determine if existing roads would be sufficient or if upgrades would need to be made.

Due to the size of WTGs, upgrades to public roads may be required for their transportation to the Project area. As outlined in Section 6.7.1, the main access to the Project area would be via the Great Western Highway, and/ or via Curly Dick Road.

Both existing access tracks and new access tracks would be used within the Project area. Widening of existing access tracks would be required during construction, but this would result in negligible traffic impacts. New access tracks would connect existing access tracks and access points to the proposed infrastructure within the Project area, also resulting in negligible traffic impacts.

The transportation of WTG components would result in a temporary increase in the number of heavy vehicles on the Great Western Highway, Castlereagh Highway and Golden Highway. Heavy vehicles coming from Port Botany or the Port of Newcastle would need to travel through a number of towns situated along the routes shown in Figure 3-3, meaning potential minor delays for vehicles using main and local roads would be experienced.

During the construction of the WTGs, BESS and associated Project infrastructure, it is anticipated that there would be a minor increase in the number of heavy and light vehicles accessing the Project area, which would be associated with the delivery of equipment and workers accessing the site. Workers are expected to travel to the Project area from Wallerawang, Lithgow and Bathurst. Should a temporary accommodation facility be provided within the Project area, light vehicle movements for construction workers entering and leaving the Project area would be minimal.

6.7.2.2 Operation

Six to eight site-based workers are anticipated to be required during the Project's operation, which would result in a very minor increase in vehicles utilising the Great Western Highway, and Curly Dick Road throughout operation. This number of workers is not anticipated to result in traffic delays or congestion on roads surrounding the Project. The internal access track network would also continue to be used for operational purposes, which is expected to have a negligible impact on property owners. Additionally, light vehicles used by operational workers are not anticipated to materially increase traffic in nearby townships such as Rydal, Wallerawang, Portland, Lithgow and Bathurst.

6.7.3 Assessment approach

A traffic and transport assessment would be required during the EIS. Impacts from the Project would be assessed by analysing traffic on the existing road and freight network and considering road safety. Construction and operational impacts would be assessed by reviewing expected construction activities and generated traffic volumes, haulage routes and distribution of construction traffic, and the impact of activities on road network performance, road access and safety, and public and active transport.

The existing road network would be characterised, including the existing road capacity, daily and peak traffic volumes and the proportion of light and heavy vehicles. A study to assess the suitability of potential routes for transportation of heavy and/or oversized equipment, largely relating to the transportation of WTG components from port/s to the Project area, and the need for road upgrades, following swept path analysis, would also be carried out.

6.8 Soils and contamination

6.8.1 Existing environment

The Project area is currently used for agricultural and farming purposes, and the landscape is comprised of plateaus, with areas of forest and woodland. Additionally, the Project area intersects numerous watercourses, including Deadmans Creek (which flows north to south through the Project's central-eastern area), Lawson's Creek in the northern extent, and tributaries of Solitary Creek in the south-eastern extent.

The Project area is mapped as sensitive land under Section 7.7 of the Lithgow LEP. The LEP aims to protect, maintain and improve the diversity and stability of landscapes, including via restriction of development on land with slopes greater than 25 per cent, land subject to high erosion potential, land subject to salinity or impeded drainage, land subject to regular of permanent inundation, or any significant karst environment.

A review of the geology and soils mapping for the region indicates that the Project is located within the Hill End subregion of the South Eastern Highlands bioregion (Commonwealth DCCEEW, 2024). The characteristics of this subregion are outlined in Table 6-9, with soils being slightly acidic.

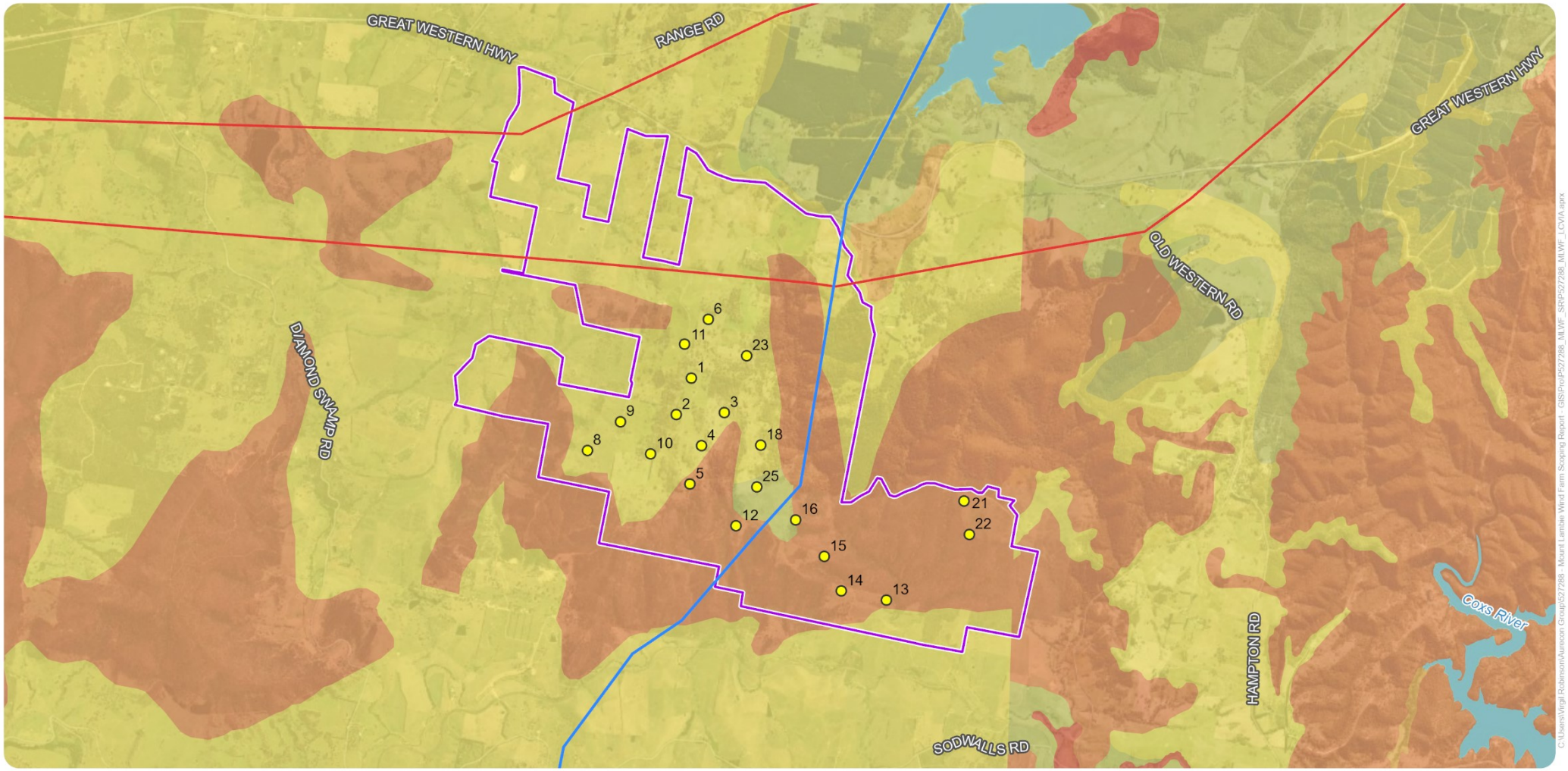
Table 6-9 Characteristics of the Hill End subregion of the South Eastern Highlands bioregion

Feature	Description
Geology	Silurian and Devonian slates, sandstones and volcanics with numerous quartz veins. Steeply dipping, tightly folded sequence. Tertiary basalt caps with river gravels parallel to the main streams.
Landform	Plateau with hilly to mountainous edges into deep entrenched channels of Turon and Macquarie River cutting across the structural trends.
Soils	Mottled red and yellow texture contrast soils, with red earths.

The Project area is mapped as having moderate-severe limitations (i.e. the land has moderate to severe limitations for high impact land uses such as cropping, high-intensity grazing and horticulture) to extremely severe limitations (i.e. the land has severe limitations that restrict most land uses and there should be minimal disturbance of native vegetation) (OEH, n.d.). Land and soil capability is shown in Figure 6-8.

A review of the NSW Environment Protection Authority (EPA) contaminated land register on 19 August 2024 (NSW EPA, 2024) revealed no recorded contaminated sites within 5 km of the Project area.

However, there could be potential hazardous materials and contaminants within the Project area due to its existing and past land use. Potential hazardous materials and contaminants would be associated with farming practices and equipment. These could include pesticides, oils, petroleum, lubricating oil and miscellaneous cleaning chemicals. These hazardous materials would largely be contained near existing dwellings or farm sheds which are scattered throughout the Project area. Further details on the storage and handling of hazardous materials are included in Section 6.10.2.



Project area

Mount Lambie Wind Farm Infrastructure

Turbine location

Existing transmission

132kV line

500kV line

Land and Soil Capability

4 - Moderate to severe limitations

5 - Severe limitations

6 - Very severe limitations

7 - Extremely severe limitations

8 - Extreme limitations

Water

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Global Wind Atlas, Esri Basemap

1:75,000

0 0.9 1.8 km

Projection: GDA2020 MGA Zone 55

Figure 6-8: Land and soil capability

6.8.2 Potential impacts

6.8.2.1 Construction

Construction of the Project would involve the establishment of WTGs, the BESS facility, meteorological mast/s, substation/s, access tracks, an internal collector network, other operational and maintenance infrastructure (including site offices, parking, amenities, construction compound/laydown areas, operational and maintenance facilities such as storage and equipment sheds) and temporary infrastructure areas (including construction compounds, a worker accommodation facility and laydown and stockpile areas). Establishment of the WTGs would involve soil disturbance at the WTG locations outlined in Figure 3-2.

Given that these areas are considered to have moderate-severe to extremely severe soil limitations, it is anticipated that negligible impacts to soil health would result from the construction of WTGs, however further assessment would be required using the design of footings and hardstands at the base of each WTG at each location.

Similar negligible impacts to soil health are anticipated for the establishment of BESS infrastructure and temporary construction areas, while minor impacts are expected from construction of the internal collector network.

Erosion risk is mapped as being low to high, with high erosion risk present within areas of high slope in the central Project area (eSPADE, 2024). Given WTGs are planned to be built within areas of low-moderate to high erosion risk, erosion risk from the establishment of WTGs is anticipated to be moderate. Further investigations during the EIS phase would be required to confirm this.

Site rehabilitation would occur following construction for areas used temporarily during construction, including construction compounds and laydown areas, and operation and maintenance facilities. Both existing access tracks and new access tracks would be used during construction and operation. Widening of existing access tracks and construction of new tracks would be required during construction, which would require soil disturbance. Additionally, earthworks would be required during trenching works and the establishment of underground cabling.

Contamination impacts during the construction of the Project would be limited to potential leaks of fuels and oils from construction vehicles and equipment. These impacts would be minor and could be avoided through the implementation of standard management measures. Potential hazardous materials and contaminants associated with farming practices and equipment may be encountered within the Project area. If encountered, standard management measures will be implemented to manage potential risks. This would be investigated further during the EIS phase.

6.8.2.2 Operation

Operation of the Project would involve minimal soil disturbance. Existing access tracks, which would have been widened during construction, and new access tracks would continue to be used for workers accessing the WTG and BESS locations during operation. Similar to construction, contamination impacts would be limited to potential leaks of fuels and oils from vehicles and equipment, however these impacts would be minor and could be avoided through the implementation of standard management measures. It should also be noted that the Project area is relatively steep, with headwaters of Solitary Creek throughout the Project area. As such, it is considered possible that accidental spills that enter overland flows may reach sensitive receiving environments.

6.8.3 Assessment approach

A detailed soils and contamination assessment would be required during the EIS stage. Subsurface geotechnical investigations would be required during the EIS stage to provide information for the design of footings and hardstands for the WTGs and for the construction of BESS infrastructure. A qualitative assessment of likely contamination impacts during the construction and operation of the Project is proposed during the EIS stage.

6.9 Water and hydrology

6.9.1 Existing environment

The Project area is located within the Murray-Darling Basin in the headwaters of the Macquarie River catchment, around 28 km east of the Macquarie River. Numerous watercourses run through the Project area, however most are minor in nature (ranging from first to third order streams). Deadmans Creek and an unnamed tributary of Solitary Creek, which are fourth order streams, run through the central Project area and flow into Solitary Creek, a fifth order stream located south of the Project area. Lawsons Creek, a fourth order stream, flows through the northern section of the Project area, flowing into Meadow Flat Creek/ Diamond Swamp Creek (a fifth order creek), which runs south adjacent to Curly Dick Road before flowing into Solitary Creek as it transitions into a sixth order stream. Solitary Creek flows to Fish River, a tributary of Macquarie River located around 6.3 km south-west of the Project area (refer to Figure 6-4). The Project area lies to the west of the Sydney drinking water catchment.

Lake Lyell is a constructed lake located around 4 km east of the Project area. It was originally built to support local power stations and currently provides cooling water for Mount Piper Power Station. It is within the Hawkesbury-Nepean catchment area. Thompsons Creek Dam is approximately 1.8 km north of the Project area. It was constructed to support local power stations and is currently primarily used as an off creek water storage for Mount Piper Power Station. It is within the Hawkesbury-Nepean catchment area.

The Project is on land mapped as riparian land and watercourses, and areas of high groundwater vulnerability under the Lithgow LEP. Key fish habitat is mapped along multiple third and fourth order streams and farm dams within the Project area (refer to Figure 6-4).

The Project area includes numerous farm dams that contain varying levels of water. There are five registered groundwater bores located within the Project area based on a desktop review of the MinView Geological Survey of NSW on 19 August 2024 (Bureau of Meteorology, 2023). The bores are located in the western extent of the Project area. The Project is not mapped as a flood planning area (as defined in the Flood risk management manual (DPE, 2023c)) under the Lithgow LEP.

6.9.2 Potential impacts

6.9.2.1 Construction

Water usage for the Project would be predominantly for civil foundations and concrete, potable construction worker consumption, compaction during earthworks and dust suppression. Water and hydrology impacts associated with the construction of the Project may include:

- Potential changes to surface water runoff associated with earthworks required for the construction of WTG foundations, the BESS facility, substation/s and temporary construction infrastructure. There would be potential for altered runoff conditions through the obstruction of overland flows and through increased runoff potential due to vegetation removal and the establishment of hardstand areas.
- Potential water quality impacts associated with accidental spills or leaks from construction vehicles and equipment or from stored construction and waste materials.
- Minor impacts to local water supply through increasing demand for water in the area.
- Impacts on the quantity and quality of groundwater through potential spills or leaks from construction vehicles, or ground disturbing activities during construction of WTG foundations.

As is noted in Section 6.8.2, the Project area is relatively steep, with multiple streams and farm dams.

No hydrological impacts are expected to occur to Lake Lyell, Thompsons Creek Dam or the Sydney drinking water catchment as a result of the Project.

6.9.2.2 Operation

Water and hydrology impacts during operation would be limited to minor increases in surface water runoff due to increased overland obstructions and increased hardstand areas, as well as potential water quality impacts due to leaks or spills from the operation of equipment and vehicle use.

Due to the low volume of water required for operational purposes, impacts are expected to be negligible. The operation and maintenance workforce is anticipated to be six to eight workers and therefore impacts on potable local water supply are anticipated to be negligible.

6.9.3 Assessment approach

A qualitative water and hydrology assessment would be prepared as part of the EIS. The water and hydrology assessment would investigate potential impacts to erosion and sediment, water availability, and potential pollution of watercourses and groundwater during construction. A detailed Soil and Water Management Plan would also be proposed prior to the Project beginning construction.

The EIS would determine appropriate water-related mitigation and management measures to be implemented to ensure that all potential water and hydrology impacts are dealt with to address matters outlined within the SEARs.

6.10 Hazards and safety

Desktop assessments of the relevant hazards and safety aspects of the Project's construction and operation have been carried out. This section details the potential impacts of the below potential hazards and safety risks:

- Aviation safety
- Hazardous materials and dangerous goods
- Electromagnetic fields (EMF)
- Telecommunications
- Blade throw
- Bushfire.

6.10.1 Aviation safety

The Project would need to consider the potential for interactions with aviation. The location and heights of WTGs would need to consider potential safety hazards for aviation including impacts on air space and navigational equipment for aircraft.

The International Civil Aviation Organisation and Civil Aviation Safety Authority (CASA) definition of an aerodrome is generic to all areas suitable for the arrival, departure, and surface movement of aircraft. There are two types of aerodromes: certified and non-certified. Certified aerodromes are aerodromes that require certification under the Civil Aviation Safety Regulations 1998. Part 139 of the Civil Aviation Safety Regulations 1998 sets out requirements and standards for certified aerodromes, including standards for facilities, obstacle control, operational procedures and safety management.

There are three certified aerodromes located within 30 nautical miles (55.6 km) of the Project area, as shown in Figure 6-9:

- Bathurst Airport – located on the eastern side of Bathurst, approximately 6 km from Bathurst's CBD on Russell Street and operated and maintained by Bathurst Regional Council. It is used by government and private aircraft, which may include emergency services. It had commercial flights up until 2023. Based on the preliminary Project layout, the closest WTG to Bathurst Airport is located approximately 27 km north-west of the airport.
- Katoomba Airfield – located approximately 5 km north of Katoomba CBD in the suburb of Medlow Bath. There are currently no companies operating at the airfield, however it is available for use by emergency services. Based on the preliminary Project layout, the closest WTG to Katoomba Airfield is approximately 35.5 km to the north-west of the airport.
- Pipers Airfield – located to the north-east of Bathurst, approximately 7 km from the CBD, and operated and maintained by Bathurst Soaring Club. The airport provides recreational flying (gliding), including pilot training courses. Based on the preliminary Project layout, the closest WTG to Pipers Airfield is approximately 40 km to the south-east of the airport.

No in-use non-certified aerodromes within or in close proximity to the Project area (i.e. three nautical miles (5.56 km)) have been identified, as shown in Figure 6-9. One mapped non-certified aerodrome has been identified within the Project area, however the landholder has confirmed that it is not in use. Non-certified aerodromes (or aircraft landing areas (ALAs)) are not regulated by CASA.

Construction and operation of the Project may result in aviation safety risks and affect the operation of Bathurst Airport, Katoomba Airfield, Pipers Airfield, which are within 30 nautical miles of the Project area. Potential safety risks may be associated with intrusions into the airspace or potential effects on navigation instruments. The nearby ALAs are not likely to be impacted given their buffer distance from the Project area.

An Aviation Impact Assessment would be carried out for EIS to assess potential impacts on aviation safety and the use of Bathurst Airport, Katoomba Airfield and Pipers Airfield. The Aviation Impact Assessment would include, but would not be limited to, consideration of:

- Potential impacts on:
  - aerodromes, operational airspace, air traffic routes, height procedures, radar and communications systems and navigation aids
  - aviation safety, including wake/turbulence issues
  - aerial emergency services and aerial agricultural operations.
- Consultation with CASA, Airservices Australia, the Department of Defence, aerodrome operators, emergency services, and ALA owners.
- The need for mitigation strategies, such as obstacle lighting on WTGs in accordance with *AS ISO 31000:2018 Risk Management – Guidelines*, and notification and reporting requirements.

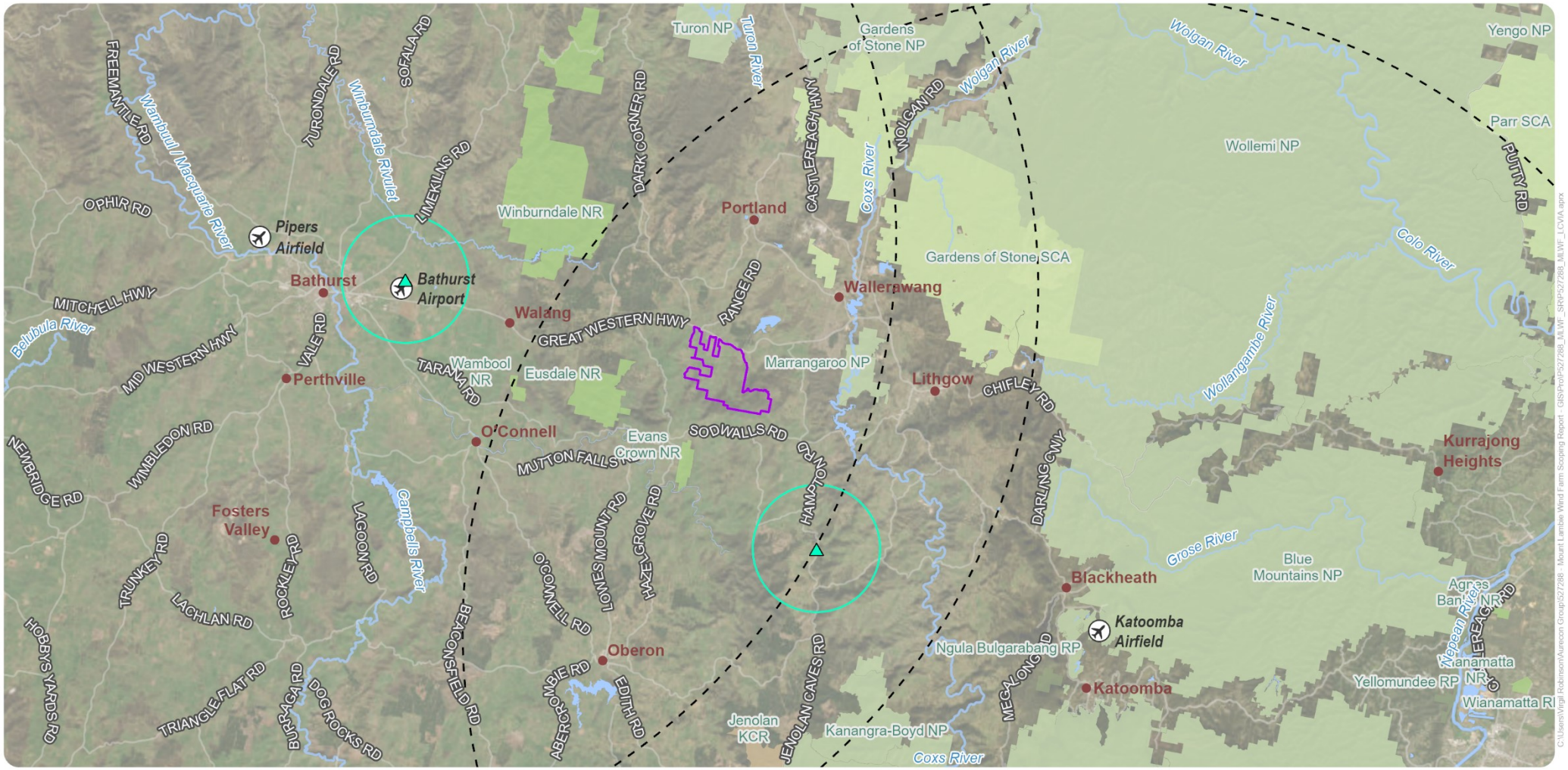


Figure 6-9: Certified and non-certified aerodromes

6.10.2 Hazardous materials and dangerous goods

Any dangerous goods associated with the Project would be stored and handled in accordance with the relevant Australian Standards and relevant legislation. Dangerous goods are anticipated to largely relate to fuels and lubricants. The risks associated with dangerous goods and materials would be appropriately mitigated and managed through the application of standard environmental controls and practices.

Fuels and lubricants associated with the operation of vehicles and equipment and the maintenance of WTGs and the BESS infrastructure would be stored appropriately and would not pose any additional risks.

6.10.3 Electromagnetic fields

EMF are present where electric current flows, including overhead and underground transmission lines, substations and electrical appliances. The Project would involve the generation of EMF during operation from the proposed transmission lines and substation. 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 would include an assessment of potential EMF and would consider potential health issues and risks associated with EMF produced during operation in accordance with the International Commission on Non-Ionizing Radiation Protection *Guidelines for Limiting Exposure to Time-varying Electric, Magnetic and Electromagnetic Fields* (1998).

6.10.4 Telecommunications

Telecommunications and radar services (civil and meteorological) could be impacted by WTGs through electromagnetic interference (EMI). Local telecommunications infrastructure includes a Telstra tower on top of Mount Lambie, approximately 750 m east of the Project area.

The EIS would include an assessment of EMI, which would address any impact to radiocommunication services within and surrounding the Project area, including the Telstra tower as required, as a result of the Project and identify any required mitigation measures.

6.10.5 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 would be addressed through refinements to the WTG design and layout. The EIS would include an assessment of the potential risk of blade throw associated with the proposed WTG layout.

The assessment would include:

- An assessment of the likelihood of blade throw occurring and a review of typical blade throw distances
- Calculation of the separation distance between WTGs, the BESS, nearby structures and property boundaries
- Consideration of mechanisms to reduce the likelihood of blade throw occurring.

6.10.6 Bushfire

Bushfire prone land mapping indicates that the Project area is located on bushfire prone land. The Project area is largely mapped as Vegetation Category 1 and Vegetation Category 3. As such, the Project area is considered to have both high bush fire risk vegetation in Category 1 areas and low bush fire risk vegetation in Category 3 areas (NSW Rural Fire Service (RFS), 2015).

A bushfire threat assessment would be carried out in accordance with the requirements of *Planning for Bushfire Protection 2019* (NSW RFS, 2019) as part of the EIS. The bushfire threat assessment would consider fire risk and would identify potential fire ignition sources. Consultation with the NSW RFS would be undertaken during the preparation of the EIS to inform the bushfire threat assessment.

6.11 Cumulative impacts

6.11.1 Existing environment

The *Cumulative Impact Assessment Guidelines for State Significant Projects* (DPE, 2022c) guide the identification of relevant future projects and the assessment of potential cumulative impacts for SSD projects. As discussed in Section 2.2.4, the relevant future projects that could have cumulative impacts when considered with the Project include:

- Sunny Corner Wind Farm
- Central West Pumped Hydro
- Mount Piper to Wallerawang Transmission Line Upgrade Project
- Angus Place West
- Mount Piper Battery Energy Storage System
- Lake Lyell Pumped Hydro Energy Storage Project
- Wallerawang Battery Energy Storage System
- Great Western Battery Energy Storage System
- Glanmire Solar Farm
- Eglinton Solar Farm
- Ben Bullen Wind Farm
- The Pines Wind Farm
- Paling Yards Wind Farm.

There is one operating wind farm within the Lithgow City LGA, the Hampton Wind Park, about 14 km south of the Project. Hampton Wind Park consists of two 74 m WTGs and was commissioned in 2002 as an early demonstration wind farm site. Given the relatively small scale and size of the Hampton Wind Park, it is unlikely that it would contribute to increasing the impact of the Project.

The next closest proposed, approved or operating wind farm is the Sunny Corner Wind Farm, which is proposed to be located about 3.5 km north west of the Project. Given the proposed size of the wind farm, the timing of construction, and its proximity to the Project, cumulative impacts will need to be considered.

The following closest proposed, approved, or operating is the operational Crudine Ridge Wind Farm located in the Bathurst Regional LGA, about 62 km north-west of the Project. Given the distance, it is unlikely that it would contribute to increasing the impact of the Project.

6.11.2 Potential impacts

Relevant cumulative impact assessment matters for each relevant future project have been detailed in Table 6-10.

The potential for cumulative impacts associated with the Project and the relevant future projects may include cumulative socio-economic, traffic and transport impacts, noise impacts, landscape character and visual impacts and biodiversity impacts.

Table 6-10 Relevant future projects and cumulative considerations

Relevant future project	Project description	Approximate distance to the Project	Status	Potential overlap
Sunny Corner Wind Farm	The Sunny Corner Wind Farm is a proposed wind farm to be located about 3.5 km north-west of the Project area within Sunny Corner State Forest. The project is expected to have an output of about 500 MW and have a lifespan of approximately 30 years.	Approximately 3.5 km north-west of the Project area	▪ Scoping Report submitted	Construction is expected to commence in about 2028.
Central West Pumped Hydro	The Central West Pumped Storage Hydro Project is a proposed energy storage facility to be located in Yetholme, between Bathurst and Lithgow in the Central West region of NSW. The project is expected to have a total output of 325 MW, with an 8 hour, 2,600 MWh storage capacity. The reservoir will be three gigalitres in capacity. Transmission will be via the Transgrid network.	Approximately 9.5 km west of the Project area	▪ Prepare EIS	Construction was due to commence in 2024 and will take approximately 42 months, therefore likely overlapping construction programs.
Mount Piper to Wallerawang Transmission Line Upgrade Project	This project involves the delivery of a new 300 kV transmission line between the existing Mount Piper and Wallerawang substations.	Approximately 12 km north-east of the Project area	▪ Prepare EIS ▪ Project determination expected late 2024	Construction due to commence in 2026, therefore likely consecutive construction programs.
Angus Place West	The project involves the development of bord and pillar mining in two new mining areas and the continued operation of the Angus Place Colliery pit top.	Approximately 15 km north-east of the Project area	▪ Prepare EIS	Not applicable
Mount Piper Battery Energy Storage System	This project involves the utilising nearby, existing electricity infrastructure to develop a grid-scale battery with the capacity to dispatch up to 500 MW of power to the network over a duration of four hours.	Approximately 12 km north-east of the Project area	▪ Approved November 2024	18-24 month construction program from 2025, therefore unlikely consecutive construction programs
Lake Lyell Pumped Hydro Energy Storage Project	Construction of a 335 MW pumped hydro scheme.	Approximately 6 km east of the Project area	▪ Prepare EIS	4 year construction program commencing in 2025 and concluding in 2029, therefore likely consecutive construction programs
Wallerawang Battery Energy Storage System	Construction of a 335 MW pumped hydro scheme	Approximately 12 km north-east of the Project area	▪ Approved August 2022	Construction has commenced, therefore, unlikely consecutive construction programs
Great Western Battery Energy Storage System	Construction of a 500 MW/1,000 MWh BESS project	Approximately 14 km north-east of the Project area	▪ Approved November 2023	Construction period 12 to 16 months
Glanmire Solar Farm	Development of a 60 MW solar farm, associated infrastructure and battery storage.	Approximately 21 km west of the Project area	▪ Approved January 2024	12 month construction program

Relevant future project	Project description	Approximate distance to the Project	Status	Potential overlap
Ben Bullen Wind Farm	Development of a 500 MW wind farm, associated infrastructure and battery storage.	Approximately 25 km north of the Project area	▪ Prepare EIS	18 to 24 months construction program commencing in 2028, therefore likely overlapping/ consecutive construction programs
Paling Yards Wind Farm	The proposed Paling Yards Wind Farm is a 310 MW wind farm consisting of 47 turbines WTGs with a maximum tip height of 240 m.	Approximately 70 km south of the Project	▪ Prepare EIS	Potential overlap with the Project would be investigated at the EIS stage when project details are available.
The Pines Wind Farm	The Pines Wind Farm is a proposed wind farm located about 43 km south of the Project. The draft layout of the project indicated approximately 250 wind turbines would be developed within the permit area of the State's softwood pine plantations. The permit covers plantation areas in Gurnang, part of Mt David, and parts of Vulcan south of Black Springs. The Pines Wind Farm is proposed to connect to the existing transmission network via a new switching station on the 500 kV transmission line that traverses the Investigation Permit Area.	Approximately 43 km south of the Project	▪ Prepare Scoping Report	Potential overlap with the Project would be investigated at the EIS stage when project details are available.

Cumulative socio-economic impacts from the Project and the relevant future projects could be associated with health and wellbeing impacts and accessibility-related issues. However, the Lithgow City LGA may also experience positive socio-economic impacts due to greater employment opportunities and regional development.

Cumulative traffic and transport impacts would likely be limited to heavy vehicle movements associated with haulage and deliveries for the relevant future projects and the transportation of WTG components for the Project. As such, the cumulative traffic and transport impacts would be short in duration and limited to overlapping construction periods of the Project and other wind farm projects.

Cumulative landscape character and visual impacts would be associated with the introduction of new infrastructure into the environment. There is the potential for cumulative visual impacts with Sunny Corner Wind Farm for 157 private receivers within the 8 km cumulative visual impact study area. Further investigation is needed to determine the visibility of the Project and future projects.

Further investigation would also be needed to determine the cumulative biodiversity impacts, which would be associated with further reduction in native vegetation and threatened species habitat within the region.

6.11.3 Assessment approach

A qualitative cumulative impact assessment would be required during the EIS stage. The assessment of cumulative impacts for the EIS would follow the *Cumulative Impact Assessment Guidelines for State Significant Projects* (DPE, 2022c). The assessment would also confirm the relevant future projects, including additional searches of the data sources listed in Section 2.2.4.

6.12 Other matters

The EIS would also address other matters relating to:

- Land use and property – the Project area is zoned RU1 – Primary production and RU2 – Rural landscape under the Lithgow LEP and is currently used for agricultural purposes by multiple landholders. The EIS would assess the potential interactions of the Project with other nearby land uses as well as with the current land use of the Project area. Other assessments carried out for the EIS, including impacts to visual amenity, noise, biodiversity and hazards, would inform the land use assessment.
- Waste – the EIS would assess the likely waste streams that would be generated by the construction, operation and decommissioning of the Project. This would include classifying and quantifying anticipated waste. Appropriate management measures for waste generated by the Project would also be determined, including the reuse, recycling and disposal of waste as appropriate and in line with the relevant guidelines.
- Air quality – the EIS would assess the potential air quality impacts resulting from the construction and operation of the Project. This would include construction air quality controls in line with relevant guidelines.

These matters would be addressed in the EIS, however detailed assessments are not proposed. This is due to impacts from these matters being considered minimal and can be minimised through the implementation of standard management practices and procedures.

6.13 Matters requiring no further assessment

Table 6-11 outlines the matters that are not considered to require any further assessment in the EIS based on the scoping phase assessment. Justification has been provided to detail why no further assessment is required.

Table 6-11 Matters requiring no further assessment in the EIS

Matter	Justification
Greenhouse gas	As the Project would generate renewable energy, the emissions resulting from the construction, operation or decommissioning would be offset by the reduction in energy generation emissions. GHG emissions would be addressed in the justification for the Project as part of the EIS.
Odour	The Project is not anticipated to cause any odour.
Rail facilities	The Project does not propose to use any rail facilities.
Land movement	The Project is not anticipated to result in any land movement. The Project results in relatively minor excavation works only.

7 Conclusion

Tetris Energy proposes to build the Mount Lambie Wind Farm, which would include the construction and operation of up to 20 WTGs spread over an area of 2,540 hectares about 12 km south-west of Wallerawang in the Central Tablelands of NSW. The Project is a renewable energy development with a generation capacity of 200 MW, enough to power 115,000 households across the NEM. The Project would also include the installation of BESS infrastructure within the Project area.

The Project is SSD as defined under the Planning Systems SEPP and would require development consent under Part 4 of the EP&A Act.

This scoping report provides a high-level overview of the Project and outlines the potential environmental impacts and proposed assessment approaches in support of an application for the SEARs for the Project. Once SEARs have been issued for the Project, Tetris Energy would prepare an EIS in accordance with the SEARs and the requirements of the EP&A Act, the EP&A Regulation, the SSD Guidelines, and taking into consideration stakeholder and community views following consultation. The EIS would be placed on public exhibition in accordance with Part 4, of the EP&A Act prior to being assessed and determined by DPHI.

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Appendix A
Scoping summary table

Level of assessment	Topic	Cumulative impact assessment	Scoping report reference	Engagement	Relevant government plans, policies and guidelines	Key considerations
Detailed	Landscape character and visual impact	Yes	Section 6.1	Specific	▪ '*Wind Energy Guideline – Technical Supplement for Landscape and Visual Impact Assessment*' (the Technical Supplement for LVIA, DPHI 2024) ▪ *NSW Roads and Maritime Services Practice* Note – Guideline for Landscape Character and Visual Impact Assessment EIA-N04	The landscape character and visual impact assessment is to include: ▪ Consultation with residents to undertake further visual assessment from selected sensitive viewpoints on private property ▪ Consultation with potentially affected landholders, which should focus on receivers within the setback thresholds and those with potential moderate impacts ▪ Additional viewpoints and areas of sensitivity that are identified through design development and consultation, as required ▪ Mitigation of potential visual impacts and ongoing WTG design and location development as needed.
Detailed	Biodiversity	Yes	Section 6.2	Specific	▪ *Biodiversity Conservation Act 2016* ▪ *Environment Protection and Biodiversity Conservation Act 1999* ▪ *Local Land Services Act 2013* ▪ *Fisheries Management Act 1974* ▪ *Biosecurity Act 2015* (NSW) ▪ Biodiversity Conservation State Significant Planning Policy (SEPP) 2021 ▪ Biodiversity Assessment Method ▪ 'Species credit' threatened bats and their habitats NSW survey guide for the Biodiversity Assessment Method (OEH, 2018) ▪ *Koala Biodiversity Assessment Method Survey Guide* (DPE, 2022) ▪ *Wind Farms – turbine strike assessment & adaptive impact management Biodiversity Assessment Method Guide* (DCCEEW, 2024)	The biodiversity assessment is to include: ▪ The preparation of a biodiversity development assessment report (BDAR) in accordance with the NSW Biodiversity Assessment Method ▪ Bird and bat utilisation surveys across multiple seasons and the development of a Bird and Bat Adaptive Management Plan ▪ Demonstration of the extent to which impacts of the Project on biodiversity values have been avoided, minimised and offset to an acceptable level ▪ Entry of the Project into the NSW biodiversity offset scheme. ▪ Assessment of impacts to aquatic ecology within the Project area

Level of assessment	Topic	Cumulative impact assessment	Scoping report reference	Engagement	Relevant government plans, policies and guidelines	Key considerations
Detailed	Noise and vibration	Yes	Section 6.3	General	▪ *Wind Energy Guideline: Technical Supplement for Noise Assessment* (DPHI, 2024) ▪ *Wind farms environmental noise guidelines* (South Australia EPA, 2009) ▪ *NSW Noise Policy for Industry* (NSW EPA, 2017) ▪ *Road Noise Policy* (DECCW, 2011) ▪ *NSW Interim Construction Noise Guideline* ▪ *Protection of the Environment Operations Act* (1997) ▪ Protection of the Environment Operations (Noise Control) Regulation (2017) ▪ *UK Institute of Acoustics - A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise* ▪ *Draft Construction Noise Guideline* (EPA, 2020) ▪ *Assessment Vibration: A technical Guideline* (DECC, 2006)	A construction noise impact assessment to: ▪ Establish relevant background noise levels ▪ Provide predictive noise modelling of the Project's construction and operational activities ▪ Assess the road traffic noise during construction and operational activities ▪ Assess any vibration impacts at sensitive receivers ▪ Identify any reasonable and feasible mitigation and management measures.
Detailed	Socio-economic	Yes	Section 6.4	Specific	▪ *Social Impact Assessment Guideline for State Significant projects* (DPE, 2023)	The social impact assessment is to include: ▪ Identification of relevant strategies to mitigate the Project's negative impacts and opportunities to enhance its positive impacts ▪ Further assessment of potential property, land use, visual and traffic impacts ▪ Further stakeholder engagement to provide evidence to inform the detailed assessment of the Project's positive and negative impacts.

Level of assessment	Topic	Cumulative impact assessment	Scoping report reference	Engagement	Relevant government plans, policies and guidelines	Key considerations
Detailed	Aboriginal heritage	No	Section 6.5	Specific	■ *Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010) ■ *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales 2010* (DECCW, 2010) ■ *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010)	An Aboriginal Cultural Heritage Assessment Report (ACHAR) would be developed for the Project. This would allow for more than just visible physical attributes of the Project area to be assessed. An on-Country visit should also be carried out with traditional owners to map heritage values and sites within the Project area and to better understand the local cultural landscape. Design development should be informed by Aboriginal heritage areas that are identified.
Standard	Historic heritage	No	Section 6.6	General	■ *Heritage Act 1977* ■ *Australian Heritage Council Act 2003* ■ State Heritage Register ■ *Lithgow Local Environmental Plan 2014*	A Historic Heritage Assessment would be prepared for the Project. This is to include: ■ A field survey to confirm the presence of any unrecorded heritage items ■ Assessment of the impacts of the Project on unrecorded heritage items, if necessary.
Standard	Traffic and transport	Yes	Section 6.7	General	■ *Roads Act 1993* ■ Road Rules 2014 ■ NSW Heavy Vehicle Access Policy Framework 2018 ■ Road Safety Action Plan 2026 ■ *Traffic Control at Work Sites – Technical Manual*	The traffic and transport assessment is to include: ■ Analysis of traffic on the existing road and freight network ■ Review of expected construction activities and generated traffic volumes, haulage routes and distribution of construction traffic, and the impact of activities on road network performance, road access and safety, and public and active transport ■ A study to assess the suitability of potential routes for transportation of heavy and/or oversized equipment, largely relating to the transportation of WTG components from port/s to the Project area, and the need for road upgrades

Level of assessment	Topic	Cumulative impact assessment	Scoping report reference	Engagement	Relevant government plans, policies and guidelines	Key considerations
Standard	Soils and contamination	No	Section 6.8	General	■ *Land and Soil Capability Scheme* (OEH, 2012) ■ Soil and Land Survey Handbooks ■ *Managing Urban Stormwater: Soils and Construction Volume 1* (Landcom, 2004) ■ *Managing Urban Stormwater: Soils and Construction Volume 2* (DECC, 2008) ■ Agricultural Land Use Mapping Resources in NSW (DPI, 2017)	The soil and contamination assessment is to include: ■ Subsurface geotechnical investigations to provide information for the design of footings and hardstands for the WTGs and for the construction of the BESS ■ A qualitative assessment of likely contamination impacts during the construction and operation of the Project.
Standard	Water and hydrology	No	Section 6.9	General	■ *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG, 2018) ■ *NSW Water and River Flow Objectives Managing Urban Stormwater: Soils and Construction Volume 2* (DECC, 2008) ■ NSW State Groundwater Dependent Ecosystem Policy (DLWC, 2002)	The water and hydrology assessment would investigate the potential impacts related to erosion and sediment, water availability and potential pollution on watercourses during construction. A detailed Soil and Water Management Plan (SWMP) would also be proposed prior to the Project beginning construction.
Standard	Aviation risk	No	Section 6.10.1	General	■ *National Airports – Safeguarding Framework – Guideline D: Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation* (Department of Infrastructure, Transport, Regional Development and Communications, 2019)	The Aviation Impact Assessment would include, but would not be limited to, consideration of: ■ Consultation with CASA, Airservices Australia, the Department of Defence, aerodrome operators, emergency services, and ALA owners ■ Potential impacts on: – aerodromes, operational airspace, air traffic routes, height procedures, radar and communications systems and navigation aids – aviation safety, including wake/turbulence issues – aerial emergency services and aerial agricultural operations. ■ The need for mitigation strategies, such as obstacle lighting on WTGs in accordance with *AS ISO 31000:2018 Risk Management – Guidelines*, and notification and reporting requirements.

Level of assessment	Topic	Cumulative impact assessment	Scoping report reference	Engagement	Relevant government plans, policies and guidelines	Key considerations
Standard	Hazards and safety	No	Section 6.10	General	**Hazardous materials and dangerous goods** ■ *State Environmental Planning Policy No 33 – Hazardous and Offensive Development – 1992 EPI 129* ■ *Assessment Guideline: Multi-level Risk Assessment* (DPI, 2011) ■ *Hazardous Industry Planning Advisory Paper No 6: Hazard Analysis* (Department of Planning, 2011) **EMF** ■ National Health and Medical Research Council advice **Telecommunications** ■ *Wind Energy Guideline* (DPIE, 2016) **Blade throw** ■ Applicable international standards for design of wind turbine components **Bushfire** ■ *Planning for Bushfire Protection* (NSW RFS, 2019)	Detailed assessment would be prepared for the following hazards potentially evident during the construction and operation of the Project: ■ EMF ■ Telecommunications ■ Blade throw ■ Bushfire. A qualitative assessment of hazardous materials and dangerous goods used during construction and operation would be carried out.
Standard	Cumulative impacts	N/A	Section 6.11	General	■ *Cumulative Impact Assessment Guidelines for State Significant Projects* (DPE, 2022)	Under the guidelines, the level of assessment for the relevant cumulative impact assessment matters includes: ■ Landscape Character – detailed assessment ■ Biodiversity – detailed assessment ■ Socio-economic – detailed assessment ■ Traffic and transport – standard assessment

Appendix B
Preliminary Landscape Character and Visual Impact Assessment

Mount Lambie Wind Farm

Preliminary Landscape and Visual Impact Assessment

Tetris Energy Pty Ltd as trustee for the Tetris Energy Unit Trust

Reference: P527288

Revision: 4

10 June 2025

aurecon

Bringing ideas to life

Document control record

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Approval			
Author signature		Approver signature	
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Title	Lead Consultant, Integrated Design	Title	Associate, Environment and Planning

Executive Summary

We acknowledge Aboriginal elders past and present and all members of Wiradjuri Country, the original custodians of the land on which this Project resides.

Aurecon Australasia Pty Ltd (Aurecon) has been engaged by Tetris Energy Pty Ltd as trustee for the Tetris Energy Unit Trust ('Tetris Energy') to assist with the environmental and planning approvals for the Mount Lambie Wind Farm (the Project). This report forms the Preliminary Landscape Character and Visual Impact Assessment (PLCVIA) which informs the '*State significant development guidelines – preparing a scoping report'*, on the visual and broader landscape impacts of the proposed wind energy Project.

The scope of this PLCVIA includes identifying public and private viewpoints that are representative of the potential worst-case scenario visual impacts resulting from the Project and providing preliminary findings and recommendations for next steps.

Project overview

Tetris Energy proposes to construct the Mount Lambie Wind Farm, which would include the construction and operation of up to 20 wind turbine generators (WTGs) with blade-tip heights of between 252 metres (m) and 285 m spread over an area of around 2,540 hectares. The Project area is located within the Lithgow City Local Government Area (LGA) located about 12 kilometres (km) south-west of Wallerawang in the Central Tablelands of New South Wales (NSW). The Project is situated on land owned by Freehold Landowners, Local Government Authorities and Crown land, and will be developed on land that is predominantly cleared and used for sheep and cattle grazing. The location of the Project is shown in Figure 1-1.

The Project is a renewable energy development with a generation capacity of up to 200 megawatts (MW), enough to power about 115,000 households per year. The Project would also include the installation of one battery energy storage system (BESS) with a duration of two to six hours (up to 600 megawatt hours (MWh)), and associated infrastructure within the Project area. The Project is currently in the early stages of development, including stakeholder engagement and concept design.

The Project is classified as State Significant Development (SSD) as defined under State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP) and would require development consent under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This PLCVIA responds to requirements set out in the 'Wind Energy Guideline – Technical Supplement for Landscape Character and Visual Impact Assessment' (NSW Department of Planning, Housing and Infrastructure, November 2024; the Technical Supplement), that identifies public viewpoints and private receivers that require assessment in the environmental impact statement.

The landscape and visual baseline

The landscape and visual base line is established through assessments of the surrounding landscape character contained within the Landscape Character Study area, measured as a 10 km buffer area from the Project turbines, and within the Visual Study area, measured as a buffer of 7,200 m (for turbines at 252 m height) and 8,100 m (for turbines at 285 m height), from the Project turbines.

Relevant planning policies and legislation applicable to the Lithgow Shire LGA have been reviewed to understand landscape and visual significance within the Study areas.

Preliminary landscape character assessment findings

The baseline assessment identified a total of six Landscape Character Types (LCTs) within the Landscape Character Study area. These were identified based on attributes including land use and landscape features. The LCT's, identified are:

- LCT 1: Agricultural hills
- LCT 2: Native bushland
- LCT 3: Villages and rural settlements

- LCT 4: Forestry
- LCT 5: Lakes and dams
- LCT 6: Mining and power generation

Due to distance, intervening topography and vegetation; potential effects from the Project are unlikely to impact LCTs 4-6. Direct impacts of the Project are likely to apply to LCT 1 Agricultural hills and LCT 2 Native bushland, noted as **potential low impacts**. Indirect impacts are likely to be **low** to LCT 3, with the presence of turbines introducing a new type of built feature to the region.

Preliminary visual assessment findings

The major defining factor in the level of visual impact expected at representative viewpoints is the proximity of the viewpoint to the turbines. Rural residents and workers are the main groups affected, both of which are likely to have high familiarity with their surroundings and frequent exposure to views. Refer to Section 6.2 Visual Impacts for analysis and results.

The potential visual impacts of turbines on sensitive receivers, including private residents and public viewpoints, have been assessed through the following tools in accordance with the Technical Supplement:

- **Setback threshold**: Identification of five private receivers within 9-degree vertical field of view (FOV) setback from turbines. This is a distance of 1,570 m for turbines at a height of 252 m and 1,800 m for turbines at a height of 285 m (Section 3.2.1). The receivers within the setback threshold are R01 (associated), R02 and R06 (associated, under negotiation), R74 (non-associated, under negotiation), and R142 (non-associated). Engagement will be ongoing with all receivers within the setback threshold through the EIS phase.
- **Visual Study area**: Identification of 308 private receivers and ten public viewpoints within the Visual Study area of up to 8,100 m (Section 5.2).
- **Viewpoint assessment**: Identification and preliminary assessment of seven viewpoints representative of public viewpoints and private receivers (Section 6.2.1).
- **Cumulative impacts**: Identification of approximately 157 private receivers within 8,000 m of both the Project and the proposed Sunny Corner Wind Farm (SCWF) with potential for cumulative visual impacts, pending submission of a planning application for SCWF (Section 6.3).

Representative viewpoint assessment findings

There were seven public viewpoints identified within the Visual Study area that are representative of private receivers and public viewpoints that include rural dwellings, public roads, scenic lookouts or elements of community interest. Representative viewpoints were selected in and around the Project area at different distances and viewing angles, to ascertain a preliminary understanding of visual impacts from the current Project layout.

Potential preliminary visual impacts to viewpoints have been considered including likely intervening vegetation, as identified through desktop analysis and the field survey, though it is acknowledged that the amount of intervening vegetation from the individual dwellings cannot be certain without access to private property. The potential preliminary visual impacts are summarised in Table 1.

Table 1 Summary of preliminary visual impacts

Viewpoint no. and location	Visual sensitivity	Potential visual modification	Closest turbine distance	No. visible turbines	Degree of screening	Potential visual impact
VP1 - Thorpes Pinch Road	Moderate	Moderate	2,101 m (WTG 6) + BESS and substation	20	Low	Moderate
VP2 - Bonaventure Road	Moderate	Moderate	1,801 m (WTG 23)	18	Moderate	Moderate
VP3 - Sodwalls Road	Moderate	High	2,617 m (WTG 13)	20	Low	Moderate

Viewpoint no. and location	Visual sensitivity	Potential visual modification	Closest turbine distance	No. visible turbines	Degree of screening	Potential visual impact
VP4 - Sodwalls Station Road	Moderate	High	1,692 m (WTG 13)	18	Low	Moderate
VP5 - Sodwalls Road	Moderate	High	2,704 m (WTG 14)	20	Low	Moderate
VP6 - Curly Dick Road	Moderate	Low	2,009 m (WTG 9) + BESS and substation	15-18	High	Low
VP7 - Sunny Corner Road	Moderate	Low	4,250 m (WTG 6) + BESS and substation	16	Moderate	Low

Preliminary cumulative impact findings

Cumulative impacts on sensitive receivers have been determined through identification of other existing, approved or proposed wind farms and large infrastructure projects within 8,000 m of the Project (the Cumulative Visual Impact Study area). This PLCVIA provides guidance to proponents, the community and the consent authority on how the proponent should consider visual assessment and performance of the projects. Potential cumulative impacts from existing, approved or proposed wind farms include:

- Hampton Wind Park 17 km south:
  - no cumulative impacts, due to the distance of the Project and intervening topography.
- Sunny Corner 3.5 km northwest:
  - cumulative impacts potentially experienced by 157 private receivers in an area within an 8,000 m buffer between the two wind farms, located to the northwest of the Project.
- Ben Bullen 20 km north:
  - no cumulative impacts, due to the distance of the Project

There is an existing substation at Sunny Corner Road and connecting transmission lines. Cumulative visual impacts experienced from public and private viewpoints in the vicinity of both existing electrical infrastructure and the Project's BESS and substation near to Curly Dick Road, have potential for **very low level** of localised cumulative impacts.

Recommendations for further investigation

Community engagement will continue during the Environmental Impact Statement (EIS) phase, including engagement with Aboriginal stakeholders. This consultation could identify further areas or views that are of cultural and local value, which should be addressed regarding the potential visual impacts as a result of the Project.

There are a high number of visual receivers in the Visual Study area, including 308 private receivers and ten public viewpoints. The landowners should be further consulted, with additional investigation of visual impacts assessed from viewpoints within private property during the EIS process in accordance with The Technical Supplement.

The next steps should include a simple assessment to identify potential sensitive receivers within the Visual Study area that are likely to have a line of sight to the Project. Steps would include:

- Undertaking a desktop review to analyse the amount of intervening vegetation and therefore the likelihood of visual impacts from private receivers.
- Determination of the visual sensitivity and scenic value of public viewpoint and private receivers.
- Analysis of potential magnitude of change to determine visual impacts of moderate or higher.

For those with potential moderate or higher visual impacts, further intermediate and detailed assessment would be required.

Contents

Figures

Tables

Glossary

Term	Definition
BioNet VIS	NSW BioNet Vegetation information System
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DPHI	Department of Planning, Housing and Infrastructure (NSW)
Dwelling	A structure for residential use.
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EPBC Act	*Environment Protection Biodiversity Conservation Act 1999*
ESO	Environmental Significance Overlay
Foreground	The area that immediately surrounds the Project up to a distance of 2 kilometres.
FOV	Field of View (typically in discussing the horizontal extent that the Project occupies the view)
HO	Heritage Overlay
IBRA	Interim Biogeographic Regionalisation for Australia.
km	kilometre
Landscape	Its constituent elements, its character, and the way this varies spatially, its geographic extent, its condition, the way the landscape is experienced, and the value attached to it.
LCT	Landscape Character Types
LEP	Local Environmental Plan
LPPF	Local planning policy framework: Local planning policies are tools used to implement the objectives and strategies of the Municipal Strategic Statement.
m	metre
Magnitude	The apparent size of a wind energy project in the landscape or when viewed from a given viewpoint.
PCT	Plant Community Type: identified using the PCT classification system described in the BioNet Vegetation Classification
PLCVIA	Preliminary Landscape and Visual Impact Assessment: The assessment of the impacts of the proposal on landscape and visual values. The preliminary PLCVIA is conducted to determine the likelihood of high impacts and assist in determining further assessment.
Private receiver	A privately owned or used viewpoint type
Public viewpoint	A publicly owned or used viewpoint type
SSD	State Significant Development
Cumulative Visual Impact Study area	The area relevant for assessment of cumulative impacts the Project, set as eight kilometres from the Project area, as set out in the 'Wind Energy Guideline – Technical Supplement for Landscape and Visual Impact Assessment', NSW Department of Planning, Housing and Infrastructure, November 2024
Landscape Character Study area	The area designated relevant for assessment of landscape character for the Project, set as 10 kilometres from the turbine layout
Visual Study area	The area designated relevant for assessment of the Project, set as 7,200 m from the turbine layout, as determined by the 'Wind Energy Guideline – Technical Supplement for Landscape and Visual Impact Assessment', NSW Department of Planning, Housing and Infrastructure, November 2024
the Project	Mount Lambie Wind Farm
Project area	Proposed construction and operational area for the Project
Sensitive receiver	Those visual receivers within the Study areas that are likely to view the Project from their dwelling, or a popular or significant viewing location (such as a lookout).
Viewpoint (VP)	Moderate or high sensitivity location from which views to the construction process or components of the Project may be possible.
Viewshed	The area visible from a particular viewing location.

Term	Definition
Visual amenity	The qualities of a landscape setting that are appreciated and valued by a viewer.
Visual catchment	The area over which an object can be seen within the landscape based on the line of sight.
Visual impact	The result of assessing the sensitivity level of a viewer and the modification level of a development.
Visual sensitivity	The degree to which various user groups would respond to change based on their expectation of a particular experience in each setting for example the expectation of a high level of visual amenity in a national park.
ZTV	Zone of Theoretical Visibility
Zone of visual influence	Area in which components of the Project are visible. This is calculated through GIS mapping based on topographic data and does not consider intervening vegetation or built form.

1 Introduction

Aurecon Australasia Pty Ltd (Aurecon) has been engaged by Tetris Energy Pty Ltd as trustee for the Tetris Energy Unit Trust (Tetris Energy) to assist with the environmental and planning approvals for the Mount Lambie Wind Farm (the Project).

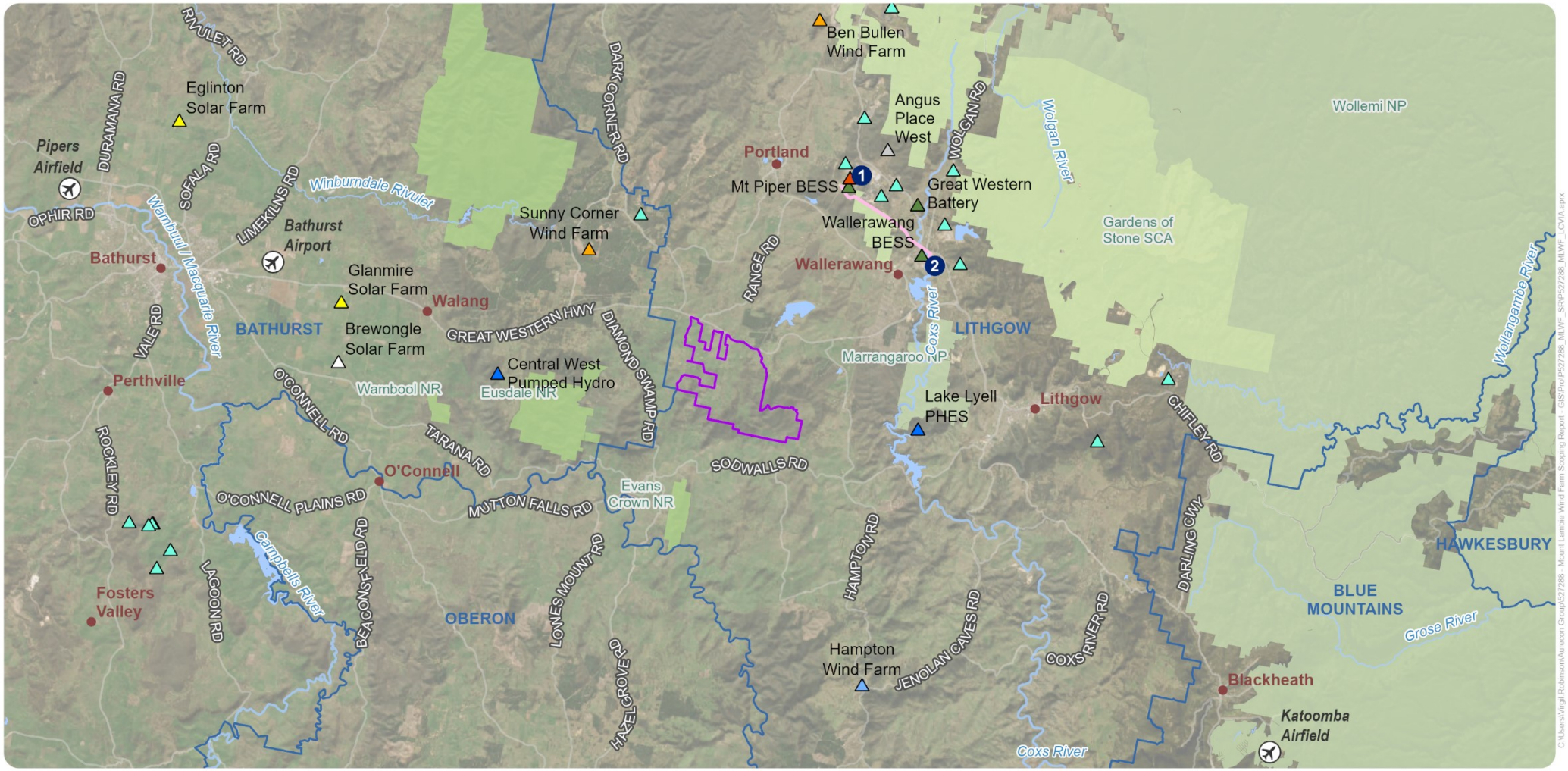
1.1 Project overview

Tetris Energy proposes to construct the Mount Lambie Wind Farm (the Project), which would include the construction and operation of up to 20 wind turbine generators (WTGs) spread over an area of around 2,540 hectares. The Project area is located within the Lithgow City Local Government Area (LGA) located about 12 kilometres (km) south-west of Wallerawang in the Central Tablelands of New South Wales (NSW). The Project is situated on land owned by Freehold Landowners, Local Government Authorities and Crown land, and will be developed on land that is predominantly cleared and used for sheep and cattle grazing. The location of the Project is shown in Figure 1-1.

The Project is a renewable energy development with a generation capacity of up to 200 megawatts (MW), enough to power about 115,000 households per year. The Project would also include the installation of one battery energy storage system (BESS) with a duration of two to six hours (up to 600 megawatt hours (MWh)), and associated infrastructure within the Project area. The Project is currently in the early stages of development, including stakeholder engagement and concept design.

The Project is classified as State Significant Development (SSD) as defined under State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP) and would require development consent under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Refer to Figure 1-1 for the location of the Project.



- Project area
- Local Government Area
- Waterbody
- Waterway
- Airport
- Mount Piper to Wallerawang Transmission Line Upgrade

Major power stations

1. Mt Piper
2. Wallerawang

Underground mines

- Existing
- Proposed

Nearby energy projects

- Battery - In Planning
- Coal - Operational
- Hydro - In Planning
- Solar - In Planning
- Solar - Withdrawn
- Wind - In Planning
- Wind - Operational

NPWS Estate

- National Park
- Nature Reserve
- State Conservation Area

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:350,000
0 3.5 7 km

Projection: GDA2020 MGA Zone 55

Mount Lambie Wind Farm **Landscape Character and Visual Impact Assessment**

Figure 1-1: Regional context and related development

1.2 Purpose

This report is a Preliminary Landscape Character and Visual Impact Assessment (PLCVIA) and responds to requirements set out in 'Wind Energy Guideline – Technical Supplement for Landscape and Visual Impact Assessment (DPHI, 2024), to identify public viewpoints and private receivers that require assessment in the Environmental Impact Statement (EIS).

The objective of the preliminary assessment is to inform the final design of the wind farm and ensure compliance with relevant legislation and policy. Identification of moderate or higher impacts in the scoping phase, triggers the need for further and more detailed assessment in the EIS phase of approvals.

The Project methodology is derived from existing best practice in landscape character and visual impact assessment with reference to:

- Local Policy Framework and zoning for Lithgow Shire
- Best practice guidelines for implementation of wind energy projects in Australia (Auswind, Dec 2006)
- Wind farms and landscape values: National Assessment Framework (Australian Wind Energy Association and Australian Council of National Trusts, June 2007)
- EP&A Act.

The landscape and visual amenity analysis is undertaken in two stages:

- A preliminary assessment of landscape significance to inform the wind farm design process (undertaken in this report)
- A detailed assessment as part of the planning and approval process (to be undertaken as part of the EIS).

This report relates to the preliminary assessment phase. The requirements for the preliminary phase of the PLCVIA study are described in Table 1-1.

Table 1-1 PLCVIA report chapter description

Addressed in report	Bulletin requirements
Chapter 2 Project description Chapter 4 Landscape context	Production of a map detailing key landscape features (informed by community consultation and any ground-truthing undertaken), the preliminary wind turbine layout, the location of dwellings and key public viewpoints, and an overlay of the wind resource.
Section 6.1 Potential Landscape Character Impacts	Preliminary results for landscape character impacts to identified landscape character zones (LCZs).
Section 6.2 Potential Visual Impacts	Preliminary results for visual impacts based on representative viewpoint assessment.
Section 6.3 Cumulative Analysis	The use of Geographic Information Systems (GIS) to facilitate the application of the tools will streamline the evaluation phase of a project during the pre-lodgement stage. Most GIS systems can establish the theoretical 'zone of visual influence' of the proposal (the area from which the proposal is theoretically visible or the 'visual catchment').

1.3 Assumptions and limitations

The following assumptions and limitations apply to this report:

- The PLCVIA process aims to be objective and, as such, seeks to describe any changes factually. Potential changes resulting from the Project have been defined. However, the significance of these changes requires qualitative (subjective) judgements to be made. Therefore, the conclusions to this assessment combine both objective measurement and subjective professional interpretation. This assessment has attempted to be objective; however, it is recognised that visual assessment can be highly subjective, and individuals are likely to associate different visual experiences to the Visual Study area.
- The PLCVIA is based on the preliminary site layout (refer to Figure 2-2):
  - The design of the substation and ancillary infrastructure has not been confirmed at the time of this assessment. The substation and BESS locations have been included and considered in the assessment.
  - The assessment of either underground or above ground transmission lines within the Project boundary is not considered in this assessment; based on the assumption that the larger adjacent turbines are the prominent visual component.
- A night-time visual assessment is not included in this assessment. This may be required for the next phase of assessment, given that turbines typically have aviation warning lighting.
- Access to all dwellings identified within the Visual Study area was limited by:
  - Private land was not accessible.
  - Dwellings were not accessible from public roads.
  - Where *'do not access, private property'* signs were posted on public roads, these were acknowledged by the site team and were not accessed:
    - Therefore, viewpoints were selected to represent dwellings from as close as possible (to capture the typical existing visual conditions) and aerial imagery of the environment surrounding dwellings was used to analyse the potential for views in the direction of the Project. It is noted that the accuracy of these viewpoint assessments for private land/dwellings are limited to what is visible in the representative viewpoint and aerial imagery.
- The scope of the assessment included up to seven viewpoint assessments as this was considered sufficient to provide assessment of sufficient representative viewpoints, demonstrating potential visual impacts from differing aspects and distances.
- For the purpose of this assessment, an unobstructed viewpoint from a publicly accessible location has been used as a worst-case scenario of potential visual impacts.
- Sensitive receivers have been identified through mapping of dwellings, property titles, street view analysis and verification through a field visit.
- Methodology, program and timing of the construction works are currently indicative and dependent upon planning approvals.
- Desktop investigations were undertaken to inform the findings of this report.
- A site visit was undertaken by a registered landscape architect (author) in August 2024 to ground-truth the desktop analysis and undertake site photography.
- Community and stakeholder consultation/engagement has commenced and is ongoing, but has not informed the report at the time of writing.
- The PLCVIA is based on the Project Description as outlined in Section 2. As the design layout of the Project is not yet finalised, our advice provides a point-in-time reference that may be subject to change.

- The zone of theoretical visibility (ZTV) mapping taken from the location and height of proposed wind turbines assumes that those areas not highlighted in the mapping, cannot see the wind turbine due to intervening topography.
- The assessment of cumulative impacts is based on project boundaries sourced from proposals websites and are not confirmed. Therefore the cumulative assessment is indicative only and subject to wind farm proposals being submitted for planning purposes.

2 Project description

The following section provides details on the location and scope of the Project.

2.1 Location

The Project is in eastern NSW, approximately 160 km northwest of Sydney and within the Lithgow Shire LGA. The Bathurst LGA boundary is located to the northwest of the Project area. The Project is located directly west of the Blue Mountains National Park, of World Heritage significance; and south of the Thomson Creek Dam. Regional context and Project overview maps that show the Project in relation to nearby key features are provided in Figure 2-2 and Figure 2-3.

The Project area covers approximately 2,540 hectares of land owned by Freehold Landowners, Local Government Authorities and Crown Land within the Lithgow City Local Government Area (LGA). The Project area includes eight landowners' land and is located across 37 lots.

2.2 Project components

The Project is seeking approval for up to 20 WTGs, with blade-tip heights of between 252 m and 285 m above ground level and a generating capacity of between 7 to 10 MW each. BESS infrastructure is also proposed and would allow for the capture and storage of dispatchable energy to be distributed to the electricity grid as required. The power generated by the Project (from WTG or released from battery storage) would feed into the existing transmission network via the existing 132 kV overhead transmission lines. The key components of the Project are as follows:

- Up to 20 WTGs, with blade-tip heights of between 252 m and 285 m above ground level
- Up to two temporary meteorological masts (up to 160 m height).
- One 100 MW capacity BESS with duration of two to six hours (up to 600 MWh).
- One or two substation and transmission connection points.
- Temporary infrastructure areas, including construction compounds, a worker accommodation facility and laydown and stockpile areas.
- Approximately 27 km of access tracks (combination of upgrades to existing tracks and construction of new tracks) throughout the Project area (minimum width of 5.5 m on straight tracks, widened to 6 m on corners)
- Internal collector cable network (electrical connections between the proposed WTGs and the substation/s), which is expected to be underground.
- Site access, including access points from Great Western Highway and/or Curly Dick Road
- Public road upgrades to facilitate the delivery of WTG components to the development footprint (required upgrades will be determined during preparation of the EIS)
- Other operational and maintenance infrastructure, including site offices, parking, amenities, laydown areas, and operational and maintenance facilities such as storage and equipment sheds.

Wherever possible, existing access tracks within the Project area would be used during the construction and operation of the Project to minimise environmental impacts that would be associated with the construction of new access tracks. It is expected that some vegetation clearing would be required to widen access tracks. New access tracks within the Project area would be constructed where there are no existing access tracks. The transport and access would be subject to a detailed traffic assessment.

An existing 132 kV transmission line runs through the northern Project area. Connection to this would be through the construction of the BESS collector station and via a combination of underground and overhead internal collector cable network. An existing 500 kV transmission line runs through the centre of the Project area however no connection to this transmission line is proposed.

The preliminary layout of the Project is included in Figure 2-2 and Figure 2-3. The indicative Project components are provided in Table 2-1. All Project components would be subject to further refinement as part of ongoing design development and the planning approvals process. The temporary construction facilities required for the Project are described in Section 2.3. The Project includes the following permanent and ancillary infrastructure.

Table 2-1 Indicative operational components and approximate dimensions

Feature	Parameters	Quantity
Turbines (refer to Figure 2-1)		
Indicative Power	7 to 10 MW each	Up to 20
Maximum Tip Height (above ground level)	285 m or 252 m	
Maximum Hub Heights (above ground level)	185 m or 166 m	
Maximum Blade Length	100 m or 85 m	
WTG foundations	30 m diameter	
Ancillary Infrastructure – Permanent		
Operation and maintenance (O&M) building, including a car park and an office	O&M Option 1 – 100 m x 75 m O&M Option 2 – 160 m x 115 m	1
Main (on-site) substation (collector station)	Substation Option 1 – 180 m x 70 m Substation Option 2 – 80 m x 60 m Substation Option 3 – 115 m x 100 m Substation Option 4 – 170 m x 60 m	Up to 2
Internal cable network	19.21 km	N/A
Internal access tracks	26.95 km (10.9 km of new access tracks and 16.06 km of existing access tracks)	N/A
Primary site access point	Access points off the Great Western Highway and/or Curly Dick Road.	Number of access points to be determined as the design is developed
BESS		
Facility/compound	BESS Option 1 - 100 m x 70 m BESS Option 2 - 170 m x 130 m BESS Option 3 - 110 m x 100 m	1
Capacity	100 MW/2-6 hr (up to 600 MWh)	N/A

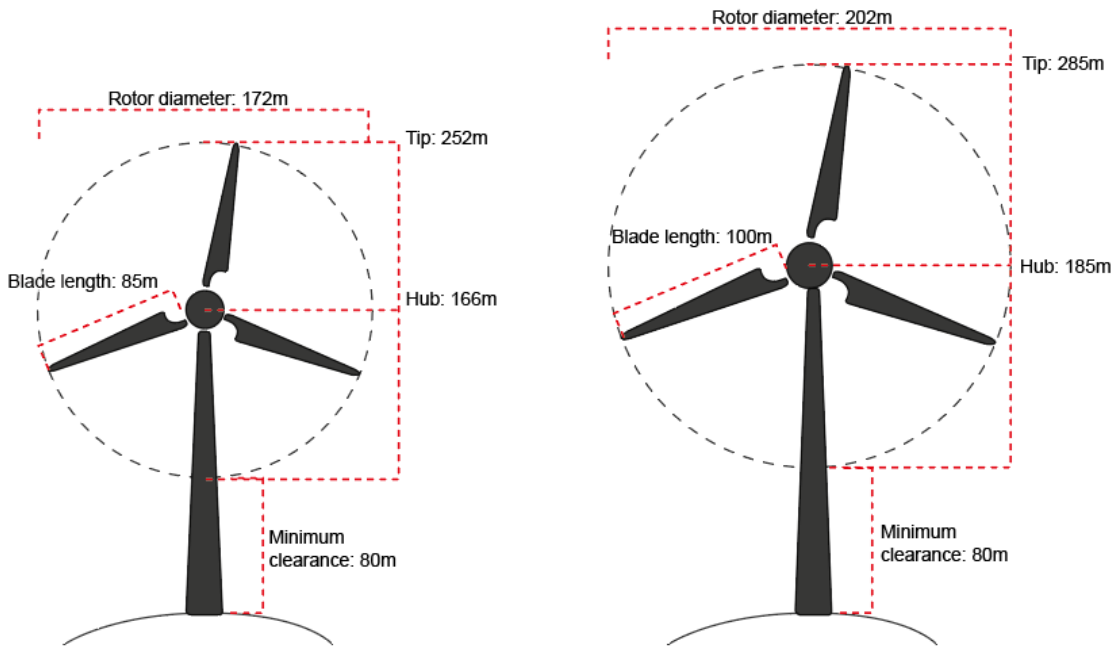


Figure 2-1 Indicative WTG dimensions (turbine model Vestas V172-7.2 MW)

Project timing

The Project is anticipated to be operational by 2028 and would operate for up to 35 years. Around six to eight workers would be required for the operation and maintenance of the Project.

Construction works will commence as soon as practicable following Project approval (estimated to be in 2026). The timing of construction would be driven by additional permits and authorisations, contractor selection, detailed design and procurement processes and a final investment decision.

Tetris Energy aims to construct the Project as a single development phase.

2.3 Construction

2.3.1 Construction features

Key components for Project construction are shown in Figure 2-2 and detailed in Table 2-1.

Table 2-2 Indicative construction compounds and approximate dimensions

Project component(s)	Approximate area (ha)	Quantity
Temporary worker accommodation facility	Subject to capacity requirements.	1
Construction compound/ laydown area	Option 1 - 0.53 Option 2 - 2.43	2
Stockpiles and materials storage compound	Subject to construction requirements	

Up to two temporary meteorological masts (up to 160 m high) would be used during construction of the Project.

2.3.2 Construction workforce

It is estimated that 150 full time equivalent workers would be required during the peak of construction activities. A temporary worker accommodation facility is anticipated to be required on-site, however further consultation with community and regulatory stakeholders would be required to determine the feasibility of this accommodation facility, including capacity.

2.3.3 Transport access routes

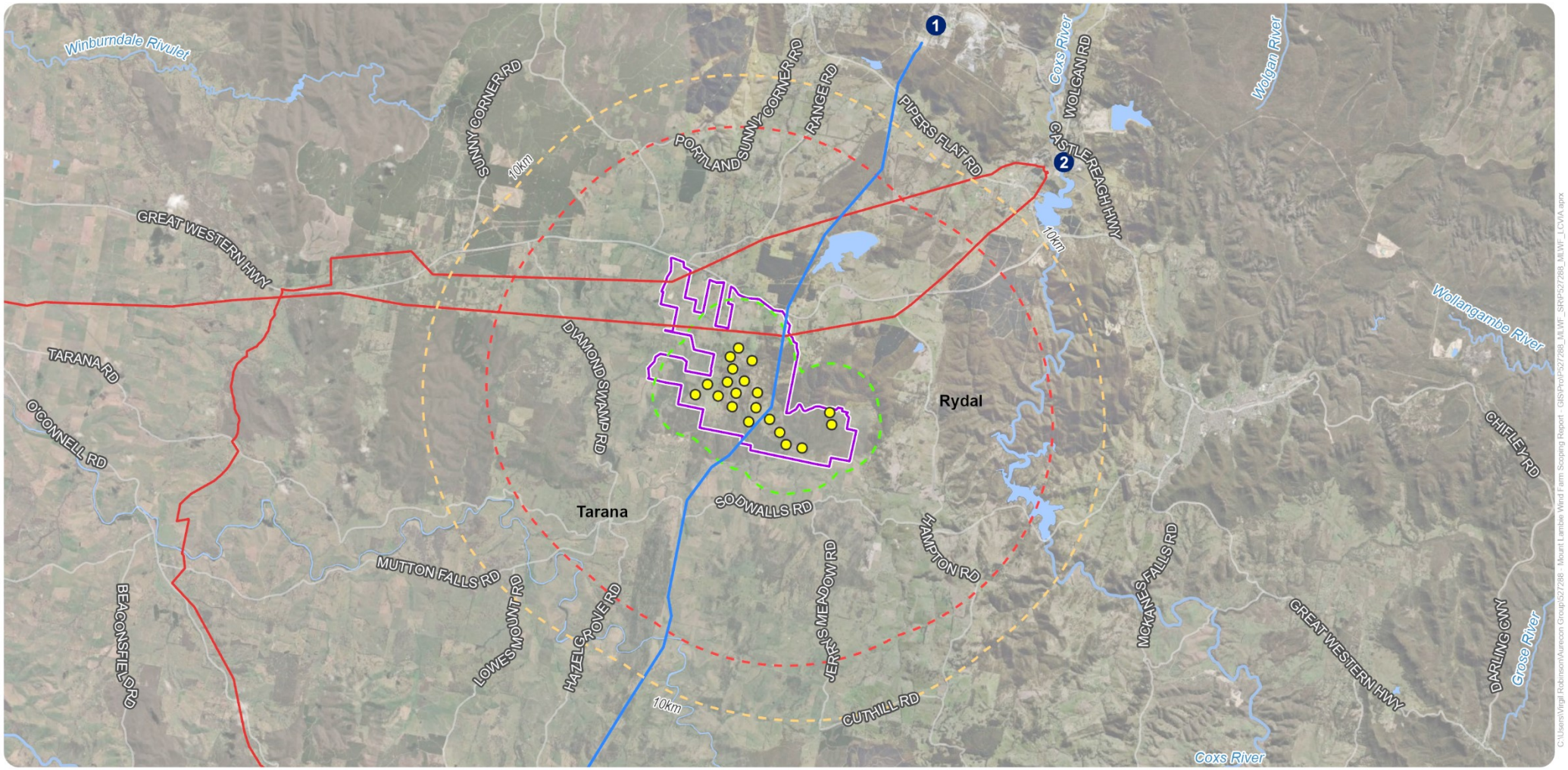
Wind turbines, BESS infrastructure and substation components would likely be delivered to the Port of Newcastle and then transported by oversized and/or overmass (OSOM) vehicles via the Golden Highway, Castlereagh Highway and Great Western Highway. Alternative routes are currently being investigated via a route survey assessment and may include Port Botany (Sydney) or Geelong (Victoria).

The main site access would be off the Great Western Highway and/or via Curly Dick Road. The transport route of infrastructure components and other Project related materials would be investigated further during the preparation of the EIS with the outcomes considered as part of the traffic study.

2.4 Decommissioning

Decommissioning of the Project would involve dismantling the WTGs, site office and any other ancillary infrastructure and transporting them offsite for disposal or reuse and ensuring the roads and foundations pads are covered. In line with the indicative timeframes for the Project outlined in Section 3.3, this would occur after the estimated operational life of up to 35 years. The land for the Project would then be revegetated and returned to its previous condition as far as practicable.

Landscape and visual impacts of the decommissioning are not covered within this report.



Project area
Landscape Character Study area (10km)
Visual Study area
Receiver setback

Waterbody

Major power stations
1 Mt Piper
2 Wallerawang

Mount Lambie Wind Farm Infrastructure
Turbine location

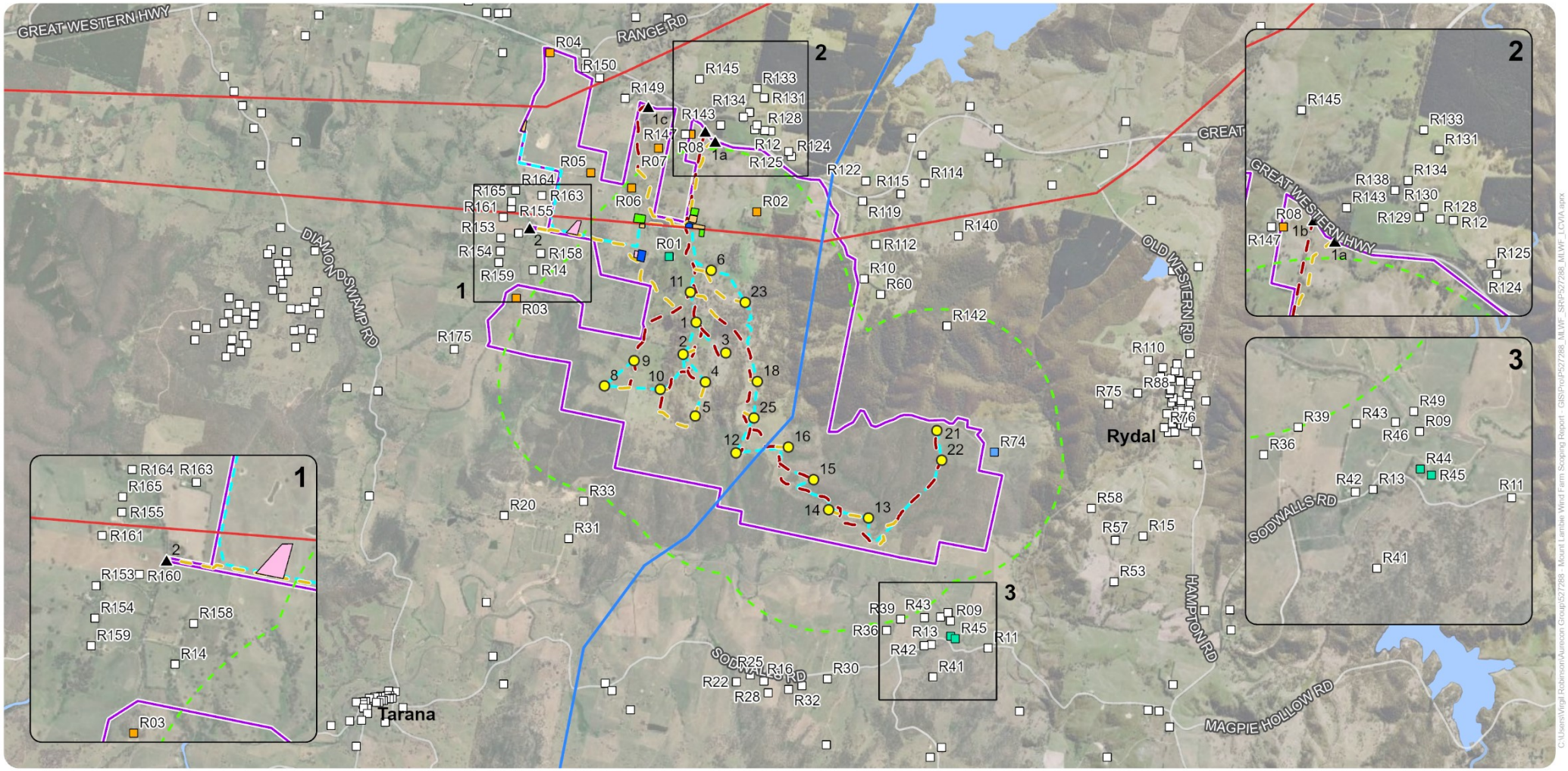
Existing transmission
132kV line
500kV line

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:210,000
0 2.5 5 km

Projection: GDA2020 MGA Zone 55

Figure 2-2: Preliminary project layout



Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:85,000

0 1 2 km

Projection: GDA2020 MGA Zone 55

Figure 2-3: Preliminary project layout - detailed view

3 Methodology

3.1 Approach to the assessment

The PLCVIA considers of the potential impacts of the proposed Mount Lambie Wind Farm on sensitive receivers including dwellings and key public viewpoints.

The PLCVIA comprises a desktop evaluation of the Project and its various components, turbines and ancillary facilities, identifying sensitive viewpoints with potential for moderate to high adverse impacts. A field visit was conducted by a qualified landscape architect (report author) on 12 to 13 August 2024, to evaluate the landscape character areas, ascertain appropriate publicly accessible viewpoints, ground truth the desktop evaluation and undertake site photography.

3.1.1 PLCVIA objectives

The following documents have guided the methodology in setting out a clear and systematic approach to documenting the baseline landscape character and visual conditions and potential impacts:

- 'Wind Energy Guideline – Technical Supplement for Landscape and Visual Impact Assessment', NSW Department of Planning, Housing and Infrastructure, November 2024 (the Technical Supplement)

The Study area visual thresholds are outlined in Table 3-1, based on the two heights of proposed turbines.

Table 3-1 Summary of PLCVIA Study area visual thresholds

Study areas and thresholds	Distance	Source	Purpose
Visual setback threshold	1,570 m and 1,800 m	Wind Energy Guideline – Technical Supplement for Landscape and Visual Impact Assessment', NSW Department of Planning, Housing and Infrastructure, November 2024	The minimum area required between a dwelling and a turbine (at a height of 252 m and 285 m respectively). If a sensitive receiver is located within the setback threshold it will trigger a high visual impact unless the turbine(s) would be largely screened by topography or vegetation. Refer to Section 3.2.2 for further detail.
Visual Study area	7,200 m and 8,100 m	Wind Energy Guideline – Technical Supplement for Landscape and Visual Impact Assessment', NSW Department of Planning, Housing and Infrastructure, November 2024	The visual assessment identifies those dwellings or key public viewpoints that are within the visual magnitude threshold and therefore more likely to experience a higher magnitude of change in foreground and middle ground views. The distance is based on turbine heights of 252 m and 285 m respectively. Refer to Section 3.2 for further detail.
Cumulative Impact Study area	8,000 m	Wind Energy: Visual Impact Assessment Bulletin, 2016	The cumulative assessment identifies effects resulting from changes to the landscape or visual amenity caused by the Project in conjunction with other developments or actions that occurred in the past, present or are likely to occur in the foreseeable future. Refer to Section 3.2.3 for further detail.
Landscape Character Study area	10,000 m	Qualified landscape architect (report author)	This distance provides a broad area preliminary analysis of the landscape surrounding the Project area to identify potential moderate to high landscape character impacts at the scoping report stage.

The objectives for the PLCVIA for the scoping report include:

- Identify the visual and landscape study areas
- Undertake viewshed mapping to identify areas from which the Project could be visible, based on the height of proposed turbines and topography
- Identify public viewpoints and private receivers that would have line of sight to the Project and sit within the Visual Study area.
- Undertake a visual impact analysis that identifies public viewpoints and private receivers that require assessment in the EIS. This includes potential visual impacts of moderate and high ratings.

3.2 Identifying the Study area

The visual assessment identifies those dwellings or key public viewpoints that are within the visual magnitude threshold and therefore more likely to experience a higher magnitude of change in foreground and middle ground views. 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 as shown in Figure 3-1. This is measured at 7,200 m (for turbines at 252 m height) and 8,100 m (for turbines at 285 m height) based on the Technical Supplement.

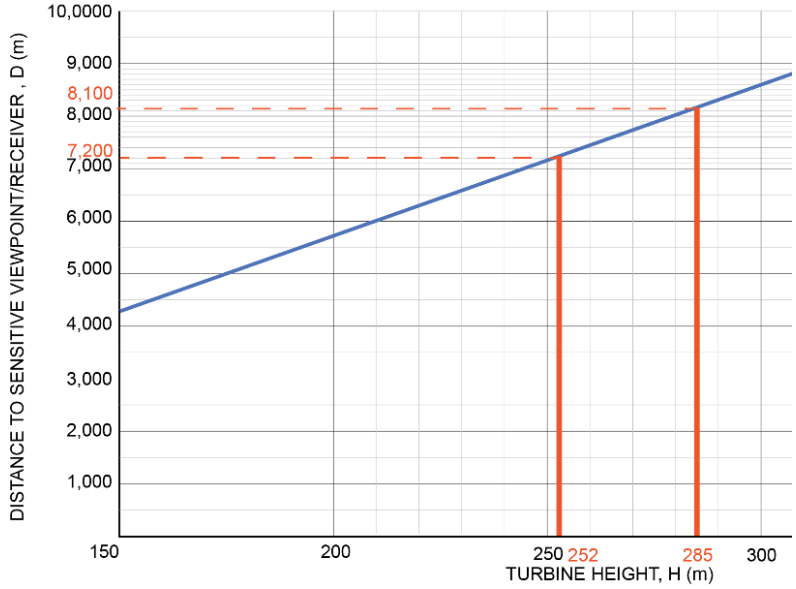


Figure 3-1 Visual Study area (adapted from the Technical Supplement)

The Landscape Character Study Area has been set at 10 km from the Project area (location of proposed turbines), to capture a broader area of landscape patterning than the Visual Study area. The potential for moderate or higher landscape character impacts is reduced outside the area of direct impacts, and at a distance where the Project is unlikely to have influence on land use, biophysical attributes, or have visual prominence. As the purpose of the scoping report is to identify potential impacts that are moderate or higher, a 10 km Landscape Character Study area is considered sufficient to capture these impacts.

3.2.1 Viewshed mapping

Within the Visual Study area, the production of viewshed mapping indicates the zone of theoretical visibility (ZTV) or the theoretical area from which the mapped components could be visible.

The viewshed mapping provides a preliminary representation of the likely 'worst case' visual envelope of the wind turbine layout currently under investigation. These map outputs illustrate the number of wind turbines potentially visible from within the Visual Study area, accounting for the height of turbine (252 m or 285 m above ground level).

It should be noted that the outputs of the viewshed is limited to the available terrain data (Digital Elevation Model data (5 m) loaded from ELVIS, Geoscience Australia 2015), and does not consider the screening effect of intervening vegetation or built form. Therefore the mapping provides an exaggerated indication of the theoretical extent of visibility of wind turbines. They are therefore used primarily to guide the desktop studies and inform site visit work. The ZTV analysis has been undertaken for both heights of turbine, with the ZTV outputs combined to show worst-case visual scenario. Refer to Figure 5-18.

These mapping outputs illustrate the number of wind turbines potentially visible (from the hub to tip height) from within the Visual Study area (refer to Figure 3-2).

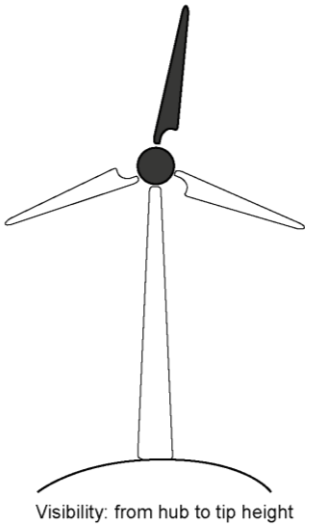


Figure 3-2 Potential visibility of turbines generated within the ZTV mapping

3.2.2 Setback threshold

Setback distances are defined in the Technical Supplement for LVIA as the minimum area required between a turbine and a dwelling. If a sensitive receiver is located within the setback threshold it will trigger a high visual impact unless the turbine(s) would be largely screened by topography or vegetation. The threshold is set by the height of the turbine, as shown in Figure 3-3.

The setback threshold accounts for turbines at two heights including:

- turbines with a height of 252 m, the setback threshold is 1,570 m.
- turbines with a height of 285 m, the setback threshold is 1,800 m.

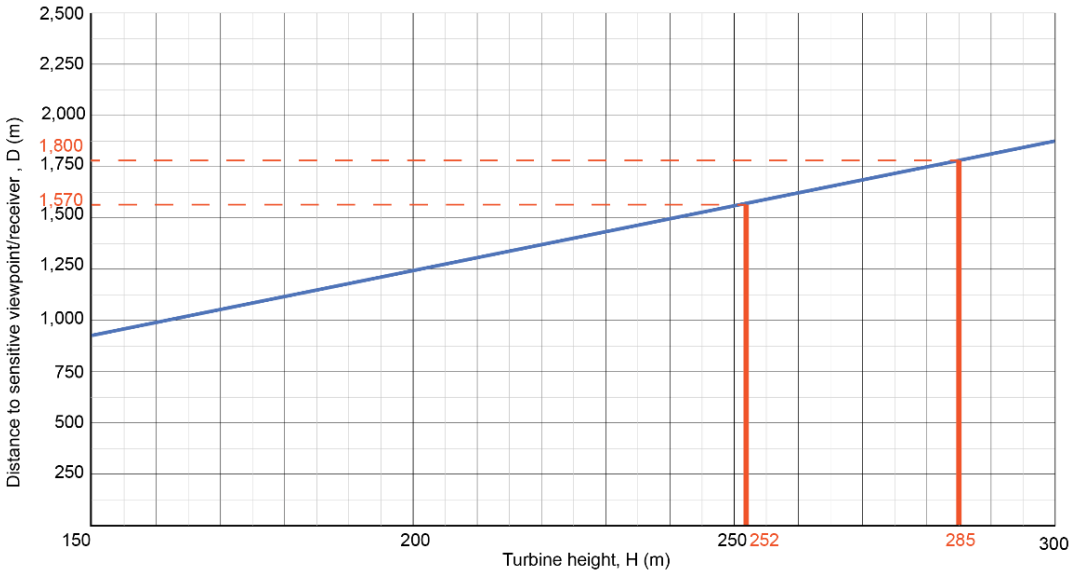


Figure 3-3 Setback from sensitive receivers (adapted from the Technical Supplement)

3.2.3 Cumulative visual impacts

Cumulative landscape and visual effects result from changes to the landscape or visual amenity caused by the Project in conjunction with other developments (associated with or separate to it) or actions that occurred in the past, present or are likely to occur in the foreseeable future (Landscape Institute et al, 2002).

The potential cumulative visual impact is considered in relation to the potential visual impact from the Project when viewed sequentially (such as when looking from left to right, or as you move along a road). For example, if a number of wind farms are viewed in succession as a traveller moves through the landscape (i.e. along a road or walking track) this may result in a change in the overall perception of the landscape character.

Scottish Natural Heritage (2005) describes a range of potential cumulative landscape impacts of wind farms on landscapes, including:

- Combined visibility (whether two or more wind farms will be visible from one location).
- Sequential visibility (e.g. the effect of seeing two or more wind farms along a single journey, e.g. road or walking trail).
- The visual compatibility of different wind farms in the same vicinity.
- Perceived or actual change in land use across a character type or region.
- Loss of a characteristic element (e.g. viewing type or feature) across a character type caused by developments across that character type.

The potential cumulative visual impact is considered in relation to the potential visual impact from the Project when viewed from a singular perspective such as a private dwelling. The preliminary Cumulative Impact Study area is an 8,000 m buffer from the Project area. The analysis of cumulative impacts applies where the receiver has potential views of two or more wind farms within this distance.

3.3 The assessment method

The level of visual impact resulting from the proposed development has been assessed against the following components:

- Landscape sensitivity: the ability of the landscape setting to absorb the development/change.
- Visual sensitivity made up of the following:
  - Viewer sensitivity: the sensitivity of the viewer to the development/change and distance from the viewpoint, and
  - Scenic quality: the scenic or aesthetic value of the landscape based on the relative presence or absence of key landscape features known to be associated with community perceptions of high, moderate or low scenic quality.
- Scale of modification: how well the development/change contrasts or blends with the surrounding land use based on varying levels of visual prominence.
- Establishing the level of visual impact involves assigning levels of visual sensitivity and modification such as high, medium, low or very low. A determination matrix (refer to Table 3-6) is then used to assign an overall level of visual impact.

3.3.1 Baseline analysis

A visual baseline study establishes the existing landscape and visual conditions. The baseline study should consider the following inputs in the ‘visual catchment’ for the Project:

- Elements of the landscape important to the community, including public and private viewpoints
- The sensitivity of the viewers who use those viewpoints, and the distances at which they may view the landscape and potential wind turbines and other ancillary facilities

- The character of the landscape environment, its key features and the relative scenic quality of the area; and
- The location of any existing operational or approved wind energy projects within both a regional and local context, including any nearby surrounding wind energy projects within 8,000 m which may have the potential to create direct or indirect visual impacts between the proposed and any other operational, approved or proposed wind energy projects.

3.4 Impact assessment criteria

The potential level of impacts associated with the proposed development on landscape character and visual amenity have been assessed based on themes of magnitude and sensitivity.

3.4.1 Landscape sensitivity

The sensitivity of a landscape is judged based on the extent to which it is considered able to accept change of a particular type and scale without adverse effects on its character. Sensitivity varies according to the type of development and the nature of the landscape, including:

- Its inherent landscape value (its condition, perceptual qualities, cultural importance, and any specific values that may apply, such as landscape planning designations); and
- The likely congruency of the proposed change (i.e. the extent to which the proposal may fit or be 'visually absorbed' into the scale, landform, land use, pattern, texture of the existing landscape).

The attributes which influence the sensitivity of landscape character are outlined in Table 3-2.

Table 3-2 Evaluating level of Landscape sensitivity

Landscape sensitivity rating	Description
High	■ Of high value with distinct elements and features making a positive contribution to character and sense of place. ■ Likely to be identified as a 'landscape scenic value' within local planning instruments. ■ Areas of special recognised value, through use, perception or historic and cultural associations. ■ The extent of alteration would result in the landscape losing significant natural landscape features, its character and/or sense of place. ■ Open, expansive or elevated landscapes with little presence of modification. ■ The viewer is highly sensitive to changes in their immediate surroundings such as residents or 'natural' areas such as National Parks.
Moderate	■ Comprised of commonplace elements and features creating generally unremarkable character but with some sense of place. ■ Locally identified with landscape of scenic value, or their value may be expressed through non-statutory local publications. ■ Containing some features of value through use, perception of historic and cultural associations. ■ Likely to contain some features and elements that could not be replaced. ■ The extent of alteration would result in the landscape partially losing some natural or designed landscape features, its character and/or sense of place. ■ Open, expansive and moderately vegetated landscapes including canopy trees. ■ Elevated and vegetated landscape including canopy trees. ■ The viewer is moderately sensitive to changes in their immediate surroundings such as users of regional and local reserves.
Low	■ Containing few, if any, features of value through use, perception or historic and cultural associations. ■ Likely to contain few, if any, features and elements that could not be replaced. ■ Built-up landscapes typically interspersed with canopy trees. ■ The viewer is aware of the change but not overly sensitive to changes in their immediate surroundings such as users of commercial areas and farming land.

Landscape sensitivity rating	Description
Very Low	■ Comprised of some features and elements that are discordant, derelict or in decline, resulting in indistinct character with little or no sense of place. ■ Modified landscapes with an abundance of built form and limited natural characteristics. ■ The viewer is aware of the change but not overly sensitive to changes in their immediate surroundings such as users of industrial areas.

3.4.2 Visual sensitivity

The sensitivity of viewpoints is dependent upon factors including:

- The importance (scenic quality) of the view.
- Viewer exposure, typically assessed by measuring the number of viewers exposed to the resource change and the type and duration of viewer activity.
- The nature of the visual receiver (type and volume of sensitive receivers or viewers) experiencing the view.
- Distance of the Project from the identified land use area.

Table 3-3 describes the level of viewpoint sensitivity as defined in the Technical Supplement.

Table 3-3 Viewpoint sensitivity level and examples

Viewpoint type	Viewpoint sensitivity			
	Very Low	Low	Moderate	High
Private receiver	Private recreation areas and sporting fields (land zoned RE2)	Secondary view from dwellings in rural areas (zoned RU1, RU2, RU3, RU4 and RU6), large lot residential areas (zoned R5) and environmental or conservation areas (zoned C2, C3 and C4)	Primary view from dwellings in rural areas (zoned RU1, RU2, RU3, RU4 and RU6), large lot residential areas (zoned R5) and environmental or conservation areas (zoned C2, C3 and C4) Tourist and visitor accommodation (bed-and-breakfasts, motels and hotels) and places of worship	Dwellings in residential and rural villages (zoned R1, R2, R3, R4 and RU5) Historic rural homesteads/residences on the national, state or local heritage list
Public viewpoint	State highways, freeways and classified main roads	Cemeteries, memorial parks Tourist roads and scenic drives.4 Significant entry ways to regional towns and cities	Tourist uses in tourist areas (zoned SP3) Publicly accessible green and open spaces, including picnic areas, parks, public recreation areas and lookouts Town centres and central business districts	n/a

Scenic quality

Scenic quality refers to the relative scenic, cultural or aesthetic value of the landscape within the viewshed based on the presence or absence of key landscape features known to be associated with community perceptions from very low to high scenic quality.

Table 3-4 defines scenic quality ratings, taken from the Technical Supplement which are used as a guide.

Table 3-4 Scenic quality values

Viewpoint type	Scenic quality			
	Very Low	**Low**	**Moderate**	**High**
Landform	Large expanses of flat or gently undulating terrain Indistinct, dissected or broken landforms that provide little illusion of spatial definition or landmarks with which to orient	Mostly flat or gently undulating terrain with isolated areas of undulating topography	Steep, hilly and undulating ranges that are not visually dominant Broad, shallow valleys Moderately deep gorges or moderately steep valley walls Minor rock outcrops	Isolated peaks, steep rocky ridges, cones or escarpments with distinctive form and colour contrast that become focal points Large areas of distinctive rock outcrops or boulders Well-defined, steep valley gorges
Vegetation	Extensively cleared and cropped areas with very limited variation in colour and texture Pastoral areas, human-created paddocks, pastures or grasslands and associated buildings typical of grazing lands	Predominantly cleared and cropped areas with small areas of variation in colour and texture Most pastures or grasslands with small blocks of distinct native vegetation	Predominantly open forest or woodland combined with some natural openings in patterns that offer some visual relief Vegetative stands ranging in size, form, colour, texture and spacing, including human-influenced vegetation (for example, vineyards, plantation forests and orchards)	Strongly defined natural patterns with combinations of native forest, naturally appearing openings, streamside vegetation and scattered exotics Distinctive stands of vegetation that may create unusual forms, colours or textures compared with surrounding vegetation
Waterbodies	Absence of natural waterbody Farm dams, irrigation canals or stormwater infrastructure	Minor water forms, such as creeks and streams	Intermittent streams, lakes, rivers, swamps and reservoirs	Visually prominent lakes, reservoirs, rivers, streams, wetlands and swamps Presence of harbour inlet, bay or open ocean
Social and cultural	Places of worship, cemeteries, memorial parks, private open spaces	Places of worship, cemeteries, memorial parks, private open spaces Local heritage sites	Local or state heritage sites Distinguishable entry ways to a regional city identified in the State Environmental Planning Policy (Transport and Infrastructure) 2021	Culturally important sites, wilderness, world heritage areas and protected areas World, national and state heritage sites
Human presence	Dominating presence of infrastructure, human settlements, highly modified landscapes and higher density populations, such as regional cities, industrial areas, agricultural transport or electricity infrastructure	Highly modified landscapes with visible infrastructure, such as transmission lines and railway corridors	Dispersed yet evident presence of human settlement, such as villages, small towns, isolated pockets of production and industry, lower scale and trafficked transport infrastructure	Natural, undisturbed landscape Minimal evidence of human presence and production

The visual sensitivity is determined through combining the viewpoint sensitivity and scenic quality ratings as matrix in Table 3-5.

Table 3-5 Visual sensitivity matrix

Viewpoint sensitivity	Scenic quality			
	High	**Moderate**	**Low**	**Very Low**
High	High	High	Moderate	Low
Moderate	High	Moderate	Low	Low
Low	Moderate	Low	Low	Very Low
Very Low	Very Low	Very Low	Very Low	Very Low

3.4.3 Magnitude of change

The magnitude of change affecting a landscape or visual receiver depends on the nature, scale and duration of the change that is expected to occur. It describes the extent of change and identifies elements which are removed or added, changed in colour or texture, and the compatibility of new elements with the existing landscape.

Table 3-6 outlines the six categories of modification used for determining the magnitude of change potentially resulting from the Project which includes:

- Scale - with respect to the loss of addition of features in the view and changes in its composition.
- Degree of contrast or integration - form, scale and mass, line, height, colour, texture.
- Nature of view in relation to the proposal - angle, distance and extent.

Table 3-6 Criteria for determining the visual modification level

Modification level	Description
Very high	The proposal is a dominant change in the view in regard to the size, scale and geographical extent, or obstructing a substantial part or important elements of view.
High	The proposal is highly visible and intrusive in regard to the size, scale and geographical extent, and would disrupt views currently experienced from sensitive land use areas and/or strongly contrasts with the existing landscape setting which has limited capacity for change and/or the extent of area over which the changes would be visible from sensitive land use areas is significant.
Moderate	The proposal partially intrudes in regard to the size, scale and geographical extent or somewhat obstructs current views from sensitive land use areas and/or a noticeable compositional change to the existing landscape setting in which there is moderate capacity for change and/or the extent of area over which the changes would be visible from sensitive land use areas is moderate.
Low	The proposal is barely perceptible resulting in minor deterioration to the view currently experienced from sensitive land use areas; and/or results in a small change to the existing landscape setting in which change is possible without harm and/or the extent of area over which the changes would be visible from sensitive land use areas is limited.
Very low	There is minimal compositional contrast and a high level of integration of form, line, shape, pattern, colour or texture values between the proposal and the environment setting. The proposal may be noticeable but does not markedly contrast with the existing landscape setting and/or the extent of area over which the changes would be visible from sensitive land use areas is negligible.
No impact	There are no views of the proposal components and as such, there is no impact.

3.5 Assigning a level of impact

The impact significance ratings have been determined through a combination of the sensitivity and magnitude of change.

Impacts can either be beneficial where the modification improves visual amenity or enhances landscape character, however the introduction of built form within the environment is typically considered to have an adverse effect. If the Project is not visible, there is no impact (neutral). Table 3-7 shows how the level of impact is determined through the matrix.

Table 3-7 Impact determination matrix

Degree of modification	Sensitivity			
	High	**Moderate**	**Low**	**Very Low**
Very High	High	High	Moderate	Moderate
High	High	Moderate	Moderate	Low
Moderate	Moderate	Moderate	Low	Low
Low	Moderate	Low	Low	Very Low
Very Low	Low	Low	Very Low	Very Low

4 Landscape context

4.1 Regional landscape context

The Project is in eastern NSW and approximately 26 km to the northwest of Blue Mountains National Park. The closest settlements are Tarana to the southwest and Rydal to the east, with the closest town of Lithgow approximately 13 km to the east of the Project area.

The Project is located south-east of the Central West Orana Renewable Energy Zone (REZ). These zones have been identified as having high solar and wind renewable energy resource potential.

The area is part of the 'Seven Valleys' region which encompasses *Lithgow, Wolgan, Kanimbla, Capertee, Megalong, Hartley* and *Tarana*; which represent industrial heritage, unique geological areas, valleys and distinctive ridges.

4.1.1 Bioregion

The Project is located within the South Eastern Highlands bioregion, which spans parts of New South Wales, the Australian Capital Territory, and Victoria. This region is primarily characterised by its varied topography, which includes rugged mountain ranges, rolling hills, and deep valleys.

The climate in the South Eastern Highlands is generally temperate, with cool to cold winters, often accompanied by snowfall in higher elevations, and mild to warm summers. Rainfall varies across the region but is typically adequate to support diverse ecosystems.

Vegetation in the South Eastern Highlands bioregion is diverse and includes sclerophyll forests, woodlands, and grasslands. The area is home to significant stands of eucalypt species alongside a variety of understory plants and shrubs. The highlands provide critical habitats for a range of fauna, including marsupials like wombats and kangaroos, as well as numerous bird species.

4.1.2 Topography and geology

Mount Lambie is a part of the Great Dividing Range and stands at an altitude of about 1,291 m above sea level. The surrounding area is hilly, with the most prominent peaks being Mount Tarana, Bald Ridge and Jerrys' Mountain. The area features a mix of prominent ridge lines, steep slopes, rolling hills, and deep valleys, all of which are influenced by historical volcanic activity and tectonic uplift associated with the Great Dividing Range. Refer to Figure 4-10 for topographical mapping.

Rocky outcrops of basalt, sandstone, granite, limestone, and shale are key elements of the regions' geological landscape. Noticeable granite outcrops and an array of tors are located within Evans Crown, to the southwest of the Landscape Character Study area.

The soils in the Mount Lambie region are characterised by their volcanic origins, leading to fertile volcanic loams and clays. Key soil types include:

- Basalt-Derived Soils: Rich, dark, and well-drained soils stemming from basalt bedrock, known for their agricultural productivity.
- Red and Brown Soils: Found in upland areas and tablelands, these alluvial and eluvial soils are excellent for grazing and pasture land.
- Clayey Podzols: Present in wooded and forested areas, these soils support native vegetation and forest cover.

Overall, the soil composition ranges from fertile loams to clays, with specific areas conducive to agriculture and others supporting diverse native flora.

Figure 4-1 Granite tors at Evans Crown Nature Reserve

Source: Brenton Jones (https://sevenvalleys.com.au/member/tarana-2/)

Figure 4-2 Mount Tarana and ridgeline as seen from Sodwalls Road

Source: Aurecon (August 2024)

4.1.3 Hydrology

Streams and rivers originating in the Mount Lambie area contribute to significant catchments in the region. These watercourses often display strong seasonal variability. In the wetter months, streams can swell and display increased flow, while during drier periods, flow rates can diminish considerably.

The Project area is bisected by a series of named and unnamed waterways including Native Dog Creek, Watercress Gully, Deadmans Creek and Lawsons Creek; with Solitary Creek and Diamond Swamp Creek within the Landscape Character Study area (refer to Figure 4-3). The regions key river is the Fish River flowing northward, to the southwest of the Project Area, through Tarana. The Fish River eventually converges with the Macquarie River near the town of Bathurst, thereby contributing to the greater Murray-Darling Basin. The entire course of the river plays a significant role in supplying water for agricultural, domestic, and environmental needs in the area.

Thompson Creek Dam is an important water storage facility located north of the Project area and is part of the Fish River Water Supply Scheme. The dam was construction in the early 1990s. The dam is used for fishing, similar to Lake Lyell (to the east of the Landscape Character Study area, refer to Figure 4-4) which provides recreational facilities such as fishing and boating.

Lake Wallace, near Wallerawang to the north of the Project area, was originally constructed to supply cooling water for the Wallerawang Power Station. This function of Lake Wallace has come to an end since the closure of the power station in 2014, however, the lake still serves as a minor supplementary water supply for agricultural uses and other local recreational needs.

These lakes and dams provide recreational and a natural amenity attraction for visitors and locals.

Figure 4-3 Diamond Swamp Creek

Source: Aurecon (August 2024)

Figure 4-4 Lake Lyell

Source: Aurecon (August 2024)

4.1.4 Vegetation

Vegetation communities differ depending on topography, access to water and soil types. The vegetation form within the Landscape Character Study area is typically Dry Sclerophyll Forests (refer to Figure 4-5 to Figure 4-6) with the largest PCTs within the Project area comprising:

- Central Tableland Peppermint Shrub-Grass Forest
- Southern Tableland Western Hills Scribbly Gum Forest
- Central Tableland Ranges Peppermint-Gum Grassy Forest
- Central Tableland Granites Grassy Box Woodland.

Plant Community Types (PCTs) are mapped in Figure 4-11.

Being a rural area used for livestock grazing, there are many cleared pastures with remnant scattered native trees and exotic windrows to the perimeter of paddocks (refer to Figure 4-7).

Forestry is a large industry within the broader area, with logging occurring in native and pine plantations such as Lidsdale State Forest (to the northeast of the Project area on Old Western Road) (refer to Figure 4-8).

Larger areas of native vegetation are located on steeper hills such as those at Mount Lambie and to the west of Rydal. There are some bush reserve areas within and at the perimeter of the Landscape Character Study area including Evans Crown and Eusdale Nature Reserves; Marrangaroo National Park and Lidsdale State Park. These parks and reserves boast a diverse array of vegetation types, including eucalypt forests, shrublands, riparian zones, grasslands, and native wildflowers.

Figure 4-5 Example of a dry sclerophyll forest within the Landscape Character Study area

Source: Aurecon (August 2024)

Figure 4-6 Example of a dry sclerophyll forest within the Landscape Character Study area

Source: Aurecon (August 2024)

Figure 4-7 Modified pastures, tussocks and exotic windrows

Source: Aurecon (August 2024)

Figure 4-8 Lidsdale State Forest

Source: Aurecon (August 2024)

4.1.5 Zones and overlays

Land zones

Mount Lambie Wind Farm is located within RU1 Primary Production zone and RU2 Rural landscape zone, as shown in Figure 4-9 (GIS data source NSW Department of Planning). The land use within the Project area is primarily for farm practices comprising rearing livestock within vast paddocks, with some farm dams and dwellings plus sheds associated with the property.

Table 4-1 lists those plan zones within the Landscape Character Study area and relevant Local Environmental Plans (LEP) objectives for landscape and visual amenity.

Table 4-1 Land zone and objectives for landscape and visual amenity

Plan zone	LEP objectives (relevant to the study)	Location and relevance to landscape and visual
RU1 Primary Production zone	▪ Encouraging sustainable primary industry production by maintaining and enhancing the natural resource base. ▪ Encourage diversity in primary industry enterprises and systems appropriate for the area. To minimise fragmentation and alienation of resource lands. ▪ To minimise conflict between land use within this zone and land uses within adjoining zones. ▪ To provide for a range of compatible land uses, including extensive agriculture.	▪ Zone within Project area and surrounding areas. ▪ The Project is considered a compatible land use, allowing agriculture to continue in unison with power generation.
RU2 Rural landscape zone	In addition to the above RU1 objectives: ▪ To ensure that the type and intensity of development is appropriate in relation to the rural capability and suitability of the land, the preservation of the agricultural, mineral and extractive production of the land, the rural environment (including scenic resources) and the costs of providing services and amenities. ▪ To facilitate tourism and recreational uses that are compatible with the capability and suitability of the land.	▪ Zone within Project area and surrounding areas. ▪ The Project area does not comprise any tourist or recreational uses.
RU3 Forestry	▪ To enable other development that is compatible with forestry land uses.	▪ Applies to: Sunny Corner State Forest and Lidsdale State Forest. ▪ The Project is located outside of this land zone.
RU5 Village and R5 Large lot residential	▪ To maintain and enhance the unique character of each of the rural villages. ▪ To provide residential housing in a rural setting while preserving, and minimising impacts on, environmentally sensitive locations and scenic quality.	▪ Applies to: Rydal ▪ The character of Rydal is outlined in Section 5.1.3 and impacts are assessed in Section 6.1.
SP2 Infrastructure	▪ To prevent development that is not compatible with or that may detract from the provision of infrastructure.	Applies to: ▪ Rail Infrastructure: Great Western Railway ▪ Roads and traffic facility: Great Western Highway ▪ Electricity generating works: Thompsons Creek Dam The Project is considered a compatible land use for rail, roads and the dam.

Plan zone	LEP objectives (relevant to the study)	Location and relevance to landscape and visual
C1 National Parks and Nature Reserves	▪ To identify land that is to be reserved under the National Parks and Wildlife Act 1974 and to protect the environmental significance of that land.	▪ Applies to: Evans Crown Nature Reserve and Eusdale Nature Reserve ▪ The Project is located outside of this land zone.
C4 Environmental Living	▪ To provide for low-impact residential development in areas with special ecological, scientific or aesthetic values.	▪ Applies to areas around Mount Haven Road, to the west of the Landscape Character Study area.

City of Lithgow Development Control Plan 2021

The Development Control Plan (DCP) recognises the visual quality of the rural landscape, stating that development in rural areas should be 'consistent with the rural character' and avoid 'significant environmental features, such as natural forms, remnant native vegetation, wetlands or natural watercourses and drainage' (DCP Chapter 5, s.5.3).

Table 4-2 lists those plan zones within the Landscape Character Study area and relevant Development Control Plan (DCP) objectives for landscape and visual amenity.

Table 4-2 DCP objectives for landscape and visual amenity

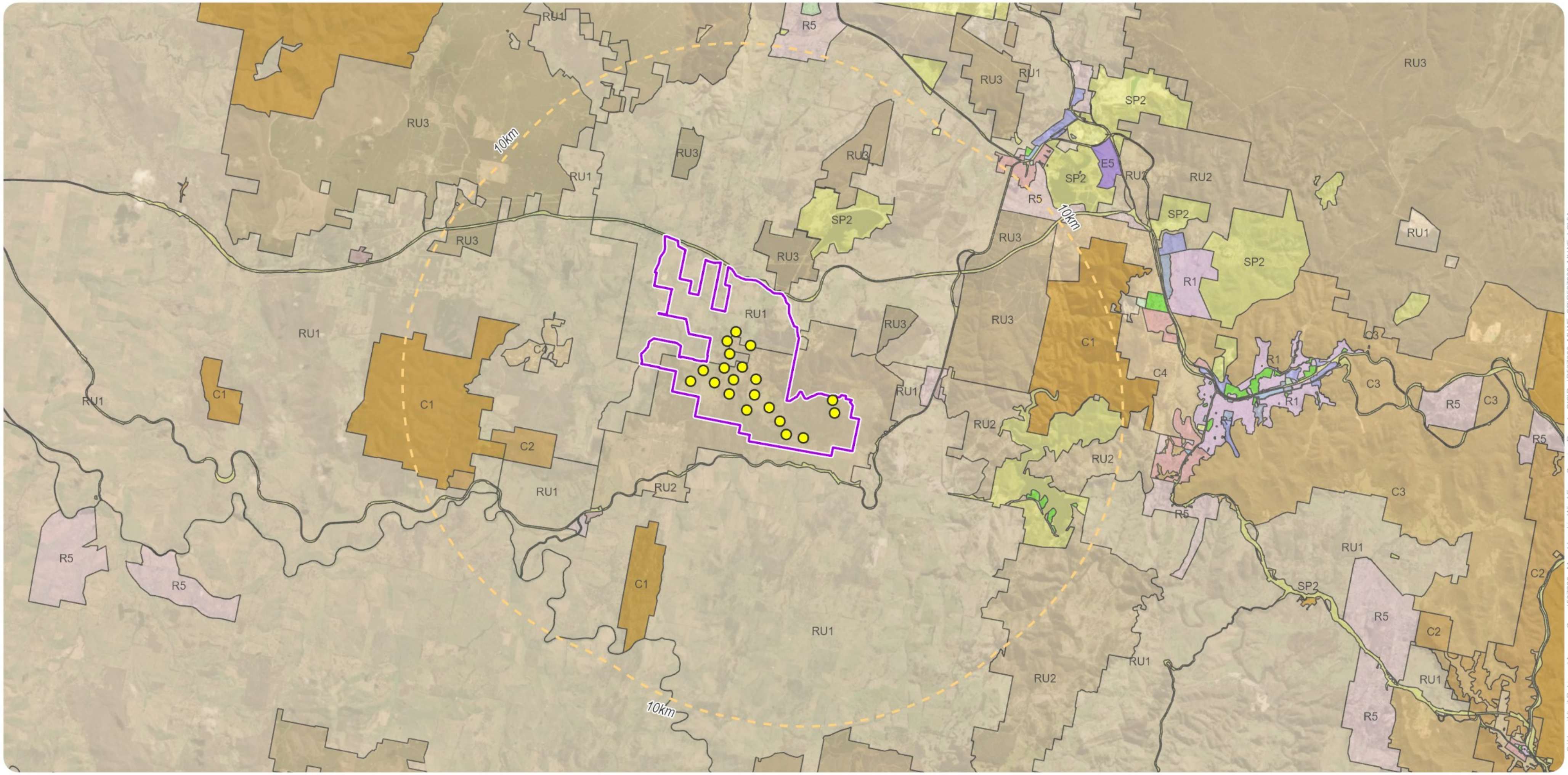
Plan zone	DCP objectives (relevant to the study)	Location and relevance to landscape and visual
Local Character and Context (DCP Chapter 2, s.2.3)	▪ O1. To retain and enhance the unique qualities of local character and context by responding to the essential elements that make up the character of the surrounding area whilst allowing areas to transition to future desired character. ▪ O2. To ensure that new development is responsive and sympathetic to the surrounding context in scale, massing, orientation, siting, form, construction and materials (this does not necessarily mean that it produces the same outcomes as the surrounding context). ▪ O3. To ensure that new development integrates with the existing built form, landscape and public domain and encourages a vibrant, safe and attractive place for activity and community interaction.	There are no location specific controls that apply to the Landscape Character Study area. Within Rydal there are heritage conservation elements which contribute to character of Rydal as outlined in Section 5.1.3.
Visually Prominent Sites (DCP Chapter 2, s.2.4)	▪ O1. To protect and preserve the importance of views to/from visually prominent sites including, but not limited to, regionally significant landscape and heritage features such as mountain escarpment(s); National Parks; gateways to settlements; etc. ▪ O3. To avoid insensitive or incompatible development on or in close proximity to a visually prominent site that due to location, form, scale, bulk, materials or colours detracts from or dominates the visual amenity of a visually prominent site. ▪ O4. To retain and enhance significant native vegetation on sites, not only for its environmental benefits, but where it can also act as a buffer or screen to existing or proposed development, while also having regard to bushfire protection.	Visually prominent sites relative to the assessment comprise higher elevations in rural areas including: ▪ Mount Lambie ▪ Mount Tarana
Farm building and ancillary structures (DCP Chapter 8, s.5.3	▪ To ensure that farm buildings & ancillary structures are of a size, height & bulk that is suited to the site area & minimise the visual impact of larger buildings on rural & landscape character. ▪ To minimise impacts on the landscape and rural/scenic character, particularly for Visually prominent Site(s).	BESS structure Building controls include a maximum height of 10 m and a setback up to 50 m from a primary road, depending on the maximum building footprint.

Relevance to PLCVIA

The land in the region is generally within RU1 and RU2 which includes uses associated with livestock farming, where herds graze over areas of modified pastures. Dwellings are widely dispersed and typically located well within ownership boundaries.

Where possible, environmental features identified to be considered by the Project include:

- The heritage character of Rydal
- Mount Lambie as a visually prominent site
- Ancillary structures meet building controls (maximum height of 10 m and a setback up to 50 m from a primary road).



Project area
Landscape Character Study area (10km)
Mount Lambie Wind Farm Infrastructure
Turbine location
Land Zoning
C1 - National Parks and Nature Reserves
C2 - Environmental Conservation / Management
C3 - Environmental Management
C4 - Environmental Living
E1 - Local Centre
E3 - Productivity Support
E4 - General Industrial
E5 - Heavy Industrial
MU1 - Mixed Use
R1 - General Residential
R2 - Low Density Residential
R5 - Large Lot Residential
RE1 - Public Recreation
RE2 - Private Recreation
RU1 - Primary Production
RU2 - Rural Landscape
RU3 - Forestry
RU5 - Village
SP2 - Infrastructure

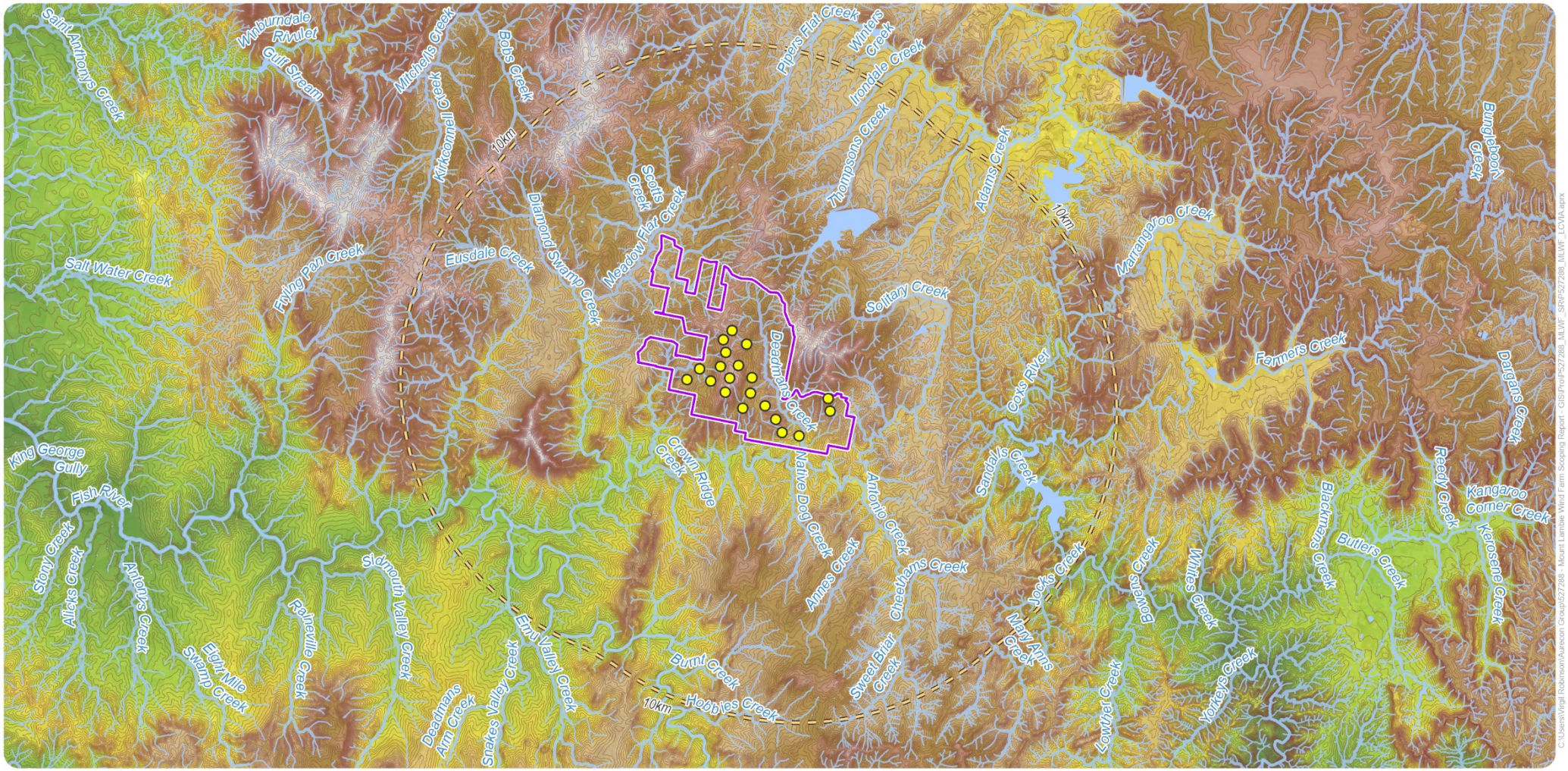
Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:200,000
0 2.5 5 km

Projection: GDA2020 MGA Zone 55

Mount Lambie Wind Farm **Landscape Character and Visual Impact Assessment**

Figure 4-9: Land zoning



Project area

Landscape Character Study area (10km)

Waterbody

Waterway

10m contour

Mount Lambie Wind Farm Infrastructure

Turbine location

Digital Elevation (m)

1288

0

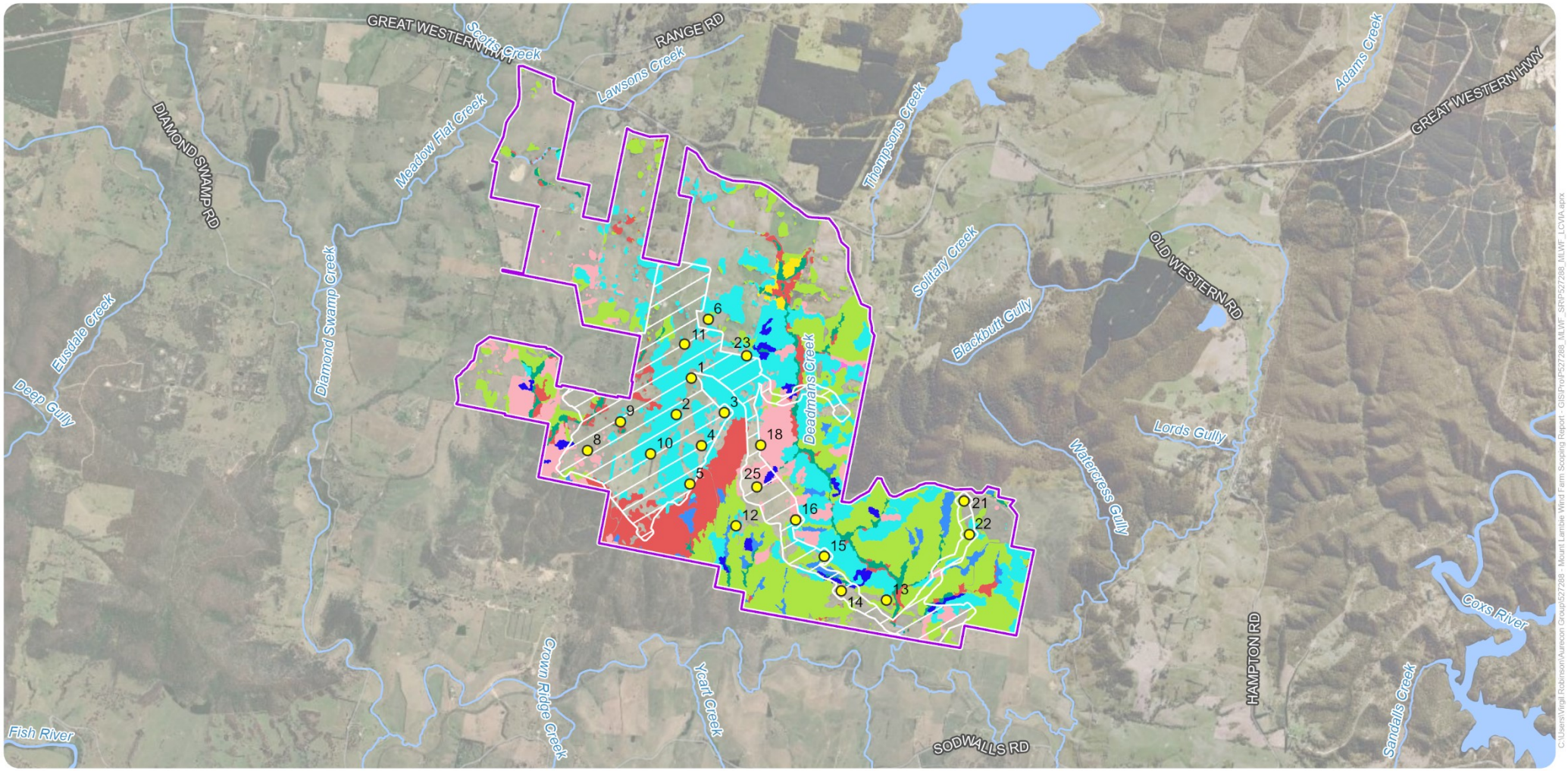
Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:200,000

0 2.5 5 km

Projection: GDA2020 MGA Zone 55

Figure 4-10: Topography and hydrology



Project area

Biodiversity Survey area

Waterbody

Mount Lambie Wind Farm Infrastructure

Turbine location

NSW State Type Vegetation Mapping

PCT ID and Name (Mapped occurrence in the Project area (ha))

- 3211 - Central Tableland Montane Wet Forest (52.4ha)
- 3294 - Central Tableland Peppermint-Gum Montane Forest (3ha)
- 3303 - Central Tableland Ribbon Gum Sheltered Forest (10.5ha)
- 3347 - Southern Tableland Creekflat Ribbon Gum Forest (73.5ha)
- 3367 - Central Tableland Granites Grassy Box Woodland (173.9ha)
- 3369 - Central Tableland Ranges Peppermint-Gum Grassy Forest (554.3ha)
- 3534 - Central West Stony Hills Stringybark-Box Forest (22.8ha)
- 3735 - Central Tableland Peppermint Shrub-Grass Forest (408.4ha)
- 3747 - Southern Tableland Western Hills Scribbly Gum Forest (118.5ha)

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:75,000

0 1 2 km

Projection: GDA2020 MGA Zone 55

Figure 4-11: Plant Community Types within the Project area

4.1.6 Sites and landscape features

Recreation and public areas

The Landscape Character Study area is predominantly farmland with some areas of native bush, plantations and settlement. There are areas in which residents and visitors enjoy outdoor activities and the natural environment. Some areas are appreciated for their natural beauty and occasional views of the surrounding countryside.

Conservation areas within the Landscape Character Study area include:

- Evans Crown Nature Reserve

Community facilities within the Landscape Character Study area include:

- Meadow Flat Public School
- Rydal showgrounds.

Figure 4-12 Evans Crown Nature Reserve entrance

Source: Aurecon (August 2024)

Figure 4-13 Evans Crown Nature Reserve walking track

Source: Aurecon (August 2024)

Towns and settlements

Rydal and Tarana are small villages located in the Landscape Character Study area, with heritage tied to early European exploration, settlement, and the development of transportation and agriculture in the region. The villages are both located on the Great Western Railway line.

Various historic buildings including railway stations, churches, homes and the Rydal Pub contribute to the village's historical charm and reflect its early settler history. Local agricultural shows and events have long been part of Tarana's community traditions, showcasing the area's farming heritage.

The population of the towns and parishes within the Landscape Character Study area, according to the 2021 Census, are listed as:

- Tarana has a population of 187
- Rydal has a population of 163
- Mount Lambie (parish) has a population of 65
- Meadow Flat (parish) has a population of 356
- Sodwalls (parish) has a population of 94.

Roads and railway

The main roads in the Landscape Character Study area include Great Western Highway to the north, Curly Dick Road to the west, Hampton Road to the east, Sodwalls Road and Main Western (Railway) Line to the south (refer to Figure 4-14).

Various local roads and tracks connecting to rural properties, lie within the area and are generally unsealed gravel roads as shown in Figure 4-16.

Figure 4-14 Great Western Highway near intersection of Old Western Road, to the east of the Project area

Source: Aurecon (August 2024)

Figure 4-15 Sodwalls Road to the south of the Project area

Source: Aurecon (August 2024)

Figure 4-16 Stacks Road to the southeast of the Project area

Source: Aurecon (August 2024)

Figure 4-17 Main Western (railway) Line at Tarana Station

Source: Aurecon (August 2024)

4.1.7 Cultural heritage

Refer to Section 6.7 of the Scoping report for further details on heritage context and preliminary potential impacts, as per the Heritage Due Diligence report (Aurecon, September 2024).

Aboriginal cultural heritage

The Project area falls within the eastern extent of the lands occupied by the Wiradjuri people. Any consultation that might be required on Aboriginal matters in the Landscape Character Study area, would be undertaken with the Bathurst Aboriginal Land Council.

A search of the NSW Aboriginal Heritage Management System (AHIMS) was completed by Aurecon on 22 August 2024 (refer to Heritage Due Diligence report), identifying seven sites of Aboriginal significance. Two within the Project area comprise an open camp site and an isolated find; whilst the five within 1 km of the Project area comprised a potential archaeological deposit, a scarred tree site, an isolated find, and an open camp site and an open site containing one artefact.

The Heritage Due Diligence report predicts that there is high potential for Aboriginal sites to be present within the Project area that reflect intensive historic use by Wiradjuri people. The Aboriginal sites are localised and are not considered of specific relevance to the visual amenity or protected views of the Landscape Character Study area.

Non-Aboriginal historical heritage

Within the Landscape Character Study area, significant heritage elements are associated with early pastoralism, settlement, and railway transportation. By the late 1830s, pastoralism had emerged as the dominant economic activity in the greater Lithgow region, with Mount Lambie serving as a critical junction for stock routes. While sheep farming was particularly prominent, cattle also played an essential role in the area's economy. Furthermore, gold mining was conducted within the Project area. The presence of both coal and iron ore in adjacent regions enabled Lithgow to become one of the earliest sites of steel production in Australia. The rail network further facilitated the transport of raw materials into Lithgow, bolstering its industrial development.

The following lists key historic items in the Landscape Character Study area (shown in Figure 4-22).

- State heritage items:
  - Rydal Railway Station, built in the 1860s (refer to Figure 4-18)
  - Tarana Railway Station, built in the 1870s (refer to Figure 4-20)
  - Stone Viaducts 1–6 (rail bridges), Sodwalls (refer to Figure 4-21)
- Local heritage items:
  - St. Matthew's Church, Rydal
  - Rydal Cemetery
  - Mount Lambie Presbyterian Church Cemetery (refer to Figure 4-19)
  - Meadow Flat Public School, St Luke's Anglican Church, Cemetery and Showground buildings
  - Local heritage areas within Tarana, Rydal and Mount Lambie relating to early settlers
  - Rydal Heritage Conservation Area - protecting heritage buildings i.e. Hotel, Post Office, former police station, cottages
  - Tarana heritage items including Tarana Hotel, St Stephens Anglican Church, cottages
- Landscape heritage including bushland reserves, recreational reserves and forests.

The Heritage Conservation objectives (Lithgow LEP, 2014) that are to be considered are:

- *(b) to conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views.*

These heritage items contribute to the landscape character of villages and settlements within the Landscape Character Study area and are not considered of specific relevance to visual amenity or protected views.

Figure 4-18 Rydal railway station

Source: Aurecon (August 2024)

Figure 4-19 Mount Lambie Presbyterian Church

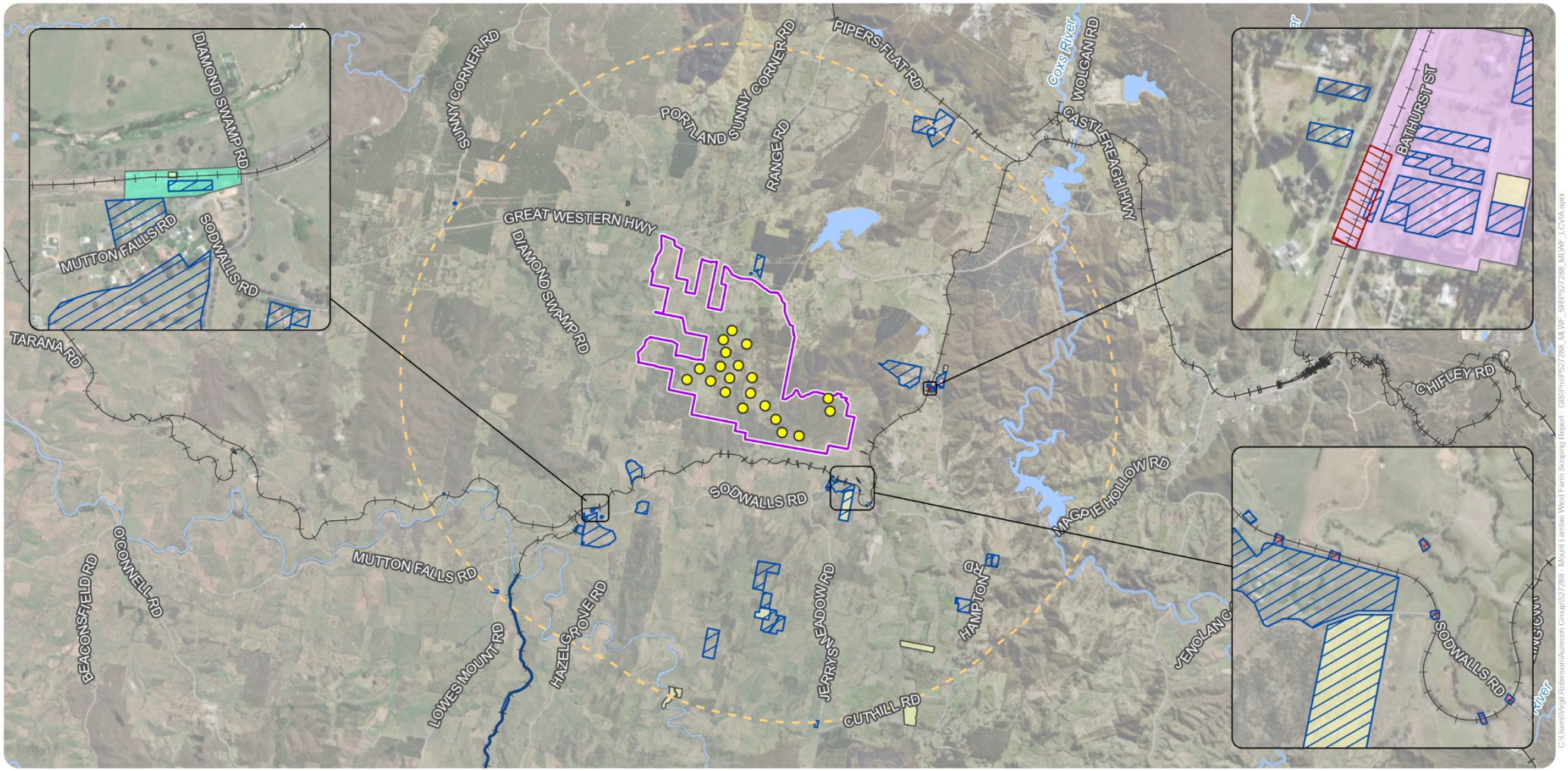
Source: Aurecon (August 2024)

Figure 4-20 Tarana railway station

Source: Aurecon (August 2024)

Figure 4-21 Railway stone viaduct, Sodwalls

Source: Aurecon (August 2024)



Project area
Landscape Character Study area (10km)
Railway
Waterbody
Waterway

Mount Lambie Wind Farm Infrastructure
Turbine location

State Heritage Register Curtilage
Rydal Rail Underbridges
Rydal Railway Station Group
Tarana Railway Station Group

EPI Heritage
Item - General
Item - Archaeological
Conservation Area - General

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:200,000
0 2.5 5 km

Projection: GDA2020 MGA Zone 55

Figure 4-22: Historic heritage listings within the Landscape Character Study area

4.2 Key landscape features and public viewpoints

There are no significant features or public viewpoints located within the Project area, however in the broader Landscape Character Study Area there are key landscape features and public viewpoints as identified in Table 4-3.

Table 4-3 Summary of landscape features and public viewpoints

Landscape feature	Significance	Suggested scenic quality	Distance/direction to Project area	Relevance to PLCVIA
Evans Crown Nature Reserve	Regional environmental, historical, and high visual value	High - from rock outcrops	Approximately 5 km southwest	The Project is not visible within the reserve due to intervening trees, however there are rocky outcrops where the Project is potentially visible. These areas are outside of the high visibility threshold.
Lake Lyell	Regional environmental value	Moderate – lake is modified	Approximately 7.5 km east	The Project is not visible due to intervening topography.
Thompsons Dam	Local landscape value associated with historical significance	Low – man-made lake	Approximately 4.5 km northeast.	The Project is not visible due to intervening topography.
Historical character of Rydal	Local landscape value associated with historical significance	Low – local heritage sites	Approximately 3.5 km east	The Project is not visible due to intervening topography, however, may have bearing on the character perceived generally in the area.
Mount Lambie	Local landscape value associated with landscape amenity value	Moderate – undulating ranges with native vegetation that are not visually distinctive but of local scenic value.	Approximately 1.8 km north	Areas are considered within the viewpoint assessments. The Project has the potential to disrupt or compete with views of Mount Lambie.
Golden Poplars	Local landscape value associated with landscape amenity	Low – planted trees of visual interest, though not uncommon.	Approximately 4.2 km northwest	View of trees typically experienced by motorists with some nearby dwellings, and Project potentially visible.
Mount Lambie Scenic Rest Area, Great Western Highway	Local landscape value associated with landscape amenity	Moderate – lookout showing hilly area with foreground waterbody.	Approximately 2.1 km northeast.	The Project is not visible from the Rest Area

Community landscape values

Community engagement has been undertaken directly with the closest residents to the Project and through an online survey[1] to inform the community and gauge their sentiments about the Project. The below include the responses to questions/themes relevant to this assessment.

- Key landscape features valued by the community including:
  - grazing land, hills and ridgelines
  - previous and adjacent land uses including open-cut mining, active and retired power stations were acknowledged.
- Key viewpoints in the area (both public and private), including:
  - State forests (native)
  - Evans Crown Nature Reserve
  - Sodwalls-Tarana Road
- General information about the relative scenic quality of the area including:
  - valleys and hills, farmland and native bushland.
  - views towards Mount Lambie.

Refer to Chapter 5 (Engagement) of the Scoping Report for further details on engagement parties, type and feedback received.

[1] Community Landscape Values Proposed Mount Lambie wind energy project

5 Baseline analysis

5.1 Landscape Character

Landscape Character Types (LCT) help to identify unifying aspects of the landscape and distinguish why one landscape is visually distinct from another (refer to Section 3.4.1 for assigning landscape sensitivity). The character zones have been established through both desktop and field analysis, which also determined that the Project has the potential to influence the LCTs within the Landscape Character Study area.

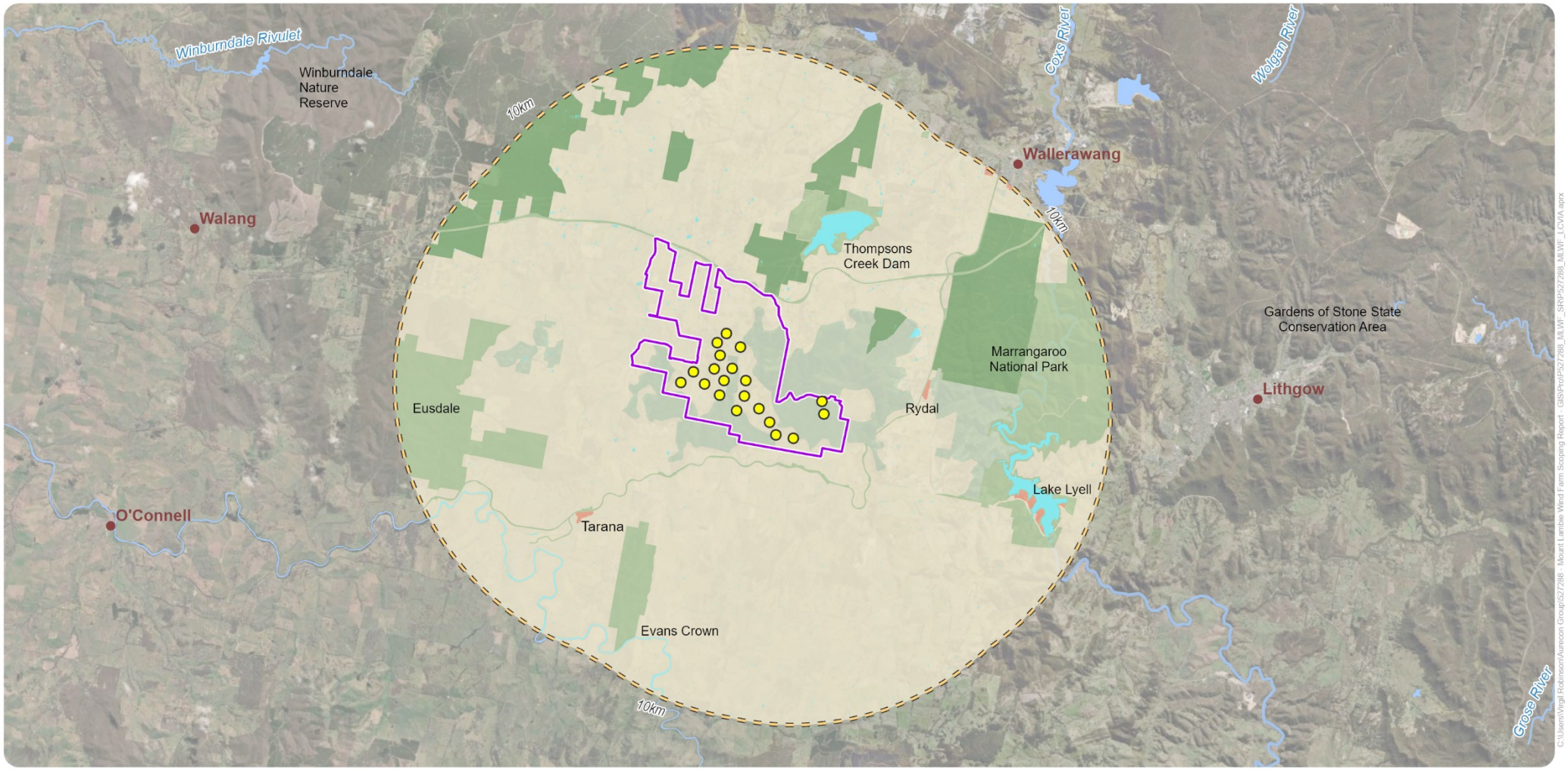
Each character type identified is based on the consideration of the following attributes, some of which have been previously described in Sections 4.1.1 and 4.1.5:

- Landscape value: landscape designated for their scenic or landscape importance or valued recreational function (as described in Section 4.2)
- Landscape elements that contribute to defining character: residential and commercial built form and landform
- Landscape character attributes: scale, grain, perceptual characteristics such as connection to natural landscape
- Observed land uses and current and future land use zones outlined in strategic planning documents and Local Environmental Plans (as described in Section 4.1.5)
- Topography and vegetation.

The LCTs identified within the Landscape Character Study area are shown in Figure 5-1 and include:

- LCT 1: Agricultural hills
- LCT 2: Native bushland
- LCT 3: Villages and rural settlements
- LCT 4: Forestry
- LCT 5: Lakes and dams
- LCT 6: Mining and power generation.

Roads are assumed to take on the character of adjacent LCTs.



Project area
Landscape Character Study area (10km)
Waterbody
Waterway
City or town

Mount Lambie Wind Farm Infrastructure
Turbine location

Landscape Character Zones
LCT 1: Agricultural hills
LCT 2: Native bushland
LCT 3: Villages and rural settlements
LCT 4: Forestry
LCT 5: Lakes and dams

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:200,000
0 2 4 km

Projection: GDA2020 MGA Zone 55

Mount Lambie Wind Farm **Landscape Character and Visual Impact Assessment**

Figure 5-1: Landscape character zones

5.1.1 LCT 1: Agricultural hills

LCT 1 is a rural landscape comprising undulating topography with cleared areas with modified pastures and some areas of native bushland, within and surrounding the Project area. Grassed paddocks are used for livestock grazing of cattle and sheep. Many of the paddocks have windrows to the perimeter, comprising native or exotic species.

The undulating landscape comprises valleys with streams and creeks, with surrounding hills which are low rises to steep feature ranges. Manmade dams are spotted around farms. The views are limited by the topography, however elevated areas have vast views depending on the level of surrounding native vegetation. Some areas within the landscape character zone are influenced by transmission lines, the Main Western Line and the Great Western Highway.

Supporting farm infrastructure includes fencing, sheds, stockyards and machinery. There are residential dwellings spotted around the area that are often located down long driveways and surrounded by vegetation and near large farm sheds. Typical landscape patterns are shown in Figure 5-2 to Figure 5-5.

Key characteristics and landscape features:

- Gently undulating to steep feature ranges
- Scattered native trees and windrows
- Grassed paddocks with grazing livestock, mostly cattle
- Rural dwellings
- Ancillary farming sheds.

Figure 5-2 Undulating hills with some scattered and hedgerow vegetation and a dam to the foreground

Source: Aurecon (August 2024)

Figure 5-3 Grazing livestock on rolling paddocks, with a dam to the foreground, native and exotic vegetation in the background

Source: Aurecon (August 2024)

Figure 5-4 Farm shed on Curly Dick Road

Source: Aurecon (August 2024)

Figure 5-5 Cattle grazing on slopes

Source: Aurecon (August 2024)

5.1.2 LCT 2: Native bushland

The native bushland comprises dry sclerophyll forests and some areas with granitic outcrops. These are in both small and large areas on undulating terrain. The bushland provides habitat for native flora and fauna. There are both tall trees (canopy), middle-storey and groundcover vegetation.

Key characteristics and landscape features:

- Abundance of native vegetation and typically little presence of modification
- Limited views to surrounding area due to tree screening
- Some publicly accessible tracks for recreational purposes, or access to private property.

Key features:

- Evans Crown Nature Reserve (refer to Figure 5-7) – 5 km south
- Eusdale Nature Reserve Park – 7.5 km west
- Marrangaroo National Park – 8 km east

Figure 5-6 Bushland at Mount Lambie

Source: Aurecon (August 2024)

Figure 5-7 Evans Crown Nature Reserve

Source: Aurecon (August 2024)

5.1.3 LCT 3: Villages and rural settlements

The closest townships to the Project include Rydal, 4 km to the east and Tarana, 10 km to the southwest. These are villages with residents supporting local industries including farming and forestry. At a further distance from the Project Area are the towns of Lithgow, Wallerawang and Portland (to the north to northeast) which are key places supporting the forestry (LCT 4), mining and power generation industries (LCT 6).

The villages of Rydal and Tarana are located along the Main Western (Railway) Line, a freight and passenger service line with train stations, of local historic significance, to the centre of the towns. There are quaint cottages on large lots, with maintained gardens. The houses are situated on large lots. Due to the topography and cover of surrounding trees, views are generally within the foreground at Rydal. In Tarana, there are more open views and less screening by trees.

The towns Lithgow, Wallerawang and Portland comprise larger low-density residential area with main streets for shops, as well as schools, health services and parks.

Key characteristics and landscape features:

- Low density residential houses on large lots
- Rydal Recreation Reserve for agricultural shows and community events
- Historic sandstone buildings including train stations and churches
- Historic cottages relating to early pastoralism in the area

- Taverns as a key community social hub (Tarana and Rydal)
- Community service buildings including police stations and Rural Fire Service.

Figure 5-8 Rydal

Source: https://sevenvalleys.com.au/

Figure 5-9 Rydal recreation reserve

Source: Aurecon (August 2024)

5.1.4 LCT 4: Forestry

There are extensive areas of planted pine forests including Lidsdale and Sunny Corner State Forests. There are also a few timber mills. The pine forests have a much more ordered and modified character with straight rows and highly defined boundaries to surrounding land uses, than native bushland (LCT 2).

Key characteristics and landscape features:

- Highly modified landscape
- State forests are planted with abundance of mono-species (Pinus radiata)
- Limited views to surrounding area due to tree screening.

Figure 5-10 Forestry north of the Project area, Mount Lambie

Source: www.commercialrealestate.com.au/property/34-cases-lane-mount-lambie-nsw)

Figure 5-11 Lidsdale State Forest

Source: Aurecon (August 2024)

5.1.5 LCT 5: Lakes and dams

Lake Lyell is a man-made lake to the east of the Project area, formed in a deep valley along Coxs River. The lake has been dammed at its south end and is used for power generation, originally to support the Mount Piper and Wallerawang Power Stations (LCT 6). It is a recreational lake, valued for swimming, fishing, boating and camping.

Similarly, Thompsons Creek Reservoir is man-made and used to store water as part of power generation. There is no boating allowed but is used recreationally for camping and fishing.

Lake Wallace, to the edge of Wallerawang, is also a dammed lake that was constructed to provide additional water-cooling capacity for the power station. As the power station is decommissioned, the lake is now used for recreational purposes.

Key characteristics and landscape features:

- Large water bodies providing landscape amenity
- Modified landscape with dam structure forming the lakes.

Key features:

- Lake Lyell – 7.5 km east
- Thompson Creek Reservoir – 4.5 km northeast.

Figure 5-12 Lake Lyell

Source: Aurecon (August 2024)

Figure 5-13 Thompson Creek Dam

Source: https://www.seabeesfishingclub.com/)

5.1.6 LCT 6: Mining and power generation

There are coal mines within the Lithgow region which are used to supply the coal-fired power station at Mt Piper and previously, the Wallerawang and Lithgow Power Stations which closed in 2014 and 1964 (respectively). The mines and coal processing plants are located within vicinity of the Castlereagh Highway, to the northeast of the Landscape Character Study area. These are highly modified landscapes, with at-grade storage of extractive materials, overburden mounds, conveyors and large machinery.

Key characteristics and landscape features:

- Large and extensive built structures including cooling towers and stacks
- Connection substations and transmission towers (refer to Figure 5-16 and Figure 5-17).

Figure 5-14 Mt Piper Power station

Source: https://www.energyaustralia.com.au/

Figure 5-15 Springvale mine near Lithgow with previous Wallerawang power station in distance

Source: lithgowmercury.com.au

Figure 5-16 Substation between Sunny Corner Road and the Great Western Highway

Figure 5-17 Transmission towers visible to the top of Mount Lambie

Source: Kazim Ali Noori (April 2023)

5.2 Visual catchment

The assessment of potential visual impacts is based on the sensitivity of the view and the degree of modification or changes to the view as part of the proposal at the operational phase of the Project. At Scoping phase, the preliminary visual assessment is to identify the potential visual receivers of the Project within the Visual Study area (refer to Section 6.2) and determine the likely 'worst case' visual envelope of the wind turbine layout through Zone of Theoretical Visibility (ZTV) mapping.

The following is relevant when interpreting the findings of the ZTV:

- It takes into account the topographic constraints of the view and does not include land cover factors such as the presence of buildings and vegetation. As it only uses the landform, it is considered a worst-case scenario of the potential visual extents.
- It does not consider the effect of distance. Generally, the greater the distance from the wind farm, the less prominent it will be within the view due to its perceived scale and fading due to atmospheric conditions.
- The ZTV identifies increased visibility due to altitude and ridgelines, as well as decreased visibility caused by intervening topography.
- The turbine height from hub to blade tip (refer to Section 2.2 and Figure 3-2) is used to generate the 'worst case' ZTV.

The Scoping map shown in Figure 5-18 and Figure 5-19 shows the ZTV and location of sensitive receivers within the Visual Study area. Based on this mapping, the potential viewing pattern of turbines include:

- Views to top of turbines (hub to blade tip) extend to areas beyond 10 km in elevated areas;
- There are a greater number of turbines viewed from the south to southeast of the Project; and
- There is decreased visibility of the number of turbines at the base of the hill range to the south and east of the Project area, including the township of Rydal.

5.2.1 Visual receivers

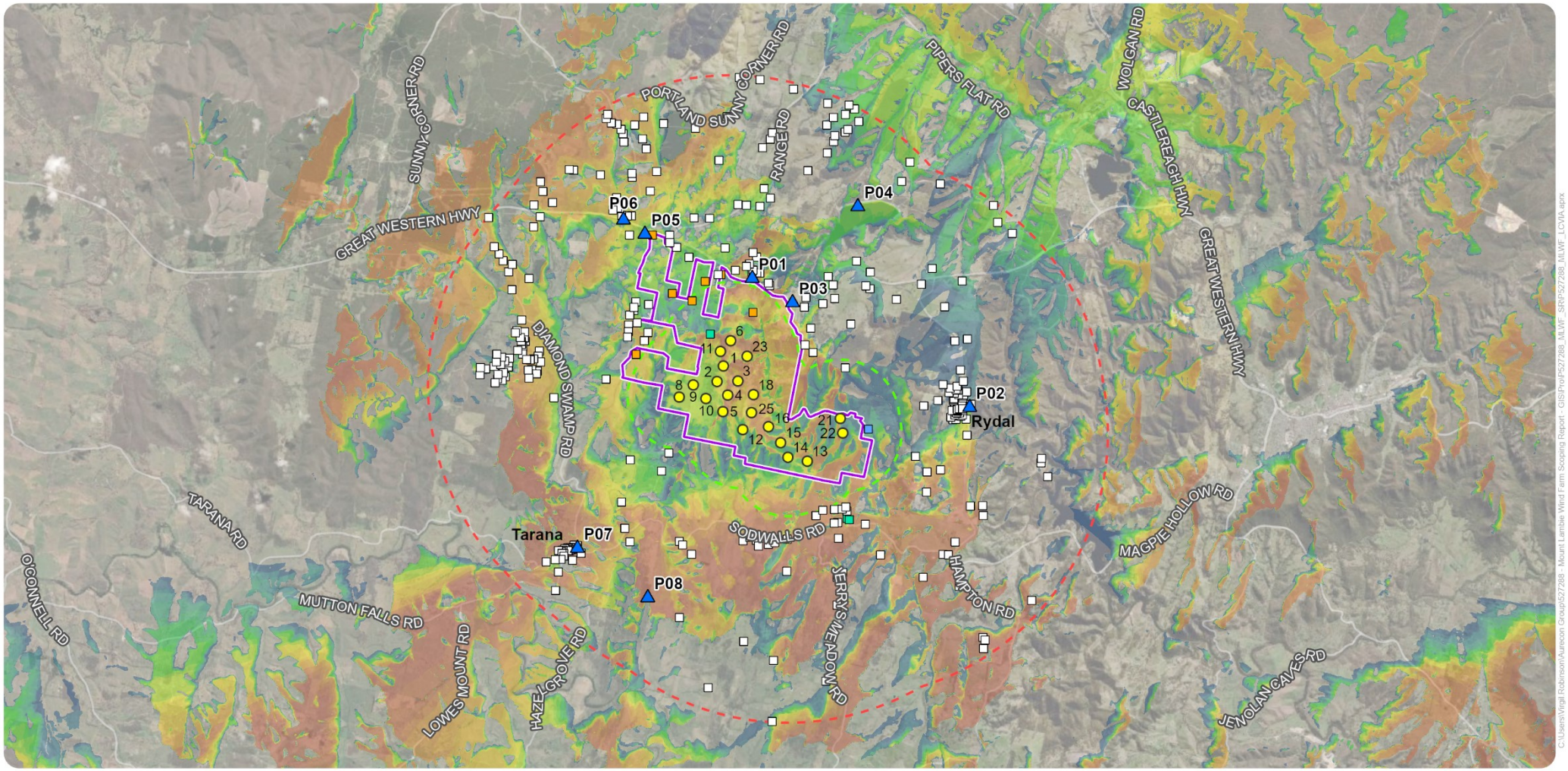
To understand the potential visual impact of proposed wind turbines, viewpoints of higher sensitivity including public viewpoints and private receivers have been identified within the Visual Study Area. The preliminary assessment thresholds provide an early indication of where placement of turbines will require further assessment and justification, and where consultation with potentially affected landowners needs to be focused – including discussions for landowner agreements.

The preliminary assessment thresholds involve analysis of two key visual parameters:

- Visual Study Area (refer to Section 3.2)
- Setback threshold (refer to Section 3.2.1), based on turbine height of either 252 m or 285 m.

As shown in the Scoping map (refer to Figure 5-18 and Figure 5-19), there are a high number of residential receivers within the Visual Study area, and ten public viewpoints. The visual receivers within the Visual Study area are made up of the following.

- Total of 308 private receivers within the Visual Study area including:
  - three associated dwellings (R01, R44 and R45)
  - seven other associated (under negotiation) dwellings (R02, R03, R04, R05, R06, R07 and R08).
- 10 public viewpoints within the Visual Study area including:
  - Mount Lambie Presbyterian Church and Graveyard (P01)
  - Rydal Showground (P02)
  - Mount Lambie Scenic Rest Area, Great Western Highway (P03)
  - Thompsons Creek Dam (P04)
  - Golden Poplars on Sunny Corner Road (P05)
  - Meadow Flat Primary School (P06)
  - Tarana Community Farmers Market (P07)
  - Evans Crown Nature Reserve (P08)
  - Tarana Railway Station (P09)
  - Rydal Railway Station (P10)
- Five (5) private receivers within the setback threshold including:
  - one non-associated (R142)
  - one non-associated (under negotiation) (R74)
  - two associated (under negotiation) (R02, R06)
  - once associated (R01).



Project area
Visual Study area
Receiver setback
Public viewpoint

Dwellings within the Visual Study area
- Associated dwelling
- Associated (under negotiation)
- Non-associated (under negotiation)
- Non-associated dwelling

Mount Lambie Wind Farm Infrastructure
- Turbine location

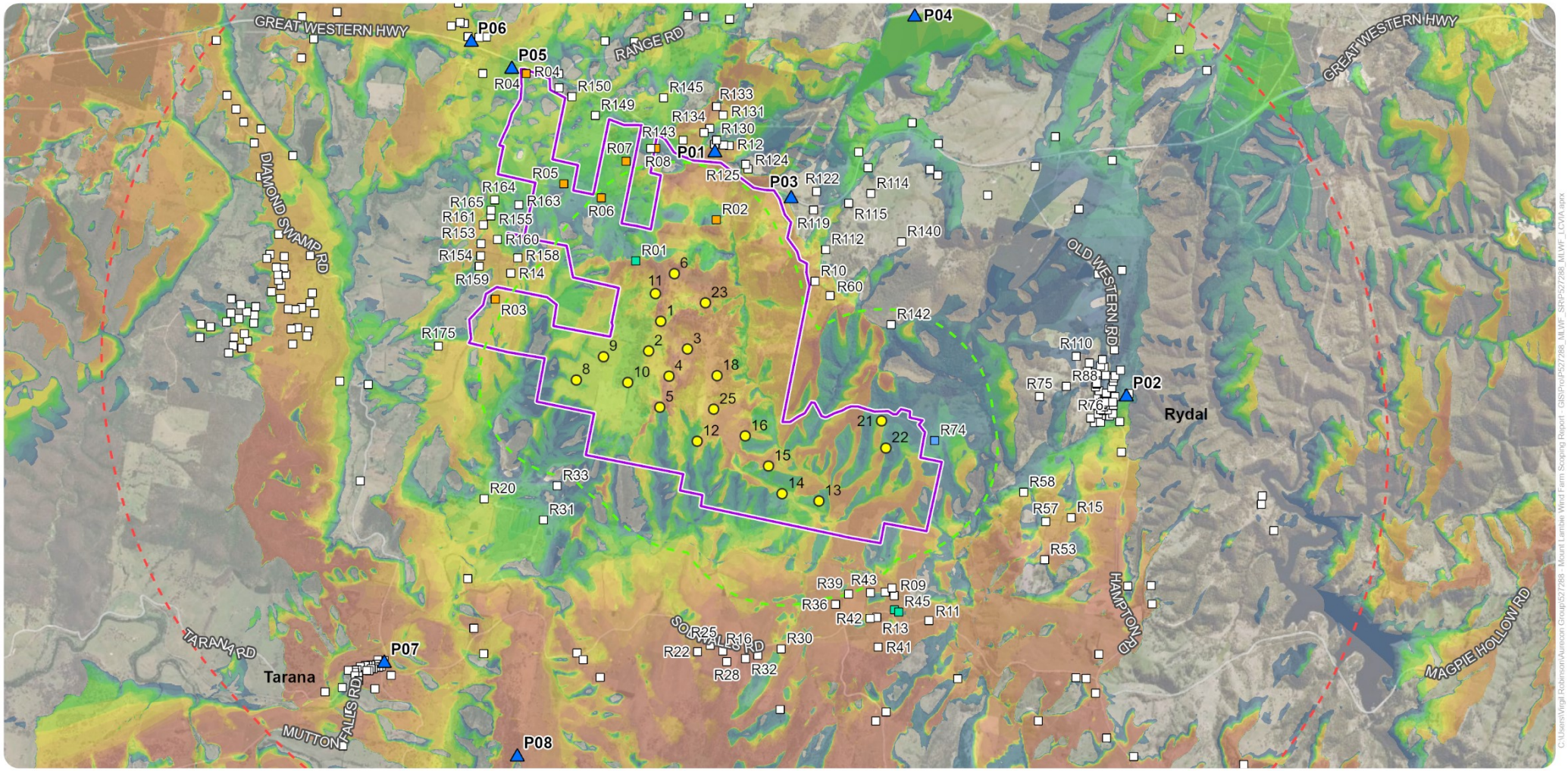
Turbine visibility
Hub to blade tip
20
0

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:175,000
0 2 4 km

Projection: GDA2020 MGA Zone 55

Figure 5-18: Scoping map: Turbines visibility and visual receivers



Project area
Visual Study area
Receiver setback
Public viewpoint

Dwellings within the Visual Study area
- Associated dwelling
- Associated (under negotiation)
- Non-associated (under negotiation)
- Non-associated dwelling

Mount Lambie Wind Farm Infrastructure
- Turbine location

Turbine visibility
Hub to blade tip
20
0

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:92,500
0 1 2 km

Projection: GDA2020 MGA Zone 55

Figure 5-19: Scoping map (detailed view): Turbine visibility and visual receivers

6 Potential impacts

6.1 Potential Landscape Character impacts

A summary of preliminary impacts to landscape character is shown in Table 6-1, providing a summary of matters for the referral which may require further investigation, assessment, management and mitigation.

The Project area lies within LCT 1 Agricultural hills and adjacent to LCT 2 Native bushland. Due to the visual influence dictated by the height of the turbines, there is a potential for landscape character impacts to adjacent LCTs, where the visual amenity is a part of the character. The potential for impacts arising on these LCTs have been considered from day one of operation.

Table 6-1 Summary of preliminary impacts to landscape character

Landscape Character Type	Sensitivity	Potential Magnitude	LCT Potential Impact
LCT 1 Agricultural hills	Low ■ Whilst it is not considered to be of any specific scenic value, some receivers likely place value upon its openness and typically low built form density. ■ There are no specific planning controls attributing special value to this landscape.	Low ■ Turbines located within this LCT have the potential to become the dominant visual feature in the landscape, however, will allow agricultural use to continue with the provision of access roads and additional infrastructure. ■ It is considered however that the ZTV is a relatively small portion of what is a widely distributed and expansive LCT.	**Low**
LCT 2 Native bushland	Moderate ■ A high degree of perceived naturalness and providing ecological habitat. ■ There are some areas of regional importance.	Low ■ The vegetation removal is considered small in this expansive LCT and is subject to existing vegetation removal for agricultural purposes. ■ The impact is not to areas of regional importance. ■ The presence of turbines adjacent bushland, introduces built structures of high contrast.	**Low**
LCT 3 Villages and rural settlements	Low ■ The rural villages (Rydal and Tarana) have some historic features and a small community which would be more sensitive to change. ■ Towns and settlements have low residential numbers and are not considered primary tourist destinations.	Very low ■ The Project does not have a direct impact on this character, though its presence would be noticeable as a new feature in the region. ■ The villages of Rydal and Tarana are the closest villages, with residents regularly experiencing views of the turbines, typically outside of the village.	**Very low**
LCT 4 Forestry	Very low ■ A highly modified landscape, typically comprising mono-cultured tree species and subject to change through forest clearing and replanting.	Negligible ■ The Project has no direct impact on this LCT. ■ Changes are likely to be barely perceptible due to intervening topography and vegetation.	**Negligible**
LCT 5 Lakes and dams	Moderate ■ Though the large waterbodies are modified landscapes, they are attractive features valued for recreation.	Negligible ■ The Project has no direct impact on this LCT. ■ Changes are likely to be barely perceptible due to intervening topography and vegetation.	**Negligible**

Landscape Character Type	Sensitivity	Potential Magnitude	LCT Potential Impact
LCT 6 Mining and power generation	Very low ■ Highly modified landscape with no landscape amenity.	Negligible ■ The Project is at a distance that is not immediately noticeable within this LCT.	**Negligible**

6.2 Potential visual impacts

This section documents a preliminary understanding of the potential visual change that may arise as a result of the Project and provides a summary of matters which will require further investigation.

The factors a visual assessment will consider include the sensitivity of the visual receiver, scenic quality and the magnitude of change. The magnitude of change includes distance from turbines, horizontal field of view (FOV), amount of intervening vegetation and/or topography and the number and extent of turbines potentially visible.

The potential for visual impacts arising at these representative viewpoints has been considered from day one of operation.

6.2.1 Representative viewpoint assessment

A total of 7 viewpoints representative of private and public views, were identified within the Visual Study area based on the design, viewing distance, turbine visibility, aspect and significant views.

These viewpoints were selected based upon the following:

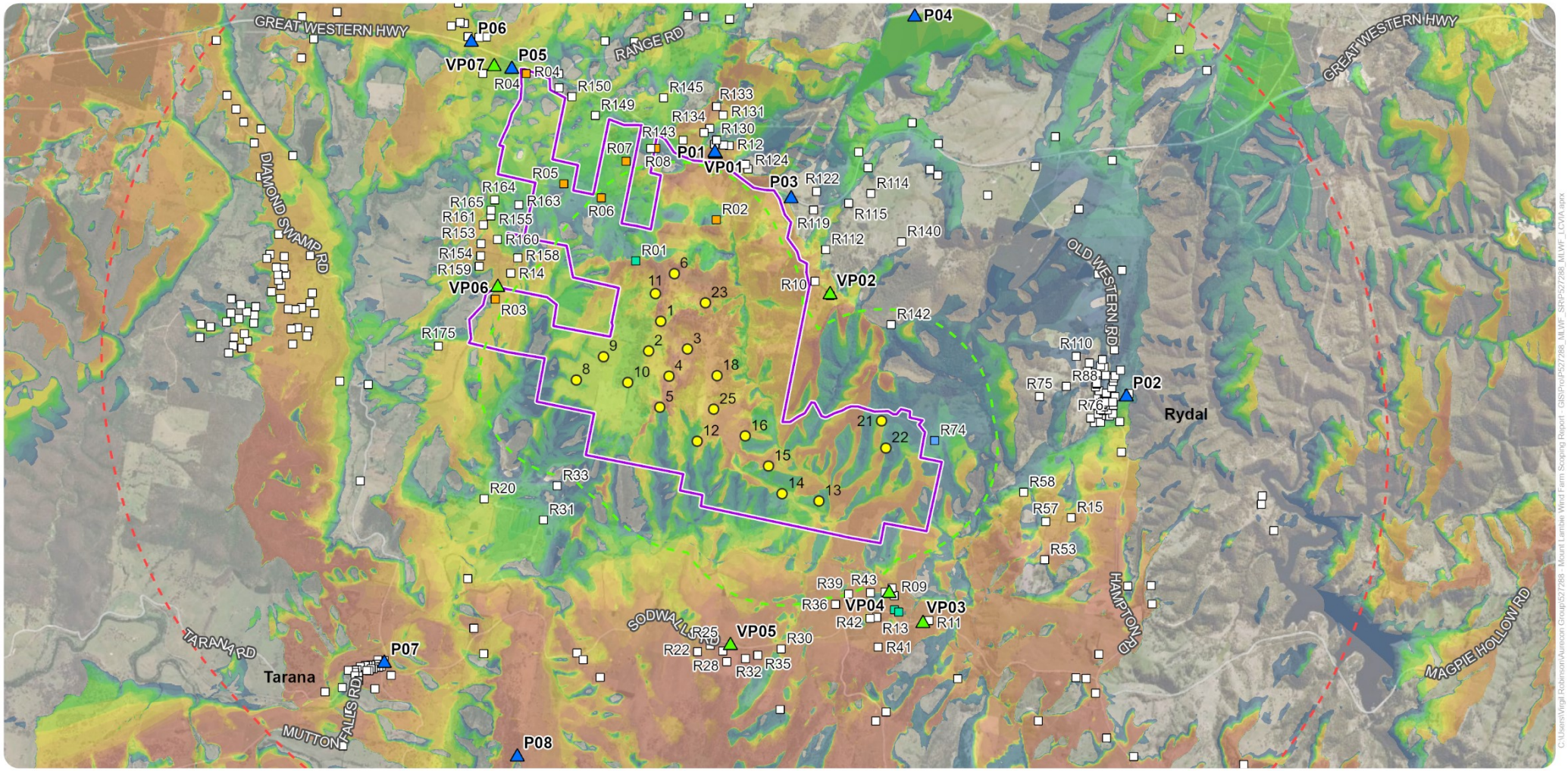
- Identification within the ZTV
- Desktop studies identifying places within close vicinity of potential sensitive receivers
- Significant viewpoints
- Viewpoints that are publicly accessible.

There are no significant viewpoints or view corridors identified within the 10 km Landscape Character Study area (identified in Section 4.1.6). There is a scenic lookout on Great Western Highway, to the north of the Project area, however this view is in the opposite direction of the Project, looking north towards Thompsons Creek Dam.

The details of viewpoint assessments including images of their existing conditions can be found in the following section. The locations of the assessed viewpoints are shown in Figure 6-1 and listed in Table 6-2.

Table 6-2 Representative viewpoints

Viewpoint no.	Location	Visual receiver	Closest representative receivers
VP1	Thorpes Pinch Road/ Great Western Highway	Visitors to Mount Lambie Presbyterian Church and graveyard	R89
VP2	Bonaventure Road	Rural residential dwellings	R10, R60
VP3	Sodwalls Road (east)	Rural residential dwellings	R11, R45, R47
VP4	Sodwalls Station Road	Rural residential dwellings	R09, R36, R43, R46, R49
VP5	Sodwalls Road	Rural residential dwellings	R16, R22, R25, R28, R30, R32, R35
VP6	Curly Dick Road	Rural residential dwellings	R03, R14, R158
VP7	Sunny Corner Road, Meadow Flat	Rural residential dwellings and local motorists adjacent the Golden Poplars	R04, R150



Project area
Visual Study area
Receiver setback
Viewpoint location
Public viewpoint

Dwellings within the Visual Study area
Associated dwelling
Associated (under negotiation)
Non-associated (under negotiation)
Non-associated dwelling

Mount Lambie Wind Farm Infrastructure
Turbine location

Turbine visibility
Hub to blade tip
20
0

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:92,500
0 1 2 km

Projection: GDA2020 MGA Zone 55

Figure 6-1: Viewpoint locations

VP01 - Representative Viewpoint 1: Mount Lambie Presbyterian church

Figure 6-2 Viewpoint 1: View west to northwest from the Presbyterian Church graveyard, Mt Lambie

Source: Aurecon, August 2024

Viewpoint selection	Public viewpoint (P01), representative historic church visitors and views above Great Western Highway.		
Viewing distance (m)	Near middleground - 2,101 m to the nearest turbine (WTG 6)		
Visual baseline	The view is elevated from the yard of Mount Lambie Presbyterian Church and graveyard with the highway partially visible below in the foreground. This view is screened by the hill to houses located behind the viewpoint. There are views to hills in the background between middleground hills, including the Telstra towers to the top of Mount Lambie to the left. The hills comprise bushland, thinning to scattered vegetation and pastures. Partial views of the surrounding environment are viewed from the highway by motorists, between trees and hills. The view is of a modified landscape including highway and farmland, however, has limited built form and large areas of vegetation.		
Land use	Farm zone	**Landscape Type**	LCT 1 Agricultural hills
Scenic quality	Moderate	Mount Lambie visible in the middleground, is a local landscape feature	
Visual sensitivity	Moderate	Church or cemetery visitors are interested in their immediate surroundings; however the view is from an important local site. Motorists have a low visual sensitivity travelling on a highway where views are experienced temporarily.	
Potential visual modification	■ 20 turbines are potentially partially visible, to the south to southwest ■ There is a low-level of intervening vegetation screening, near to the viewpoint ■ BESS and substation facilities may be partially visible on the hillside in the middleground		
Further investigation	■ Community engagement to provide further understanding of scenic value and number of visitors ■ Detailed assessment of the screening value of intervening vegetation through the preparation of a photomontage.		

VP02 - Representative Viewpoint 2: Bonaventure Road

Figure 6-3 Viewpoint 2: View in south direction from Bonaventure Road, Mt Lambie (image: Aurecon, August 2024)

Source: Aurecon, August 2024

Viewpoint selection	Representative of view from three private dwellings (R10, R60 and R112) near to the Project		
Viewing distance (m)	Far foreground - 1,801 m to nearest turbine (WTG 23)		
Visual baseline	The viewpoint is from a ridgeline on Mount Lambie, within a cleared area in the foreground between highly vegetated areas, in which there are two dwellings and grassed paddocks. There is a high level of screening vegetation with native bushland to the far left and exotic windrows to the right, which narrow the outlook from the dwellings. Views to the south, overlook bushland hills in the far background and a scene with a high degree of naturalness.		
Land use	Farm zone	**Landscape Type**	LCT 1 Agricultural hills
Scenic quality	Moderate	Viewpoint from near to summit of Mt Lambie, with adjacent hill range of moderate scenic value	
Visual sensitivity	Moderate	Rural residential dwellings	
Potential visual modification	▪ Up to 18 turbines are potentially visible, to the south of the dwellings. ▪ There is high degree of screening vegetation close to dwellings, which will screen views of turbines located to the southeast and southwest.		
Further investigation	▪ Detailed assessment of the screening value of intervening vegetation through the preparation of a photomontage. ▪ ZTV mapping to determine extent of turbine visible from this viewpoint.		

VP03 - Representative Viewpoint 3: Sodwalls Road east

Figure 6-4 Viewpoint 3: View to the northwest direction from Sodwalls Road (image: Aurecon, August 2024)

Source: Aurecon, August 2024

Viewpoint selection	Representative of view from private dwellings (R11, R45 + R47), at 339 Sodwalls Road			
Viewing distance (m)	Near middleground – 2,617 m to nearest turbine (WTG 13)			
Visual baseline	The view is elevated along Sodwalls Road with an undulating valley visible to the north of the road. Hills to the south of the road, screen views. The foreground views overlook grassed paddocks, undulating hills, scattered trees and some rural dwellings. To the lowest area of the valley, is the rail line and Solitary Creek. The Telco towers to the top of Mount Lambie, are screened by the foreground tree. The taller bushland hill range in the middleground is Mount Lambie to the right. The horizon is not visible due to the surrounding hills.			
Land use	Farm zone		**Landscape Type**	LCT 1 Agricultural hills
Scenic quality	Moderate	Mount Lambie visible in the middleground, is a local landscape feature		
Visual sensitivity	Moderate	Rural residential dwellings		
Potential visual modification	■ 20 turbines are anticipated to be visible, to the northwest to north of the dwellings. ■ There is high degree of screening vegetation close to dwelling (R11), however views from dwellings are elevated which provide a broader view			
Further investigation	■ Detailed assessment of the screening value of intervening vegetation through the preparation of a photomontage. ■ ZTV mapping to determine extent of turbine visible from this viewpoint.			

VP04 - Representative Viewpoint 4: Sodwalls Station Road

Figure 6-5 Viewpoint 4: View in east direction from Sodwalls Station Road, Sodwalls (image: Aurecon, August 2024)

Source: Aurecon, August 2024

Viewpoint selection	Representative of view from private rural dwellings (R09, R43, R46 + R49) on Sodwalls Station Road			
Viewing distance (m)	Near foreground – 1,692 m to nearest turbine (WTG 13)			
Visual baseline	The view is near the bottom of the valley, with surrounding grassed hills. The rail line is visible in the foreground and a rural cottage to the right. Electrical lines and poles are also visible. The foreground views overlook grassed paddocks, undulating hills, scattered trees and some rural dwellings. The taller bushland hill range in the middleground is range to the west of Mount Lambie, which is screened by the foreground hill.			
Land use	Farm zone		**Landscape Type**	LCT 1 Agricultural hills
Scenic quality	Low	There are no significant landscape features		
Visual sensitivity	Moderate	Rural residential dwellings		
Potential visual modification	■ There are 18 turbines potentially visible, to the northwest to northeast of the dwellings. ■ There is a low level of intervening screening vegetation close to dwellings. ■ The viewpoint is within a valley, with near turbines located above the horizon line or potentially screened by foreground hills			
Further investigation	■ Detailed assessment of the screening value of intervening vegetation through the preparation of a photomontage. ■ ZTV mapping to determine extent of turbine visible from this viewpoint.			

VP05 - Representative Viewpoint 5: Sodwalls Road

Figure 6-6 Viewpoint 5: View in northwest to northeast direction from 449 Sodwalls Road, Sodwalls (image: Aurecon, August 2024)

Source: Aurecon, August 2024

Viewpoint selection	Representative of view from private dwellings (R16, R22, R25, R28, R30, R32 + R35) at 639-741 Sodwalls Road		
Viewing distance (m)	Near foreground – 2,704 m to nearest turbine (WTG 14)		
Visual baseline	The view is elevated along Sodwalls Road with views across the valley to Mount Lambie hill range to the north. There are a few rural dwellings to the south of the road (behind image), which are further elevated and have a low level of screening vegetation. The foreground comprises scattered native trees surrounding Sodwalls Road, some trees within grassed paddocks and undulating hills. There are power poles and lines visible, overhead of the viewpoint image and down into the valley. The Telco towers to the top of Mount Lambie, are visible to the background. The viewpoint comprises a modified farming scene to the foreground and middleground views, with a more natural appearance of bushland hills as a key view.		
Land use	Farm zone	**Landscape Type**	LCT 1 Agricultural hills
Scenic quality	Moderate	Mount Lambie visible in the middleground, is a local landscape feature	
Visual sensitivity	Moderate	Rural residential dwellings	
Potential visual modification	■ There are 20 turbines potentially visible, to the north of the dwellings. ■ There is low level of screening vegetation close to dwellings and views from dwellings are elevated on a hill range, providing open views towards Mt Lambie		
Further investigation	■ Detailed assessment of the screening value of intervening vegetation through the preparation of a photomontage. ■ ZTV mapping to determine extent of turbine visible from this viewpoint.		

VP06 - Representative Viewpoint 6: Curly Dick Road

Figure 6-7 Viewpoint 6: View in south direction from 335 Curly Dick Road, Meadow Flat (image: Aurecon, August 2024)

Source: Aurecon, August 2024

Viewpoint selection	Representative of view from private dwellings (R14 + R158) at 335 and 333 Curly Dick Road (respectively)			
Viewing distance (m)	Near foreground – 2,009 m to nearest turbine (WTG 9)			
Visual baseline	The viewpoint is from Curly Dick Road, near to the residential driveway. It demonstrates the clearest view in the direction of the Project, where there is a gap in roadside vegetation. There is a slight valley between hills in the foreground and rising to another hill in the middleground. There are no background views, which are screened by the terrain. The foreground is a livestock grazing paddock, with scattered native vegetation.			
Land use	Farm zone		**Landscape Type**	LCT 1 Agricultural hills
Scenic quality	Low	There are no key landscape features		
Visual sensitivity	Moderate	Rural residential dwellings		
Potential visual modification	■ There are 15-18 turbines potentially visible, to the east of the dwellings. ■ R158 has partial screening vegetation close to dwelling and R14 has a high level of screening vegetation			
Further investigation	■ Consultation with property owners to investigate screening value of intervening vegetation for dwellings to the west side of Curly Dick Road			

VP07 - Representative Viewpoint 7: Golden Poplars

Figure 6-8 Viewpoint 7: View in east to south direction from Sunny Corner Road (image: Aurecon, August 2024)

Source: Aurecon, August 2024

Viewpoint selection	Public viewpoint (P05) with avenue of Golden Poplars of local landscape amenity. Representative of views rural dwellings (R04, R150) and Meadow Flat primary school			
Viewing distance (m)	Near foreground – 4,250 m to nearest turbine (WTG 6)			
Visual baseline	The foreground comprises the avenue of Golden Poplars which are planted to both sides of Sunny Corner Road which runs east-west. This is a rural scene, with grassed paddocks and scattered trees within the foreground. A dwelling located to the far right of the viewpoint, is screened by surrounding vegetation and an exotic windrow. There are powerlines to both sides of the road, which connect to a substation located near the end of the road adjacent to Great Western Highway. The landscape pattern is similar in the middle and background, with low-rise hills, undulating terrain, grassed paddocks and scattered vegetation or windrows.			
Land use	Farm zone		**Landscape Type**	LCT 1 Agricultural hills
Scenic quality	Low	The Poplars are a local landscape feature of low scenic quality		
Visual sensitivity	Moderate	Experienced by rural residential dwellings and public school		
Potential visual modification	■ There are up to 16 turbines potentially visible from the viewpoint ■ The view of turbines is not considered prominent to the Golden Poplars and is not framed by the avenue of trees. ■ There are potential partially views of BESS infrastructure in middleground views ■ There is a high degree of screening vegetation close to adjacent dwellings, which will screen views of turbines located to the southeast and southwest. ■ There is a high degree of screening vegetation surrounding Meadow Flat primary school (further to the west).			
Further investigation	■ Ground truth screening value at dwellings and primary school			

6.2.2 Summary of preliminary visual impacts

A summary of the preliminary visual impacts is provided in Table 6-3 based on the level of sensitivity and visual modification potentially experienced from representative viewpoints. The location of the receivers is indicated in Figure 6-1.

Table 6-3 Summary of preliminary visual impacts

Viewpoint no. and location	Visual sensitivity	Potential visual modification	Closest turbine distance	No. visible turbines	Degree of screening	Potential visual impact
VP1 Thorpes Pinch Road/ Great Western Highway	Moderate	Moderate ■ turbines ■ BESS and substation	2,101 m to WTG 6	20	Low	Moderate
VP2 Bonaventure Road	Moderate	Moderate ■ turbines	1,801 m to WTG 23	18	High	Moderate
VP3 Sodwalls Road	Moderate	High ■ turbines	2,617 m to WTG 13	20	Low	Moderate
VP4 Sodwalls Station Road	Moderate	High ■ turbines	1,692 m to WTG 13	18	Low	Moderate
VP5 Sodwalls Road	Moderate	High ■ turbines	2,704 m to WTG 14	20	Low	Moderate
VP6 Curly Dick Road	Moderate	Low ■ turbines ■ BESS and substation	2,009 m to WTG 9	15-18	High	Low
VP7 Sunny Corner Road, Meadow Flat	Moderate	Low ■ turbines ■ BESS and substation	4,250 m to WTG 6	16	Moderate	Low

The representative viewpoints are within proximity to the Project at distances between 1,600 m to 2,700 m; and slightly further at 4,250 m for a public viewpoint. These viewpoints capture a preliminary understanding of the potential for worst-case visual impacts; however, the extent of visual impact assessment is limited by limited access to private properties. During the next phase of assessment, it would be recommended to provide analysis of the potential magnitude of change experienced by private receivers that cover a broader extent of the Visual Study area.

6.3 Cumulative visual impact analysis

The potential cumulative visual impact is considered in relation to the potential visual impact from the Project when viewed from a singular perspective such as a private dwelling. The preliminary Cumulative Impact Study area is an 8,000 m buffer from the Project area.

6.3.1 Wind farm projects

There is one operational wind farm and two proposed wind farms which have potential for cumulative impacts within the Cumulative Visual Impact Study area including:

- Hampton Wind Park (operational) - two wind turbines, at a height of 97 m (50 m hub height and 47 m rotor diameter), located approximately 17 km to the southeast of the Project.
- Sunny Corner – 500 MW, 3.5 km to the northwest of the Project. The project is pending planning submission, with project details to be confirmed.

- Ben Bullen – 500 MW, 20 km to the north. The project proposes approximately 64 turbines, at a height of up to 252 m (150 m hub height and 183 m rotor diameter), as well as a BESS and associated infrastructure.

The mapping (refer to Figure 6-9) of the proposed wind farms is based on the Project boundaries. The mapping shows the area (hatched area to the northwest of the Project) in which there is potential for cumulative visual impacts, shown as the intersecting area that is within 8,000 m of both the Project and Sunny Corner Wind Farm. There are 157 private receivers within this cumulative visual impact area, which have potential for views of the two wind farms (pending confirmed planning submission for Sunny Corner Wind Farm).

The 8,000 m buffers for Hampton Wind Park and Ben Bullen Wind Farm do not intersect with the 8,000 m Cumulative Visual Impact Study area for the Project, meaning there are unlikely to be cumulative visual impacts with these wind farms.

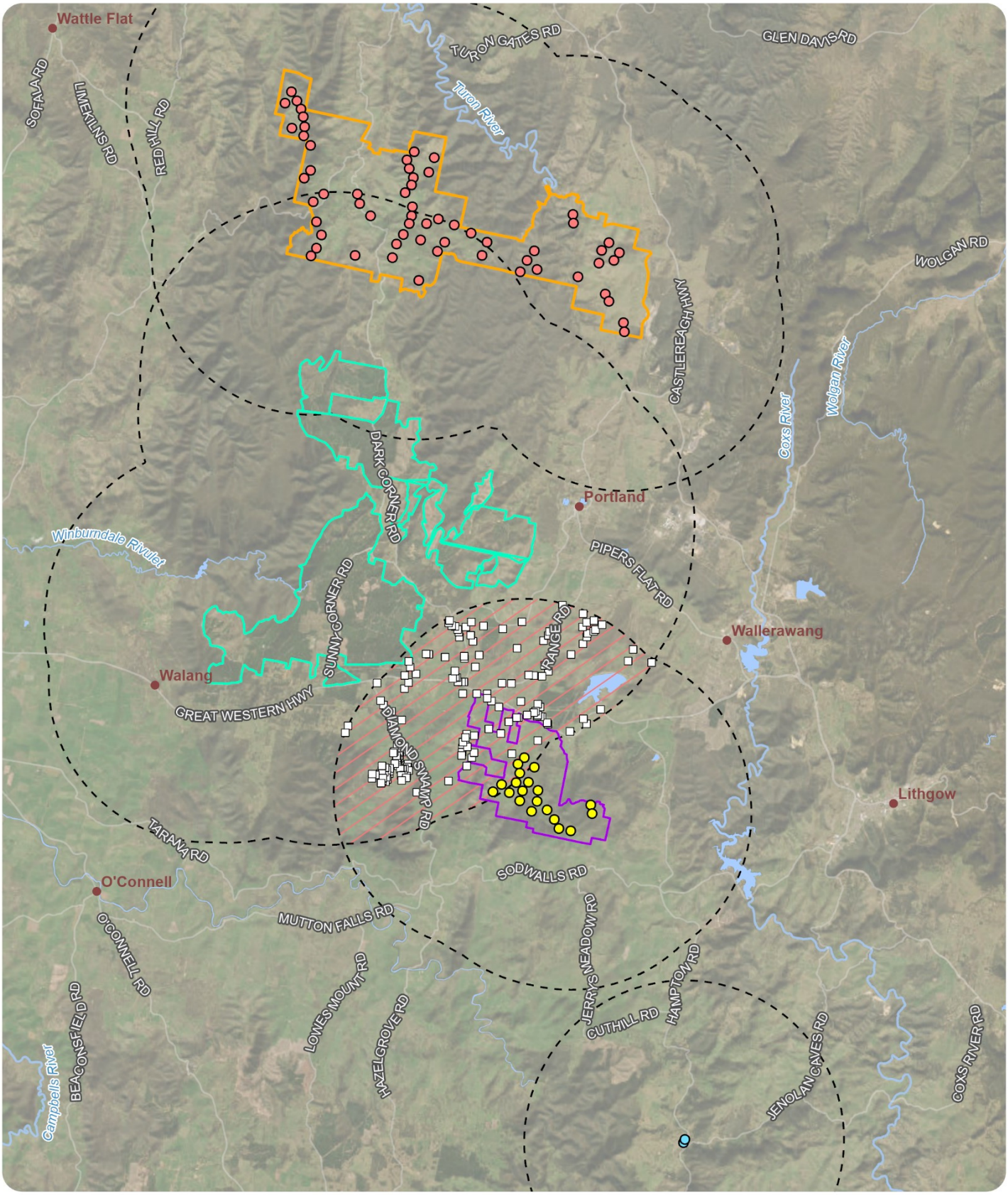
6.3.2 Other projects

There is potential for cumulative impacts for private receivers to the northwest of the Project with views of proposed BESS and substation structures, and from other existing electrical infrastructure including the substation on Sunny Corner Road.

Other large-scale renewable energy projects have been proposed in the NSW Central West Orana (REZ), however due the height of their infrastructure, the potential for these to incur cumulative visual impacts, is much lower than that of another wind farm. Other existing or proposed projects within the region include:

- Lake Lyell Pumped Hydro – approximately 6 km east of the Project
- Central West Pumped Hydro – approximately 9.5 km west of the Project at Yetholme
- Glanmire Solar Farm – approximately 22 km west of the Project areas
- Mt Piper BESS - approximately 12 km north-east of the Project area
- Wallerawang BESS - approximately 12 km north-east of the Project area
- Great Western Battery/ Eglington Solar Farm - approximately 14 km north-east of the Project area.

There are no visual receivers likely to incur impacts of both the Project and other proposed renewable energy project/s due to the low visibility of these projects (of much lower height than WTGs), distances between the project areas and the intervening topography.



Project area
8km to wind farm
Sunny Corner Wind Farm
Ben Bullen Wind Farm
Ben Bullen Wind Farm turbine
Hampton Wind Farm turbine
Cumulative impact area
Impacted receiver
Waterbody
Waterway
Mount Lambie Wind Farm Infrastructure
Turbine location

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:270,000
0 3.5 7 km

C:\Users\Virgil.Robinson\Aurecon Group\527288 - Mount Lambie Wind Farm Scoping Report - GIS\Pro\P527288_MLWF_SR\P527288_MLWF_SR.aprx

Figure 6-9: Operational or proposed wind farms with potential for cumulative impacts

6.3.3 Summary of cumulative impacts

A preliminary cumulative visual impact analysis has been completed to identify dwellings and significant viewpoints, within 8,000 m from the Project and other surrounding wind farms. At 8,000 m, turbines and objects recede into the background in terms of visibility and thus, further cumulative visual impacts from windfarms other than Sunny Corner Wind Farm are unlikely.

Due to the distance of the Project from the proposed Sunny Corner Wind Farm, there is potential for cumulative views of two or more wind farms (including the Project) within 8,000 m of the Project, experienced by up to 157 private receivers.

Potential cumulative impacts from existing electrical infrastructure and Project electrical infrastructure (including BESS and substations) include a **very low level** of localised potential cumulative impacts along Curly Dick Road, Sunny Corner Road and Great Western Highway, located northwest of the Project, in proximity to these components.

Further assessment of the cumulative impacts is recommended for the next phase and when details of the other wind farms are confirmed.

7 Conclusions

The purpose of this report is to offer an initial evaluation of the potential effects on landscape and visual quality that may arise from the Project. The preliminary landscape and visual impacts resulting from the Project were evaluated in accordance with the Technical Supplement and using the VIA Bulletin to guide the level of magnitude. The PLCVIA considers both the degree of modification compared to the existing conditions and the susceptibility of a landscape or view to change.

7.1 Landscape Character impacts

The preliminary impact assessment to the Landscape Character indicates that the Project would potentially have moderate to negligible impacts including:

- **Moderate landscape character impacts:** LCT 2: Native bushland
- **Low landscape character impacts:** LCT 1: Agricultural hills
- **Very low landscape character impacts:** LCT 3: Villages and rural settlements.

The preliminary landscape character impacts are considered negligible for LCT 4 Forestry, LCT 5 Lakes and dams; or LCT 6 Mining and power generation.

7.2 Visual impacts

7.2.1 Setback threshold

There are five private receivers that are located within the setback threshold of the nearest turbine (based on turbine tip height of 252 m or 285 m), including:

- One non-associated (R142), located 1,557 m to the nearest turbine.
  - Receiver R142 has been conservatively classified as a dwelling for this preliminary assessment due to the property's inability to be accessed; however the characterisation of this receiver would be confirmed during the EIS stage.
- One non-associated (under negotiation) private residence (R74) located 792 m to the nearest turbine.
  - A preliminary visual assessment indicated that this residence may experience visual impacts, due to open views of up to nine turbines.
- Two associated (under negotiation) private residences including:
  - R02 located 1,100 m to the nearest turbine (WTG 13), is likely to experience visual impacts, with up to 13 visible turbines and intervening vegetation
  - R06 located 1,697 m to the nearest turbines, is likely to experience visual impacts, with up to 11 visible turbines and intervening vegetation.
- One associated private residence (R01) located 615 m to the nearest turbine.

7.2.2 Representative viewpoint assessment

The preliminary assessment identified 7 viewpoints within the Visual Study area; representative of visual receivers of higher sensitivity including from rural dwellings and community places of interest. The assessment considered the sensitivity of the viewpoint and the magnitude of change, resulting in the following preliminary visual impacts outcomes:

- Potential for **moderate visual impacts**, representative of rural dwellings and public places:
  - VP01: Mount Lambie Presbyterian Church & Graveyard

- VP02: Bonaventure Road
- VP03: 339 Sodwalls Road
- VP04: Sodwalls Station Road
- VP05: 741 Sodwalls Road

- Potential for **low visual impacts**, representative of rural dwellings and public places:
  - VP06: 333-335 Curly Dick Road
  - VP07: Sunny Corner Road.

7.2.3 Cumulative impacts

A preliminary analysis of the cumulative impacts of the Project with other proposed wind farms, shows that there are approximately 157 private receivers with 8,000 m to the northwest of the Project that have potential to incur cumulative visual impacts with Sunny Corner Wind Farm. Further assessment is required at the next phase and when other proposed wind farm developments are confirmed.

Potential cumulative impacts from existing electrical infrastructure and Project electrical infrastructure (including BESS and substations) include a **very low level** of localised potential cumulative impacts along Curly Dick Road, Sunny Corner Road and Great Western Highway, located northwest of the Project, in close proximity to these components.

7.3 Summary and next steps

This PLCVIA has identified that the Project has the potential for moderate or higher visual impacts from public viewpoints and private receivers. These moderate visual impacts are predominantly experienced by private rural residents that are located to the southeast of the Project, with elevated views and no vegetation screening.

The representative viewpoints were located within a distance of up to 4,250 m from a turbine which captured a preliminary understanding of the potential worst-case scenario visual impacts. These viewpoints were representative of clusters of rural dwellings with elevated views, within valleys and with clear views towards Mt Lambie.

It is recommended that further assessment (based on ZTV identification and determination of the visual sensitivity and scenic value for dwellings) is undertaken to define the extent to which moderate or higher visual impacts are experienced. The following should be considered:

- Private dwellings close to the setback threshold (where access permission is granted);
- Private and public viewpoints within the village of Tarana;
- Clusters of dwellings with elevated views to the east of Diamond Swamp Road, Meadow Flat
- Clusters of dwellings to the north of the Meadow Flat settlement; and
- The small cluster of rural dwellings south of Rydal.

The preliminary assessment is limited to representative viewpoints from public locations. Therefore it is recommended that consultation with residents to undertake further visual assessment from selected sensitive viewpoints on private property would determine the viewing conditions, through further assessment of landscape character and visual impacts.

As the Project progresses, further community consultation will be undertaken potentially identifying additional viewpoints and areas of sensitivity for detailed assessment. Consultation with potentially affected landowners needs to focus on:

- Private receivers within the setback threshold of 1,800 m;
- Gauge the scenic value and sensitivity of identified public viewpoints; and

- Confirm whether identified building are occupied or used as a dwelling; and
- Representative private receivers

The next steps for the assessment as guided by the Technical Supplement are:

- Simple assessment including:
  - Desktop assessment of identified public viewpoints and private receivers, applying worst-case assumption on the likely visual sensitivity and magnitude of change based on the line of sight.
  - Potential moderate or higher impacts are to proceed with an intermediate assessment.
- Intermediate assessment including:
  - Producing wireframes and using the visual magnitude grid tool to determine the magnitude of change. This is used both for visual assessment of the Project and for cumulative impacts of two or more wind farms.
  - Potential moderate or higher impacts are to proceed with a detailed assessment.
- Detailed assessment including:
  - Undertaking a field visit including to private receivers (where access permission is granted) to analyse viewpoint sensitivity, screening elements and take panoramic photos.
  - Producing panoramic photomontages from public viewpoints and private receivers.
  - Refining the visual magnitude rating through analysis of the rendered model and the magnitude grid tool on the panoramic photograph
  - Determining the effectiveness of mitigation measures such as vegetation screening or turbine layout.
  - Assessing against visual performance objectives.

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Appendix C
Preliminary Biodiversity Impact Assessment

Mount Lambie Wind Farm

Preliminary Biodiversity Impact Assessment Report

Tetris Energy Pty Ltd as trustee for the Tetris Energy Unit Trust

Reference: P527288

Revision: 2

17 February 2025

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Document control record

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Client contact		Frank Boland and Georgiana Garland			
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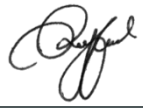
1	18/12/2024	Revised in response to revised project layout	R Ffrost	J Sullivan	M Drowley
2	17/02/2025	Revised in response to comments	R Ffrost, I Andary-Geslin, N Mansell, M Leigh	J Sullivan	M Drowley
Current revision		**2**			

Approval			
Author signature		Approver signature	
Name	Rebecca Ffrost	Name	Michael Drowley
Title	Ecologist	Title	Associate

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Abbreviations and Acronyms

Abbreviation	Description
AoS	Assessment of Significance
ASL	Above sea level
BAM	Biodiversity Assessment Method
BC Act	NSW Biodiversity Conservation Act 2016
BDAR	Biodiversity Development Assessment Report
BIA	Biodiversity Impact Assessment
BOS	Biodiversity Offsets Scheme
BVM	Biodiversity Values Map
CE	Critically Endangered species or population
CEEC	Critically Endangered Ecological Community
cm	centimetres
Cth	Commonwealth
DA	Development Application
DBH	Diameter at Breast Height
DCP	Development Control Plan
DP	Development Plan
E	Endangered species or population
EEC	Endangered Ecological Community
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
FFA	Flora and Fauna Assessment
Ha	hectares
IBRA	Interim Biogeographic Regionalisation of Australia
km	kilometres
LEP	Local Environmental Plan
LGA	Local Government Area
m	metres
MDB	Murray-Darling Basin
MNES	Matters of National Environmental Significance
NSW	New South Wales
PCT	Plant Community Type
PMST	Protected Matters Search Tool
Qld	Queensland
SEPP	State Significant Planning Policy
SIA	Significant Impact Assessment
SIC	Significant Impact Criteria
SVTM	State Vegetation Type Map
TEC	Threatened Ecological Community
ToS	Test of Significance
V	Vulnerable
VEC	Vulnerable Ecological Community
WTG	Wind Turbine Generator

1 Introduction

Aurecon Australia (Aurecon) has been engaged by Tetris Energy Pty Ltd as trustee for the Tetris Energy Unit Trust ('Tetris Energy') to assist with the environmental and planning approvals for the Mount Lambie Wind Farm (the Project). This preliminary Biodiversity Impact Assessment (BIA) has been prepared to inform the Scoping Report for the Mount Lambie Wind Farm Project.

1.1 Purpose

The purpose of the preliminary BIA is to identify biodiversity values present in the Project area that could represent constraints to the development of the Project and to inform the Scoping Report for the proposed Mount Lambie Wind Farm.

1.2 Background

Tetris Energy is currently undertaking preliminary investigations to inform a Scoping Report for the proposed Mount Lambie Wind Farm. The proposed Mount Lambie Wind Farm is located about 12 kilometres (km) south-west of Wallerawang in the Central Tablelands of New South Wales (NSW), within the Lithgow City Local Government area (LGA). It is situated on 2,540 hectares (ha) of land (the 'Project area') owned by Freehold Landowners, Local Government Authorities and Crown land across the suburbs of Meadow Flat, Mount Lambie and Tarana. The Project is currently in the early stages of development, including stakeholder engagement and concept design.

The Project is State Significant Development (SSD) as defined under the State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP) and will require development consent under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

1.2.1 Project layout

The Project is seeking approval for up to 20 wind turbine generators (WTGs), with blade-tip heights of between 250 metres (m) and 285 m above ground level and a generating capacity of up to 7 to 10 MW each. Battery Energy Storage System (BESS) infrastructure is also proposed and would allow for the capture and storage of dispatchable energy to be distributed to the electricity grid as required. The power generated by the Project (from WTG or released from battery storage) would feed into the existing transmission network via existing 132 kV overhead transmission lines. The key components of the Project are as follows:

- Up to 20 WTGs, with blade-tip heights of between 250 m and 285 m above ground level
- Up to two temporary meteorological masts
- One 100 MW capacity BESS with duration of 2 to 6 hours
- One or two substation and transmission connection points
- Temporary infrastructure areas including construction site compounds, a worker accommodation facility, and laydown and stockpile areas
- Approximately 27 km of access tracks throughout the Project area (minimum width of 5.5 m on straight tracks, widened to 6 m on corners). Access tracks include:
  - Existing access tracks: Existing access tracks would be used during the construction and operation of the Project. It is expected that some vegetation clearing would be required to widen existing access tracks.
  - New access tracks: New tracks would be constructed where there are no existing access tracks. It is expected that vegetation clearing would be required to build new access tracks.
- Internal collector cable network (electrical connections between the proposed wind turbine generators and the substation/s), which is expected to be underground

- Site access, including access points from Great Western Highway and/or Curly Dick Road
- Public road upgrades to facilitate the delivery of WTG components to the development footprint (required upgrades will be determined during preparation of the Environmental Impact Statement (EIS))
- Other operational infrastructure including site offices, parking, amenities, laydown areas, and operational and maintenance facilities such as storage and equipment sheds.

The proposed layout of the Project is shown in Figure 1.

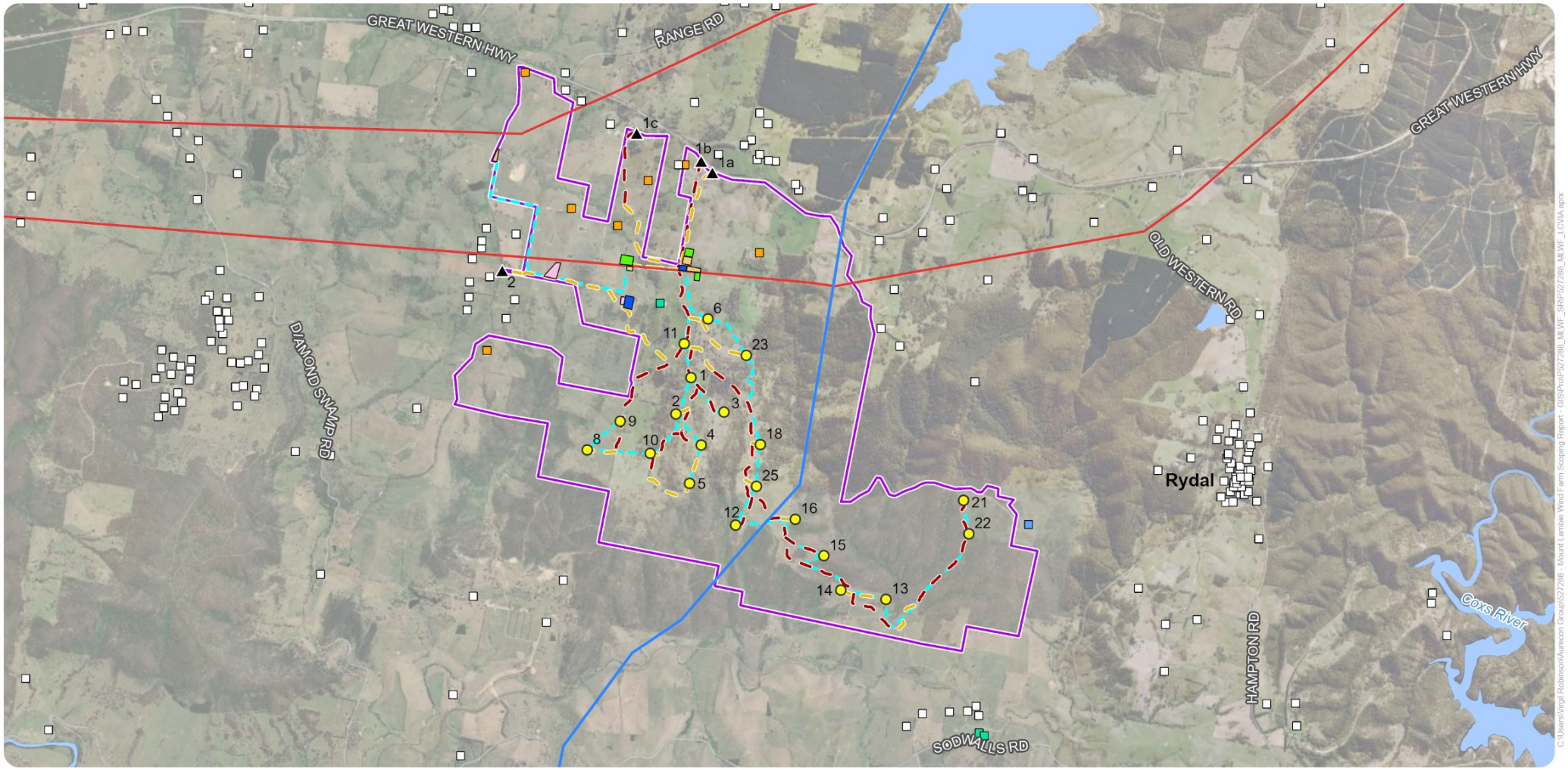
1.2.2 Project staging

Construction works would commence as soon as practicable following Project approval (estimated to be in 2026). The timing of construction would be driven by additional permits and authorisations, contractor selection, detailed design and procurement processes and a final investment decision.

The construction of the Project is anticipated to be 18 to 24 months. The Project has an operational life of up to 35 years after which it may be decommissioned or repowered. The anticipated timeframes for the Project are:

- Planning and approvals: in progress and aiming to be complete by 2026
- Detailed design and securing finance: 2027
- Construction and commissioning: planned to commence in 2027, for around 18 months
- Operation: planned to commence in 2028

Tetris Energy aims to construct the Project as a single development phase.



Project area
Waterbody

Dwellings within 5.02km of a turbine

Associated dwelling
Associated (under negotiation)
Non-associated (under negotiation)
Non-associated dwelling

Mount Lambie Wind Farm Infrastructure

Turbine location
Access point
New access track
Existing access track to be utilised
Cable network
Temporary construction compound / Laydown area
Operation and maintenance facility
Substation
BESS infrastructure

Existing transmission

132kV line
500kV line

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:75,000
0 0.9 1.8 km

Projection: GDA2020 MGA Zone 55

Figure 1: Preliminary Project Layout

1.3 Project overview

The proposed Mount Lambie Wind Farm would be developed within 2,540 ha of land located approximately 34 km east of Bathurst and approximately 15 km west of Lithgow, NSW (refer to Figure 1). For the purposes of the preliminary BIA, a Survey area of approximately 503.6 ha was considered for biodiversity surveys (refer to Figure 2), with an Indicative Disturbance Footprint of 125.1 ha. Table 1-1 provides details of the Project location and area surveyed to inform this preliminary BIA. Table 1-2 provides the lots and land ownership within the Project area.

Table 1-1 Project location and site details

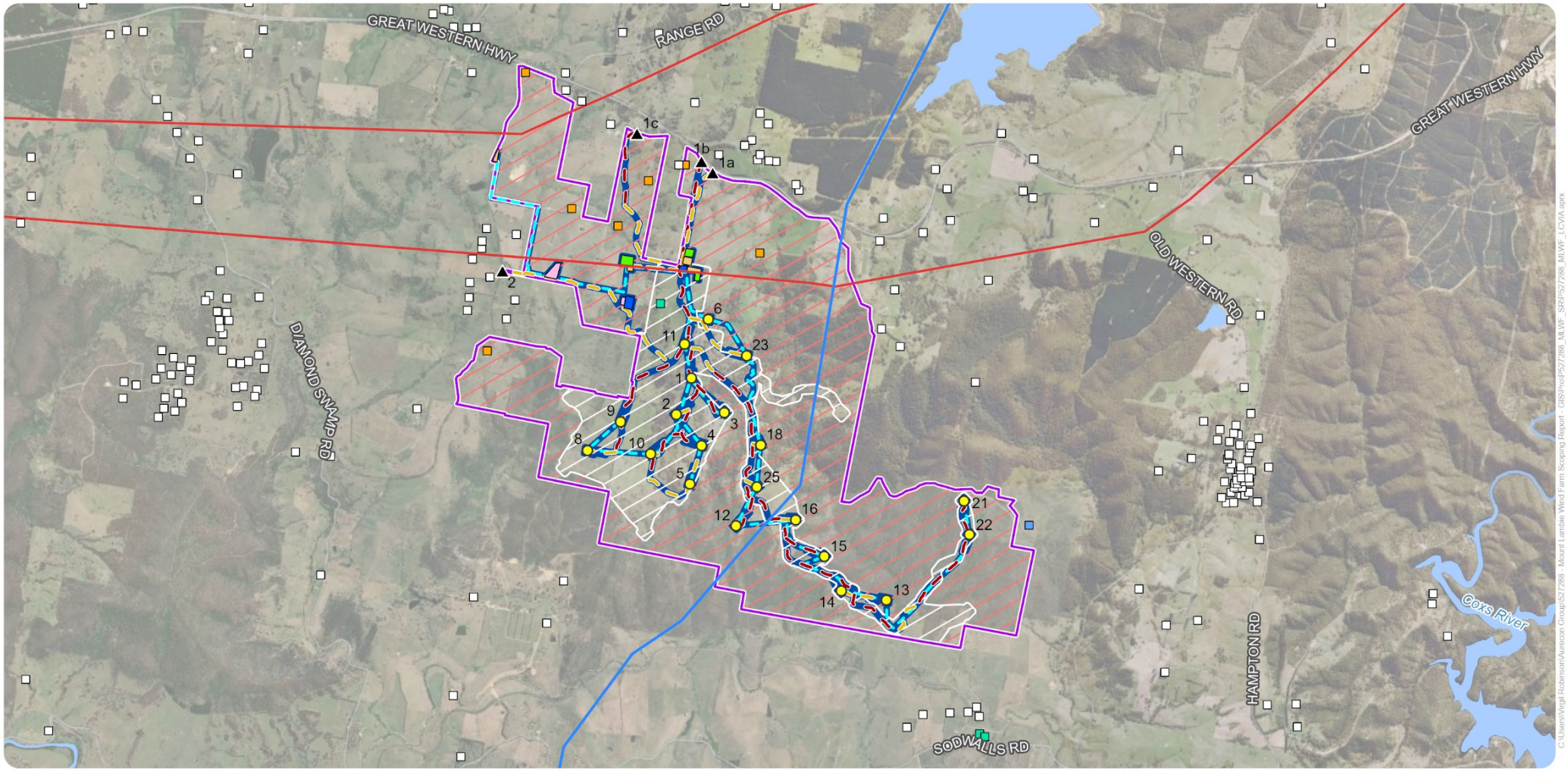
Properties	Details
Project area	The Project area is delineated by the project boundary shown in Figure 1. The Project area includes the land of eight landowners across 37 lots in the suburbs of Meadow Flat, Mount Lambie and Tarana. The lots and addresses of land forming part of the Project area are listed in Table 1-2.
Project area	The Project area is the land where permanent and temporary development impacts would occur. The components of the Project area are shown in Figure 1, and listed in Section 1.2.
Survey area	For the purposes of the preliminary BIA report, the Survey area is the area that has been ground-truthed. The Survey area covers an area of 503.6 ha (refer to Figure 2).
Indicative Disturbance Footprint	The proposed area for all associated Project infrastructure (access tracks, BESS infrastructure, laydown areas, substation, hardstands, cabling and turbines). The Indicative Disturbance Footprint encompasses 125.106 ha (refer to Figure 2), of which 57.1% was surveyed.
Locality	The area within a 10 km radius around the Project area, which is used for review of existing threatened species records.
Project Location	The Project is located approximately 34 km east of Bathurst and approximately 15 km west of Lithgow, NSW. The following is visible in the Project area and Survey area: ■ The Project area has undergone historical clearing, with rural activities such as farming. ■ Remnant bushland appears to occur in steep areas on slopes, depressions and small hills. ■ Isolated paddock trees occur across the Project area. ■ Mapped streams include Solitary Creek, Deadmans Creek, and unnamed tributaries of Meadow Flat Creek. Some ponds occur along streamlines. Land surrounding the Project area includes historically cleared rural landscape, further afield some bushland areas occur (e.g. Lindsale State Forest then Marrangaroo National Park about 6 km to the east, Evans Crown Nature Reserve about 4 km to the south, Eusdale Nature Reserve about 7 km to the west and Falnash State Forest about 4 km to the north-east). Thompsons Creek Reservoir is located approximately 4 km north-east.
Local Government Area (LGA)	Lithgow City Council
Zoning	Under the Lithgow Local Environmental Plan (LEP) 2014, the Project area is zoned as: ■ RU1 Primary Production ■ RU2 Rural Landscape The LEP also indicates that the Project area includes Sensitive Land Areas (Environmentally Sensitive Areas – Land Overlay Map), Watercourses and Groundwater Vulnerable (Environmentally Sensitive Areas – Water Overlay Map) and Biodiversity (Environmentally Sensitive Areas – Biodiversity Overlay Map).
Local Land Services Region	The Project area is located within the Central Tablelands Local Land Services (LLS) region.
IBRA[1] Bioregion and Subregion	■ IBRA Bioregion: South Eastern Highlands ■ IBRA Subregion: Hill End
Mitchell Landscape	■ Mount Horrible Plateau (Mhp) ■ Bathurst Granites (Bgr) which has an over-cleared status

Table note:

1 IBRA = Interim Biogeographic Regionalisation of Australia

Table 1-2 Lots within the Project area

Lot/DP	Ownership
Lot 1 DP748805	Freehold Landowner
Lot 1 DP995950	Freehold Landowner
Lot 1 DP1134343	Freehold Landowner
Lot 2 DP817970	Freehold Landowner
Lot 2 DP995950	Freehold Landowner
Lot 2 DP1022552	Local Government Authority
Lot 3 DP844060	Freehold Landowner
Lot 3 DP995950	Freehold Landowner
Lot 3 DP1129492	Freehold Landowner
Lot 4 DP995950	Freehold Landowner
Lot 4 DP1129492	Freehold Landowner
Lot 6 DP755794	Freehold Landowner
Lot 7 DP755794	Freehold Landowner
Lot 9 DP755794	Freehold Landowner
Lot 13 DP837978	Freehold Landowner
Lot 18 DP755794	Freehold Landowner
Lot 19 DP755794	Freehold Landowner
Lot 20 DP755794	Freehold Landowner
Lot 22 DP1039032	Freehold Landowner
Lot 23 DP837978	Freehold Landowner
Lot 24 DP837978	Freehold Landowner
Lot 24 DP1067481	Freehold Landowner
Lot 25 DP755794	Freehold Landowner
Lot 25 DP837978	Freehold Landowner
Lot 28 DP755794	Freehold Landowner
Lot 31 DP837978	Freehold Landowner
Lot 32 DP837978	Freehold Landowner
Lot 68 DP755794	Freehold Landowner
Lot 84 DP755794	Freehold Landowner
Lot 98 DP755794	Freehold Landowner
Lot 99 DP755794	Freehold Landowner
Lot 107 DP755794	Freehold Landowner
Lot 117 DP755794	Freehold Landowner
Lot 126 DP755794	Freehold Landowner
Lot 204 DP755794	Freehold Landowner
Lot 212 DP722328	Freehold Landowner
Lot 7300 DP1133240	Crown



Project area
Biodiversity Survey area
Indicative disturbance footprint
Area not surveyed
Waterbody

Dwellings within 5.02km of a turbine
Associated dwelling
Associated (under negotiation)
Non-associated (under negotiation)
Non-associated dwelling

Mount Lambie Wind Farm Infrastructure
Turbine location
Access point
New access track
Existing access track to be utilised
Cable network
Temporary construction compound / Laydown area
Operation and maintenance facility
Substation
BESS infrastructure

Existing transmission
132kV line
500kV line

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:75,000
0 1 2 km

Projection: GDA2020 MGA Zone 55

Figure 2: Biodiversity Survey area and the disturbance footprint

2 Legislative requirements

Legislative instruments applicable to impacts on biodiversity in NSW and their requirements are listed in Table 2-1.

Table 2-1 Legislative instruments applicable to the Project

Legislative Instrument	Biodiversity Assessment Requirements
Commonwealth (Cth) *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)	The EPBC Act provides for protection of Matters of National Environmental Significance (MNES), which include threatened ecological communities (TECs), threatened species and migratory birds under bilateral agreements. Proponents of development actions are required to assess if their proposed action will result in significant impacts on MNES (DoE 2013), where a proposed action is likely to result in significant adverse impact on a MNES, a referral to the Cth Department of Climate Change, Energy, the Environment and Water (DCCEEW) is required. Section 4.5 provides further consideration of MNES.
NSW *Biodiversity Conservation Act 2016* (BC Act)	The BC Act sets rules to assess impacts on native terrestrial biodiversity values (e.g. vegetation communities, habitat of flora and fauna) and threatened biodiversity (i.e. threatened species, threatened populations, threatened ecological communities (TECs) and their habitat). The Biodiversity Offsets Scheme (BOS) under the BC Act sets requirements to assess impacts and offset residual impacts of development on native and threatened biodiversity. There are two triggers for application of the BOS for development proposals: ■ Biodiversity Values Map (BVM): The BVM shows areas of high biodiversity values across the state. Where a proposed development will impact areas of high biodiversity values mapped in the BVM, the BOS is triggered. ■ Area Clearing Threshold: The BOS is triggered by local development and clearing proposals that involve clearing native vegetation that exceeds the area clearing threshold. The area clearing threshold varies according to the minimum lot size at the proposal site. Where the BOS is triggered, a Biodiversity Development Assessment Report (BDAR) must be prepared describing the impacts of a proposed development on biodiversity, the BDAR and surveys informing it must be prepared in accordance with the Biodiversity Assessment Method (BAM). The BDAR must be prepared and certified by an Accredited Assessor. The BOS applies to State Significant Development (SSD), as such a BDAR is required to assess impacts on biodiversity as part of an EIS.
NSW *Local Land Services Act 2013* (LLS Act)	The LLS Act regulates the management of vegetation in rural land. There are three different land categories for clearing on rural land: ■ Category 1 – 'Exempt Land' which will not be subject to clearing approval. ■ Category 2 – 'Regulated Land' in which clearing of native vegetation may be carried out with or without approval in accordance with 'allowable activity' or 'code' under the LLS Act. There are three Category 2 land types: – Category 2 – 'Regulated Land' – Category 2 – 'Vulnerable Regulated Land' includes step or highly erodible land, protected riparian land and special category land. – Category 2 – 'Sensitive Regulated Land' is land with high biodiversity values, land that is already protected by an agreement or land that was previously required to be set aside, offset or retained as a condition of development consent or subject to a remedial action. ■ 'Excluded Land' – land not categorised in the draft Native Vegetation Regulatory Map and to which Part 5A of the LLS Act does not apply. The Draft Native Vegetation Regulatory Map indicates that the Survey area includes Category 1 – Exempt Land, Category 2 – Regulated Land and Category 2 – Vulnerable Regulated Land.

Legislative Instrument	Biodiversity Assessment Requirements
NSW *Fisheries Management Act 1974* (FM Act)	The FM Act aims to conserve, develop, and share the fishery resources of the state of NSW for the benefit of present and future generations. The FM Act sets rules for the assessment of impacts on freshwater species listed as threatened under the Act. Where development proposals occur on aquatic habitat, an assessment of significance (AoS) of impacts resulting from the proposed development on threatened species, threatened populations, threatened ecological communities or their habitats is required. Identification of key threatening processes (KTP) triggered by the proposed development and mitigation measures are to be provided. If the proposed development is likely to significantly affect threatened biodiversity, a Species Impact Statement (SIS) or an EIS would accompany the development application under Part 4 or 5, respectively, of the NSW *Environment Planning and Assessment Act 1979* (EP&A Act).
NSW *Biosecurity Act 2015* (Biosecurity Act)	The Biosecurity Act provides for the management of introduced exotic plants and pest animals. The Biosecurity Act has a General Biosecurity Duty that applies to all land owners, which states "Any person who deals with biosecurity matter or a carrier and who knows or ought reasonably to know, the biosecurity risk posed or likely to be posed by the biosecurity matter, carrier or dealing has a biosecurity duty to ensure that, so far as is reasonably practicable, the biosecurity risk is prevented, eliminated or minimised". Management actions for managing exotic plants (i.e. Priority Weeds) and pest animals apply to land in accordance with the corresponding LLS Region and LGA.
Biodiversity Conservation State Significant Planning Policy (SEPP) 2021	The Biodiversity Conservation SEPP provides for the land use planning and assessment framework for koala habitat (Chapter 3 Koala Habitat Protection 2020 and Chapter 4 Koala Habitat Protection 2021). Chapter 3 and Chapter 4 of the Biodiversity Conservation SEPP aims to protect koala habitat in the state, and it applies to Lithgow LGA as follows: ■ Chapter 3 – Koala Habitat Protection 2020: applies to Land zoned RU1, RU2 and RU3. ■ Chapter 4 – Koala Habitat Protection 2021: applies to all other land zones.

3 Methodology

3.1 Desktop research

A desktop review of publicly accessible environmental databases for biodiversity values and threatened biodiversity (i.e. threatened species, threatened populations, threatened ecological communities and their habitat) was carried out in September 2024. The databases reviewed included:

- NSW BioNet Atlas database (DEH 2024) for identification of predicted threatened species and threatened ecological communities (TECs) listed under the BC Act.
- BioNet Vegetation Classification (DEH 2024) for identification of plant community types (PCTs) known in NSW.
- Commonwealth DCCEEW Protected Matters Search Tool (PMST) (DCCEEW 2024a) for identification of MNES listed under the EPBC Act.
- Existing vegetation mapping, published on the State Vegetation Type Map (SVTM) NSW extant PCT (DPE 2023).
- Biodiversity Values Map and Threshold Tool (DEH 2024) to identify high biodiversity values mapped within the Project area and triggers to the BOS.
- State Environmental Planning Policy (Biodiversity Conservation) 2021 (SEPP) for applicability of koala habitat protection to the Project area.
- National Atlas of Groundwater Dependent Ecosystems (GDE) (BoM 2024).
- DPI Fisheries NSW Spatial Data Portal for Key Fish Habitat (DPI 2024).
- Atlas of Living Australia.
- Lithgow City LGA relevant planning instruments.

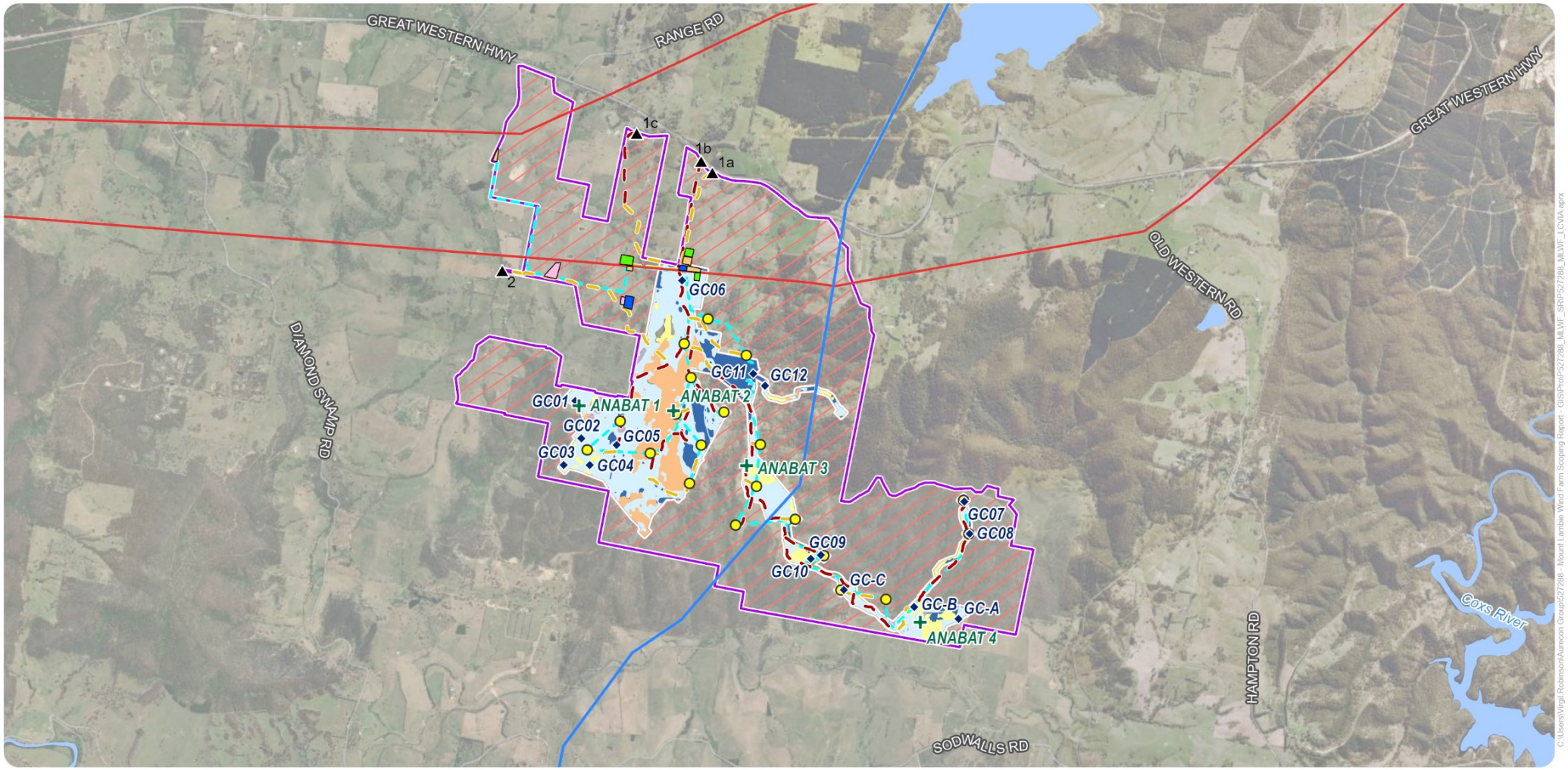
3.2 Field surveys

Field surveys were undertaken between 19 and 23 August 2024 by suitably qualified ecologists and in accordance with the methodology summarised in Table 3-1 and detailed in Figure 3. Weather conditions on the days of survey are summarised in Table A-1 (refer to Appendix A).

Table 3-1 Details of survey and methodology

Group	Survey type	Survey method and objectives
Terrestrial ecology		
Vegetation ground-truthing	Rapid Data Points (RDP) along Random Meander Transect (RMT)	Rapid Data Points (RDP, also labelled as RAP or RBA) were collected along Random Meander Transects (RMT) walked across the Survey area to ground-truth vegetation. The following was carried out as part of the vegetation ground-truthing: ■ Each RDP consisted of collecting data of the dominant species in each stratum (e.g. canopy, shrub and ground layer). ■ The RDP data were used to identify and allocate the most likely PCT to a vegetation zone and assess the general condition of the point in terms of disturbance and/or condition. RDP data were also used to identify TECs. ■ RDP data were used to prepare the preliminary ground-truthed vegetation map showing vegetation zones. The vegetation map was prepared by collecting RDPs in field maps (an ArcGIS mapping app), refining vegetation polygons in GIS and allocating PCTs and condition as per RDPs data.
Grassland and non-woody vegetation	100 m transects	Assessment of grasslands and non-woody vegetation in the Survey area was undertaken along 100 m transect intercept method as per the interim grasslands and other groundcover assessment method (OEH 2017).

Group	Survey type	Survey method and objectives
Flora and Fauna Species	Opportunistic sightings	Opportunistic sightings of flora and fauna species were collected during the survey period to supplement flora records collected at RDP and to obtain an idea of fauna utilisation of the Survey area.
Fauna habitat features	Opportunistically along RMT	General fauna habitat assessment was undertaken along RMTs to assess suitable habitats for threatened biodiversity that is likely to occur in the Survey area. The availability and quality of habitat within the Survey area was assessed with respect to the following factors: ■ Structural and floral diversity. ■ Variety and extent of habitat types. ■ Habitat connectivity, including continuity with similar habitats within the Project area, and adjacent land via habitat corridors. ■ Presence of key habitat features including tree hollows, water bodies, caves, crevices, rocky areas, nests and burrows. ■ Degree of disturbance and degradation evident from visual observations. ■ Topographic features such as aspect and slope. Fauna occupation was assessed by collecting: ■ Direct fauna habitat evidence: opportunistic records of fauna sightings and fauna habitat features such as creeks, hollow-bearing trees, rocky outcrops, bird nests, culverts, etc. ■ Indirect fauna use evidence such as recording of scats, nests, burrows, and other incidental evidence of fauna occupation.
Threatened Species	Opportunistically along RMT	Threatened species predicted to occur within the Survey area as per BioNet Atlas and PMST report were considered for opportunistic survey by: ■ Adding threatened species sightings to the Field Maps. ■ Reviewing threatened species profiles and based on ecologist's experiences. ■ Undertaking a visual search in areas where threatened species were predicted to occur.
Microbats	ANABATs	The presence of microchiropteran bats (i.e. microbats) in the Survey area was assessed by recording microbat echolocation activity with ANABATs. Three ANABATs were installed at selected locations and set to record bat activity over four nights. Due to site access constraints, one ANABAT was set to record bat activity for only three nights. The bat call recordings were submitted for analysis to specialist Greg Ford of Balance! Environmental who provided a Bat Call Report (refer to Appendix G).
Aquatic ecology		
Aquatic Habitat Assessment	RDP	Aquatic habitat assessment along RMTs consisted of RDP and visual assessment of streambed composition, aquatic and riparian vegetation, and evidence of disturbance.
Aquatic Flora and Fauna	Opportunistic sightings	Opportunistic sightings of aquatic fauna in waterways and farm dams were undertaken.



Project area
Biodiversity Survey area
Area not surveyed
Waterbody
100m transect

ANABAT

Mount Lambie Wind Farm Infrastructure
Turbine location
Access point
New access track

Existing access track to be utilised
Cable network
Temporary construction compound / Laydown area

Operation and maintenance facility
Substation
BESS infrastructure

Existing transmission
132kV line
500kV line

Ground-truthed Vegetation
Exotic

PCT 3211
PCT 3347
PCT 3367
PCT 3369
PCT 3735

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:75,000
0 1 2 km

Projection: GDA2020 MGA Zone 55

Mount Lambie Wind Farm **Biodiversity Impact Assessment**

Figure 3: Field Survey Location

3.2.1 Survey limitations

The results presented in this preliminary BIA are limited and were collected during a site inspection over five days (19 to 23 August 2024). As such, the survey results do not account for temporal variation, and the potential for other threatened species and ecological values whose presence in the Project area may be affected by seasonal migration, seasonal flowering times, seasonal availability of food and foragers, or other species life-cycle behaviours.

Surveys were not able to be undertaken within properties in the northern section of the Project area due to access restrictions (refer Figure 2). The biodiversity values for this part of the Survey area are limited to desktop review only.

An ecological field survey was undertaken based on the preliminary project design as of August 2024. Following the field survey and draft preparation of this assessment report, feedback was provided to Tetris Energy on opportunities to avoid/minimise impacts to ecological values. The current Project layout therefore has changed since the field work was completed to avoid and minimise impacts to key biodiversity, visual and noise constraints. As a result, portions of the Project layout occur beyond the area ground-truthed in the field.

3.3 Likelihood of occurrence and impact assessment

Presence of threatened biodiversity is predicted based on desktop review (e.g. BioNet Atlas, PMST and records in the Atlas of Living Australia). A likelihood of occurrence is undertaken to assess the possibility of threatened biodiversity inhabiting the Project area and based on desktop review and observations made during site inspections. Likelihood of occurrence results are provided in Section 4 and Appendix H.

Generally, where threatened species and threatened ecological communities are identified as having moderate or higher likelihood of occurrence at a development site, an assessment of significance (AoS) is undertaken to identify whether significant impacts are likely to occur. However, for the purposes of this preliminary BIA, Preliminary AoS have been prepared for observed threatened species only (refer to Appendix I).

4 Existing biodiversity values

4.1 Desktop research outcomes

4.1.1 Predicted threatened biodiversity

BioNet Atlas

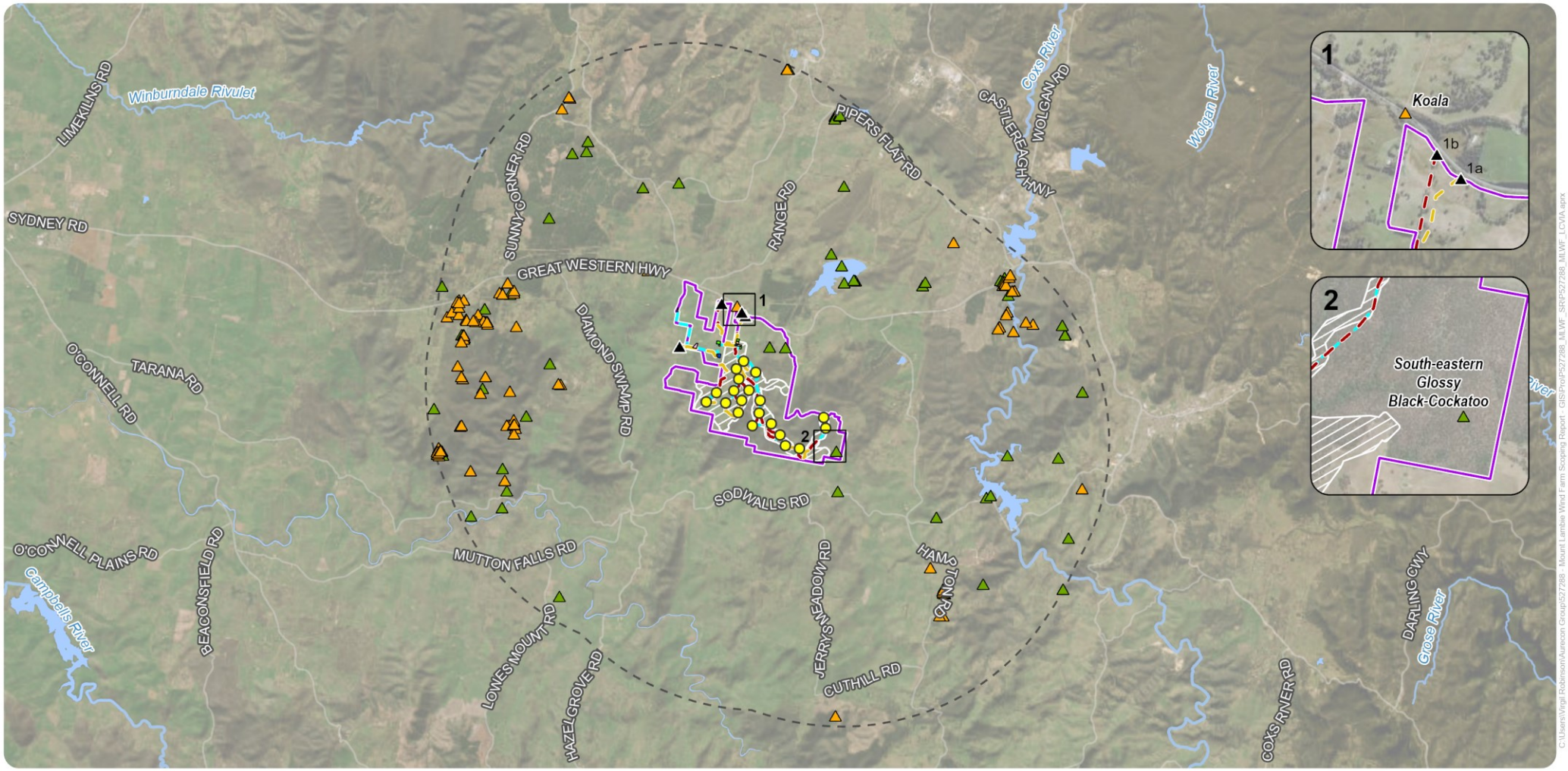
A total of 22 threatened species have been recorded within a 10 km buffer area surrounding the Project area during the last 20 years. Threatened species records include 13 birds, seven mammals, one insect and one flora species.

One record of the South-eastern Glossy Black-Cockatoo (*Calyptorhynchus lathami lathami*) from December 2019 occurred on the south-eastern portion of the Project area, and within 500 m from WTG 22 and 600 m from WTG 21 (refer Figure 4).

Other records of threatened species in proximity to the Project area include:

- One record of Koala (*Phascolarctos cinereus*) from June 2018 occurred at Great Western Highway, approximately 300 m west of an existing access track.
- One record of Koala (*Phascolarctos cinereus*) between June 2017 and June 2019 occurred at Great Western Highway, approximately 1.6 km west of the Project area, specifically the corner of Curly Dick Road and the Great Western Highway.
- One record of Blue-billed Duck (*Oxyura australis*) and one record of Freckled Duck (*Stictonetta naevosa*) in April 2005 at Karoo Homestead located within 200 m of the Project area boundary and 1.01 km north-west from the proposed access track at Curly Dick Road.

The results of the BioNet Atlas search are shown in Figure 4 and provided in Appendix B.



Project area
Biodiversity Survey area
10km to Project area
Waterbody

Mount Lambie Wind Farm Infrastructure

Turbine location
Access point
New access track
Existing access track to be utilised
Cable network
Temporary construction compound / Laydown area
Operation and maintenance facility
Substation
BESS infrastructure

BioNet Atlas Records

Threatened Flora & Fauna

Endangered
Vulnerable

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:240,000
0 3 6 km

Projection: GDA2020 MGA Zone 55

Figure 4: BioNet Atlas records within 10km locality surrounding the Project area

Matters of National Environmental Significance

Table 4-1 summarises potential MNES as per the PMST report for a 10 km locality surrounding the Project area. The PMST report is provided in Appendix C.

Four MNES have the potential to occur within the locality, including four wetlands of international importance, three TECs, 71 threatened species and 11 migratory species.

The wetlands of international importance are located over 300 km from the Project area, and they are considered unlikely to be indirectly affected by the Project. Therefore, no further assessment for this MNES is deemed necessary.

Table 4-1 Summary of potential MNES

<table>
<tr><th>Matter of National Environmental Significance</th><th>Potential MNES</th><th>Further assessment requirements</th></tr>
<tr><td>World Heritage Properties</td><td>None</td><td>Not applicable</td></tr>
<tr><td>National Heritage Places</td><td>None</td><td>Not applicable</td></tr>
<tr><td>Wetlands of International Importance (Ramsar Wetlands)</td><td>Four Wetlands of International Importance were predicted:
Banrock Station Wetland Complex: The Project area is located 800 to 900 km upstream from the wetland.
Riverland: The Project area is located 800 to 900 km upstream from the wetland.
The Coorong, and Lakes Alexandriana and Albert Wetland: The Project area is located 900 to 1,000 km upstream from the wetland.
The Macquarie Marshes: The Project area is located 300 to 400 km upstream from the wetland.</td><td>Given the distance of the wetlands to the Project area, and that the Project would not require extraction or input of water in aquifers, streams or water bodies associated with these wetlands, it is predicted that the Project would not directly or indirectly affect these wetlands.
No further assessment is deemed necessary.</td></tr>
<tr><td>Great Barrier Reef Marine Park</td><td>None</td><td>Not applicable</td></tr>
<tr><td>Commonwealth Marine Area</td><td>None</td><td>Not applicable</td></tr>
<tr><td>Threatened Ecological Communities (TECs)</td><td>A total of three TECs were predicted to occur in the locality:
Natural Temperate Grassland of the South Eastern Highlands (Critically Endangered Ecological Community, CEEC).
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion (Endangered Ecological Community, EEC).
White Box – Yellow Box – Blakely’s Red Gum Grassy Woodland and Derived Native Grassland (CEEC).</td><td>Further assessment was undertaken to ground-truth vegetation in the Project’s Survey area, including assessment and mapping of EPBC Act listed TECs (refer to Section 4.5).</td></tr>
<tr><td>Threatened Species</td><td>A total of 71 threatened species were predicted as follows:
<table>
<tr><th>Group</th><th>V</th><th>E</th><th>CE</th><th>CD</th></tr>
<tr><td>Birds</td><td>13</td><td>4</td><td>3</td><td></td></tr>
<tr><td>Fish</td><td>2</td><td>2</td><td></td><td></td></tr>
<tr><td>Frog</td><td>2</td><td>2</td><td>1</td><td></td></tr>
<tr><td>Mammal</td><td>5</td><td>4</td><td></td><td></td></tr>
<tr><td>Plant</td><td>13</td><td>13</td><td>2</td><td></td></tr>
<tr><td>Reptile</td><td>1</td><td>2</td><td>1</td><td></td></tr>
</table></td><td>Assessments of likelihood of occurrence (LoO) for threatened species were undertaken. The LoO assessments were based on habitat suitability identified during site surveys (refer to Section 4.5 and Appendix G).</td></tr>
</table>

Matter of National Environmental Significance	Potential MNES	Further assessment requirements
Migratory Species	A total of 11 migratory species were predicted to occur in the locality, including: ■ One migratory marine bird ■ Five migratory terrestrial species ■ Five migratory wetland species.	LoO assessments for migratory species were undertaken based on habitat suitability identified during site surveys (refer to Section 4.5 and Appendix G).
Nuclear actions	Not applicable	Not applicable
Water resources as they relate to nuclear power	Not applicable	Not applicable

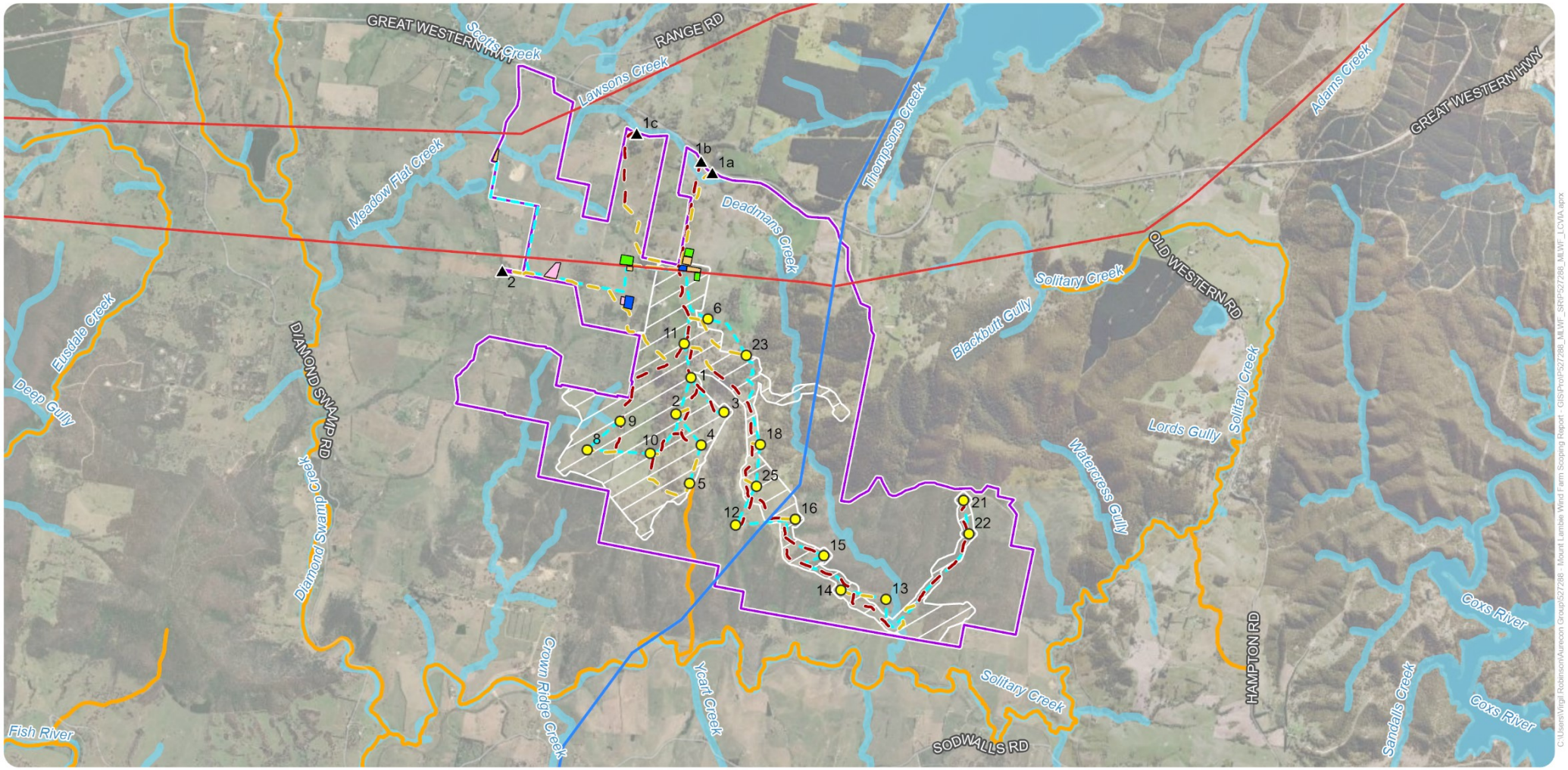
Table notes:

TEC status: VEC = Vulnerable Ecological Community; EEC = Endangered Ecological Community, CEEC = Critically Endangered Ecological Community
Threatened Species Status: V = vulnerable; E = Endangered; CE = Critically Endangered; CD = Conservation Dependant

Key Fish Habitat and Fish Freshwater Threatened Species

The NSW Department of Primary Industries' Fisheries NSW spatial data portal (DPI 2024) indicated that the reaches of Lawsons Creek, Deadmans Creek and unnamed tributaries of Solitary Creek within the Project area are mapped as Key Fish Habitat (KFH, refer to Figure 5). Youngman Creek is mapped as KFH further downstream, where it is Strahler steam order three.

Solitary Creek is mapped as habitat for Southern Purple Spotted Gudgeon (*Mogunda adspersa*). Proposed WTG 5 is located within 200 m upstream of a tributary of Solitary Creek. In addition, an existing track and a proposed new track are located within 100 m of Solitary Creek.



Project area
Biodiversity Survey area
Key Fish Habitat
Southern Purple Spotted Gudgeon

Mount Lambie Wind Farm Infrastructure
Turbine location
Access point
New access track
Existing access track to be utilised
Cable network
Temporary construction compound / Laydown area
Operation and maintenance facility
Substation
BESS infrastructure

Existing transmission
132kV line
500kV line

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:75,000
0 1 2 km

Projection: GDA2020 MGA Zone 55

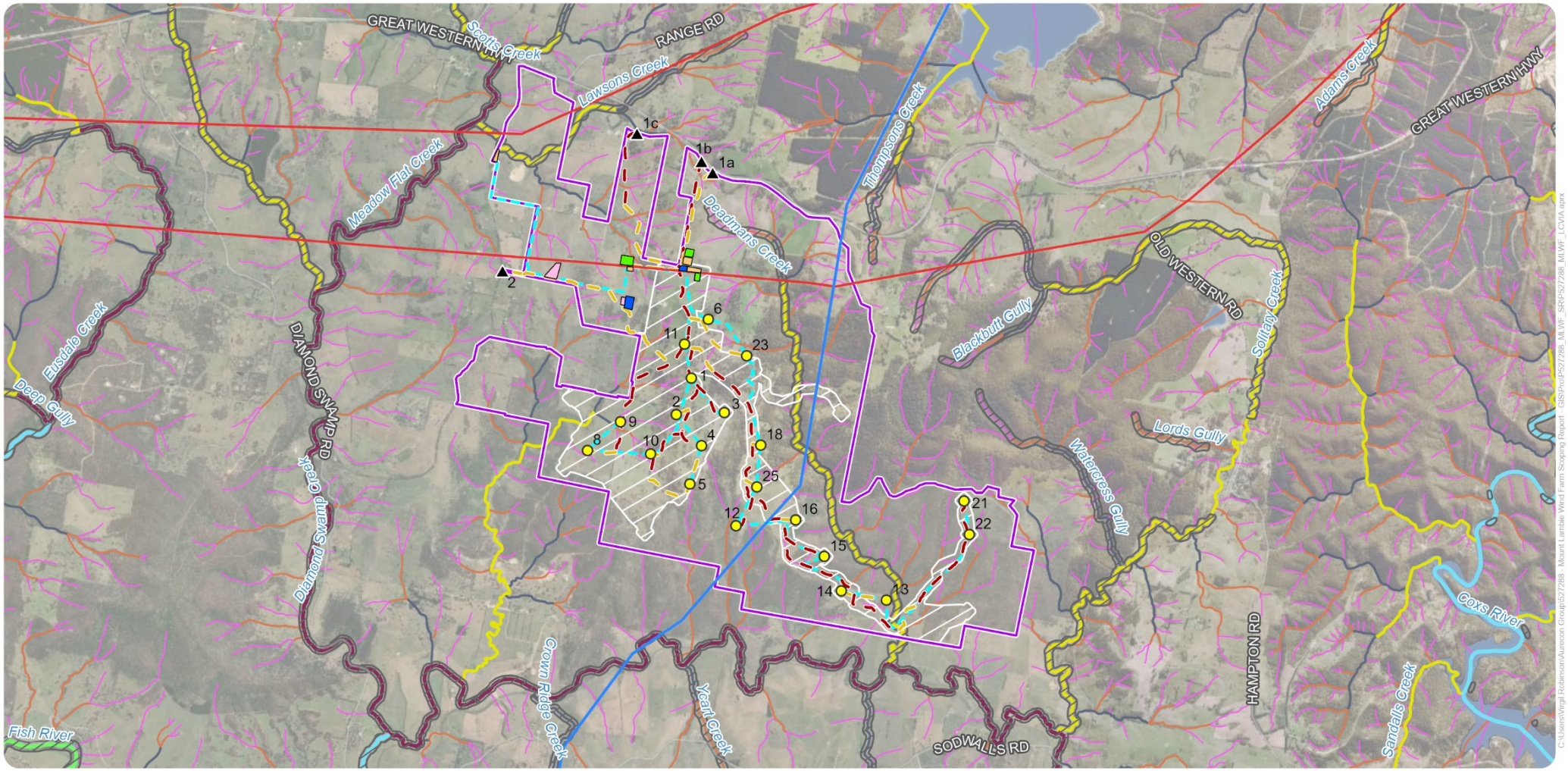
Figure 5: Key Fish Habitat and Fish Freshwater Threatened Species

4.1.2 Biodiversity Values Map

The Biodiversity Values Map (BVM) identifies land with high biodiversity values, particularly those values sensitive to impacts from development and clearing. The BVM indicates that high biodiversity values occur within the Project area and are due to biodiverse riparian land at Lawson Creek, Deadmans Creek, Solitary Creek and their riparian corridors (refer to Figure 5).

Existing access tracks occur across creek lines within the Project area, including tributaries of Deadmans Creek and Solitary Creek.

Mapped biodiversity values are shown in Figure 6. The Biodiversity Values Map and Threshold Tool (BMAT) report is included in Appendix D.



Project area
Biodiversity Survey area
Biodiversity Values
Waterbody

Mount Lambie Wind Farm Infrastructure
Turbine location
Access point
New access track
Existing access track to be utilised
Cable network
Temporary construction compound / Laydown area
Operation and maintenance facility
Substation
BESS infrastructure

Existing transmission
132kV line
500kV line

Strahler Stream Order
1
2
3
4
5
6
7

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:75,000
0 1 2 km

Projection: GDA2020 MGA Zone 55

Figure 6: Biodiversity Values Map and Strahler Stream Order

4.1.3 Vegetation communities

The State Vegetation Type Map (SVTM) for NSW extant PCTs (DPE 2023) indicates that nine PCTs are mapped in the Project area, and seven PCTs are mapped in the Survey area (refer to Figure 7).

The Threatened Biodiversity Data Collection indicates that none of the predicted PCTs are known to be associated with TECs listed under the BC Act and EPBC Act.

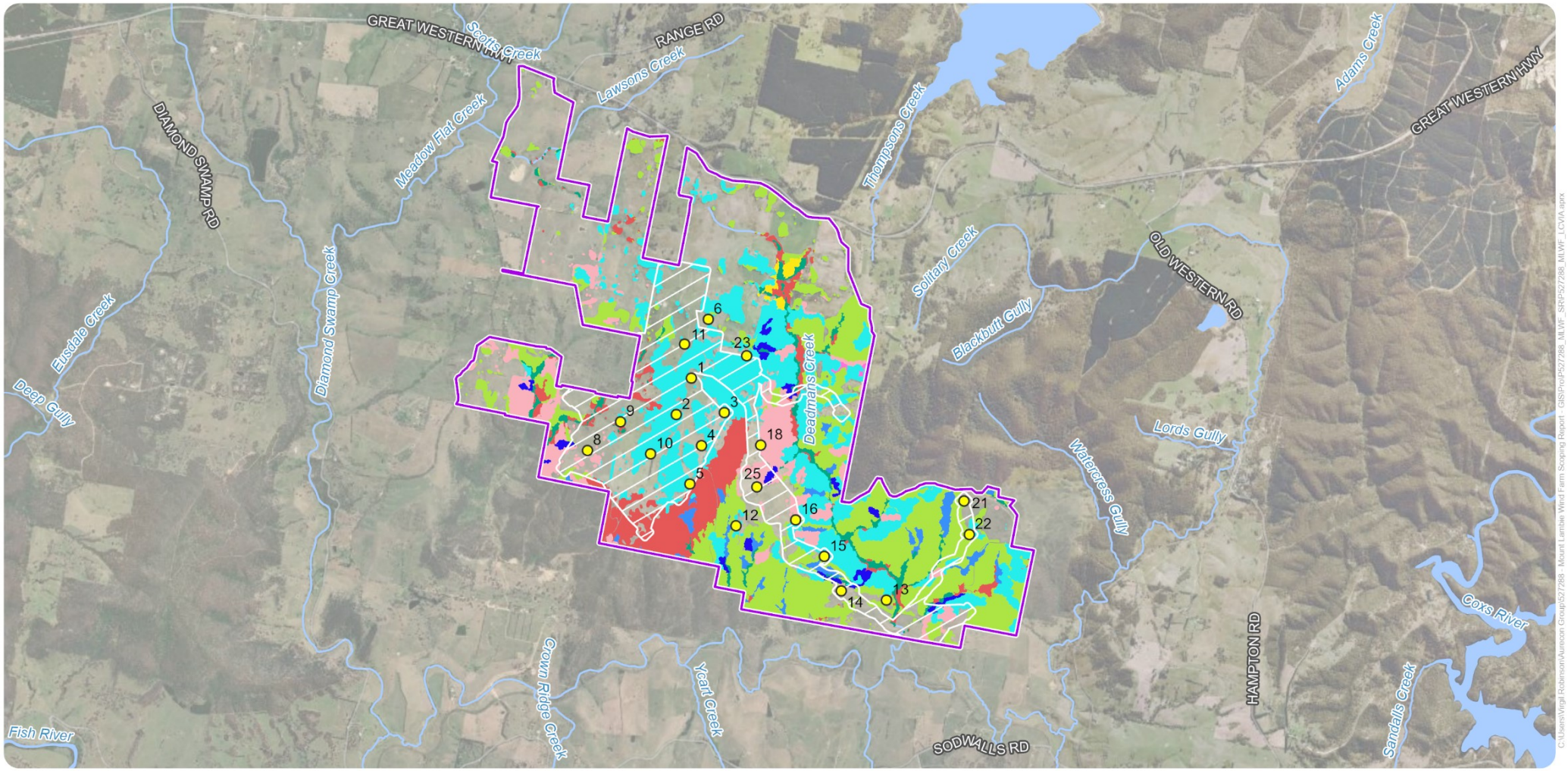
The ecological field survey was undertaken based on the preliminary Project design as of August 2024. Changes to the layout occurred as a result of preliminary technical investigations and, as such, new and additional areas identified in the current Project layout were not ground-truthed during the August 2024 survey. The Survey area discussed in this report is limited to the area ground-truthed during the site visits in August 2024. Modelled PCTs (DPE 2023) have been used for areas within the Indicative Disturbance Footprint that have not been ground-truthed. As the Project progresses, it is recommended that vegetation surveys be conducted to ground-truth all areas within the Indicative Disturbance Footprint.

Table 4-2 Summary of PCTs mapped in the Project area, Survey area

PCT ID	PCT name	Vegetation formation	Vegetation class	PCT area (ha)		Known associated TEC	
				Project area	Survey area	BC Act	EPBC Act
0	Not classified	-	-	1,122.2	304.9	NA	NA
PCT 3211	Central Tableland Montane Wet Forest	Wet Sclerophyll Forests (Shrubby sub-formation)	Southern Escarpment Wet Sclerophyll Forests	52.4	1.4	-	-
PCT 3294	Central Tableland Peppermint-Gum Montane Forest	Wet Sclerophyll Forests (Grassy sub-formation)	Southern Tableland Wet Sclerophyll Forests	3	0	-	-
PCT 3303	Central Tableland Ribbon Gum Sheltered Forest	Wet Sclerophyll Forests (Grassy sub-formation)	Southern Tableland Wet Sclerophyll Forests	10.5	0	Endangered Mt Canobolas Xanthoparmelia Lichen Community	-
PCT 3347	Southern Tableland Creekflat Ribbon Gum Forest	Grassy Woodlands	Tablelands Clay Grassy Woodlands	73.5	6.8	-	-
PCT 3367	Central Tableland Granites Grassy Box Woodland	Grassy Woodlands	Southern Tablelands Grassy Woodlands	173.9	19.9	-	-
PCT 3369	Central Tableland Ranges Peppermint-Gum Grassy Forest	Grassy Woodlands	Southern Tablelands Grassy Woodlands	554.3	28.3	-	-
PCT 3534	Central West Stony Hills Stringybark-Box Forest	Dry Sclerophyll Forests (Shrub/grass sub-formation)	Upper Riverina Dry Sclerophyll Forests	22.8	2.3	-	-
PCT 3735	Central Tableland Peppermint Shrub-Grass Forest	Dry Sclerophyll Forests (Shrubby sub-formation)	Southern Tableland Dry Sclerophyll Forests	408.4	125.8	-	-
PCT 3747	Southern Tableland Western Hills Scribbly Gum Forest	Dry Sclerophyll Forests (Shrubby sub-formation)	Southern Tableland Dry Sclerophyll Forests	118.5	14.2	-	-
Total				**2,539.5 ha**	**503.6 ha**		

Key:

PCT = Plant Community Type
TEC = Threatened Ecological Community
BC Act = NSW *Biodiversity Conservation Act 2016*
EPBC Act = Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*
NA = not applicable
- none



Project area

Biodiversity Survey area

Waterbody

Mount Lambie Wind Farm Infrastructure

Turbine location

NSW State Type Vegetation Mapping

PCT ID and Name (Mapped occurrence in the Project area (ha))

- 3211 - Central Tableland Montane Wet Forest (52.4ha)
- 3294 - Central Tableland Peppermint-Gum Montane Forest (3ha)
- 3303 - Central Tableland Ribbon Gum Sheltered Forest (10.5ha)
- 3347 - Southern Tableland Creekflat Ribbon Gum Forest (73.5ha)
- 3367 - Central Tableland Granites Grassy Box Woodland (173.9ha)
- 3369 - Central Tableland Ranges Peppermint-Gum Grassy Forest (554.3ha)
- 3534 - Central West Stony Hills Stringybark-Box Forest (22.8ha)
- 3735 - Central Tableland Peppermint Shrub-Grass Forest (408.4ha)
- 3747 - Southern Tableland Western Hills Scribbly Gum Forest (118.5ha)

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:75,000

0 1 2 km

Projection: GDA2020 MGA Zone 55

Mount Lambie Wind Farm **Biodiversity Impact Assessment**

Figure 7: Plant Community Types within the Project area

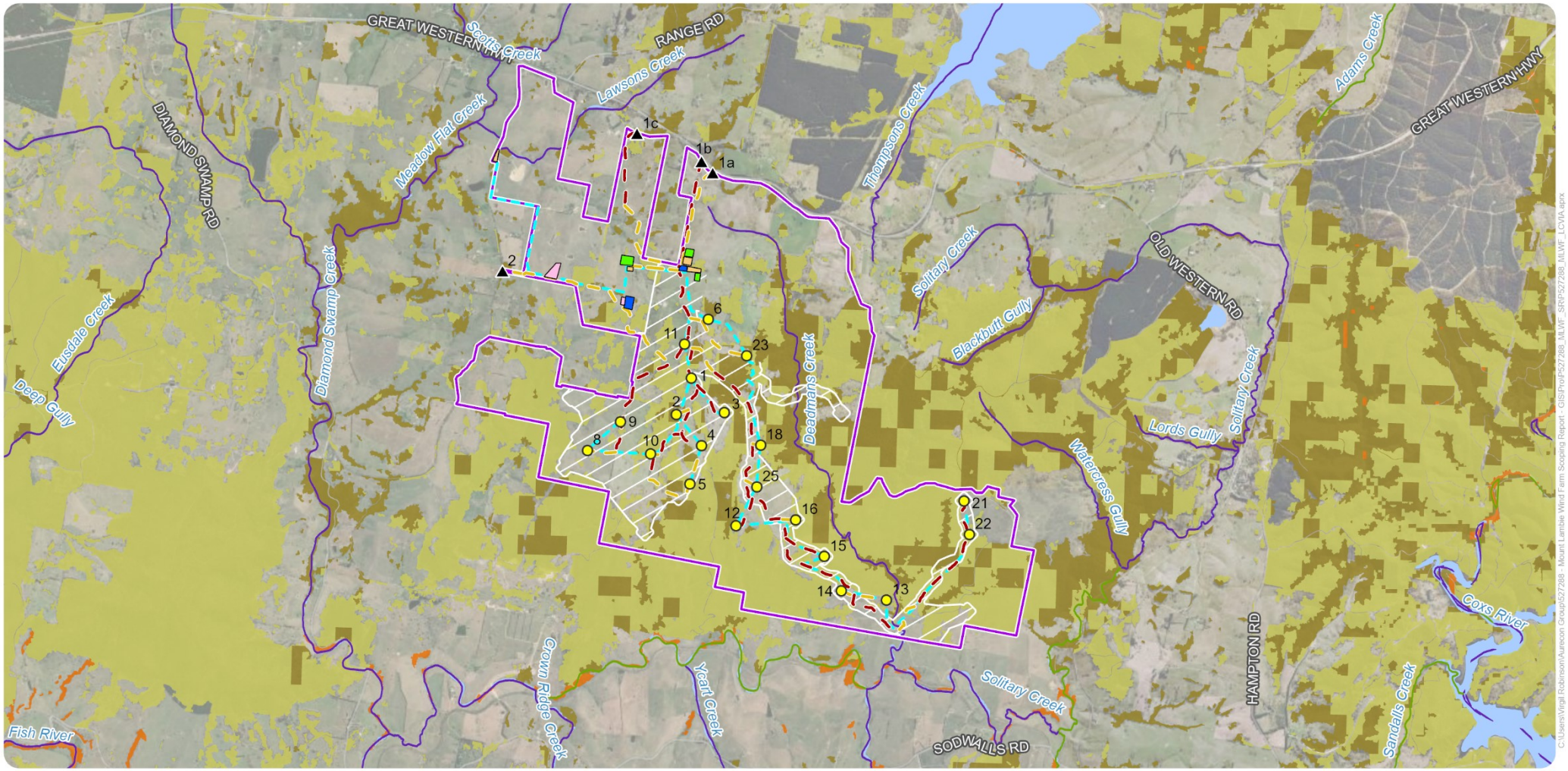
4.1.4 Groundwater dependent ecosystems

The Project area is within the Murray-Darling Basin (MDB) and it is part of the Lachlan fold belt MDB (Mudgee) Management Zone (WaterNSW 2024). The Bureau of Meteorology (BoM) Groundwater Dependent Ecosystems (GDE) Atlas indicated that:

- Aquatic GDE: Lawsons Creek, Deadmans Creek and Solitary Creek are mapped as moderate to high potential aquatic GDEs within the Project area. These aquatic GDEs are part of the Macquarie-Bogan Rivers region, and the NSW Murray Darling Basin Fractured Rock Groundwater – Lachlan Fold Belt groundwater management area.
- Terrestrial GDE: Vegetation with moderate and low potential of terrestrial GDE are predicted within the Project area.
- Subterranean GDE: The Project area is mapped as part of the NSW Murray-Darling Basin Fractured Rock: Lachlan Fold Belt MDB, which is part of water sharing plan (Water Sharing Plan for the NSW Murray Darling Basin Fractured Rock Groundwater Sources 2020). Groundwater source in the Project area is the Lachlan Fold Belt MDB Groundwater Source. There is no subterranean GDE mapping available within NSW, however the potential for them to occur would be investigated during the EIS phase.

The vision of the Water Sharing Plan for the NSW Murray-Darling Basin Fractured Rock Groundwater Sources 2020 is to provide for the a) protection of the conditions of the groundwater sources and their dependent ecosystems; b) continuing productive extraction of groundwater for economic benefit; c) social and cultural benefits to urban and rural communities that result from groundwater extraction; and d) spiritual, social, customary and economic benefits of groundwater to Aboriginal communities. The broad environmental objective of the Plan is to protect the condition of the groundwater sources and their GDEs over the term of the plan, which ends in June 2030. The targeted environmental objectives are to a) protect the extent and condition of high priority GDEs; and b) to contribute to the prevention of structural damage to aquifers of the groundwater sources resulting from groundwater extraction.

Predicted GDEs are shown in Figure 8.



Project area
Biodiversity Survey area
Waterbody

Mount Lambie Wind Farm Infrastructure

Turbine location
Access point
New access track
Cable network
Existing access track to be utilised
Temporary construction compound / Laydown area
Operation and maintenance facility
Substation
BESS infrastructure

Aquatic GDE Potential

High (national assessment)
Moderate (national assessment)

Terrestrial GDE Potential

High (regional studies)
Moderate (regional studies)
Low (regional studies)

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:75,000
0 1 2 km

Projection: GDA2020 MGA Zone 55

Mount Lambie Wind Farm **Biodiversity Impact Assessment**

Figure 8: Groundwater Dependent Ecosystems in the Project area

4.1.5 Habitat connectivity

Mount Lambie mountain range is located within the Great Dividing Range, situated west of Lithgow and east of Bathurst. Generally, the landscape is characterised by rolling hills, rocky outcrops, high-altitude grasslands and sections of dry sclerophyll forest and patches of woodland. The Mount Lambie mountain range is located on the eastern boundary and within the Project area.

Mount Lambie mountain range is in a mostly disturbed landscape where continuous remnant vegetation only remains on mountain ridges with steep slopes. Within Mount Lambie mountain range, remnant native vegetation acts as a corridor for the movement of fauna and dispersion of flora species. The connectivity within Mount Lambie is significantly reduced by the presence of cleared areas, where remnant isolated and highly disturbed patches of canopy and paddock trees would provide a stepping stone corridor for highly mobile species (e.g. birds, bats, large mammals such as macropods) to move across cleared and disturbed areas to the next densely vegetated remnant area. The corridor value of disturbed canopy and paddock trees in highly cleared and disturbed land within Mount Lambie mountain range would provide low corridor value for small ground-dwelling animals (e.g. mammals), arboreal animals (e.g. hollow dependent mammals or gliders) and low mobile fauna, as these animals would be exposed to high predation pressure (e.g. raptor birds, feral foxes) or would be unable to reach suitable habitat (e.g. absence of canopy within suitable gliding distances).

The landscape surrounding Mount Lambie mountain range includes roads (Great Western Highway, small rural roads), part of the Western Railway line and mostly cleared rural land. This area does not offer connectivity value for low mobile fauna and fauna with small movement or home ranges because cleared land, roads and railways restrict their mobility across the landscape (e.g. due to vehicular collision risk, predation pressure, lack of suitable refuge/habitat and food).

Several vegetated areas occur further away, and after the cleared rural landscape surrounding Mount Lambie, these areas albeit disconnected from Mount Lambie mountain range's vegetation, would likely be used by highly mobile fauna (e.g. birds and bats). Vegetated areas within 3 to 10 km from Mount Lambie include:

- Mount Tarana, then Eusdale Nature Reserve to the south-west
- Evans C Rowan Nature Reserve then Hamptons State Forest to the south
- Lidsdale State Forest, then Marrangardo National Park to the east
- Sunny Corner State Forest to the north of Great Western Highway
- Lucky Swam then Winburndale Nature Reserve to the north-west.

These vegetated areas would, however, have negligible connectivity value for other fauna and flora species with less mobility or dispersion capacity.

4.2 Vegetation communities and flora

4.2.1 Ground-truthed vegetation

The Survey area comprises mostly cleared land (i.e. exotic pastures with forbs), and five PCT vegetation zones, refer to Table 4-3 which details the ground-truthed vegetation within the Project area. The PCT vegetation zones include isolated patches of disturbed vegetation and vegetation at the edge of larger vegetation areas. A description of vegetation zones is provided in the sub-sections below, and their distribution is shown in Figure 9.

Field data sheets with RDP are provided in Appendix E and the Flora list is included in Appendix F.

Table 4-3 Vegetation zones ground-truthed within the Project area

Vegetation zone		Survey area (ha)	Indicative Disturbance Footprint[1]
No	Name		
1	PCT 3211 - Central Tableland Montane Wet Forest	1.4	0.6
2	PCT 3347 - Southern Tableland Creekflat Ribbon Gum Forest	6.0	0.6
3	PCT 3367 - Central Tableland Granites Grassy Box Woodland	91.0	7.7
4	PCT 3369 - Central Tableland Ranges Peppermint-Gum Grassy Forest	44.7	10.0
5	PCT 3735 - Central Tableland Peppermint Shrub-Grass Forest	54.4	10.1
	PCT 3534 - Central West Stony Hills Stringybark-Box Forest	-	0.3[2]
	PCT 3747 - Southern Tableland Western Hills Scribbly Gum Forest	-	1.2[2]
Total native vegetation ground-truthed within the Project area		**197.553**	**30.57**
6	Mixed Planted Native - Exotics	0.4	
7	Planted Exotics	0.6	
8	Exotic Grassland	305.6	
9	Dams	*	

Table notes:

* area included in exotic grassland
1. 57.1% of the Indicative Disturbance Footprint was surveyed. For areas not surveyed, PCT mapping has been used.
2. Inclusion of PCT 3534 and PCT 3735 is based on PCT mapping of areas within the Indicative Disturbance Footprint that were not surveyed.

Note: Whilst PCT 3294 (Central Tableland Peppermint-Gum Montane Forest, 3303 (Central Tableland Ribbon Gum Sheltered Forest were identified in the desktop search as modelled to occur within the Survey area, they were recorded or observed during the biodiversity site survey. PCT 3534 (Central West Stony Hills Stringybark-Box Forest) and PCT 3747 (Southern Tableland Western Hills Scribbly Gum Forest) were not identified in the biodiversity site survey, however PCT mapping of the unsurveyed area within the Indicative Disturbance Footprint indicates they may occur. As the Project progresses, it is recommended that vegetation surveys be conducted in the unsurveyed areas within the Indicative Disturbance Footprint.

PCT 3211 – Central Tableland Montane Wet Forest

Table 4-4 provides a summary of PCT 3211 in the Survey area and Indicative Disturbance Footprint.

Table 4-4 Summary of PCT 3211 in the Survey area

Vegetation Zone: PCT 3211 – Central Tablelands Montane Wet Forest		
Vegetation type	**PCT ID**	3211
	PCT name:	Central Tablelands Montane Wet Forest
	Vegetation formation:	Wet Sclerophyll Forests (Shrubby sub-formation)
	Vegetation Class:	Southern Escarpment Wet Sclerophyll Forests
	PCT estimate percentage cleared:	4.12% cleared

Vegetation Zone: PCT 3211 – Central Tablelands Montane Wet Forest		
PCT description[1]:	A tall moist grassy sclerophyll open forest of sheltered, often south-facing slopes and gullies of the high, cool and moist central plateau and scattered peaks of the Central Tablelands. This PCT is primarily distributed from Mount Walker in Marangaroo National Park south along the Great Dividing Range to Mount Guineacor, with western outliers at Sunny Corner, Eusdale and Vulcan. It occurs at elevations of 800 to 1,300 m above sea level (ASL), with means of 800 to 1,150 mm precipitation and 8 to 35 frost days annually, located primarily on sandstone, granitic and rhyolitic ignimbrite substrates. A tall to very tall tree canopy very frequently includes *Eucalyptus fastigata*, commonly with *Eucalyptus dalrympleana* and occasionally *Eucalyptus radiata*, with scattered small trees, typically *Acacia melanoxylon*, and sparse shrubs, typically *Lomatia myricoides*. The ground layer is mid-dense and very frequently dominated by *Poa sieberiana*, commonly *Pteridium esculentum*, *Lomandra longifolia* and *Microlaena stipoides* with occasional *Echinopogon ovatus*, *Stellaria pungens*, *Viola hederacea*, *Viola betonicifolia*, *Asperula conferta*, *Hydrocotyle laxiflora*, *Dichondra repens* and *Poranthera microphylla*. This community may be replaced in similar sheltered environments at lower elevations to the east by PCT 3226.	
PCT in the Survey area:	**Description:**	An open moist gully forest with canopy, with sparse sub-canopy and shrub layers, and dense groundcover. Native species recorded included Mountain Gum *(Eucalyptus dalrympleana),* River Lomatia (*Lomatia myricoides),* Rough Tree Fern *(Cyathea australis),* Silver Wattle *(Acacia dealbata),* Spiny-head Mat-rush (*Lomandra longifolia,* Bracken Fern *(Pteridium esculentum*), and Australian Blackwood *(Acacia melanoxylon*).
	Condition:	Moderate
	RDP assessed:	RAP23
Area (ha)	Survey area: 1.4 ha Indicative Disturbance Footprint: 0.6 ha	
TEC status	**BC Act:**	None
	EPBC Act:	None
Image of the PCT in the Survey area	 **Photograph 1 Example of PCT in the Survey area**	

Table note:

1 As per BioNet Vegetation Classification description

PCT 3347 - Southern Tableland Creekflat Ribbon Gum Forest

Table 4-5 Table provides a summary of PCT 3347 in the Survey area and Indicative Disturbance Footprint.

Table 4-5 Summary of PCT 3347 in the Survey area

Vegetation Zone: PCT 3347 - Southern Tableland Creekflat Ribbon Gum Forest		
Vegetation type	**PCT ID**	3347
	PCT name:	Southern Tableland Creekflat Ribbon Gum Forest
	Vegetation formation:	Grassy Woodlands
	Vegetation Class:	Tablelands Clay Grassy Woodlands
	PCT estimate percentage cleared:	65.00% cleared

Vegetation Zone: PCT 3347 - Southern Tableland Creekflat Ribbon Gum Forest		
PCT description[1]:	A tall to very tall grassy sclerophyll open forest to woodland of creek flats and gentle footslopes in undulating tablelands of higher eastern parts of the South Eastern Highlands bioregion. This PCT is widely distributed, occurring from Delegate north to Portland and west to Eucumbene, Grabben Gullen and Orange, at elevations of 600 to 1,300 m ASL, with means of 550 to 1,000 mm precipitation and 10 to 80 frost days annually. Soils are often relatively deep, including alluvium or colluvium, derived from a wide range of sedimentary and granitic rocks. The canopy is sparse to mid-dense and commonly includes *Eucalyptus viminalis* and/or *Eucalyptus pauciflora*, occasionally with *Eucalyptus stellulata*. A sparse small tree layer is sometimes present and includes scattered occasional *Acacia melanoxylon*. Smaller shrubs are also sparse and commonly include scattered *Acacia dealbata*, or rarely *Cassinia longifolia*. The ground layer is generally dense and grassy, and very frequently dominated by large tussocks of *Poa labillardierei* var. *labillardiere*i, commonly with other grasses *Microlaena stipoides*, *Poa sieberiana*, *Elymus scaber*, *Themeda triandra* and occasionally *Rytidosperma racemosum*. The ground layer also includes a suite of soft-leaved forbs (*Dichondra repens*, *Acaena novae-zelandiae*, *Viola betonicifolia*, *Geranium solanderi*, *Hydrocotyle laxiflora*, *Stellaria pungens*, *Gonocarpus tetragynus*, *Rumex brownii*, *Oreomyrrhis eriopoda*, *Hypericum gramineum*), small vines (*Glycine clandestina*, *Desmodium varians*), and occasional clumps of the large riparian sedge *Carex appressa*. This community grades into a wide variety of other types on hillslopes adjacent to its riparian habitats. In more rugged tableland ranges it may be replaced along watercourses by PCT 3303, or by PCT 4063 on rocky, gravelly fast-flowing streams.	
PCT in the Survey area:	**Description:**	PCT 3347 within the Survey area occurs in isolated patches surrounded by exotic grasslands and at edge of larger parches. The vegetation zone is disturbed with remnant canopy and mostly exotic groundcover. Some areas include a shrub layer. Native species present across patches of the PCT included Ribbon Gum (*Eucalyptus viminalis*), Broad-leaved Peppermint *(Eucalyptus dives)*, Common Tussock-Grass *(Poa labillarieri), Geranium sp.,* Bracken Fern *(Pteridium esculentum),* Common Cassinia *(Cassinia aculeata),* Wild Rosemary *(Cassinia quinquefaria),* Knotty Spear Grass *(Austrostipa nodosa), Juncus sp,* Silver Wattle *(Acacia dealbata),* Weeping Grass *(Microlaena stipoides),* Spiny-head mat-rush (*Lomandra longifolia),* Prickly Starwort *(Stellaria pungens),* Hickory Wattle (*Acacia falciformis)*, Red Bidibid *(Acaena novae-zelandiae),* Sweet Bursaria (*Bursaria spinosa),* Stinking Pennywort (*Hydrocotyle laxiflora),* River Lomatia (*Lomatia myricoides),* Goatsbeard (*Clematis aristata),* Hoary Guinea flower *(Hibbertia obtusifolia),* Trailing Speedwell *(Veronica plebeia),* Native Sorrel (*Oxalis perennans),* Peach Heath (*Lissanthe strigosa)*, and Hoary Guinea flower *(Hibbertia obtusifolia).* Exotic species included Blackberry *(Rubus fruticosus aggr.),* Orchid Grass *(Dactylis glomerata),* White Clover *(Trifolium repens),* St John's wort (*Hypericum perforatum),* Sweet Vernal Grass *(Anthoxanthum odoratum),* Scotch Broom (*Cytisus scoparius*), Sheep Sorrel (*Rumex acetosella),* Bulbous Canary Grass *(Phalaris aquatica),* Dandelion *(Taraxum officinale)*, Argentine peppercress *(Lepidium bonariense),* Scotch Thistle (*Onopordum acanthium*), Tall Fleabane (*Conyza sumatrensis*), and *Verbena sp.*
	Condition:	Low to Moderate
	RDP assessed:	RAP05, RAP31, RAP32, RAP33, RAP35, RBA11, RBA16, RBA21,
Area (ha)	Survey area: 6.0 ha Indicative Disturbance Footprint: 0.6 ha	
TEC status	**BC Act:**	None
	EPBC Act:	None

Vegetation Zone: PCT 3347 - Southern Tableland Creekflat Ribbon Gum Forest	
Image of the PCT in the Survey area	

Photograph 2 Example of PCT in the Survey area

Table note:

1 As per BioNet Vegetation Classification description

PCT 3367 - Central Tableland Granites Grassy Box Woodland

Table 4-6 Table provides a summary of PCT 3367 in the Survey area and Indicative Disturbance Footprint.

Table 4-6 Summary of PCT 3367 in the Survey area

Vegetation Zone: PCT 3367 – Central Tablelands Granites Grassy Box Woodland		
Vegetation type	**PCT ID**	3367
	PCT name:	Central Tableland Granites Grassy Box Woodland
	Vegetation formation:	Grassy Woodlands
	Vegetation Class:	Southern Tablelands Grassy Woodlands
	PCT estimate percentage cleared:	78.19% cleared
PCT description[1]:	A mid-high to tall sclerophyll grassy woodland of sandy soils derived from granitoid, rhyolite, quartzite or quartz diorite rocks in undulating to hilly landscapes in moderately cool, dry broad river valleys of the Central Tablelands. This PCT occurs within the catchments of the Fish and upper Coxs and Abercrombie rivers, at elevations of 580 to 1,050 m ASL, with means of 680 to 950 mm precipitation and 4 to 25 frost days annually. The canopy is sparse and very frequently includes *Eucalyptus bridgesiana* with occasional *Eucalyptus viminalis* or *Eucalyptus melliodora*, above occasional tall *Acacia falciformis* and a sparse smaller shrub layer that commonly includes *Hibbertia obtusifolia*, *Brachyloma daphnoides* and *Bursaria spinosa*. The mid-dense ground layer is dominated by grasses that commonly include *Poa sieberiana*, *Microlaena stipoides*, *Themeda triandra* and *Aristida ramosa*. Forbs very frequently include *Hydrocotyle laxiflora*, *Lomandra filiformis* and *Cheilanthes sieberi subsp. sieberi*, commonly with *Lomandra longifolia*, *Dianella revoluta*, *Lomandra multiflora subsp. multiflora*, *Gonocarpus tetragynus*, *Hypericum gramineum*, *Geranium solanderi* and *Stellaria pungens*. On granites in the east of its range, this community may be replaced on moist sheltered slopes by PCT 3348.	

Vegetation Zone: PCT 3367 – Central Tablelands Granites Grassy Box Woodland		
PCT in the Survey area:	**Description:**	Open woodland with sparse to moderately dense shrub layer and groundcover, disturbance evident. Exotic cover variable, with Blackberry (*Rubus fruticosus aggr.*). Native species included Apple Box (*Eucalyptus bridgesiana*), Knotty Spear Grass *(Austrostipa nodosa),* Yellow Box (*Eucalyptus melliodora),* Ribbon Gum (*Eucalyptus viminalis*), Sweet Bursaria (*Bursaria spinosa),* Common Cassinia *(Cassinia aculeata),* Weeping Grass *(Microlaena stipoides), Acacia sp,* Broad-leaved Peppermint (*Eucalyptus dives),* Drooping Cassinia (*Cassinia arcuata), S*ilver Wattle *(Acacia dealbata),* Common Tussock-Grass *(Poa labillarieri),* Weak plantain (*Plantago debilis),* Peach Heath (*Lissanthe strigosa),* Wattle Mat Rush (*Lomandra filiformis),* Long-leaved Box (*Eucalyptus goniocalyx),* Scrub Nettle (*Urtica incisa),* Shade Plantain *(Plantago debilis),* Red bidibid *(Acaena novae*), Bears Ear *(Cymbonotus lawsonianus),* Dog-tooth Wattle *(Acacia cultriformis),* Fringed Wattle *(Acacia fimbriata),* Austral Crane's-bill *(Geranium solanderi),* Stinking Pennywort (*Hydrocotyle laxiflora,* Bracken Fern *(Pteridium esculentum),* Matted Bossiaea *(Bossiaea buxifolia),* Australian Tussock Grass (*Rhydiospermum pallidum),* Small-leaf parrot pea (*Dillwynia phylicoides),*Common Hovea (*Hovea linearis),* Spiny-head Mat-rush (*Lomandra longifolia*), and Creeping Cudweed *(Euchiton japonicus*). Other exotics recorded include Blackberry *(Rubus fruticosus),* Orchid Grass *(Dactylis glomerata),* White Clover *(Trifolium repens),* Bulbous Canary Grass *(Phlaris aquatica),* St John's Wort (*Hypericum perforatum),* Sheep Sorrel (*Rumex acetosella),* Red-flowered Mallow (*Modiola caroliniana),* Paterson's curse (*Echium plantagineum),* Scotch Thistle (*Onopordum acanthium),* Argentine Peppercress *(Lepidium bonariense,* Blackberry *(Rubus fruticosus),* Prairie Grass (*Bromus catharticus),* and Kidney Weed (*Dichondra repens*).
	Condition:	Low to Moderate
	RDP assessed:	RAP01, RAP02, RAP06, RAP07, RAP08, RAP10, RAP22, RAP25, RAP26, RAP29, RAP30, RAP34, RAP36, RAP37, RAP38, RBA03, RBA10, and RBA18.
Area (ha)	Survey area: 91.0 ha Indicative Disturbance Footprint: 7.7 ha	
TEC status	**BC Act:**	None
	EPBC Act:	None
Image of the PCT in the Survey area	 **Photograph 3 Example of PCT in the Survey area**	

Table note:

1 As per BioNet Vegetation Classification description

PCT 3369 - Central Tableland Ranges Peppermint-Gum Grassy Forest

Table 4-7 Table provides a summary of PCT 3369 in the Survey area and Indicative Disturbance Footprint.

Table 4-7 Summary of PCT 3369 in the Survey area

Vegetation Zone: PCT 3369 – Central Tablelands Range Peppermint – gum Grassy Forest		
Vegetation type	**PCT ID**	3369
	PCT name:	Central Tableland Ranges Peppermint-Gum Grassy Forest
	Vegetation formation:	Grassy Woodlands
	Vegetation Class:	Southern Tablelands Grassy Woodlands
	PCT estimate percentage cleared:	62.32% cleared
PCT description[1]:	A tall to very tall moist grassy sclerophyll open forest found on sheltered slopes of ranges along the high cool spine of the Central Tablelands. It occurs from Kandos south to Lithgow, Oberon and Taralga and into the Southern Tablelands at Mount Rae and on the Cookbundoon Range near Goulburn. Plot are at elevations of 700 to 1,250 m ASL, with means of 700 to 1,000 mm precipitation and 8 to 33 frost days annually. Plots are primarily on soils derived from sedimentary substrates including sandstone, shale, conglomerate and chert, with scattered samples from granitoid and acid volcanic rocks. A mid-dense tree canopy very frequently includes *Eucalyptus dives*, commonly with *Eucalyptus dalrympleana* and occasionally with *Eucalyptus macrorhyncha*. The mid-stratum is sparse to very sparse with *Hibbertia obtusifolia* the only common species and occasionally taller *Acacia dealbata* or *Acacia melanoxylon*. The ground layer very frequently has high cover of *Poa sieberiana* and also very frequently includes scattered *Viola betonicifolia*, *Hydrocotyle laxiflora*, *Lomandra filiformis*, *Microlaena stipoides*, *Stellaria pungens*, *Gonocarpus tetragynus* and *Senecio prenanthoides*. Other common ground layer plants include *Geranium solanderi*, *Acaena novae-zelandiae*, *Poranthera microphylla*, *Lomandra longifolia*, *Dichondra repens*, *Glycine clandestina* and *Veronica plebeia*. This community often grades into PCT 3735 on nearby exposed and relatively dry slopes and crests. At higher altitudes on the Central Tablelands with greater rainfall and lower temperatures it may be replaced by PCT 3294.	
PCT in the Survey area:	**Description:**	An open forest with sparse shrub and ground layer, with patches of exotics present. The vegetation zone presents larger native component in fenced off areas compared with areas freely accessed by cattle. An area of derived native grassland (DNG) with shrubs present. Native species present include Mountain Gum *(Eucalyptus dalrympleana),* Broad-leaved Peppermint (*Eucalyptus dives),* Apple Box (*Eucalyptus bridgesiana)*, Ribbon Gum (*Eucalyptus viminalis*), Drooping Cassinia (*Cassinia arcuata),* Common Cassinia *(Cassinia aculeata),* Snow Grass (*Poa sieberiana)*, Weeping Grass (*Microlaena stipoides*), Wattle Mat Rush (*Lomandra filiformis),* Hop Bitter-pea (*Daviesia latifolia*), Hoary Guinea flower *(Hibbertia obtusifolia), Luzula sp,* Small-leaf parrot pea (*Dillwynia phylicoides,* Dog's tooth Wattle *(Acacia gunnii),* Silver Wattle *(Acacia dealbata),* River Lomatia (*Lomatia myricoides),* Common Tussock-Grass *(Poa labillarieri),* Wattle Mat Rush (*Lomandra filiformis),* Bracken Fern *(Pteridium esculentum),* Australian blackwood *(Acacia melanoxylon),* Austral Crane's-bill *(Geranium solanderi),* Stinking Pennywort (*Hydrocotyle laxiflora),* Cotton Fireweed (*Senecio quadridentatus),* Spiny-head Mat-rush (*Lomandra longifolia),* Sweet Bursaria (*Bursaria spinosa),* Peach Heath (*Lissanthe strigosa), Juncus sp,* Mulga Fern *(Cheilanthes sieberi*), Common Tussock-Grass *(Poa labillarieri),* Wild Rosemary *(Cassinia quinquefaria),* and Native Sorrel (*Oxalis perennans*). Exotic species observed include Blackberry *(Rubus fruticosus),* Orchid Grass *(Dactylis glomerata),* Scotch Thistle (*Onopordum acanthium),* Sheep Sorrel (*Rumex acetosella),* Fireweed Groundsel (*Senecio linearifolius),* Bulbous Canary Grass *(Phlaris aquatica),* White Clover *(Trifolium repens*), and Chick Weed *(Stellaria media*).
	Condition:	Low to Moderate, DNG
	RDP assessed:	RAP03, RAP15, RAP27, RAP27, RAP28, RBA01, RBA02, RBA04, RBA06, RBA07, RBA08, RBA09, RBA12, RBA13, RBA14, and RBA17.
Area (ha)	Survey area: 44.7 ha Indicative Disturbance Footprint: 10.0 ha	

Vegetation Zone: PCT 3369 – Central Tablelands Range Peppermint – gum Grassy Forest		
TEC status	**BC Act:**	None
	EPBC Act:	None
Image of the PCT in the Survey area	 **Photograph 4 – Example of PCT in the Survey area**	

Table note:

1 As per BioNet Vegetation Classification description

PCT 3735 - Central Tableland Peppermint Shrub-Grass Forest

Table 4-8 provides a summary of PCT 3735 in the Survey area and Indicative Disturbance Footprint.

Table 4-8 Summary of PCT 3735 in the Survey area

Vegetation Zone: PCT 3735 – Central Tablelands Peppermint Shrub-Grass Forest		
Vegetation type	**PCT ID**	3735
	PCT name:	Central Tableland Peppermint Shrub-Grass Forest
	Vegetation formation:	Dry Sclerophyll Forests (Shrubby sub-formation)
	Vegetation Class:	Southern Tableland Dry Sclerophyll Forests
	PCT estimate percentage cleared:	69.49% cleared
PCT description[1]:	A tall dry shrub-grass sclerophyll open forest of high, cool, central parts of the Central Tablelands, generally on dry slopes and broad crests in rolling hilly country, from Ilford south to Taralga and Hartley Vale west to Mount David. This PCT is known from elevations of 800 to 1,250 m ASL, with means of 700 to 1,050 mm precipitation and 6 to 33 frost days annually, predominantly on sedimentary substrates and occasionally granites. Plots defining this PCT commonly have relatively low species richness. A tall mid-dense tree canopy almost always includes *Eucalyptus dives*, commonly with *Eucalyptus dalrympleana* and occasionally including *Eucalyptus mannifera* or *Eucalyptus macrorhyncha*. A sparse to patchy shrub layer very frequently includes low *Hibbertia obtusifolia*, commonly with *Monotoca scoparia* and occasionally *Daviesia leptophylla*, *Brachyloma daphnoides*, *Acacia gunnii* or *Gompholobium huegelii*. The ground layer is sparse to mid-dense and characterised by very frequent high cover of *Poa sieberiana* and *Rytidosperma pallidum* and sparse *Dianella revoluta*, *Lomandra filiformis* and *Gonocarpus tetragynus*. The subshrub Hovea linearis is common, and there may be occasional *Hardenbergia violacea*, *Poranthera microphylla* or *Microlaena stipoides*. In mountainous landscapes in the eastern parts of its distribution, this community is replaced on higher slopes by PCT 3294.	

<table>
<tr><th colspan="3">Vegetation Zone: PCT 3735 – Central Tablelands Peppermint Shrub-Grass Forest</th></tr>
<tr><td rowspan="3">PCT in the Survey area:</td><td>Description:</td><td>Forest with sparse canopy, sparse to dense shrub layer, in some areas with Blackberry (Rubus fruticosus aggr.). Groundcover generally native with few exotics.

Native species present included Long-leaved Box (Eucalyptus goniocalyx), Broad-leaved Peppermint (Eucalyptus dives), Mountain Gum (Eucalyptus dalrympleana), Apple Box (Eucalyptus bridgesiana), Brittle Gum (Eucalyptus mannifera), Drooping Cassinia (Cassinia arcuata), Common Cassinia (Cassinia aculeata), Bears Ear (Cymbonotus lawsonianus), Tree Violet (Melicytus dentatus), Snow Grass (Poa sieberiana), Red Bidibid (Acaena novae-zelandiae), Common Woodruff (Asperula conferta), Australian Blackwood (Acacia melanoxylon), Creeping Cudweed (Euchiton japonicus), Prickly Starwort (Stellaria pungens), Bracken Fern (Pteridium esculentum), Broad-leaved Peppermint (Eucalyptus dives), Wild Rosemary (Cassinia quinquefaria), Spiny-head Mat-rush (Lomandra longifolia), Hoary Guinea flower (Hibbertia obtusifolia), Common Tussock-Grass (Poa labillarieri), Snow Grass (Poa sieberiana), Weeping Grass (Microlaena stipoides), Peach Heath (Lissanthe strigosa), Wattle Mat Rush (Lomandra filiformis), River Lomatia (Lomatia myricoides), Common Hovea (Hovea linearis), Creeping Hovea (Hovea heterophylla), Common Raspwort (Gonocarpus tetragynus), Wild Rosemary (Cassinia quinquefaria), Wattle Mat Rush (Lomandra filiformis), Narrow-leaved Geebung (Persoonia linearis), Silver Wattle (Acacia dealbata), Australian Tussock Grass (Rhydiospermum pallidum), Sweet Bursaria (Bursaria spinosa), Beaked Fireweed (Senecio prenanthoides), Common Clover (Oxalis perennans).

Exotic component includes Blackberry (Rubus fruticosus aggr.), Orchid Grass (Dactylis glomerata), Juncus sp., Serrated Tussock (Nassella trichotoma), St John's Wort (Hypericum perforatum), Sweet Vernal Grass (Anthoxanthum odoratum), Scotch Broom (Cytisus scoparius), Sheep Sorrel (Rumex acetosella), White Clover (Trifolium repens), Bulbous Canary Grass (Phalaris aquatica), and Scotch Thistle (Onopordum acanthium).</td></tr>
<tr><td>Condition:</td><td>Low to Moderate</td></tr>
<tr><td>RDP assessed:</td><td>RAP04, RAP12, RAP13, RAP14, RAP16, RAP17, RAP18, RAP19, RAP20, RAP25, RBA05, RBA15, RBA19, and RBA20.</td></tr>
<tr><td>Area (ha)</td><td colspan="2">Survey area: 54.4 ha
Indicative Disturbance Footprint: 10.1 ha</td></tr>
<tr><td rowspan="2">TEC status</td><td>BC Act:</td><td>None</td></tr>
<tr><td>EPBC Act:</td><td>None</td></tr>
<tr><td>Image of the PCT in the Survey area</td><td colspan="2"> 
Photograph 5 Example of PCT (RAP04) in the Survey area</td></tr>
</table>

Table note:

1 As per BioNet Vegetation Classification description

PCT 3534 - Central West Stony Hills Stringybark-Box Forest

Table 4-9 provides a summary of PCT 3534 in the Survey area and Indicative Disturbance Footprint.

Table 4-9 Summary of PCT 3534 in the Survey area and Indicative Disturbance Footprint

Vegetation Zone: PCT 3534 – Central West Stony Hills Stringybark-Box Forest		
Vegetation type	**PCT ID**	3534
	PCT name:	Central West Stony Hills Stringybark-Box Forest
	Vegetation formation:	Dry Sclerophyll Forests (Shrub/grass sub-formation)
	Vegetation Class:	Riverina Dry Sclerophyll Forests
	PCT estimate percentage cleared:	65.35% cleared
PCT description[1]:	A mid-high to tall sclerophyll dry shrub-grass open forest to woodland found on stony hills and ranges of north-west and northern parts of the South Eastern Highlands and adjacent higher parts of the NSW South Western Slopes bioregion. This PCT is distributed from Murrumbateman north to Dunedoo, west to Conimbla and Nangar national parks, and east to Capertee and Abercrombie River National Park. It occurs at elevations of 350 to 1,050 m asl, in locations receiving 600 to 950 mm mean annual precipitation and with 3 to 26 mean annual frost days, on a wide variety of sedimentary, acid volcanic and granitic rocks. A mid-dense tree canopy almost always includes *Eucalyptus macrorhyncha,* very frequently with *Eucalyptus goniocalyx* and commonly *Eucalyptus polyanthemos*, occasionally with *Eucalyptus rossii*. A sparse to mid-dense shrub layer very frequently includes *Hibbertia obtusifolia*, commonly *Brachyloma daphnoides* and occasionally *Styphelia triflora, Melichrus urceolatus, Cassinia sifton* or *Dillwynia phylicoides*. The ground layer is also sparse and often grassy, however also includes graminoids and tough forbs. Species present very frequently include scattered *Poa sieberiana, Lomandra filiformis* and *Goodenia hederacea*, commonly with *Rytidosperma pallidum, Lomandra multiflora subsp. multiflora, Gonocarpus tetragynus, Dianella revoluta* and *Cheilanthes sieberi subsp. sieberi*, with occasional *Dichelachne micrantha, Stypandra glauca* or *Phyllanthus hirtellus*. This community is floristically related to PCT 3747, which replaces it in similar dry rocky range habitats with cooler temperatures to the east. Where they overlap, this PCT tends to be found in more exposed, dry and rocky situations such as west-facing stony slopes.	
PCT in the Survey area:	**Description:**	-
	Condition:	-
	RDP assessed:	-
Area (ha)	Survey area: 0 ha Indicative Disturbance Footprint: 0.3 ha[2]	
TEC status	**BC Act:**	None
	EPBC Act:	None
Image of the PCT in the Survey area	-	

Table notes:

1 As per BioNet Vegetation Classification description
2 Based on PCT mapping of unsurveyed areas within the Indicative Disturbance Footprint

PCT 3747 - Southern Tableland Western Hills Scribbly Gum Forest

Table 4-10 provides a summary of PCT 3747 in the Survey area and Indicative Disturbance Footprint.

Table 4-10 Summary of PCT 3747 within the Survey area and Indicative Disturbance Footprint

Vegetation Zone: PCT 3747 – Southern Tableland Western Hills Scribbly Gum Forest		
Vegetation type	**PCT ID**	3747
	PCT name:	Southern Tableland Western Hills Scribbly Gum Forest
	Vegetation formation:	Dry Sclerophyll Forests (Shrubby sub-formation)
	Vegetation Class:	Southern Tablelands Dry Sclerophyll Forests

Vegetation Zone: PCT 3747 – Southern Tableland Western Hills Scribbly Gum Forest		
	PCT estimate percentage cleared:	65.05% cleared
PCT description[1]:	A mid-high to tall dry shrubby sclerophyll open forest of slopes and crests of dry, rocky tableland hills and ranges, at moderate altitudes across the Central Tablelands and northern parts of the Southern Tablelands. This PCT is widely distributed from Mullions Range east to the slopes of Mount Vincent and to Windeyer and Rylstone in the north, south to Mundoonen Range, Bungonia, and Cuumbeun east of Queanbeyan in the south. It generally occurs at elevations of 500 to 1,200 m asl and in locations receiving 600 to 920 mm mean annual rainfall, commonly on quartz-rich sedimentary, acid volcanic and granitoid substrates, with scattered occurrences in areas mapped as shales or mudstones. A sparse to mid-dense tree canopy very frequently includes *Eucalyptus macrorhyncha* and or *Eucalyptus rossii*, commonly with *Eucalyptus mannifera* and occasionally *Eucalyptus goniocalyx*. A sparse shrub layer very frequently includes *Hibbertia obtusifolia*, commonly with *Daviesia leptophylla* and *Brachyloma daphnoides* and occasionally *Acacia gunnii, Monotoca scoparia* or *Melichrus urceolatus*. The ground layer is sparse to mid-dense, and very frequently includes large tussocks of *Rytidosperma pallidum*, which dominates with a high cover, and *Lomandra filiformis*, *Poa sieberiana, Dianella revoluta, Gonocarpus tetragynus* and *Goodenia hederacea*. Also common is *Hovea linearis* (most records likely to be *Hovea heterophylla*), with *Lomandra multiflora subsp. multiflora* occasional. On lower slopes with increasing depth of accumulated soil, this community may grade into a variety of grassy open forest communities, such as PCT 3370 in relatively moist parts of its range or PCT 3372 in relatively dry parts. With decreasing rainfall and increasing temperatures it is replaced on similar rocky hills to the west by PCT 3353.	
PCT in the Survey area:	**Description:**	-
	Condition:	-
	RDP assessed:	-
Area (ha)	Survey area: 0 ha Indicative Disturbance Footprint: 1.2 ha[2]	
TEC status	**BC Act:**	None
	EPBC Act:	None
Image of the PCT in the Survey area	-	

Table notes:

1 As per BioNet Vegetation Classification description
2 Based on PCT mapping of unsurveyed areas within the Indicative Disturbance Footprint

Mixed planted native – exotics

Mixed planted native and exotic windbreaks were observed in the Survey area (refer to Photograph 6). Native species included *Eucalyptus spp*., *Acacia spp*., and *Grevillea sp*. Exotic species included Monterey Pine (*Pinus radiata*) (refer to Photograph 7), cypress pine (*Cupressus* sp.), Blackberry (*Rubus fruticosus* aggr.), grasses and forbs.

Photograph 6 Windbreak with planted native and exotic plants

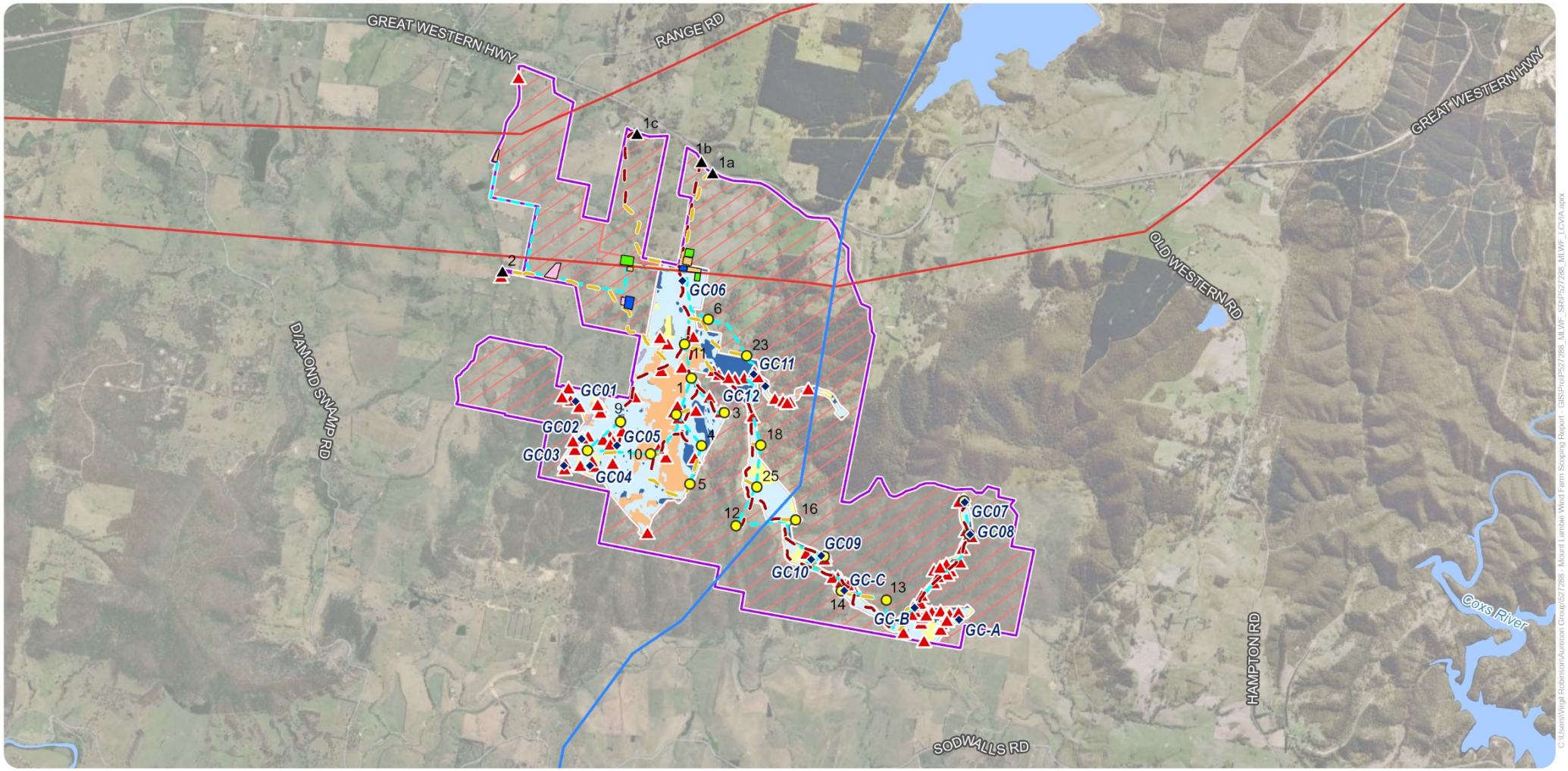
Photograph 7 Windbreak planted with exotic plants

Exotic grassland

The Survey area included extensive land used for cattle grazing. This vegetation zone was exotic grasslands mixed with exotic forbs (refer to Photograph 8).

A total of fifteen 100 m transects were undertaken to determine the percentage of native versus exotic components in the vegetation zone. It was estimated that only 18.69 per cent of the groundcover was native whereas an 80.13 per cent consisted of exotic plant cover. These estimates indicated that the exotic grassland vegetation zone within the Survey area has a native ground cover of <50 per cent and it is deemed ‘Low Conservation Grassland” which is classed as Class 1 – ‘Exempted Land’ under the LLS Act.

Photograph 8 Example of exotic grassland within the Survey area



Project area
Biodiversity Survey area
Area not surveyed
Waterbody
Rapid Data Point

Mount Lambie Wind Farm Infrastructure
Turbine location
Access point
New access track
Existing access track to be utilised
Cable network
Temporary construction compound / Laydown area
Operation and maintenance facility
Substation
BESS infrastructure

Existing transmission
132kV line
500kV line

Ground-truthed Vegetation
Exotic
PCT 3211
PCT 3347
PCT 3367
PCT 3369
PCT 3735

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:75,000
0 1 2 km

Projection: GDA2020 MGA Zone 55

Mount Lambie Wind Farm **Biodiversity Impact Assessment**

Figure 9: Ground-truthed Vegetation

4.2.2 Flora records

A total of 117 flora species across 38 families were recorded within the Survey area. This includes 84 (71.79 per cent) native and 34 exotic (28.21 per cent) species. A list of flora species is provided in Appendix F.

Listed exotic plants

Listed exotic plants include:

- Weeds of National Significance (WoNS) listed under the Australian Weed Strategy (IPAC 2017).
- Priority Weeds (PW) listed under the NSW *Biosecurity Act 2015*. Four of the exotic species recorded are listed weeds (refer to Table 4-11).

Table 4-11 Listed weeds

Scientific name (Common name)	PW	WoNS	Biosecurity management
Rubus fruticosus aggr. (Blackberry)	Yes	Yes	**Prohibition on certain dealings** Must not be imported into the state, sold, bartered, exchanged or offered for sale. All species in the *Rubus fruiticosus* species aggregate have this requirement, except for the varietals Black Satin, Chehalem, Chester Thornless, Dirksen Thornless, Loch Ness, Murrindindi, Silvan, Smooth Stem, and Thornfree.
Hypericum perforatum (St John's Wort)	Yes		**Regional Recommended Measure** Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.
Nassella trichotoma (Serrated Tussock)	Yes	Yes	**Prohibition on certain dealings** Must not be imported into the state, sold, bartered, exchanged or offered for sale. **Regional Recommended Measure** Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.
Salix sp. (a Willow)	Yes	Yes	**Prohibition on certain dealings** Must not be imported into the state, sold, bartered, exchanged or offered for sale. All species in the *Salix* genus have this requirement, except Weeping Willow (*Salix babylonica*), Pussy Willow (*Salix x calodendron*) and Sterile Pussy Willow (*Salix x reichardtii*).

4.3 Fauna and fauna habitat

4.3.1 Fauna recorded

A total of 49 fauna species were recorded during surveys, including 30 native bird and 19 mammal species (13 native and six introduced species).

Three observations of Gang-gang Cockatoo (*Callocephalon fimbriatum*), a threatened species under the BC Act and the EPBC Act, were recorded during surveys. A pair of Gang-gang Cockatoo were recorded in the western portion of the Survey area feeding on a Broad-leaved Peppermint (*Eucalyptus dives*). Two additional records were observed in the north-eastern portion of the Survey area.

The echolocation call of ten microbat species were recorded with ANABATs as per the Bat Call Report (refer to Appendix G). Two of the ten species are threatened under the BC Act, including the Eastern False Pipistrelle (*Falsistrellus tasmaniensis*) and Large Bent-winged Bat (*Miniopterus orianae oceanensis*).

The full list of fauna species recorded is provided in Appendix F. Threatened fauna records are shown in Figure 11.

4.3.2 Fauna habitat features

Table 4-12 summarises fauna habitat features observed in the Survey area. Fauna habitat features are shown in Figure 10.

Table 4-12 Fauna Habitat Features

Habitat value	Description
Hollow Bearing Tree	Several hollows in stags and living trees were observed. Hollows were generally small (<10 centimetres (cm) in diameter) and medium (between 10 and 20 cm in diameter). These hollows can provide habitat to birds, small reptiles, and small mammals.
Stag	A stag is a dead tree which can provide habitat when crevices, hollows or decorticating bark is present. Several stags were observed across the Survey area.
Logs	Logs and fallen trees can provide habitat for numerous animals (e.g. insects, arachnids, reptiles, small mammals) and refuge for animals moving across the landscape. Numerous logs were observed within the Survey area.
Rocky Outcrops	Rocky habitat was recorded within the Survey area, these areas can provide habitat for small invertebrates (e.g. insects, spiders), reptiles and mammals.
Caves	No caves were observed within the Survey area. The presence of mountain ranges suggests that cliffs with caves have the potential to occur in the wider landscape. Highly mobile animals inhabiting those caves have the potential to fly over the Project area during migratory and/or feeding movements (e.g. microbats).
Leaf Litter	Small areas of leaf litter occur in remnant patches of native vegetation (i.e. PCTs) inaccessible to cattle (e.g. fenced off areas). Leaf litter can provide habitat for small animals (e.g. invertebrates, reptiles, small mammals).
Decorticating bark	Decorticating bark was observed in numerous gum trees (e.g. Ribbon Gum (*Eucalyptus viminalis*)) and stags. Decorticating bark can provide habitat for invertebrates, reptiles and small mammals (e.g. microbats).
Burrows, nests and other fauna-made habitat	Numerous wombat burrows were observed across the Survey area. Termite mounds were observed on the ground. A small stick nest was observed. No large stick nests were observed in emergent trees. Significant ground-cover damage due to feral pigs was observed in exotic and PCT areas.

4.3.3 Aquatic habitat

Two aquatic habitat features are present in the Survey area:

- Creeks: several creek lines were observed. Unidentified frog calls were heard near a creek line.
- Farm Dams: over ten farm dams are present within and/or near the Survey area. These water bodies are accessed by cattle and a few birds (e.g. Pacific Black Duck (*Anas superciliosa*), and Australian Wood Duck (*Chenonetta jubata*)) were observed during surveys. Few of the dams have sparse fringing vegetation which can provide habitat for frogs and insects.

Aquatic habitats can be used by other bids, insects, mammals and reptiles as a water source. It is known that the Grey-headed Flying-fox (*Pteropus poliocephalus*) sources water from open water bodies (e.g. dams, ponds, creeks, rivers). Two flying-fox camps are known near the Project area, one in Bathurst (approximately 30 km west) and one in Portland (approximately 12 km north-east) from the Project area. The breeding camp in Portland has no records of habitation by Grey-headed Flying-fox. The breeding camp in Bathurst is within foraging range for flying-foxes.

Creek systems

Three creeks and their unnamed tributaries occur within the Project area, this includes:

- Lawson Creek, a tributary of Meadow Flat Creek then Diamond Swamp Creek and Solitary Creek, within the Project area, Lawson Creek includes fourth to first order streams.
- Deadmans Creek, a tributary of Solitary Creek, within the Project area, Deadmans Creek includes streams of orders one to four.
- Solitary Creek, a tributary of Fish River is located on part of the southern boundary of the Project area.

Overall, creeks within the Survey area present a high level of disturbance (e.g. erosion, clearing, crossings, cattle trampling and weedy banks). A limited amount of aquatic vegetation was observed. Unidentified frog calls were heard in some of the creeks.

Photograph 9 View of an unnamed tributary of Solitary Creek within the Survey area

Photograph 10 View of eroded portion of Deadmans Creek near WTG 12 within the Survey area

Photograph 11 View of unnamed tributary of Deadmans Creek within the Survey area

Photograph 12 View of a segment of Solitary Creek south of WTG 12 within the Survey area

Photograph 13 View of creek line adjacent to an existing track

Farm dams

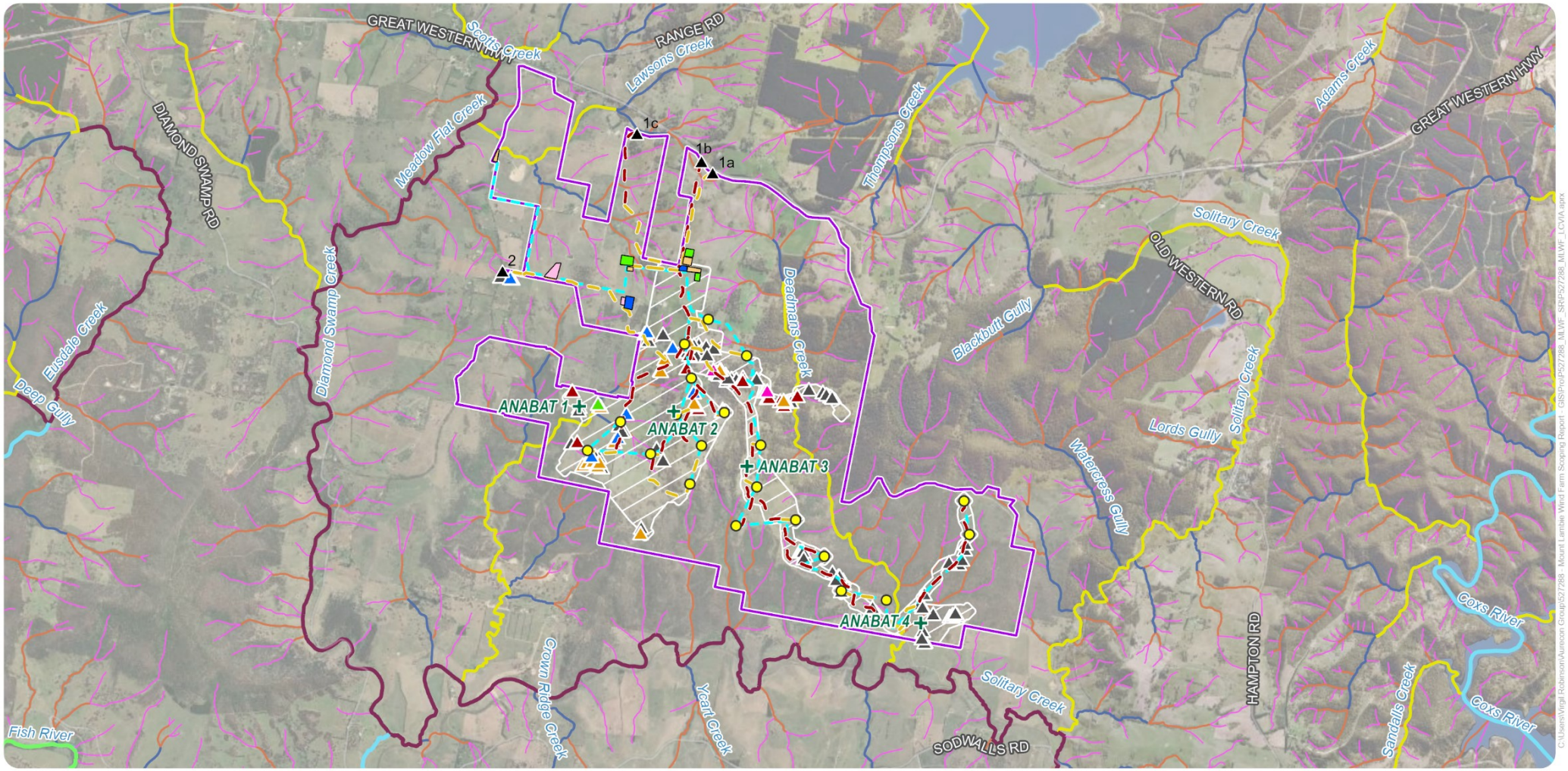
Over ten farm dams were recorded within the Survey area (refer to Photograph 14 to Photograph 17). Overall, farm dams lack or have sparse fringing vegetation along their batters, and they lack emerged and submerged aquatic vegetation. Cattle have free access to these water bodies, and the land showed disturbances consistent with cattle trampling.

Photograph 14 View of a farm dam within the Survey area

Photograph 15 View of a farm dam within the Survey area

Photograph 16 View of a farm dam within the Survey area

Photograph 17 View of a farm dam within the Survey area



Project area
Biodiversity Survey area
Waterbody
ANABAT

Mount Lambie Wind Farm Infrastructure
Turbine location
Access point
New access track
Existing access track to be utilised
Cable network
BESS infrastructure
Substation
Operation and maintenance facility
Temporary construction compound / Laydown area

Strahler Stream Order
1
2
3
4
5
6
7

Fauna Habitat
Burrow
Dam
HBT / Stag
Log
Nest
Rocky outcrop

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:75,000
0 1 2 km

Projection: GDA2020 MGA Zone 55

Figure 10: Fauna and Fauna Habitat

4.4 Threatened biodiversity

4.4.1 Threatened Ecological Communities

None of the PCTs recorded within the Survey area are known to be associated with BC Act or EPBC Act listed TECs. Flora data collected with RDP suggest that the ground-truthed PCTs are not commensurate with predicted TECs.

4.4.2 Threatened flora species

No threatened flora species were recorded within the Survey area. However, several Black Gum (*Eucalyptus aggregata*) trees were recorded on the road reserve along Curly Dick Road and within 5 m of the Project area boundary (refer Figure 11).

The likelihood of occurrence assessment (refer to Appendix H) indicated that four threatened flora species have moderate or higher likelihood of occurrence in the Project area (refer to Table 4-13).

Table 4-13 Threatened flora species with moderate or higher likelihood of occurrence

Scientific name	Common name	BC Act	EPBC Act	Likelihood of occurrence
Eucalyptus aggregata	Black Gum	V	V	High
Eucalyptus pulverulenta	Silver-leaved Mountain Gum	V	V	Moderate
Hibbertia acaulothrix	a Guinea Flower	E	E	Moderate
Lepidium hyssopifolium	Basalt Peppercress	E	E	Moderate

Table notes:

BC Act = NSW *Biodiversity Conservation Act 2016*
EPBC Act = Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
Listing status: V = vulnerable; E = endangered; CE = critically endangered

4.4.3 Threatened fauna and migratory species

Three records of Gang-gang Cockatoo (*Callocephalon fimbriatum*) were observed in the Survey area during surveys as part of this preliminary BIA (refer to Figure 11).

The bat call report (refer to Appendix G) indicated that two threatened microbat species were recorded in two of the ANABAT locations (refer to Figure 11). This included the Eastern False Pipistrelle (*Falsistrellus tasmaniensis*) and Large Bent-winged Bat (*Miniopterus orianae oceanensis*).

The likelihood of occurrence assessment (refer to Appendix H) indicated that 16 threatened fauna species have moderate or higher likelihood of occurrence in the Project area (refer to Table 4-14).

Table 4-14 Threatened fauna species with moderate or higher likelihood of occurrence

Scientific name	Common name	BC Act	EPBC Act	Likelihood of occurrence
Anthochaera phrygia	Regent Honeyeater	CE	CE	Moderate
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V		Moderate
Callocephalon fimbriatum	Gang-gang Cockatoo	E	E	Known
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	V	V	Known
Daphoenositta chrysoptera	Varied Sittella	V, P	-	Moderate
Grantiella picta	Painted Honeyeater	V	V	Moderate
Ninox strenua	Powerful Owl	V		Moderate

Scientific name	Common name	BC Act	EPBC Act	Likelihood of occurrence
Phascolarctos cinereus	Koala	E	E	Moderate
Paralucia spinifera	Bathurst Copper Butterfly	E	V	Moderate
Aprasia parapulchella	Pink-tailed Worm-lizard	V	V	Moderate
Hoplocephalus bungaroides	Broad-headed Snake	E	E	Moderate
Dasyurus maculatus	Spotted-tailed Quoll	V	E	Moderate
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	-	Known
Miniopterus oranae oceanensis	Large Bent-winged Bat	V	-	Known
Petauroides volans	Greater Glider (southern and central)	E	E	Moderate
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	Moderate

Table notes:

BC Act = NSW *Biodiversity Conservation Act 2016*
EPBC Act = Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
Listing status: V = vulnerable; E = endangered; CE = critically endangered

(Image redacted to protect sensitive species locations)

1:75,000

0 1 2 km

Projection: GDA2020 MGA Zone 55

Mount Lambie Wind Farm **Biodiversity Impact Assessment**

Figure 11: Threatened Flora and Fauna recorded

4.4.4 Preliminary identification of candidate species

In accordance with the BC Act assessment requirements, a BDAR would be required for the Project. Habitat suitability for threatened species would require assessment as per the BAM (DPIE 2020, DPE 2022, DPE 2023). Once vegetation zones are assessed as per the BAM and data entered into the BAM calculator (BAM-C), a list of threatened species would automatically be generated by the BAM-C. The list of threatened species generated by the BAM-C would be of two biodiversity credit classes:

- Ecosystem credit species (ECS): ECS are species whose presence can be determined based on availability of suitable habitat features and do not require targeted surveys to be undertaken. These species are referred to as 'predicted species' in the BAM-C. ECS with no suitable habitat present in the Project's footprint (i.e. impact area) are excluded from further assessment in the BAM-C. ECS with suitable habitat in the Project area are further assessed in the BAM-C. The BDAR must include assessment of impacts for each ECS with suitable habitat, including measures taken to avoid, minimise and mitigate impacts. The extent of habitat of ECS with suitable habitat to be impacted (i.e. area within the footprint area) is declared in the BAM-C for generation of corresponding residual species credits.
- Species credit species (SCS): SCS are species whose presence cannot be determined based on presence of habitat features and they require further assessment via targeted surveys undertaken as per the BAM. SCS are referred to as 'candidate' species in the BAM-C. Impacts to some SCS have the potential to result in serious and irreversible impact (SAII), further research and assessment is required for SCS to confirm presence or absence of SAII due to project impacts.

A preliminary list of candidate species has been created based on likelihood of occurrence assessment and is provided in Table 4-15.

Table 4-15 Preliminary list of candidate species that would require assessment under the BAM

Scientific name	Common name	SAII	Survey months
Eucalyptus aggregata	Black Gum	No	Year round
Eucalyptus pulverulenta	Silver-leaved Mountain Gum	No	Year round
Hibbertia acaulothrix	a Guinea Flower	*	profile incomplete
Lepidium hyssopifolium	Aromatic Peppercress, Basalt Peppercress	No	October to December
Anthochaera phrygia	Regent Honeyeater	Yes	Not applicable, assessment as per important habitat map
Callocephalon fimbriatum	Gang-gang Cockatoo	No	October to January
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	No	January to September
Aprasia parapulchella	Pink-tailed Worm-lizard	No	September to November
Hoplocephalus bungaroides	Broad-headed Snake	Yes	August to February
Paralucia spinifera	Bathurst Copper Butterfly	No	September, October and December

Table notes:

SAII = Serious and Irreversible Impact
* profile incomplete, SAII status to be confirmed

4.5 Matters of National Environmental Significance

As summarised in Section 4.1.1, three of the four predicted MNES to occur in the Project area warranted further assessment, including:

- Listed threatened ecological communities: No EPBC Act listed TEC were identified in the Survey area based on rapid flora data collected (refer to Section 4.4.1). Further assessment, including detailed flora survey, would be required to confirm the full presence and extent of TECs in the Project area.

- Listed threatened species:
  - One threatened bird, Gang-gang Cockatoo (*Callocephalon fimbriatum*) listed as Endangered, was opportunistically recorded within the Survey area during the ecology field survey. Suitable breeding habitat for the species occurs in hollows across the Survey area and Project area.
  - One threatened tree, Black Gum (*Eucalyptus aggregata*), listed as Vulnerable, was recorded along Curly Dick Road and within 5 m from the Project area during the ecology field survey. Further survey targeting this species would be required to determine its presence within the Project area.
  - Twenty additional threatened species, including four plants (refer to Table 4-13) and sixteen fauna species (refer to Table 4-14) were assessed as having moderate or higher likelihood of occurrence in the Project area. Further assessment would be required to assess use of the Project area by these MNES, particularly if suitable habitats would be impacted as a result of the Project.
- Listed migratory species: no migratory species was observed opportunistically during surveys or assessed as having moderate or higher likelihood of occurrence.

For listed MNES under the EPBC Act, potential significant impacts are to be assessed as per the EPBC Act *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance* (DoE 2013). Where potential significant impacts are identified, a referral to the Cth Minister for Environment is required to be prepared.

For birds and bats, additional information is to be collected to inform the significant impact assessment and referral in accordance with the EPBC Act *Policy Statement 2.3 – Wind Farm Industry* (DEWHA 2009) and *Onshore Wind Farms – interim guidance on bird and bat management* (DAWE 2021).

Preliminary impact assessments under the *Significant Impact Guidelines 1.1 – Matters of Environmental Significance* (DoE 2013) have been completed for species recorded during the ecology field survey, namely the Gang-gang Cockatoo and Black Gum (refer to Appendix I). Further investigation would be required to determine the likelihood of a significant impact to Gang-gang Cockatoo and Black Gum from the Project (refer to Appendix I).

Additional flora and fauna surveys would be required to gather information on presence of MNES identified as having moderate or higher likelihood of occurrence (refer to Section 5.3).

5 Preliminary impact assessment

5.1 Efforts to avoid and minimise impacts to ecological values

The proposed layout for the Mount Lambie Wind Farm project has been designed with the aim to minimise impacts to native vegetation and ecological values. Efforts to avoid and minimise impacts on ecological values have been undertaken through strategic planning and site-specific actions. These include design modifications, relocating turbines to avoid native vegetation, increasing buffer distances from significant habitats, and reducing direct impacts on threatened species. Additionally, the majority of turbines are located within open pasture on the margin of treed vegetation, as such direct impacts to native vegetation and species habitat has been reduced where possible.

Further assessment is required to understand in more detail potential impacts to ecological values and will be undertaken during the EIS phase. Once potential impacts are fully understood, specific actions to minimise or avoid impacts to native vegetation, threatened ecological communities and threatened species habitat can be developed. These may include mitigation measures such as:

- Removal/relocation of WTGs to avoid impact to PCT 3367 (Central Tableland Granites Grassy Box Woodland) in the Project area, and providing additional buffer between associated project infrastructure and forest habitat to the south
- Removal/relocation of WTGs to avoid impact to a number of PCTs in the northeast portion of the Project area
- Relocation of WTGs to provide additional buffer between WTGs and habitat.

5.2 Potential impacts to ecological values

Despite the implementation of mitigation measures and efforts to reduce direct impacts to ecological values, the Project has the potential to cause impacts on native vegetation (e.g. PCTs), high biodiversity values mapped under the BC Act and threatened biodiversity (e.g. threatened species, TECs) listed under the BC Act, FM Act and EPBC Act.

In line with the avoid, minimise, mitigate hierarchy approach, the Project area has been selected in land with historically cleared and rural land use. Despite the historical land use of the Project area, it includes vegetation areas (i.e. PCTs), paddock trees and fauna habitat features suitable as habitat for threatened species. Based on findings of this preliminary BIA, it is predicted that impacts during construction and operation of the Project that would require assessment include:

- Impacts on biodiverse riparian land mapped as having high biodiversity value.
- Clearing of vegetation (e.g. PCTs, native trees and planted native trees) and the loss of extent of native vegetation and associated habitat for flora and fauna species, including threatened species.
- Spreading or facilitating incursion of weeds, pests and diseases.
- Further reduction of connectivity value for species with low mobility and/or dispersal capacity.
- Impacts on threatened species due to loss of roosting, feeding and/or breeding habitat. Resulting in the potential loss of suitable breeding habitat for threatened species (e.g. hollow-bearing trees).
- Mortality and injury of native ground-dwelling species (e.g. wombats, reptiles) from vehicle collisions within internal wind farm access tracks during construction and/or operation..
- Mortality and injury of birds and bats (megabats and microbats) from turbine strike and barotrauma.
- Indirect impacts to creeks and dams that worsen the already degraded habitat for aquatic fauna (e.g. frogs) and water birds based on changes in hydrology, sediment runoff and further erosion during construction phase.

Based on further impact assessments, mitigation measures can be appropriately applied to reduce/eliminate impacts to biodiversity values from the Project by:

- Avoiding and minimising impacts on riparian areas, particularly those mapped as having high biodiversity value.
- Reducing clearing of native vegetation and removal of fauna habitat for threatened species through the use of existing exotic grasslands to reduce impact on native vegetation and native paddock trees.
- Minimising removal of fauna habitat, particularly hollow-bearing trees.
- Minimising impacts on birds and bats due to wind turbine strikes and barotrauma by micro-sitting WTGs as far as practicable from suitable habitats including mature trees, hollow-bearing trees, creekline vegetation, flyways, and remnant vegetation areas. The need for any further mitigation measures to reduce bird and bat strike would be dependent on, and should be informed by, the results of Bird and Bat Utilisation Surveys for the Project.
- Implementing a feral animal and weed management plan for the Project. The plan would define weed and pest animal management strategy, actions to control weed species and pest animals and clearly identify responsibilities for implementing the plan.
- Biosecurity controls to prevent the introduction and spread of weeds, diseases, pathogens and any other exotic species

5.2.1 Summary of proposed impacts to ecological values and habitats for threatened species

Table 5-1 details the proposed impacts to ground-truthed PCT's within the Indicative Disturbance Footprint as depicted in Figure 9.

Table 5-1 Proposed impacts to PCTs within the Indicative Disturbance Footprint

PCT ID	PCT Name	Amount of ground-truthed native vegetation recorded within Project area (ha)	Amount of native vegetation intersecting Indicative Disturbance Footprint (ha)
3211	Southern Escarpment Wet Sclerophyll Forests	1.414	0.455
3347	Tableland Clay Grassy Woodlands	6.007	0.567
3367	Southern Tableland Grassy Woodlands	91.032	7.109
3369	Southern Tableland Grassy Woodlands	44.676	5.972
3735	Southern Tableland Dry Sclerophyll Forests	54.424	5.703
Non native vegetation		306.658	51.861
Additional modelled PCT in Project Area (outside Survey area)		**Amount of non ground-truthed native vegetation recorded within Project area (ha)**	**Amount of non ground-truthed native vegetation intersecting Indicative Disturbance Footprint (ha)**
Unverified PCT's (i.e. not ground-truthed)		2,059.797	52.34
Total		2,564.008	124.009

5.3 Potential impacts to EPBC Act MNES

5.3.1 Flora

To reduce the risk and quantum of direct and indirect impacts, a large proportion of the proposed location of turbines and associated project infrastructure (including cabling, access tracks and laydown areas) has been selectively positioned within areas of open agricultural land that lack suitable habitats to support threatened flora species. As such, it is considered that the Project will have limited impacts to identified threatened flora species, however, it is recommended that targeted surveys within suitable habitats potentially impacted by the Project be conducted to verify that no threatened flora are present.

The following four threatened flora species listed under the EPBC Act have been identified as having a moderate, high or known likelihood of occurrence within the Project area (as detailed in Appendix H). This includes:

- **Black Gum** (*Eucalyptus aggregate*) listed as Vulnerable under the BC Act and EPBC Act. Recorded on the western boundary of the Project area.
- **Silver-leaved Mountain Gum** (*Eucalyptus pulverulenta*) listed as Vulnerable under the BC Act and EPBC Act. The species is considered to have a moderate likelihood of occurrence within the Project area, particularly on rocky outcrops and in the understorey of woodland dominated by *Eucalyptus mannifera* and *Eucalyptus bridgesiana*.
- **A guinea flower** (*Hibbertia acaulothrix*) listed as Endangered under the BC Act and EPBC Act. The species is considered to have a moderate likelihood of occurrence within the Project area particularly on rocky outcrops and in the understorey of woodland dominated by *Allocasuarina sp*.
- **Basalt Peppercress** (*Lepidium hyssopifolium*) listed as Endangered under the BC Act and EPBC Act. The species is considered to have a moderate likelihood of occurrence within the Project area particularly in areas that have not been heavily disturbed from livestock.

Suitable habitats for the above listed flora species are generally limited to rocky outcrops, intact vegetation and treed areas that have not undergone previous disturbance from agricultural land practices and livestock (refer to Appendix H). These areas occur either outside or on the margins and surrounding the current Project design (refer to Figure 10).

All locations where the proposed impact area intersects suitable habitats for threatened flora (i.e. rocky outcrops and areas of intact native vegetation) should be subject to targeted flora surveys and subsequent Significant Impact Assessment to determine any potential impacts.

5.3.2 Fauna

The following 11 threatened fauna species listed under the EPBC Act have been identified as having moderate, high or known likelihood of occurrence within the Project area (as detailed in Appendix H). This includes:

- **Woodland fauna**
  - Regent Honeyeater (*Anthochaera phrygia*) listed as Critically Endangered under the BC Act and EPBC Act. The species is considered to have a moderate likelihood of occurrence within the Project area.
  - Gang-gang Cockatoo (*Callocephalon fimbriatum*) listed as Endangered under the BC Act and EPBC Act. The species was recorded during the field survey and a total of 197.553 ha of suitable habitat occurs within the Survey Area, and 30.57 ha within the Indicative Disturbance Footprint.
  - South-eastern Glossy Black-Cockatoo (*Calyptorhynchus lathami lathami*) listed as Vulnerable under the BC Act and EPBC Act. The species is considered to have a high likelihood of occurrence within the Project area given the recent records of the species and presence of suitable habitat.

- Painted Honeyeater (*Grantiella picta*) listed as Vulnerable under the BC Act and EPBC Act. The species is considered to have a moderate likelihood of occurrence within the Project area.
- Bathurst Copper Butterfly (*Paralucia spinifera*) listed as Endangered under the BC Act and Vulnerable under the EPBC Act. The species is considered to have a moderate likelihood of occurrence within the Project area.

- **Ground dwelling fauna**
  - Pink-tailed Worm-lizard (*Aprasia parapulchella*) listed as Vulnerable under the BC Act and EPBC Act. The species is considered to have a moderate likelihood of occurrence within the Project area.
  - Broad-headed Snake (*Hoplocephalus bungaroides*) listed as Endangered under the BC Act and EPBC Act. The species is considered to have a moderate likelihood of occurrence within the Project area.
- **Mammals**
  - Spotted-tailed Quoll (*Dasyurus maculatus*) listed as Vulnerable under the BC Act and Endangered under the EPBC Act. The species is considered to have a moderate likelihood of occurrence within the Project area.
  - Greater Glider (*Petauroides volans*) (southern and central) listed as Endangered under the BC Act and EPBC Act. The species is considered to have a moderate likelihood of occurrence within the Project area.
  - Grey-headed Flying-fox (*Pteropus poliocephalus*) listed as Vulnerable under the BC Act and EPBC Act. The species is considered to have a moderate likelihood of occurrence within the Project area.
  - Koala (*Phascolarctos cinereus*) listed as Endangered under the BC Act and EPBC Act. The species is considered to have a moderate likelihood of occurrence within the Project area.

The majority of fauna species listed above prefer or are restricted to higher quality habitats such as open woodlands, eucalypt forests with a shrub understorey, rocky outcrops, or farmland situated along the edges of intact tree stands. The strategic placement of turbines and associated Project infrastructure within more disturbed farmland and areas lacking suitable habitat minimise the extent and risk of impacts to known habitats for woodland birds, mammals and other ground dwelling fauna. Therefore, whilst the species identified above have the possibility of occurring within the Project area, direct impacts to areas of significant habitat are likely to be limited, given the placement of a large portion of the infrastructure in agricultural areas.

Despite the efforts to avoid areas of significant habitat within the Project area, it is considered that some bird and bat species are likely to be directly impacted by turbine collision or barotrauma. Particularly, raptors and insectivorous microbats, are amongst the main groups of avifauna that are considered at-risk of collision, though the risk of collision can differ greatly between species based on the species flight heights and behaviour. Given the deficiency of data available on flight heights of microbats in Australia, it should be assumed that all microbat species may fly at rotor swept area at some periods during their lifecycle. Further information regarding bird and bat utilisation within the Project area will be determined during formal bird and bat utilisation surveys. Assessment of significant impacts for threatened and/or migratory birds and bat species, as well as development of mitigation measures to reduce turbine collision will be informed by the results of bird and bat utilisation surveys.

6 Biodiversity assessment requirements

The Project would require preparation of a BDAR as per the BAM. The following recommendations are provided to ensure that adequate assessment of biodiversity values is achieved:

- Prepare and submit a BDAR in accordance with the BAM, including assessment requirements for wind farm projects.
- Document steps undertaken to apply the avoid – minimise – mitigate impact hierarchy in the BDAR.
- Consider SAII entities and how they can be impacted by the Project.
- Ensure that detailed vegetation surveys meet minimum requirements as per the BAM and for every vegetation zone.
- Ensure that sufficient time and effort for targeted surveys for SCS listed in Section 4.4.4 meet BAM guideline requirements.
- Ensure that adequate bird and bat use surveys over 24-month period are undertaken to inform a bird and bat Adaptive Management Plan (BBAMP) and in accordance with the NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW 2024d) *Wind Farms – turbine strike assessment & adaptive impact management Biodiversity Assessment Method Guide* and Commonwealth *Onshore Wind Farm Guidance – Best practice approaches when seeking approval under Australia's national environmental law* (DCCEEW 2024e).
- Ensure that the impact assessment requirements on birds and bats in wind farms as set in the Standard Secretary's Environmental Assessment Requirements are met to inform the EIS. This includes assessment of impacts of blade strike, low air pressure zones at the blade tips (barotrauma), air quality impacts, alteration of movement patterns, and cumulative impacts of other wind farms in the vicinity.

7 Conclusion

7.1 Summary of key biodiversity constraints

The main biodiversity constraints to the Project are due to biodiverse riparian land mapped in the high biodiversity values map, potential for clearing of native vegetation and removal of threatened fauna habitat (e.g. hollows).

The avoid – minimise – mitigate hierarchy should be implemented throughout the development of the project design to minimise residual offset obligations resulting from impacts of the Project.

The Project has the potential to result in the following impacts to ecological values:

- Reduction in biodiverse riparian land mapped as high biodiversity value.
- Clearing of vegetation, including native trees, planted native trees, and PCTs, leading to habitat loss for flora and fauna, including threatened species.
- Increased risk of weed, pest, and disease incursion or spread.
- Further reduction in habitat connectivity, impacting species with low mobility or limited dispersal capacity.
- Habitat loss for threatened species, including roosting, feeding, and breeding areas (e.g. hollow-bearing trees).
- Increased mortality and injury risk for ground-dwelling fauna (e.g. wombats, reptiles) from vehicle collisions within internal wind farm access tracks during construction and/or operation.
- Mortality and injury risk for birds and bats (megabats and microbats) due to turbine strikes and barotrauma.
- Indirect impacts on aquatic fauna (e.g. frogs) and water birds due to changes in hydrology, sediment runoff, and erosion affecting creeks and dams during construction.

7.2 Results of Preliminary Significant Impact Assessments

During the ecological field assessment, two EPBC Act listed MNES were recorded, namely Gang-gang Cockatoo and Black Gum. A preliminary assessment against the Significant Impact Criteria considered that the Project is unlikely to result in a significant impact to Black Gum following the avoidance of key suitable habitats and the implementation of mitigation measures.

Fifteen EPBC Act listed threatened species, comprising four plants and eleven fauna species were assessed as having a moderate or higher likelihood of occurrence within the Project area. Importantly, the majority of EPBC Act listed species considered to occur within the Project area prefer or are restricted to higher quality habitats such as open woodlands, eucalypt forests with a shrub understorey, rocky outcrops, or farmland situated along the edges of intact tree stands where limited Project infrastructure is proposed. Whilst the species identified have the possibility of occurring within the Project area, direct impacts to areas of significant habitat have been reduced where possible, given the placement of a large portion of the infrastructure in agricultural areas.

The Significant Impact Assessments (refer to Appendix I) undertaken for all fifteen EPBC Act listed threatened species with a moderate to high likelihood of occurrence within the Project area determined that the Project has the potential to significantly impact two MNES, Gang-gang Cockatoo and South-eastern Glossy Black-Cockatoo. Based on the proposed removal of 30.57 ha of suitable associated PCTs on the edges of intact habitats and potential turbine collision (refer to Table I-6 and Table I-13). It is recommended that the assessment of significance for both species is re-evaluated following further investigation, including bird and bat utilisation surveys, where the flight height and movement patterns of Gang-gang Cockatoo and South-eastern Glossy Black-Cockatoo are better understood within the Project area and the wider landscape.

It is noted that while other species identified in Appendix I are subject to a similar quantum of habitat loss, impacts are considered to be less significant as the species presence and extent has not been confirmed within the Project area and impacts are largely confined to the edges of remnant patches and habitat (with the exception Turbine 21 and 22 and associated access roads).

Given the strategic placement of a large portion of turbines within more disturbed locations of the Project area and on the margins of intact woodland, it is considered that the Project will have limited impacts to threatened flora and woodland fauna species. However, where the proposed impact area intersects suitable habitats for threatened flora and fauna species, additional targeted surveys would need to be undertaken to determine the presence and extent of threatened species and habitats. Several candidate species have been identified in Section 4.4.4 as requiring targeted survey. These surveys would need to comply with the relevant survey guidelines and the seasonal timeframes specified in the NSW BioNet Threatened Biodiversity Profile Data Collection.

Avifauna species, namely raptors, bats and high-flying mobile bird species have the potential to be impacted by turbine collision or barotrauma. Further information regarding bird and bat utilisation within the Project area will be determined during formal bird and bat utilisation surveys.

Additionally, the Project would require the preparation of a BDAR as per the BAM. The BDAR would assess the Project's impacts on threatened species and communities and impacts on biodiversity values within the Project area. It would also provide guidance on avoiding and minimising potential biodiversity impacts and identify the number and class of biodiversity credits that need to be offset to achieve a standard of 'no net loss' of biodiversity.

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Appendix A
Field Survey Dates and Weather Conditions

Table A-1 Summary of weather conditions during field days

Date	Temperature (°C) *		Rainfall* (mm)	Other observations on-site
	Minimum	Maximum		
19/08/2024	7.0	13.6	0	Sunny
20/08/2024	3.7	16.8	0	Cloudy / Sunny
21/08/2024	9.6	17.4	0	Sunny
22/08/2024	8.4	13.4	0	Overcast / Sunny
23/08/2024	-0.8	17.0	0	Sunny

Table note:

* Data as per Bureau of Meteorology (BoM) nearest meteorological station (Station 063226 Lithgow (Cooerwull)) at http://www.bom.gov.au/jsp/ncc/cdio/weatherData/av?p_nccObsCode=122&p_display_type=dailyDataFile&p_stn_num=063226&p_startYear=

Appendix B
BioNet Atlas Records Table

Table B-1 BioNet Atlas records of threatened species within 10 km locality surrounding the Project area

Scientific name	Common name	BC Act status	EPBC Act status	Records
Aves				
Oxyura australis	Blue-billed Duck	V		1
Stictonetta naevosa	Freckled Duck	V		1
Hirundapus caudacutus	White-throated Needletail	V	V, C, J, K	1
Haliaeetus leucogaster	White-bellied Sea-Eagle	V		3
Callocephalon fimbriatum	Gang-gang Cockatoo	E	E	14
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	V	V	2
Ninox strenua	Powerful Owl	V		1
Chthonicola sagittata	Speckled Warbler	V		1
Daphoenositta chrysoptera	Varied Sittella	V		4
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V		6
Petroica boodang	Scarlet Robin	V		5
Petroica phoenicea	Flame Robin	V		5
Stagonopleura guttata	Diamond Firetail	V	V	1
Mammalia				
Dasyurus maculatus	Spotted-tailed Quoll	V	E	1
Phascolarctos cinereus	Koala	E	E	2
Petauroides volans	Southern Greater Glider	E	E	13
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	2
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V		3
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V		4
Miniopterus orianae oceanensis	Large Bent-winged Bat	V		4
Insects				
Paralucia spinifera	Purple Copper Butterfly, Bathurst Copper Butterfly	E	V	12
Flora				
Eucalyptus pulverulenta	Silver-leafed Gum	V	V	3

Table notes:

BC Act = NSW Biodiversity Conservation Act 2016; EPBC Act = Commonwealth Environmental Protection and Biodiversity Conservation Act 1999
Listing Status: V = Vulnerable, E = Endangered; CE = Critically Endangered
Migratory Bird Agreements: C = CAMBA (China-Australia Migratory Bird Agreement); J = JAMBA (Japan-Australia Migratory Bird Agreement), K = ROKAMBA (Republic of Korea – Australia Migratory Bird Agreement)

Appendix C
PMST Report

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 26-Aug-2024

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	4
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	71
Listed Migratory Species:	11

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	36
Commonwealth Heritage Places:	None
Listed Marine Species:	19
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	5
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	20
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands) [Resource Information]

Ramsar Site Name	Proximity	Buffer Status
Banrock station wetland complex	800 - 900km upstream from Ramsar site	In feature area
Riverland	800 - 900km upstream from Ramsar site	In feature area
The coorong, and lakes alexandrina and albert wetland	900 - 1000km upstream from Ramsar site	In feature area
The macquarie marshes	300 - 400km upstream from Ramsar site	In feature area

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Natural Temperate Grassland of the South Eastern Highlands	Critically Endangered	Community likely to occur within area	In feature area
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion	Endangered	Community may occur within area	In buffer area only
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia			
Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area	In feature area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat known to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat likely to occur within area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area	In feature area
Polytelis swainsonii Superb Parrot [738]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat known to occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area	In feature area
FISH			
Maccullochella macquariensis Trout Cod [26171]	Endangered	Species or species habitat may occur within area	In feature area
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area	In feature area
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Prototroctes maraena			
Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area	In feature area
FROG			
Heleioporus australiacus			
Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Litoria booroolongensis			
Booroolong Frog [1844]	Endangered	Species or species habitat known to occur within area	In feature area
Litoria castanea			
Yellow-spotted Tree Frog, Yellow-spotted Bell Frog [1848]	Critically Endangered	Species or species habitat likely to occur within area	In buffer area only
Litoria littlejohni			
Northern Heath Frog, Littlejohn's Tree Frog [64733]	Endangered	Species or species habitat may occur within area	In buffer area only
Mixophyes balbus			
Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat may occur within area	In buffer area only
INSECT			
Paralucia spinifera			
Bathurst Copper Butterfly, Purple Copper Butterfly, Bathurst Copper, Bathurst Copper Wing, Bathurst-Lithgow Copper, Purple Copper [26335]	Vulnerable	Species or species habitat known to occur within area	In feature area
MAMMAL			
Chalinolobus dwyeri			
Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat known to occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population)			
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area
Nyctophilus corbeni			
Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Petauroides volans			
Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area	In feature area
Petaurus australis australis			
Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Petrogale penicillata			
Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)			
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
Pseudomys novaehollandiae			
New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat may occur within area	In feature area
Pteropus poliocephalus			
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In feature area
PLANT			
Acacia bynoeana			
Bynoe's Wattle, Tiny Wattle [8575]	Vulnerable	Species or species habitat may occur within area	In feature area
Boronia deanei			
Deane's Boronia [8397]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Cryptostylis hunteriana			
Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area	In feature area
Eucalyptus aggregata			
Black Gum [20890]	Vulnerable	Species or species habitat known to occur within area	In feature area
Eucalyptus macarthurii			
Camden Woollybutt, Paddys River Box [7827]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Eucalyptus pulverulenta Silver-leaved Mountain Gum, Silver-leaved Gum [21537]	Vulnerable	Species or species habitat known to occur within area	In feature area
Eucalyptus robertsonii subsp. hemisphaerica Robertson's Peppermint [56223]	Vulnerable	Species or species habitat known to occur within area	In feature area
Euphrasia arguta [4325]	Critically Endangered	Species or species habitat may occur within area	In feature area
Haloragodendron lucasii Hal [6480]	Endangered	Species or species habitat may occur within area	In buffer area only
Hibbertia acaulothrix [87409]	Endangered	Species or species habitat may occur within area	In buffer area only
Hibbertia cistiflora subsp. quadristaminea [91164]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Kunzea cambagei [11420]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Leionema lachnaeoides [64924]	Endangered	Species or species habitat may occur within area	In buffer area only
Lepidium aschersonii Spiny Peppercress [10976]	Vulnerable	Species or species habitat may occur within area	In feature area
Lepidium hyssopifolium Basalt Pepper-cress, Peppercress, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat likely to occur within area	In feature area
Leucochrysum albicans subsp. tricolor Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Persoonia hirsuta Hairy Geebung, Hairy Persoonia [19006]	Endangered	Species or species habitat may occur within area	In buffer area only
Persoonia marginata Clandulla Geebung [10852]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pomaderris brunnea Rufous Pomaderris, Brown Pomaderris [16845]	Vulnerable	Species or species habitat may occur within area	In feature area
Pomaderris cotoneaster Cotoneaster Pomaderris [2043]	Endangered	Species or species habitat likely to occur within area	In feature area
Prasophyllum petilum Tarengo Leek Orchid [55144]	Endangered	Species or species habitat may occur within area	In feature area
Prasophyllum sp. Wybong (C.Phelps ORG 5269) a leek-orchid [81964]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pultenaea glabra Smooth Bush-pea, Swamp Bush-pea [11887]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Rhizanthella slateri Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area	In feature area
Swainsona recta Small Purple-pea, Mountain Swainson-pea, Small Purple Pea [7580]	Endangered	Species or species habitat may occur within area	In feature area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat known to occur within area	In feature area
Xerochrysum palustre Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Zieria obcordata			
Granite Zieria [3240]	Endangered	Species or species habitat may occur within area	In buffer area only
REPTILE			
Aprasia parapulchella			
Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Eulamprus leuraensis			
Blue Mountains Water Skink [59199]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Hoplocephalus bungaroides			
Broad-headed Snake [1182]	Endangered	Species or species habitat likely to occur within area	In feature area
Tympanocryptis mccartneyi			
Bathurst Grassland Earless Dragon [90478]	Critically Endangered	Species or species habitat may occur within area	In feature area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Hirundapus caudacutus			
White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Monarcha melanopsis			
Black-faced Monarch [609]		Species or species habitat known to occur within area	In feature area
Motacilla flava			
Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Myiagra cyanoleuca			
Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rhipidura rufifrons			
Rufous Fantail [592]		Species or species habitat known to occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Gallinago hardwickii			
Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Commonwealth Bank of Australia		
Commonwealth Land - Commonwealth Bank of Australia [12459]	NSW	In buffer area only
Commonwealth Trading Bank of Australia		
Commonwealth Land - Commonwealth Trading Bank of Australia [12394]	NSW	In buffer area only
Commonwealth Land - Commonwealth Trading Bank of Australia [12384]	NSW	In buffer area only
Commonwealth Land - Commonwealth Trading Bank of Australia [12383]	NSW	In buffer area only
Commonwealth Land - Commonwealth Trading Bank of Australia [12382]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Commonwealth Trading Bank of Australia [12381]	NSW	In buffer area only
Commonwealth Land - Commonwealth Trading Bank of Australia [12366]	NSW	In buffer area only
Commonwealth Land - Commonwealth Trading Bank of Australia [12367]	NSW	In buffer area only
Commonwealth Land - Commonwealth Trading Bank of Australia [12365]	NSW	In buffer area only
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [12476]	NSW	In feature area
Commonwealth Land - Australian Telecommunications Commission [12474]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [12388]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [12387]	NSW	In feature area
Commonwealth Land - Australian Telecommunications Corporation [12389]	NSW	In feature area
Commonwealth Land - Australian Telecommunications Corporation [15901]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [12477]	NSW	In buffer area only
Defence		
Defence - MARRANGAROO [10108]	NSW	In buffer area only
Unknown		
Commonwealth Land - [12455]	NSW	In buffer area only
Commonwealth Land - [12471]	NSW	In buffer area only
Commonwealth Land - [12470]	NSW	In buffer area only
Commonwealth Land - [12473]	NSW	In buffer area only
Commonwealth Land - [12472]	NSW	In buffer area only
Commonwealth Land - [12475]	NSW	In buffer area only
Commonwealth Land - [12458]	NSW	In buffer area only
Commonwealth Land - [12393]	NSW	In buffer area only
Commonwealth Land - [12457]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [12450]	NSW	In buffer area only
Commonwealth Land - [12449]	NSW	In buffer area only
Commonwealth Land - [12462]	NSW	In buffer area only
Commonwealth Land - [12461]	NSW	In buffer area only
Commonwealth Land - [12460]	NSW	In buffer area only
Commonwealth Land - [12456]	NSW	In buffer area only
Commonwealth Land - [12467]	NSW	In buffer area only
Commonwealth Land - [12469]	NSW	In buffer area only
Commonwealth Land - [12468]	NSW	In buffer area only
Commonwealth Land - [12466]	NSW	In buffer area only

Listed Marine Species

[Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State	Buffer Status
Eusdale	Nature Reserve	NSW	In buffer area only
Evans Crown	Nature Reserve	NSW	In feature area
Gardens of Stone	State Conservation Area	NSW	In buffer area only
Marrangaroo	National Park	NSW	In buffer area only
Winburndale	Nature Reserve	NSW	In buffer area only

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Angus Place West	2022/09270		Assessment	In buffer area only
Central West Pumped Hydro Project	2022/09331		Assessment	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Lake Lyell Pumped Hydro Energy Storage Project	2022/09445		Assessment	In buffer area only
McPhillamys Gold Project - Modification 1	2023/09704		Assessment	In buffer area only
Mount Piper to Wallerawang Transmission Line Upgrade Project	2024/09855		Assessment	In buffer area only
Mt Piper Battery Energy Storage System (BESS)	2023/09660		Completed	In buffer area only
Controlled action				
Coalpac Consolidation Project- open cut mine	2010/5776	Controlled Action	Completed	In buffer area only
Great Western Highway Upgrade - Mount Victoria to Lithgow	2013/6804	Controlled Action	Post-Approval	In buffer area only
Longwall mining of Longwalls 910 & 900 W at Angus Place Colliery	2011/5952	Controlled Action	Post-Approval	In buffer area only
Springvale Longwall Mine Extension Project, NSW	2013/6881	Controlled Action	Post-Approval	In buffer area only
Stage 2 Extension of the Pine Dale Coal Mine	2012/6326	Controlled Action	Completed	In buffer area only
The Neubeck Coal Project, NSW	2013/6880	Controlled Action	Completed	In buffer area only
Not controlled action				
Extension of Mt Piper Power Station, Mt Piper, NSW	2009/5049	Not Controlled Action	Completed	In buffer area only
Hard rock quarry	2002/814	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Invincible Colliery Modification and Cullen Bullen Valley Mine Modification, Cullen Bullen, NSW	2014/7147	Not Controlled Action	Completed	In buffer area only
Marrangaroo Quarry extraction extension, 4km NW Lthgow, NSW	2014/7297	Not Controlled Action	Completed	In buffer area only
Mt Piper Power Station Ash Placement Project	2010/5506	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
Aerial baiting for wild dog control	2006/2713	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action (particular manner)				
Pine Dale Coal Mine Stage 1 Yarraboldy extension	2011/6016	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only

Bioregional Assessments

[Resource Information]

SubRegion	BioRegion	Website	Buffer Status
Sydney	Sydney Basin	BA website	In feature area

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

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

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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Appendix D
BMAT Report

Department of Planning and Environment

Biodiversity Values Map and Threshold Report

This report is generated using the Biodiversity Values Map and Threshold (BMAT) tool. The BMAT tool is used by proponents to supply evidence to your local council to determine whether or not a Biodiversity Development Assessment Report (BDAR) is required under the Biodiversity Conservation Regulation 2017 (Cl. 7.2 & 7.3).

The report provides results for the proposed development footprint area identified by the user and displayed within the blue boundary on the map.

There are two pathways for determining whether a BDAR is required for the proposed development:

1. Is there Biodiversity Values Mapping?
2. Is the 'clearing of native vegetation area threshold' exceeded?

Biodiversity Values Map and Threshold Report

Date of Report Generation		03/09/2024 12:32 PM
1. Biodiversity Values (BV) Map - Results Summary (Biodiversity Conservation Regulation Section 7.3)		
1.1	**Does the development Footprint intersect with BV mapping?**	yes
1.2	Was ALL BV Mapping within the development footprinted added in the last 90 days? (dark purple mapping only, no light purple mapping present)	no
1.3	**Date of expiry of dark purple 90 day mapping**	N/A
1.4	**Is the Biodiversity Values Map threshold exceeded?**	yes
2. Area Clearing Threshold - Results Summary (Biodiversity Conservation Regulation Section 7.2)		
2.1	**Size of the development or clearing footprint**	24,930,362.4 sqm
2.2	**Native Vegetation Area Clearing Estimate (NVACE)** (within development/clearing footprint)	13,300,522.3 sqm
2.3	**Method for determining Minimum Lot Size**	Lot size
2.4	**Minimum Lot Size** (10,000sqm = 1ha)	11,690 sqm
2.5	**Area Clearing Threshold** (10,000sqm = 1ha)	5,000 sqm
2.6	**Does the estimate exceed the Area Clearing Threshold?** (NVACE results are an estimate and can be reviewed using the Guidance)	yes

REPORT RESULT: Is the Biodiversity Offset Scheme (BOS) Threshold exceeded for the proposed development footprint area? (Your local council will determine if a BDAR is required)	**yes**

Department of Planning and Environment

What do I do with this report?

• If the result above indicates the BOS Threshold has been exceeded, your local council may require a Biodiversity Development Assessment Report with your development application. Seek further advice from Council. An accredited assessor can apply the Biodiversity Assessment Method and prepare a BDAR for you. For a list of accredited assessors go to: https://customer.lmbc.nsw.gov.au/assessment/AccreditedAssessor.

• If the result above indicates the BOS Threshold has not been exceeded, you may not require a Biodiversity Development Assessment Report. This BMAT report can be provided to Council to support your development application. Council can advise how the area clearing threshold results should be considered. Council will review these results and make a determination if a BDAR is required. Council may ask you to review the area clearing threshold results. You may also be required to assess whether the development is '"likely to significantly affect threatened species" as determined under the test in Section 7.3 of the *Biodiversity Conservation Act 2016*.

• If a BDAR is not required by Council, you may still require a permit to clear vegetation from your local council.

• If all Biodiversity Values mapping within your development footprint was less than 90 days old, i.e. areas are displayed as dark purple on the BV map, a BDAR may not be required if your Development Application is submitted within that 90 day period. Any BV mapping less than 90 days old on this report will expire on the date provided in Line item 1.3 above.

For more detailed advice about actions required, refer to the Interpreting the evaluation report section of the Biodiversity Values Map Threshold Tool User Guide .

Review Options:

• If you believe the Biodiversity Values mapping is incorrect please refer to our BV Map Review webpage for further information.

• If you or Council disagree with the area clearing threshold estimate results from the NVACE in Line Item 2.6 above (i.e. area of Native Vegetation within the Development footprint proposed to be cleared), review the results using the Guide for reviewing area clearing threshold results from the BMAT Tool.

Acknowledgement

I, as the applicant for this development, submit that I have correctly depicted the area that will be impacted or likely to be impacted as a result of the proposed development.

Signature: _____ Date:_____

(Typing your name in the signature field will be considered as your signature for the purposes of this form)

03/09/2024 12:32 PM

Department of Planning and Environment

Biodiversity Values Map and Threshold Tool

The Biodiversity Values (BV) Map and Threshold Tool identifies land with high biodiversity value, particularly sensitive to impacts from development and clearing.

The BV map forms part of the Biodiversity Offsets Scheme threshold, which is one of the factors for determining whether the Scheme applies to a clearing or development proposal. You have used the Threshold Tool in the map viewer to generate this BV Threshold Report for your nominated area. This report calculates results for your proposed development footprint and indicates whether Council may require you to engage an accredited assessor to prepare a Biodiversity Development Assessment Report (BDAR) for your development.

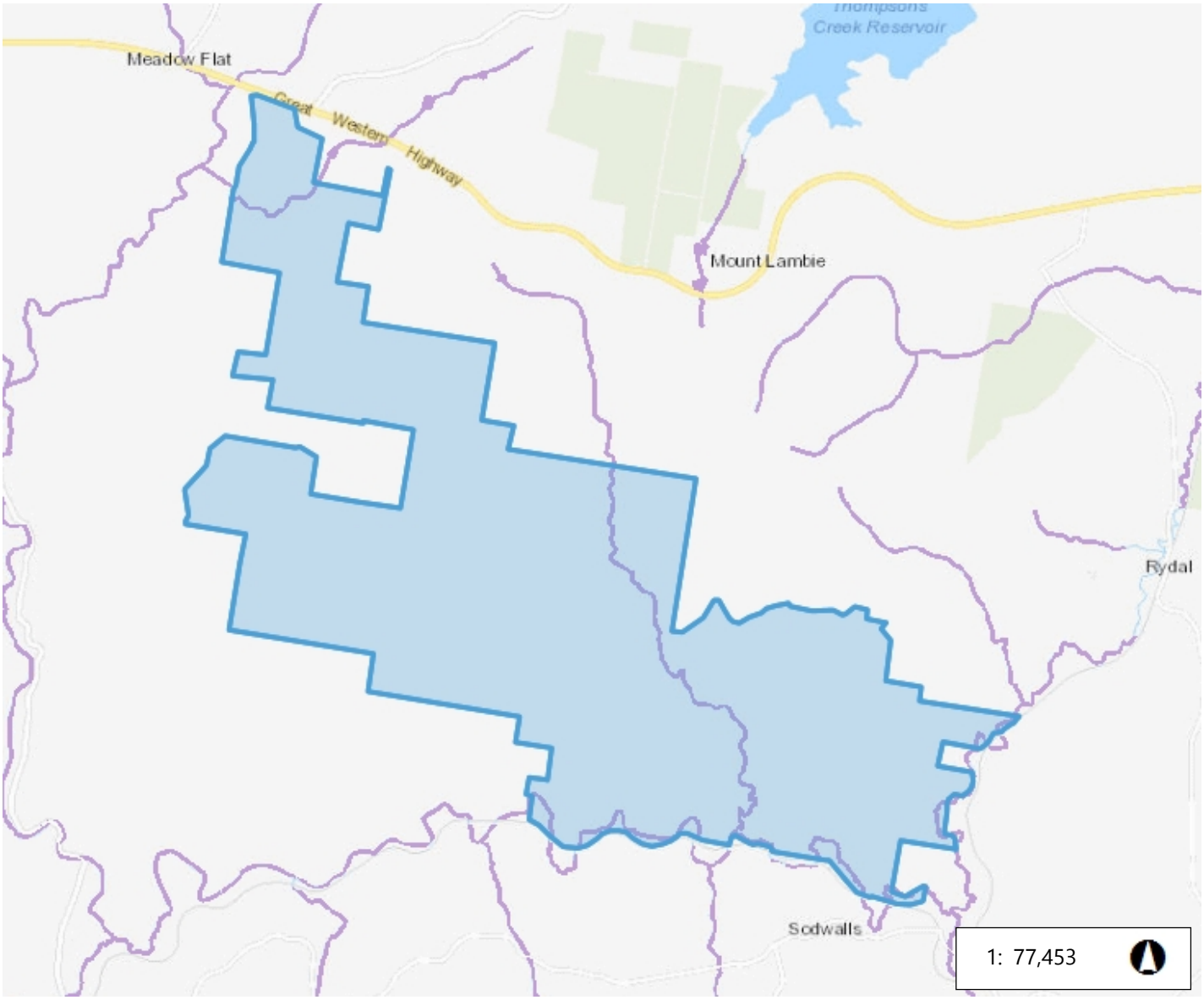
This report may be used as evidence for development applications submitted to councils. You may also use this report when considering native vegetation clearing under the State Environmental Planning Policy (Biodiversity and Conservation) 2021 - Chapter 2 vegetation in non-rural areas.

What's new? For more information about the latest updates to the Biodiversity Values Map and Threshold Tool go to the updates section on the Biodiversity Values Map webpage.

Map Review: Landholders can request a review of the BV Map where they consider there is an error in the mapping on their property. For more information about the map review process and an application form for a review go to the Biodiversity Values Map Review webpage.

If you need help using this map tool see our Biodiversity Values Map and Threshold Tool User Guide or contact the Map Review Team at map.review@environment.nsw.gov.au or on 1800 001 490.

Biodiversity Values Map



3,934.6 0 1,967.31 3,934.6 Metres

WGS_1984_Web_Mercator_Auxiliary_Sphere

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Legend

- Biodiversity Values that have been mapped for more than 90 days
- Biodiversity Values added within last 90 days
- Native Vegetation Area Clearing Estimate (NVACE)
- Development area selected by proponent

03/09/2024 12:32 PM

The results provided in this tool are generated using the best available mapping and knowledge of species habitat requirements.

This map is valid as at the date the report was generated. Checking the Biodiversity Values Map viewer for mapping updates is recommended.

Appendix E
Rapid Data Points

Field Data Sheets

WP 3065 777616 6289291

Near PCT 3364 Low

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21/08/24	Mt Lambie WS	RBA01	ACM

GF code		Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund-ance	Voucher
T	1	Eucalyptus viminalis				
	2					
	3					
	4					
S	5	Blackberry Dom				
S	6	Cassinia aculeata				
S	7	Bursaria spinosa ≈ 7 ind				
	8					
G	9	Dillwynia phylicoides	N			
G	10	Sheep sorrel **	E			
G	11	Geranium	N			
G	12	Setaria parv	E			
G	13	Acaena novae-zea	N			
G	14	Dic perennans clover	*			
G	15	Exotic grass - grazed	*			
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					
	32					
	33					
	34					
	35					

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

WP 3066 B. spinosa, Fauna habitat

WP 3067 { 777618 / 6289226

PCT 3369?

Low

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21/08/24	RBA02 ⟷	Mt Lambie WF	ACM

GF code		Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund-ance	Voucher
T	1	Euc viminalis	N		Pon	
T	2	Euc bridgesiana	N			
	3					
	4					
S	5	Blackthorn	E		Pau	
S	6	Cassinia quinqo very few	N			
S	7	Cassinia aculeata 2-3 ind	N			
G	8	Poa hb	N			
F	9	Acaena n=2	N			
F	10	~~Dillwynia~~ Lissanthe strigosa	N			
	11					
S	12	? S1 Exocarpos strictus				
S	13	Bursaria spinosa 1 ind	N			
	14					
	15					
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					
	30					
Vine	X	31 Hardenbergia viol bredacea				
	32					
	33					
	34					
	35					

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

WP3072 — no photo

PCT 3367

L-M

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21 08 24	Mt Lambie WF	RBA03	ACH

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund-ance	Voucher
T	Snow Gum	N		Low	
T	Euc Viminalis	N		Dom	
T	Apple Box	N		Low	
S	Cassinia arc				
S	Cass quinq				
S	Bur spin Ind				
G	Poa lab				
F	~~Dittrichia~~ Lissanthe strigosa	N			
G	Lomandra sp	N			
F	Plantago	N			
F	Geranium				

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, …, 1, 2, 3, 4, 5, 10, 15, 20, 25, …100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 …, when ≤10, estimate when >10, 20, 30 … 100, 200, 300 …, 1000, 2000, 3000 … (as integer values).

→ { 777766
6289180

WP 3073 { RBA
Logs
Bucura

PCT ~~3534D~~ 3369
Mod

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21 08 24	Mt Lambie WF	RBA04	ACM

GF code		Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund-ance	Voucher
T	1	Euc vimin	N		Dom	
T	2	Apple Box				
	3					
	4					
S	5	Cass arcuata	N			
S	6	Bur spin ≈ 6 ind	N			
S	7	Acacia dealbata				
	8					
F	9	~~Dillwynia~~ Lissanthe strigosa				
F	10	St John's Wort	E			
F	11	Geranium				
G	12	Poa				
G	13	Lomandra				
F	14	Acacia sp <20cm H				
F	15	Hydrocotyle				
F	16	Acaena n-2				

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

WP 3074 { 777881 / 6289189 }
PCT 3735
Mod

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21 08 24	Mt Lambie WF	RBA DS	ACM

	GF code		Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	² Foliage cover	Abund -ance	Voucher
	T	1	Euc viminalis				
	T	2	Apple Box				
	T	3					
	S	6	Cassia arcuata				
	S	7	Burs spinosa >10 ind				
	F	11	~~Dillwynia~~ Lissanthe strigosa				
	F	12	St John's Wort				
	G	13	Poa labi				
	F	14	Lazuk				
*	G	15	grass as ~~Poa sieb~~ Ness tree Doviu				
	F	16	Hydrocotyle				
	G	17	G1 few Rytidosperma racem.				
	V	20	Glycine clandestina				

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

² **Foliage cover:** 0.1, 0.2, 0.3, …, 1, 2, 3, 4, 5, 10, 15, 20, 25, …100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 …, when ≤10, estimate when >10, 20, 30 … 100, 200, 300 …, 1000, 2000, 3000 … (as integer values).

WP3075 {777992 / 6289148}

PCT ~~3747~~ 3369

Mod

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date		RBA06	ACH

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	² Foliage cover	Abund -ance	Voucher
T	Euc vim	N		Dom	
T	Euc bvid (Apple Box)				
S	Cassinia arcuata				
S	Black berry low coer				
S	Acacia dealbata				
S	Bors spinosa lint, bird				
G	Poa lab				
G	Lomandra				
G	Micro stip 2-3 ind	N			
V	Hlvden herd				
F	~~Dillwynia~~ Lissanthe strigosa				
F	S2 Hibb obtu				
G	Austrostipa				

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GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

² **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m*. Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3369
WP 3076 — { 778117 / 6289175 }
Low - Hydrock

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date		R BA07	

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	² Foliage cover	Abund -ance	Voucher
T	Euc vim				
T	Acde Bot				
S	Cass arcuata Dom				
S	Bur spinosa 2ind				
S	Black berry				
F	~~Dillwynia~~ Lissanthe strigosa				
G	Juncus acd				
fern	Cheilanthes sieberii				
G	Lomandra				
F	E1 * Asteraceae unknown				

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GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

² **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1%* = *2.0 x 2.0 m*, *5%* = *4 x 5 m*, *25%* = *10 x 10 m*. Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

WP 3077 {777965 / 6289061}

PCT Valley PCT ~~3747~~ Low 3369 Low

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21 08 24	Mt Lambie WF	RBA08	ACM

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	² Foliage cover	Abund -ance	Voucher
T	Apple Box				
T	Euc Viminalis				
S	Blackberry dominant				
G	Poa lab				
F	~~Dillwynia~~ Low Lissanthe strigosa				

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

² **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

wp 3079 { 777 882 / 6288 950

PCT 3369

Low

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21 08 24	Mt Lambie WC	RBA09	ACM

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
T	Acacia Bo *				
T	Euc ubkl				
S	Cass arc				
G	* grass Paniculum				
F	St John's wort				
F	F2 Euphorbia sp.				
G	Juncus usit				

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

WP 3080 {777665 / 6288798
Yellow PCT 3367
Low

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21 0824	Mt Lambie WG	RBA10	ACM

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
T	Euc Dal Snow Gum				
T	Acac Box				
S	Blackthorn DOM				
S	Bursaria spinosa >20 ind				
S	Cass Quinace				
S	* dry tree red fruit Crataegus monogyna				
G	* Pasp alum				
G	Poa labi				
F	Oxalis perennans				
F	Geranium rot				
G	* Phalaris				
F	Plantago rot				
F	St John's Wort				
G	Lomandra glauca 1 ind				

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

WP 3081 { 777696 / 6289139

PCT 3347

Low

400 m² floristics plot:	**Survey name**	**Plot identifier**	**Recorders**
Date 21 08 24		RBA 11	ACM

GF code	#	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
T	1	Buc vau				
S	7	Bur fern >10 ind				
S	8	Cass arm				
F	11	Acacia dealbata				
F	12	Scotch thistle				
F	13	Blackberry				
F	14	St John's Wort				
G	15	Lomandra sp				
G	16	Poa lab				
F	17	Acaena				
G	18	* anthoxanthum				
F	19	Geranium				
F	20	~~Dillwynia~~ Lissanthe strigosa				
G	21	Kangaroo Gras 1 ind				
G	22	* Sedanca paw				
Vin	23	Glycine clan				
S	24	Dianella caerul				
G	25	G3 - Poa sieber				

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, …, 1, 2, 3, 4, 5, 10, 15, 20, 25, …100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 …, when ≤10, estimate when >10, 20, 30 … 100, 200, 300 …, 1000, 2000, 3000 … (as integer values).

WP 3084 < 777501 / 6289143
PCT [illegible] 3369_Low
Low

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21 08 24	Mt Lambie WF	RBA 12	ACH

GF code		**Species name** Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abundance	Voucher
T	1	Euc viminalis				
T	2	Apple Box				
	3					
S	4	Blackberry				
	5					
	6					
	7					
G	8	* Phalaris aq				
G	9	* Setaria				
F	10	* White Clover (Trifolium				
F	11	* Chickweed				
	12					
	13					
	14					
	15					
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					
	30	Only canopy, ground exotic; shrub is Blackberry				
	31					
	32					
	33					
	34					
	35					

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GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3364
Lows

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21 0824	Mt Lambre WF	RBA13	ACM

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
T	Euc dives				
T	Apple Box				
S	Cass quinque				
S	Cass aculeata				
S	*S1 Exocarpos strictus				
G	Lomandra filiformis				
G	* Lux grass Bromus cat				
F	White Clover (Trifolium repens)				
F	Sheep sorrell				
F	Scotch Thistle				
F	Lomandra ~~spicata~~ multiflora				

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GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT ~~3534~~ 3369

Low

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21 08 24	Mt Lambie WF	RBA14	ACM

GF code		Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund-ance	Voucher
T	1	Euc dives				
T	2	Acde bo x				
	3					
	4					
ST	5	Allocasuarina lit 7 6 ind				
S	6	Cass quin				
S	7	Cass aculeat				
S	8	Acacia melanox				
	9					
F	10	Lomandra ~~spin~~ multiflora				
G	11	Phalaris				
F	12	~~Dillwynia~~ Lissanthe strigosa				
	13					
	14					
	15					
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					
	32					
	33					
	34					
	35					

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, …, 1, 2, 3, 4, 5, 10, 15, 20, 25, …100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 …, when ≤10, estimate when >10, 20, 30 … 100, 200, 300 …, 1000, 2000, 3000 … (as integer values).

PCT 3735

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21 08 24	Mt Lambie NF	RBAIS	ACM

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
T	E dum				
T	Euc vim				
T	E gonio				
S	Cass aur				
S	Blackberry				
S	Dov sem ≥ 3 ind				
S	Cass acum				
G	Lomandra ~~sp~~ multiflo				
F	Geranium				
G	Poa lab				
F	Sheep sorrel				
G	* ~~Lolch phalaris~~ Holcus lanatus				
F	Oxalis perr				

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3347 Low

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21 08 24	Mt Lambie WF	RBA 16	ACM

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
T	E dives				
T	E vimin				
S	Blackberry dominant				
S	*SS Exoc stricta				
F	Geranium				
F	Acacia sp				
G	Lomandra				
Oth	Mistletoe				
G	Poa lab				
G	* Hyp Set parvul				
F	*Purple top				
F	*Scotch thistle				
F	* Tall thistle				
G	* Phalaris				

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GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT ~~3534~~ → 3369

Lou

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21 08 24	Mt Lambie W F	RBA17	ACM

GF code		Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	Foliage cover [2]	Abundance	Voucher
T	1	E dives				
T	2	E gonioc?				
	3					
	4					
	5					
S	6	Blackberry lots				
S	7	Cas quarry Pin not too long leaves				
S	8	Cass ocrund				
S	9	Bursaria spinosa				
G	10	Poa lab				
F	11	Geranium				
F	12	Sheep Sorel				
F	13	St John's Wort				
F	14	* Plantago lanc				
G	15	Kangaroo Grass 2 rad				
	16					
	17					
	18					
	19					
	20					
	21					
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					
	32					
	33					
	34					
	35					

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

WTG 6
PCT3367
Low

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 22 08 24	MtLambie WF	RBA18	ACH

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
T	Snow Gum				
T	Euc dives				
S	Cass acu				
S	Cass arc				
O Fern	Bracken*				
G	* grand grazed Phalaris				
G	Poa lab				
F	White clover				
G	Juncus usit				

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3735 Low

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 22 08 24	Mt Lambie WF	RBA19	ACN

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	² Foliage cover	Abund -ance	Voucher
T	1 Euc dalrympleana				
T	2 Euc dives				
S	7 Blackberry				
S	8 Cass ~~[illegible]~~ lquinq				
S	9 Cass accum				
G	13 Phalaris aquatica				
F	14 Sheep sorell				
G	15 Poa labill				
S	16 ~~[illegible]~~ Ozothamnus sp.				

heavily grazed, shrubby cover <20%

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

² **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT3735

Low

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 22 09 24	Mt Lambie WF	RBA20	ACM

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
T	Euc bridgesiana				
T	Euc dalrympleana peppermint				
S	Cass aculeata				
S	Cass arcuata				
S	Euc sep regen				
S	Black berry				
F	*Sheep sorrel				
F	*White clover				
F	Oxalis perennans				
G	Juncus sp				
G	* Plalaris				
F	* Scotch thistle				
G	* Sweet vernal grass				

Rocky outcrops
On Hill side, large amount regen Eucs

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

DCT 3347 low

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 22 08 24	Mt Lambie WF	RBA21	ACM

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
T	Eucalyptus				
T	Eucalyptus				
S	blackberry				
G	*Phalaris aquatica				
G	Poa labillardieri				
F	*Trifolium sp.				
F	Geranium sp.				
F	*Scotch thistle				
fern	Bracken				
F	Acaena novae-zelandiae				
F	*Dandelion				

Mapped patch is smaller, northern part is cleared exotic groundcover

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

Assessing Native Groundcover:

(2) Step point method

Identify a patch that is representative of the native groundcover within the proposed clearing area.

1. Walk 100 steps in a straight line (transect) across the selected patch.

2. At each step, record the groundcover type at the tip of your boot, using these categories: • native vegetation (grasses, sedges, rushes, herbs and low shrubs), • non-native vegetation (grasses, sedges, rushes, herbs, and low shrubs), or • other - bare ground, litter, rock, cryptogam (moss/ lichen).

3. Repeat transects in at least four other representative patches within the proposed clearing area, making sure to include any significant variability across the proposed clearing area.

Step point method field sheet

Date of assessment: Assessor:

	Cover type			
	Native	Non-native	Bare ground and other	Total
Assessment line patch 1 GC-A	6	82	11	100
Assessment line patch 2 GC-B WP 3082 - start WP 3083 - end	1, 2, 3, 3, = 9	10, 10, 10, 10, 10 9, 9, 8, 7, 7 = 90	1 = 1	100
Assessment line patch 3 GC-C	—	10, 10, 10, 10, 10, 10, 10, 10, 10, 9 = 99	Rock = 1	100
Assessment line patch 4				100
Assessment line patch 5				100
Total count				
Average				

Average percentage ground cover (Average native + Average non-native): _____
This must be >10% cover to be a valid assessment

Average percentage native ground cover as a proportion of total ground cover: _____
If the native groundcover is <50% the derived grassland is deemed 'Low Conservation Grassland'

0417693

236

PCT 3367

Sally

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 19 08 24	MLWF	rap 01	K.H

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	E. bridgesiana				
	Acacia				
	Cassinia arcuata				
→	Cassinia / ~~Ozothamnus~~ aculeata				✓
	Microlaena stipoides				
	Dactylis glomerata				
	Austrostipa / nodosa				

Hill top.

Granite geol. + outcrop

Hollows present

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3367

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 19/08/24	MLWF	rap 02	KH.

	GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
1		Euc. bridgesiana				
2						
3						
4						
5						
6		Rubus fruticosa				
7		Cassinia arcuata				
8		Dactylis glomerata.				
9	sp.?	Austrostipa nodosa.				
10		Trifolium sp. White clover				
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3369

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 20/8/24	MLWF	rap 03	KH

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	E. dives (dominant)				
	E. bridgesiana				
why in brackets →	(E. viminalis) E. dalrympleana				
	Cassinia arcuata				
	Cassinia aculeata				
	Blackberry				
	Dactylis glomerata				
	Poa sieberiana				
	Microlaena stipoides				
	Lomandra filiformis				
	Daviesia latifolia				
	Hibbertia obtusifolia				
→ E?	Luzula sp. (not able to be identified) (native)				
→	Dillwynia phylicoides				
→	Acacia gunnii				

Carg Carg ♂ + other ♀ heard + sighted - feeding on E. dives (part of birds)
? breeding

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3735.

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 20824	ML	rap04	KH ACM

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	E. mannifera.				
	E. bridgesiana.				
	Blackberry				
	Cassinia arcuata. – most abundant.				
	Cassinia aculeata.				
	Dactylis. glomerata.				
	Juncus. sp.				
	serrated sp Tussock. Nassella trichotoma				
→	Cymbonotus (?) lawsonii				
	Helicetus dentatus.				
	St. Johns Wort Hyperic. perfo. Hypericum perforatum				
	Poa. sieberiana				
→	Haloragis heterophylla Haloragis ?				
	Acaena. sp. novae-zelandiae				
	Asperula conferta				

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3347

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 20 8 24	MLWF	rap 05	KH. ACM.

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
1	PCT 3347 - creek line + forest.				
2					
3	E. viminalis				
4	Poa labillardiere				
5	Dactylus glomerata.				
6	Carex appressa				
7	Juncus - sp.				
8	E. dives.				
9	Cassinia arcuata.				
10	Cassinia aculeata.				
11	Blackberry.				
12	Cerastium. sp. solanderi				
13	Acacia dealbata ✓ (bipinnate)				
14	Rumex brownii				
15	White Clover.				
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, …, 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 …, when ≤10, estimate when >10, 20, 30 … 100, 200, 300 …, 1000, 2000, 3000 … (as integer values).

PCT 3367

400 m² floristics plot: | **Survey name** | **Plot identifier** | **Recorders**

Date 20.8.24 | MLWF | rap06 | KH ACM

	GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund-ance	Voucher
1		Euc. bridgesiana				
2		E. dives.				
3		Acacia melanoxylon				
4						
5						
6		Blackberry				
7		Cassinia arcuata				
8		Cassinia aculeata				
9		Acacia dealbata.				
10						
11						
12		Dactylus glomerata				
13		Phalaris aquatica				
14		Poa labillardiei				
15		Plantago ? debilis (native)				
16		Hypericum perforatum.				
17						
18		Acaena novae-zelandiae				
19						
20		Lissanthe strigosa				
21						
22		Lomandra ~~sp.~~ filiformis				
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3367

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 20-8-24	MLWF	rap07	KH ACM

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	Euc. bridgesiana				
	Euc. goniocalyx				
	Blackberry				
	Dactylus glomerata				
	Rumex acetosella				
	Modiola carolinana				
	Chickweed. Stellaria media				
	Lolium perenne.				
	Malva parviflora				
	Echium plantagineum				
	Urtica incisa				
	Plantago (native) debilis				
	Acacia sp. novae-zelandiae (likely)				
	Scotch Thistle				
	Rumex brownii				
	~~Echium plantagineum~~				
	Cymbonotus lawsonianus				
	Lepidium. ~~africanum~~ bonariense				

almost no native understorey

almost all exotic ground cover. ~90% exotic.

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3367

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 20 8 24	MLWF	rap 08	KH ACM

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	Euc. nelliodora				
	Euc. bridgesiana				
	Euc. viminalis				
	Cassinia aculeata.				
	Cassinia arcuata.				
→	Grevillea ? rosmarinifolia ✓				
	Blackberry. planted				
	Acacia dealbata.				
	Phalaris aquatica				
	Bromus catharticus.				
	Echium plantagineum				
→	small-leaf peppermint → E. radiata				
	Acacia ?cultriformis? — not confirmed				
	Dogtooth wattle.				
	Acacia floribunda?				

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3347

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 20 8 24	MLWF	rap09	KH ACM

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	Euc viminalis				
	Euc. pauciflora				
	No shrubs.				
	Non-native dominated groundcover				
	Phalaris aquatica				
	Dactylus glomerata.				
	White clover				
	Chickweed. Setaria media Stellaria media (confirm species)				
	Poa labillardiere				
	Juncus sp. in watercourse				

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3367

400 m² floristics plot:	Survey name	Plot identifier	Recorders	
Date 20 8 24	MLWF	rap 10	KH	ACM

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	Euc. viminalis				
	Euc. dives				
	E bridgesiana				
	Bursaria spinosa – common.				
	Blackberry.				
	Austrostipa sp. nodosa (collected)				
	Poa labillardieri				
	Phalaris aquatica.				
	Cirsium sp. landeri				
	Dactylis glomeratus				
	Hydrocotyle laxiflora				
	Pteridium esculentum.				
	Cassinia aculeata or C. quinquefaria ?x				
	Purple Copper Butterfly habitat !				

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, …, 1, 2, 3, 4, 5, 10, 15, 20, 25, …100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 …, when ≤10, estimate when >10, 20, 30 … 100, 200, 300 …, 1000, 2000, 3000 … (as integer values).

3735

PCT ~~3[illegible]~~ – Derived Grassland.

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21 & 24 10.05am	MLWF.	map 12	KH + JM

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	Carpinia arcuata.				
	Acacia melanoxylon				
	Lomandra longifolia				
	Lomatia myricoides.				
	Hibbertia obtusifolia				
	Poa labillardieri				
	Poa sieberiana				
	Lomandra filiformis				
	Anthoxanthum odoratum				
	Euchiton japonicum / sphaericum.				
	Cytisus scoparius.				
?	~~Stellaria~~				
?	Stellaria pungens				
	Pteridium esculentum.				

* No trees. on turbine site
* Not mapped as a PCT.
but is a derived
shrub/grass PCT.
Native dominant
* Few exotics except
Anthoxanthum is common.

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3735.

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21/8/24 10 30 am	MLWF	rap 13	KH. JM

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	Euc. dives → only tree sp.				
	Cassinia arcuata				
	Cassinia quinquefaria				
	Lomandra longifolia				
	Hibbertia obtusifolia				
	Poa labillardieri				
	Poa sieberiana				
	Microlaena stipoides				
	Lissanthe strigosa				
	Lomandra filiformis				

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3735

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21 8 24	MLWF	rap 14	KH JM

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	Eucalyptus dives				
	Eucalyptus dalrympleana				
	Lomatia myricoides				
	Cassinia quinque.				
	Hibbertia obtusifolia				
	Poa labillardieri				
	Poa sieberiana				
	Lomandra filiformis.				
	Lissanthe strigosa				
	Gonocarpus tetragynus				
	Hovea heterophylla				
	Microlaena stipoides				

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3369 – DNG

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21 8 24		rap 15	KH

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	Acacia dealbata				
	Lomatia myricoides				
	Cassinia arcuata				
	Poa labillardieri				
	Poa sieberiana				
	Lomandra filiformis				
	Hibbertia obtusifolia – ~~abundant~~ common.				
	Pteridium esculentum				
	Tree % cover 0%				
	Shrub % cover 60%				
	Ground cover % 95%				
	Derived shrub / grassland.				
	Dense grassy groundcover.				
	Cassinia arcuata – invasive native shrub indicative of past clearing.				

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

Pct 3735

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21 & 24	MLWF	rap16	KH.

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	Euc. dives				
	Euc. dalrympleana				
	Cassinia quinque.				
	Cassinia arcuata.				
	Lomandra longifolia				
	Poa labillardiere				
	Poa sieberiana				
	Hibbertia obtusifolia				
	Pteridium esculentum.				

Cover

Tree 50%.

Shrub 30% variable

Groundcover. 30%.

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3735

400 m² floristics plot:

Date	Survey name	Plot identifier	Recorders
21 8 24	MLWF	rap 17	KH

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	² Foliage cover	Abund -ance	Voucher
	Euc. dives				
	Euc. dalrympleana				
	Poa labillardieri				
	Poa sieberiana				
	Hibbertia obtusifolia (common)				
	Gonocarpus tetragynus				
	Lomandra filiformis				
	Cassinia quinque.				
	Lissanthe strigosa				
	Persoonia linearis				
	Microlaena stipoides				
	Acacia dealbata.				
	Cassinia arcuata				
	Lomandra longifolia				

Low species diversity

Euc. dives is most dominant

Grassy forest structure

Tree 40%

Shrub 1%

Groundcover 90%

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

² **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3735 - patch with abundant E. marmifera + E. dives

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21 8 24	MCWF	rap 18	KH.

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	Eucalyptus ~~rossii~~ marmifera.				
	Euc. dives				
	Euc. dalrympleana				
	Acacia melanoxylon.				
	Rhytidosperma pallidum				
	Juncus sp.				
	Cassinia quinque				
	Poa sieberiana				
	Bursaria spinosa				
	Microlaena stipoides				
	Lomandra filiformis				
	Senecio ? prenanthoides.				
	Stellaria pungens.				

Tree 40%.
Shrub 10%.
Groundcover 50%.
grasses.

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3735.

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21 8 24		trap 19	

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	Euc marmifera				
	Euc dives				
	Acacia melanoxylon				
	Rytido. pallidum				
	Poa labillardiere				
	Poa sieberiana				
	Lomandra filiformis				
	Carinia ~~grandis~~ aculeata				
	Hibbertia obtusif				
	Lomandra longifolia				
	Bursaria spinosa				

Tree. 40%.
Shrub 5%
Gram/Groundcover 90%.

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3735

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21/8/24		rep 20	KH-

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	Euc. dives				
	Euc. dalrympleana				
	Acacia melanox.				
	Cassinia quinquefaria aculeata				
	Cassinia arcuata				
	Poa labillardieri				
	Poa sieberiana				
	Rhytidosperma pallidum				
	Microlaena stipoides				
	Persoonia linearis				
	Lissanthe strigosa				
	Lomandra longifolia				
	Euc. bridgesiana				
	Pteridium esculentum.				
	Tree 40%				
	Shrub 30%				
	Grass/groundcover 90%				

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, …, 1, 2, 3, 4, 5, 10, 15, 20, 25, …100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 …, when ≤10, estimate when >10, 20, 30 … 100, 200, 300 …, 1000, 2000, 3000 … (as integer values).

PCT 3767

? pct 3747 ~~or~~. or other PCT

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21 8 24.		rap 21	KH.

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	Euc. Bridgesiana				
	Acacia dealbata				
	Bursaria spinosa — common. in patch.				
	Hydrocotyle laxiflora				
	Carinia arcuata				
	Cassinia ~~quinque~~ aculeata				
	Lissanthe strigosa				
	Hibbertia obtusifolia				
	Comandra filiformis				
	Bossiaea buxifolia				
	Rhytidosperma pallidum				
	Microlaena stipoides.				
	Dillwynia ~~sp~~. phylicoides				
	Hovea linearis				
	Plantago debilis (native)				
	Cymbonotus lawsonianus.				
	Tiny shrub in bud (collected)				
	Hypericum perforatum				
	Eucalyptus dives				
	* Site is on a flat section.				
	Abundant Bursaria habitat				
	for Purple Copper Butterfly.				

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3367

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21 8 24		Sep 92.	KH.

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	E. dives				
	E. bridgesiana.				
	Cassinia arcuata				
	Cassinia ~~quinque~~ aculeata				
	Lomandra filiformis				
	Lomandra longifolia				
	Micrantha stypoides				
	Rhytidosperma pallidum				
	Poa labillardieri				
	Hydrocotyle laxiflora				
	Euchiton japonicus				
	Dichondra repens.				

Grassy forest.

Tree 40%.
Shrub 20% Cassinia (indicative of disturbance)
Groundcover 95%

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3211 Moist Gully forest.

400 m² floristics plot: **Survey name** **Plot identifier** rap23 **Recorders**

Date

GF code	**Species name** Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	Euc. ~~viminalis~~ dalrympleana				
	Acacia melanoxylon				
	Acacia dealbata				
	Lomandra longifolia				
	Cyathea australis				
	Pteridium esculentum.				
	Lomatia myricoides				

Wet gully forest - assessed from view point on side slope.

Tree 50%.

subcanopy 20%.

Shrub 20%.

Groundcover + ferns. 60%.

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3769

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21 8 24	MLWF	rep 24	KH-

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund-ance	Voucher
	E. dives				
	E. dalrympleana				
	E. bridgesiana				
	Lissanthe strigosa				
	Cassinia ~~quinque~~ aculeata				
	Cassinia arcuata				
	Hibbertia obtusifolia				
	Lomandra longifolia				
	Lomandra filiformis				
	Bursaria spinosa				
	Hovea heterophylla				
	Rhytidosperma pallidum				
	Luzula sp. (not flowering, not identified to species)				
	Poa sieberana				
	Aristida sp. (no inflorence)				
	Hydrocotyle laxiflora				
	Micrantha stypoides				
	Bossiaea ~~cordigera~~ buxifolia				
	Dillwynia phylicoides				

Tree 40%

Shrub 10%

Grass/Ground cover 90%

Grassy forest on steep slope

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3735.

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21 & 24		rap 25	KH.

	GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund-ance	Voucher
1		Euc. mannifera				
2		Euc. dives				
3						
4		Cassinia aculeata				
5						
6		Rhytido. pallidum				
7		Lomandra longifolia				
8		Lomandra filiformis				
9						
10		Poa sieberiana				
11		Microbrera stypoides				
12		Cionocarpus tetragynus				
13		Hibbertia obtusifolia				
14						
15		Pennoonia linearis (occasional)				
16						
17						
18						
19						
20						
21						
22						
23		Grassy forest on steep slope				
24						
25						
26						
27		Tree 30%.				
28						
29		Shrub 20%.				
30						
31		Grass/groundcover 40%.				
32						
33						
34						
35						

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3367

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21_8_24	MLWF	rep 25	KH

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	Euc. dalrympleana.				
	Euc paucicflora.				
	E. bridgesiana				
	Euc dives.				
	Dillwynia ~~retorifolia~~ phylicoides.				
	Cassinia quinque aculeata				
	Cassinia arcuata				
	Bursaria spinosa				
	Blackberry				
	Poa Siberiana				
	Lomandra filiformis.				
	Lissanthe strigosa				
	~~Dillwynia~~				
	Rhytido. pallidum.				
	Cionocarpus tetragynus				

Mixed eucalypt forest, probably transition from hill communities to valley community

Tree

Shrub 30%.

Cvan/GC. 90%.

Microlaena stipoides

Hydrocotyle

Acacia dealbata.

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3367

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21.8.24	MLWF	rap 26	KH.

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	Euc. dives – dominant				
	Euc. bridgesiana – few. *				
	Acacia ~~melanoxylon~~ falciformis				
	Cassinia arcuata				
	Cassinia ~~quinque~~ aculeata				
	Poa labillardiere				
	Poa sieberiana				
	Rytidosperma pallidum.				
	Lissanthe striçosa				
	Micrantha stypoides				
	Lomandra filiformis				
	Plantago debilis (native)				

Grassy forest.

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3369

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21 8 24	MLWF	rap 27	KH.

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	Euc. dalrympleana *				
	Euc. dives *				
	Acacia melanoxylon.				
	Lomatia myricoides — common.				
	Grassy groundcover — viewed from above, not accessible due to Blackberry thicket				
	Tall sheltered forest on south aspect.				
	PCT 3369.				

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3369.

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 21 8 24	MLWF	rep 28	KH.

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	Euc. dives	*			
	Euc. dalrympleana.	*			
	Blueberry				
	Pteridium esculentum				
	Cassinia ~~gunnii~~ aculeata				
	Cassinia arcuata.				
	Dactylis glomerata.				
	Microlaena stipoides				
	Cerastium Solanderi				
	~~Cir~~				
	Scotch Thistle.				
	Rumex acetosella				
	Senecio linearis				
	Hydrocotyle laxiflora				
	Senecio quadridentatus.				
	Lomandra longifolia				
	Tall moist grassy forest				
	weedy exotic dominated groundcover.				
	Poor condition				

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3347

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 22/8/24	MLWF	rep 28	KH.

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	Euc. viminalis - confirmed juv. leaves + fruit				
	Euc. pauciflora				
	Cassinia arcuata				
	Acacia falciformis				
	Acacia dealbata.				
	Lomandra longifolia				
	Microlaena stipoides				
	Anthoxanthum odoratum (exotic)				
	Juncus sp.				
	Poa labillardieri				
	Agrostis. (exotic)				
	Pteridium esculentum				
	Blackberry (exotic)				
	Hypericum perforatum (exotic)				
	Cerastium soleneli				
	Stellaria pungens.				
	Acaena novae-zelandiae				
	Austrostipa nodosa				

Grany woodland / forest on granite

Tree 20%.

Shrub 5%

Gram / Groundcover. 95%

Condition - moderate due to exotic component of understorey

(Also Acaena echinata nearby.)

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3367

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 22 8 24	MLWF	rap 29	

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	Euc. bridgesiana				
	Euc. dives				
	Blackberry — abundant.				
	Cassinia aculeata				
	Poa labillardieri				
	Microlaena stipoides				
	Anthoxanthum odoratum				
	Rumex acetosella				
	Lomandra longifolia				
	Lomandra filiformis				
	Veronica plebeia				
	Stellaria pungens				
	Hibbertia obtusifolia				
	Condition: moderate with mixed exotic/native groundcover high exotic cover incl blackberry.				

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3367

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 22 8 24	MLWF	rap 30	KH

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	Euc bridgsiana				
	Acacia falciformis				
	Eucalyptus dives				
	Blackberry				
	Scotch Broom.				
	Cassinia aculeata				
	Bursaria spinosa				
	Juncus sp.				
	Poa labillardieri				
	Microlaena stipoides				
	Dactylus. glomerata.				
	Yorkshire Fog.				
	Lomandra filiformis				
	Rumex acetosella.				
	White clover.				
	Conyza				
	Veronica plebeia				
	condition - Moderate				
	Disturbed + weedy understorey.				
	Low forest				
	Tree 30%				
	shrub 10%. ~~ind~~				
	Groundcover 80%				
	Weed cover [illegible]				
	Exotic in understorey ~60%.				

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3347

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 22 8 24	MLWF	rap31	KH

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	Eucalyptus viminalis				
	Eucalyptus pauciflora				
	Cassinia aculeata				
	Lomatia myricoides				
	Bursaria spinosa				
	Acacia falciformis				
	Pteridium esculentum				
	Poa labillardiere				
	Austrostipa nodosa				
	Dactylus glomerata.				
	Cerastium solanderi				
	Acaena novae-zelandiae				
	Hydrocotyle laxiflora				
	Clematis aristata				
	Cytisus scoparius (exot)				
	Blackberry				
	Stellaria flaccida				

Rap 33

Euc. bridgesiana
Euc. dalrympleana
Blackberry
Cassinia aculeata
Acacia dealbata.
Broom Cytisus scop.
Poa labillardiere
+ nonative g.c.

rap 32. PCT 3367

Euc. bridgesiana forest with same g.c. as above

Acacia falciformis trees

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, …, 1, 2, 3, 4, 5, 10, 15, 20, 25, …100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 …, when ≤10, estimate when >10, 20, 30 … 100, 200, 300 …, 1000, 2000, 3000 … (as integer values).

PCT 3367

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 22/8/24	MLWF	Map 34	KH.

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	² Foliage cover	Abund -ance	Voucher
	Eucalyptus bridgesiana *				
	Cassinia arcuata				
E	Blackberry				
	Juncus sp.				
	Microlaena stipoides				
	Rhytidosperma racemosa.				
E	Marsella trichotomes				
	Acacia dealbata.				
E	Dactylus glomerata				
E	Hypericum perforatum				
E	Yorkshire fog.				
E	Rumex acetosella				
	Cymbonotus lawsonianus				
	Goodenia ovata				
	Oxalis perennans.				

Condition: - moderate - exotics in understory
- many eucalyptus saplings

Tree 20%

~~Native~~ Shrub 40%.

~~native~~ Ground Cover 80%.

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

² **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCT 3347

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 22/8/24	MLWF	rap 35	KH

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
	Eucalyptus pauciflora *				
	Euc. viminalis *				
	Carinia aculeata.				
	Cassinia arcuata				
	Pteridium esculentum.				
	Poa labillardiere				
	Lomandra filiformis				
	Hibbertia obtusifolia				
	Anthoxanthum odoratum				
	Hypericum perforatum.				
	Hydrocotyle laxiflora				
	Veronica plebeia				
	Rumex acetosella.				
	Viola				
	Dactylis glomerata.				
	Stellaria pungens.				
	Austrostipa nodosa				

Condition Moderate.
- high non-native in groundlayer

Tree 40 %
Shrub 10 %
Ground cover 80 %

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

✓

PCT 3307

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 22.8.24	M2WF	rep 36	KH

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund -ance	Voucher
1	Trees in pasture paddock. viewed from road side.				
2	Note:- roadside trees were equivalent + used to confirm tree species identification				
3					
4					
5					
6					
7					
8	Eucalyptus pauciflora?				
9	Eucalyptus bridgesiana				
10	over non-native groundcover (improved pasture)				
11					
12					
13					
14					
15					
16					
17	Roadside trees: E. pauciflora				
18	E bridgesiana				
19	E. dalrympleana.				
20	Acacia dealbata				
21	Poa labillardieri				
22					
23	+ exotics.				
24	Phalaris aquatica.				
25	Bromus catharticus				
26	Blackberry				
27					
28					
29					
30					
31					
32					
33					
34					
35					

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

PCt 3367 - due to Euc. brideseana + location on granite hill top

400 m² floristics plot:	Survey name	Plot identifier	Recorders
Date 23/8/24	MLWF	rap 37	KH.

GF code	Species name Full species name, or a unique means of identifying separate taxa within a survey is mandatory. Data from here will be used to assign growth form richness and cover.	N, HTW or non-HTW	[2] Foliage cover	Abund-ance	Voucher
	rap 37				
	Euc. pauciflora				
	Euc. brideseana				
	Euc. dalrympleana				
	Dominant exotic grandiose				
	rap 38. PCt 3367				
	As above				
	+ extensive granite rock outcropping.				

Print more copies of this page to allow for higher species counts at a plot. All vascular plant species in a plot need to be recorded.

GF Code: see growth form definitions in BAM 2020 Appendix F. **N:** native, **HTW:** high threat weed.

[2] **Foliage cover:** 0.1, 0.2, 0.3, ..., 1, 2, 3, 4, 5, 10, 15, 20, 25, ...100%; Note: 0.1% cover represents an area of approximately 63 x 63 cm or a circle about 71 cm across, 0.5% cover represents an area of approximately *1.4 x 1.4 m, and 1% = 2.0 x 2.0 m, 5% = 4 x 5 m, 25% = 10 x 10 m.* Note the top 3 dominant native species within each GF group.

Abundance: Count 1, 2, 3 ..., when ≤10, estimate when >10, 20, 30 ... 100, 200, 300 ..., 1000, 2000, 3000 ... (as integer values).

Appendix F
Flora and Fauna Species Lists

RBA ID	RAP01	RAP02	RAP03	RAP04	RAP05	RAP06	RAP07	RAP8	RAP09	RAP10	Exotic
Collector	KH	KH	KH	KH, ACM	KH, ACM	KH, ACM	KH, ACM	KH, ACM	KH, ACM	KH, ACM	-
Date	19/08/2024	19/08/2024	20/08/2024	20/08/2024	20/08/2024	20/08/2024	20/08/2024	20/08/2024	20/08/2024	20/08/2024	-
PCT ID	PCT 3367	PCT 3367	PCT 3369	PCT 3735	PCT 3347	PCT 3367	PCT 3367	PCT 3367	PCT 3347	PCT 3367	-
Condition	Low	Low	Moderate	Low	Low	Low	Low	Low	Low	Low	-
TEC	-	-	-	-	-	-	-	-	-	-	-

Family	Scientific Name	Common Name	Origin	BC Act	EPBC Act	Growth Form											
Araliaceae	*Hydrocotyle laxiflora*	Stinking Pennywort	N	-	-	FG										x	
Araliaceae	*Hydrocotyle sp.*	-	N	-	-	FG											
Asparagaceae	*Lomandra sp.*	-	N	-	-	g											
Asparagaceae	*Lomandra filiformis*	Wattle Mat-rush	N	-	-	GG			x			x					
Asparagaceae	*Lomandra longifolia*	Spiny-headed Mat-rush	N	-	-	g											
Asparagaceae	*Lomandra multiflora*	Many-flowered Mat-rush	N	-	-	GG											
Asphodelaceae	*Dianella caerulea*	Blue Fax-lily	N	-	-	FG											
Asteraceae	*Cassinia / Ozothamus*	unidentified shrub	N	-	-	FG											x
Asteraceae	*Cassinia aculeata*	Dolly Bush	N	-	-	SG	x	x	x	x	x	x		x			x
Asteraceae	*Cassinia arcuata (Syn. C. sif*	Sifton Bush	N	-	-	SG			x	x	x	x		x			
Asteraceae	*Cassinia quinquefaria*	-	E	-	-	SG											
Asteraceae	*Conzya sumatrensis*	Tall Fleabane	E	-	-	f											
Asteraceae	*Cymbonotus lawsonianus*	Bears Ear	N	-	-	FG				x			x				
Asteraceae	*Euchiton japonicus*	Creeping cudweed	N	-	-	FG											
Asteraceae	*Euchiton sp.*	a Cudweed	N	-	-	f											
Asteraceae	*Hypochaeris radicata*	Flatweed	E	-	-	f											
Asteraceae	*Onopordum acanthium*	Scotch Thistle	E	-	-	f							x				
Asteraceae	*Ozothamnus sp.*	-	N	-	-	f											
Asteraceae	*Senecio linearifolius*	Fireweed Groundsel	N	-	-	FG											
Asteraceae	*Senecio prenathoides*	-	N	-	-	f											
Asteraceae	*Taraxcum officinale*	Dandelion	E	-	-	f											
Boraginaceae	*Echium plantagineum*	Patterson's Curse	E	-	-	f								x			
Brassicaceae	*Lepidium africanum*	-	E	-	-	f											
Brassicaceae	*Leipidium bonariense*	-	E	-	-	f							x				
Caryophyllaceae	*Stellaria media*	Common Chickweed	E	-	-	f									x		
Caryophyllaceae	*Stellaria flaccida*	-	N	-	-	FG											
Caryophyllaceae	*Stellaria pungens*	Prickly Starwort	N	-	-	f											
Casuarinaceae	*Allocasuarina littoralis*	Black She-oak	N	-	-	TG											
Convolvulaceae	*Dichondra repens*	Kidney Weed	N	-	-	f											
Cyatheaceae	*Cyathea australis*	Black Tree-fern	N	-	-	f											
Cyperaceae	*Carex appressa*	Tall Sedge	E	-	-	GG											x
Dennstaedtiaceae	*Pteridium esculentum*	Bracken	N	-	-	EG										x	
Dilleniaceae	*Hibbertia obtusifolia*	Hoary Guinea Flower	N	-	-	SG			x								
Ericaceae	*Lissanthe strigosa*	Peach Heath	N	-	-	SG						x					
Fabaceae (Faboideae)	*Bossiaea buxifolia*	-	N	-	-	f											
Fabaceae (Faboideae)	*Cytisus scoparius*	Scotch Broom	WoNS	-	-	f											
Fabaceae (Faboideae)	*Daviesia latifolia*	Hop Bitter-pea	N	-	-	SG			x								
Fabaceae (Faboideae)	*Dillwynia phylicoides*	-	N	-	-	SG			x								
Fabaceae (Faboideae)	*Dilwynia sp*		N	-	-	SG											
Fabaceae (Faboideae)	*Glycine clandestina*	-	N	-	-	OG											
Fabaceae (Faboideae)	*Hardenbergia violaceae*	Purple Coral Pea	N	-	-	OG											
Fabaceae (Faboideae)	*Hovea heterophylla*	-	N	-	-	FG											
Fabaceae (Faboideae)	*Hovea linearis*	-	N	-	-	FG											

RBA ID	RAP01	RAP02	RAP03	RAP04	RAP05	RAP06	RAP07	RAP8	RAP09	RAP10	Exotic
Collector	KH	KH	KH	KH, ACM	KH, ACM	KH, ACM	KH, ACM	KH, ACM	KH, ACM	KH, ACM	-
Date	19/08/2024	19/08/2024	20/08/2024	20/08/2024	20/08/2024	20/08/2024	20/08/2024	20/08/2024	20/08/2024	20/08/2024	-
PCT ID	PCT 3367	PCT 3367	PCT 3369	PCT 3735	PCT 3347	PCT 3367	PCT 3367	PCT 3367	PCT 3347	PCT 3367	-
Condition	Low	Low	Moderate	Low	Low	Low	Low	Low	Low	Low	-
TEC	-	-	-	-	-	-	-	-	-	-	-

Family	Scientific Name	Common Name	Origin	BC Act	EPBC Act	Growth Form											
Fabaceae (Faboideae)	*Trifolium repens*	White Clover	E	-	-	f		x			x						
Fabaceae (Faboideae)	*Trifolium sp.*	-	E	-	-	f									x		
Fabaceae (Mimosoideae	*Acacia cultriformis*	Dog-tooth Wattle	N	-	-	SG								x			
Fabaceae (Mimosoideae	*Acacia dealbata*	Silver Wattle	N	-	-	TG					x	x		x			
Fabaceae (Mimosoideae	*Acacia falciformis*	Broad-leaved Hickory	N	-	-	TG											
Fabaceae (Mimosoideae	*Acacia fimbriata*	Fringed Wattle	N	-	-	SG								x			
Fabaceae (Mimosoideae	*Acacia melanoxylon*	Blackwood	N	-	-	TG						x					
Fabaceae (Mimosoideae	*Acacia sp.*	-	N	-	-	TG	x		x				x				
Geranaceae	*Geranium sp.*	-	N	-	-	FG					x					x	
Haloragaceae	*Haloragis heterophylla*	Rough Raspwort	N	-	-	FG				x							
Haloragaceae	*Gonocarpus tetragynus*	-	N	-	-	FG											
Hypericaceae	*Hypericum perforatum*	St John's Wort	PW	-	-	f				x		x					
Juncaceae	*Juncus acutus*	Sharp Rush	E	-	-	g											
Juncaceae	*Juncus usitatus*	-	N	-	-	GG											
Juncaceae	*Juncus sp.*	-	N	-	-	GG				x	x						
Juncaceae	*Luzula sp.*	a Woodrush	N	-	-	f			x								
Loranthaceae	Amyema miquelii	Bronze Mistletoe	N	-	-	OG				(x)							
Malvaceae	*Malva parviflora*	Small-flowered Mallow	N	-	-	f							x				
Malvaceae	*Modiola carolineana*	Red-flowered Mallow	E	-	-	GG							x				
Myrtaceae	***Eucalyptus aggregata***	**Black Gum**	N	V	V	TG											
Myrtaceae	*Eucalyptus bridgesiana*	Apple Box	N	-	-	TG	x		x	x		x	x	x		x	
Myrtaceae	*Eucalyptus dalrympleana*	Mountain Gum	N	-	-	TG											
Myrtaceae	*Eucalyptus dives*	Broad-leaved Peppermint	N	-	-	TG			x		x	x				x	
Myrtaceae	*Eucalyptus goniocalyx*	Long-leaved Box	N	-	-	TG							x				
Myrtaceae	*Eucalyptus mannifera*	Brittle Gum	N	-	-	TG				x							
Myrtaceae	*Eucalyptus melliodora*	Yellow Box	N	-	-	TG								x			
Myrtaceae	*Eucalyptus pauciflora*	Snow Gum	N	-	-	TG									x		
Myrtaceae	*Eucalyptus radiata*	Narrow-leaved Peppermint	N	-	-	TG								?			
Myrtaceae	*Eucalyptus viminalis*	Ribbon Gum, Manna Gum	N	-	-	TG			(x)		x			x	x	x	
Myrtaceae	*Eucalyptus sp.*	-	N	-	-	TG											
Oxalidaceae	*Oxalis perennans*	-	N	-	-	FG											
Oxalidaceae	*Unknown genus*	a Clover	E	-	-	f											x
Pittosporaceae	*Bursaria spinosa*	Blackthorn	N	-	-	S										x	
Plantaginaceae	*Plantago sp*	-	N	-	-	FG						?	x				
Plantaginaceae	*Plantago debilis*	-	N	-	-	FG							x				
Plantaginaceae	*Plantago lanceolata*	Lamb's Tongues, Plantain	E	-	-	f											
Plantaginaceae	*Veronica plebeia*	Trailing Speedwell	N	-	-	f											
Poaceae	*Anthoxanthum odoratum*	Sweet Vernal Grass	E	-	-	g											
Poaceae	*Aristida sp*	-	N	-	-	f											
Poaceae	*Austrostipa nodosa*	-	N	-	-	GG	x	x								x	
Poaceae	*Austrostipa sp.*	-	N	-	-	GG											
Poaceae	*Bromus catharticus*	Prairie Grass	E	-	-	g								x			
Poaceae	*Dactylis glomerata*	Cocksfoot	E	-	-	g	x	x		x	x				x	x	

RBA ID	RAP01	RAP02	RAP03	RAP04	RAP05	RAP06	RAP07	RAP8	RAP09	RAP10	Exotic
Collector	KH	KH	KH	KH, ACM	KH, ACM	KH, ACM	KH, ACM	KH, ACM	KH, ACM	KH, ACM	-
Date	19/08/2024	19/08/2024	20/08/2024	20/08/2024	20/08/2024	20/08/2024	20/08/2024	20/08/2024	20/08/2024	20/08/2024	-
PCT ID	PCT 3367	PCT 3367	PCT 3369	PCT 3735	PCT 3347	PCT 3367	PCT 3367	PCT 3367	PCT 3347	PCT 3367	-
Condition	Low	Low	Moderate	Low	Low	Low	Low	Low	Low	Low	-
TEC	-	-	-	-	-	-	-	-	-	-	-

Family	Scientific Name	Common Name	Origin	BC Act	EPBC Act	Growth Form											
Poaceae	*Holcus lanatus*	Yorkshire Fog	E	-	-	g											
Poaceae	*Lolium perenne*	Perennial Ryegrass	E	-	-	g							x				
Poaceae	*Microlaena stipoides*	Weeping Grass	N	-	-	GG	x		x								
Poaceae	*Nassella trichotama*	Serrated Tussock	WoNS, PW,	-	-	g				x							
Poaceae	*Paspalum dilatatum*	Paspalum	E	-	-	g											x
Poaceae	*Phalaris aquatica*	Phalaris	E	-	-	g						x		x	x	x	x
Poaceae	*Poa labillarieri*	Tussock	N	-	-	GG					x	x			x	x	x
Poaceae	*Poa sieberiana*	-	N	-	-	GG			x	x							
Poaceae	*Rhytidosperma pallidum*	Silvertop Wallaby Grass	N	-	-	g											
Poaceae	*Rytidosperma racemosum*	-	N	-	-	GG											
Poaceae	*Setaria parviflora*	-	E	-	-	g											
Poaceae	*Themeda triandra*	Kangaroo Grass	N	-	-	GG											
Polygonaceae	*Rumex acetosella*	Sheep's Sorrel	E	-	-	f							x				
Polygonaceae	*Rumex brownii*	Swamp Dock	N	-	-	FG					x		x				
Proteaceae	*Grevillea rosmarinifolia*	Rosemary Grevillea	N (P)	-	-	SG											
Proteaceae	*Lomatia myricoides*	River Lomatia	N	-	-	s											
Proteaceae	*Persoonia linearis*	Narrow-leaved Geebung	N	-	-	s											
Pteridaceae	*Cheilanthes sieberi*	Cloak Fern	N	-	-	EG											
Ranunculaceae	*Clematis aristata*	Old Man's Beard	N	-	-	OG											
Rosaceae	*Acacena sp.*	-	N	-	-	s				x		x					
Rosaceae	*Acacena novae-zelandiae*	Bidgee-widgee	N	-	-	s											
Rosaceae	*Crataegus monogyna*	Howthorn	E	-	-	s											
Rosaceae	*Rosa rubiginosa*	Sweet Briar	E	-	-	s											x
Rosaceae	*Rubus fruticosus agg.*	Blackberry	WoNS, PW,	-	-	v		x	x	x	x	x	x	x		x	x
Rubiaceae	*Asperula conferta*	Common Woodruff	N	-	-	GG											
Salicaceae	*Salix sp.*	a Willow	WoNS, PW,	-	-	t											x
Santalaceae	*Exocarpos strictus*	Pale-fruit Ballart	N	-	-	SG											
Urticaceae	*Urtica incisa*	Stinging Nettle	N	-	-	FG							x				
Verbenaceae	*Verbena bonariensis*	Purpletop	E	-	-	f											
Violaceae	*Melicytus dentatus*	Tree Violet	N	-	-	SG				x							
Violaceae	*Viola sp.*	-	N	-	-	FG											

Key:
Origin: N = Native, E = exotic; P = planted; WoNS = Weed of National Significance, PW = Priority Weed
BC Act = NSW Biodiersity Conservation Act 2016; EPBC Act = Commonwealth Environment Protection and Biodiversity Conservation Act 1999.
Listing status: V = Vulnerable
Native species Growth Form: TG = tree; SG = shrub; FG = forb; EG = fern; GG = grass and grass-like; OG = other
Non-native ground form: t = tree; s = shrub; v = vine; f = forb; g = grass and grass-like

RBA ID	RAP 12	RAP 13	RAP 14	RAP 15	RAP 16	RAP 17	RAP 18	RAP 19	RAP 20	RAP 21
Collector		KH, JM	KH, JM	KH	KH	KH	KH	KH	KH	KH
Date	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024
PCT ID	PCT 3735	PCT 3735	PCT 3735	PCT 3369	PCT 3735	PCT 3735	PCT 3735	PCT 3735	PCT 3735	PCT 3367
Condition	Low-Moderate	Low	Low	DNG	Low	Low	Moderate	Moderate	Moderate	Moderate
TEC	-	-	-	-	-	-	-	-	-	-

Family	Scientific Name	Common Name	Origin	BC Act	EPBC Act	Growth Form										
Araliaceae	*Hydrocotyle laxiflora*	Stinking Pennywort	N	-	-	FG										x
Araliaceae	*Hydrocotyle sp.*	-	N	-	-	FG										
Asparagaceae	*Lomandra sp.*	-	N	-	-	g										
Asparagaceae	*Lomandra filiformis*	Wattle Mat-rush	N	-	-	GG	x	x	x	x		x	x	x		
Asparagaceae	*Lomandra longifolia*	Spiny-headed Mat-rush	N	-	-	g	x	x			x	x		x	x	
Asparagaceae	*Lomandra multiflora*	Many-flowered Mat-rush	N	-	-	GG										
Asphodelaceae	*Dianella caerulea*	Blue Fax-lily	N	-	-	FG										
Asteraceae	*Cassinia / Ozothamus*	unidentified shrub	N	-	-	FG										
Asteraceae	*Cassinia aculeata*	Dolly Bush	N	-	-	SG	x							x	x	x
Asteraceae	*Cassinia arcuata (Syn. C. sif*	Sifton Bush	N	-	-	SG		x		x	x	x			x	
Asteraceae	*Cassinia quinquefaria*	-	E	-	-	SG		x	x		x	x	x			
Asteraceae	*Conzya sumatrensis*	Tall Fleabane	E	-	-	f										
Asteraceae	*Cymbonotus lawsonianus*	Bears Ear	N	-	-	FG										x
Asteraceae	*Euchiton japonicus*	Creeping cudweed	N	-	-	FG	x									
Asteraceae	*Euchiton sp.*	a Cudweed	N	-	-	f										
Asteraceae	*Hypochaeris radicata*	Flatweed	E	-	-	f										
Asteraceae	*Onopordum acanthium*	Scotch Thistle	E	-	-	f										
Asteraceae	*Ozothamnus sp.*	-	N	-	-	f										
Asteraceae	*Senecio linearifolius*	Fireweed Groundsel	N	-	-	FG										
Asteraceae	*Senecio prenathoides*	-	N	-	-	f							x			
Asteraceae	*Taraxcum officinale*	Dandelion	E	-	-	f										
Boraginaceae	*Echium plantagineum*	Patterson's Curse	E	-	-	f										
Brassicaceae	*Lepidium africanum*	-	E	-	-	f										
Brassicaceae	*Leipidium bonariense*	-	E	-	-	f										
Caryophyllaceae	*Stellaria media*	Common Chickweed	E	-	-	f										
Caryophyllaceae	*Stellaria flaccida*	-	N	-	-	FG										
Caryophyllaceae	*Stellaria pungens*	Prickly Starwort	N	-	-	f							x			
Casuarinaceae	*Allocasuarina littoralis*	Black She-oak	N	-	-	TG										
Convolvulaceae	*Dichondra repens*	Kidney Weed	N	-	-	f										
Cyatheaceae	*Cyathea australis*	Black Tree-fern	N	-	-	f										
Cyperaceae	*Carex appressa*	Tall Sedge	E	-	-	GG										
Dennstaedtiaceae	*Pteridium esculentum*	Bracken	N	-	-	EG	x			x	x				x	
Dilleniaceae	*Hibbertia obtusifolia*	Hoary Guinea Flower	N	-	-	SG		x	x		x			x		x
Ericaceae	*Lissanthe strigosa*	Peach Heath	N	-	-	SG		x	x			x			x	x
Fabaceae (Faboideae)	*Bossiaea buxifolia*	-	N	-	-	f										x
Fabaceae (Faboideae)	*Cytisus scoparius*	Scotch Broom	WoNS	-	-	f	x									
Fabaceae (Faboideae)	*Daviesia latifolia*	Hop Bitter-pea	N	-	-	SG										
Fabaceae (Faboideae)	*Dillwynia phylicoides*	-	N	-	-	SG										x
Fabaceae (Faboideae)	*Dilwynia sp*		N	-	-	SG										
Fabaceae (Faboideae)	*Glycine clandestina*	-	N	-	-	OG										
Fabaceae (Faboideae)	*Hardenbergia violaceae*	Purple Coral Pea	N	-	-	OG										
Fabaceae (Faboideae)	*Hovea heterophylla*	-	N	-	-	FG			x							
Fabaceae (Faboideae)	*Hovea linearis*	-	N	-	-	FG										x

RBA ID	RAP 12	RAP 13	RAP 14	RAP 15	RAP 16	RAP 17	RAP 18	RAP 19	RAP 20	RAP 21
Collector		KH, JM	KH, JM	KH	KH	KH	KH	KH	KH	KH
Date	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024
PCT ID	PCT 3735	PCT 3735	PCT 3735	PCT 3369	PCT 3735	PCT 3735	PCT 3735	PCT 3735	PCT 3735	PCT 3367
Condition	Low-Moderate	Low	Low	DNG	Low	Low	Moderate	Moderate	Moderate	Moderate
TEC	-	-	-	-	-	-	-	-	-	-

Family	Scientific Name	Common Name	Origin	BC Act	EPBC Act	Growth Form										
Fabaceae (Faboideae)	*Trifolium repens*	White Clover	E	-	-	f										
Fabaceae (Faboideae)	*Trifolium sp.*	-	E	-	-	f										
Fabaceae (Mimosoideae	*Acacia cultriformis*	Dog-tooth Wattle	N	-	-	SG										
Fabaceae (Mimosoideae	*Acacia dealbata*	Silver Wattle	N	-	-	TG				x		x				x
Fabaceae (Mimosoideae	*Acacia falciformis*	Broad-leaved Hickory	N	-	-	TG										
Fabaceae (Mimosoideae	*Acacia fimbriata*	Fringed Wattle	N	-	-	SG										
Fabaceae (Mimosoideae	*Acacia melanoxylon*	Blackwood	N	-	-	TG							x	x	x	
Fabaceae (Mimosoideae	*Acacia sp.*	-	N	-	-	TG										
Geranaceae	*Geranium sp.*	-	N	-	-	FG										
Haloragaceae	*Haloragis heterophylla*	Rough Raspwort	N	-	-	FG										
Haloragaceae	*Gonocarpus tetragynus*	-	N	-	-	FG			x			x				
Hypericaceae	*Hypericum perforatum*	St John's Wort	PW	-	-	f										x
Juncaceae	*Juncus acutus*	Sharp Rush	E	-	-	g										
Juncaceae	*Juncus usitatus*	-	N	-	-	GG										
Juncaceae	*Juncus sp.*	-	N	-	-	GG							x			
Juncaceae	*Luzula sp.*	a Woodrush	N	-	-	f										
Loranthaceae	Amyema miquelii	Bronze Mistletoe	N	-	-	OG										
Malvaceae	*Malva parviflora*	Small-flowered Mallow	N	-	-	f										
Malvaceae	*Modiola carolineana*	Red-flowered Mallow	E	-	-	GG										
Myrtaceae	***Eucalyptus aggregata***	**Black Gum**	N	V	V	TG										
Myrtaceae	*Eucalyptus bridgesiana*	Apple Box	N	-	-	TG									x	x
Myrtaceae	*Eucalyptus dalrympleana*	Mountain Gum	N	-	-	TG			x		x	x	x		x	
Myrtaceae	*Eucalyptus dives*	Broad-leaved Peppermint	N	-	-	TG		x	x		x	x	x	x	x	x
Myrtaceae	*Eucalyptus goniocalyx*	Long-leaved Box	N	-	-	TG										
Myrtaceae	*Eucalyptus mannifera*	Brittle Gum	N	-	-	TG							x	x		
Myrtaceae	*Eucalyptus melliodora*	Yellow Box	N	-	-	TG										
Myrtaceae	*Eucalyptus pauciflora*	Snow Gum	N	-	-	TG										
Myrtaceae	*Eucalyptus radiata*	Narrow-leaved Peppermint	N	-	-	TG										
Myrtaceae	*Eucalyptus viminalis*	Ribbon Gum, Manna Gum	N	-	-	TG										
Myrtaceae	*Eucalyptus sp.*	-	N	-	-	TG										
Oxalidaceae	*Oxalis perennans*	-	N	-	-	FG										
Oxalidaceae	*Unknown genus*	a Clover	E	-	-	f										
Pittosporaceae	*Bursaria spinosa*	Blackthorn	N	-	-	S							x	x		x
Plantaginaceae	*Plantago sp*	-	N	-	-	FG										
Plantaginaceae	*Plantago debilis*	-	N	-	-	FG										x
Plantaginaceae	*Plantago lanceolata*	Lamb's Tongues, Plantain	E	-	-	f										
Plantaginaceae	*Veronica plebeia*	Trailing Speedwell	N	-	-	f										
Poaceae	*Anthoxanthum odoratum*	Sweet Vernal Grass	E	-	-	g	x									
Poaceae	*Aristida sp*	-	N	-	-	f										
Poaceae	*Austrostipa nodosa*	-	N	-	-	GG										
Poaceae	*Austrostipa sp.*	-	N	-	-	GG										
Poaceae	*Bromus catharticus*	Prairie Grass	E	-	-	g										
Poaceae	*Dactylis glomerata*	Cocksfoot	E	-	-	g										

RBA ID	RAP 12	RAP 13	RAP 14	RAP 15	RAP 16	RAP 17	RAP 18	RAP 19	RAP 20	RAP 21
Collector		KH, JM	KH, JM	KH	KH	KH	KH	KH	KH	KH
Date	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024
PCT ID	PCT 3735	PCT 3735	PCT 3735	PCT 3369	PCT 3735	PCT 3735	PCT 3735	PCT 3735	PCT 3735	PCT 3367
Condition	Low-Moderate	Low	Low	DNG	Low	Low	Moderate	Moderate	Moderate	Moderate
TEC	-	-	-	-	-	-	-	-	-	-

Family	Scientific Name	Common Name	Origin	BC Act	EPBC Act	Growth Form										
Poaceae	*Holcus lanatus*	Yorkshire Fog	E	-	-	g										
Poaceae	*Lolium perenne*	Perennial Ryegrass	E	-	-	g										
Poaceae	*Microlaena stipoides*	Weeping Grass	N	-	-	GG		x	x			x	x		x	x
Poaceae	*Nassella trichotama*	Serrated Tussock	WoNS, PW,	-	-	g										
Poaceae	*Paspalum dilatatum*	Paspalum	E	-	-	g										
Poaceae	*Phalaris aquatica*	Phalaris	E	-	-	g										
Poaceae	*Poa labillarieri*	Tussock	N	-	-	GG	x	x	x	x	x	x		x	x	
Poaceae	*Poa sieberiana*	-	N	-	-	GG	x	x	x	x	x	x	x	x	x	
Poaceae	*Rhytidosperma pallidum*	Silvertop Wallaby Grass	N	-	-	g							x	x		x
Poaceae	*Rytidosperma racemosum*	-	N	-	-	GG										
Poaceae	*Setaria parviflora*	-	E	-	-	g										
Poaceae	*Themeda triandra*	Kangaroo Grass	N	-	-	GG										
Polygonaceae	*Rumex acetosella*	Sheep's Sorrel	E	-	-	f										
Polygonaceae	*Rumex brownii*	Swamp Dock	N	-	-	FG										
Proteaceae	*Grevillea rosmarinifolia*	Rosemary Grevillea	N (P)	-	-	SG										
Proteaceae	*Lomatia myricoides*	River Lomatia	N	-	-	s	x			x						
Proteaceae	*Persoonia linearis*	Narrow-leaved Geebung	N	-	-	s						x			x	
Pteridaceae	*Cheilanthes sieberi*	Cloak Fern	N	-	-	EG										
Ranunculaceae	*Clematis aristata*	Old Man's Beard	N	-	-	OG										
Rosaceae	*Acacena sp.*	-	N	-	-	s										
Rosaceae	*Acacena novae-zelandiae*	Bidgee-widgee	N	-	-	s										
Rosaceae	*Crataegus monogyna*	Howthorn	E	-	-	s										
Rosaceae	*Rosa rubiginosa*	Sweet Briar	E	-	-	s										
Rosaceae	*Rubus fruticosus agg.*	Blackberry	WoNS, PW,	-	-	v										
Rubiaceae	*Asperula conferta*	Common Woodruff	N	-	-	GG										
Salicaceae	*Salix sp.*	a Willow	WoNS, PW,	-	-	t										
Santalaceae	*Exocarpos strictus*	Pale-fruit Ballart	N	-	-	SG										
Urticaceae	*Urtica incisa*	Stinging Nettle	N	-	-	FG										
Verbenaceae	*Verbena bonariensis*	Purpletop	E	-	-	f										
Violaceae	*Melicytus dentatus*	Tree Violet	N	-	-	SG										
Violaceae	*Viola sp.*	-	N	-	-	FG										

Key:

Origin: N = Native, E = exotic; P = planted; WoNS = Weed of National Significance, PW = Priority Weed

BC Act = NSW Biodiersity Conservation Act 2016; EPBC Act = Commonwealth Environment Protection and Biodiversity Cons Act 1999.

Listing status: V = Vulnerable

Native species Growth Form: TG = tree; SG = shrub; FG = forb; EG = fern; GG = grass and grass-like; OG = other

Non-native ground form: t = tree; s = shrub; v = vine; f = forb; g = grass and grass-like

RBA ID	RAP 22	RAP 23	RAP 24	RAP 25	RAP 25	RAP 26	RAP 27	RAP 28	RAP 28a	RAP 29
Collector	KH	KH	KH	KH	KH	KH	KH	KH	KH	KH
Date	21/08/2024		21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	22/08/2024	22/08/2024
PCT ID	PCT 3367	PCT 3211	PCT 3769	PCT 3755	PCT 3367	PCT 3367	PCT 3369	PCT3369	PCT 3347	PCT 3367
Condition	Low-Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Low	Moderate	Moderate
TEC	-	-	-	-	-	-	-	-	-	-

Family	Scientific Name	Common Name	Origin	BC Act	EPBC Act	Growth Form									
Araliaceae	*Hydrocotyle laxiflora*	Stinking Pennywort	N	-	-	FG	x		x					x		
Araliaceae	*Hydrocotyle sp.*	-	N	-	-	FG										
Asparagaceae	*Lomandra sp.*	-	N	-	-	g										
Asparagaceae	*Lomandra filiformis*	Wattle Mat-rush	N	-	-	GG	x			x	x	x				x
Asparagaceae	*Lomandra longifolia*	Spiny-headed Mat-rush	N	-	-	g	x	x	x	x				x	x	x
Asparagaceae	*Lomandra multiflora*	Many-flowered Mat-rush	N	-	-	GG										
Asphodelaceae	*Dianella caerulea*	Blue Fax-lily	N	-	-	FG										
Asteraceae	*Cassinia / Ozothamus*	unidentified shrub	N	-	-	FG										
Asteraceae	*Cassinia aculeata*	Dolly Bush	N	-	-	SG	x		x		x	x		x		x
Asteraceae	*Cassinia arcuata (Syn. C. sif*	Sifton Bush	N	-	-	SG	x		x		x	x		x	x	
Asteraceae	*Cassinia quinquefaria*	-	E	-	-	SG										
Asteraceae	*Conzya sumatrensis*	Tall Fleabane	E	-	-	f										
Asteraceae	*Cymbonotus lawsonianus*	Bears Ear	N	-	-	FG										
Asteraceae	*Euchiton japonicus*	Creeping cudweed	N	-	-	FG	x									
Asteraceae	*Euchiton sp.*	a Cudweed	N	-	-	f										
Asteraceae	*Hypochaeris radicata*	Flatweed	E	-	-	f										
Asteraceae	*Onopordum acanthium*	Scotch Thistle	E	-	-	f										
Asteraceae	*Ozothamnus sp.*	-	N	-	-	f										
Asteraceae	*Senecio linearifolius*	Fireweed Groundsel	N	-	-	FG								x		
Asteraceae	*Senecio prenathoides*	-	N	-	-	f										
Asteraceae	*Taraxcum officinale*	Dandelion	E	-	-	f										
Boraginaceae	*Echium plantagineum*	Patterson's Curse	E	-	-	f										
Brassicaceae	*Lepidium africanum*	-	E	-	-	f										
Brassicaceae	*Leipidium bonariense*	-	E	-	-	f										
Caryophyllaceae	*Stellaria media*	Common Chickweed	E	-	-	f										
Caryophyllaceae	*Stellaria flaccida*	-	N	-	-	FG										
Caryophyllaceae	*Stellaria pungens*	Prickly Starwort	N	-	-	f									x	x
Casuarinaceae	*Allocasuarina littoralis*	Black She-oak	N	-	-	TG										
Convolvulaceae	*Dichondra repens*	Kidney Weed	N	-	-	f	x									
Cyatheaceae	*Cyathea australis*	Black Tree-fern	N	-	-	f		x								
Cyperaceae	*Carex appressa*	Tall Sedge	E	-	-	GG										
Dennstaedtiaceae	*Pteridium esculentum*	Bracken	N	-	-	EG		x						x	x	
Dilleniaceae	*Hibbertia obtusifolia*	Hoary Guinea Flower	N	-	-	SG				x						x
Ericaceae	*Lissanthe strigosa*	Peach Heath	N	-	-	SG					x	x				
Fabaceae (Faboideae)	*Bossiaea buxifolia*	-	N	-	-	f			x							
Fabaceae (Faboideae)	*Cytisus scoparius*	Scotch Broom	WoNS	-	-	f										
Fabaceae (Faboideae)	*Daviesia latifolia*	Hop Bitter-pea	N	-	-	SG										
Fabaceae (Faboideae)	*Dillwynia phylicoides*	-	N	-	-	SG			x		x					
Fabaceae (Faboideae)	*Dilwynia sp*		N	-	-	SG										
Fabaceae (Faboideae)	*Glycine clandestina*	-	N	-	-	OG										
Fabaceae (Faboideae)	*Hardenbergia violaceae*	Purple Coral Pea	N	-	-	OG										
Fabaceae (Faboideae)	*Hovea heterophylla*	-	N	-	-	FG			x							
Fabaceae (Faboideae)	*Hovea linearis*	-	N	-	-	FG										

RBA ID	RAP 22	RAP 23	RAP 24	RAP 25	RAP 25	RAP 26	RAP 27	RAP 28	RAP 28a	RAP 29
Collector	KH	KH	KH	KH	KH	KH	KH	KH	KH	KH
Date	21/08/2024		21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	22/08/2024	22/08/2024
PCT ID	PCT 3367	PCT 3211	PCT 3769	PCT 3755	PCT 3367	PCT 3367	PCT 3369	PCT3369	PCT 3347	PCT 3367
Condition	Low-Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Low	Moderate	Moderate
TEC	-	-	-	-	-	-	-	-	-	-

Family	Scientific Name	Common Name	Origin	BC Act	EPBC Act	Growth Form										
Fabaceae (Faboideae)	*Trifolium repens*	White Clover	E	-	-	f										
Fabaceae (Faboideae)	*Trifolium sp.*	-	E	-	-	f										
Fabaceae (Mimosoideae	*Acacia cultriformis*	Dog-tooth Wattle	N	-	-	SG										
Fabaceae (Mimosoideae	*Acacia dealbata*	Silver Wattle	N	-	-	TG		x							x	
Fabaceae (Mimosoideae	*Acacia falciformis*	Broad-leaved Hickory	N	-	-	TG						x			x	
Fabaceae (Mimosoideae	*Acacia fimbriata*	Fringed Wattle	N	-	-	SG										
Fabaceae (Mimosoideae	*Acacia melanoxylon*	Blackwood	N	-	-	TG		x					x			
Fabaceae (Mimosoideae	*Acacia sp.*	-	N	-	-	TG								x		
Geranaceae	*Geranium sp.*	-	N	-	-	FG									x	
Haloragaceae	*Haloragis heterophylla*	Rough Raspwort	N	-	-	FG										
Haloragaceae	*Gonocarpus tetragynus*	-	N	-	-	FG				x	x					
Hypericaceae	*Hypericum perforatum*	St John's Wort	PW	-	-	f									x	
Juncaceae	*Juncus acutus*	Sharp Rush	E	-	-	g										
Juncaceae	*Juncus usitatus*	-	N	-	-	GG										
Juncaceae	*Juncus sp.*	-	N	-	-	GG									x	
Juncaceae	*Luzula sp.*	a Woodrush	N	-	-	f			x							
Loranthaceae	Amyema miquelii	Bronze Mistletoe	N	-	-	OG										
Malvaceae	*Malva parviflora*	Small-flowered Mallow	N	-	-	f										
Malvaceae	*Modiola carolineana*	Red-flowered Mallow	E	-	-	GG										
Myrtaceae	***Eucalyptus aggregata***	**Black Gum**	N	V	V	TG										
Myrtaceae	*Eucalyptus bridgesiana*	Apple Box	N	-	-	TG	x		x		x	x				x
Myrtaceae	*Eucalyptus dalrympleana*	Mountain Gum	N	-	-	TG		x	x		x		x	x		
Myrtaceae	*Eucalyptus dives*	Broad-leaved Peppermint	N	-	-	TG	x		x	x	x	x	x	x		x
Myrtaceae	*Eucalyptus goniocalyx*	Long-leaved Box	N	-	-	TG										
Myrtaceae	*Eucalyptus mannifera*	Brittle Gum	N	-	-	TG				x						
Myrtaceae	*Eucalyptus melliodora*	Yellow Box	N	-	-	TG										
Myrtaceae	*Eucalyptus pauciflora*	Snow Gum	N	-	-	TG					x				x	
Myrtaceae	*Eucalyptus radiata*	Narrow-leaved Peppermint	N	-	-	TG										
Myrtaceae	*Eucalyptus viminalis*	Ribbon Gum, Manna Gum	N	-	-	TG									x	
Myrtaceae	*Eucalyptus sp.*	-	N	-	-	TG										
Oxalidaceae	*Oxalis perennans*	-	N	-	-	FG										
Oxalidaceae	*Unknown genus*	a Clover	E	-	-	f										
Pittosporaceae	*Bursaria spinosa*	Blackthorn	N	-	-	S			x		x					
Plantaginaceae	*Plantago sp*	-	N	-	-	FG										
Plantaginaceae	*Plantago debilis*	-	N	-	-	FG						x				
Plantaginaceae	*Plantago lanceolata*	Lamb's Tongues, Plantain	E	-	-	f										
Plantaginaceae	*Veronica plebeia*	Trailing Speedwell	N	-	-	f										x
Poaceae	*Anthoxanthum odoratum*	Sweet Vernal Grass	E	-	-	g									x	x
Poaceae	*Aristida sp*	-	N	-	-	f			x							
Poaceae	*Austrostipa nodosa*	-	N	-	-	GG									x	
Poaceae	*Austrostipa sp.*	-	N	-	-	GG										
Poaceae	*Bromus catharticus*	Prairie Grass	E	-	-	g										
Poaceae	*Dactylis glomerata*	Cocksfoot	E	-	-	g								x		

RBA ID	RAP 22	RAP 23	RAP 24	RAP 25	RAP 25	RAP 26	RAP 27	RAP 28	RAP 28a	RAP 29
Collector	KH	KH	KH	KH	KH	KH	KH	KH	KH	KH
Date	21/08/2024		21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	22/08/2024	22/08/2024
PCT ID	PCT 3367	PCT 3211	PCT 3769	PCT 3755	PCT 3367	PCT 3367	PCT 3369	PCT3369	PCT 3347	PCT 3367
Condition	Low-Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Low	Moderate	Moderate
TEC	-	-	-	-	-	-	-	-	-	-

Family	Scientific Name	Common Name	Origin	BC Act	EPBC Act	Growth Form									
Poaceae	*Holcus lanatus*	Yorkshire Fog	E	-	-	g									
Poaceae	*Lolium perenne*	Perennial Ryegrass	E	-	-	g									
Poaceae	*Microlaena stipoides*	Weeping Grass	N	-	-	GG	x		x	x		x		x	x	x
Poaceae	*Nassella trichotama*	Serrated Tussock	WoNS, PW,	-	-	g										
Poaceae	*Paspalum dilatatum*	Paspalum	E	-	-	g										
Poaceae	*Phalaris aquatica*	Phalaris	E	-	-	g										
Poaceae	*Poa labillarieri*	Tussock	N	-	-	GG	x					x			x	x
Poaceae	*Poa sieberiana*	-	N	-	-	GG			x	x	x	x				
Poaceae	*Rhytidosperma pallidum*	Silvertop Wallaby Grass	N	-	-	g	x		x		x	x				
Poaceae	*Rytidosperma racemosum*	-	N	-	-	GG										
Poaceae	*Setaria parviflora*	-	E	-	-	g										
Poaceae	*Themeda triandra*	Kangaroo Grass	N	-	-	GG										
Polygonaceae	*Rumex acetosella*	Sheep's Sorrel	E	-	-	f								x		x
Polygonaceae	*Rumex brownii*	Swamp Dock	N	-	-	FG										
Proteaceae	*Grevillea rosmarinifolia*	Rosemary Grevillea	N (P)	-	-	SG										
Proteaceae	*Lomatia myricoides*	River Lomatia	N	-	-	s		x					x			
Proteaceae	*Persoonia linearis*	Narrow-leaved Geebung	N	-	-	s				x						
Pteridaceae	*Cheilanthes sieberi*	Cloak Fern	N	-	-	EG										
Ranunculaceae	*Clematis aristata*	Old Man's Beard	N	-	-	OG										
Rosaceae	*Acacena sp.*	-	N	-	-	s										
Rosaceae	*Acacena novae-zelandiae*	Bidgee-widgee	N	-	-	s									x	
Rosaceae	*Crataegus monogyna*	Howthorn	E	-	-	s										
Rosaceae	*Rosa rubiginosa*	Sweet Briar	E	-	-	s										
Rosaceae	*Rubus fruticosus agg.*	Blackberry	WoNS, PW,	-	-	v					x			x	x	x
Rubiaceae	*Asperula conferta*	Common Woodruff	N	-	-	GG										
Salicaceae	*Salix sp.*	a Willow	WoNS, PW,	-	-	t										
Santalaceae	*Exocarpos strictus*	Pale-fruit Ballart	N	-	-	SG										
Urticaceae	*Urtica incisa*	Stinging Nettle	N	-	-	FG										
Verbenaceae	*Verbena bonariensis*	Purpletop	E	-	-	f										
Violaceae	*Melicytus dentatus*	Tree Violet	N	-	-	SG										
Violaceae	*Viola sp.*	-	N	-	-	FG										

Key:

Origin: N = Native, E = exotic; P = planted; WoNS = Weed of National Significance, PW = Priority Weed

BC Act = NSW Biodiersity Conservation Act 2016; EPBC Act = Commonwealth Environment Protection and Biodiversity Cons Act 1999.

Listing status: V = Vulnerable

Native species Growth Form: TG = tree; SG = shrub; FG = forb; EG = fern; GG = grass and grass-like; OG = other

Non-native ground form: t = tree; s = shrub; v = vine; f = forb; g = grass and grass-like

RBA ID	RAP 30	RAP 31	RAP 32	RAP 33	RAP 34	RAP 35	RAP 36	RAP 37	RAP 38	RBA21	RBA 01	RBA 02
Collector	KH	KH	KH	KH	KH	KH	KH	KH	KH	ACM	ACM	ACM
Date	22/08/2024	22/08/2024	22/08/2024	22/08/2024	22/08/2024	22/08/2024	22/08/2024	23/08/2024	23/08/2024	22/08/2024	21/08/2024	21/08/2024
PCT ID	PCT 3367	PCT 3347	PCT 3347	PCT 3347	PCT 3367	PCT 3347	PCT 3367	PCT 3367	PCT 3367	PCT3347	PCT 3369	PCT 3369
Condition	Moderate	Moderate	Moderate	Low	Moderate	Moderate	Low	Low	Low	Low	Low	Low
TEC	-	-	-	-	-	-	-	-	-	-	-	-

Family	Scientific Name	Common Name	Origin	BC Act	EPBC Act	Growth Form												
Araliaceae	*Hydrocotyle laxiflora*	Stinking Pennywort	N	-	-	FG		x				x						
Araliaceae	*Hydrocotyle sp.*	-	N	-	-	FG												
Asparagaceae	*Lomandra sp.*	-	N	-	-	g												
Asparagaceae	*Lomandra filiformis*	Wattle Mat-rush	N	-	-	GG	x					x						
Asparagaceae	*Lomandra longifolia*	Spiny-headed Mat-rush	N	-	-	g												
Asparagaceae	*Lomandra multiflora*	Many-flowered Mat-rush	N	-	-	GG												
Asphodelaceae	*Dianella caerulea*	Blue Fax-lily	N	-	-	FG												
Asteraceae	*Cassinia / Ozothamus*	unidentified shrub	N	-	-	FG												
Asteraceae	*Cassinia aculeata*	Dolly Bush	N	-	-	SG	x	x		x		x						x
Asteraceae	*Cassinia arcuata (Syn. C. sif*	Sifton Bush	N	-	-	SG					x	x					x	
Asteraceae	*Cassinia quinquefaria*	-	E	-	-	SG	x											x
Asteraceae	*Conzya sumatrensis*	Tall Fleabane	E	-	-	f												
Asteraceae	*Cymbonotus lawsonianus*	Bears Ear	N	-	-	FG					x							
Asteraceae	*Euchiton japonicus*	Creeping cudweed	N	-	-	FG												
Asteraceae	*Euchiton sp.*	a Cudweed	N	-	-	f												
Asteraceae	*Hypochaeris radicata*	Flatweed	E	-	-	f												
Asteraceae	*Onopordum acanthium*	Scotch Thistle	E	-	-	f										x		
Asteraceae	*Ozothamnus sp.*	-	N	-	-	f												
Asteraceae	*Senecio linearifolius*	Fireweed Groundsel	N	-	-	FG												
Asteraceae	*Senecio prenathoides*	-	N	-	-	f												
Asteraceae	*Taraxcum officinale*	Dandelion	E	-	-	f										x		
Boraginaceae	*Echium plantagineum*	Patterson's Curse	E	-	-	f												
Brassicaceae	*Lepidium africanum*	-	E	-	-	f												
Brassicaceae	*Leipidium bonariense*	-	E	-	-	f												
Caryophyllaceae	*Stellaria media*	Common Chickweed	E	-	-	f												
Caryophyllaceae	*Stellaria flaccida*	-	N	-	-	FG		x										
Caryophyllaceae	*Stellaria pungens*	Prickly Starwort	N	-	-	f						x						
Casuarinaceae	*Allocasuarina littoralis*	Black She-oak	N	-	-	TG												
Convolvulaceae	*Dichondra repens*	Kidney Weed	N	-	-	f												
Cyatheaceae	*Cyathea australis*	Black Tree-fern	N	-	-	f												
Cyperaceae	*Carex appressa*	Tall Sedge	E	-	-	GG												
Dennstaedtiaceae	*Pteridium esculentum*	Bracken	N	-	-	EG		x				x				x		
Dilleniaceae	*Hibbertia obtusifolia*	Hoary Guinea Flower	N	-	-	SG						x						
Ericaceae	*Lissanthe strigosa*	Peach Heath	N	-	-	SG												x
Fabaceae (Faboideae)	*Bossiaea buxifolia*	-	N	-	-	f												
Fabaceae (Faboideae)	*Cytisus scoparius*	Scotch Broom	WoNS	-	-	f	x	x										
Fabaceae (Faboideae)	*Daviesia latifolia*	Hop Bitter-pea	N	-	-	SG												
Fabaceae (Faboideae)	*Dillwynia phylicoides*	-	N	-	-	SG											x	
Fabaceae (Faboideae)	*Dilwynia sp*		N	-	-	SG												
Fabaceae (Faboideae)	*Glycine clandestina*	-	N	-	-	OG												
Fabaceae (Faboideae)	*Hardenbergia violaceae*	Purple Coral Pea	N	-	-	OG												(x)
Fabaceae (Faboideae)	*Hovea heterophylla*	-	N	-	-	FG												
Fabaceae (Faboideae)	*Hovea linearis*	-	N	-	-	FG												

RBA ID	RAP 30	RAP 31	RAP 32	RAP 33	RAP 34	RAP 35	RAP 36	RAP 37	RAP 38	RBA21	RBA 01	RBA 02
Collector	KH	KH	KH	KH	KH	KH	KH	KH	KH	ACM	ACM	ACM
Date	22/08/2024	22/08/2024	22/08/2024	22/08/2024	22/08/2024	22/08/2024	22/08/2024	23/08/2024	23/08/2024	22/08/2024	21/08/2024	21/08/2024
PCT ID	PCT 3367	PCT 3347	PCT 3347	PCT 3347	PCT 3367	PCT 3347	PCT 3367	PCT 3367	PCT 3367	PCT3347	PCT 3369	PCT 3369
Condition	Moderate	Moderate	Moderate	Low	Moderate	Moderate	Low	Low	Low	Low	Low	Low
TEC	-	-	-	-	-	-	-	-	-	-	-	-

Family	Scientific Name	Common Name	Origin	BC Act	EPBC Act	Growth Form											
Fabaceae (Faboideae)	*Trifolium repens*	White Clover	E	-	-	f											
Fabaceae (Faboideae)	*Trifolium sp.*	-	E	-	-	f									x		
Fabaceae (Mimosoideae	*Acacia cultriformis*	Dog-tooth Wattle	N	-	-	SG											
Fabaceae (Mimosoideae	*Acacia dealbata*	Silver Wattle	N	-	-	TG				x	x		x				
Fabaceae (Mimosoideae	*Acacia falciformis*	Broad-leaved Hickory	N	-	-	TG	x	x	x								
Fabaceae (Mimosoideae	*Acacia fimbriata*	Fringed Wattle	N	-	-	SG											
Fabaceae (Mimosoideae	*Acacia melanoxylon*	Blackwood	N	-	-	TG											
Fabaceae (Mimosoideae	*Acacia sp.*	-	N	-	-	TG											
Geranaceae	*Geranium sp.*	-	N	-	-	FG		x							x	x	
Haloragaceae	*Haloragis heterophylla*	Rough Raspwort	N	-	-	FG											
Haloragaceae	*Gonocarpus tetragynus*	-	N	-	-	FG					x						
Hypericaceae	*Hypericum perforatum*	St John's Wort	PW	-	-	f					x	x					
Juncaceae	*Juncus acutus*	Sharp Rush	E	-	-	g											
Juncaceae	*Juncus usitatus*	-	N	-	-	GG											
Juncaceae	*Juncus sp.*	-	N	-	-	GG	x				x						
Juncaceae	*Luzula sp.*	a Woodrush	N	-	-	f											
Loranthaceae	Amyema miquelii	Bronze Mistletoe	N	-	-	OG											
Malvaceae	*Malva parviflora*	Small-flowered Mallow	N	-	-	f											
Malvaceae	*Modiola carolineana*	Red-flowered Mallow	E	-	-	GG											
Myrtaceae	***Eucalyptus aggregata***	**Black Gum**	N	V	V	TG											
Myrtaceae	*Eucalyptus bridgesiana*	Apple Box	N	-	-	TG	x		x	x	x		x	x	x		x
Myrtaceae	*Eucalyptus dalrympleana*	Mountain Gum	N	-	-	TG				x			x	x	x		
Myrtaceae	*Eucalyptus dives*	Broad-leaved Peppermint	N	-	-	TG	x										
Myrtaceae	*Eucalyptus goniocalyx*	Long-leaved Box	N	-	-	TG											
Myrtaceae	*Eucalyptus mannifera*	Brittle Gum	N	-	-	TG											
Myrtaceae	*Eucalyptus melliodora*	Yellow Box	N	-	-	TG											
Myrtaceae	*Eucalyptus pauciflora*	Snow Gum	N	-	-	TG		x				x	x	x	x		
Myrtaceae	*Eucalyptus radiata*	Narrow-leaved Peppermint	N	-	-	TG									x		
Myrtaceae	*Eucalyptus viminalis*	Ribbon Gum, Manna Gum	N	-	-	TG		x				x			x	x	x
Myrtaceae	*Eucalyptus sp.*	-	N	-	-	TG											
Oxalidaceae	*Oxalis perennans*	-	N	-	-	FG					x	x				x	
Oxalidaceae	*Unknown genus*	a Clover	E	-	-	f											
Pittosporaceae	*Bursaria spinosa*	Blackthorn	N	-	-	S	x	x								x	x
Plantaginaceae	*Plantago sp*	-	N	-	-	FG											
Plantaginaceae	*Plantago debilis*	-	N	-	-	FG											
Plantaginaceae	*Plantago lanceolata*	Lamb's Tongues, Plantain	E	-	-	f											
Plantaginaceae	*Veronica plebeia*	Trailing Speedwell	N	-	-	f	x					x					
Poaceae	*Anthoxanthum odoratum*	Sweet Vernal Grass	E	-	-	g						x					
Poaceae	*Aristida sp*	-	N	-	-	f											
Poaceae	*Austrostipa nodosa*	-	N	-	-	GG		x				x					
Poaceae	*Austrostipa sp.*	-	N	-	-	GG											
Poaceae	*Bromus catharticus*	Prairie Grass	E	-	-	g							x				
Poaceae	*Dactylis glomerata*	Cocksfoot	E	-	-	g	x	x			x	x					

RBA ID	RAP 30	RAP 31	RAP 32	RAP 33	RAP 34	RAP 35	RAP 36	RAP 37	RAP 38	RBA21	RBA 01	RBA 02
Collector	KH	KH	KH	KH	KH	KH	KH	KH	KH	ACM	ACM	ACM
Date	22/08/2024	22/08/2024	22/08/2024	22/08/2024	22/08/2024	22/08/2024	22/08/2024	23/08/2024	23/08/2024	22/08/2024	21/08/2024	21/08/2024
PCT ID	PCT 3367	PCT 3347	PCT 3347	PCT 3347	PCT 3367	PCT 3347	PCT 3367	PCT 3367	PCT 3367	PCT3347	PCT 3369	PCT 3369
Condition	Moderate	Moderate	Moderate	Low	Moderate	Moderate	Low	Low	Low	Low	Low	Low
TEC	-	-	-	-	-	-	-	-	-	-	-	-

Family	Scientific Name	Common Name	Origin	BC Act	EPBC Act	Growth Form											
Poaceae	*Holcus lanatus*	Yorkshire Fog	E	-	-	g	x				x						
Poaceae	*Lolium perenne*	Perennial Ryegrass	E	-	-	g											
Poaceae	*Microlaena stipoides*	Weeping Grass	N	-	-	GG	x				x						
Poaceae	*Nassella trichotama*	Serrated Tussock	WoNS, PW,	-	-	g					x						
Poaceae	*Paspalum dilatatum*	Paspalum	E	-	-	g											
Poaceae	*Phalaris aquatica*	Phalaris	E	-	-	g							x			x	
Poaceae	*Poa labillarieri*	Tussock	N	-	-	GG	x	x		x		x	x			x		x
Poaceae	*Poa sieberiana*	-	N	-	-	GG												
Poaceae	*Rhytidosperma pallidum*	Silvertop Wallaby Grass	N	-	-	g												
Poaceae	*Rytidosperma racemosum*	-	N	-	-	GG					x							
Poaceae	*Setaria parviflora*	-	E	-	-	g											x	
Poaceae	*Themeda triandra*	Kangaroo Grass	N	-	-	GG												
Polygonaceae	*Rumex acetosella*	Sheep's Sorrel	E	-	-	f	x				x	x						
Polygonaceae	*Rumex brownii*	Swamp Dock	N	-	-	FG												
Proteaceae	*Grevillea rosmarinifolia*	Rosemary Grevillea	N (P)	-	-	SG												
Proteaceae	*Lomatia myricoides*	River Lomatia	N	-	-	s		x										
Proteaceae	*Persoonia linearis*	Narrow-leaved Geebung	N	-	-	s												
Pteridaceae	*Cheilanthes sieberi*	Cloak Fern	N	-	-	EG												
Ranunculaceae	*Clematis aristata*	Old Man's Beard	N	-	-	OG		x										
Rosaceae	*Acacena sp.*	-	N	-	-	s												
Rosaceae	*Acacena novae-zelandiae*	Bidgee-widgee	N	-	-	s		x								x	x	x
Rosaceae	*Crataegus monogyna*	Howthorn	E	-	-	s												
Rosaceae	*Rosa rubiginosa*	Sweet Briar	E	-	-	s												
Rosaceae	*Rubus fruticosus agg.*	Blackberry	WoNS, PW,	-	-	v	x	x		x	x		x			x	x	x
Rubiaceae	*Asperula conferta*	Common Woodruff	N	-	-	GG												
Salicaceae	*Salix sp.*	a Willow	WoNS, PW,	-	-	t												
Santalaceae	*Exocarpos strictus*	Pale-fruit Ballart	N	-	-	SG												
Urticaceae	*Urtica incisa*	Stinging Nettle	N	-	-	FG												
Verbenaceae	*Verbena bonariensis*	Purpletop	E	-	-	f												
Violaceae	*Melicytus dentatus*	Tree Violet	N	-	-	SG												
Violaceae	*Viola sp.*	-	N	-	-	FG												

Key:
Origin: N = Native, E = exotic; P = planted; WoNS = Weed of National Significance, PW = Priority Weed
BC Act = NSW Biodiersity Conservation Act 2016; EPBC Act = Commonwealth Environment Protection and Biodiversity Cons Act 1999.
Listing status: V = Vulnerable
Native species Growth Form: TG = tree; SG = shrub; FG = forb; EG = fern; GG = grass and grass-like; OG = other
Non-native ground form: t = tree; s = shrub; v = vine; f = forb; g = grass and grass-like

RBA ID	RBA 03	RBA04	RBA05	RBA06	RBA07	RBA08	RBA09	RBA10	RBA11	RBA12	RBA13	RBA 14
Collector	ACM	ACM	ACM	ACM	ACM	ACM	ACM	ACM	ACM	ACM	ACM	ACM
Date	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024		21/08/2024	21/08/2024	21/08/2024
PCT ID	PCT 3367	PCT 3369	PCT 3755	PCT 3369	PCT 3369	PCT 3369	PCT 3369	PCT 3367	PCT 3347	PCT3369	PCT3369	PCT 3369
Condition	ow - Moderat	Moderate	Moderate	Moderate	ow - Moderat	Low	Low	Low	Low	Low	Low	Low
TEC	-	-	-	-	-	-	-	-	-	-	-	-

Family	Scientific Name	Common Name	Origin	BC Act	EPBC Act	Growth Form											
Araliaceae	*Hydrocotyle laxiflora*	Stinking Pennywort	N	-	-	FG											
Araliaceae	*Hydrocotyle sp.*	-	N	-	-	FG		x	x								
Asparagaceae	*Lomandra sp.*	-	N	-	-	g	x	x		x	x				x		
Asparagaceae	*Lomandra filiformis*	Wattle Mat-rush	N	-	-	GG								x			
Asparagaceae	*Lomandra longifolia*	Spiny-headed Mat-rush	N	-	-	g											
Asparagaceae	*Lomandra multiflora*	Many-flowered Mat-rush	N	-	-	GG										x	x
Asphodelaceae	*Dianella caerulea*	Blue Fax-lily	N	-	-	FG									x		
Asteraceae	*Cassinia / Ozothamus*	unidentified shrub	N	-	-	FG											
Asteraceae	*Cassinia aculeata*	Dolly Bush	N	-	-	SG									x		
Asteraceae	*Cassinia arcuata (Syn. C. sif*	Sifton Bush	N	-	-	SG	x	x	x	x	x		x			x	x
Asteraceae	*Cassinia quinquefaria*	-	E	-	-	SG	x							x		x	x	x
Asteraceae	*Conzya sumatrensis*	Tall Fleabane	E	-	-	f											
Asteraceae	*Cymbonotus lawsonianus*	Bears Ear	N	-	-	FG											
Asteraceae	*Euchiton japonicus*	Creeping cudweed	N	-	-	FG											
Asteraceae	*Euchiton sp.*	a Cudweed	N	-	-	f							x				
Asteraceae	*Hypochaeris radicata*	Flatweed	E	-	-	f											
Asteraceae	*Onopordum acanthium*	Scotch Thistle	E	-	-	f										x	
Asteraceae	*Ozothamnus sp.*	-	N	-	-	f											
Asteraceae	*Senecio linearifolius*	Fireweed Groundsel	N	-	-	FG											
Asteraceae	*Senecio prenathoides*	-	N	-	-	f											
Asteraceae	*Taraxcum officinale*	Dandelion	E	-	-	f											
Boraginaceae	*Echium plantagineum*	Patterson's Curse	E	-	-	f											
Brassicaceae	*Lepidium africanum*	-	E	-	-	f											
Brassicaceae	*Leipidium bonariense*	-	E	-	-	f		x	x				x	x			
Caryophyllaceae	*Stellaria media*	Common Chickweed	E	-	-	f										x	x
Caryophyllaceae	*Stellaria flaccida*	-	N	-	-	FG											
Caryophyllaceae	*Stellaria pungens*	Prickly Starwort	N	-	-	f											
Casuarinaceae	*Allocasuarina littoralis*	Black She-oak	N	-	-	TG											x
Convolvulaceae	*Dichondra repens*	Kidney Weed	N	-	-	f											
Cyatheaceae	*Cyathea australis*	Black Tree-fern	N	-	-	f											
Cyperaceae	*Carex appressa*	Tall Sedge	E	-	-	GG											
Dennstaedtiaceae	*Pteridium esculentum*	Bracken	N	-	-	EG											
Dilleniaceae	*Hibbertia obtusifolia*	Hoary Guinea Flower	N	-	-	SG				x							
Ericaceae	*Lissanthe strigosa*	Peach Heath	N	-	-	SG	x	x	x	x	x	x			x		x
Fabaceae (Faboideae)	*Bossiaea buxifolia*	-	N	-	-	f											
Fabaceae (Faboideae)	*Cytisus scoparius*	Scotch Broom	WoNS	-	-	f											
Fabaceae (Faboideae)	*Daviesia latifolia*	Hop Bitter-pea	N	-	-	SG											
Fabaceae (Faboideae)	*Dillwynia phylicoides*	-	N	-	-	SG											
Fabaceae (Faboideae)	*Dilwynia sp*		N	-	-	SG											
Fabaceae (Faboideae)	*Glycine clandestina*	-	N	-	-	OG			x						x		
Fabaceae (Faboideae)	*Hardenbergia violaceae*	Purple Coral Pea	N	-	-	OG											
Fabaceae (Faboideae)	*Hovea heterophylla*	-	N	-	-	FG											
Fabaceae (Faboideae)	*Hovea linearis*	-	N	-	-	FG											

RBA ID	RBA 03	RBA04	RBA05	RBA06	RBA07	RBA08	RBA09	RBA10	RBA11	RBA12	RBA13	RBA 14
Collector	ACM	ACM	ACM	ACM	ACM	ACM	ACM	ACM	ACM	ACM	ACM	ACM
Date	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024		21/08/2024	21/08/2024	21/08/2024
PCT ID	PCT 3367	PCT 3369	PCT 3755	PCT 3369	PCT 3369	PCT 3369	PCT 3369	PCT 3367	PCT 3347	PCT3369	PCT3369	PCT 3369
Condition	ow - Moderat	Moderate	Moderate	Moderate	ow - Moderat	Low	Low	Low	Low	Low	Low	Low
TEC	-	-	-	-	-	-	-	-	-	-	-	-

Family	Scientific Name	Common Name	Origin	BC Act	EPBC Act	Growth Form											
Fabaceae (Faboideae)	*Trifolium repens*	White Clover	E	-	-	f									x	x	
Fabaceae (Faboideae)	*Trifolium sp.*	-	E	-	-	f											
Fabaceae (Mimosoideae	*Acacia cultriformis*	Dog-tooth Wattle	N	-	-	SG											
Fabaceae (Mimosoideae	*Acacia dealbata*	Silver Wattle	N	-	-	TG		x		x					x		
Fabaceae (Mimosoideae	*Acacia falciformis*	Broad-leaved Hickory	N	-	-	TG											
Fabaceae (Mimosoideae	*Acacia fimbriata*	Fringed Wattle	N	-	-	SG											
Fabaceae (Mimosoideae	*Acacia melanoxylon*	Blackwood	N	-	-	TG											x
Fabaceae (Mimosoideae	*Acacia sp.*	-	N	-	-	TG		x							x		
Geranaceae	*Geranium sp.*	-	N	-	-	FG	x	x							x		
Haloragaceae	*Haloragis heterophylla*	Rough Raspwort	N	-	-	FG											
Haloragaceae	*Gonocarpus tetragynus*	-	N	-	-	FG											
Hypericaceae	*Hypericum perforatum*	St John's Wort	PW	-	-	f											
Juncaceae	*Juncus acutus*	Sharp Rush	E	-	-	g					x						
Juncaceae	*Juncus usitatus*	-	N	-	-	GG							x				
Juncaceae	*Juncus sp.*	-	N	-	-	GG											
Juncaceae	*Luzula sp.*	a Woodrush	N	-	-	f			x								
Loranthaceae	Amyema miquelii	Bronze Mistletoe	N	-	-	OG											
Malvaceae	*Malva parviflora*	Small-flowered Mallow	N	-	-	f											
Malvaceae	*Modiola carolineana*	Red-flowered Mallow	E	-	-	GG											
Myrtaceae	***Eucalyptus aggregata***	**Black Gum**	N	V	V	TG											
Myrtaceae	*Eucalyptus bridgesiana*	Apple Box	N	-	-	TG	x	x	x	x	x	x	x	x		x	x	x
Myrtaceae	*Eucalyptus dalrympleana*	Mountain Gum	N	-	-	TG												
Myrtaceae	*Eucalyptus dives*	Broad-leaved Peppermint	N	-	-	TG											x	x
Myrtaceae	*Eucalyptus goniocalyx*	Long-leaved Box	N	-	-	TG												
Myrtaceae	*Eucalyptus mannifera*	Brittle Gum	N	-	-	TG												
Myrtaceae	*Eucalyptus melliodora*	Yellow Box	N	-	-	TG												
Myrtaceae	*Eucalyptus pauciflora*	Snow Gum	N	-	-	TG	x							x				
Myrtaceae	*Eucalyptus radiata*	Narrow-leaved Peppermint	N	-	-	TG												
Myrtaceae	*Eucalyptus viminalis*	Ribbon Gum, Manna Gum	N	-	-	TG	x	x	x	x	x	x	x			x		
Myrtaceae	*Eucalyptus sp.*	-	N	-	-	TG												
Oxalidaceae	*Oxalis perennans*	-	N	-	-	FG								x				
Oxalidaceae	*Unknown genus*	a Clover	E	-	-	f												
Pittosporaceae	*Bursaria spinosa*	Blackthorn	N	-	-	S	x	x	x	x	x			x	x			
Plantaginaceae	*Plantago sp*	-	N	-	-	FG	x							x				
Plantaginaceae	*Plantago debilis*	-	N	-	-	FG												
Plantaginaceae	*Plantago lanceolata*	Lamb's Tongues, Plantain	E	-	-	f												
Plantaginaceae	*Veronica plebeia*	Trailing Speedwell	N	-	-	f												
Poaceae	*Anthoxanthum odoratum*	Sweet Vernal Grass	E	-	-	g												
Poaceae	*Aristida sp*	-	N	-	-	f												
Poaceae	*Austrostipa nodosa*	-	N	-	-	GG												
Poaceae	*Austrostipa sp.*	-	N	-	-	GG				x					x			
Poaceae	*Bromus catharticus*	Prairie Grass	E	-	-	g											x	
Poaceae	*Dactylis glomerata*	Cocksfoot	E	-	-	g												

RBA ID	RBA 03	RBA04	RBA05	RBA06	RBA07	RBA08	RBA09	RBA10	RBA11	RBA12	RBA13	RBA 14
Collector	ACM	ACM	ACM	ACM	ACM	ACM	ACM	ACM	ACM	ACM	ACM	ACM
Date	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024	21/08/2024		21/08/2024	21/08/2024	21/08/2024
PCT ID	PCT 3367	PCT 3369	PCT 3755	PCT 3369	PCT 3369	PCT 3369	PCT 3369	PCT 3367	PCT 3347	PCT3369	PCT3369	PCT 3369
Condition	ow - Moderat	Moderate	Moderate	Moderate	ow - Moderat	Low	Low	Low	Low	Low	Low	Low
TEC	-	-	-	-	-	-	-	-	-	-	-	-

Family	Scientific Name	Common Name	Origin	BC Act	EPBC Act	Growth Form												
Poaceae	*Holcus lanatus*	Yorkshire Fog	E	-	-	g												
Poaceae	*Lolium perenne*	Perennial Ryegrass	E	-	-	g												
Poaceae	*Microlaena stipoides*	Weeping Grass	N	-	-	GG				x								
Poaceae	*Nassella trichotama*	Serrated Tussock	WoNS, PW,	-	-	g			x									
Poaceae	*Paspalum dilatatum*	Paspalum	E	-	-	g							x	x				
Poaceae	*Phalaris aquatica*	Phalaris	E	-	-	g										x		x
Poaceae	*Poa labillarieri*	Tussock	N	-	-	GG	x		x	x		x		x	x			
Poaceae	*Poa sieberiana*	-	N	-	-	GG									x			
Poaceae	*Rhytidosperma pallidum*	Silvertop Wallaby Grass	N	-	-	g												
Poaceae	*Rytidosperma racemosum*	-	N	-	-	GG			x									
Poaceae	*Setaria parviflora*	-	E	-	-	g									x	x		
Poaceae	*Themeda triandra*	Kangaroo Grass	N	-	-	GG									x			
Polygonaceae	*Rumex acetosella*	Sheep's Sorrel	E	-	-	f											x	
Polygonaceae	*Rumex brownii*	Swamp Dock	N	-	-	FG												
Proteaceae	*Grevillea rosmarinifolia*	Rosemary Grevillea	N (P)	-	-	SG												
Proteaceae	*Lomatia myricoides*	River Lomatia	N	-	-	s												
Proteaceae	*Persoonia linearis*	Narrow-leaved Geebung	N	-	-	s												
Pteridaceae	*Cheilanthes sieberi*	Cloak Fern	N	-	-	EG					x							
Ranunculaceae	*Clematis aristata*	Old Man's Beard	N	-	-	OG												
Rosaceae	*Acacena sp.*	-	N	-	-	s												
Rosaceae	*Acacena novae-zelandiae*	Bidgee-widgee	N	-	-	s		x							x			
Rosaceae	*Crataegus monogyna*	Howthorn	E	-	-	s								x				
Rosaceae	*Rosa rubiginosa*	Sweet Briar	E	-	-	s												
Rosaceae	*Rubus fruticosus agg.*	Blackberry	WoNS, PW,	-	-	v				x	x	x		x	x	x		
Rubiaceae	*Asperula conferta*	Common Woodruff	N	-	-	GG												
Salicaceae	*Salix sp.*	a Willow	WoNS, PW,	-	-	t												
Santalaceae	*Exocarpos strictus*	Pale-fruit Ballart	N	-	-	SG											x	
Urticaceae	*Urtica incisa*	Stinging Nettle	N	-	-	FG												
Verbenaceae	*Verbena bonariensis*	Purpletop	E	-	-	f												
Violaceae	*Melicytus dentatus*	Tree Violet	N	-	-	SG												
Violaceae	*Viola sp.*	-	N	-	-	FG												

Key:

Origin: N = Native, E = exotic; P = planted; WoNS = Weed of National Significance, PW = Priority Weed

BC Act = NSW Biodiersity Conservation Act 2016; EPBC Act = Commonwealth Environment Protection and Biodiversity Cons Act 1999.

Listing status: V = Vulnerable

Native species Growth Form: TG = tree; SG = shrub; FG = forb; EG = fern; GG = grass and grass-like; OG = other

Non-native ground form: t = tree; s = shrub; v = vine; f = forb; g = grass and grass-like

RBA ID	RBA 15	RBA16	RBA17	RBA18	RBA19	RBA20
Collector	ACM	ACM	ACM	ACM	ACM	ACM
Date	21/08/2024	21/08/2024	21/08/2024	22/08/2024	22/08/2024	22/08/2024
PCT ID	PCT 3735	PCT3347	PCT3369	PCT3367	PCT 3735	PCT 3735
Condition	Moderate	Low	Low	Low	Low	Low
TEC	-	-	-	-	-	-

Family	Scientific Name	Common Name	Origin	BC Act	EPBC Act	Growth Form						
Araliaceae	*Hydrocotyle laxiflora*	Stinking Pennywort	N	-	-	FG						
Araliaceae	*Hydrocotyle sp.*	-	N	-	-	FG						
Asparagaceae	*Lomandra sp.*	-	N	-	-	g						
Asparagaceae	*Lomandra filiformis*	Wattle Mat-rush	N	-	-	GG						
Asparagaceae	*Lomandra longifolia*	Spiny-headed Mat-rush	N	-	-	g						
Asparagaceae	*Lomandra multiflora*	Many-flowered Mat-rush	N	-	-	GG	x	x				
Asphodelaceae	*Dianella caerulea*	Blue Fax-lily	N	-	-	FG						
Asteraceae	*Cassinia / Ozothamus*	unidentified shrub	N	-	-	FG						
Asteraceae	*Cassinia aculeata*	Dolly Bush	N	-	-	SG	x		x	x		
Asteraceae	*Cassinia arcuata (Syn. C. sif*	Sifton Bush	N	-	-	SG	x			x	x	x
Asteraceae	*Cassinia quinquefaria*	-	E	-	-	SG			x		x	x
Asteraceae	*Conzya sumatrensis*	Tall Fleabane	E	-	-	f		x				
Asteraceae	*Cymbonotus lawsonianus*	Bears Ear	N	-	-	FG						
Asteraceae	*Euchiton japonicus*	Creeping cudweed	N	-	-	FG						
Asteraceae	*Euchiton sp.*	a Cudweed	N	-	-	f						
Asteraceae	*Hypochaeris radicata*	Flatweed	E	-	-	f						
Asteraceae	*Onopordum acanthium*	Scotch Thistle	E	-	-	f		x				x
Asteraceae	*Ozothamnus sp.*	-	N	-	-	f					x	
Asteraceae	*Senecio linearifolius*	Fireweed Groundsel	N	-	-	FG						
Asteraceae	*Senecio prenathoides*	-	N	-	-	f						
Asteraceae	*Taraxcum officinale*	Dandelion	E	-	-	f						
Boraginaceae	*Echium plantagineum*	Patterson's Curse	E	-	-	f						
Brassicaceae	*Lepidium africanum*	-	E	-	-	f						
Brassicaceae	*Leipidium bonariense*	-	E	-	-	f						
Caryophyllaceae	*Stellaria media*	Common Chickweed	E	-	-	f						
Caryophyllaceae	*Stellaria flaccida*	-	N	-	-	FG						
Caryophyllaceae	*Stellaria pungens*	Prickly Starwort	N	-	-	f						
Casuarinaceae	*Allocasuarina littoralis*	Black She-oak	N	-	-	TG						
Convolvulaceae	*Dichondra repens*	Kidney Weed	N	-	-	f						
Cyatheaceae	*Cyathea australis*	Black Tree-fern	N	-	-	f						
Cyperaceae	*Carex appressa*	Tall Sedge	E	-	-	GG						
Dennstaedtiaceae	*Pteridium esculentum*	Bracken	N	-	-	EG				x		
Dilleniaceae	*Hibbertia obtusifolia*	Hoary Guinea Flower	N	-	-	SG						
Ericaceae	*Lissanthe strigosa*	Peach Heath	N	-	-	SG						
Fabaceae (Faboideae)	*Bossiaea buxifolia*	-	N	-	-	f						
Fabaceae (Faboideae)	*Cytisus scoparius*	Scotch Broom	WoNS	-	-	f						
Fabaceae (Faboideae)	*Daviesia latifolia*	Hop Bitter-pea	N	-	-	SG						
Fabaceae (Faboideae)	*Dillwynia phylicoides*	-	N	-	-	SG						
Fabaceae (Faboideae)	*Dilwynia sp*		N	-	-	SG						
Fabaceae (Faboideae)	*Glycine clandestina*	-	N	-	-	OG						
Fabaceae (Faboideae)	*Hardenbergia violaceae*	Purple Coral Pea	N	-	-	OG						
Fabaceae (Faboideae)	*Hovea heterophylla*	-	N	-	-	FG						
Fabaceae (Faboideae)	*Hovea linearis*	-	N	-	-	FG						

RBA ID	RBA 15	RBA16	RBA17	RBA18	RBA19	RBA20
Collector	ACM	ACM	ACM	ACM	ACM	ACM
Date	21/08/2024	21/08/2024	21/08/2024	22/08/2024	22/08/2024	22/08/2024
PCT ID	PCT 3735	PCT3347	PCT3369	PCT3367	PCT 3735	PCT 3735
Condition	Moderate	Low	Low	Low	Low	Low
TEC	-	-	-	-	-	-

Family	Scientific Name	Common Name	Origin	BC Act	EPBC Act	Growth Form						
Fabaceae (Faboideae)	*Trifolium repens*	White Clover	E	-	-	f				x		x
Fabaceae (Faboideae)	*Trifolium sp.*	-	E	-	-	f						
Fabaceae (Mimosoideae	*Acacia cultriformis*	Dog-tooth Wattle	N	-	-	SG						
Fabaceae (Mimosoideae	*Acacia dealbata*	Silver Wattle	N	-	-	TG						
Fabaceae (Mimosoideae	*Acacia falciformis*	Broad-leaved Hickory	N	-	-	TG						
Fabaceae (Mimosoideae	*Acacia fimbriata*	Fringed Wattle	N	-	-	SG						
Fabaceae (Mimosoideae	*Acacia melanoxylon*	Blackwood	N	-	-	TG						
Fabaceae (Mimosoideae	*Acacia sp.*	-	N	-	-	TG						
Geranaceae	*Geranium sp.*	-	N	-	-	FG	x	x	x			
Haloragaceae	*Haloragis heterophylla*	Rough Raspwort	N	-	-	FG						
Haloragaceae	*Gonocarpus tetragynus*	-	N	-	-	FG						
Hypericaceae	*Hypericum perforatum*	St John's Wort	PW	-	-	f			x			
Juncaceae	*Juncus acutus*	Sharp Rush	E	-	-	g						
Juncaceae	*Juncus usitatus*	-	N	-	-	GG				x		
Juncaceae	*Juncus sp.*	-	N	-	-	GG						x
Juncaceae	*Luzula sp.*	a Woodrush	N	-	-	f						
Loranthaceae	Amyema miquelii	Bronze Mistletoe	N	-	-	OG						
Malvaceae	*Malva parviflora*	Small-flowered Mallow	N	-	-	f						
Malvaceae	*Modiola carolineana*	Red-flowered Mallow	E	-	-	GG						
Myrtaceae	***Eucalyptus aggregata***	**Black Gum**	N	V	V	TG						
Myrtaceae	*Eucalyptus bridgesiana*	Apple Box	N	-	-	TG						x
Myrtaceae	*Eucalyptus dalrympleana*	Mountain Gum	N	-	-	TG					x	
Myrtaceae	*Eucalyptus dives*	Broad-leaved Peppermint	N	-	-	TG	x	x	x	x	x	
Myrtaceae	*Eucalyptus goniocalyx*	Long-leaved Box	N	-	-	TG	x		x			
Myrtaceae	*Eucalyptus mannifera*	Brittle Gum	N	-	-	TG						
Myrtaceae	*Eucalyptus melliodora*	Yellow Box	N	-	-	TG						
Myrtaceae	*Eucalyptus pauciflora*	Snow Gum	N	-	-	TG				x		
Myrtaceae	*Eucalyptus radiata*	Narrow-leaved Peppermint	N	-	-	TG						x
Myrtaceae	*Eucalyptus viminalis*	Ribbon Gum, Manna Gum	N	-	-	TG	x	x				
Myrtaceae	*Eucalyptus sp.*	-	N	-	-	TG						x
Oxalidaceae	*Oxalis perennans*	-	N	-	-	FG	x					x
Oxalidaceae	*Unknown genus*	a Clover	E	-	-	f						
Pittosporaceae	*Bursaria spinosa*	Blackthorn	N	-	-	S	x		x			
Plantaginaceae	*Plantago sp*	-	N	-	-	FG						
Plantaginaceae	*Plantago debilis*	-	N	-	-	FG						
Plantaginaceae	*Plantago lanceolata*	Lamb's Tongues, Plantain	E	-	-	f			x			
Plantaginaceae	*Veronica plebeia*	Trailing Speedwell	N	-	-	f						
Poaceae	*Anthoxanthum odoratum*	Sweet Vernal Grass	E	-	-	g						x
Poaceae	*Aristida sp*	-	N	-	-	f						
Poaceae	*Austrostipa nodosa*	-	N	-	-	GG						
Poaceae	*Austrostipa sp.*	-	N	-	-	GG						
Poaceae	*Bromus catharticus*	Prairie Grass	E	-	-	g						
Poaceae	*Dactylis glomerata*	Cocksfoot	E	-	-	g						

RBA ID	RBA 15	RBA16	RBA17	RBA18	RBA19	RBA20
Collector	ACM	ACM	ACM	ACM	ACM	ACM
Date	21/08/2024	21/08/2024	21/08/2024	22/08/2024	22/08/2024	22/08/2024
PCT ID	PCT 3735	PCT3347	PCT3369	PCT3367	PCT 3735	PCT 3735
Condition	Moderate	Low	Low	Low	Low	Low
TEC	-	-	-	-	-	-

Family	Scientific Name	Common Name	Origin	BC Act	EPBC Act	Growth Form						
Poaceae	*Holcus lanatus*	Yorkshire Fog	E	-	-	g	x					
Poaceae	*Lolium perenne*	Perennial Ryegrass	E	-	-	g						
Poaceae	*Microlaena stipoides*	Weeping Grass	N	-	-	GG						
Poaceae	*Nassella trichotama*	Serrated Tussock	WoNS, PW,	-	-	g						
Poaceae	*Paspalum dilatatum*	Paspalum	E	-	-	g						
Poaceae	*Phalaris aquatica*	Phalaris	E	-	-	g		x		x	x	x
Poaceae	*Poa labillarieri*	Tussock	N	-	-	GG	x	x	x	x	x	
Poaceae	*Poa sieberiana*	-	N	-	-	GG						
Poaceae	*Rhytidosperma pallidum*	Silvertop Wallaby Grass	N	-	-	g						
Poaceae	*Rytidosperma racemosum*	-	N	-	-	GG						
Poaceae	*Setaria parviflora*	-	E	-	-	g		x				
Poaceae	*Themeda triandra*	Kangaroo Grass	N	-	-	GG			x			
Polygonaceae	*Rumex acetosella*	Sheep's Sorrel	E	-	-	f	x		x		x	x
Polygonaceae	*Rumex brownii*	Swamp Dock	N	-	-	FG						
Proteaceae	*Grevillea rosmarinifolia*	Rosemary Grevillea	N (P)	-	-	SG						
Proteaceae	*Lomatia myricoides*	River Lomatia	N	-	-	s						
Proteaceae	*Persoonia linearis*	Narrow-leaved Geebung	N	-	-	s						
Pteridaceae	*Cheilanthes sieberi*	Cloak Fern	N	-	-	EG						
Ranunculaceae	*Clematis aristata*	Old Man's Beard	N	-	-	OG						
Rosaceae	*Acacena sp.*	-	N	-	-	s						
Rosaceae	*Acacena novae-zelandiae*	Bidgee-widgee	N	-	-	s		x				
Rosaceae	*Crataegus monogyna*	Howthorn	E	-	-	s						
Rosaceae	*Rosa rubiginosa*	Sweet Briar	E	-	-	s						
Rosaceae	*Rubus fruticosus agg.*	Blackberry	WoNS, PW,	-	-	v	x	x	x		x	x
Rubiaceae	*Asperula conferta*	Common Woodruff	N	-	-	GG						
Salicaceae	*Salix sp.*	a Willow	WoNS, PW,	-	-	t						
Santalaceae	*Exocarpos strictus*	Pale-fruit Ballart	N	-	-	SG		x				
Urticaceae	*Urtica incisa*	Stinging Nettle	N	-	-	FG						
Verbenaceae	*Verbena bonariensis*	Purpletop	E	-	-	f		x				
Violaceae	*Melicytus dentatus*	Tree Violet	N	-	-	SG						
Violaceae	*Viola sp.*	-	N	-	-	FG						

Key:
Origin: N = Native, E = exotic; P = planted; WoNS = Weed of National Significance, PW = Priority Weed
BC Act = NSW Biodiersity Conservation Act 2016; EPBC Act = Commonwealth Environment Protection and Biodiversity Cons Act 1999.
Listing status: V = Vulnerable
Native species Growth Form: TG = tree; SG = shrub; FG = forb; EG = fern; GG = grass and grass-like; OG = other
Non-native ground form: t = tree; s = shrub; v = vine; f = forb; g = grass and grass-like

Table F-2 List of fauna species

Family	Scientific name	Comon name	Origin	BC Act status*	EPBC Act status	Observation	Location
Birds							
Cacatuidae	*Callocephalon fimbriatum*	Gang-gang Cockatoo	N	E	E	Seen, Heard	RAP03
Acanthizidae	*Acanthiza reguloides*	Buff-rumped Thornbill	N	-	-	Seen or Heard	O
Acanthizidae	*Acanthiza nana*	Yellow Thornbill	N	-	-	Seen or Heard	O
Accipitridae	*Aquila audax*	Wedge-tail Eagle	N	-	-	Seen or Heard	O
Accipitridae	*Elanus axillaris*	Black-shouldered Kite	N	-	-	Seen or Heard	O
Alcedinidae	*Dacelo novaeguineae*	Laughing Kookaburra	N	-	-	Seen or Heard	O
Anatidae	*Anas superciliosa*	Pacific Black Duck	N	-	-	Seen or Heard	O
Anatidae	*Chenonetta jubata*	Australian Wood Duck	N	-	-	Seen or Heard	O
Artamidae	*Strepera graculina*	Pied Currawong	N	-	-	Seen or Heard	O
Cacatuidae	*Eolophus roseicapilla*	Galah	N	-	-	Seen	O
Cacatuidae	*Zanda funerea*	Yellow-tailed Black Cockatoo	N	-	-	Seen or Heard	O
Climacteridae	*Cormobates leucophaea*	White-throated Treecreeper	N	-	-	Seen or Heard	O
Corcoracidae	*Corcorax melanorhamphos*	White-winged Chough	N	-	-	Seen or Heard	O
Corvidae	*Corvus mellori*	Little Raven	N	-	-	Seen or Heard	O
Cracticidae	*Cracticus nigrogularis*	Pied Butcher-bird	N	-	-	Seen	O
Estrildidae	*Neochmia temporalis*	Red-browed Finch	N	-	-	Seen or Heard	O
Maluridae	*Malurus cyaneus*	Superb Fairy-wren	N	-	-	Seen or Heard	O
Meliphagidae	*Acanthorhynchus tenuirostris*	Eastern Spinebill	N	-	-	Seen or Heard	O
Meliphagidae	*Anthochaera carunculata*	Red Wattlebird	N	-	-	Seen or Heard	O
Meliphagidae	*Caligavis chrysops*	Yellow-faced Honeyeater	N	-	-	Seen or Heard	O
Monarchidae	*Grallina cyanoleuca*	Magpie Lark	N	-	-	Seen or Heard	O
Motacillidae	*Anthus novaeseelandiae*	Australasian Pipit	N	-	-	Seen or Heard	O
Pachycephalidae	*Pachycephala pectoralis*	Golden Whistler	N	-	-	Seen or Heard	O
Pardalotidae	*Pardalotus punctatus*	Spotted Pardalote	N	-	-	Seen or Heard	O
Pardalotidae	*Pardalotus striatus*	Striated Pardalote	N	-	-	Seen or Heard	O

Family	Scientific name	Comon name	Origin	BC Act status*	EPBC Act status	Observation	Location
Podicipedidae	*Tachybaptus novaehollandiae*	Australasian Grebe	N	-	-	Seen or Heard	O
Psittacidae	*Platycercus elegans*	Crimson Rosella	N	-	-	Seen or Heard	O
Psittacidae	*Platycercus eximius*	Eastern Rosella	N	-	-	Seen or Heard	O
Psophodidae	*Psophodes olivaceus*	Eastern Whipbird	N	-	-	Seen or Heard	O
Rhipiduridae	*Rhipidura albiscapa*	Grey Fantail	N	-	-	Seen or Heard	O
Mammals							
Bovidae	Bos taurus	Cows	E	-	-	Seen	O
Bovidae	Capra aegagrus hircus	Feral Goat	E	-	-	Seen	O
Canidae	Vulpes Vulpes	Red Fox	E	-	-	Seen	O
Cervidae	Cervus elaphus	Red Deer	E	-	-	Seen	O
Equidae	Equus ferus caballus	Horse	E	-	-	Seen	O
Macropodidae	Macropus giganteus	Eastern Grey Kangaroo	N	-	-	Seen	O
Macropodidae	Macropus robustus	Common Wallaroo	N	-	-	Seen	O
Suidae	Sus domesticus	Feral Pig	E	-	-	Seen	O
Vombatidae	Vombatus ursinus	Wombat	N	-	-	Seen	O
Microbats							
Vespertilioniidae	*Chalinolobus gouldii*	Gould's Wattled Bat	N	-	-	ANABAT	2
Vespertilioniidae	*Chalinolobus morio*	Chocolate Wattled Bat	N	-	-	ANABAT	3
Vespertilioniidae	*Falsistrellus tasmaniensis*	Eastern False Pipistrelle	N	V	-	ANABAT	3
Vespertilioniidae	*Nyctophilus sp.*	-	N	-	-	ANABAT	1, 2
Vespertilioniidae	*Scotorepens greyii*	Little Broad-nosed Bat	N	-	-	ANABAT	3
Vespertilioniidae	*Vespadelus darlingtoni*	Large Forest Bat	N	-	-	ANABAT	1, 2, 3
Vespertilioniidae	*Vespadelus regulus*	Southern Forest Bat	N	-	-	ANABAT	1
Vespertilioniidae	*Vespadelus vulturnus*	Little Forest Bat	N	-	-	ANABAT	1
Miniopteridae	*Miniopterus orianae oceanensis*	Large Bent-winged Bat	N	V	-	ANABAT	2, 3
Molosidae	*Ozimops ridei*	Eastern Free-tailed Bat	N	-	-	ANABAT	2

Table notes:

Origin: N = native; E = exotic/introduced
BC Act = NSW *Biodiversity Conservation Act 2016*; EPBC Act = *Environment Protection and Biodiversity Conservation Act 1999*.
*all native species are protected under the BC Act.
Threat listing status: V = Vulnerable, E = Endangered; CE = Critically Endangered
Location: O – opportunistic; 1 to 4 as per ANABAT location shown in Figure 10

Appendix G
Bat Call Report

Microbat Call Identification Report

Prepared for ("Client"):	Aurecon
Survey location/project name:	Mount Lambie Wind Farm, NSW
Survey dates:	19-23 August 2024
Client project reference:	P527288
Job no.:	AUR-2401
Report date:	11 September 2024

Methods

Data received

Balance! Environmental received 1408 full-spectrum ultrasonic files (.WAV format), recorded between 19th and 22nd August 2024, using four Anabat detectors (see **Table 1**).

Bat-call analysis

All post-processing and analyses were performed with *Anabat Insight* (Version 2.1.2; Titley Scientific, Brisbane), as follows:

1. The entire dataset was first scanned twice using the *Search* tool to separate files containing potentially-identifiable bat calls from those with only non-bat background noise and/or short duration calls (<3 pulses) that would be of little use for species identification. To achieve this, the following *Search* criteria were applied to every file:
    a. Filter settings
        i. Characteristic frequency (Fc) = 10 – 165 kHz
        ii. Pulse duration (Dur) = 2 – 120 ms
        iii. Time between pulses (TBC) = 5 – 1500 ms
        iv. File must contain a minimum of three (3) pulses that match the above criteria.
    b. Analysis settings
        i. ZC threshold = 15 (first pass) and "Auto" (second pass)
        ii. Smoothness = 5 (first pass) and "None" (second pass)
        iii. Search Per Pulse
2. Files that passed the above noise filtration process were then scanned using the *Decision Tree* tool, to group them according to the average zero-crossing metrics of the calls within. *Decision Tree* grouping was based primarily on characteristic frequency (Fc), with some frequency groups further subdivided using metrics such as pulse duration (Dur), slope of the characteristic section (Sc), and a custom "bandwidth" metric derived from the difference between maximum frequency (Fmax) and Fc.
3. Species present within each *Decision Tree* output group were verified by manually reviewing the call spectrograms and comparing pulse properties and metrics with those of regionally relevant reference calls and the call descriptions provided in Pennay *et al.* (2004).

The likelihood of species' occurrence in the survey area was confirmed by referring to relevant distributional information (e.g., Australasian Bat Society 2021; Baker & Gynther 2023; Churchill 2008).

Where a call is assigned to a single species in the above process, it is implied that the identification is highly reliable (i.e. better than 90% probability that the call belongs to the relevant species). Those calls are listed as "Positively identified" in the Results and the species should be regarded as "Definitely present" at the relevant site.

Where there is any doubt over call identities, a multi-species label is applied, and those calls are presented as "Unresolved calls" in the Results. All members of those species groups should be regarded as "Possibly present" at the relevant site unless also listed as "Positively identified calls".

Reporting standard

The format and content of this report follows Australasian Bat Society standards for the interpretation and reporting of bat call data (Reardon 2003), available on-line at http://www.ausbats.org.au/.

Species nomenclature follows Armstrong *et al.* (2020).

Table 1 Bat detector deployment details: Mount Lambie Wind Farm, 19-22 August 2024.

GPS coordinates derived from metadata stored in the WAV files.

Detector	Night	Latitude	Longitude	Total WAV files	Files with calls	Notes
ANABAT Swift SN567879	19/08/2024	-33.4781	149.9528	2	1	
	20/08/2024	-33.4782	149.9528	258	4	
	21/08/2024	-33.4780	149.9530	9	6	
	22/08/2024	-33.4782	149.9528	48	23	
Chorus_C1 SN743582	20/08/2024	-33.4779	149.9395	1010	3	
	21/08/2024	-33.4780	149.9395	39	28	
	22/08/2024	-33.4779	149.9395	24	4	
Chorus_C2 SN743584	19/08/2024	not recorded		0	0	Did not operate
Chorus_C3 SN743583	19/08/2024	-33.4830	149.9561	1	1	
	20/08/2024	-33.4845	149.9634	6	2	
	21/08/2024	-33.4844	149.9633	6	6	
	22/08/2024	-33.4844	149.9633	0	0	

Results & Discussion

The noise filtration process reduced the analysis dataset to just 78 files, each of which contained a single bat call pass.

At least ten and possibly twelve species were detected (see **Table 2**). The positively identified calls were attributed to nine distinct species plus the undifferentiated *Nyctophilus* genus, two species of which –*N. geoffroyi* and *N. gouldi* – potentially occur in the study area.

Most "unresolved" calls belonged to species that were reliably identified from more definitive calls; however, several calls potentially represented one additional species (*Vespadelus troughtoni*) that were not otherwise identified.

Sample spectrograms of each identified call type are presented in **Appendix 1**.

References

Armstrong, K.N., Reardon, T.B., and Jackson, S.M. (2020). A current taxonomic list of Australian Chiroptera. Australasian Bat Society. Version 2020-06-09. URL: http://ausbats.org.au/species-list/4593775065

Australasian Bat Society (2021), *BatMap.* http://ausbats.org.au/batmap. Accessed 8/6/2024.

Baker, A.M. and Gynther, I.C. (editors) (2023). *Strahan's Mammals of Australia*. Fourth Edition; Reed New Holland Publishers; Sydney.

Churchill, S. (2008). *Australian Bats.* Jacana Books, Allen & Unwin; Sydney.

Pennay, M., Law, B., and Reinhold, L. (2004). *Bat calls of New South Wales*: Region based guide to echolocation calls of Microchiropteran bats. NSW Department of Environment and Conservation, Hurstville.

Reardon, T. (2003). Standards in bat detector based surveys. *Australasian Bat Society Newsletter* **20**, 41-43.

Table 2 Bats recorded during the Mount Lambie Wind Farm survey, 19th – 23rd August 2024.

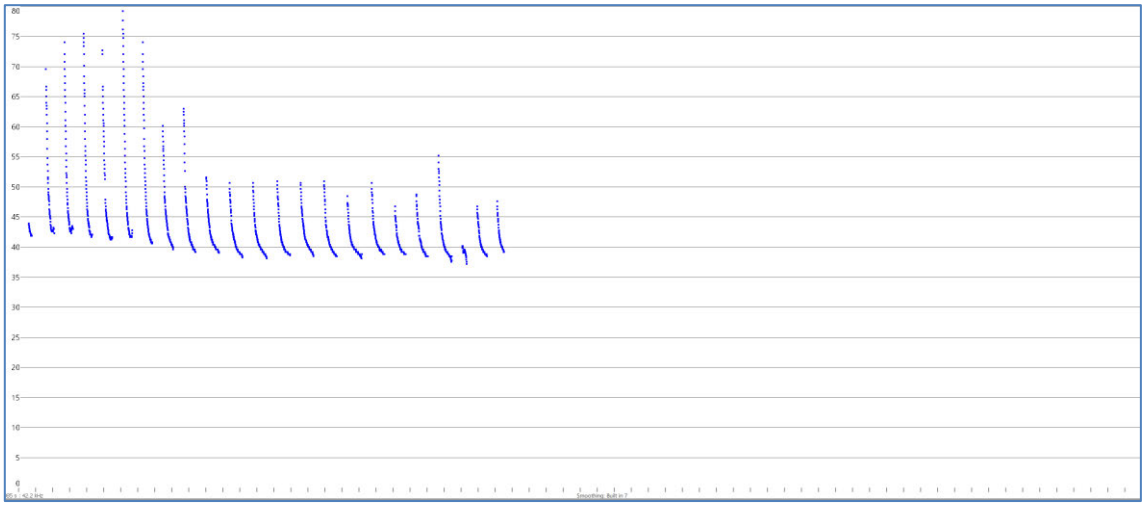
Number of calls allocated to each species and unresolved group.

Detector:	ANABAT Swift_567879				Chorus_C1_743582			Chorus_C3_743583			Species Total
Night:	19-Aug	20-Aug	21-Aug	22-Aug	20-Aug	21-Aug	22-Aug	19-Aug	20-Aug	21-Aug	
Positively identified calls											
Chalinolobus gouldii		1									1
Chalinolobus morio										1	1
Falsistrellus tasmaniensis										1	1
Nyctophilus sp.		1	1	7			2				11
Scotorepens greyii									1		1
Vespadelus darlingtoni			1	4	1		1		1	1	9
Vespadelus regulus						9					9
Vespadelus vulturnus					1	1					2
Miniopterus orianae oceanensis				3						1	4
Ozimops ridei		1									1
Unresolved calls											
V. darlingtoni or *Scotorepens greyii*		1		3				1		1	6
V. darlingtoni or *V. regulus*	1		4	6		16	1			1	29
V. vulturnus or *Vespadelus troughtoni*					1	2					3
Detector-night Total	1	4	6	23	3	28	4	1	2	6	78

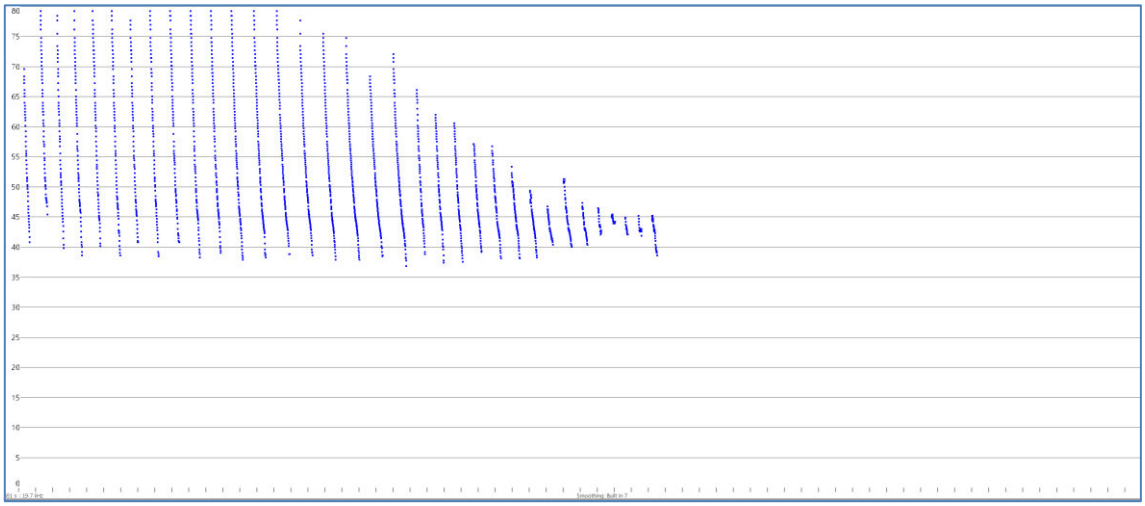
Appendix 1 Representative call sequences recorded at Mount Lambie, 19-23 August 2024.
x-axis = 10 ms per tick-mark; time between pulses removed ("compressed")

Chalinolobus gouldii

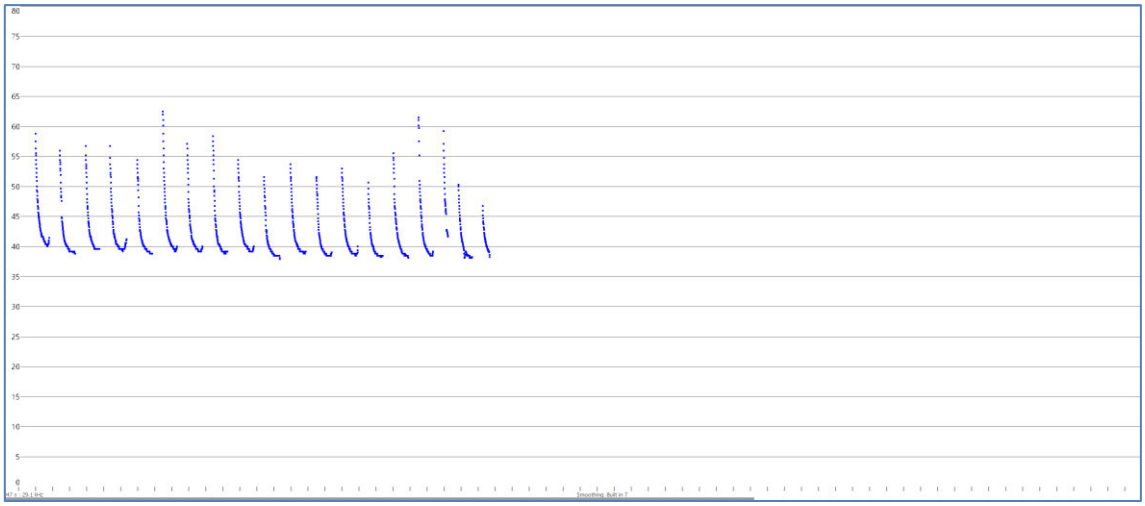
Chalinolobus morio



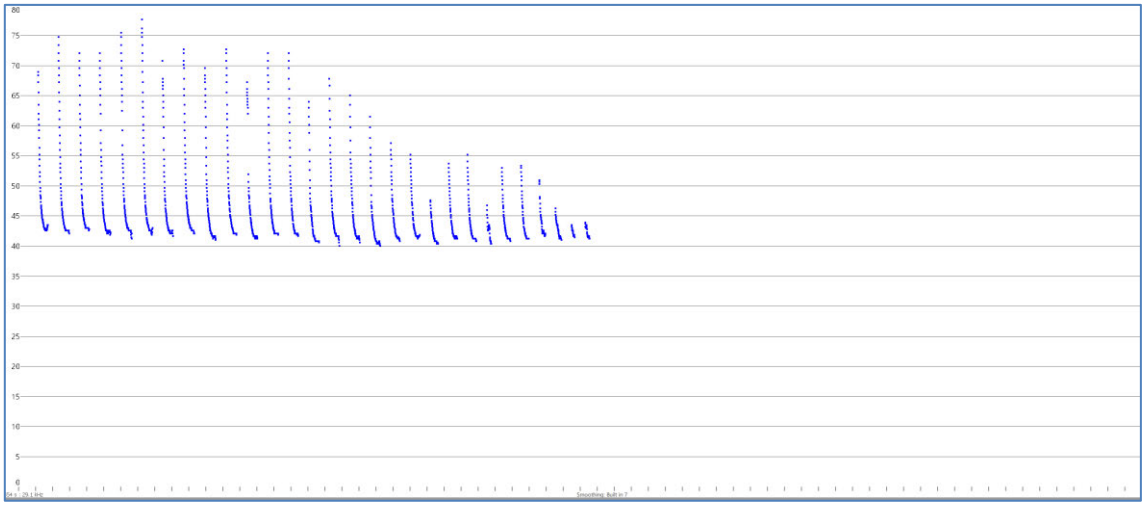
Falsistrellus tasmaniensis



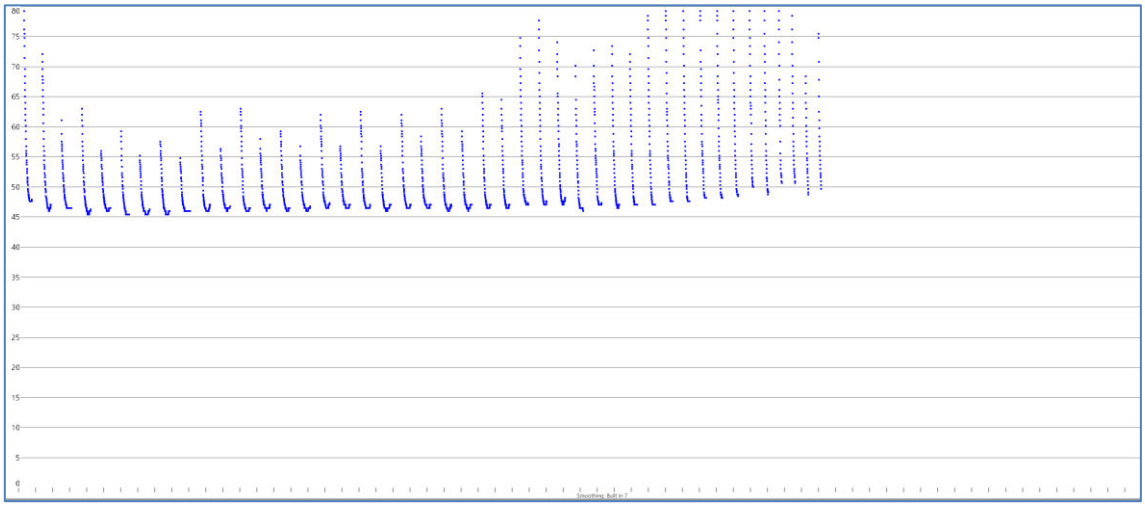
Nyctophilus sp.



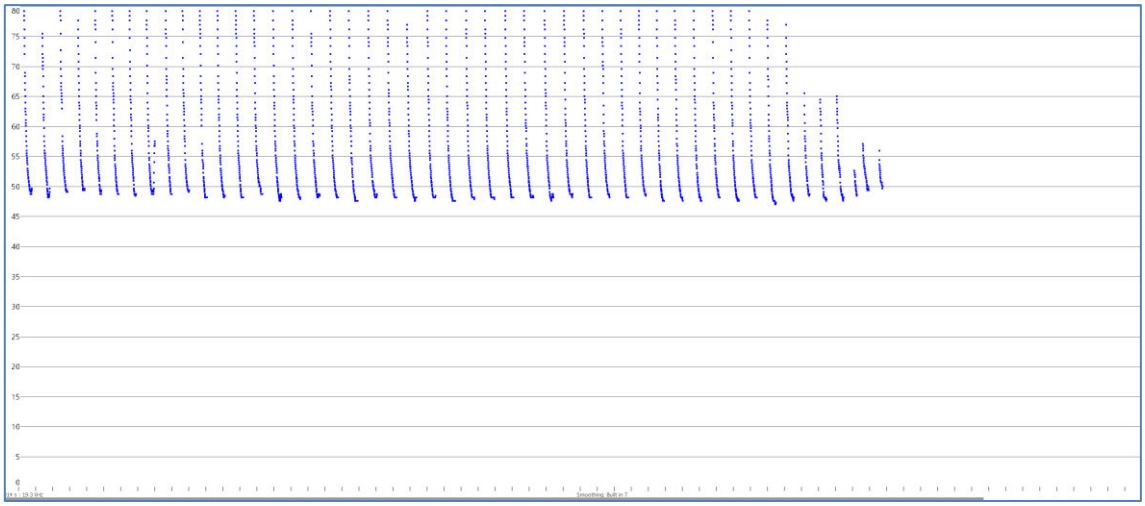
Scotorepens greyii



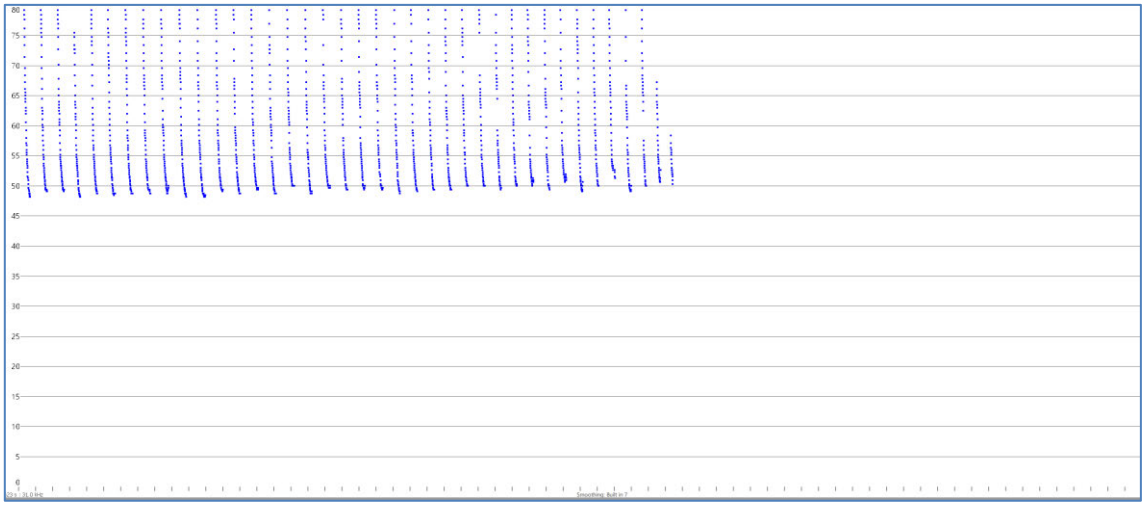
Vespadelus darlingtoni



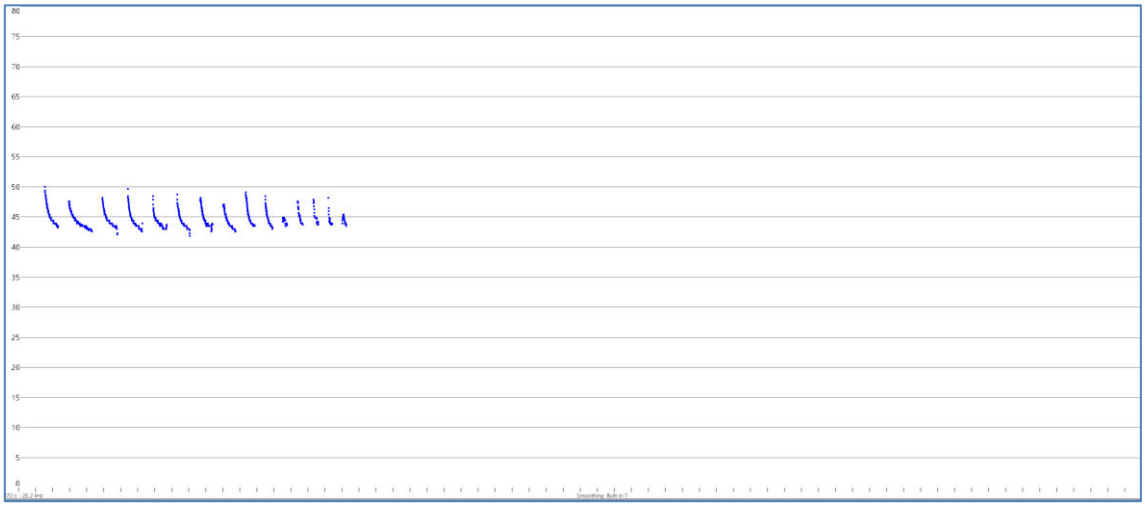
Vespadelus regulus



Vespadelus vulturnus



Vespadelus vulturnus or *V. troughtoni*



Miniopterus orianae oceanensis

Ozimops ridei

Appendix H
Likelihood of Occurrence Assessment

Threatened species, populations and ecological communities, and migratory species (listed under the BC Act, FM Act and/or EPBC Act) that are known, or have potential, to occur within a 10 km radius of the Project area have been considered in this section. The likelihood of occurrence within the Project area of each species or TEC was assessed using the criteria described in Table H-1 and the findings presented in Table H-2. This assessment was undertaken based on previous records, the results of the field survey and known species habitat requirements.

Table H-1 Likelihood of Occurrence Criteria

Likelihood rating	Criteria
Known	The species was recorded within the Survey area during the field surveys.
High	It is likely that a species would inhabit or utilise habitat within the Survey area. Criteria for this category may include: ■ Species recently and/or regularly recorded in contiguous or nearby habitat; ■ High quality habitat or resources present within the Survey area; ■ Species is known or likely to maintain a resident population surrounding the Survey area; and ■ Species is known or likely to visit during migration or in response to seasonal availability of resources present on site.
Moderate	Potential habitat for a species occurs within the Survey area. Criteria for this category may include: ■ Species previously recorded in contiguous habitat albeit not recently (>10 years); ■ Habitat present, but poor quality, depauperate or modified types and/or resources; ■ Species has potential to utilise habitat during migration or seasonal availability of resources; and ■ Cryptic flora species with potential habitat within the Survey area that have not been targeted by surveys (for example, surveys were not undertaken with the flowering season.
Low	It is unlikely that the species inhabits the area, if it did, it would likely be a transient visitor. Criteria for this category may include: ■ The Survey area does not support the specific habitat types or resources required by the species; ■ The Survey area is beyond the current distribution of the species or is isolated from known populations; and ■ Non-cryptic flora species not observed during targeted surveys.
Absent	The habitat within the Survey area is unsuitable for the species.

Table H-2 Likelihood of occurrence

Scientific name	Common name	Conservation status[1]		Number of records	Habitat description[2]	Likelihood of occurrence
		BC Act	EPBC Act			
Flora						
Acacia bynoeana	Bynoe's Wattle	E	V	PMST	Found in central eastern NSW, from the Hunter District south to southern highlands and west to the Blue Mountains. Typically occurs on dry sclerophyll forest on sandy soils. Species prefers open and sometimes disturbed sites such as roadside verges, and grazed areas.	**Low.** No previous records within the Survey area, and Project area. Whilst there is a dominance of sandy soils in the Mount Lambie area, the lack of dry sclerophyll habitat indicates limited habitat suitability. The species was not observed during field survey.
Boronia deanei	Deane's Boronia	V	V	PMST	Deane's Boronia is found in scattered locations in the higher Blue Mountains, north of Clarence and Kanangra-Boyd National Park in NSW. The species grows on the margins of high-altitude swamps (Ollerenshaw 1979), in wet heath (Harden 1991) and in drier open forest (Duretto 2003) on low nutrient, poorly drained peaty soils on sandstone or granite.	**Low.** No previous records within the Survey area and Project area. There is also a lack of habitat suitability due to the absence of wet heath and swamp habitat. The species was not observed during field survey.
Cryptostylis hunteriana	Leafless Tongue-orchid	V	V	PMST	The Leafless Tongue-orchid has been reported to occur in a wide variety of habitats including heathlands, heathy woodlands, sedgelands, *Xanthorrheoa spp.* plains, dry sclerophyll forests (shrub/grass sub-formation and shrubby sub-formation), forested wetlands, freshwater wetlands, grasslands, grassy woodlands, rainforests and wet sclerophyll forests (grassy sub-formation) (Backhouse & Jeanes 1995; Bell 2001; DECC 2005a; Jones 2006; Riley & Banks 2002). Soils are generally considered to be moist and sandy, however, this species is also known to grow in dry or peaty soils (Backhouse & Jeanes 1995; Bell 2001; Brown 2007; Jones 2006; Riley & Banks 2002).	**Low**. No previous records within the Survey area and Project area. There is also a lack of habitat suitability, due to the highly grazed and exotic ground cover. The species was not observed during field survey.
Eucalyptus aggregata	Black Gum	V	V	PMST	Grows on alluvial soils, on cold, poorly drained flats and hollows adjacent to creeks and small rivers. In NSW it occurs in the Southeastern Highlands Bioregion and on the western fringe of the Sydney Basin Bioregion. Black Gum has a moderately narrow distribution, occurring mainly in the wetter, cooler and higher parts of the tablelands.	**High.** Whilst there are no records within the Survey area and Project area, there is habitat suitability due to the presence of alluvial soils throughout the Mount Lambie area, and the presence of several small dams and creeks within the Project area. Species was observed during field survey.
Eucalyptus macarthurii	Camden Woollybutt	E	E	PMST	The Camden woollybutt is indigenous to NSW, where it is recorded on the Boyd Plateau in the southern Blue Mountains area. Occurs in grassy woodland on relatively fertile soils on broad, cold flats and near swamps and streams.	**Low.** No records within the Survey area and Project area. Lack of habitat suitability as the ground cover is highly grazed and exotic, limiting the availability of a grassy woodland that supports this species. The species was not observed during field survey

Scientific name	Common name	Conservation status[1]		Number of records	Habitat description[2]	Likelihood of occurrence
		BC Act	EPBC Act			
Eucalyptus pulverulenta	Silver-leaved Mountain Gum	V	V	3	Populations of the Silver-leaved Mountain Gum occur on the crests or upper slopes of moderately steep hillsides or mountains (Briggs & Leigh 1990; Chippendale 1988), at altitudes of 800 to 1,000 m asl (Peters et al. 1990), usually on well-drained skeletal soils with frequent rock outcrops. The species is usually an understorey plant in open forest or woodland with a canopy height of 5 to 10 m, typically dominated by Brittle Gum (*Eucalyptus mannifera),* Red Stringybark *(E. macrorhynca),* Broad-leafed Peppermint (*E. dives),* Silvertop Ash (*E. sieberi),* Inland Scribbly Gum (*E. rossii*), Red Box (*E. polyanthemos),* Long-leaved Box (*E. goniocalyx*), and Apple Box (*E. bridgesiana*) (Benson & McDougall 1998; NSW OEH 2012a; Peters et al. 1990; Pryor 1981). Plants also occasionally occur in Acacia - Callitris low woodland (Briggs & Leigh 1990).	**Moderate.** Three records present outside the survey and Project area, but within 10 km. Due to the identification of several rocky outcrops and associated species such as *Eucalyptus mannifera* and *Eucalyptis bridgesiana* during field survey, this species presence cannot be discounted.
Eucalyptus robertsonii subsp hemisphaerica	Robertson's Peppermint	V	V	PMST	Robertson's Peppermint is found in closed grassy woodland in locally sheltered sites (Johnson & Hill 1990). Associated species include Red Stringy Bark (*Eucalyptus macrorhyncha*), Scribbly Gum (*E. rossii),* Broad-leaved Peppermint *(E. dives*), Brittle Gum (*E. mannifera)* and Mountain Gum (E. *dalrympleana)* (Benson & McDougall 1998). It is found on lighter soils, often on granite or quartzite, which are often nutrient poor (Benson & McDougall 1998).	**Low.** No records present within the Survey area and Project area. There is a lack of habitat suitability due to the ground cover being predominantly grazed and exotic. There is also a limited availability of associated *eucalypt sp.* The species was not observed during field survey
Euphrasia arguta	-	CE	CE	PMST	Occurs in eucalypt forest with a mixed grass and shrub understorey within Nundle State Forest. The species' previous habitat consisted of grassy areas near rivers at elevations up to 700 m above sea level, with an annual rainfall of 600 mm. The recently discovered populations are in grassy forests or regrowth vegetation	**Low.** No records present within the Survey area and Project area. There is a lack of habitat suitability due to the absence of native grassy areas, as the ground cover is predominantly grazed and exotic. The species was not observed during field survey
Haloragodendron lucasii	Hal	E	E	PMST	Occurs on Hawkesbury Sandstone in moist sandy loam soil. The species prefers sheltered aspects and inhabits gentle slopes below cliff lines near creeks in low open woodland or open forest.	**Low.** Whilst there are no records within the Survey area and Project area, there is habitat suitability due to the sandy soils within the Mount Lambie area, and the presence of rocky outcrops and creek lines which may support this species.
Hibbertia acaulothrix	A guinea flower	E	E	PMST	Hibbertia acaulothrix is found on rocky outcrops and has been recorded growing in *Eucalyptus sieberi* (silvertop ash) woodland or in association with *Allocasuarina littoralis* (black she-oak), *Corymbia gummifera (*red bloodwood), and *Leptospermum trinervium* (flaky-barked tea-tree).	**Moderate.** Whilst there are no records within the Survey area and Project area, there is habitat suitability due to the presence of several rocky outcrops and associated species such as *Allocasuarina sp.*

Scientific name	Common name	Conservation status[1]		Number of records	Habitat description[2]	Likelihood of occurrence
		BC Act	EPBC Act			
Hibbertia cistiflora subsp quadristaminea	-	E	E	PMST	*Hibbertia cistiflora subsp. quadristaminea* has been recorded from two subpopulations in NSW, from the Blue Mountains National Park and on the Newnes Plateau in the Gardens of Stone State Conservation Area (formerly Newnes State Forest).	**Low.** No records within the Survey area and Project area. Lack of geographic suitability as the Project area is outside the known geographic distribution for this species. The species was not observed during field survey
Kunzea cambagei	Cambage Kunzea	V	V	PMST	*Kunzea cambagei* occurs in the western and southern parts of the Blue Mountains. Restricted to damp, sandy soils in wet heath or mallee open scrub at higher altitudes on sandstone outcrops or Silurian group sediments.	**Low.** No records within the Survey area and Project area. Lack of habitat suitability due to the absence of wet heath and mallee open scrub habitat. The species was not observed during field survey
Leionema lachnaeoides	-	E	E	PMST	Populations occur on exposed sandstone cliff tops and terraces, at 960 to 1,000 m altitude and with aspects from south-east to south-west. Habitat vegetation is montane heath and commonly includes *Eucalyptus stricta, Allocasuarina nana*, *Dillwynia retorta, Epacris microphylla and Caustis flexuosa.*	**Low.** No records within the Survey area and Project area. Lack of suitable habitat due to the absence of cliff tops, montane heath habitat and associated vegetation species. The species was not observed during field survey
Lepidium hyssopifolium	Basalt Peppercress	E	E	PMST	Currently, the species is known from near Bathurst and Bungendore, in the South Eastern Highlands Bioregion. Recently recorded localities have predominantly been in weed-infested areas of heavy modification, high degradation and high soil disturbance such as road and rail verges, on the fringes of developed agricultural land or within small reserves in agricultural land. Many populations are now generally found amongst exotic pasture grasses and beneath exotic trees such as the Radiata Pine (*Pinus radiata*) and Monterey Cypress (*Cupressus macrocarpus).*	**Moderate.** Whilst there are no records within the Survey area and Project area, there is geographic and habitat suitability as the Project area is heavily disturbed from cattle and pig grazing and from weed incursion.
Leucochrysum albicans subsp tricolor	Hoary Sunray,	E	E	PMST	The Hoary Sunray occurs at relatively high elevations in woodland and open forest communities, in an area roughly bounded by Goulburn, Albury and Bega. The species occurs in a wide variety of grassland, woodland and forest habitats, generally on relatively heavy soils (Sinclair 2010). Plants can be found in natural or semi-natural vegetation and grazed or ungrazed habitat. Bare ground is required for germination. The unpalatability of this species is likely to protect it in heavily grazed areas where patches of bare ground are likely to develop, favouring recruitment (Gilfedder & Kirkpatrick 1994d, 1994e).	**Low.** No records within the Survey area and Project area. Lack of geographic suitability, as the Project area is outside of species known distribution. The species was also not observed during field survey

Scientific name	Common name	Conservation status[1]		Number of records	Habitat description[2]	Likelihood of occurrence
		BC Act	EPBC Act			
Persoonia hirsuta	Hairy Geebung	E	E	PMST	Persoonia hirsuta occurs in dry sclerophyll forest and woodland with a shrubby understorey (NSW DEC 2007a). It also favours disturbed heath, shrubby thickets and sandstone scrubs (NSW DEC 2007a). Vegetation associations where it has been found include Sydney Sandstone Ridge-top Woodland and Sydney Sandstone Open Forests (NSW DEC 2007a). Canopy species associated with *Persoonia hirsuta* include Hard-leaved Scribbly Gum (*Eucalyptus sclerophylla*), Red Bloodwood (*Eucalyptus gummifera),* Woolly Tea-tree (*Leptospermum trinervium),* Silvertop *Ash (Eucalyptus sieberi),* Grey Gum (*Eucalyptus punctata*), Narrow-leaved Stringybark *(Eucalyptus sparsifolia*), Yellow Bloodwood (*Eucalyptus eximia*) and Golden Banksia (*Banksia ericifolia).*	**Low.** No records within the Survey area and Project area. Lack of habitat suitability due to the absence of a heath, and shrubby understory and the absence of associated canopy, and shrub layer vegetation species. The species was not observed during field survey
Persoonia marginata	Clandulla Geebung	V	V	PMST	Grows in dry sclerophyll forest on sandstone (Harden 1991; Weston 1995b) in heavier clayey, gravelly loam derived from Permian rocks (Blombery & Maloney 1992), at c. 700 m alt. on low ridges (Harden 1991; Blombery & Maloney 1992; Weston 1995b).	**Low.** No records within the Survey area and Project area. Lack of associated soil profile, as the Project area is dominated by a loamy sand topsoil. The species was not observed during field survey.
Pomaderris brunnea	Rufous Pomaderris	E	V	PMST	Grows in open forest (Harden 1990). The species has been found in association with *Eucalyptus amplifolia, Angophora floribunda, Acacia parramattensis, Bursaria spinosa and Kunzea ambigua* (Maryott-Brown & Wilks 1993).	**Low.** No records within the Survey area and Project area, however there are some occurrences of associated species such as *Bursaria spinosa.*
Pomaderris cotoneaster	Cotoneaster Pomaderris	E	E	PMST	Usually growing on shallow soils with outcropping rock, often associated with clifflines (above, on or below) or riverbanks. The species occurs in dry, shrubby open forest on north-west to south-west facing slopes.	**Low.** No records within the Survey area and Project area. Lack of suitable habitat due to the absence of cliff lines. The species was not observed during field survey
Prasophyllum sp. *Wybong*	a leek-orchid	-	CE	PMST	Highly restricted, estimated area of occupancy of 1.5 km^2. Known from seven populations in open eucalypt woodland and grassland in NSW, near Ilford, Premer, Muswellbrook, Wybong, Yeoval, Inverell and Tenterfield. Distribution of this species overlaps with the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland EPBC Act-listed TEC.	**Low.** No records within the Survey area and Project area. Lack of geographic suitability, as the Project area is outside of species known distribution. The species was not observed during field survey

Scientific name	Common name	Conservation status[1]		Number of records	Habitat description[2]	Likelihood of occurrence
		BC Act	EPBC Act			
Pultenaea glabra	Smooth Bush Pea	V	V	PMST	The Smooth Bush-pea is restricted to the higher Blue Mountains and has been recorded from the Katoomba-Hazelbrook and Mount Victoria areas, with unconfirmed sightings in the Mount Wilson and Mount Irvine areas (NSW OEH 2012u). Grows on swamp margins, hillslopes, gullies and creekbanks at 400 to 1,000 m altitude, with an annual rainfall of 700 to 1,400 mm. It grows in sandy loam on sandstone, with low nutrients (Benson & McDougall 1996), in dry sclerophyll forest (Harden 1991), tall damp heath (NSW OEH 2012u) or in open forest and scrub, on protected slopes	**Low.** No records within the Survey area and Project area. The Project area is within the geographic distribution, however suitable habitat for this species along creek banks is highly eroded and trampled by cattle. There are also suitable soil profiles within the Project area to support this species.
Rhizanthella slateri	Eastern Underground Orchid	V	E	PMST	Grows in sclerophyll forest in shallow to deep loams. Collections tend to be accidental, and it is not possible to determine distribution accurately; recorded for the Blue Mtns, also Bulahdelah south to Dharug N.P.	**Low**. No records within the Survey area and Project area and lack of suitable sclerophyll habitat present. The species was not observed during field survey
Swainsota recta	Small Purple Pea	E	E	PMST	Small Purple-pea occurs predominantly in grassy woodlands, but sometimes extends into grassy open-forest. The native understory at most sites is dominated by *Themeda triandra* (Kangaroo Grass), *Poa sieberiana* (Snow Grass) and *Stipa spp*. (Spear Grass).	**Low.** No records within the survey and Project area and lack of a native understory present to support this species, due to it being predominantly grazed by cattle and pigs and weed infested. The species was not observed during field survey
Thesium australe	Austral Toad-flax	V	V	PMST	Once widespread across Victoria, but all recent collections are from highland areas in the vicinity of Wulgulmerang and it is believed to have become extinct across most of its Australian range due to loss of habitat and grazing. Grows in grasslands, woodlands and herbfields, usually in damp situations.	**Low**. No records within the survey and Project area, and outside current known distribution for this species. The species was not observed during field survey
Xerochrysum palustre	Swamp Everlasting	-	V	PMST	Grows in swamps and bogs which are often dominated by heaths. Also grows at the edges of bog margins on peaty soils with a cover of shrubs or grasses.	**Low.** No records within the survey and Project area and lack of associated habitat such as swamps and heaths. The species was not observed during field survey
Zieria obcordata	Granite Zieria	E	E	PMST	This species grows in eucalypt woodland or shrubland dominated by species of *Acacia o*n rocky granite hillsides. It also occurs in *Eucalyptu*s and *Callitris* dominated woodland with an open, low shrub understorey growing on moderately steep, mainly west to north-facing slopes in sandy loam amongst granite boulders. The altitude range of sites is 500 to 830 m.	**Low.** No records within the survey and Project area, the species is only known from two locations, one of which is Crackerjack Rock/Rock Forests area north west of Bathurst and approximately 50 km west of the Project Area. Likelihood of occurrence in the Project area is considered to be Low.

Scientific name	Common name	Conservation status[1]		Number of records	Habitat description[2]	Likelihood of occurrence
		BC Act	EPBC Act			
Fauna						
Amphibians						
Helioporus australiacus	Giant burrowing frog	V	V	PMST	The giant burrowing frog occurs in areas of native vegetation (Penman et al., 2004) and can be found in heath, woodland and open dry sclerophyll forest on a variety of soils, except clay-based soils (OEH, 2012). The species has not been recorded from cleared land.	**Low**. No records within the survey and Project area. Whilst there are several dams and creek lines, these are within a bad condition due to being grazed and devegetated by cattle, and they are disturbed from the growth of exotic forbs. Therefore, there is a lack of suitable sheltering and breeding habitat as the species requires dense native vegetation for survival. The species was not observed during field survey.
Litoria booroolongensis	Booroolong Frog	E	E	PMST	The Booroolong Frog lives exclusively along rocky sections of permanent streams in wet and dry forest, woodland, and cleared grazed land. The species is reliant on permanent running water and does not occupy ephemeral streams, or streams that have dried during severe drought (Hunter & Smith 2006; Hunter 2007; D Hunter unpub data cited in OEH 2012; Hunter & Smith 2013).	**Low**. No records within the survey and Project area. Whilst there are several dams these are only periodically wet, and semi- permanent. Likewise, the creek- lines are disturbed from the growth of exotic forbs and grazing. Therefore, there is a lack of suitable sheltering and breeding habitat as the species requires dense native vegetation for survival. The species was not observed during field survey.
Litoria castanea	Yellow-spotted Tree Frog	CE	CE	PMST	The Yellow-spotted Tree Frog has been found in permanent ponds, swamps, lagoons, farm dams and the still backwaters of slow flowing streams usually with emergent vegetation such as tall reeds or with overhanging grassy banks (Courtice & Grigg 1975; White & Ehmann 1997a, b).	**Low**. No records within the survey and Project area. Whilst there are several dams and creek lines, these are within a bad condition due to being grazed and devegetated by cattle, and they are disturbed from the growth of exotic forbs. Therefore, there is a lack of suitable sheltering and breeding habitat as the species requires dense native vegetation for survival. The species was not observed during field survey.
Littoria littlejohni	Northern Heath Frog	E	E	PMST	Forest-dependent species that has been recorded from a range of natural forest vegetation types (wet and dry forest, woodland, bushland, and heathland) at mid to high elevations. The species has never been recorded from areas of cleared native forest, such as farmland or forest plantations	**Low**. No records within the survey and Project area. Whilst there are several dams and creek lines, these are within a bad condition due to being grazed and devegetated by cattle, and they are disturbed from the growth of exotic forbs. Therefore, there is a lack of suitable sheltering and breeding habitat as the species requires dense native vegetation for survival. The species was not observed during field survey.

Scientific name	Common name	Conservation status[1]		Number of records	Habitat description[2]	Likelihood of occurrence
		BC Act	EPBC Act			
Mixophyes balbus	Stuttering Frog	E	V	PMST	The Stuttering Frog inhabits rainforest, Antarctic beech and wet sclerophyll forests (Cogger 2000). The species depends on freshwater streams and riparian vegetation for breeding and habitation. No records are known from riparian habitat that has been disturbed	**Low**. No records within the survey and Project area. Whilst there are several dams and creek lines, these are within a bad condition due to being grazed and devegetated by cattle, and they are disturbed from the growth of exotic forbs. Therefore, there is a lack of suitable sheltering and breeding habitat as the species requires dense native vegetation for survival. The species was not observed during field survey.
Birds						
Anthochaera phrygia	Regent Honeyeater	CE	CE	PMST	Primarily occurs in box-ironbark woodland, but also occurs in other forest types. Mainly feeds on nectar from eucalypts and mistletoes with movements governed by the flowering of select eucalypt species.	**Moderate.** Whilst there are no records within the survey and Project area, there were several mistletoes identified within the Project area, alongside *Eucalyptus melliodora* which is a favoured feed tree by the species. Therefore, there may be suitable feeding and foraging habitat. The species occasional presence cannot be discounted
Aphelocephala leucopsis	Southern Whiteface	V	V	PMST	Dry open forests and woodland and inland scrubs of mallee, mulga and saltbush are the preferred habitat of Southern Whiteface, especially areas with fallen timber or dead trees and stumps.	**Low**. No records within the survey and Project area. Lack of suitable habitat such as scrubs of mallee, mulga and salt bush present. The species was not observed during field survey.
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V		6	Primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland.	**Moderate.** A total of 6 previous species records occur within the 10 km search area. Suitable eucalypt forest and woodland was recorded within the Survey area, as such there is the potential that the species occurs within the Project area.
Botaurus poiciloptilus	Australasian Bittern	E	E	PMST	Frequents reedbeds, and other vegetation in water such as cumbungi, lignum and sedges.	**Low**. No records within the survey and Project area. Lack of suitable habitat due to the absence of suitable creek side native vegetation as it is highly degraded from weed invasion. The species was not observed during field survey.
Calidris acuminata	Sharp-tailed Sandpiper	-	V, M, Mi, C, J, K	PMST	Prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.	**Low**. No records within the survey and Project area. Lack of suitable wetland habitat and vegetation present. The species was not observed during field survey.

Scientific name	Common name	Conservation status[1]		Number of records	Habitat description[2]	Likelihood of occurrence
		BC Act	EPBC Act			
Calidris ferruginea	Curlew Sandpiper	E	CE, M, Mi, C, J, K	PMST	Intertidal mudflats in sheltered coastal areas. Non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms.	**Low**. No records within the survey and Project area. Lack of suitable habitat as the Project area is inland and does not support coastal habitat. The species was not observed during field survey
Callocephalon fimbriatum	Gang-gang Cockatoo	E	E	PMST	During summer, the Gang-gang Cockatoo is found in tall mountain forests and woodlands, with dense shrubby understoreys. In winter, Gang-gangs would move to lower altitudes into drier, more open forests and woodlands. At this time, they may be seen by roadsides and in parks and gardens of urban areas. They require tall trees for nest hollows.	**Known**. Species was heard during field survey. Suitable habitat present including several stags and hollows.
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	V	V	2	Species almost exclusively feeds on the seeds of Black Sheoak (*Allocasuarina littoralis*) and Forest Sheoak (*A. torulosa*) and most often found in woodlands and open forests dominated by sheoaks. Belah (*Casuarina glauca* and *Acacia excelsa*) is also utilised and may be a critical food source for some populations.	**Known.** Two records present within the Project area, observed in 2019. There is suitable habitat in the Project area due to the presence of several *Allocasuarina sp,* which is suitable feeding and foraging habitat.
Chthonicola sagittata	Speckled Warbler	V		1	Lives in a wide range of Eucalyptus dominated communities that have a grassy understorey, often on rocky ridges or in gullies.	**Low.** There is one record within 10 km of the Project area. There is also a lack of a native grassy understorey as the Project area is highly disturbed from weed incursion and grazing. The species was not observed during field survey.
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V	V	PMST	Endemic to eastern Australia. Mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (*Eucalyptus camaldulensis*) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses. Usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging.	**Low**. No records within the survey and Project area. Lack of suitable habitat due to the absence of grassy understory as the Project area is highly degraded, and also does not support an understory of saltbush, lignum, cumbungi and native grasses. The species was not observed during field survey.
Daphoenositta chrysoptera	Varied Sittella	V, P	-	4	The Varied Sittella is sedentary and has a continuous distribution in NSW from the coast to the far west. It inhabits eucalypt forest and woodlands specifically rough barked species and Acacia woodlands.	**Moderate.** Four records present not within the survey and Project area but within 10 km. The presence of a woodland with a canopy dominated by *Eucalyptus* and *Acacia* species may suggest that suitable habitat for this species is present, so its occasional presence cannot be discounted.

Scientific name	Common name	Conservation status[1]		Number of records	Habitat description[2]	Likelihood of occurrence
		BC Act	EPBC Act			
Falco hypoleucos	Grey Falcon	V	V	PMST	Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast.	**Low.** No records within the Survey area or Project area. There is also a lack of quality shrub and grassland habitat. The species was not observed during field survey.
Gallinago hardwickii	Latham's Snipe	-	V, M, Mi, J, K	PMST	Occurs in a range of permanent and ephemeral wetlands including freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies)	**Low.** No records within the Survey area or Project area. There is also a lack of permanent and ephemeral wetland habitat. The species was not observed during field survey.
Grantiella picta	Painted Honeyeater	V	V	PMST	Found in dry open forests and woodlands and is strongly associated with mistletoe. During the winter it is more likely to be found in the north of its distribution. Inhabits Boree/ Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*) and Box-Gum Woodlands and Box-Ironbark Forests. Feeds on the fruits of mistletoes in woodland *Eucalyptus* and *Acacias*. Prefers *Amyema* mistletoes. Nests spring to autumn, hanging within the outer canopy of drooping eucalypts, she-oak, paperbark or mistletoe.	**Moderate.** Whilst there are no records within the survey and Project area, there were several mistletoes identified within the Project area, alongside *Eucalyptus melliodora* which is a favoured feed tree by the species. Therefore, there may be suitable feeding and foraging habitat. The species occasional presence cannot be discounted
Haliaeetus leucogaster	White-belled Sea Eagle	V		3	Habitat generally characterised by presence of large areas of open water sources including swamps, rivers, lakes and the sea. Terrestrial habitat includes coastal dunes, tidal flats, grassland, heathland, woodland and forest. Breeding within mature open forest, tall woodland and swamp sclerophyll forest close to foraging habitat.	**Low.** The Project area does not intersect a large open water source or preferred habitat features considered to support the species. Whilst there is a large Reservoir located approximately 6 km north of the Project area, it is considered that the species is unlikely to consistently utilise any terrestrial habitat or depend on habitat within the Project area.
Hirundapus caudacutus	White-throated Needletail	-	V, M, Mi, C, J, K	PMST	Widespread in eastern and south-eastern Australia. Migrates to Australia from October to April from its breeding grounds in central Asia and Southern Siberia. Overhead around hilltops and timbered ranges. Feeds on airborne insects. Only occasionally roosts in trees.	**Low.** No records within the Survey area or Project area. There is also a lack of suitable hilltop habitat. The species was not observed during field survey.
Lathamus discolor	Swift Parrot	E	CE, M	PMST	Breeds in Tasmania and overwinters in Victoria. Found in dry sclerophyll forests and woodlands, suburban parks and gardens where it feeds on the nectar of flowering eucalypts, namely Grey, Red Ironbark, Mugga Ironbark, Yellow Gum and White Box. Also feed on lerp psyllids amongst Red Gum.	**Low.** No records within the Survey area or Project area. There is also a lack of suitable habitat due to the absence of favoured feed trees such as Ironbark Forest. The species was not observed during field survey.

Scientific name	Common name	Conservation status[1]		Number of records	Habitat description[2]	Likelihood of occurrence
		BC Act	EPBC Act			
Leipoa ocellata	Malleefowl	E	E	PMST	Malleefowl live in semi-arid shrublands and low woodlands, usually dominated by mallee eucalypts and/or acacias (Benshemesh 2007). They require a sandy substrate and abundant leaf litter for breeding.	**Low.** No records within the Survey area or Project area. There is also a lack of suitable habitat due to the absence of semi-arid habitat and mallee E*ucalyptus* species. The species was not observed during field survey.
Melanodryas cucullata cucullata	South-eastern Hooded Robin	E	E	PMST	Found in lightly timbered woodland, mainly dominated by acacia and/or eucalypts.	**Low.** No records within the Survey area or Project area. Limited *Acacia* habitat available. The species was not observed during field survey.
Neophema pulchella	Turquoise Parrot	V	-	PMST	Favours open, grassy woodland with dead trees near permanent water. It also inhabits coastal heaths and pastures with exotic grasses and weeds, along roadsides and in orchards.	**Low.** No records within the Survey area or Project area. There is also a lack of suitable coastal heath habitat. The species was not observed during field survey.
Ninox strenua	Powerful Owl	V		1	Occurs in open forests and woodlands, as well as along sheltered gullies in wet forests with dense understoreys, especially along watercourses. Will sometimes be found in open areas near forests such as parks and suburban areas. Needs old growth trees to nest.	**Moderate.** Limited species records within the 10 km search area. However, the Project area supports intact and extensive areas of forest, as such there is the potential that the species occurs.
Oxyura australis	Blue-billed Duck	V		1	Almost wholly aquatic. Non-breeding flocks congregate on large, deep open freshwater dams and lakes in autumn.	**Low.** Limited species records within the 10 km search area. The Survey area did not support high quality aquatic habitat that is considered to attract the species or support an ongoing population within the Project area.
Polytelis swainsonii	Superb Parrot	V	V	PMST	Inhabit Box-Gum, Box-Cypress-pine and Boree woodlands and River Red Gum Forest. Superb Parrots nest in tree hollows with an entrance diameter of 6 cm or wider, and that are at least 3.5 m above the ground.	**Low.** No records within the Survey area or Project area. There is also a lack of associated vegetation communities within the Project area. The species was not observed during field survey.
Pycnoptilus floccosus	Pilotbird	V	V	PMST	Pilotbirds are found in the ground level of wet forests on coastal mountain ranges and in moist gullies timbered with mature gumtrees and with a dense understorey of bracken, low shrubs or tree ferns.	**Low.** No records within the Survey area or Project area. There is also a lack of wet forest and coastal mountain range habitat, as the Project area is predominantly inland. The species was not observed during field survey.
Petroica boodang	Scarlet Robin	V		5	Primarily occurs in dry eucalypt forests and woodlands with an open and grassy understorey with few scattered shrubs. Prefers habitat with abundant logs and fallen timber	**Low.** There are limited species records within the Project area and the ground later lacks native grassy understorey or suitable habitat features considered to attract or support the species.

Scientific name	Common name	Conservation status[1]		Number of records	Habitat description[2]	Likelihood of occurrence
		BC Act	EPBC Act			
Petroica phoenicea	Flame Robin	V	-	4	Occurs in clearings or open areas with open understoreys with a ground layer dominated by native grasses and a sparse shrub layer. Occasionally occurring in temperate rainforest and moist tall eucalypt woodland on slopes and ridges.	**Low.** There are records within 10 km of the Project area, however none have been documented within the Survey area or the Project area. There is also a lack of a native grassy understorey as the Project area is highly disturbed from weed incursion and grazing. The species was not observed during field survey.
Rostratula australis	Australian Painted-snipe	E	E, M	PMST	Inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. Also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains.	**Low.** No records within the Survey area or Project area. There is also a lack of freshwater wetland and swamp habitat. The species was not observed during field survey.
Stagonopleura guttata	Diamond Firetail	V	V	1	Found in open grassy woodland, heath and farmland or grassland with scattered trees	**Low.** One record within the Project area. There is also a lack of a native grassy understorey as the Project area is highly disturbed from weed incursion and grazing. The species was not observed during field survey.
Stictonetta naevosa	Freckled Duck	V		1	Prefers permanent fresh water swamps and creeks with heavy growth of cumbungi (bullrushes), lignum or tea-tree.	**Low.** Despite the occurrence of several isolated farm dams, there is limited suitable habitat to support the species.
Mammal						
Chalinolobus dwyeri	Large-eared Pied Bat	V	E	PMST	The species' current distribution is poorly known. Found mainly in areas with extensive cliffs and caves, from Rockhampton in Queensland south to Bungonia in the NSW Southern Highlands. It is generally rare with a very patchy distribution in NSW. There are scattered records from the New England Tablelands and North West Slopes. Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (*Petrochelidon ariel*). Found in well-timbered areas containing gullies.	**Low.** No records within the Survey area or Project area but the presence of a number of tree hollows and rocky outcrops may provide suitable roosting habitat.
Dasyurus maculatus	Spotted-tailed Quoll	V	E	1	Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Den sites: Hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces. Traverse home ranges along densely vegetated creek lines.	**Moderate.** One record present, north of the Project area, within 10 km. The most recent record was in 2006. The presence of rocky outcrops and hollows within the Project area may provide suitable den sites for this species. Therefore, the species occasional presence cannot be discounted.

Scientific name	Common name	Conservation status[1]		Number of records	Habitat description[2]	Likelihood of occurrence
		BC Act	EPBC Act			
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	-	ANABAT	Prefers moist habitats, with trees taller than 20 m. Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings. Hunts beetles, moths, weevils and other flying insects above or just below the tree canopy. Hollow trunks of Eucalypt trees over 20 m high in wet sclerophyll forest and coastal mallee. Occasional old wooden buildings. Nocturnal species that flies fast and direct in a fixed horizontal plane with sudden darting changes in course. Hunts and feeds within or just above the tree canopy. Hibernates in winter. Females give birth to one single young in December.	**Known.** The species was recorded with ANABATs in the Survey area in August 2024.
Miniopterus oranae oceanensis	Large Bent-winged Bat	V	-	ANABAT	The Large Bent-winged Bat occurs in caves, which are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. It forms discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young. Maternity caves have very specific temperature and humidity regimes. At other times of the year, populations disperse within about 300 km range of maternity caves. Cold caves are used for hibernation in southern Australia. Breeding or roosting colonies can number from 100 to 150,000 individuals. Hunt in forested areas, catching moths and other flying insects above the tree tops.	**Known.** The species was recorded with ANABATs in the Survey area in August 2024.
Nyctophilus corbeni	Corben's Long-eared Bat	V	V	PMST	Inhabits a variety of vegetation types, including mallee, bulloke *Allocasuarina leuhmanni* and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland. Roosts in tree hollows, crevices, and under loose bark.	**Low.** While several tree hollows and rocky outcrops may provide suitable roosting and breeding habitat, the Project area is well outside the known/likely published distribution of the species (DCCEEW 2025). The attached bat call analysis report (Appendix G) notes *Nyctophilus sp* calls recorded during the preliminary survey would be attributable to either *N. geoffroyi* or *N. gouldi*.

Scientific name	Common name	Conservation status[1]		Number of records	Habitat description[2]	Likelihood of occurrence
		BC Act	EPBC Act			
Petauroides volans	Greater Glider (southern and central)	E	E	13	Occurs most commonly in tall, moist eucalypt forests and woodlands with old trees and abundant hollows.	**Moderate.** A total of 13 records occur within the 10 km desktop search area. The species has the potential to occur in tree hollows, trees with fissures and stags may provide suitable foraging and sheltering habitat.
Petaurus australis australis	Yellow-bellied Glider	-	V	PMST	Found at altitudes between sea level to 1400 m above sea level. Tall mature eucalypt forest, high rainfall and nutrient rich soils. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south.	**Low.** No records within the Survey area or Project area. Lack of suitable tall eucalypt forest habitat and coastal forest habitat, as the Project area is inland. The species was not observed during field survey.
Petrogale penicillata	Brush-tailed Rock-wallaby	E	V	PMST	Rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north; Land within 1 km of rocky escarpments, gorges, steep slopes, boulder piles, rock outcrops or cliff lines. Shelter or bask during the day in rock crevices, caves and overhangs. Browse on vegetation in and adjacent to rocky areas eating grasses and forbs as well as the foliage and fruits of shrubs and trees.	**Low.** No records within the Survey area or Project area. Lack of suitable escarpment and cliff network habitat for this species to survive. Only marginal rocky outcrop habitat, however these are isolated from larger cliff lines. Also lack of suitable feeding grasses available due to high weed incursion and grazing. The species was not observed during field survey.
Phascolarctos cinereus	Koala	E	E	2	Occurs in a range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by species from the genus *Eucalyptus*. Home range size varies according to quality of habitat, ranging from less than two ha to several hundred ha.	**Moderate.** Two previous records not within the study or Project area however, are within 2 km of the Project area. Whilst the Project area intersects disconnected patches of vegetation, a number of locally important trees for Koala occur were recorded within the Survey area, namely Apple Gum, Long-leaved box, Brittle gum, Yellow box, Snow gun, Inland Scribbly gum, Hard-leaved scribbly gum and Rough-barked ribbon gum. As such there is potential that the species occurs within the Project area and the wider landscape.
Pseudomys novaehollandiae	New Holland Mouse, Pookila	-	V	PMST	Found in coastal areas and up to 100 km inland on sandstone country. The species is known to inhabit open heathland, open woodland with a heathland understorey and vegetated sand dunes.	**Low.** No records within the Survey area or Project area. Lack of suitable habitat, as the Project area is inland and does not support coastal habitat. The species was not observed during field survey.

Scientific name	Common name	Conservation status[1]		Number of records	Habitat description[2]	Likelihood of occurrence
		BC Act	EPBC Act			
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	2	Requires foraging resources and roosting sites. The primary food source is blossom from Eucalyptus and related genera but commonly forages on fruit trees in urban areas. Two flying-fox camps are known near the Project area, one in Bathurst (approximately 30 km west) and one in Portland (approximately 12 km north-east) from the Project area.	**Moderate.** Two records within the Project area. The closest roosting camp is over within 20 km from the Project area. Gum trees occur in remnant patches of vegetation and as paddock trees within the Project area which would offer seasonal foraging resources to support this species. No camps of the species were observed during field survey.
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V		3	Occurs in a wide range of habitats, roosts in hollow old trees.	**Low.** There are limited species records within the 10 km search area and the species was not detected on any acoustic recording devices deployed across the Survey area in suitable habitats.
Fish						
Maccullochella macquariensis	Trout Cod	E	E	PMST	Trout Cod tend to occupy areas which have lots of large in-stream woody debris or 'snags', which provide complex habitats for each stage of the species' life cycle	**Low**. There are several key fish habitats forming part of the Murray Darling Basin south within the Project area, including Deadmans Creek, which connects to Solitary creek, a key habitat for freshwater fish communities. However, the creeks within the Project area are highly degraded from cattle plugging and weed incursion and lacks clear water with dense vegetation and woody debris. So the species is more likely to use the creek networks in the wider area.
Maccullochella peelii	Murray Cod	E	V	PMST	The Murray Cod occurs naturally in the waterways of the Murray-Darling Basin (ACT, SA, NSW and Vic) and is known to live in a wide range of warm water habitats that range from clear, rocky streams to slow flowing turbid rivers and billabongs.	**Low**. There are several key fish habitats forming part of the Murray Darling Basin south within the Project area, including Deadmans Creek, which connects to Solitary creek, a key habitat for freshwater fish communities. However, the creeks within the Project area are highly degraded from cattle plugging and weed incursion and lacks clear water with dense vegetation. So the species is more likely to use the creek networks in the wider area.

Scientific name	Common name	Conservation status[1]		Number of records	Habitat description[2]	Likelihood of occurrence
		BC Act	EPBC Act			
Macquaria australasica	Macquarie Perch	E	E	PMST	Macquarie Perch occur in waters with lots of cover such as aquatic vegetation, snags, boulders and overhanging banks.	**Low**. There are several key fish habitats forming part of the Murray Darling Basin south within the Project area, including Deadmans Creek, which connects to Solitary creek, a key habitat for freshwater fish communities. However, the creeks within the Project area are highly degraded from cattle plugging and weed incursion and lacks clear water with dense vegetation. So the species is more likely to use the creek networks in the wider area.
Mogurnda adspersa	Southern Purple-spotted Gudgeon	E under the Fisheries Management Act		N/A	Southern Purple Spotted Gudgeon are a benthic species that can be found in a variety of habitat types such as rivers, creeks and billabongs with slow-moving or still waters or in streams with low turbidity. Cover in the form of aquatic vegetation, overhanging vegetation from river banks, leaf litter, rocks or snags are important for the species.	**Low.** Whilst there is mapped desktop habitat at Solitary Creek for the species, all aquatic habitat within the Survey area is heavily modified and degraded due to cattle pugging, weed incursion and lacks suitable habitat.
Prototroctes maraena	Australian Grayling	V	V	PMST	Australian Grayling spend most of their lives in freshwater, inhabiting rivers and streams, usually in cool, clear waters with a gravel substrate and alternating pool and riffle zones.	**Low**. There are several key fish habitats forming part of the Murray Darling Basin south within the Project area, including Deadmans Creek, which connects to Solitary creek, a key habitat for freshwater fish communities. However, the creeks within the Project area are highly degraded from cattle plugging and weed incursion and lacks clear water with dense vegetation. So the species is more likely to use the creek networks in the wider area.
Reptile						
Aprasia parapulchella	Pink-tailed Worm-lizard	V	V	PMST	Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (*Themeda australis).* Habitat includes rocky outcrops or scattered partly buried rocks in grassland and woodland in south-east Australia. Commonly found beneath small, partially embedded rocks and appear to spend considerable time in burrows below these rocks; the burrows have been constructed by and are often still inhabited by small black ants and termites.	**Moderate.** No records within the Survey area or Project area, however the presence of a number of rocky outcrops and wombat holes, may provide suitable sheltering habitat for this species. There is also an abundance of logs which may provide suitable ground cover habitat. Therefore, this species occasional presence cannot be discounted.

Scientific name	Common name	Conservation status[1]		Number of records	Habitat description[2]	Likelihood of occurrence
		BC Act	EPBC Act			
Eulamprus leuraensis	Blue Mountains Water Skink	E	E	PMST	The Blue Mountains Water Skink is restricted to an isolated and naturally fragmented habitat of sedge and shrub swamps in the Blue Mountains. These swamps form on valley sides and floors where water-bearing strata, constrained by impermeable layers of rock are exposed.	**Low.** No records within the survey and Project area and a lack of suitable swamp habitat for this species to survive. The species was not observed during field survey.
Hoplocephalus bungaroides	Broad-headed Snake	E	E	PMST	Shelters in sandstone rock crevices and under flat rocks on exposed cliff edges during autumn, winter and spring. In summer, this species moves to crevices or hollows in large trees within 500 m of escarpments.	**Moderate.** No records within the Survey area or Project area, however the presence of several rocky outcrops and wombat holes, may provide suitable sheltering habitat for this species. There is also an abundance of logs which may provide suitable ground cover habitat. The presence of several tree hollows can further support this species. Therefore, this species occasional presence cannot be discounted.
Tympanocryptis mccartneyi	Bathurst Grassland Earless Dragon	CE	CE	PMST	A grassland specialist, inhabiting treeless plains and open grasslands. The species has been found along railway tracks, with weedy Paspalum grass thickets, and in vacant paddocks with tall pasture grass (Melville et al. 2019). Within its habitat, apparently prefers areas with a more open structure, characterised by small patches of bare ground between the grasses and herbs.	**Low.** No records within the Survey area or Project area, however the Project area is within the geographic distribution for this species. Given the Project area lacks extensive area of native grassland habitat, it is considered the species is unlikely to occur.
Insect						
Paralucia spinifera	Bathurst Copper Butterfly	E	V	12	The species is found in the area bordered by Bathurst, Portland, Lithgow and Oberon in the Central Tablelands of NSW. Lives in open woodland or open forest with a sparse understorey that is dominated by the shrub native blackthorn – *Bursaria spinosa* subsp. *lasiophylla*.	**Moderate.** Total of 12 records occur within the 10 km search area. The Project area supports suitable habitat due to the dominance of *Bursaria spinosa* within the shrub-layer of the Project area.

Table notes:

1 Act: BC Act = Biodiversity Conservation Act, EPBC Act = Environment Protection and Biodiversity Conservation Act
Status: CE= Critically Endangered, E=Endangered, V=Vulnerable, P=Protected

2 Source of information: SPRAT profiles (DCCEEW 2024a), Species profiles (EHG 2024), PlantNET (2024)

Appendix I
Assessment of Significance

The following assessment of significance (AoS) are presented herein:

- Test of Significance (ToS, also known as five-part test) as detailed in Section 7.3 of the NSW *Biodiversity Conservation Act 2016*. Where significant impacts are identified, preparation of a Biodiversity Development Assessment Report (BDAR) is triggered. The following ToS are provided below:
  - ToS for Gang-gang Cockatoo
  - ToS for Black Gum
- Significant Impact Assessment (SIA) under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*. Where significant impacts are identified, preparation of a referral for submission and approval from the Cth Minister for the Environment is required. The following summary outlines the species assessed and the likelihood of the Project resulting in a significant impact.
  - **Critically Endangered species:**
    - Regent Honeyeater (*Anthochaera phrygia*) – unlikely to be significantly impacted (Table I-3).
  - **Endangered species:**
    - A Guinea Flower (*Hibbertia acaulothrix*) – unlikely to be significantly impacted (Table I-4).
    - Basalt Peppercress (*Lepidium hyssopifolium*) – unlikely to be significantly impacted (Table I-5
    - **Gang-gang Cockatoo (*Callocephalon fimbriatum*) – the Project has the potential to result in a significant impact by the removal of foraging habitat and the potential for turbine collision (Table I-6)**
    - Koala (*Phascolarctos cinereus*) – unlikely to be significantly impacted (Table I-7)
    - Broad-headed Snake (*Hoplocephalus bungaroides*) – unlikely to be significantly impacted (Table I-8)
    - Spotted-tailed Quoll (*Dasyurus maculatus*) – unlikely to be significantly impacted (Table I-9)
    - Greater Glider (southern and central) (*Petauroides volans*) – unlikely to be significantly impacted (Table I-10)
  - **Vulnerable species:**
    - Black Gum (*Eucalyptus aggregata*) – unlikely to be significantly impacted (Table I-11)
    - Silver-leaved Mountain Gum (*Eucalyptus pulverulenta*) – unlikely to be significantly impacted (Table I-12)
    - **South-eastern Glossy Black-Cockatoo (*Calyptorhynchus lathami lathami*) – the Project has the potential to result in a significant impact by the removal of foraging habitat and the potential for turbine collision (Table I-13)**
    - Painted Honeyeater (*Grantiella picta*) – unlikely to be significantly impacted (Table I-14)
    - Bathurst Copper Butterfly (*Paralucia spinifera*) – unlikely to be significantly impacted (Table I-15)
    - Pink-tailed Worm-lizard (*Aprasia parapulchella*) – unlikely to be significantly impacted (Table I-16)
    - Grey-headed Flying-fox (*Pteropus poliocephalus*) – unlikely to be significantly impacted (Table I-17)

NOTE: Calculations presented in regards to impacts to habitat for threatened species are limited to areas of habitat that been ground-truthed during the preliminary ecology survey, and areas within the Indicative Disturbance Footprint (of which 57.1% has been ground-truthed, with the remaining 42.9% based on desktop PCT mapping).

Test of Significance

Table I-1 Test of Significance – Gang-gang Cockatoo

Test of Significance for Gang-gang Cockatoo	
Threatened Species Assessed:	
	Species: Gang-gang Cockatoo (*Callocephalon fimbriatum)* **Listing status under the BC Act: Endangered** **Gang-gang Cockatoo (*Callocephalon fimbriatum)*** **Habitat:** Gang-gang Cockatoos (GGC) primarily occur within the temperate eucalypt forests and woodlands of mainland south-east Australia. The species primarily inhabits mature, wet sclerophyll forests, typically dominated by eucalypts. **Breeding and nesting requirements:** Breeding typically occurs between October and January and is reliant on stands of suitable hollow bearing trees. The species also nests in the hollows of tree trunks and limbs, especially those containing dead branches. **Feeding Ecology:** The species regularly feeds on flower buds, leaf buds, fruits and seeds from both native and introduced ornamental flora species. When feeding on native flora, the species is heavily dependent on *Eucalypt* and *Acacia* species. **Gang-gang Cockatoo Habitat present in the site (i.e. impact area):** The Bionet Vegetation Classification threatened species profiles, indicates that the GGC is associated with PCT 3211, PCT 3347, PCT 3369, PCT 3735, PCT 3367, PCT 3534 and PCT 3747, all of which were identified within the Project area. The total area occupied by suitable PCT habitat in the Survey area is 197.553 ha. The Indicative Disturbance Footprint intersects a total of 30.57 ha of PCTs that provide suitable habitat for the species. Likewise, the Project area has several native habitat trees for the GGC including Snow Gum (*Eucalyptus pauciflora*), Broad-leaved Peppermint (*Eucalyptus dives)* and several *Acacia species* including Silver Wattle *(Acacia dealbata*), Fringed Wattle (*Acacia fimbriata)* and Blackwood (*Acacia melanoxylon).* There were also several hollows and stags identified within the Project area, which may provide suitable nesting and breeding habitat for this species. The GGC was observed in three locations within the Survey area (refer Figure 11).
Test of Significance	
a)	*in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.*
	The GGC was heard during field survey and observed flying overhead and feeding on Broad-leaved Peppermint (*Eucalyptus dives).* Historically, the species has previously been recorded within the Project area and within the 10 km locality. The Indicative Disturbance Footprint would unlikely result in direct impacts to the GGC as since the species is highly mobile and migratory, the species is able to easily relocate to areas of suitable feeding, nesting and breeding habitat. However, the potential removal of hollow bearing trees is considered to adversely affect the life cycle of the species if GGC permanently occur within the Project area. Therefore, the project can avoid causing adverse effect on the life cycle of the GGC if: ■ Critical habitat such as hollow-bearing trees and stags are retained as far as practicable. In the case of vegetation removal, if feed trees are impacted, replanting of feed trees would contribute to long-term availability of food resources for the species. Mitigation measures are to be proposed to avoid and minimise potential direct impacts from occurring, such as from wildlife-turbine collision.
b)	*in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*
	(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or
	Not applicable
	ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.
	Not applicable.

Test of Significance for Gang-gang Cockatoo	
c)	*In relation to the habitat of a threatened species or ecological community:*
	(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and
	The Project area has several native habitat trees for the GGC including Snow Gum (*Eucalyptus pauciflora*), Broad-leaved Peppermint (*Eucalyptus dives)* and several *Acacia sp.* including Silver Wattle *(Acacia dealbata*), Fringed Wattle (*Acacia fimbriata)* and Blackwood (*Acacia melanoxylon).* These trees may provide critical feeding and nesting habitat. Likewise, there is suitable breeding habitat in the form of several small to large hollows. Mitigation measures should be implemented to ensure that habitat removal is minimal. This includes the retention of critical habitat such as feed trees, hollows and stags where possible.
	(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and
	Mitigation measures would be implemented to minimise habitat fragmentation impacts. This includes the retention of critical habitat trees where possible, to ensure that well-connectivity remains with the broader landscape.
	(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,
	Within the Project area, there is critical habitat for the GGC due to the presence of several native feeding and breeding trees including Snow Gum (*Eucalyptus pauciflora*), Broad-leaved Peppermint (*Eucalyptus dives)* and several *Acacia sp* including Silver Wattle *(Acacia dealbata*), Fringed Wattle (*Acacia fimbriata)* and Blackwood (*Acacia melanoxylon).* There are also several medium-large hollows and stags that could further provide nesting and breeding habitat. Therefore, the retention of this native vegetation, and habitat features are important to prevent loss of GGC habitat, and for preventing the increasing isolation of habitat trees. Furthermore, the GGC occupancy recorded during surveys in the Project area indicates the frequent utilisation of the habitat values within the Project area. Therefore, the retention of native trees and habitat features, would not have a positive effect on long-term survival of GGC *per se*, but this action would contribute to long-term survival of the species by securing suitable refuge/feed trees for the species, as they move across the landscape.
d)	*whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).*
	As of 10 September 2024, there are four Areas of Outstanding Biodiversity Value (AOBV) declared under the BC Act. The AOBV are: ■ Gould's Petrel. ■ Little penguin population in Sydney's Harbour. ■ Mitchell's Rainforest Snail in Stotts Island Nature Reserve ■ Wollemi Pine There is no AOBV relevant to Gang-gang Cockatoo and the Survey area is not part of the declared AOBV. Therefore, the Project is unlikely to adversely affect any AOBV.
e)	*whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process*
	Under the BC Act, key threatening processes (KTP) are threats that can adversely affect threatened species or ecological communities or could cause species or ecological communities to become threatened. OEH (2017) Key Threatening Processes strategy lists 38 KTP, of which, the following are likely to be triggered by the project and are relevant to GGC: Anthropogenic Climate Change: Loss of canopy cover would reduce cooling effect provided by the trees. Clearing of native vegetation: Clearing of native vegetation could remove critical nesting and breeding habitat. Native vegetation impacts should be avoided as much as possible. Loss of hollow bearing trees: Removal of hollow bearing trees could reduce the availability of nesting and breeding habitat. All hollow bearing trees should be retained. Removal of dead wood and dead trees: Removal of stags could reduce the availability of perching habitat. All stags should be retained. Invasion, establishment and spread of Lantana, *Lantana camara*. Hygiene protocol to be implemented for plant, machinery and PPE for prevention of introduction of exotic plants into the Project area and adjacent vegetation Triggering the above listed KTP might be avoided or minimised by implementing adequate mitigation measures, including replanting canopy with native trees, sediment and erosion controls, hygiene protocols and weed management plan.

Test of Significance for Gang-gang Cockatoo	
Conclusion	
	Due to the presence of GGC habitat, it is recommended that habitat values within the Project area including hollow-bearing trees, stags and native vegetation are retained as far as practicable. Where residual impacts cannot be avoided, replanting of habitat and feed trees should be part of the mitigation measures to ensure long-term availability of resources for the GGC in the locality. Likewise, mitigation measures would need to be implemented to reduce the likelihood of GGC wind-turbine collision as the species is highly mobile. Information on flight heights of GGC gathered during formal bird and bat surveys to be undertaken in the Project area would inform such measures.
References	
DAWE (2022a) Conservation advice for *Callocephalon fimbriatum* (Gang-gang Cockatoo) combined populations of Queensland, New South Wales and the Australian Capital Territory. Australian Government via Department of Agriculture, Water and the Environment DCCEEW (2024c) Species Profile and Threats Database. *Callocephalon fimbriatum* (combined populations of Qld, NSW and ACT) – Gang-gang Cockatoo (combined populations of Queensland, New South Wales and the Australian Capital Territory). SPRAT Profile. On-line resource accessed via: **Callocephalon fimbriatum — Gang-gang Cockatoo (environment.gov.au)** EHG (2024) NSW BioNet Atlas and BioNet Vegetation Classification application. NSW Department of Environment and Heritage. On-line resources accessed via: **https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/nsw-bionet** DoE (2013) Matters of National Environmental Significance. Significant Impact Guidelines 1.1 – Environment Protection and Biodiversity Conservation Act 1999. Australian Government via Department of Environment. DCCEEW (2024c) Gang-gang Cockatoo – Species Profile. NSW Department of Climate Change, Energy, the Environment and Water via Environment and Heritage. On-line resource accessed via: **Gang-gang Cockatoo - profile | NSW Environment, Energy and Science** NSW TSSC (2022) *Callocephalon fimbriatum* (Gang-gang Cockatoo) Goldfuss 1817 – Endangered Species Listing. NSW Threatened Species Scientific Committee Final Determination. OEH (2018a) Threatened Species Test of Significance Guidelines. NSW Department of Planning and Environment.	

Table I-2 Test of Significance – Black Gum

Test of Significance for Black Gum	
Threatened Species Assessed:	
	Species: Black Gum (*Eucalyptus aggregata*) **Listing status under the BC Act: Vulnerable** **Habitat:** Black gum is endemic to south-eastern Australia and is found in the ACT, NSW and in a small isolated sub-population in Victoria. The species occurs mainly in the wetter, cooler and higher parts of the tablelands (NSW OEH, 2013) and is found at altitudes of 600 to 1,200 m and in areas with annual rainfall of 600 to 900 mm. **Black Gum Habitat present in the site (i.e. impact area):** The Bionet Vegetation Classification threatened species profiles, indicates that Black Gum is associated with PCT 3347, which is identified within the Project area. The species was observed along Curly Dick Road, and within 5 m of the Project area. Additional surveys are required to confirm habitat within the Project area and footprint.
Test of Significance	
a)	*in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.*
	The species was observed along Curly Dick Road. and within 5 m of the Project area. The species was not observed within the Survey area. There were no records, included within Bionet Atlas records, within the Survey area, Project area and within 10 km. The project would not result in direct impacts to Black Gum trees as the species was not observed within the Survey area. Indirect impacts may include minor tree trimming works, root impacts or the potential removal of these trees, due to pre-construction works such as road widening to allow for the easy passage of large machinery. Overall, it is unlikely that the project would have an adverse effect on the life cycle of the species as: ■ No trees or habitat were identified within the Survey area. ■ Mitigation measures are proposed to avoid and minimise potential indirect impacts from occurring, such as implementing tree protection zones, flagging roadside trees to mark their retention and replanting removed trees
b)	*in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:*
	(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or
	Not applicable
	ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.
	Not applicable.
c)	*In relation to the habitat of a threatened species or ecological community:*
	(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and
	There would be no direct impacts to Black Gum, as the species was not observed within the Project area. Indirect impacts may include minor tree trimming works, or in some cases removal of the trees along the roadside. Mitigation measures would be implemented to ensure that if impacts are to occur, it would be minimal. This includes the retention of as many threatened habitat trees as possible, and the implementation of tree protection zones.
	(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and
	Black Gum was not observed within the Project area, and therefore Black Gum habitat would not be impacted by fragmentation or isolation. There are, however, roadside trees which may be indirectly impacted by pre-construction works such as road widening to allow for the safe passage of large machinery and equipment. As there are no records for this species within 10 km of the Project area, this indicates that the species is already within an isolated patch. Mitigation measures would be implemented to reduce further isolation, including the retention of as many trees as possible, the implementation of tree protection zones, taping and flagging trees to mark retention and the replanting of removed trees.

Test of Significance for Black Gum	
	(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,
	No Black Gum trees were identified within the Survey area. The species was observed along Curly Dick Road, and within 5 m of the Project area. Indirect impacts may include the removal of roadside trees during construction, for the easy movement of large machinery or as part of road widening works. As there are no records within 10 km of the Project area, this indicates that the observed trees are already in an isolated population. Mitigation measures such as the provision of tree protection zones, and the replanting of removed trees, would be implemented to ensure the long-term survival of the species within the locality.
d)	*whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).*
	As of the 10 September 2024, there are four Areas of Outstanding Biodiversity Value (AOBV) declared under the BC Act. The AOBV are: ■ Gould's Petrel. ■ Little penguin population in Sydney's Harbour. ■ Mitchell's Rainforest Snail in Stotts Island Nature Reserve ■ Wollemine Pine The Survey area is not part of the declared AOBV. Therefore, the project would not have an adverse effect on declared AOBV.
e)	*whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process*
	Under the BC Act, key threatening processes (KTP) are threats that can adversely affect threatened species or ecological communities or could cause species or ecological communities to become threatened. OEH (2017) Key Threatening Processes strategy lists 38 KTP, of which, the following are likely to be triggered by the project: ■ Anthropogenic Climate Change: Loss of canopy cover would reduce cooling effect provided by the trees. ■ Clearing of native vegetation: Net loss of trees can be avoided by replanting trees of the same species and ensuring that the planted trees become established and survive in the long-term ■ Infection of frogs by amphibian chytrid causing the disease chytridiomycosis. All plant, equipment and infrastructure associated with the installation of the wind turbines must be clean to prevent the introduction of pathogens into nearby dams, Solitary creek and its associated tributaries. ■ Invasion, establishment and spread of Lantana, *Lantana camara*. Hygiene protocol to be implemented for plant, machinery and PPE for prevention of introduction of exotic plants into the Project area and adjacent vegetation Triggering the above listed KTP might be avoided or minimised by implementing adequate mitigation measures, including replanting canopy with native trees, sediment and erosion controls, hygiene protocols and weed management plan.
Conclusion	
	If the recommended mitigation measures are adhered to, then the potential indirect and direct impacts to the Black Gum trees on Curly Dick Road could be minimised, and therefore it would be unlikely to result in a significant impact. Should the Indicative Disturbance Footprint intersect trees or extensive areas of treed vegetation, targeted surveys to verify the presence and extent of Black Gum trees and re-assessment against the significant impact assessment criteria will be required.

References

DAWE (2015a) Conservation advice for *Eucalyptus aggregata* (Black Gum) combined populations of Queensland, New South Wales and the Australian Capital Territory. Australian Government via Department of Agriculture, Water and the Environment

DCCEEW (2024c) Species Profile and Threats Database. *Eucalyptus aggregata* (combined populations of Qld, NSW and ACT) – Black Gum (combined populations of Queensland, New South Wales and the Australian Capital Territory). SPRAT Profile. On-line resource accessed via: Eucalyptus aggregata — Black Gum (environment.gov.au)

DEH (2024) NSW BioNet Atlas and BioNet Vegetation Classification application. NSW Department of Environment and Heritage. On-line resources accessed via: https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/nsw-bionet

DoE (2013) Matters of National Environmental Significance. Significant Impact Guidelines 1.1 – Environment Protection and Biodiversity Conservation Act 1999. Australian Government via Department of Environment.

DCCEEW (2024c) Black Gum – Species Profile. NSW Department of Climate Change, Energy, the Environment and Water via Environment and Heritage. On-line resource accessed via: Black Gum - profile | NSW Environment, Energy and Science

NSW TSSC (2022) *Eucalyptus aggregata* (Black Gum) Deane and Maiden– Vulnerable Species Listing. NSW Threatened Species Scientific Committee Final Determination.

OEH (2018a) Threatened Species Test of Significance Guidelines. NSW Department of Planning and Environment.

Significant Impact Assessment – Critically Endangered and Endangered Species

Table I-3 Significant Impact Assessment – Regent Honeyeater

Significant Impact Assessment for Regent Honeyeater	
Threatened Species Assessed	
	Species: Regent Honeyeater (*Anthochaera phrygia*) **Listing status under the EPBC Act: Critically Endangered** **Habitat:** The species favours dry eucalypt woodland and forests dominated by box and ironbark eucalypts, on moist fertile sites, along creeks, broad river valleys and on lower slopes of foothills. Regent Honeyeater is most typically associated with dry box-ironbark eucalypt woodlands and dry sclerophyll forests, with an abundance of reliable nectar producing species, including Mugga, Yellow Box, White Box and Yellow Gum (BirdLife Australia 2023). **Breeding and nesting requirements:** Breeding typically occurs between August to January when key eucalypt and mistletoe species are in flower. The species will construct a nest in the canopy of mature eucalypt trees (BirdLife Australia 2023: DoE 2015). **Feeding Ecology:** Regent Honeyeater is dependent on nectar producing vegetation, namely eucalyptus and mistletoe species. In additional to nectar, they also feed on a number of invertebrates and insects (DoE 2015). **Regent Honeyeater suitable habitat present in the site (i.e. impact area):** The Bionet Vegetation Classification threatened species profiles, indicates that Regent Honeyeater is associated with PCT 3367, PCT 3477, PCT 3734 and PCT 4063, only one of which (PCT 3367) was recorded within the Survey area and totalling 91.032 ha. The Project area is considered to support suitable feed trees and foraging habitat for Regent Honeyeater. The Indicative Disturbance Footprint intersects a total of 7.7 ha of PCT 3367. The species was not incidentally recorded during the field survey. The species is considered to have the potential to occur within the Study Area despite the lack of previous species records.
Significant Impact Criteria	
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:	
	Lead to a long-term decrease in the size of a population
	During preliminary ecological surveys, Regent Honeyeater was not recorded within the Project area and the species has not historically been recorded within the 10 km buffer search area from the Project area. The proposed Mount Lambie Wind Farm project is located within a somewhat cleared and rural land use setting, as such proposed impacts are limited to areas lacking remnant native vegetation or suitable habitats for the species. High-quality remnant native vegetation contained to the Mount Lambie mountain range has not historically supported Regent Honeyeater, nor is it known to support a current population of the species. For these reasons, the Project is not considered to lead to any decrease in the size of the population of Regent Honeyeater.
	Reduce the area of occupancy of the species
	Current published advice provided by the DCCEEW indicates that Regent Honeyeater has an area of occupancy at 300 km^2 (30 000 ha). The Project is likely to result in the removal of 7.7 ha of PCT 3367 which is potentially suitable or opportunistic habitat for Regent Honeyeater. Given that the species is not historically known to occur within the Project area, the removal of 7.7 ha of suitable habitat represents 0.0256% of the area of occupancy for the species. This level of proposed impact is considered unlikely to reduce the area of habitat available that results in an impact which is notable or of consequence to the species.
	Fragment an existing population into two or more populations
	The Project area is not currently considered to support a population of Regent Honeyeater, rather the species has the potential to opportunistically occur within higher-quality patches of treed vegetation whilst moving or dispersing through the greater landscape. As such, the Project is not considered to fragment any existing population of Regent Honeyeater.
	Adversely affect habitat critical to the survival of a species
	As documented in the National Recovery Plan (DoE 2016) for Regent Honeyeater, habitat critical to the survival of the species includes: ■ Any breeding or foraging habitat in areas where the species is likely to occur; and ■ Newly discovered breeding and foraging locations.

Significant Impact Assessment for Regent Honeyeater	
	The Project area is not located within or nearby to any 'key breeding areas' or 'other breeding areas' as identified in the National Recovery Plan, with the closest key breeding area Capertree Valley situated approximately 50 km north-east of the Project area. Upon review of the Regent Honeyeater distribution map provided in the National Recovery Plan, the Project area occurs within the 'species may occur' presence category. As such, the Project area is not considered to classify as habitat critical to the survival of Regent Honeyeater. Proposed impacts for the Mount Lambie Wind Farm are primarily limited to open pasture and edges of treed vegetation. Whilst there is one large and linear patch of remnant native vegetation included within the Indicative Disturbance Footprint, this vegetation loss is not considered habitat critical to the survival of the species.
	Disrupt the breeding cycle of a population
	The Project area is not considered to support a local population of Regent Honeyeater, nor is it within or nearby to any identified 'key' or 'other' breeding areas documented in the National Recovery Plan. The Project is unlikely to disrupt any breeding cycle of Regent Honeyeater.
	Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
	The Project has the potential to result in 7.7 ha of removal of one suitable PCT for Regent Honeyeater, namely PCT 3367 Central Tableland Grainites Grassy Box Woodland. Despite the likely impacts to the associated PCT, the Project area is not considered to provide permanent or ongoing habitat opportunities for the species, though this would need to be confirmed during formal bird and bat utilisation surveys within the Project area. As such, the Project is considered unlikely to modify, destroy, remove, isolate or decrease the availability of habitat to the extent that Regent Honeyeater is likely to decline.
	Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat
	It is known that competition for hollows occur with other hollow-dependent native species and with the introduced Common Myna (*Acridotheres tristis*) and feral honeybees. It is not expected for Project activities to favour introduction or invasion of the Project area by Common Myna or feral honeybees.
	Introduce disease that may cause the species to decline, or
	The Project is unlikely to release or introduce a disease that is likely to cause the species to decline. To reduce the spread and establishment of disease and introduced flora species, the Project will implement best-practice construction hygiene measures.
	Interfere with the recovery of the species.
	The National Recovery Plan (DoE 2016) for Regent Honeyeater includes the following relevant actions and objectives: ■ Improve the extent and quality of Regent Honeyeater habitat; ■ Bolster the wild population with captive-bred birds until the wild population becomes self-sustaining; ■ Increase understanding of the size, structure, trajectory and viability of the wild population; and ■ Maintain and increase community awareness, understanding and involvement in the recovery program. The Project is unlikely to interfere with or reduce the species capacity to survive in the wild given the Project Area is not situated in any high-quality or intact areas of Regent Honeyeater breeding or foraging habitat. The Project Area is not a known locality in which Regent Honeyeater commonly occur, nor is the Project Area considered to be a significant Travelling Stock Route (TSR).
Conclusion	
	Based on the assessment provided above, it is considered that **the Project is unlikely to have a significant impact to the Regent Honeyeater**. This is based on the lack of species records and the limited desktop evidence that the site is frequently or permanently visited by the species. Though this would need to be confirmed through future bird and bat utilisation surveys.
References	
BirdLife Australia (2023). Regent Honeyeater. [Text before updates sourced from: Marchant, S. et al (eds) 1990-2006 Handbook of Australian, New Zealand and Antarctic Birds.Volume 1 to 7.] Birdlife Australia. Birdlife Australia. Last modified 2024-10-26 08:43. Source: https://hanzab.birdlife.org.au/species/regent-honeyeater/ Accessed: January 30, 2025 Time Zone: +10:00 Department of the Environment (2015). *Conservation Advice* Anthochaera phrygia *regent honeyeater*. Canberra: Department of the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/82338-conservation-advice.pdf. Department of the Environment (2016). *National Recovery Plan for the Regent Honeyeater* (Anthochaera phrygia). Canberra, ACT: Commonwealth of Australia. Available from: http://www.environment.gov.au/biodiversity/threatened/recovery-plans/national-recovery-plan-regent-honeyeater-anthochaera-phrygia-2016. In effect under the EPBC Act from 04-May-2016 as *Anthochaera phrygia*.	

Table I-4 Significant Impact Assessment – A Guinea Flower

Significant Impact Assessment for A Guinea Flower	
Threatened Species Assessed	
	Species: A Guinea Flower (*Hibbertia acaulothrix*) **Listing status under the EPBC Act: Endangered** **Habitat:** The species is found on rocky outcrops and has been recorded growing in *Eucalyptus sieberi* woodland or in association with *Allocasuarina littoralis* (black she-oak), *Corymbia gummifera* (red bloodwood), and *Leptospermum trinervium* (flaky-barked tea-tree) (DCCEEW 2023). The species flowers between October and April. **Guinea Flower habitat present in the site (i.e. impact area):** The species is not associated with any particular PCT community types recorded within the Project Area. Whilst the specimen was not recorded during the field survey, suitable habitats namely rocky outcrops and patches of associated species including *Allocasuarina* trees were recorded within the Survey area. Further targeted survey is recommended to confirm the absence/presence and extent of plants within the Project Area given the potentially suitable habitat to support the species.
Significant Impact Criteria	
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:	
	Lead to a long-term decrease in the size of a population
	The species was not recorded during preliminary field surveys within the Survey area and has not historically been recorded within the 10 km search area, however there are suitable habitats noted along rocky outcrops and within understorey vegetation of Eucalypt woodland. The majority of the Indicative Disturbance Footprint encompasses modified farmland, dominated by pasture grasses. Areas of remnant intact vegetation and treed areas have been avoided where possible to reduce impacts to ecological values. There is the potential that the Project intersects suitable habitat for *Hibbertia acaulothrix*, though the species presence should be determined by future targeted surveys.
	Reduce the area of occupancy of the species
	The area of occupancy for the species estimated to be 16 km^2 to 100 km^2 , based on known records of the species and potentially suitable habitat within its range (DCCEEW 2023). Given that the Project Area is situated outside the modelled habitat range, there are no previous records within a 10 km search area and impacts to native vegetation are not associated with any PCT for the species, the Project is unlikely to reduce the area of occupancy of the species.
	Fragment an existing population into two or more populations
	There is no known or existing population within the Project area, through this would need to be confirmed through targeted survey. Given the lack of desktop records and disjunct patches of suitable habitat, it is considered that the Indicative Disturbance Footprint is unlikely to fragment a population of *Hibbertia acaulothrix*.
	Adversely affect habitat critical to the survival of a species
	No critical habitat has been formally defined for the species. However, where critical habitat is not defined, areas 'needed' for the species' survival are considered habitat critical to its survival. Therefore, habitat critical to the survival of the species comprises the area of occupancy of known occurrences and similar habitat adjacent to important occurrences (within 200 m) (DCCEEW 2023). Given there are no known occurrences of the species within the Project area, it is considered that the Indicative Disturbance Footprint will adversely affect critical habitat to the survival of a species, though this would need to be confirmed through targeted flora surveys.
	Disrupt the breeding/reproductive cycle of a population
	The Project is not going to directly impact any known populations of the species based on preliminary field assessments. As such, the Project is unlikely to disrupt any breeding or recruitment of *Hibbertia acaulothrix*.
	Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
	Based on the preliminary field survey, it is unknown whether a population of *Hibbertia acaulothrix* occurs within the Project Area or the Indicative Disturbance Footprint. Although there are areas supporting suitable habitat for the species, the Project is not considered to modify, destroy, remove, isolate or decrease the availability of habitat to the extent that the species is likely to decline, based on the lack of species records within a 10 km buffer.
	Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat
	There is no published documentation that outlines any invasive species that pose any significant threat to *Hibbertia acaulothrix*. The Project is unlikely to result in any release or spread of invasive species that would result in harm to the species.

Significant Impact Assessment for A Guinea Flower	
	Introduce disease that may cause the species to decline, or
	Phytophthora cinnamomi, a soil borne pathogen has been identified as a threat to *Hibbertia acaulothrix* by causing dieback and widespread plant death (DCCEEW 2023). Where the disease is present, fire and disturbance have the potential to facilitate the spread and severity of *Phytophthora cinnamomi.* To mitigate the spread and establishment of weeds and disease the Project will implement best-practice construction hygiene measures.
	Interfere with the recovery of the species.
	There is no published Recovery Plan or Threat Abatement Plan for the species. As such, the Project is unlikely to interfere with any State or Commonwealth obligations for the species conservation or management efforts.
Conclusion	
	Based on the assessment above, it is considered that **the Project is unlikely to result in a significant impact to *Hibbertia acaulothrix.***
References	
Department of Climate Change, Energy, the Environment and Water (2023). *Conservation Advice for* Hibbertia acaulothrix. Canberra: Department of Climate Change, Energy, the Environment and Water. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/87409-conservation-advice-07092023.pdf. In effect under the EPBC Act from 07-Sep-2023.	

Table I-5 Significant Impact Assessment – Basalt Peppercress

Significant Impact Assessment for Basalt Peppercress	
Threatened Species Assessed	
	Species: Basalt Peppercress (*Lepidium hyssopifolium*) **Listing status under the EPBC Act: Endangered** **Habitat**: The Basalt Pepper-cress is endemic to south-eastern Australia, patchily distributed. The species is considered to have been associated with eucalypt and/or Allocasuarina woodland with a grassy understorey and native grasslands (Tumino, 2010). The species establishes on relatively open bare ground where there is limited competition from other plants, and persist in shaded bare ground with lack of competition from shade-intolerant forbs and grasses (Tumino, 2010). The species is known from about 35 populations containing about 1700 plants, mostly occurring in Tasmania (Tumino, 2010). Almost all remaining populations of the species occur in heavily modified, non-natural environments, usually amongst pasture grasses and weeds. A population of approximately 3 plants (as of 2008) occur in private land in Bathurst (Tumino, 2010). **Basalt Peppercress habitat present in the site (i.e. impact area):** The species is not associated with any particular PCT community types recorded within the Project Area. Whilst the specimen was not recorded during the field survey and there are no species records within the Project Area, there is potential habitat suitability based on the species persistence potential persistence in disturbed environments. **Recorded during field survey:** The species was not incidentally recorded during the field survey. Further targeted survey is recommended to confirm the absence/presence and extent of plants within the Project Area given the potentially suitable habitat to support the species.
Significant Impact Criteria	
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:	
	Lead to a long-term decrease in the size of a population
	The species is known from about 35 populations containing about 1700 plants, mostly occurring in Tasmania (Tumino, 2010). The Project is likely to result in the removal of 93.439 ha of pasture grass habitat; 51.861 ha of this was surveyed and was of low-quality but potentially suitable pasture grass habitat for Basalt Pepper-cress. There are no current populations known within the Project area. Potential direct impacts can be mitigated through pre-clearance surveys in suitable habitat areas. Therefore, the Project is considered unlikely to lead to a long term decrease in the size of a population.
	Reduce the area of occupancy of the species
	There is no estimated extent of occurrence or area of occupancy for the species. The Project is likely to result in the removal of 93.439 ha of potentially suitable pasture grass habitat for Basalt Pepper-cress, including 51.861 ha of low-quality pasture grass habitat surveyed. This reduction is unlikely to be significant given the species has not historically been recorded within the Project area. Potential direct impacts can be mitigated through pre-clearance surveys in suitable habitat areas.
	Fragment an existing population into two or more populations
	The species is known from about 35 populations containing about 1700 plants, mostly occurring in Tasmania (Tumino, 2010). There are no current populations known within the Project area. Therefore, while the Project would reduce potential habitat for the species, this is not considered to fragment an existing population into two or more populations.
	Adversely affect habitat critical to the survival of a species
	Habitat critical to the survival of the Basalt Pepper-cress includes: ▪ Temperate grasslands (Tumino, 2010). Some suitable habitat of exotic pasture grasses and weed species occurs throughout the project area. The project is not considered to contain habitat critical to the survival of the species.
	Disrupt the breeding cycle of a population
	The Basalt Peppercress produces many seeds which can remain viable in the soil for at least two years, and have a limited dispersal ability due to seed size. Disturbance of soil stored seed is required for seed germination, in combination with open bare ground and suitable soil moisture conditions for the survival of seedlings (Tumino, 2010). There are no current populations known within the Project area. The Project is considered unlikely to disrupt the seed dispersal of a population.
	Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
	The species is common among exotic pasture grasses and weed species. The Project is likely to result in the removal of 93.439 ha of potentially suitable pasture grass habitat for Basalt Pepper-cress. This reduction would not significantly reduce the overall availability or alter the quality of already disturbed pasture grasses within and adjacent to the Project area.

Significant Impact Assessment for Basalt Peppercress	
	Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat
	The project is unlikely to result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat. Appropriate mitigation measures for biosecurity must be implemented during the project works, as recommended in Section 5.2.
	Introduce disease that may cause the species to decline, or
	The project is unlikely to result in introduced disease that may cause the species to decline. Appropriate mitigation measures for biosecurity must be implemented during the project works, as recommended in Section 5.2.
	Interfere with the recovery of the species.
	The following have been identified as potentially threatening processes to the Basalt Pepper-cress: ■ Degradation of grassland and grassy woodlands ■ Grazing by sheep and cattle ■ Competition and weed invasion ■ Habitat disturbance and destruction (Tumino, 2010). The National Recovery Plan for the Basalt Peppercress (Tumino, 2010) identifies the following objectives for the recovery of the species: 1. Determine distribution, abundance and population structure, 2. Determine habitat requirements, 3. Determine and manage threats to populations, 4. Protect habitat on private and public land, 5. Identify key biological and ecological functions, 6. Determine growth rates and viability of populations, 7. Establish a population in cultivation, 8. Establish new populations in the wild, and 9. Build community support for conservation. The project does not interfere with these objectives or contribute to the threatened processes. The Project is considered unlikely to interfere with the recovery of the species.
Conclusion	
	The species has been assessed against the criteria above and it has been determined that the project works are **unlikely to constitute a significant impact on this species.**
References	
Tumino, M. (2010). *National Recovery Plan for the Basalt Peppercress Lepidium hyssopifolium*. Department of Sustainability and Environment, Melbourne. Available from: http://www.environment.gov.au/biodiversity/threatened/recovery-plans/national-recovery-plan-basalt-peppercress-lepidium-hyssopifolium. In effect under the EPBC Act from 13-Aug-2010.	

Table I-6 Significant Impact Assessment – Gang-gang Cockatoo

Significant Impact Assessment for Gang-gang Cockatoo	
Threatened Species Assessed	
	Species: Gang-gang Cockatoo (*Callocephalon fimbriatum*) **Listing status under the EPBC Act: Endangered** **Habitat:** Gang-gang Cockatoos (GGC) primarily occur within the temperate eucalypt forests and woodlands of mainland south-east Australia. The species primarily inhabits mature, wet sclerophyll forests, typically dominated by eucalypts. **Breeding and nesting requirements:** Breeding typically occurs between October and January and is reliant on stands of suitable hollow bearing trees. The species also nests in the hollows of tree trunks and limbs, especially those containing dead branches. **Feeding ecology:** The species regularly feeds on flower buds, leaf buds, fruits and seeds from both native and introduced ornamental flora species. When feeding on native flora, the species is heavily dependent on *Eucalypt* and *Acacia* species. **Gang-gang Cockatoo Habitat present in the site (i.e. impact area):** The Bionet Vegetation Classification threatened species profiles, indicates that the GGC is associated with PCT 3211, PCT 3347, PCT 3369, PCT 3735, PCT 3367, PCT 3534 and PCT 3747, all of which were identified within the Project area. A total of 197.553 ha of native vegetation across the PCTs occurred within the Survey area, with 30.57 ha of suitable PCTs intersecting the Indicative Disturbance Footprint. The Project area has several native habitat trees for the GGC including Snow Gum (*Eucalyptus pauciflora*), Broad-leaved Peppermint (*Eucalyptus dives)* and several *Acacia species* including Silver Wattle *(Acacia dealbata*), Fringed Wattle (*Acacia fimbriata)* and Blackwood (*Acacia melanoxylon).* There were also several hollows and stags identified within the Project area, which may provide suitable nesting and breeding habitat for this species. Three records of the Gang-gang Cockatoo were recorded during surveys (refer Figure 11).
Significant Impact Criteria	
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:	
	Lead to a long-term decrease in the size of a population
	The Mount Lambie Wind Farm project is proposed to be located in land with historical clearing and rural land use. In spite of the history of disturbance, native vegetation across five plant community types (PCTs) were recorded within the Survey area and tree species part of the GGC habitat occur therein. Also, numerous hollow-bearing trees and stags with hollows were observed. The project is currently on its scoping phase and preliminary surveys have been undertaken to identify biodiversity constraints. The final concept design and footprint are to be decided on. During surveys in August 2024, two individuals were opportunistically observed feeding on a Broad-leaved Peppermint. Therefore, additional surveys would be required to determine if the GGC is a regular resident or an occasional visitor of the Project area and its development footprint. The following is recommended to prevent long-term decrease of GGC in the Project area: ▪ Avoid and minimise as far as practicable clearing of suitable PCTs habitat for the species. ▪ Numerous hollows in hollow-bearing trees (HBT) and stags were observed across the Survey area and it is recommended to minimise loss of roosting and breeding hollow habitat for the species. ▪ Where removal of hollows and HBT cannot be avoided, implement a mitigation strategy for replanting of habitat trees within the locality to assist with availability of long-term feeding and habitat resources for the species. ▪ Undertake assessment of Project area use and flying patterns of the GGC to determine risk of collision of the GGC with WTGs blades and barometric trauma. This information is to be used to implement strategies to reduce potential risk of collision in the wind farm.
	Reduce the area of occupancy of the species
	As mentioned above, two individuals of the GGC were observed in August 2024 and these are the first records of the species in the Project area and the 10 km locality. Assessment of occupancy of the Project area and seasonal migratory patterns of the GGC from mountain ranges to lower altitudes should be undertaken to improve understanding of the area of occupancy of the species. As stated in the Conservation Advice for the species (DAWE 2022a), GGC occupy approximately 40,000 km^2. The potential removal of 30.57 ha (0.00075%) of associated GGC PCTs is unlikely to reduce the occupancy of the species or limit GGC ability to occur within the surrounding environment. However, the extent of proposed native vegetation removal has the potential to result in a significant impact on GGC based on the reduction in available foraging habitat.

Significant Impact Assessment for Gang-gang Cockatoo	
	Habitat critical for the survival of the species includes all foraging habitat during both the breeding and non-breeding season. This includes bushland with suitable food resources, structure (e.g. dense canopy with shrub layer) and stands of suitable HBTs. Suitable hollows include chambers of around 20cm in floor diameter, around 50.5 cm deep (range 22 to 90 cm) and occur between around 7.5 m (range 5 to 9.4 m) above ground level. Therefore, occupancy of the species in land within its distribution range would depend on the availability of critical habitat. Indirect impacts on critical habitat of the GGC include: ■ Noise and light pollution on habitat. ■ Introduction of new diseases, weeds, or predators compromise the survival of adults and juveniles. The following recommendations are provided to avoid and minimise the area of occupancy of the species: ■ Avoid reducing the extent of suitable habitat for the species, ensuring that remnant patches of vegetation include a complex structure with canopy and shrub layer. ■ Avoid reducing availability of food resources for the species. ■ Avoid reducing the availability of HBTs which are suitable breeding habitat for the species. ■ Avoid indirect impacts (e.g. light pollution, noise, introduction of weeds, disease or predators) on habitat of the GGC.
	Fragment an existing population into two or more populations
	Given that the two individuals observed during surveys in August 2024 are the first records of the species in the 10 km locality, surveys on occupancy of the Project area by GGC would be required to understand if a population of the GGC is present and its size. Generally, population fragmentation would occur when introduction of barriers to movement impedes free passage of individuals, where the distance among patches of suitable habitat is such that individuals cannot move among patches (e.g. due to lack of food resources, due to distances being larger than the distances the animal can move across without succumbing to exhaustion, or due to mortality risks (e.g. predation pressure, vehicle-wildlife collisions, mortality due to collision with WTGs turbine or barotrauma). The possibility exists that the two individuals observed were transient animals moving across the landscape as part of their foraging and feeding movements. Given that the species is highly mobile and that the level of clearing in the Project area would be unlikely to result in further fragmentation vegetation, it is not expected that the project would result in fragmentation of an existing population of the GGC.
	Adversely affect habitat critical to the survival of the species
	The Project would result in removal of 30.57 ha of suitable habitat for the GGC within the Indicative Disturbance Footprint (i.e. PCTs with suitable foraging resources and hollow). Given that the Project would be placed in land with historical clearing, the preliminary amount of ground-truthed PCTs in the Survey area of 197.553 ha, is considered low compared with the amount of bushland present within the broader locality. Furthermore, given that the species is highly mobile and capable of moving across the landscape to find food resources, it is considered that the Project is unlikely to affect critical feeding habitat for the species. It is unknown if suitable breeding habitat (i.e. hollows of suitable size for nesting by the GGC) are widely available in the broader locality. It is considered that loss of naturally occurring hollows would contribute to loss of critical breeding habitat for hollow-dependent species, such as the GGC. Therefore, it is recommended to avoid as far as practical removal of HBTs and to adequately mitigate the loss of any HBTs if hollows are removed as part of the Project.
	Disrupt the breeding cycle of a population
	GGC favour old growth forest and woodland assemblages for nesting, loafing and roosting. They nest in hollows and breeding aggregations are reliant on stands of suitable HBTs and food resources. It is unknown if critical breeding habitat was lost in the broader landscape and during the 2019/2020 bushfires forcing the species to rely on substandard breeding habitat for nesting in disturbed landscapes such as the Project area. Therefore, survey of GGC use of the Project area and occupancy of HBTs therein would be required to understand the GGC pattern of use of habitat The Project has potential to disrupt the breeding cycle of GGC if: ■ Loss of suitable hollows occur, precluding the species from finding suitable nesting habitat. ■ Construction works causes noise, vibration and light pollution that disturbs nesting behaviours. ■ Introduction of diseases (e.g. Psittacine beak and feather disease (PBFD), myrtle rush), weeds, or predators occurs during construction and operational phases. It is known that cleared areas and linear clearing (e.g. tracks, roads) favour incursion and movement of weeds and pests. Weeds can outcompete native species altering woodland structure, composition and availability of native food resources. Accidental introduction of diseases affecting gum trees and wattles would affect availability of feeding and breeding habitat. ■ Potential turbine collision risk of breeding individuals

Significant Impact Assessment for Gang-gang Cockatoo	
	Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
	The Project has the potential to result in the removal of 30.57 ha of PCTs considered to provide suitable habitat for GGC. This removal of native vegetation is considered to decrease the availability and extent of suitable habitats within the Project area, however based on the amount of retained suitable habitats within the surrounding landscape the Project is not likely to result or cause species decline within the Mount Lambie locality.-
	Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat.
	It is known that competition for hollows occur with other hollow-dependent native species and with the introduced Common Myna (*Acridotheres tristis*) and feral honeybees. It is not expected for Project activities to favour introduction or invasion of the Project area by Common Myna or feral honeybees.
	Introduce disease that may cause the species to decline, or
	The food resources for GGC include gum trees and acacias. Myrtle rust (*Puccinia psidii*) is a fungal disease which infects plants in the Myrtaceae family, which includes gum trees. Myrtle rust can be introduced to Project area if brought into the land on infected plant material, contaminated equipment, vehicles and clothing. Accidental introduction of myrtle rust must be avoided by preparing and implementing hygiene protocols for PPE, vehicles and equipment. If soil is to be imported into the Project area, imported soils and materials to include a certificate stating the soil and/or materials are clean and sourced from areas free of myrtle rust.
	Interfere with the recovery of the species.
	A recovery plan for the GGC is not currently available. Reduction in species populations has been associated with loss of habitat and breeding resources (i.e. hollows). Clearing of native vegetation and loss of HBT would contribute to habitat loss. Given that the proponent needs to meet the project offset obligations, it would be expected that no net loss of habitat would occur.
Conclusion	
	Based on the assessment above, **it is considered that removal of 30.57 ha of suitable Gang-gang Cockatoo habitat and possible turbine strike has the potential to result in a significant impact**. It is recommended the assessment of significance analysis for this species be informed by the Bird and Bat utilisation surveys, when the flight heights and patterns of dispersal of the species are better understood within the Project area. Due to the presence of GGC habitat, it is recommended for the avoid – minimise – mitigate hierarchy is applied to the project such that loss of suitable habitat for the Gang-gang Cockatoo is avoided as far as practicable (e.g. avoid and minimise loss of PCTs that the species inhabits and avoid clearing of breeding habitat (i.e. hollow-bearing trees). Where residual impacts cannot be avoided, replanting of habitat and feed trees should be part of the mitigation measures to ensure long-term availability of resources for the GGC in the locality. Likewise, mitigation measures may need to be implemented to reduce the risk of GGC wind-turbine collision as the species is highly mobile. Information on flight heights of GGC gathered during formal bird and bat surveys to be undertaken in the Project area would inform such measures.
References	
DAWE (2022a) Conservation advice for *Callocephalon fimbriatum* (Gang-gang Cockatoo) combined populations of Queensland, New South Wales and the Australian Capital Territory. Australian Government via Department of Agriculture, Water and the Environment DCCEEW (2024c) Species Profile and Threats Database. *Callocephalon fimbriatum* (combined populations of Qld, NSW and ACT) – Gang-gang Cockatoo (combined populations of Queensland, New South Wales and the Australian Capital Territory). SPRAT Profile. On-line resource accessed via: **Callocephalon fimbriatum — Gang-gang Cockatoo (environment.gov.au)** EHG (2024) NSW BioNet Atlas and BioNet Vegetation Classification application. NSW Department of Environment and Heritage. On-line resources accessed via: **https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/nsw-bionet** DoE (2013) Matters of National Environmental Significance. Significant Impact Guidelines 1.1 – Environment Protection and Biodiversity Conservation Act 1999. Australian Government via Department of Environment. DCCEEW (2024c) Gang-gang Cockatoo – Species Profile. NSW Department of Climate Change, Energy, the Environment and Water via Environment and Heritage. On-line resource accessed via: **Gang-gang Cockatoo - profile | NSW Environment, Energy and Science** NSW TSSC (2022) *Callocephalon fimbriatum* (Gang-gang Cockatoo) Goldfuss 1817 – Endangered Species Listing. NSW Threatened Species Scientific Committee Final Determination. OEH (2018a) Threatened Species Test of Significance Guidelines. NSW Department of Planning and Environment.	

Table I-7 Significant Impact Assessment – Koala

Significant Impact Assessment for Koala	
Threatened Species Assessed	
	Species: Koala (*Phascolarctos cinereus* (combined populations of Qld, NSW and the ACT) — Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)) **Listing status under the EPBC Act: Endangered** **Habitat**: In NSW, the majority of koalas are found in forests and subhumid woodlands on the central and north coast, and to the west across the Western Plains and slopes, within Pilliga forest, low woodland and forested areas (DAWE, 2022a). It is considered that low-density populations also occur west of the Great Dividing Range in semi-arid environments. **Breeding and nesting requirements**: Koalas are opportunistic breeders, heavily influenced by seasonality, and the breeding season differs between northern and southern populations. In the north, an estimated 60 percent of births occur in summer and early autumn (December-March), and the remainder are distributed throughout the year (DAWE, 2022a) **Feeding Ecology**: Koalas are tree-dwelling, obligate folivores (leaf eaters) with a highly specialised diet which is defined by the availability and palatability of a limited variety of *Eucalyptus*, *Corymbia* and *Angophora* species (DAWE, 2022a). **Koala habitat present in the site (i.e. impact area):** The BioNet Vegetation Classification threatened species profiles, indicates that the Koala is associated with PCT 3211, 3347, 3367, 3369, 3477, 3534, 3734, 3735, 3747, 4063, conservatively mapped as occurring within the project area. A total of 197.553 ha of ground-truthed native vegetation across five PCTs occurred within the Survey area, with approximately 30.57 ha PCTs intersecting the Indicative Disturbance Footprint. The Project area is adjacent to the Central and Southern Tablelands, and Central NSW Coast Koala Management Bioregions (Youngentob et al., 2021). The Project area contains several species of native trees for the koala, including Locally Important Koala Trees: Apple Box (*Eucalyptus bridgesiana*), Mountain Gum *(Eucalyptus dalrympleana),* Broad-leaved Peppermint *(Eucalyptus dives),* Long-leaved Box (*Eucalyptus goniocalyx),* Brittle Gum (*Eucalyptus mannifera),* Yellow Box (*Eucalyptus melliodora),* and Ribbon Gum (*Eucalyptus viminalis*) *(*Youngentob et al., 2021). **Recorded during field survey:** The species was not incidentally recorded during the field survey. The species is considered to have the potential to occur within the Study Area, and has been previously recorded in 2018 at Great Western Highway, approximately 300 m west of an existing access track, and between 2017 and 2019 at Great Western Highway, approximately 1.6 km west of the Project area, specifically the corner of Curly Dick Road and the Great Western Highway. Further targeted survey is recommended to confirm the presence of Koala within the Project Area given the previous species records and potentially suitable habitat to support the species within the Indicative Disturbance Footprint.
Significant Impact Criteria	
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:	
	Lead to a long-term decrease in the size of a population
	Koalas are tree-dwelling, obligate folivores (leaf eaters) with a highly specialised diet which is defined by the availability and palatability of a limited variety of *Eucalyptus*, *Corymbia* and *Angophora* species (DAWE, 2022a). The Project would impact potential foraging and breeding habitat, likely including Locally Important Koala Trees: Apple Box (*Eucalyptus bridgesiana*), Mountain Gum *(Eucalyptus dalrympleana),* Broad-leaved Peppermint *(Eucalyptus dives),* Long-leaved Box (*Eucalyptus goniocalyx),* Brittle Gum (*Eucalyptus mannifera),* Yellow Box (*Eucalyptus melliodora),* and Ribbon Gum (*Eucalyptus viminalis*) *(*Youngentob et al., 2021). The majority of the Project impacts are within previously disturbed pasture grass communities which would constitute dispersal habitat. There would be no impact to koala dispersal. Native Eucalypt, Corymbia, and Angophora species constitute potential breeding and foraging habitat. It is unlikely this area constitutes significant foraging resources in comparison to the immediately surrounding available native forest vegetation, and the undisturbed potential foraging habitat within Eusdale Nature Reserve to the west, and Marrangaroo National Park. Mitigation measures include pre-clearance surveys undertaken to reduce the potential for direct mortality impacts to Koalas, especially for breeding adults or infants. It is considered unlikely that the Project would lead to a long term decrease in the size of a population.
	Reduce the area of occupancy of the species
	The area of occupancy of koala is contracting and is estimated to be 19,400 km^2 (DAWE, 2022a). The Project involves clearance of potential koala foraging and breeding habitat. The Project would not impact koala dispersal habitat. It is considered that these impacts are negligible considering the scale and extent of surrounding surrounding available native forest vegetation, and the undisturbed potential foraging habitat within Eusdale Nature Reserve to the west, and Marrangaroo National Park. It is considered unlikely that the Project would reduce the area of occupancy of the species.

Significant Impact Assessment for Koala	
	Fragment an existing population into two or more populations
	One section of the Project includes clearing approximately 10 m width of native forest, along a previously disturbed and existing track (condition unknown) for a road reserve access corridor. Koalas spend large periods of time moving across the ground between food and shelter trees (DAWE, 2022a). It is recommended that fauna crossing measures be implemented to mitigate the risk of direct mortality from vehicle strike. Widening the existing track is considered unlikely to fragment an existing population into two or more populations.
	Adversely affect habitat critical to the survival of a species
	The current National Recovery plan for the Koala: *Phascolarctos cinereus* (combined populations of Queensland, NSW and the Australian Capital Territory (ACT)) identifies habitat critical to the survival of a species as the area that the species relies on to halt decline and promote the recovery of the species (DAWE, 2022b) and can include the following factors: ■ Whether the habitat is used during periods of stress (examples: flood, drought or fire) ■ Whether the habitat is used to meet essential life cycle requirements (examples: foraging, breeding, nesting, roosting, social behaviour patterns or seed dispersal processes) ■ The extent to which the habitat is used by important populations ■ Whether the habitat is necessary to maintain genetic diversity and long-term evolutionary development ■ Whether the habitat is necessary for use as corridors to allow the species to move freely between sites used to meet essential life cycle requirements ■ Whether the habitat is necessary to ensure the long-term future of the species or ecological community through reintroduction or re-colonisation ■ Any other way in which habitat may be critical to the survival of a listed threatened species or a listed TEC. The habitat within the Project area is not a known refuge during periods of stress. Eucalyptus, Corymbia and Angophora trees within the Project area are considered likely foraging trees. However, the Project area is not considered meet essential life cycle requirements as it is unlikely this area constitutes significant foraging resources in comparison to the immediately surrounding available native forest vegetation, and the undisturbed potential foraging habitat within Eusdale Nature Reserve to the west, and Marrangaroo National Park to the east. There are scarce previous records of koala within 2 km of the Project area, and there are no known populations within the Project area. The majority of the project occurs within previously disturbed areas of pasture grasses. One section of the Project includes clearing approximately 10 m width of native forest, along a previously disturbed and existing track (condition unknown) for a road reserve access corridor. Koalas spend large periods of time moving across the ground between food and shelter trees (DAWE, 2022a). Vegetation clearance would not impact dispersal, and as such is not considered to be habitat necessary to maintain genetic diversity and long-term evolutionary development, necessary for use as corridors to allow the species to move freely between sites used to meet essential life cycle requirements, or necessary to ensure the long-term future of the species or ecological community through reintroduction or re-colonisation.
	Disrupt the breeding cycle of a population
	Koalas are indicated to be opportunistic breeders, coinciding with rainfall and food availability (DAWE, 2022a). Direct mortality is the primary threat to disruption of the breeding cycle. Mitigation measures include pre-clearance surveys undertaken to reduce the potential for direct mortality impacts to Koalas, especially for breeding adults or infants. The Project is considered unlikely to disrupt the breeding cycle of a population.
	Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
	The majority of the Project impacts are within previously disturbed pasture grass communities which would constitute dispersal habitat. There would be no impact to koala dispersal. Native Eucalypt, Corymbia, and Angophora species constate potential breeding and foraging habitat. It is unlikely this area constitutes significant foraging resources in comparison to the immediately surrounding available native forest vegetation, and the undisturbed potential foraging habitat within Eusdale Nature Reserve to the west, and Marrangaroo National Park. It is unlikely the Project would modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
	Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat
	Dogs are considered to be a key threat to Koala populations (DAWE, 2022a). The project is unlikely to result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat. Appropriate mitigation measures for biosecurity must be implemented during the project works, as recommended in Section 5.2.
	Introduce disease that may cause the species to decline, or
	Koala retrovirus and Chlamydia (*Chlamydia pecorum*) are key threats to Koala (DAWE, 2022a). The project is unlikely to result in introduced disease that may cause the species to decline. Appropriate mitigation measures for biosecurity must be implemented during the project works, as recommended in Section 5.2.

Significant Impact Assessment for Koala	
	Interfere with the recovery of the species.
	The species National Recovery Plan (DAWE, 2022b) goal is '*To stop the trend of decline in population size of the listed Koala, by having resilient, connected, and genetically healthy metapopulations across its range, and to increase the extent, quality and connectivity of habitat occupied*.' The project is not expected to interfere with the Recovery Plan's goal or objectives, or result in any significant impacts on the criteria discussed here, therefore the Proposed Action is not expected to interfere with the recovery of the species.
Conclusion	
	The species has been assessed against the criteria above and it has been determined that the **project works are unlikely to constitute a significant impact on this species.**
References	
Youngentob, Marsh and Skewes (2021). *A review of koala habitat assessment criteria and methods.* Available from: https://www.dcceew.gov.au/sites/default/files/documents/review-koala-habitat-assessment-criteria-and-methods-2021.pdf Department of Agriculture, Water and the Environment (2022a). *Conservation Advice for* Phascolarctos cinereus *(Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory*. Canberra: Department of Agriculture, Water and the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/85104-conservation-advice-12022022.pdf. In effect under the EPBC Act from 12-Feb-2022. Department of Agriculture, Water and the Environment (2022b). *National Recovery Plan for the Koala* Phascolarctos cinereus *(combined populations of Queensland, New South Wales and the Australian Capital Territory)*. Department of Agriculture, Water and the Environment, Canberra. Available from: http://www.dcceew.gov.au/environment/biodiversity/threatened/publications/recovery/koala-2022. In effect under the EPBC Act from 08-Apr-2022.	

Table I-8 Significant Impact Assessment – Broad-headed Snake

Significant Impact Assessment for Broad-headed Snake	
Threatened Species Assessed	
	Species: Broad-headed Snake (*Hoplocephalus bungaroides*) **Listing status under the EPBC Act: Endangered** **Habitat**: General habitat is on exposed sandstone ridges, escarpments, outcrops, slopes and bluffs of the Narrabeen Group, Hawkesbury Sandstone and Shoalhaven Group formations, and in woodlands and forests within approximately 1 km of these exposed sandstone area. The Broad-headed snake inhabit exposed rocky ridges, escarpments, outcrops, and bluffs during cooler months, with mature males and non-breeding females usually moving into adjacent trees, woodland, and forest during the warm summer months (DCCEEW, 2023). The species is arboreal when occupying woodlands and forests, usually dominated by Eucalypts and/or Turpentine (*Syncarpia glomulifera*), sheltering in dead and live tree hollows. It selects dead trees, large trees, and trees that have many branches and hollows which provide shelter for both the snake and its prey (DCCEEW, 2023). The species has been recorded sheltering in hollows of Red bloodwood (*C. gummifera*), Yellow bloodwood (*C. eximia*), Grey gum (*E. punctata*), Scribbly gum (*E. haemastoma*), Narrow-leaved stringy-bark (*E. sparsifolia*) and Sydney peppermint (*E. piperita*). The species also occasionally shelter under bushes and in hollow logs on the forest floor during warm summer months (DCCEEW, 2023). In cooler months it shelters under thin, broad, loose, exposed rocks that have a tight closed-in fit with the parent rock below and are resilient to the accumulation of soil and litter, and in crevices. These shelters are generally located close to cliff edges or in windblown caves on escarpments, bluffs, and slopes that face north to west and receive a high amount of solar radiation through gaps in the canopy (DCCEEW, 2023). **Breeding and nesting requirements**: Juveniles and gravid females remain in exposed rocky areas (exposed rocky ridges, escarpments, outcrops, and bluffs) throughout the year, whereas mature males and non-breeding females usually move into adjacent trees, woodland, and forest during the warm summer months (DCCEEW, 2023). **Feeding ecology**: Lesueur's zigzag gecko (*Amalosia lesueurii*) is an important prey species (DCCEEW, 2023). Other recorded prey include skinks: striped snake-eyed skink (*Cryptoblepharus virgatus*), elegant snake-eyed skink (*C. pulcher*), weasel skink (*Saproscincus mustelinus*), red-throated skink (*Acritoscincus platynotus*), eastern water-skink (*Eulamprus quoyii*), barred-sided skink (*E. tenuis*), copper-tailed skink (*Ctenotus taeniolatus*), White's skink (*Liopholis whitii*), Cunningham's skink (*Egernia cunninghami*), jacky lizard (*Amphibolurus muricatus*), and the mammals house mouse (*Mus domesticus*) and brown antechinus (*Antechinus stuartii*). **Broad-headed Snake habitat present in the site (i.e. impact area):** The BioNet Vegetation Classification threatened species profiles, indicates that there are no PCTs associated with the Broad-headed Snake occurring within the Project area. A total of 197.553 ha of native vegetation across five PCTs occurred within the Survey area, with the Indicative Disturbance Footprint intersecting 30.57 ha of PCTs. **Recorded during field survey:** The species was not incidentally recorded during the field survey, there are no PCTs associated with the Broad-headed Snake occurring within the project area, and the Project area is outside the species known or likely extent of occurrence (DCCEEW, 2023). Regardless, the species is considered to have the potential to occur within the Study area give the presence of several rocky outcrops and wombat holes, may provide suitable sheltering habitat for this species. There is also an abundance of logs which may provide suitable ground cover habitat. The presence of several tree hollows can further support this species. Therefore, this species occasional presence cannot be discounted.
Significant Impact Criteria	
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:	
	Lead to a long-term decrease in the size of a population
	The Project area may constitute occasional opportunistic dispersal, sheltering, foraging and breeding habitat. The majority of the Project impacts are within previously disturbed pasture grass communities which would constitute dispersal habitat, and paddock trees may constitute opportunistic sheltering habitat. There would be no change to species dispersal in these areas. One section of the Project includes clearing approximately 10 m width of native forest, along a previously disturbed and existing track (condition unknown) for a road reserve access corridor. This area would constitute dispersal, sheltering, foraging, and breeding habitat. The Project is unlikely to alter the species dispersal or foraging use of the area. The Project may reduce species sheltering and breeding habitat in this area. Therefore, it is recommended to avoid as far as practical removal of HBTs and to adequately mitigate the loss of any HBTs if hollows are removed as part of the Project. Mitigation measures include pre-clearance surveys prior to impacting hollows, logs, and bushes, rocky ridges, escarpments, outcrops or bluffs, undertaken to reduce the potential for direct mortality impacts to the species. Provided mitigation measures are adhered to, the project is considered unlikely to lead to a long-term decrease in the size of a population.

Significant Impact Assessment for Broad-headed Snake	
	Reduce the area of occupancy of the species
	The area of occupancy of Broad-headed snake is estimated to be 500 km^2 and 1,000 km^2 (DCCEEW, 2023). A total of 197.553 ha of native vegetation across five PCTs occurred within the Survey area, of this 30.57 ha of habitat intersects the proposed Indicative Disturbance Footprint. Given that there are no species records and no associated PCTs within the Project area for Broad-headed snake, the Project is considered unlikely to reduce the area of occupancy of the species to a measurable degree.
	Fragment an existing population into two or more populations
	The species is highly mobile and able to continue to disperse through the Project area. Therefore, the Project is not expected to fragment an existing population into two or more populations.
	Adversely affect habitat critical to the survival of a species
	All exposed rocky sandstone ridges, escarpments, outcrops, slopes, and bluffs within areas where the Broad-headed snake is likely to, or may, occur that have the following habitat attributes are critical to its survival (DCCEEW, 2023): ■ Thermally adequate rock shelters (thin, broad, loose, exposed rocks that have a tight closed-in fit with the parent rock below and are resilient to the accumulation of soil and litter, and in crevices generally located close to cliff edges or in windblown caves on escarpments, bluffs, and slopes that face north to west and receive a high amount of solar radiation through gaps in the canopy) – Surrounded or interspersed by eucalypt woodland or forest with large hollow-bearing trees (usually dominated by eucalypts and/or turpentine with dominant or occurrence of Grey gum, Sydney peppermint, Narrow-leaved stringy-bark, Yellow bloodwood, Red bloodwood, Scribbly gum, Blue-leaf stringybark (*E. agglomerata*), White stringybark (*E. globoidea*), and/or Silvertop ash (*E. sieberi*)) – An abundance of Lesueur's zigzag gecko (*Amalosia lesueurii*) and presence of other prey species – Very large in size or within close proximity (i.e. < 0.5 km) to other exposed rocky sandstone areas with these attributes or the capacity to regenerate, restore, or develop these attributes. Th Project area may include eucalypt woodland or forest with large hollow-bearing trees, in proximity to thermally adequate rock shelters. The Project may result in minor removal of habitat critical to the survival of a species. However, it is unlikely this area constitutes significant sheltering, foraging, and breeding resources in comparison to the immediately surrounding available native forest, and the undisturbed potential foraging habitat within Eusdale Nature Reserve to the west, and Marrangaroo National Park.
	Disrupt the breeding cycle of a population
	Gravid female Broad-headed snakes have been observed in late spring and early summer, and neonates are born in the warm months of summer to early autumn (DCCEEW, 2023). Juveniles and gravid females remain in exposed rocky areas (exposed rocky ridges, escarpments, outcrops, and bluffs) throughout the year (DCCEEW, 2023). Mitigation measures include pre-clearance surveys prior to impacting rocky ridges, escarpments, outcrops or bluffs, to reduce the potential for direct mortality impacts to the species. Provided mitigation measures are adhered to, the project is considered unlikely to disrupt the breeding cycle of a population.
	Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
	The Project area may constitute occasional opportunistic dispersal, sheltering, foraging and breeding habitat. The Project is unlikely to alter the species dispersal or foraging use of the area. The Project may reduce species sheltering and breeding habitat in this area. Therefore, it is recommended to avoid as far as practical removal of HBTs and to adequately mitigate the loss of any HBTs if hollows are removed as part of the Project. It is unlikely this area constitutes significant foraging resources in comparison to the immediately surrounding available native forest, and the undisturbed potential foraging habitat within Eusdale Nature Reserve to the west, and Marrangaroo National Park. The Project is considered unlikely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
	Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat
	The project is unlikely to result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat. Appropriate mitigation measures for biosecurity must be implemented during the project works, as recommended in Section 5.2.
	Introduce disease that may cause the species to decline, or
	The project is unlikely to result in introduced disease that may cause the species to decline. Appropriate mitigation measures for biosecurity must be implemented during the project works, as recommended in Section 5.2.

Significant Impact Assessment for Broad-headed Snake	
	Interfere with the recovery of the species.
	There is no adopted or made Recovery Plan for this species. The species Conservation Advice outlines conservation and recovery actions for the species (DCCEEW, 2023). The primary conservation objective is '*Increase the resilience of the Broad-headed snake across its distribution by stopping, then reversing, the overall population decline, increasing the abundance and area of occupancy, halting further subpopulation declines, and improving subpopulation connectivity.* The Project is not expected to interfere with the conservation objective. Therefore, the Project is not expected to interfere with the recovery of the species.
Conclusion	
	The species has been assessed against the criteria above and it has been determined that the project works are **unlikely to constitute a significant impact on this species.**
References	
Department of Climate Change, Energy, the Environment and Water (2023). *Conservation Advice for* Hoplocephalus bungaroides *(broad-headed snake)*. Canberra: Department of Climate Change, Energy, the Environment and Water. Available from: **http://www.environment.gov.au/biodiversity/threatened/species/pubs/1182-conservation-advice-15112023.pdf**. In effect under the EPBC Act from 15-Nov-2023.	

Table I-9 Significant Impact Assessment – Spotted-tailed Quoll

Significant Impact Assessment for Spotted-tailed Quoll	
Threatened Species Assessed	
	Species: Spotted-tailed Quoll (*Dasyurus maculatus*) **Listing status under the EPBC Act: Endangered** **Habitat:** the Spotted-tailed Quoll is a mainly forest dependent species but occurs in a variety of habitats including closed forests (including temperate and sub-tropical rainforest), tall eucalypt forests, open woodlands, open forests, drier rainshadow woodlands and coastal heathlands (TSSC, 2020). **Breeding and nesting requirements:** The species den sites include rock crevices, hollow logs, hollow tree buttresses, tree hollows, windrows, clumps of vegetation, caves and boulder tumbles, under buildings and underground burrows, including those of rabbits and wombats (DELWP, 2016). **Feeding ecology:** The Spotted-tailed Quoll is carnivorous, feeding on variety of prey (less than 5kg), including gliders, possums, small wallabies, rats, birds, bandicoots, rabbits, insects and reptiles (TSSC, 2020). **Spotted-tailed Quoll habitat present in the site (i.e. impact area):** The Bionet Vegetation Classification threatened species profiles, indicates that the Spotted-tailed Quoll is associated with PCT 3211, 3347, 3367, 3369, 3477, 3534, 3734, 3735, 3747, and 4063, conservatively mapped as occurring within the project area. A total of 197.553 ha of native vegetation across the five PCTs occurred within the Survey area with the Indicative Disturbance Footprint intersecting 30.57 ha of PCTs considered as suitable habitat for the species. The species was not incidentally recorded during the field survey. The majority of the Project occurs across previously disturbed pasture grasses, and does not constitute the species general habitat (forest dependent). However, there were several hollows and stags identified within the Project area, and one area of the Project occurs within native forest vegetation, adjacent to an existing track, and includes up to 10 m width clearance along the existing track. There is one record present, north of the Project area, within 10 km from 2006; the presence of rocky outcrops and hollows within the Project area may provide suitable den sites for this species. Therefore, the species occasional presence cannot be discounted. Survey area
Significant Impact Criteria	
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:	
	Lead to a long-term decrease in the size of a population
	The majority of the Project occurs across previously disturbed pasture grasses, and does not constitute the species general habitat (forest dependent). One section of the Project includes clearing approximately 10 m width of native forest, along a previously disturbed and existing track (condition unknown) for a road reserve access corridor. Given the already disturbed nature of the habitat (widening an existing track with native forest, and the majority of the project within disturbed pasture grass communities with low habitat value), the potential den habitat is considered to be suboptimal habitat for the species. Mitigation measures include presence of a fauna spotter catcher and conducting preclearance surveys, for potential denning sites, including rocky outcrops and hollows. It is considered unlikely that the project would lead to a long-term decrease in the size of a population.
	Reduce the area of occupancy of the species
	The area of occupancy of Spotted-tailed Quoll is estimated to be 2,512 km^2 (TSSC, 2020). While the Project area is potential dispersal, foraging, and breeding habitat, the Project would not alter the species use of the area for either of dispersal and foraging functions. Given the already disturbed nature of the habitat (widening an existing track with native forest, and the majority of the project within disturbed pasture grass communities with low habitat value), the potential den habitat is considered to be suboptimal habitat for the species. It is considered unlikely that the project would reduce the area of occupancy of the species.
	Fragment an existing population into two or more populations
	One section of the Project includes clearing approximately 10 m width of native forest, along a previously disturbed and existing track (condition unknown) for a road reserve access corridor. The species is highly mobile and able to disperse across clear areas. It is considered unlikely that the project would fragment an existing population into two or more populations.
	Adversely affect habitat critical to the survival of a species
	Habitat that is critical to the survival of the species includes large patches of forest with adequate denning resources and relatively high densities of medium-sized mammalian prey (DELWP, 2016). One section of the Project includes clearing approximately 10 m width of native forest, along a previously disturbed and existing track (condition unknown) for a road reserve access corridor. However, it is unlikely this area constitutes significant denning or foraging resources in comparison to the immediately surrounding available native forest vegetation, and the undisturbed potential foraging habitat within Eusdale Nature Reserve to the west, and Marrangaroo National Park. The Project is not considered to adversely affect habitat critical to the survival of a species.

Significant Impact Assessment for Spotted-tailed Quoll	
	Disrupt the breeding cycle of a population
	Maternal den sites include rock crevices, caves, boulder tumbles, hollow logs, hollow tree roots and burrows (DELWP, 2016). Given the already disturbed nature of the habitat (widening an existing track with native forest, and the majority of the project within disturbed pasture grass communities with low habitat value), the potential den habitat is considered to be suboptimal habitat for the species. There is an abundance of relatively undisturbed, potential habitat immediately surrounding the Project area, and within Eusdale Nature Reserve to the west, and Marrangaroo National Park to the east. Mitigation measures include presence of a fauna spotter catcher and conducting preclearance surveys, for potential denning sites, including rocky outcrops and hollows. Provided mitigation measures are adhered to, it is considered unlikely that the Project would disrupt the breeding cycle of a population.
	Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
	The majority of the Project impacts are within previously disturbed pasture grass communities which may constitute dispersal habitat. There would be no impact to species dispersal. One section of the Project includes clearing approximately 10 m width of native forest, along a previously disturbed and existing track (condition unknown) for a road reserve access corridor. The Project would not alter the species use of the area for either of dispersal and foraging functions. Given the already disturbed nature of the habitat (widening an existing track with native forest, and the majority of the project within disturbed pasture grass communities with low habitat value), the potential den habitat is considered to be suboptimal habitat for the species. There is an abundance of undisturbed potential foraging and denning habitat within Eusdale Nature Reserve to the west, and Marrangaroo National Park. It is unlikely the Project would modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
	Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat
	The Project is unlikely to result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat. Appropriate mitigation measures for biosecurity must be implemented during the project works, as recommended in Section 5.2.
	Introduce disease that may cause the species to decline, or
	The Project is unlikely to result in introduced disease that may cause the species to decline. Appropriate mitigation measures for biosecurity must be implemented during the project works, as recommended in Section 5.2.
	Interfere with the recovery of the species.
	The species National Recovery Plan (DELWP, 2016) objectives include: ▪ Determine the distribution and status of Spotted-tailed quoll populations throughout the range and identify key threats and implement threat abatement management practices. ▪ Investigate key aspects of the biology and ecology of the Spotted-tailed quoll to acquire targeted information to aid recovery. ▪ Reduce the rate of habitat loss and fragmentation on private land. ▪ Evaluate and manage the risk posed by silvicultural practices. ▪ Determine and manage the threat posed by introduced predators (foxes, cats, wild dogs) and of predator control practices on Spotted-tailed quoll populations ▪ Determine and manage the impact of fire regimes on Spotted-tailed quoll populations. ▪ Reduce deliberate killings of Spotted-tailed quolls. ▪ Reduce the frequency of Spotted-tailed quoll road mortality. ▪ Assess the threat Cane toads pose to Spotted-tailed quolls and develop threat abatement actions if necessary. ▪ Determine the likely impact of climate change on Spotted-tailed quoll populations. ▪ Increase community awareness of the Spotted-tailed quoll and involvement in the Recovery Program. The project is not expected to interfere with the Recovery Plan's goal or objectives, or result in any significant impacts on the criteria discussed here, therefore the Proposed Action is not expected to interfere with the recovery of the species.
Conclusion	
	The species has been assessed against the criteria above and it has **been determined that the project works are unlikely to constitute a significant impact on this species.**

Significant Impact Assessment for Spotted-tailed Quoll
References
Threatened Species Scientific Committee (2020). *Conservation Advice* Dasyurus maculatus maculatus *(southeastern mainland population) Spotted-tailed Quoll, south eastern mainland*. Canberra: Department of Agriculture, Water and the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/75184-conservation-advice-01092020.pdf. In effect under the EPBC Act from 01-Sep-2020. Department of Environment, Land, Water and Planning (2016). *National Recovery Plan for the Spotted-tailed Quoll* Dasyurus maculatus. Australian Government, Canberra. Available from: http://www.environment.gov.au/biodiversity/threatened/recovery-plans/spotted-tailed-quoll. In effect under the EPBC Act from 06-May-2016.

Table I-10 Significant Impact Assessment – Greater Glider

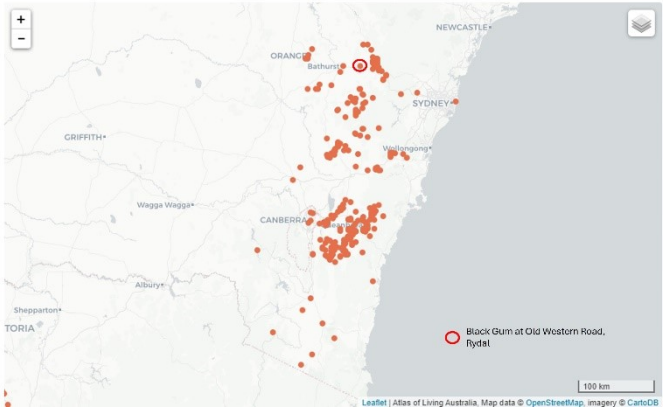
Significant Impact Assessment for Greater Glider	
Threatened Species Assessed:	
	Species: Greater Glider (*Petauroides volans*) **Listing status under the EPBC Act: Endangered** **Habitat:** The species is restricted to eucalypt forests and woodlands of eastern Australia and can be found in regrowth forest provided sufficient hollows are present (DCCEEW 2022). During the day the species shelters in tree hollows, with a preference for large hollows (diameter >10 cm) in large, old live and dead trees; the probability of occurrence is positively correlated with the availability of tree hollows, which is a key limiting resource (DCCEEW 2022). **Feeding ecology:** The species is folivorous, with a diet mostly comprising eucalypt leaves supplemented by buds and flowers s from a restricted range of eucalypt species based on geography (DCCEEW 2022). It favours forests with a diversity of eucalypt species, due to seasonal variation (DCCEEW 2022). **Greater Glider habitat present in the site (i.e. impact area):** The Bionet Vegetation Classification threatened species profiles, indicates that the Grater Glider is associated with 3211, 3347, 3367, 3369, 3477, 3534, 3734, 3735, 3747, and 4063, conservatively mapped as occurring within the Project area. A total of 197.553 ha of native vegetation across the five PCTs occurred within the Survey area with the Indicative Disturbance Footprint intersecting 30.57 ha of PCTs. The species was not incidentally recorded during the field survey. The majority of the Project occurs across previously disturbed pasture grasses, and does not constitute the species general habitat. However, there were also several hollows and stags identified within the Project area. A total of 13 records occur within the 10 km desktop search area. The species has the potential to occur in tree hollows, trees with fissures and stags may provide suitable foraging and sheltering habitat. Additional targeted survey is recommended to confirm the presence and extent of plants within the Project Area given the potentially suitable habitat to support the species.
Significant Impact Criteria	
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:	
	Lead to a long-term decrease in the size of a population
	Greater gliders disperse poorly across vegetation that is not native forest (DCCEEW 2022). The majority of the Project occurs across previously disturbed pasture grasses, and does not constitute the species general habitat. One section of the Project includes clearing approximately 10 m width of native forest, along a previously disturbed and existing track (condition unknown) for a road reserve access corridor. This area may contain stags and hollows suitable to dispersal, sheltering, foraging, and breeding habitat for the species. Although there are stags and hollow bearing trees within the Project area, the edge habitat the project area is considered to be suboptimal habitat for the species. There is an abundance of relatively undisturbed, potential habitat immediately surrounding the Project area. Habitat such as hollow-bearing trees and stags should be retained as far as practicable. Mitigation measures include presence of a fauna spotter catcher and conducting preclearance surveys, for hollows. It is considered unlikely that the project would lead to a long-term decrease in the size of a population.
	Reduce the area of occupancy of the species
	The area of occupancy of Greater glider is estimated to be between 15,316 km^2 to > 40,000 km^2 (DCCEEW 2022). One section of the Project includes clearing approximately 10 m width of native forest, along a previously disturbed and existing track (condition unknown) for a road reserve access corridor. This area may contain stags and hollows suitable to dispersal, sheltering, foraging, and breeding habitat for the species. However, given the already disturbed nature of the habitat (edge habitat associated with widening an existing track with native forest, and the majority of the project within disturbed pasture grass communities with low habitat value), the project area is considered to be suboptimal habitat for the species. The project is not expected to reduce the area of occupancy of the species to a measurable degree.
	Fragment an existing population into two or more populations
	Greater gliders disperse poorly across vegetation that is not native forest (DCCEEW 2022). One section of the Project includes clearing approximately 10 m width of native forest, along a previously disturbed and existing track (condition unknown) for a road reserve access corridor. The species is mobile within forested areas, and unlikely to disperse across currently cleared/ pasture grass areas. The project would not alter dispersal ability within the forested area. It is considered unlikely that the project would fragment an existing population into two or more populations.
	Adversely affect habitat critical to the survival of a species
	Habitat critical to survival of the species includes (DCCEEW, 2022): ▪ Large contiguous areas of eucalypt forest, which contain mature hollow-bearing trees and a diverse range of the species' preferred food species in a particular region ▪ Smaller or fragmented habitat patches connected to larger patches of habitat, that can facilitate dispersal of the species and/or that enable recolonisation

Significant Impact Assessment for Greater Glider	
	▪ Cool microclimate forest/woodland areas (e.g. protected gullies, sheltered high elevation areas, coastal lowland areas, southern slopes) ▪ Areas identified as refuges under future climate changes scenarios ▪ Short-term or long-term post-fire refuges (i.e. unburnt habitat within or adjacent to recently burnt landscapes) that allow the species to persist, recover and recolonise burnt areas. ▪ Forest areas currently unoccupied by the species may still represent habitat critical to survival, if the recruitment of hollow-bearing trees as the forest ages could allow the species to colonise these areas and ensure persistence of a subpopulation. The project area includes smaller or fragmented habitat patches connected to larger patches of habitat, that can facilitate dispersal of the species and/or that enable recolonisation. The Proposed Action will not increase fragmentation or limit dispersal to the extent that the species can no longer traverse the disturbed area. As the project would not alter the facilitation of dispersal, the project is considered unlikely to adversely affect habitat critical to the survival of the species.
	Disrupt the breeding cycle of a population
	Females give birth to a single young from March to June, and rely on den trees for sheltering, with a particular preference for hollows >10 cm diameter in large, old trees (DCCEEW, 2022). One section of the Project includes clearing approximately 10 m width of native forest, along a previously disturbed and existing track (condition unknown) for a road reserve access corridor. This area may contain stags and hollows suitable to dispersal, sheltering, foraging, and breeding habitat for the species. Although there are stags and hollow bearing trees within the Project area, the edge habitat the project area is considered to be suboptimal habitat for the species. There is an abundance of relatively undisturbed, potential habitat immediately surrounding the Project area. Habitat such as hollow-bearing trees and stags should be retained as far as practicable. Mitigation measures include presence of a fauna spotter catcher and conducting preclearance surveys, for hollows. Provided mitigation measures are adhered to, it is considered unlikely that the project would disrupt the breeding cycle of a population.
	Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
	The majority of the Project impacts are within previously disturbed pasture grass communities which is unlikely to be constitute dispersal habitat (Greater gliders disperse poorly across vegetation that is not native forest (DCCEEW 2022)). One section of the Project includes clearing approximately 10 m width of native forest, along a previously disturbed and existing track (condition unknown) for a road reserve access corridor. The Project would not measurably reduce foraging habitat within the general area, considering the undisturbed immediately surrounding native forest community. Given the already disturbed nature of the habitat, the potential sheltering and breeding habitat is considered to be suboptimal habitat for the species. Habitat such as hollow-bearing trees and stags should be retained as far as practicable. It is unlikely the Project would modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
	Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat
	The project is unlikely to result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat. Appropriate mitigation measures for biosecurity must be implemented during the project works, as recommended in Section 5.2.
	Introduce disease that may cause the species to decline, or
	The project is unlikely to result in introduced disease that may cause the species to decline. Appropriate mitigation measures for biosecurity must be implemented during the project works, as recommended in Section 5.2.
	Interfere with the recovery of the species.
	The species Conservation Advice (DCCEEW, 2022) outline the conservation objectives "*Within the next three generations, the population size as well as the extent, quality and connectivity of habitat required to maintain the population will have increased*". Actions to support this objective include: ▪ Protect unburnt habitat in the aftermath of bushfires, re-asses prescribed burning to avoid loss of hollows ▪ Reduce direct mortality and loss of hollows during prescribed burns ▪ Protect hollow bearing trees, avoid fragmentation of habitat, restore habitat connectivity, avoid the use of barbed wire (DCCEEW, 2022). Provided that hollow-bearing trees are retained as far as practicable, and mitigation measures such as pre-clearance surveys are adhered to, the project is not expected to interfere with the conservation objective, or result in any significant impacts on the criteria discussed here, therefore the project is not expected to interfere with the recovery of the species.

Significant Impact Assessment for Greater Glider	
Conclusion	
	The species has been assessed against the criteria above and it has been determined that the project works are unlikely to constitute a significant impact on this species.
References	
Department of Climate Change, Energy, the Environment and Water (2022). *Conservation Advice for* Petauroides volans *(greater glider (southern and central))*. Canberra: Department of Climate Change, Energy, the Environment and Water. Available from: **http://www.environment.gov.au/biodiversity/threatened/species/pubs/254-conservation-advice-05072022.pdf**. In effect under the EPBC Act from 05-Jul-2022.	

Significant Impact Assessment – Vulnerable Species

Table I-11 Significant Impact Assessment – Black Gum

Significant Impact Assessment for Black Gum	
Threatened Species Assessed	
	Species: Black Gum (*Eucalyptus aggregata*) **Listing status under the EPBC Act: Vulnerable** **Habitat:** Black gum is endemic to south-eastern Australia and is found in the ACT, NSW and in a small isolated sub-population in Victoria. The species occurs mainly in the wetter, cooler and higher parts of the tablelands (NSW OEH, 2013) and is found at altitudes of 600 to 1,200 m and in areas with annual rainfall of 600 to 900 mm. **Black Gum Habitat present in the site (i.e. impact area):** The Bionet Vegetation Classification threatened species profiles, indicates that Black Gum is associated with PCT 3347, which is present within the Project area. A total of 6.007 ha of PCT 3347 were recorded within the Survey area, with 0.587 ha of PCT 3347 intersecting the Indicative Disturbance Footprint. The species was observed along Curly Dick Road, and within 5 m of the Project area. Additional surveys are required to confirm habitat within the Project area and footprint.
Significant Impact Criteria	
An action is likely to have a significant impact on vulnerable species if there is a real chance or possibility that it will:	
	Lead to a long-term decrease in the size of an important population of a species
	No known records of the species were found within the 10 km locality in BioNet Atlas. The Atlas of Living Australia (2024) shows tree records of the Black Gum at and near Old Western Road, at approximately 4.8 km east from Curly Dick Road, where Black Gum was recorded during surveys in August 2024. It is unknown if more Black Gum individuals occur in the locality. Targeted surveys would be required to know if Black Gum is present within the Project area and Indicative Disturbance Footprint. If present, an assessment would be required to determine if an important population of the species occurs in the Project area.
	Reduce the area of occupancy of an important population
	Presence of Black Gum in the Project area and footprint would require assessment. If present, it is recommended for individuals of the species being retained within the Project area. Image below shows the distribution of the species as per records in the Atlas of Living Australia (2024). The species is known as far west as Orange. Numerous records appear to occur in Gardens of Stone National Park and within proximity of Coxs River, this likely represents an important population area for the species. Given that most of the Indicative Disturbance Footprint would be located in historically cleared land and only 6.007 ha of ground-truthed PCT 3347 occurs within the Survey area, and 0.587 ha within the Indicative Disturbance Footprint, it is predicted that the project is unlikely to result in a reduction in the area of occupancy of an important population of the Black Gum.  **Image:** Black Gum (Eucalyptus aggregate) in the Atlas of Living Australia (12 September 2024)
	Fragment an existing important population into two or more populations
	Targeted surveys are required to determine the presence and abundance of the species in the Project area and footprint. Only 6.007 ha of PCT 3347 occur within the Survey area with 0.587 ha intersecting the Indicative Disturbance Footprint, the BioNet Vegetation Classification data indicates that the frequency of Black Gum in the PCT is three individuals per plot (20 m by 20 m). Estimations would be required to determine if an important population is present in the Project area and if the Indicative Disturbance Footprint would fragment it.

Significant Impact Assessment for Black Gum	
	Adversely affect habitat critical to the survival of a species
	Critical habitat for the species is not defined in the listing advice (TSSC 2015), however, an important population for the species occurs in the Cox River area which is considered an important stand. Associated PCT would be habitat critical for the long-term presence of the species. Removal of its associated habitat would result is loss of habitat where the species can persist. If Black Gum is found to be present in the Project area and footprint, it is recommended to avoid clearing of individuals.
	Disrupt the breeding cycle of an important population
	Eucalypts rely on insects and birds for pollination. It is unlikely that the project would result in impacts on insects, however, wind farms are known to pose risks to birds and bats. Provided that adequate mitigation measures are implemented to prevent loss of bird populations in the Project area, it would not be expected for the project to reduce bird pollinators presence which would disrupt the breeding cycle for the species.
	Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
	The Project area is located in historically disturbed land where small, isolated patches of vegetation are also highly disturbed (e.g. cattle grazing, lack of native mid and ground cover, cattle trampling and weed dominance in the groundcover). The project is unlikely to modify, destroy, remove or isolate quality habitat for the species resulting in decline of occurrence of the Black Gum. A total of 6.007 ha of PCT 3347 occurs in the Survey area with 0.587 ha intersecting the Indicative Disturbance Footprint, if removed, this would represent loss of substandard habitat for the species.
	Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
	Cattle grazing and trampling prevent recruitment of native species, including seedlings of gum trees, such as Black Gum. Weed species can outcompete recruitment of native species. Most part of the Survey area is grazed by cattle and has a high weed component and are an existing threat for recruitment of native species. Project activities during construction (e.g. earthworks, importation of soils and materials contaminated with weed seeds or plants) and operation (e.g. introduction of seed and/or tissue of weeds in tyres of vehicles and machinery) have potential to further introduce weed species. If introduced weeds become established, they can outcompete seedling of native species (e.g. eucalypts) preventing recruitment. It is recommended for hygiene protocols to be established and implemented during the construction and operational phases of the project to prevent introduction of weeds.
	Introduce disease that may cause the species to decline; or
	Myrtle rust (*Puccinia psidii*) is a fungal disease which infects plants in the Myrtaceae family, which includes gum trees, such as Black Gum. Myrtle rust can be introduced to Project area if brought into the land on infected plant material, contaminated equipment, vehicles and clothing. Accidental introduction of myrtle rust must be avoided by preparing and implementing hygiene protocols for PPE, vehicles and equipment. If soil is to be imported into the Project area, imported soils and materials to include a certificate stating the soil and/or materials are clean and sourced from areas free of myrtle rust.
	Interfere substantially with the recovery of the species.
	No conservation advice for the species is available. It is, however, known that threats to Black Gum include mortality, suppression of gene flow, lack of recruitment and hybridisation. Therefore, prevention of contributing threats would prevent inference with species recovery. Presence of Black Gum in the Project area and footprint requires targeted surveys. If present and requiring removal, clearing of individuals of the species would contribute to direct loss of individual trees. Pollen movement for Black Gum is less than 1 km and seed dispersal can be up to 300 m or less. If Black Gum is found to be present in the Indicative Disturbance Footprint, it should be retained in a vegetated corridor fenced off from cattle, this would allow pollen dispersal, seed dispersal and recruitment.
Conclusion	
	If the recommended mitigation measures are adhered to, then the potential indirect and direct impacts to the Black Gum trees along Curly Dick Road could be minimised, and therefore it would be unlikely to result in a significant impact. Should the Indicative Disturbance Footprint intersect trees or extensive areas of treed vegetation, targeted surveys to verify the presence and extent of Black Gum trees and re-assessment against the significant impact assessment criteria will be required.

Significant Impact Assessment for Black Gum
References
DAWE (2015a) Conservation advice for *Eucalyptus aggregata* (Black Gum) combined populations of Queensland, New South Wales and the Australian Capital Territory. Australian Government via Department of Agriculture, Water and the Environment
DCCEEW (2024c) Species Profile and Threats Database. *Eucalyptus aggregata* (combined populations of Qld, NSW and ACT) – Black Gum (combined populations of Queensland, New South Wales and the Australian Capital Territory). SPRAT Profile. On-line resource accessed via: **Eucalyptus aggregata — Black Gum (environment.gov.au)**
EHG (2024) NSW BioNet Atlas and BioNet Vegetation Classification application. NSW Department of Climate Change, the Environment, Energy and Water via Environment and Heritage Group. On-line resources accessed via: **https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/nsw-bionet**
DoE (2013) Matters of National Environmental Significance. Significant Impact Guidelines 1.1 – Environment Protection and Biodiversity Conservation Act 1999. Australian Government via Department of Environment.
DCCEEW (2024c) Black Gum – Species Profile. NSW Department of Climate Change, Energy, the Environment and Water via Environment and Heritage. On-line resource accessed via: **Black Gum - profile | NSW Environment, Energy and Science**
NSW TSSC (2022) *Eucalyptus aggregata* (Black Gum) Deane and Maiden– Vulnerable Species Listing. NSW Threatened Species Scientific Committee Final Determination.
OEH (2018a) Threatened Species Test of Significance Guidelines. NSW Department of Planning and Environment.
TSSC (2015) Conservation Advice Eucalyptus aggregata Black Gum. Threatened Species Scientific Committee for the EPBC Act.

Table I-12 Significant Impact Assessment – Silver-leaved Mountain Gum

Significant Impact Assessment for Silver-leaved Mountain Gum	
Threatened Species Assessed:	
	Species: Silver-leaved Mountain Gum (*Eucalyptus pulverulenta)* **Listing status under the EPBC Act: Vulnerable** **Habitat:** Silver-leaved Mountain Gum occurs on the crests or upper slopes of moderately steep hillsides or mountains, usually on well-drained skeletal soils with frequent rock outcrops (DEWHA 2008). The species grows in shallow soils as an understorey plant in open forest, typically dominated by Brittle Gum (*Eucalyptus mannifera*), Red Stringybark (*E. macrorhynca*), Broad-leafed Peppermint (*E. dives*), Silvertop Ash (*E. sieberi*) and Apple Box (*E. bridgesiana*). The species is found in two disjunct locations, from Lithgow to Bathurst and the Monaro (Bredbo to Bombala) (NSW OE&H 2021). **Silver-leaved Mountain Gum habitat present in the site (i.e. impact area):** The Bionet Vegetation Classification threatened species profiles, indicates that Silver-leaved Mountain Gum is associated with PCT 3347, 3534 and 3734, one of which is present within the Project area. A total of 6.007 ha of PCT 3347 was recorded within the Survey area, with the Indicative Disturbance Footprint interesting 0.587 ha. The species was not incidentally recorded during the field survey, however there are three records of the species outside the Project area but within 10 km. Further targeted survey is recommended to confirm the absence/presence and extent of plants within the Project Area given the potentially suitable habitat to support the species.
Significant Impact Criteria	
An action is likely to have a significant impact on vulnerable species if there is a real chance or possibility that it will:	
	Lead to a long-term decrease in the size of an important population of a species
	The species was not recorded during preliminary field surveys within the Survey area and has not historically been recorded within the 10 km search area, however there are several suitable habitats noted along rocky outcrops and the presence of associated species including, *Eucalyptus mannifera* and *Eucalyptus bridgesiana.* The majority of the Indicative Disturbance Footprint encompasses modified farmland, domintated by pasture grasses. Areas of remnant intact vegetation and treed areas have been avoided where possible to reduce impacts to ecological values. There is the potential that the Project intersects potentially suitable habitat for Silver-leaved Mountain Gum, particularly on rocky outcrops though the species presence this would need to be determined by future targeted surveys.
	Reduce the area of occupancy of an important population
	Silver-leaved Mountain Gum is distributed in two disjunct locations, with several small stands occurring in Bowenfels district and Bredbo, both located in the NSW Tablelands. There is no published guidance on the total area of occupancy for the species, however the Project area is entirely situated in modelled habitat considered likely to support the species (DCCEEW 2012). The extent of suitable ground-truthed during the field survey includes 6.007 ha of PCT 3347 Southern Tableland Creekflat Ribbon Gum Forest, removal of 0.587 ha of this associated PCT is unlikely to reduce the area of occupancy for the species.
	Fragment an existing important population into two or more populations
	There is no known or existing population within the Project area, though this would need to be confirmed through targeted survey. Given there are three records of the species within the 10 km search area, there is potential that the species occurs within the Project area, specifically within intact patches of PCT 3347 and rocky outcrops. The majority of suitable habitats for the species have been avoided, as such it is unlikely that the Project will cause fragmentation to any population of Silver-leaved Mountain Gum, if present.
	Adversely affect habitat critical to the survival of a species
	No critical habitat has been formally defined for the species. However, where critical habitat is not explicitly identified, habitat critical to the species' survival is considered to include areas essential for its persistence. This includes the localities where all 10 currently known populations exist. The Project area does not intersect or come within 10 km of the nearest population of the species, as such it is unlikely that the Project will adversely affect habitat critical to the survival of Silver-leaved Mountain Gum.
	Disrupt the breeding cycle of an important population
	The Project is not going to directly impact any known populations of the species based on preliminary field assessments. As such, the Project is unlikely to disrupt any breeding or recruitment of Silver-leaved Mountain Gum.
	Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
	The Proposed Action is not going to directly impact any known populations of this species. The vegetation to be cleared is the more disturbed edge components of the wider patches within the Project area.

Significant Impact Assessment for Silver-leaved Mountain Gum	
	Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
	There is no published documentation that outlines any invasive species that pose any significant threat to Silver-leaved Mountain Gum. The Project is unlikely to result in any release or spread of invasive species that would result in harm to the species.
	Introduce disease that may cause the species to decline; or
	There are no disease agents or pathogens identified in the conservation advice for the species. To mitigate the spread and establishment of disease and present weeds, the Project will implement best-practice construction hygiene measures.
	Interfere substantially with the recovery of the species.
	There is no published Recovery Plan or Threat Abatement Plan for the species. As such, the Project is unlikely to interfere with any State or Commonwealth obligations for the species conservation or management efforts.
Conclusion	
	Based on the assessment above, it is considered that the Project is unlikely to have a significant impact on Silver-leaved Mountain Gum given no specimens have previously been recorded within the Study Area and the majority of suitable habitats have been avoided. It is recommended that targeted surveys are undertaken within areas where the Indicative Disturbance Footprint intersects extensive areas of treed vegetation.
References	
Department of the Environment, Water, Heritage and the Arts (2008). *Approved Conservation Advice for Eucalyptus pulverulenta (*Silver-leaved Mountain Gum*)*. Canberra: Department of the Environment, Water, Heritage and the Arts. Available from: **http://www.environment.gov.au/biodiversity/threatened/species/pubs/21537-conservation-advice.pdf**. In effect under the EPBC Act from 03-Jul-2008. Department of Climate Change, Energy, the Environment and Water (2012) *Eucalyptus pulverulenta* — Silver-leaved Mountain Gum, Silver-leaved Gum, Species Profile and Threats Database, Canberra: Department of Climate Change, Energy, the Environment and Water. Available from: **https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=21537** NSW Government Office of Environment & Heritage (2021) *Silver-leaf Gum – Profile,* Available from: **Silver-leafed Gum - profile | NSW Environment, Energy and Science**	

Table I-13 Significant Impact Assessment – South-eastern Glossy Black-Cockatoo

Significant Impact Assessment for South-eastern Glossy Black-Cockatoo	
Threatened Species Assessed	
	Species: South-eastern Glossy Black-Cockatoo (*Calyptorhynchus lathami lathami)* **Listing status under the EPBC Act: Vulnerable** **Habitat:** South-eastern Glossy Black-Cockatoo is an uncommon but widespread species found from Queensland, eastern NSW and East Gippsland Victoria. The species prefers woodland areas dominated by Sheoak (i.e. Allocasuarina trees), or open sclerophyll forests and woodlands with a stratum of Allocasuarina beneath Eucalyptus, Corymbia or Angophora (DCCEEW 2022). The species feeds almost exclusively on seeds of (*Allocasuarina spp. and Casuarina spp*.), usually relying on one or two species within a region. **Breeding requirements:** South-eastern Glossy Black-Cockatoo is a hollow nesting species, utilising large hollows in living and dead eucalyptus trees. As such, the species is entirely dependent on large-hollow bearing trees for reproduction. The species lays one single egg between March and May (NSW OE&H 2025). **South-eastern Gossy Black-Cockatoo habitat present in the site (i.e. impact area):** The Bionet Vegetation Classification threatened species profiles, indicates that South-eastern Glossy Black-Cockatoo is associated with PCT 3211, PCT 3347, PCT 3367, PCT 3369, PCT 3477, PCT 3534, PCT 3734, PCT 3735, PCT 3747 and PCT 4063, five of which were confirmed present within the Project area during the field survey (namely PCT 3211, PCT 3347, PCT 3367, PCT3369 and PCT 3735). A total of 197.553 ha of associated PCTs for South-eastern Glossy Black-cockatoo was ground-truthed within the Survey area, with 30.57 ha of the PCTs intersecting the Indicative Disturbance Footprint. The species was not recorded within the Survey area during the field survey, however there are two verified species records present within the Project area from 2019. Given the extent of confirmed suitable habitat for the species and the recent species records, it is considered that the species has a high likelihood of occurrence within the Project area. It is assumed, that following the bird and bat utilisation surveys the species presence and flight paths will be better understood.
Significant Impact Criteria	
An action is likely to have a significant impact on vulnerable species if there is a real chance or possibility that it will:	
	Lead to a long-term decrease in the size of an important population of a species
	Although the proposed Mount Lambie Wind Farm is primarily located within land historically farmed and cleared for rural land use, there are five verified PCT communities occurring within the Survey area that are considered to provide foraging and potential breeding habitat for the species. Removal of suitable habitats, large hollow bearing trees and potential ongoing operation of the wind farm has the potential to result in a significant impact to South-eastern Glossy Black-Cockatoo. Additional targeted surveys are required to determine the species presence and flight paths within the Project area and dependence on habitat within the landscape. The following is recommended to prevent any long-term decrease to South-eastern Glossy Black-Cockatoo in the Project area: ▪ Avoid impacts to intact stands of native vegetation that comprise any associated PCT's for the species (namely PCT 3211, PCT 3347, PCT 3367, PCT3369, PCT 3735, PCT 3534 and PCT 3747) ▪ Avoid impacts to all large hollow bearing trees that may provide suitable breeding habitat for the species within the Indicative Disturbance Footprint. ▪ Undertake targeted survey within the Project area to determine species occurrence, flight paths and determine risk of collision of South-eastern Glossy Black-Cockatoo with WTGs blades and barometric trauma.
	Reduce the area of occupancy of an important population
	Current published advice provided by the DCCEEW indicates that South-eastern Glossy Black-Cockatoo has an area of occupancy at 40,000 km^2. The Project is likely to result in the removal of 30.57 ha of potentially suitable or opportunistic foraging and roosting habitat for the species. Based on the recent reputable records of South-eastern Glossy Black-Cockatoo, potential impacts to 30.57 ha of suitable vegetation is considered to reduce the availability and extent of habitat within the Project Area. However, removal of 30.57 ha of suitable habitat represents 0.00076% of the area of occupancy for the species. The level of proposed impacts is considered unlikely to reduce the area of habitat available that results in an impact which is notable or of consequence to the species.

	Fragment an existing important population into two or more populations
	Although South-eastern Glossy Black-Cockatoo was not recorded during the field survey, the species is considered to have a high likelihood of occurrence given the vicinity of recent species records within the Project area. Additional surveys on occupancy of the Project area by South-eastern Glossy Black-Cockatoo would be required to understand if a population of the species is present and its size. Generally, population fragmentation would occur when introduction of barriers to movement impedes free passage of individuals, where the distance among patches of suitable habitat is such that individuals cannot move among patches (e.g. due to lack of food resources, due to distances being larger than the distances the animal can move across without succumbing to exhaustion, or due to mortality risks (e.g. predation pressure, vehicle-wildlife collisions, mortality due to collision with WTGs turbine or barotrauma). There is the potential that the species has previously been recorded within the Project area whilst dispersing throughout the landscape as part of their foraging and feeding movements. Given that the species is highly mobile and that the level of clearing in the Project area would be unlikely to result in any physical barriers or further fragmentation of vegetation, it is not expected that the project would result in fragmentation of an existing population of the South-eastern Glossy Black-Cockatoo.
	Adversely affect habitat critical to the survival of a species
	Habitat critical to the survival of South-eastern Glossy Black-Cockatoo refers to areas that are necessary: ■ For activities such as foraging, breeding, roosting or dispersal; ■ For the long-term maintenance of the species; ■ To maintain genetic diversity and long-term evolutionary development; or ■ For the reintroduction of populations or recovery of the species (DCCEEW 2022). Whilst the species presence and occupancy has not been determined for the Project, the Project area is considered to support suitable foraging, breeding, roosting and dispersal habitat based on preliminary field investigations and the presence of suitable feed trees. As such, removal of 30.57 ha of associated PCTs is likely to adversely affect habitat critical to the survival of South-eastern Glossy Black-Cockatoo. In addition, the following indirect impacts on habitat for South-eastern Glossy Black-Cockatoo have the potential to cause a significant impact on the species: ■ Noise and light pollution onto habitats ■ Introduction of weeds, or predators compromise the survival of adults and juveniles. The following recommendations are provided to avoid and minimise the area of occupancy of the species: ■ Avoid reducing the extent of suitable habitat for the species, ensuring that remnant patches of vegetation include a complex structure with canopy and shrub layer. ■ Avoid reducing availability of food resources for the species. ■ Avoid reducing the availability of HBTs which are suitable breeding habitat for the species. ■ Avoid indirect impacts (e.g. light pollution, noise, introduction of weeds, disease or predators) on habitat.
	Disrupt the breeding cycle of an important population
	South-eastern Glossy Black-Cockatoo are dependent on large hollow bearing trees for breeding. It is unknown whether the species regularly utilises habitat within the Project area, therefore a survey of South-eastern Glossy Black-Cockatoo occupancy and habitat reliance is required to determine the extent to which the species uses the area for roosting and potential breeding. The Project has the potential to disrupt the breeding cycle of South-eastern Glossy Black-Cockatoo if present, based on the following impacts: ■ Removal or impact to suitable hollows ■ Construction works including, noise, vibration and light pollution that disturbs nesting behaviours or deters species from utilising habitats within proximity of turbines ■ Introduction of diseases (e.g. Psittacine beak and feather disease (PBFD), myrtle rush), weeds, or predators occurs during construction and operational phases. It is known that cleared areas and linear clearing (e.g. tracks, roads) favour incursion and movement of weeds and pests. Weeds can outcompete native species altering woodland structure, composition and availability of native food resources. Accidental introduction of diseases affecting gum trees and wattles would affect availability of feeding and breeding habitat. ■ Potential turbine collision risk of breeding individuals.
	Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
	The Project has the potential to result in the removal of native vegetation across various PCT's considered to provide suitable habitat for the species within the Survey area. Based on the current Indicative Disturbance Footprint, 30.57 ha of suitable PCTs will be impacted. This extent of native vegetation removal is not considered to decrease the species capacity to occur within the environment given the extent of retained habitats in the Project area.

	Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
	The Project is unlikely to result in the spread and establishment of any invasive species in addition to those already present within the landscape. However, it is acknowledged that many arboreal mammals and avifauna depend on hollow bearing trees for refugia and breeding, as such the Project has the potential to result in interspecific competition through the removal of large hollow bearing trees. To mitigate the spread and establishment of weeds, the Project will implement best-practice construction hygiene measures.
	Introduce disease that may cause the species to decline; or
	South-eastern Glossy Black-Cockatoo is susceptible to Psittacine Beak and Feather Disease (PBFD). The Project is unlikely to exacerbate the spread of this disease within the Project Area.
	Interfere substantially with the recovery of the species.
	There is currently no published recovery plan available for South-eastern Glossy Black-Cockatoo. As such, the Project is unlikely to interfere with any State or Commonwealth obligations for the species conservation or management efforts.
Conclusion	
	Based on the assessment above, **it is considered that removal of 30.57 ha of suitable South-eastern Glossy Black-Cockatoo habitat has the potential to result in a significant impact**. Bird and bat utilisation surveys and additional targeted surveys for South-eastern Glossy Black-Cockatoo are recommended to confirm the species presence and dependence on habitat provided within the Project area.
References	
Department of Climate Change, Energy, the Environment and Water (2022). *Conservation Advice for* Calyptorhynchus lathami lathami *(South-eastern Glossy Black Cockatoo)*. Canberra: Department of Climate Change, Energy, the Environment and Water. Available from : http://www.environment.gov.au/biodiversity/threatened/species/pubs/67036-conservation-advice-10082022.pdf. In effect under the EPBC Act from 10-Aug-2022. NSW OE&H (2025) *South-eastern Glossy Black-Cockatoo – Profile,* NSW Government Office of Environment & Heritage, Available from: South-eastern Glossy Black-Cockatoo - profile | NSW Environment, Energy and Science	

Table I-14 Significant Impact Assessment – Painted Honeyeater

Significant Impact Assessment for Painted Honeyeater	
Threatened Species Assessed	
	Species: Painted Honeyeater (*Grantiella picta*) **Listing status under the EPBC Act: Vulnerable** **Habitat:** The species inhabits mistletoes in eucalypt forests/woodlands, riparian woodlands of black box and river red gum, box-ironbark-yellow gum woodlands, acacia-dominated woodlands, paperbarks, casuarinas, callitris, and trees on farmland or gardens (DoE 2015; DAWE 2021). The species prefers woodlands which contain a higher number of mature trees, as these host more mistletoes. It is more common in wider blocks of remnant woodland than in narrower strips. **Breeding requirements:** Breeding occurs from October to March when mistletoe fruits are most available. The species will build a small nest in the outer foliage of trees anywhere between 3 – 20 m above ground. **Painted Honeyeater habitat present in the site (i.e. impact area):** The Bionet Vegetation Classification threatened species profiles, indicates that Painted Honeyeater is associated with PCT 3211, PCT 3367, PCT 3369, PCT 3477, PCT 3734, PCT 3735, PCT 3747 and PCT 4063, four of which have been ground-truthed within the Project area (namely PCT 3211, PCT 3367, PCT 3369 and PCT 3735) totalling 190.676 ha in the Survey area. The Indicative Disturbance Footprint intersects a total of 29.647 ha of associated PCTs. The species was not incidentally recorded during the field survey. The species is considered to have the potential to occur within the Project area despite the lack of previous species records.
Significant Impact Criteria	
An action is likely to have a significant impact on vulnerable species if there is a real chance or possibility that it will:	
	Lead to a long-term decrease in the size of an important population of a species
	During preliminary ecological surveys, Painted Honeyeater was not recorded within the Project area and the species has not historically been recorded within the 10 km buffer search area from the Project area. The proposed Mount Lambie Wind Farm project is located within a somewhat cleared and rural land use setting, as such proposed impacts are limited to areas lacking remnant native vegetation or suitable habitats for the species. High-quality remnant native vegetation contained to the Mount Lambie mountain range has not historically supported Painted Honeyeater, nor is it known to support a current population of the species. For these reasons, the Project is not considered to lead to any decrease in the size of the population of Painted Honeyeater.
	Reduce the area of occupancy of an important population
	Current published advice provided by DCCEEW indicates that Painted Honeyeater has an area of occupancy of 1000 $km^{2.}$ Whilst the species has not historically been recorded, the Project is likely to result in the removal of 29.647 ha of potentially suitable habitat for Painted Honeyeater. The potential removal of 29.647 ha of suitable habitat represents 0.0296% of the area of occupancy for the species. This level of proposed impact is considered unlikely to reduce the area of habitat available that results in an impact which is notable or of consequence to the species.
	Fragment an existing important population into two or more populations
	The Project area is not currently considered to support a population of Painted Honeyeater, rather the species has the potential to opportunistically occur within higher-quality patches of treed vegetation whilst moving or dispersing through the greater landscape. As such, the Project is not considered to fragment any existing population of Painted Honeyeater.
	Adversely affect habitat critical to the survival of a species
	As documented in the National Recovery Plan (DAWE 2021) for Painted Honeyeater, habitat critical to the survival of the species includes: ▪ Areas that are necessary for activities such as foraging, breeding, roosting or dispersal; ▪ For the long-term maintenance of the species (including the maintenance of species essential to the survival or the species, such as pollinators); ▪ To maintain genetic diversity and long-term evolutionary development; or ▪ For the reintroduction of populations or recovery of the species. The Project area is located within a Key Biodiversity Area for Painted Honeyeater, namely the South-west Slopes Bioregion encompassing an area approximately 25,653 km^2 and is considered to provide important conservation habitat and support to ensure long-term persistence of the species. Given that Painted Honeyeater has not previously been recorded within the Project area or immediate surroundings, the Mount Lambie locality is not considered to sustain or provide habitat that is responsible for the long-term maintenance of the species.

Significant Impact Assessment for Painted Honeyeater	
	Disrupt the breeding cycle of an important population
	Based on the preliminary field survey, Painted Honeyeater is considered to have a moderate likelihood of occurrence within the Project area. The Project area is not considered to support an ongoing or permanent population of Painted Honeyeater, as such the Project is not likely to disrupt any breeding activities for Painted Honeyeater.
	Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
	The Project has the potential to result in 29.647 ha of removal of suitable PCTs for Painted Honeyeater. Despite the likely impacts to the associated PCTs, the Project area is not considered to provide permanent or ongoing habitat opportunities for the species, though this would need to be confirmed during formal bird and bat utilisation surveys within the Project area. As such, the Project is considered unlikely to modify, destroy, remove, isolate or decrease the availability of habitat to the extent that Painted Honeyeater is likely to decline
	Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
	It is known that competition for hollows and resources occur with other hollow-dependent native species and with the introduced Common Myna (*Acridotheres tristis*) (DoE 2015). In addition, predation by black rats (*Rattus rattus*) is also identified as a key threat to Painted Honeyeater (DoE 2015) It is not expected for Project activities to favour introduction or invasion of the Project area by Common Myna or black rats.
	Introduce disease that may cause the species to decline; or
	The Project is unlikely to release or introduce a disease that is likely to cause the species to decline. To reduce the spread and establishment of disease and introduced flora species, the Project will implement best-practice construction hygiene measures.
	Interfere substantially with the recovery of the species.
	The National Recovery Plan for Painted Honeyeater includes the following relevant strategies to sustain a positive population trend and improve the extent, condition and connectivity of habitats for the species: ■ Protect, manage and restore Painted Honeyeater breeding and foraging habitats at the local, regional and landscape scales Based on preliminary field assessments and the desktop review, the Project area is not considered to sustain a permanent or ongoing population of Painted Honeyeater, though this would need to be verified through future bird and bat utilisation surveys. Given the Indicative Disturbance Footprint is primarily located within modified farmland on the edges of remnant vegetation with the potential to support the species, the Project is unlikely to interfere with the recovery of Painted Honeyeater.
Conclusion	
	Based on the assessment provided above, it is considered that the Project is unlikely to have a significant impact to Painted Honeyeater. This is based on the lack of species records and the limited desktop evidence that the site is frequently or permanently visited by the species. Though this would need to be confirmed through future bird and bat utilisation surveys.
References	
Department of the Environment (2015). *Conservation Advice* Grantiella picta *painted honeyeater*. Canberra: Department of the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/470-conservation-advice.pdf. In effect under the EPBC Act from 08-Jul-2015. Department of Agriculture, Water and the Environment (2021). *National Recovery Plan for the Painted Honeyeater* (Grantiella picta). Department of Agriculture, Water and the Environment, Canberra. Available from: http://www.dcceew.gov.au/environment/biodiversity/threatened/publications/recovery/painted-honeyeater-2022. In effect under the EPBC Act from 16-Jun-2022. NSW Government (2022) *Painted Honeyeater – profile,* Available from: *Painted Honeyeater - profile | NSW Environment, Energy and Science*	

Table I-15 Significant Impact Assessment – Bathurst Copper Butterfly

Significant Impact Assessment for Bathurst Copper Butterfly	
Threatened Species Assessed	
	Species: Bathurst Copper Butterfly (*Paralucia spinifera)* **Listing status under the EPBC Act: Vulnerable** **Habitat:** The Purple Copper Butterfly is found in the area bordered by Bathurst, Portland, Lithgow and Oberon in the Central Tablelands of New South Wales (TSSC 2016). The following features are common to known sites: ▪ Altitude greater than 850 m ▪ Presence of native blackthorn (*Bursaria spinosa subsp. lasiophylla*) which is the only food plant of the purple copper butterfly ▪ Presence of attendant ant (*Anonychomyrma itinerans*) ▪ Heavy frosts and/or occasional snow ▪ 3 to 4 hours of exposure to direct spring sunlight **Life Cycle requirements:** the butterfly's life cycle depends on a mutualistic relationship with the ant *Anonychomyrma itinerans* and the presence of native blackthorn (TSSC 2016). After mating, the female lays her eggs on or near blackthorn bushes, at the base of which there are nests of the attendant ants. During the 14 to 17 days the caterpillars take to hatch, the attendant ants constantly patrol the blackthorn. When the larvae hatch, they are immediately tended by ants. As the caterpillars grow, the ants move them underground into their nest during the day and out at night to continue grazing on the native blackthorn leaves. The ants' efforts are rewarded with a sugary honeydew from a gland on the caterpillar's back. Pupation occurs between December and August within the underground ants' nest (NSW Government n.d.). **Bathurst Copper Butterfly habitat present in the site (i.e. impact area):** The Bionet Vegetation Classification threatened species profiles, indicates that Bathurst Copper Butterfly is associated with PCT 3347, PCT 3367, PCT 3369, PCT 3534, PCT 3734, PCT 3735, PCT 3747, four of which are verified to occur within the Survey area (namely PCT 3347, PCT 3367, PCT 3369 and PCT 3735) totalling 195.269 ha. The Indicative Disturbance Footprint intersects a total of 29.952 ha of suitable PCTs. The species was not recorded within the Survey area during preliminary field surveys, however is considered to have a moderate likelihood of occurrence within the Project area given the presence of species records within the 10 km search area and the abundance of *Bursaria spinosa* within the shrub-layer of the Project area.
Significant Impact Criteria	
An action is likely to have a significant impact on vulnerable species if there is a real chance or possibility that it will:	
	Lead to a long-term decrease in the size of an important population of a species
	The Project area is predominately confined to areas of farmland and improved pasture. Most treed vegetation within the Project area has been avoided where possible, however the Indicative Disturbance Footprint intersects 29.952 ha of suitable habitats. Given the extent of surrounding habitat values that are likely to be retained, it is considered that the Project is unlikely to lead to a long-term decrease in the size of an important population of Bathurst Copper Butterfly. To determine if the species occurs within the Project Area, it is recommended that targeted surveys are undertaken specifically within extensive areas of native blackthorn (*Bursaria spinosa*).
	Reduce the area of occupancy of an important population
	The species occupies a small area of occupancy and is restricted to the Central Tablelands. The species is known from a total of 29 sites comprising <30 ha of habitat. The Project area is not currently known to support an important population of the Bathurst Copper Butterfly, as such the proposed impacts are not expected to reduce the area of an important population.
	Fragment an existing important population into two or more populations
	There is no known population of Bathurst Copper Butterfly within vicinity of the Project area, however the species is considered to have the potential to occur given the locality of the Project area and the presence of suitable habitat. The Bathurst Copper Butterfly is known to have a limited dispersal ability but can fly up to several dozen metres in search for resources. While the species is reliant on its host plant and the associated ant species, the Indicative Disturbance Footprint and installation of a 20-meter-wide clearance is unlikely to act as any barrier for movement or cause fragmentation, provided suitable habitat remains on both sides of the impact corridor. Given the species' ability to traverse similar distances, individuals are likely to be able to cross the cleared corridor, particularly if conditions such as shelter from wind and minimal disturbance are maintained.

Significant Impact Assessment for Bathurst Copper Butterfly	
	Adversely affect habitat critical to the survival of a species
	No critical habitat has been formally defined for the species. However, where critical habitat is not explicitly identified, habitat critical to the species' survival is considered to include areas essential for its persistence and environments supporting the host feeding plant and attendant ant. Whilst targeted surveys for the species have not been undertaken, the Indicative Disturbance Footprint primarily includes areas of improved pasture or ground surface supporting an exclusive cover of non-native flora. Impacts to treed vegetation are primarily limited to the periphery of large stands of remnant vegetation and previously cleared areas. As such, the Project is unlikely to adversely affect habitat critical to the survival of Bathurst Copper Butterfly.
	Disrupt the breeding cycle of an important population
	The Proposed Action is not going to directly impact any known populations of this species. Indirect impacts, such as dust, noise and ongoing operation of the windfarm, are also considered unlikely to disrupt any potential population of the Bathurst Copper Butterfly as the majority of the Project area is limited to non-native open pasture unlikely to support the species.
	Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
	The Proposed Action is not going to directly impact any known populations of this species. The vegetation to be cleared is the more disturbed edge components of the wider patches within the Project area.
	Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
	Although there will be increased disturbance in the Indicative Disturbance Footprint due to the proposed development, this is unlikely to result in the introduction of invasive species, namely weeds, as appropriate construction hygiene controls will be implemented.
	Introduce disease that may cause the species to decline; or
	Disease is not currently listed as a threat factor to Bathurst Copper Butterfly in the published conservation advice. The Project is unlikely to result in the introduction of any disease agent that would impact any population of Bathurst Copper Butterfly.
	Interfere substantially with the recovery of the species.
	The published recovery plan for the Bathurst Copper Butterfly includes twenty recovery actions with an overall objective to stabilise the population through the prevention of threatening processes. A key aim of the recovery plan is to: ■ Identify and prevent the continuation of processes, such as habitat removal, weed incursion, alteration of fire regimes and vehicular access to habitat that threaten the Bathurst Copper Butterfly (NSW National Parks and Wildlife Service 2001). Although it is not confirmed if the species occurs within the Project Area, the Project has the potential to result in the removal of suitable habitat and potential exacerbation of weed spread. However, given the extent of retained habitat in the immediate surrounding area, the quantum of impacts proposed for habitat removal (i.e. 29.952 ha) are not anticipated to significantly impact any population of Bathurst Copper Butterfly.
Conclusion	
	It is unknown whether the Project area supports any population of Bathurst Copper Butterfly, based on the number of species records within the 10 km search buffer and presence of suitable habitat the species is considered to have a moderate likelihood of occurrence. Based on the assessment, **the Project is unlikely to result in a significant impact to the Bathurst Copper Butterfly** given species presence is not confirmed and impacts are limited to potential habitat suitability. It is recommended that targeted surveys are undertaken within areas of suitable and high-quality habitat to determine if the species is present.
References	
Threatened Species Scientific Committee (2016). *Conservation Advice* Paralucia spinifera *purple copper butterfly*. Canberra: Department of the Environment and Energy. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/26335-conservation-advice-16122016.pdf. In effect under the EPBC Act from 16-Dec-2016. NSW National Parks and Wildlife Service (2001). *Bathurst Copper Butterfly* (Paralucia spinifera) *Recovery Plan*. Available from: http://www.environment.gov.au/resource/recovery-plan-bathurst-copper-butterfly-paralucia-spinifera-2001-2006. In effect under the EPBC Act from 26-Mar-2002. NSW Government (n.d.) *Purple Copper Butterfly (Paralucia spinifera),* NSW Government Environment and Heritage, Available from: Purple copper butterfly | Native animals | Environment and Heritage, Viewed: 4 February 2025	

Table I-16 Significant Impact Assessment – Pink-tailed Worm Lizard

Significant Impact Assessment for Pink-tailed Worm Lizard	
Threatened Species Assessed	
	Species: Pink-tailed worm-lizard (*Aprasia parapulchella*) **Listing status under the EPBC Act: Vulnerable** **Habitat:** The pink-tailed worm-lizard' spend the majority of time below the surface, and habitat includes primary and secondary grassland, grassy woodland and woodland communities, and the species usually inhabits sloping sites that contain rocky outcrops or scattered, partially buried rocks (TSSC, 2015). Rocky habitats tend to be well-drained mid-slope or ridge-top sites with loosely embedded rocks on soil substrate with ant galleries present. A cover of predominantly native grasses, particularly kangaroo grass (*Themeda australis*) is usual (TSSC, 2015). **Breeding requirements:** The species is oviparous and has a clutch size of two, and most likely lays inside the ant nests (TSSC, 2015). Hatching is thought to occur in mid to late summer (TSSC, 2015). **Feeding ecology:** Species spend a significant amount of time sheltering and foraging in ant burrows below rocks, and feeds mainly on the eggs and larvae of ants (TSSC, 2015). **Pink-tailed worm-lizard habitat present in the site (i.e. impact area):** The Bionet Vegetation Classification threatened species profiles, indicates that Pink-tailed worm-lizard is associated with PCT 3347, PCT 3534, PCT 3734, PCT 3735, and PCT 3747, which are conservatively mapped within the Project area. Two PCTs were ground-truthed within the Project area, including PCT 3347 and 3735, totalling an area of 60.431 ha. A total of 12.224 ha of PCTs (including PCT 3534 and PCT 3747) intersect the Indicative Disturbance Footprint. The species was not opportunistically observed during field survey. The presence of a number of rocky outcrops and wombat holes may provide suitable sheltering habitat for this species. There is also an abundance of logs which may provide suitable ground cover habitat. Therefore, this species occasional presence cannot be discounted. Additional surveys are required to confirm habitat within the Project area and footprint.
Significant Impact Criteria	
An action is likely to have a significant impact on vulnerable species if there is a real chance or possibility that it will:	
	Lead to a long-term decrease in the size of an important population of a species
	The Project area includes large areas of pasture grasses, areas of native forest, and contain key habitat values for species including of rocky outcrops, wombat holes, and logs, which may provide suitable sheltering habitat for this species. The Project may involve reduction of sheltering habitat. Mitigation measures include pre-clearance surveys to reduce direct mortality to the species, and exclusion zones around ant nests within suitable habitat areas for the species. Provided these mitigation measures are adhered to, it is considered unlikely that the removal of select sheltering habitat would lead to a long-term decrease in the size of an important population of a species.
	Reduce the area of occupancy of an important population
	The Project area may reduce sheltering habitat, through impact to rocky outcrops, wombat holes, and logs. It is considered unlikely that the removal of select sheltering habitat would lead to a long-term decrease in the size of an important population of a species, however, additional surveys are required to confirm habitat within the Project area and footprint.
	Fragment an existing important population into two or more populations
	The Project would not involve erection of fencing or large areas of hardstand, such that the species dispersal would be significantly affected. The Project is considered unlikely to fragment an existing important population into two or more populations.
	Adversely affect habitat critical to the survival of a species
	There is no identified habitat critical to the survival of the species. The Project is considered unlikely to adversely affect habitat critical to the survival of a species.
	Disrupt the breeding cycle of an important population
	The species most likely lays inside the ant nests, and hatching is thought to occur in mid to late summer (TSSC, 2015). No ant nests were identified within the project area in the initial field survey, however, additional surveys are required to confirm habitat within the Project area and footprint. Mitigation measures include pre-clearance surveys to reduce direct mortality to the species, and exclusion zones around ant nests within suitable habitat areas for the species. Provided these mitigation measures are adhered to, it is considered unlikely that the removal of select sheltering habitat would disrupt the breeding cycle of a population.

Significant Impact Assessment for Pink-tailed Worm Lizard	
	Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
	The Project area may reduce sheltering habitat, through impact to rocky outcrops, wombat holes, and logs. It is considered unlikely that the removal of select sheltering habitat would modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
	Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
	The Project is unlikely to result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat. Appropriate mitigation measures for biosecurity must be implemented during the project works, as recommended in Section 5.2.
	Introduce disease that may cause the species to decline; or
	The project is unlikely to result in introduced disease that may cause the species to decline. Appropriate mitigation measures for biosecurity must be implemented during the project works, as recommended in Section 5.2.
	Interfere substantially with the recovery of the species.
	The Conservation Advice for the species (TSSC, 2015) outlines key threats as: ■ Habitat loss and fragmentation ■ Habitat degradation ■ Removal of rocks ■ Inappropriate fire regimes Primary conservation actions include identifying and protecting sites not in conservation reserves, avoiding removal of rocks to preserve habitat integrity, and reduce modification of vegetation such as ploughing and pasture (TSSC, 2015). The project does not interfere with these actions or contribute to the key threats. The Project is considered unlikely to substantially interfere with the recovery of the species.
Conclusion	
	The species has been assessed against the criteria above and it has been determined that the project works are unlikely to constitute a significant impact on this species.
References	
Threatened Species Scientific Committee (2015). *Conservation Advice* Aprasia parapulchella *Pink-tailed worm-lizard*. Canberra: Department of the Environment. Available from: http://www.environment.gov.au/biodiversity/threatened/species/pubs/1665-conservation-advice-01102015.pdf. In effect under the EPBC Act from 01-Oct-2015.	

Table I-17 Significant Impact Assessment – Grey-headed Flying-fox

Significant Impact Assessment for Grey-headed Flying-fox	
Threatened Species Assessed:	
	Species: Grey-headed Flying-fox (*Pteropus poliocephalus*) **Listing status under the EPBC Act: Vulnerable** **Breeding and nesting requirements:** Grey-headed Flying-foxes roost in large aggregations, known as camps, in the exposed branches of trees (DAWE, 2021). **Feeding ecology:** The species is a canopy-feeding frugivore and nectarivore (primarily blossoms and fruit in canopy vegetation, and supplements this diet with leaves) (DAWE, 2021). Telemetry indicates that Grey-headed Flying-foxes forage in all habitat types, and major food types include *Ficus* spp., Eucalyptus, Corymbia and Angophora, melaleucas, banksias, and *Syzygium* spp. (DAWE, 2021). The species can fly as far as 40 km to feed, before returning to their roost the same night (DAWE, 2021). **Grey-headed Flying-fox habitat present in the site (i.e. impact area):** The Bionet Vegetation Classification threatened species profiles, indicates that Grey-headed Flying-fox is associated with PCTs 3211, 3347, 3367, 3369, 3477, 3534, 3734, 3735, 3747, and 4063, conservatively mapped as occurring within the project area. A total of 197.553 ha of native vegetation across five PCTs occurs within the Survey area, with 30.57 ha of PCTs intersecting the Indicative Disturbance Footprint. The species was not incidentally recorded during the field survey. There are two previous records of the species within the Project area. Gum trees occur in remnant patches of vegetation and as paddock trees within the Project area which would offer seasonal foraging resources to support this species. Additionally, over ten farm dams are present within and/or near the Survey area. It is known that the Grey-headed Flying-fox (*Pteropus poliocephalus*) sources water from open water bodies (e.g. dams, ponds, creeks, rivers).
Significant Impact Criteria	
An action is likely to have a significant impact on vulnerable species if there is a real chance or possibility that it will:	
	Lead to a long-term decrease in the size of an important population of a species
	Two flying-fox camps are known near the Project area, one in Bathurst (approximately 30 km west) and one in Portland (approximately 12 km north-east) from the Project area. There are no flying-foxes recorded at the Portland site. Therefore, the nearest breeding camp is in Bathurst, and is within foraging range of the project area. The Project area contains foraging vegetation and dispersal habitat. The species is considered to be a single, mobile population due to interbreeding and movement between camps with individuals distributed across Queensland, NSW, Victoria, South Australia, Tasmania and the ACT. The Project would reduce forging vegetation. There is an abundance of relatively undisturbed, potential foraging habitat immediately adjacent to the project area, and within Eusdale Nature Reserve to the west, and Marrangaroo National Park to the east. Furthermore, it is considered likely that the species would preference less disturbed and more extensive areas of vegetation for foraging over vegetation present within the project area, which is within previously disturbed pasture, and adjacent to an existing track within native forest vegetation. Therefore, while the project will remove foraging habitat for the species, this is not expected to lead to a long-term decrease in the size of an important population of the species. Mitigation measures may need to be implemented to reduce the risk of Grey-headed Flying-fox wind-turbine collision as the species is highly mobile. Information on flight heights of Grey-headed Flying-fox gathered during formal bird and bat surveys to be undertaken in the Project area would inform such measures. It is recommended the assessment of significance analysis for this species be informed by the Bird and Bat utilisation surveys, when the flight heights and patterns of dispersal of the species are better understood within the Project area.
	Reduce the area of occupancy of an important population
	The Project would reduce forging vegetation within previously disturbed pasture dominated areas, and adjacent to an existing track within native forest. The project area is unlikely to constitute significant habitat in comparison to surrounding resources. The project is unlikely to reduce the area of occupancy of an important population.
	Fragment an existing important population into two or more populations
	The species is highly mobile and able to continue to move through the project area. Therefore, the project is not expected to fragment an existing population into two or more populations.
	Adversely affect habitat critical to the survival of a species
	Habitat critical to the survival of the species are winter and spring flowering vegetation communities containing *Eucalyptus tereticornis, E. albens, E. crebra, E. fibrosa, E. melliodora, E. paniculata, E. pilularis, E. robusta, E. seeana, E. sideroxylon, E. siderophloia, Banksia integrifolia, Castanospermum australe, Corymbia citriodora, C. eximia, C. maculata, Grevillea robusta, Melaleuca quinquenervia* or *Syncarpia glomulifera* (DAWE, 2021). Also considered critical are vegetation communities that (DAWE, 2021): ■ Contain native species that are known to be productive as foraging habitat during the final weeks of gestation, and during the weeks of birth, lactation and conception (August to May) ■ Contain native and or exotic species used for roosting at the site of a nationally important grey-headed flying-fox camp as identified on the Department's interactive flying-fox web viewer

Significant Impact Assessment for Grey-headed Flying-fox	
	▪ Contain native species used for foraging and occur within 20 km of a nationally important camp as identified on the Department's interactive flying-fox web viewer. No nationally important camps are within foraging proximity of the project area. However, two flying-fox camps are known near the Project area, one in Bathurst (approximately 30 km west) and one in Portland (approximately 12 km north-east) from the Project area. There are no flying-foxes recorded at the Portland site. Therefore, the nearest breeding camp is in Bathurst, and is within foraging range of the project area. The Project area is likely to contain winter and spring flowering vegetation communities, including the species listed above. **The Project is considered to adversely impact habitat critical to the survival of the species**.
	Disrupt the breeding cycle of an important population
	There were no breeding camps identified within the project area. The project is not expected to impact on a nationally important flying-fox camp or disrupt the breeding cycle of an important population.
	Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
	The Project would reduce forging vegetation within previously disturbed pasture dominated areas, and adjacent to an existing track within native forest. The project area is unlikely to constitute significant habitat in comparison to surrounding resources. The project is considered unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
	Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
	The project is unlikely to result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat. Appropriate mitigation measures for biosecurity must be implemented during the project works, as recommended in Section 5.2.
	Introduce disease that may cause the species to decline; or
	The project is unlikely to result in introduced disease that may cause the species to decline. Appropriate mitigation measures for biosecurity must be implemented during the project works, as recommended in Section 5.2.
	Interfere substantially with the recovery of the species.
	The overall objectives of the species Recovery Plan are (DAWE, 2021): ▪ To improve the Grey-headed flying-foxes national population trend by reducing the impact of the threats outlined in this plan on Grey-headed flying-foxes through habitat identification, protection, restoration and monitoring ▪ To assist communities and Grey-headed flying-foxes to coexist through better education, stakeholder engagement, research, policy and continued support to fruit growers. The project will not interfere with the species conservation and recovery actions and the Project is not expected to interfere with the recovery of the species.
Conclusion	
	The project will not result in a significant impact to the Grey-headed flying-fox (*Pteropus poliocephalus*).
References	
Department of Agriculture, Water and the Environment (2021). *National Recovery Plan for the Grey-headed Flying-fox* Pteropus poliocephalus. Canberra: Commonwealth of Australia. Available from: http://www.environment.gov.au/biodiversity/threatened/publications/recovery/grey-headed-flying-fox. In effect under the EPBC Act from 19-Mar-2021.	

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Appendix D
Preliminary Noise and Vibration Impact Assessment

Mount Lambie Wind Farm Scoping Report

Preliminary Environmental Noise Assessment

S240267RP1 Revision D

Thursday, 1 May 2025

Document Information

Project	Mount Lambie Wind Farm Scoping Report
Client	Aurecon Australasia Pty Ltd
Report title	Preliminary Environmental Noise Assessment
Project Number	S240267

Revision Table

Report revision	Date	Description	Author	Reviewer
0	16/12/2024	Draft issue	Marc Schlussel	Tom Evans
A	24/02/2025	Draft issue	Marc Schlussel	Tom Evans
B	12/03/2025	Draft issue	Marc Schlussel	Tom Evans
C	19/03/2025	Draft issue	Marc Schlussel	Tom Evans
D	01/05/2025	For issue	Marc Schlussel	Tom Evans

Glossary

A-weighting	A spectrum adaption that is applied to measured noise levels to represent human hearing. A-weighted levels are used as human hearing does not respond equally at all frequencies.
Background noise	The underlying noise level at a given location, measured in the absence of a noise source under investigation and any other short-term noise sources such as intermittent traffic, industry, lawnmowers, insect, animals and the like. It is typically described using the L_{A90} metric.
C-weighting	A spectrum adaption that is applied to measured noise levels to represent human hearing at high levels of noise. Because, unlike the A-weighting, the C-weighting does not apply large negative weightings to low frequency noise levels, it is commonly used for the assessment of low frequency noise.
Day	Between 7 am and 6 pm Monday to Saturday or 8 am to 6 pm Sunday as defined by the NPI.
Daytime	Between 7 am and 10 pm every day as defined by the RNP.
dB	Decibel—a unit of measurement used to express sound level. It is based on a logarithmic scale which means a sound that is 3 dB higher has twice as much energy. We typically perceive a 10 dB increase in sound as a doubling of that sound level.
Evening	Between 6 pm and 10 pm as defined by the NPI.
Frequency (Hz)	The number of times a vibrating object oscillates (moves back and forth) in one second. Fast movements produce high frequency sound (high pitch/tone), but slow movements mean the frequency (pitch/tone) is low. 1 Hz is equal to 1 cycle per second.
ICNG	NSW *Interim Construction Noise Guideline*
L_{A90}	A-weighted noise level exceeded for 90 % of the measurement time.
L_{Aeq}	A-weighted equivalent Noise Level—Energy averaged noise level over the measurement time.
L_{Amax}	The maximum A-weighted instantaneous noise level.
L_{Ceq}	The equivalent continuous C-weighted sound pressure level.
L_{WA}	A-weighted sound power level.
Night	Between 10 pm and 7 am Monday to Saturday, and between 10 pm and 8 am on Sundays as defined by the NPI
Nighttime	Between 10 pm and 7 am every day as defined by the RNP.
NPI	NSW *Noise Policy for Industry*
Peak Particle Velocity (PPV)	Vibration velocity can be measured in a number of ways. For some projects vibration levels can be given in terms of Peak Particle Velocity (PPV) which represents the maximum level of vibration velocity arising at a given point.
RNP	NSW *Road Noise Policy*
Standard Working Hours	Between 7 am and 6 pm Monday to Friday, 8 am to 1pm Saturday, No work on Sundays or public holidays as defined in the ICNG
Vibration	Movement in solid materials. Can be felt at higher levels but can also disturb the operation of sensitive equipment at levels below that which would be felt by building occupants.
Vibration Dose Value (VDV)	A metric that combines the magnitude and duration of vibration, typically across a defined day or night period. It is measured in units of $m/s^{1.75}$.

Table of Contents

1 Introduction

Resonate has been engaged by Aurecon on behalf of Tetris Energy, to undertake a Preliminary Noise and Vibration Assessment for the proposed Mount Lambie wind farm to inform an application to the DPHI requesting Secretary's Environmental Assessment Requirements (SEARs).

The objectives of this assessment are to:

- identify noise and vibration sources associated with the proposed wind farm
- identify relevant noise and vibration criteria that will apply to the development
- undertake a preliminary assessment of noise from the wind farm operation to inform future planning stage assessments.

The Project within the Lithgow City LGA is seeking approval for up to 20 wind turbine generators (WTGs), with blade-tip heights of between 250 metres (m) and 285 m above ground level and a generating capacity of between 7 to 10 MW for each WTG. Battery energy storage system (BESS) infrastructure is also proposed and would allow for the capture and storage of dispatchable energy to be distributed to the electricity grid as required. The power generated by the Project (from WTG or released from battery storage) would feed into the existing transmission network via the existing 132 kV overhead transmission lines.

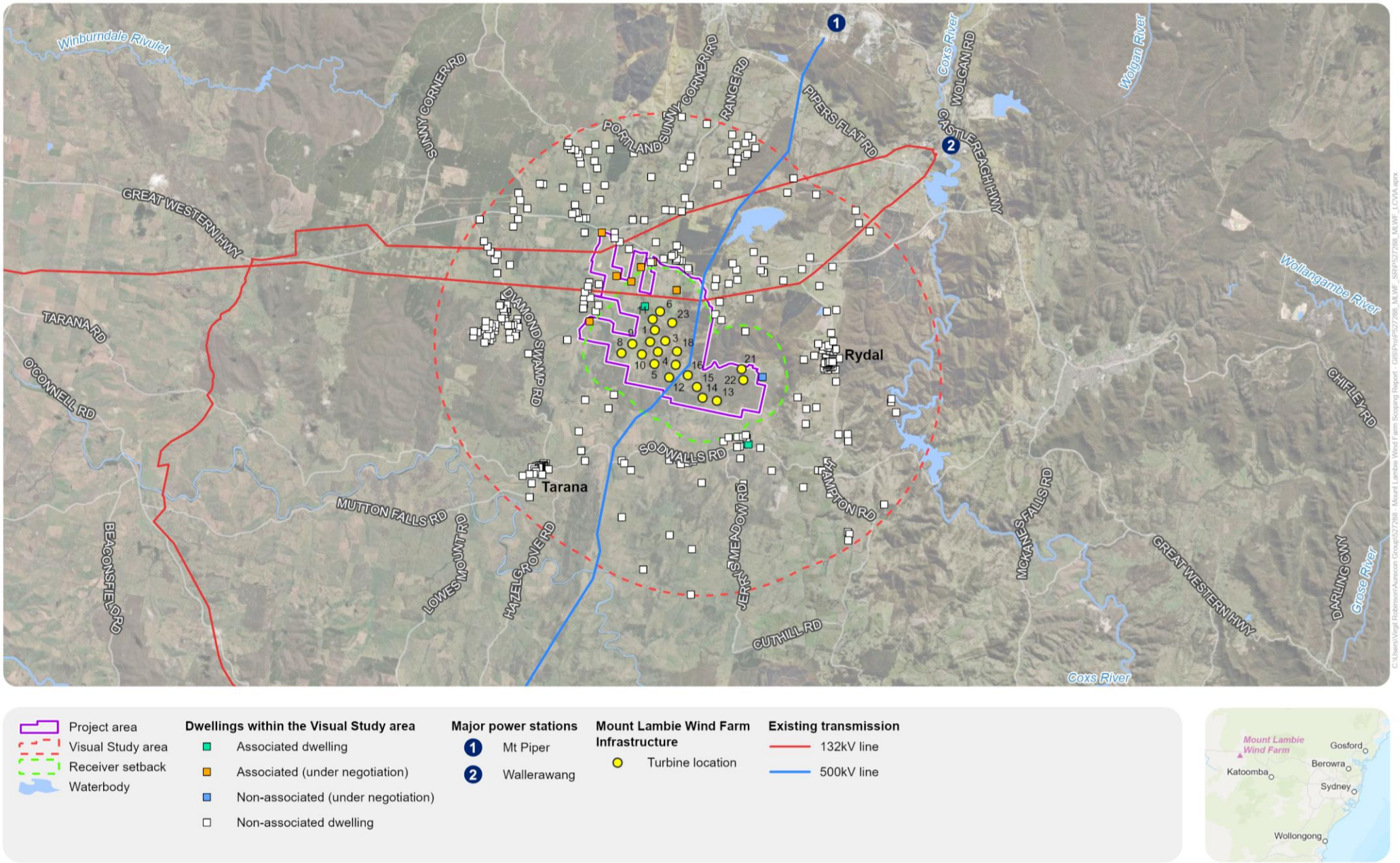
The key components of the Project are as follows:

- Up to 20 WTGs, with blade-tip heights of between 250 metres and 285 metres above ground level
- Up to two temporary meteorological masts.
- One 100 MW capacity battery energy storage system (BESS) with duration of 2 to 6 hours (up to 600 MWh).
- One or two substation and transmission connection points.
- Temporary infrastructure areas, including construction compounds, a worker accommodation facility and laydown and stockpile areas
- Approximately 27 kilometres of access tracks (combination of upgrades to existing, and construction of new tracks) throughout the Project area (minimum width of 5.5 metres on straight tracks, widened to six metres on corners)
- Internal collector cable network (electrical connections between the proposed WTGs and the substation/s), which is expected to be underground
- Site access, including access points from Great Western Highway and/or Curly Dick Road
- Public road upgrades to facilitate the delivery of WTG components to the development footprint (required upgrades will be determined during preparation of the EIS)
- Other operational and maintenance infrastructure, including site offices, parking, amenities, laydown areas, and operational and maintenance facilities such as storage and equipment sheds.

Aurecon and Tetris Energy have identified the residential receivers around the Project area. Some residential receivers have agreements in place, as identified in Appendix A, that allow for a higher level of wind turbine noise to be produced (referred to herein as associated, associated (under negotiation) or non-associated (under negotiation)). The allowance for higher noise levels in this report was only applied to receivers classified as associated. Tetris Energy continues to engage with residential receivers around the Project area. Seven receivers have been classified as 'associated (under negotiation)', and one further receiver is classified as 'non-associated (under negotiation)'.

Figure 1 shows the Project area, surrounding receiver locations and transmission line. A preliminary WTG layout in more detail is shown on Figure 2 but will be subject to change as the design of the Project develops.

Appendix A details the preliminary WTG coordinates and sensitive receiver locations within 5 km of a proposed turbine location.



Project area
Visual Study area
Receiver setback
Waterbody

Dwellings within the Visual Study area
- Associated dwelling
- Associated (under negotiation)
- Non-associated (under negotiation)
- Non-associated dwelling

Major power stations
1. Mt Piper
2. Wallerawang

Mount Lambie Wind Farm Infrastructure
- Turbine location

Existing transmission
- 132kV line
- 500kV line

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:210,000
0 2.5 5 km

Projection: GDA2020 MGA Zone 55

Mount Lambie Wind Farm **Preliminary Environmental Noise Assessment**

Figure 1: Preliminary project layout

Figure 1 Project layout

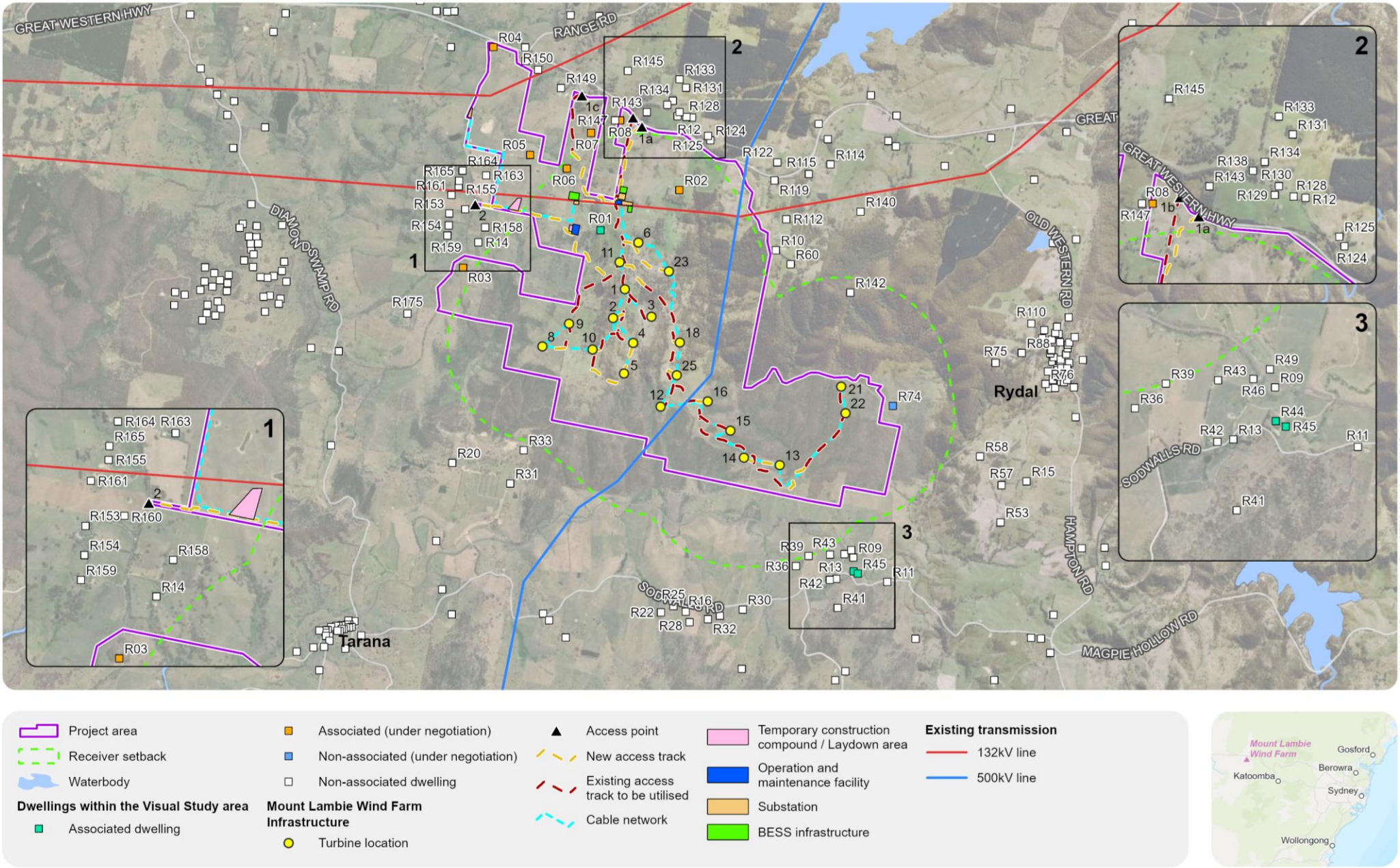


Figure 2 Preliminary project layout – detailed view

2 Assessment criteria

This section provides an overview of relevant noise and vibration assessment criteria for the Project.

2.1 Construction noise and vibration

2.1.1 Construction noise

Construction noise in New South Wales is assessed using the Department of Environment & Climate Change (now Environment Protection Authority (EPA)) *Interim Construction Noise Guideline* (ICNG).

The ICNG aims to manage noise from construction works regulated by the EPA. It is also intended to provide guidance to other interested parties in the management of construction noise. The ICNG prescribes $L_{eq,15min}$ Noise Management Levels (NML) for sensitive receivers as part of a quantitative construction noise assessment. Where the predicted or measured construction noise level exceeds these management levels, then all feasible and reasonable work practices should be implemented to reduce construction noise, and community consultation regarding construction noise is required to be undertaken.

The NMLs prescribed for residential land uses by the ICNG are presented in Table 1.

Table 1 Noise management levels for residential land uses

Time of day	NML, $L_{eq,15min}$	Application notes
Recommended Standard Working Hours of: • 7 am to 6 pm Mon – Fri • 8 am to 1 pm Sat	Noise affected: (Rating Background Level) RBL + 10 dB	May be some community reaction to noise. • Where the predicted or measured construction noise level exceeds the noise affected level, all feasible and reasonable work practices should be applied to meet the noise affected level. • All residents potentially impacted by the works should be informed of the nature of the works, the expected noise levels and duration, and provided with site contact details.
	Highly noise affected: 75 dB	May be strong community reaction to noise. • Where construction noise is predicted or measured to be above this level, the relevant authority may require respite periods that restrict the hours that the very noisy activities can occur. • Respite activities would be determined taking into account times identified by the community when they are less sensitive to noise, and if the community is prepared to accept a longer period of construction to accommodate respite periods.
Outside recommended Standard Working Hours	Noise affected: RBL + 5 dB	• A strong justification would typically be required for works outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the affected noise level. • Where all feasible and reasonable practices have been applied and noise is more than 5 dB(A) above the affected noise level, the proponent should negotiate with the affected community.

The ICNG also prescribes NMLs for other sensitive land uses, including educational buildings and hospitals, however these are not considered relevant to the immediate areas around the Project area.

2.1.2 Construction road traffic

Noise associated with construction traffic using local roads is assessed in NSW using the Department of Environment, Climate Change & Water (now EPA) *Road Noise Policy* (RNP).

The RNP recommends that land use developments that generate additional traffic on existing freeways/arterial/sub-arterial roads should limit road traffic noise levels at sensitive receivers to:

- 60 dB $L_{Aeq,15h}$ during the RNP daytime period (7 am to 10 pm)
- 55 dB $L_{Aeq,9h}$ during the RPN nighttime period (10 pm to 7 am).

Where the above criteria are already exceeded, the RNP recommends limiting the increase in road traffic noise levels to no more than 2 dB.

It is noted that any increase in noise from construction road traffic would only be temporary during the construction phase. Where the increase in traffic resulting from construction works exceeds the above criteria, then additional noise management measures should be investigated.

2.1.3 Construction vibration

Ground vibration generated by construction can have a range of effects on buildings and building occupants. The main effects are generally classified as:

- human disturbance – disturbance to building occupants: vibration which inconveniences or interferes with the activities of the occupants or users of the building
- effects on building structures – vibration which may compromise the condition of the building structure itself.

In general, vibration criteria for human disturbance are more stringent than vibration criteria for effects on buildings. Building occupants will normally feel vibration readily at levels well below those which may cause a risk of cosmetic or structural damage to a structure. However, it may not always be practical to achieve the human comfort criteria. Furthermore, unnecessary restriction of construction activities can prolong construction works longer than necessary, potentially resulting in other undesirable effects for the local community.

During future planning stages, construction vibration criteria would be adopted from the following sources to assess the potential vibration generated from construction works associated with the Project:

- Cosmetic and structural damage to buildings: German Standard DIN 4150-3[1]
- Human comfort: NSW Department of Environment & Conservation *Assessing Vibration – A Technical Guideline* (the Vibration Guideline).

2.2 Operational wind turbine noise

2.2.1 2024 NSW Wind Energy Guideline

The DPHI issued the *Wind Energy Guideline: Technical Supplement for Noise Assessment* (NSW Wind Energy Guideline) in November 2024 to provide guidance on the assessment of wind turbine noise from State significant wind energy developments. The NSW Wind Energy Guideline advises that noise from wind farms should be controlled to the noise criteria established in the 2009 South Australian *Wind farms environmental noise guidelines* (SA Guidelines), with the clarification that the base criterion of 35 dB L_{Aeq} should be adopted for all residences not associated with the wind farm development.

[1] German Standard DIN 4150-3, 1999, *Structural Vibration – Part 3: Effects of vibration on structures*.

The NSW Wind Energy Guideline does not provide guidance for assessment criteria for dwellings that are located on land where the landowner has an agreement in place with the wind farm. The 2009 SA Guidelines do provide guidance on appropriate noise criteria for associated dwellings and have therefore been adopted here. The 2009 SA Guidelines were amended in 2021 to recommend the following design guidelines for associated dwellings:

- An external noise criterion of 52 dB L_{Aeq}, which is based on a level set 5 dB below the South Australian Noise Policy recommendations for general daytime industrial noise in zones intended for rural industry (e.g. primary production) such as those zones where wind farms may be developed.
- An internal noise criterion of 30 dB L_{Aeq} consistent with the World Health Organisation (WHO) *Guidelines for community noise* (1999). This internal noise criterion is generally considered to be achieved with windows partially open for ventilation if the external noise level is no higher than 45 dB L_{Aeq}. Higher external noise levels may require treatments to the dwelling to allow windows to be closed for noise control reasons.

For this preliminary noise assessment, this results in wind turbine noise criteria of:

- for noise-sensitive receivers not associated with the wind farm:
  - 35 dB or
  - the background noise level (L_{A90}) plus 5 dB

  whichever is the greater for each integer wind speed from cut-in to rated power.
- for residential receivers associated with the wind farm with a suitable noise agreement in place:
  - 45 dB or
  - the background noise level (L_{A90}) plus 5 dB

  whichever is the greater for each integer wind speed from cut-in to rated power.
- Noise limit for National Parks of 50 dB for low wind speed conditions (less than or equal to 4 m/s).

At the time of this preliminary noise assessment, no background noise monitoring has been conducted at residential locations around the wind farm site and therefore, the assessment has been conducted against the minimum applicable noise criteria of 35 dB for noise-sensitive receivers outside of the Project area and 45 dB for associated dwellings within the Project area.

2.3 Ancillary infrastructure noise

Operational noise from ancillary infrastructure, predominantly the substation/s and potential BESS, will need to comply with the relevant requirements of the NSW *Noise Policy for Industry* (NPI). The project noise trigger levels set forth in the NPI vary for different times of day, namely:

- Day: 7 am to 6 pm Monday to Saturday or 8 am to 6 pm on Sundays and public holidays
- Evening: 6 pm to 10 pm
- Night: the remaining periods.

As the substation/s and BESS would operate at any time, compliance with the night-time trigger levels would be required.

The NPI establishes project noise trigger levels as the lower of the following:

- Amenity level: a criterion established with reference to the land zoning of an area and with the aim of not increasing industrial noise levels in an area. In the area surrounding the Project area, it is likely that the amenity level would be 35 dB at night.
- Intrusiveness level: 5 dB above the Rating Background Level (RBL) for each time of day. The minimum intrusiveness criterion that can apply is 35 dB at evening and night.

Background noise level monitoring could be undertaken during later planning stages to more clearly establish the intrusiveness level and the NPI trigger levels for the ancillary infrastructure. However, it is considered likely that the

substation/s could be designed to achieve the minimum applicable trigger level of 35 dB at non-associated sensitive receivers.

3 Preliminary assessment

3.1 Construction noise and vibration

Construction noise and vibration would be assessed as the Project progresses through later planning stages. Given the distance between the Project area and the nearest sensitive receivers, it is expected that construction noise and vibration from the Project area, including noise and vibration during decommissioning works, will be able to be appropriately controlled to minimise any impacts to an acceptable level.

Measures to manage construction noise and vibration would be expected to include:

- Development of a Construction Noise and Vibration Management Plan for implementation by the appointed construction contractor(s). The Construction Noise and Vibration Management Plan would identify activities with the potential to impact on sensitive receivers and detail measures to be implemented to manage these impacts.
- Notifying the community of the times of work, particularly noise- or vibration-intensive activities proposed outside of standard hours.
- Maintaining an effective complaint management and response system during construction.
- Limiting works to standard daytime working hours wherever feasible.
- Restricting deliveries to site to daytime hours where possible.
- Planning site access routes to minimise the impact on sensitive land uses as much as is feasible.
- Planning site compounds such that they are sufficiently removed from sensitive land uses.
- Maximising the offset distance between construction works and sensitive land uses.
- Selecting quieter equipment and work practices.

3.2 Wind turbine noise

3.2.1 Prediction methodology

At this preliminary stage of the Project, the WTG model that will be used has not been confirmed. Tetris Energy has selected a preliminary WTG to inform this assessment, although the final wind turbine selection may differ. The selected WTG for the preliminary noise assessment is a Vestas EnVentus 172 wind turbine with serrated trailing edges (STE) on blades. Sound power levels have been based on Vestas EnVentus 172 specification documents.[2]

The overall sound power levels used in this assessment with hub height wind speed for the Vestas EnVentus 172 WTG are summarised in Table 2 based on the manufacturer specification document. Sound power level for operation mode PO7200 (standard operation) and the sound optimised mode SO1 are shown as some turbines could potentially operate with a sound optimised mode to reduce noise levels at the nearby sensitive receivers. Table 2 also shows the hub height per WTG. WTG 8, 13 and 23 have a hub height of 166 metres, while the remaining WTGs have a hub height of 185 meters.

[2] *Noise level, Power curves, Thrust curves – Vestas EnVentus 172-7.2MW* Performance Specification issued by Vestas, reference 0180-4980 V01 dated 5 November 2024.

Table 2 WTG sound power levels with wind speed

WTG	Mode	Sound power level in dB L_{WA} for hub height wind speed in m/s							
		3	4	5	6	7	8	9	≥ 10
V172 EnVentus with STE	PO7200	97.6	97.6	97.7	99.5	102.2	105.0	107.1	107.8
V172 EnVentus with STE	SO1	97.6	97.6	97.7	99.5	102.2	105.0	105.0	105.0

As is normal for modern pitch-controlled wind turbines, the sound power levels for Vestas EnVentus 172 WTG increase from the cut-in wind speed before levelling off at a wind speed close to the wind speed at which the turbines reach rated power. This noise assessment has been based on the maximum sound power level, with the specified sound power level spectrum presented in Table 3.

Table 3 WTG sound power level spectrum for V172 EnVentus with STE

Mode	Sound power level in dB L_{WA} at octave band centre frequency in Hz									Overall
	31.5	63	125	250	500	1000	2000	4000	8000	dB L_{WA}
PO7200	78.3	89.8	96.8	101.4	100.4	101.0	99.9	98.3	85.5	107.8
SO1	75.3	88.0	96.0	99.4	99.8	98.0	93.3	85.4	74.3	105.0

Table 4 shows all WTG IDs and which of them are proposed to operate in mode SO1. It should be noted that this will be further refined during the EIS stage, when local wind occurrences and directions will also be considered.

Table 4 WTG operation mode summary

WTG ID	Operation mode	Overall in dB L_{WA}	Hub height in m
1	SO1	105	185
2	PO7200	107.8	185
3	SO1	105	185
4	PO7200	107.8	185
5	PO7200	107.8	185
6	SO1	105	185
8	PO7200	107.8	166
9	PO7200	107.8	185
10	PO7200	107.8	185
11	SO1	105	185
12	PO7200	107.8	185
13	SO1	105	166
14	SO1	105	185
15	SO1	105	185
16	PO7200	107.8	185
18	SO1	105	185

WTG ID	Operation mode	Overall in dB L_{WA}	Hub height in m
21	PO7200	107.8	185
22	PO7200	107.8	185
23	SO1	105	166
25	PO7200	107.8	185

To predict wind farm noise levels from the Project, an environmental noise model has been developed in SoundPLAN version 9.0 environmental noise prediction software. The noise model implements the ISO 9613-2:2024[3] prediction algorithm.

In accordance with standard prediction procedures for wind farm noise as set out in ISO 9613-2:2024, predictions have been undertaken on the basis of the following parameters:

- WTG and residence locations as per the coordinates detailed in Appendix A.
- Topographical contours obtained from Geoscience Australia.
- Ground absorption factor of 50% representing mixed reflective and absorptive ground. This corresponds to a value of G = 0.5 in accordance with ISO 9613-2:1996.
- WTG hub height of 166 m and 185m and rotor diameter of 172 m (corresponding to a tip height of around 285 m) and sound power level as per Table 3.
- Receiver height of 4 m above ground.
- Temperature of 10˚C and relative humidity of 70%.
- +3 dB applied to the predicted noise level from any wind turbine where concave topography observed between it and the receiver location as defined by the UK Institute of Acoustics *A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise* (Good Practice Guide).
- Topographical shielding limited to 2 dB based on the noise source at tip height.

The noise prediction methodology adopted is expected to result in wind turbine noise predictions that are approximately 1.5 to 2 dB higher than would be measured when applying the wind turbine noise measurement methodology specified by the NSW Wind Energy Guideline. This is because:

- Our previous Australian study[4] has shown that wind turbine noise predictions using a receiver height of 1.5 m above ground accurately predict downwind noise levels for Australian sites when using the wind turbine noise measurement methods applied in Australia that use the L_{A90} metric to measure wind turbine noise as per the NSW Wind Energy Guideline.
- Increasing the receiver height to 4 m as recommended by ISO 9613-2:2024 increases the predicted noise levels by approximately 1.5 dB in comparison to predictions using a receiver height of 1.5 m.
- The receiver height of 4 m is understood to be based on the recommendations of the Good Practice Guide. However, the Good Practice Guide also recommends that 2 dB be subtracted from predicted noise levels to adjust predicted L_{Aeq} noise levels to the assessed L_{A90} noise levels. This correction has conservatively not been adopted for this assessment.

[3] International Standard ISO 9613-2, 2024, *Acoustics – Attenuation of sound during propagation outdoors, Part 2: General method of calculation*

[4] Evans T & Cooper J, 2012, *Comparison of predicted and measured wind farm noise levels and implications for assessments of new wind farms*, Acoustics Australia, vol. 40, no. 1, pp 28-36.

3.2.2 Preliminary prediction results

Table 5 below presents the predicted wind turbine noise levels for the preliminary layout at nearby associated, associated (under negotiation), non-associated, and non-associated (under negotiation) receivers where predicted noise levels were 30 dB and above. The predicted noise levels at all other receivers are below 30 dB and therefore, at least 5 dB below the minimum applicable noise criteria in NSW for non-associated receivers.

Table 5 Preliminary wind farm noise predictions

Receiver ID	Status	Noise criteria, dB L_{Aeq}	Predicted noise level, dB L_{Aeq}	Compliance?
R01	Associated dwelling	45	43	Yes
R44	Associated dwelling	45	33	Yes
R45	Associated dwelling	45	32	Yes
R02	Associated (under negotiation)	35	37	Compliance would be achieved if it became an associated landowner with noise agreement
R03	Associated (under negotiation)	35	36	Compliance would be achieved if it became an associated landowner with noise agreement
R05	Associated (under negotiation)	35	32	Yes
R06	Associated (under negotiation)	35	35	Yes
R07	Associated (under negotiation)	35	33	Yes
R08	Associated (under negotiation)	35	32	Yes
R74	Non-associated (under negotiation)	35	40	Compliance would be achieved if it became an associated landowner with noise agreement
R09	Non-associated dwelling	35	33	Yes
R10	Non-associated dwelling	35	38	Further investigation to be undertaken during the EIS
R11	Non-associated dwelling	35	32	Yes
R12	Non-associated dwelling	35	32	Yes
R13	Non-associated dwelling	35	33	Yes
R14	Non-associated dwelling	35	35	Yes
R16	Non-associated dwelling	35	33	Yes
R24	Non-associated dwelling	35	31	Yes
R26	Non-associated dwelling	35	31	Yes

Receiver ID	Status	Noise criteria, dB L_{Aeq}	Predicted noise level, dB L_{Aeq}	Compliance?
R28	Non-associated dwelling	35	33	Yes
R30	Non-associated dwelling	35	33	Yes
R31	Non-associated dwelling	35	33	Yes
R32	Non-associated dwelling	35	33	Yes
R33	Non-associated dwelling	35	35	Yes
R34	Non-associated dwelling	35	31	Yes
R35	Non-associated dwelling	35	33	Yes
R36	Non-associated dwelling	35	35	Yes
R39	Non-associated dwelling	35	35	Yes
R40	Non-associated dwelling	35	30	Yes
R41	Non-associated dwelling	35	32	Yes
R42	Non-associated dwelling	35	33	Yes
R43	Non-associated dwelling	35	34	Yes
R46	Non-associated dwelling	35	33	Yes
R49	Non-associated dwelling	35	33	Yes
R53	Non-associated dwelling	35	29	Yes
R58	Non-associated dwelling	35	30	Yes
R60	Non-associated dwelling	35	37	Further investigation to be undertaken during the EIS
R112	Non-associated dwelling	35	35	Yes
R115	Non-associated dwelling	35	31	Yes
R119	Non-associated dwelling	35	32	Yes
R122	Non-associated dwelling	35	31	Yes
R124	Non-associated dwelling	35	33	Yes
R125	Non-associated dwelling	35	33	Yes
R128	Non-associated dwelling	35	32	Yes
R129	Non-associated dwelling	35	32	Yes
R130	Non-associated dwelling	35	32	Yes
R131	Non-associated dwelling	35	30	Yes
R134	Non-associated dwelling	35	31	Yes
R138	Non-associated dwelling	35	31	Yes
R142	Non-associated dwelling	35	35	Yes

Receiver ID	Status	Noise criteria, dB L_{Aeq}	Predicted noise level, dB L_{Aeq}	Compliance?
R143	Non-associated dwelling	35	32	Yes
R147	Non-associated dwelling	35	32	Yes
R153	Non-associated dwelling	35	33	Yes
R154	Non-associated dwelling	35	34	Yes
R155	Non-associated dwelling	35	31	Yes
R158	Non-associated dwelling	35	34	Yes
R159	Non-associated dwelling	35	34	Yes
R160	Non-associated dwelling	35	32	Yes
R161	Non-associated dwelling	35	31	Yes
R163	Non-associated dwelling	35	32	Yes
R164	Non-associated dwelling	35	31	Yes
R165	Non-associated dwelling	35	31	Yes
R175	Non-associated dwelling	35	32	Yes

The predictions are based on the turbines operating at rated power and for the receiver being downwind of the wind farm. Lower noise levels would generally be expected for lower wind speeds and for situations where the receiver is not downwind of the wind farm. Additionally, if background noise levels are higher than 30 dB at wind speeds at which the turbines are operating at rated power, then the applicable noise criteria would be higher than 35 dB for non-associated receivers. In this respect, the preliminary assessment is conservative.

3.2.3 Summary of non-associated receivers that require further investigation

Table 6 shows a summary of the non-associated receivers where preliminary predicted noise levels exceed the minimum applicable 35 dB noise criterion:

Table 6 Non-associated receivers that are predicted to exceed the minimum applicable 35 dB noise criterion

Receiver ID	Status	Noise criteria, dB L_{Aeq}	Predicted noise level, dB L_{Aeq}	Compliance?
R74	Non-associated (under negotiation)	35	40	Compliance would be achieved if it became an associated landowner with noise agreement
R10	Non-associated dwelling	35	38	Further investigation to be undertaken during the EIS
R60	Non-associated dwelling	35	37	Further investigation to be undertaken during the EIS

Project refinements may need to be made in the case where an agreement is not reached, and further investigations determine that the receiver would still experience noise levels above the noise criteria. If this is required, further investigation would consider one or more of the following:

- Background noise monitoring at the receiver to assess whether the background noise level-adjusted criteria are sufficiently high to allow for wind turbine noise levels in excess of 35 dB at higher wind speeds.
- Implementation of appropriate noise agreements with the identified receiver.
- Refinement to the Project design, including consideration of turbine locations and hub heights, to ensure predicted noise levels comply with the applicable criteria.

3.2.4 Predicted noise levels at associated and associated (under negotiation) receivers

The predicted noise levels at all associated receivers comply with the minimum 45 dB noise criterion with the highest predicted noise level being 43 dB at receiver R01.

Of the receivers that are under negotiation to become associated, the predicted noise levels at all but two locations are at 35 dB or lower. Table 7 shows receivers that are associated (under negotiation) with predicted noise levels above 35 dB, and where compliance would be achieved if they become an associated landowner with a noise agreement.

Table 7 Associated (under negotiation) receivers that are predicted to exceed the minimum applicable 35 dB noise criterion

Receiver ID	Status	Noise criteria, dB L_{Aeq}	Predicted noise level, dB L_{Aeq}	Compliance?
R02	Associated (under negotiation)	35	37	Compliance would be achieved if it became an associated landowner with noise agreement
R03	Associated (under negotiation)	35	36	Compliance would be achieved if it became an associated landowner with noise agreement

3.2.5 Penalties

The NSW Wind Energy Guideline advises that a 5 dB penalty would need to be applied to the wind turbine noise level at a sensitive receiver where one or both of the following are detected as a repeated characteristic of the noise:

- tonality, being noise which has unusually high levels of energy in a narrow frequency range
- low frequency noise, being wind turbine noise levels exceeding 60 dB L_{Ceq} when measured and assessed in accordance with the SA Guideline methodology.

For a penalty to apply, the characteristic must be repeated in that it occurs for more than 10% of a 24 hour period. Under the NSW Wind Energy Guideline, the penalties are only applicable to non-associated sensitive receivers.

With respect to tonality, it is generally not possible to assess in detail at this preliminary stage. One-third octave band information for the candidate Vestas EnVentus 172-7.2MW by Tetris Energy does not indicate any tonal noise that would attract a penalty in accordance with the NSW Wind Energy Guideline.

For low-frequency noise, the noise model described in Section 3.2.1 was used to predict the C-weighted noise level at the non-associated receiver with the highest predicted A-weighted noise level (receiver R74 (non-associated, under negotiation)). The predicted C-weighted noise level for the wind turbines operating at rated power is 54 dB L_{Ceq} at this receiver. As such, it is not expected that the low-frequency noise characteristic would occur in accordance with the NSW Wind Energy Guideline based on this preliminary assessment.

Noise character penalties from wind farms at residences are, in our experience, a relatively rare occurrence in NSW and it is considered reasonable to assume that they will not occur for the purposes of this preliminary noise assessment. Therefore, no adjustment has been made to the predicted noise levels to account for any penalty. It is noted that this will need to be confirmed through noise measurements once the Project commences operation.

3.2.6 Summary of wind turbine noise assessment

On the basis of this preliminary assessment, it is expected that the Project will be able to operate in compliance with the applicable wind turbine noise criteria subject to further investigations as outlined above. As the project design progresses and further planning stage assessments are carried out, the following should be considered:

- updated wind farm noise predictions to reflect the finalised layout and wind turbine selections.
- background noise monitoring at the nearest receivers to establish a baseline against which future operational monitoring can be undertaken to verify compliance.
- ensuring appropriate noise agreements are in place with associated receivers.
- selection of quieter WTG model(s).
- implementation of a curtailment scheme on selected turbines such that wind turbine noise levels achieve compliance with the applicable noise criteria.
- cumulative impacts with other projects in the locality.

3.3 Ancillary infrastructure noise

The proposed location and the nature of the ancillary infrastructure would be refined during ongoing design. Proposed location options are identified in the Scoping Report.

In general, and given the relatively large extent of land available, it is expected that ancillary infrastructure will be able to be installed to achieve compliance with the minimum applicable NPI trigger level of 35 dB through consideration of the following:

- locating ancillary infrastructure as far away from noise-sensitive locations as reasonably practicable
- selection of quieter ancillary infrastructure equipment.

As the Project progresses, it will be necessary for a noise assessment to be conducted to confirm that the predicted noise levels can achieve compliance with the NPI requirements. This includes a detailed assessment of the proposed BESS and substation/s. If necessary, contingency measures would be available in the form of shielding structures around key noise sources at ancillary infrastructure sites.

4 Conclusion

A preliminary noise and vibration assessment has been carried out for the Mount Lambie Wind Farm Project, a proposed wind farm including ancillary infrastructure to be located in the Lithgow LGA. The assessment has been carried out to inform an application to DPHI requesting SEARs for further planning investigations.

Based on this preliminary assessment, which had WTGs operating in operational modes PO7200 and SO1 as a preliminary potential operating scheme, operational noise from the wind farm is expected to comply with the minimum applicable noise criteria for wind turbine noise applicable in NSW at the majority of identified receivers. However, further investigation will be required as the assessment of the Project progresses for two associated (under negotiation) receivers, one non-associated (under negotiation) receiver and two non-associated receivers where the predicted noise levels currently exceed the minimum applicable criterion of 35 dB. A number of options have been identified to assist in achieving the non-associated residence criteria at these receivers, where an agreement is not entered into by the landowner, including background noise monitoring to better establish noise criteria appropriate WTG selections to reduce noise emissions, refinements to the Project design or further modifications to operating settings of the wind farm. It is anticipated that remaining exceedances of the criterion at receivers can be readily mitigated or managed if required.

It is also expected that noise from ancillary infrastructure and noise and vibration associated with construction and decommissioning works will be able to be managed to acceptable levels. The proposed BESS and substation/s will be assessed in detail during the EIS phase.

It is considered that appropriate SEARs for the proposal would require:

- wind turbine noise to be assessed in accordance with the 2024 NSW Wind Energy Guideline
- noise from ancillary infrastructure to be assessed in accordance with the NSW NPI
- construction noise to be assessed in accordance with the NSW ICNG
- noise from construction-related traffic to be assessed in accordance with the NSW RNP
- construction vibration to be assessed in accordance with the NSW Vibration Guideline.

Appendix A—WTG and receiver coordinates

Table A1 presents the preliminary locations of WTG for the Project considered in this assessment.

Table A1 Preliminary Mount Lambie Wind Farm WTG coordinates in MGA GDA2020 Zone 55S

WTG	Easting	Northing
1	774616	6292232
2	774420	6291753
3	775052	6291780
4	774750	6291347
5	774600	6290844
6	774837	6293000
8	773256	6291286
9	773692	6291662
10	774085	6291240
11	774528	6292675
12	775203	6290298
13	777171	6289330
14	776577	6289450
15	776356	6289897
16	775983	6290378
18	775523	6291356
21	778185	6290627
22	778254	6290188
23	775340	6292524
25	775473	6290810

Table A2 presents the coordinates of associated and non-associated dwellings respectively within approximately 5 km of a preliminary WTG location based on information supplied by Aurecon, via Tetris Energy, on 13 February 2025. Note that dwellings shown in this dataset have not yet been field verified and may not represent all dwellings present in the area and may also include rural outbuildings. Three receivers were identified as associated receivers, seven as associated (under negotiation), and one as non-associated (under negotiation).

Table A2 Noise-sensitive receiver coordinates in MGA GDA2020 Zone 55S

Receiver ID	Status	Easting	Northing	Nearest WTG (preliminary)	Min. horizontal distance to WTG location (preliminary), m
R01	Associated dwelling	774214	6293205	11	615
R44	Associated dwelling	778390	6287580	13	2132
R45	Associated dwelling	778458	6287543	13	2202
R02	Associated (under negotiation)	775514	6293867	6	1100
R03	Associated (under negotiation)	771946	6292587	8	1846
R04	Associated (under negotiation)	772447	6296225	6	4014
R05	Associated (under negotiation)	773053	6294447	6	2297
R06	Associated (under negotiation)	773658	6294221	6	1697
R07	Associated (under negotiation)	774057	6294811	6	1971
R08	Associated (under negotiation)	774537	6295017	6	2039
R74	Non-associated (under negotiation)	779038	6290307	22	792
R09	Non-associated dwelling	778386	6287807	13	1947
R10	Non-associated dwelling	777107	6292875	23	1801
R11	Non-associated dwelling	778946	6287405	13	2617
R12	Non-associated dwelling	775724	6295063	6	2245
R13	Non-associated dwelling	778104	6287456	13	2093
R14	Non-associated dwelling	772197	6293006	9	2009
R15	Non-associated dwelling	781244	6289064	22	3193
R19	Non-associated dwelling	769767	6289657	8	3850
R20	Non-associated dwelling	771768	6289369	8	2427
R22	Non-associated dwelling	775211	6286904	14	2890
R24	Non-associated dwelling	773366	6286774	12	3973
R25	Non-associated dwelling	775417	6287007	14	2704
R26	Non-associated dwelling	773640	6286490	12	4116
R27	Non-associated dwelling	771602	6287282	8	4332
R28	Non-associated dwelling	775684	6286741	14	2852

Receiver ID	Status	Easting	Northing	Nearest WTG (preliminary)	Min. horizontal distance to WTG location (preliminary), m
R29	Non-associated dwelling	771760	6286871	8	4661
R30	Non-associated dwelling	776561	6286948	13	2459
R31	Non-associated dwelling	772725	6289027	8	2320
R32	Non-associated dwelling	775986	6286791	14	2724
R33	Non-associated dwelling	772946	6289578	8	1735
R34	Non-associated dwelling	776546	6285971	13	3416
R35	Non-associated dwelling	776184	6286846	14	2633
R36	Non-associated dwelling	777439	6287666	13	1684
R37	Non-associated dwelling	778086	6284937	13	4486
R38	Non-associated dwelling	778087	6285786	13	3660
R39	Non-associated dwelling	777648	6287833	13	1571
R40	Non-associated dwelling	778254	6285932	13	3566
R41	Non-associated dwelling	778127	6286977	13	2539
R42	Non-associated dwelling	777996	6287440	13	2062
R43	Non-associated dwelling	778001	6287855	13	1692
R46	Non-associated dwelling	778240	6287864	13	1814
R47	Non-associated dwelling	779411	6286468	13	3633
R48	Non-associated dwelling	781318	6286484	22	4807
R49	Non-associated dwelling	778351	6287930	13	1831
R50	Non-associated dwelling	781483	6286471	22	4923
R51	Non-associated dwelling	780712	6285788	13	5008
R52	Non-associated dwelling	781689	6286862	22	4780
R53	Non-associated dwelling	780814	6288386	22	3130
R54	Non-associated dwelling	782548	6287672	22	4976
R55	Non-associated dwelling	782156	6287961	22	4492
R56	Non-associated dwelling	782532	6287970	22	4818
R57	Non-associated dwelling	780832	6289001	22	2837
R58	Non-associated dwelling	780476	6289474	22	2333
R59	Non-associated dwelling	782053	6290121	22	3799
R60	Non-associated dwelling	777351	6292644	23	2014
R61	Non-associated dwelling	781773	6290991	21	3606

Receiver ID	Status	Easting	Northing	Nearest WTG (preliminary)	Min. horizontal distance to WTG location (preliminary), m
R62	Non-associated dwelling	781878	6291010	21	3713
R63	Non-associated dwelling	781947	6291017	21	3782
R64	Non-associated dwelling	781618	6290599	22	3388
R65	Non-associated dwelling	781715	6290603	22	3485
R66	Non-associated dwelling	781668	6291039	21	3507
R67	Non-associated dwelling	781777	6291008	21	3612
R68	Non-associated dwelling	781784	6291019	21	3621
R69	Non-associated dwelling	781802	6291024	21	3639
R70	Non-associated dwelling	782026	6290613	22	3795
R71	Non-associated dwelling	782174	6291066	21	4013
R72	Non-associated dwelling	781689	6291111	21	3537
R73	Non-associated dwelling	781809	6291072	21	3651
R75	Non-associated dwelling	780732	6291017	21	2577
R76	Non-associated dwelling	781557	6290670	22	3337
R77	Non-associated dwelling	781635	6291171	21	3493
R78	Non-associated dwelling	781810	6290710	22	3594
R79	Non-associated dwelling	781862	6290703	22	3643
R80	Non-associated dwelling	781913	6290739	22	3700
R81	Non-associated dwelling	781897	6291161	21	3750
R82	Non-associated dwelling	781679	6290737	22	3468
R83	Non-associated dwelling	781653	6291219	21	3518
R84	Non-associated dwelling	781653	6291234	21	3521
R85	Non-associated dwelling	781759	6290790	22	3556
R86	Non-associated dwelling	781826	6290801	22	3623
R87	Non-associated dwelling	781921	6291258	21	3788
R88	Non-associated dwelling	781163	6291181	21	3029
R89	Non-associated dwelling	781720	6290805	22	3520
R90	Non-associated dwelling	781729	6290855	22	3538
R91	Non-associated dwelling	781766	6290850	22	3573
R92	Non-associated dwelling	781851	6290877	22	3662
R93	Non-associated dwelling	781923	6290874	22	3732

Receiver ID	Status	Easting	Northing	Nearest WTG (preliminary)	Min. horizontal distance to WTG location (preliminary), m
R94	Non-associated dwelling	781926	6291316	21	3804
R95	Non-associated dwelling	781949	6291353	21	3833
R96	Non-associated dwelling	781597	6290876	22	3412
R97	Non-associated dwelling	781749	6290927	22	3572
R98	Non-associated dwelling	781756	6290898	22	3573
R99	Non-associated dwelling	781816	6290928	22	3637
R100	Non-associated dwelling	781798	6291358	21	3686
R101	Non-associated dwelling	781915	6290927	22	3734
R102	Non-associated dwelling	782039	6291443	21	3939
R103	Non-associated dwelling	781661	6291400	21	3561
R104	Non-associated dwelling	781503	6291422	21	3412
R105	Non-associated dwelling	781773	6291492	21	3691
R106	Non-associated dwelling	781717	6291510	21	3641
R107	Non-associated dwelling	781536	6291558	21	3477
R108	Non-associated dwelling	781747	6291614	21	3696
R109	Non-associated dwelling	781940	6291768	21	3924
R110	Non-associated dwelling	781323	6291666	21	3305
R111	Non-associated dwelling	781852	6292109	21	3955
R112	Non-associated dwelling	777279	6293386	23	2121
R113	Non-associated dwelling	782061	6293054	21	4573
R114	Non-associated dwelling	778009	6294291	23	3200
R115	Non-associated dwelling	777651	6294132	23	2815
R116	Non-associated dwelling	781679	6292993	21	4219
R117	Non-associated dwelling	779099	6295095	23	4553
R118	Non-associated dwelling	777965	6294706	23	3413
R119	Non-associated dwelling	777085	6294026	23	2301
R120	Non-associated dwelling	778676	6295430	23	4424
R121	Non-associated dwelling	777813	6294959	23	3470
R122	Non-associated dwelling	777132	6294324	23	2539
R123	Non-associated dwelling	781368	6294038	21	4666
R124	Non-associated dwelling	776026	6294687	6	2064

Receiver ID	Status	Easting	Northing	Nearest WTG (preliminary)	Min. horizontal distance to WTG location (preliminary), m
R125	Non-associated dwelling	775987	6294761	6	2103
R126	Non-associated dwelling	780660	6294727	21	4789
R127	Non-associated dwelling	779894	6294264	21	4018
R128	Non-associated dwelling	775632	6295073	6	2219
R129	Non-associated dwelling	775485	6295085	6	2183
R130	Non-associated dwelling	775518	6295153	6	2258
R131	Non-associated dwelling	775625	6295555	6	2673
R132	Non-associated dwelling	776048	6297354	6	4519
R133	Non-associated dwelling	775518	6295694	6	2778
R134	Non-associated dwelling	775408	6295341	6	2409
R135	Non-associated dwelling	779089	6294588	21	4062
R136	Non-associated dwelling	775729	6297100	6	4195
R137	Non-associated dwelling	775856	6297644	6	4754
R138	Non-associated dwelling	775316	6295273	6	2322
R139	Non-associated dwelling	778963	6294676	21	4123
R140	Non-associated dwelling	778505	6293510	21	2900
R141	Non-associated dwelling	775318	6297136	6	4164
R142	Non-associated dwelling	778336	6292177	21	1557
R143	Non-associated dwelling	774978	6295152	6	2156
R144	Non-associated dwelling	775058	6297157	6	4163
R145	Non-associated dwelling	774664	6295833	6	2837
R146	Non-associated dwelling	774192	6296737	6	3792
R147	Non-associated dwelling	774454	6295018	6	2053
R148	Non-associated dwelling	773718	6296750	6	3913
R149	Non-associated dwelling	773561	6295550	6	2851
R150	Non-associated dwelling	773184	6295851	6	3296
R151	Non-associated dwelling	772971	6296220	6	3721
R152	Non-associated dwelling	772976	6295995	6	3526
R153	Non-associated dwelling	771718	6293482	8	2681
R154	Non-associated dwelling	771710	6293285	8	2526
R155	Non-associated dwelling	771875	6293928	9	2904

Receiver ID	Status	Easting	Northing	Nearest WTG (preliminary)	Min. horizontal distance to WTG location (preliminary), m
R156	Non-associated dwelling	771803	6296815	6	4874
R157	Non-associated dwelling	771684	6296807	6	4943
R158	Non-associated dwelling	772310	6293252	9	2106
R159	Non-associated dwelling	771688	6293117	8	2411
R160	Non-associated dwelling	771981	6293550	9	2548
R161	Non-associated dwelling	771754	6293786	9	2875
R162	Non-associated dwelling	771745	6296225	6	4468
R163	Non-associated dwelling	772327	6294109	11	2627
R164	Non-associated dwelling	771937	6294187	11	2999
R165	Non-associated dwelling	771879	6294021	11	2970
R166	Non-associated dwelling	768962	6293290	8	4739
R167	Non-associated dwelling	768566	6292986	8	4988
R168	Non-associated dwelling	768994	6292686	8	4486
R169	Non-associated dwelling	768488	6292808	8	5005
R170	Non-associated dwelling	768956	6292532	8	4477
R171	Non-associated dwelling	768480	6292597	8	4952
R172	Non-associated dwelling	769031	6292357	8	4359
R173	Non-associated dwelling	768819	6292450	8	4587
R174	Non-associated dwelling	768718	6292420	8	4677
R175	Non-associated dwelling	771029	6291831	8	2292
R176	Non-associated dwelling	768603	6292431	8	4792
R177	Non-associated dwelling	768933	6292076	8	4395
R178	Non-associated dwelling	768756	6292125	8	4577
R179	Non-associated dwelling	768653	6292107	8	4675
R180	Non-associated dwelling	768905	6291992	8	4408
R181	Non-associated dwelling	768677	6291862	8	4615

Appendix E
Preliminary Social Impact Assessment

Mount Lambie Wind Farm

Preliminary Social Impact Assessment

Tetris Energy Pty Ltd as trustee for the Tetris Energy Unit Trust

Reference: P527288

Revision: 3

19 March 2025

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Bringing ideas to life

Document control record

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Current revision		**3**			

Approval			
Author signature		Approver signature	
Name	Ryan Kennedy	Name	Michael Drowley
Title	Senior Consultant	Title	Associate

Executive Summary

We acknowledge Aboriginal elders past and present and all Aboriginal community members as the original custodians of the land on which this proposal is based.

Aurecon Australasia Pty Ltd (Aurecon) has been engaged by Tetris Energy Pty Ltd (Tetris Energy) to assist with the environmental and planning approvals for the Mount Lambie Wind Farm (the Project). The preliminary Social Impact Assessment (preliminary SIA) has been prepared in line with the Department of Planning and Environment (DPE) *Social Impact Assessment Guideline* (SIA Guideline) (DPE, 2023) on the social impacts of the proposed wind energy project.

This preliminary SIA provides a high-level overview of the Project and outlines potential social impacts in support of an application for the Planning Secretary's Environmental Assessment Requirements (SEARs) for the Project as part of the development approvals process associated with the State Significant Development (SSD) planning pathway.

Project overview

Tetris Energy Pty Ltd, as trustee for the Tetris Energy Unit Trust, proposes to construct the Mount Lambie Wind Farm, which would include the construction and operation of up to 20 wind turbine generators (WTGs) spread over an area of around 2,540 hectares about 12 kilometres (km) south-west of Wallerawang in the Central Tablelands of New South Wales (NSW) (the Project). The Project would be located within the Lithgow City Local Government Area (LGA) and is situated on land owned by Freehold Landowners, Local Government Authorities and Crown land. The Project will be developed on land that is predominantly cleared and used for sheep and cattle grazing.

The Project is a renewable energy development with a generation capacity of up to 200 megawatts (MW), enough to power about 115,000 households per year. The Project includes the installation of one 100 MW capacity battery energy storage systems (BESS) with a duration of 2 to 6 hours (up to 600 megawatt hours (MWh)) within the Project area. The Project is currently in the early stages of development, including stakeholder engagement and concept design.

The Project is SSD as defined under the State Environmental Planning Policy (Planning Systems) 2021 and will require development consent under Part 4 of the *Environmental Planning and Assessment Act 1979*.

Preliminary Social Impact Assessment findings

This preliminary SIA provides a preliminary desktop assessment of the Project's potential impacts. It includes compiling a social baseline profile for the Project and preliminary prediction and evaluation of social impacts. Early community and stakeholder consultation outcomes informed the scoping of Project-related social impacts and opportunities.

The preliminary assessment of the social impacts will inform and support the refinement of the Project design to reduce the likelihood of negative Project impacts and enhance positive Project benefits.

Indirect construction impacts may be experienced by sensitive receivers within approximately 20 km from the Project area. Direct impacts may be experienced by private dwellings located directly near any proposed WTG or BESS infrastructure. The magnitude of impacts for the sensitive receivers of the Mount Lambie township would be **minor**. There are 10,203 private dwellings located within the Lithgow City LGA. The magnitude of impacts for these dwellings would be **minor to moderate**.

The Project would create a new industry in the Lithgow City LGA that would contribute to the emission reductions required to support those affected by climate change, including in the Central Tablelands of NSW.

The Project could improve intergenerational equity due to use of cleaner energy sources, and by providing economic and climate resilience at both a local and wider scale. Project-associated benefit-sharing initiatives would aim to improve community well-being and create long-term economic benefits through increased job prospects including local employment opportunities, project related procurement, and training opportunities to upskill the local community. The Project would create local employment through the operational phase and foster a positive shift towards a more sustainable and resilient community due to the creation of a new long-term industry in the region.

At a local level, communities incorporating alternate energy sources see intergenerational equity through environmental protection by reducing emissions and air pollution, ensuring economic stability with a reliable energy supply, creating local job opportunities, and empowering the local community for future generations[1].

Construction impacts

The preliminary SIA identified the following potential negative and positive social impacts during the construction phase:

- Construction activities and associated noise and vibration could temporarily impact local amenity for sensitive receivers near a proposed WTG or BESS facility infrastructure. However, due to the distance of the nearest sensitive receivers, vibration and noise impacts during construction are expected to be minor.
- Construction activities may impact local traffic due to increased heavy vehicles on the local road network and potentially changed road conditions. These impacts would largely be associated with the delivery of WTG components and BESS infrastructure. The route and upgrade requirements for WTG transportation would be determined during the preparation of the environmental impact statement (EIS).
- Increased travel times, causing day-to-day disruption due to increased traffic and potentially changed road conditions which may frustrate road users. Traffic increases would largely be associated with the workforce entering and leaving the Project area each day and are not anticipated to result in major disruptions to the local road network.
- Social infrastructure and service availability may be temporarily impacted due to the increased workforce population and social services demand.
- The influx of Project-related workforce and construction activities could temporarily impact the surroundings, amenity, and the local community's way of life.
- The Project may present challenges in sourcing local employment due to skilled workers already employed in the mining sector. Community members may be concerned that there would be limited employment opportunities due to the specific skillsets required by the Project.
- Community members may be concerned about changes to the agricultural local character and transition to a perceived "industrial" landscape associated with new infrastructure development, potentially impacting people's sense of place.
- The Project would improve the livelihoods of local business owners by stimulating economic activity through the temporary increase in the workforce in the region.
- The Project would improve workers' livelihoods by creating increased job opportunities and providing training to the local workforce, including vulnerable groups.

[1] (United Nations System, 2023)

Operational impacts

The preliminary SIA identified the following potential negative and positive Project social impacts during the operational phase:

- Concern amongst community members that there would be limited long-term employment opportunities due to the specific skillsets required by the Project. There is the potential for some stakeholders to question the scale of benefits likely to be experienced locally, given the expected small operational workforce numbers.
- Impacted visual amenity due to the operation of the WTGs and increased potential for impacts to telecommunications, navigation, and radar services due to the operation of the WTGs. The preliminary Landscape Character and Visual Impact Assessment for the Project indicated that the Project could have up to low and moderate landscape and visual character impacts respectively.
- Perceived reduced availability of land for agricultural purposes due to changes in land use and increased fear of property devaluation due to the presence of the Project.
- Increased impacts on biodiversity due to the operation of the WTGs (e.g. through blade strike).
- Increased perceived impacts on health and wellbeing, including through electromagnetic interference, shadow flicker, blade throw and noise because of the operation of the WTGs and BESS facility.
- Community concerns that the influx of workers may change existing community dynamics and social networks.
- Generation of employment opportunities for local and sub-regional workers, including First Nations people and young people.
- Generation of supply and procurement opportunities for local and sub-regional businesses.
- Enhanced community wellbeing and cohesion through community benefit sharing supporting community initiatives and improvements to social services.
- Increased tourism associated with the interest in clean energy.
- Transition to cleaner electricity generation, improving regional air quality.
- Diversity of energy generation sources in the area.
- Reliability of electricity supply through the battery energy storage system.
- Improved local infrastructure, including public road upgrades to facilitate the delivery of WTG components to the Project area.
- Increased local income due to WTG land rental, employment, and neighbour benefits.

Preliminary recommendations

Without proper management, e.g. proactive, timely community engagement and consistent and transparent Project messaging, construction and operation activities may cause anxiety and uncertainty in the local community regarding the scale of the development, required land agreements, and added pressure to access affordable housing, accommodation, and community services (including medical facilities) due to the temporary increase in workforce population. Stakeholder engagement with nearby neighbours and landowners have been conducted and have directly informed the perceived concerns, impacts, opportunities, and benefits to the involved parties as a result of the Project's construction and operation phases. Ongoing consultation sessions will occur as the Project stages develop. It is recommended that Tetris Energy provides clear and consistent updates regarding the Project to community stakeholders.

The Preliminary Landscape Character and Visual Impact Assessment for the Project indicated that the Project could have up to low and moderate landscape character and visual impacts respectively. Ongoing participation agreement discussions with neighbouring properties would assist in resolving potential concerns regarding unfair distribution of benefits and impacts throughout the Project area. Further engagement with the local community is recommended to co-design and implement benefit-sharing initiatives or good neighbour programs.

Overall, it is considered that the potential adverse amenity and way of life impacts arising from the Project's construction and operation in the social locality can be well managed and mitigated through a robust construction environmental management plan and other control measures, including transparent and proactive consultation with the local community.

Furthermore, it is recommended that First Nations stakeholders be identified and consulted with during the EIS stage, in accordance with the Aboriginal Cultural Heritage consultation requirements (DECCW,2010).

It is recommended that the identified social impacts are ground-truthed, supplemented by stakeholder engagement, and reviewed against any changes associated with further Project design development as part of a detailed Social Impact Assessment to be prepared as part of the EIS.

As part of the EIS, future stages of the social impact assessment for this Project would include a detailed prediction and assessment of positive and negative impacts. Informed by stakeholder consultation, a detailed Social Impact Assessment would identify relevant strategies to mitigate the Project's negative impacts and opportunities to enhance its positive impacts.

Further stakeholder engagement and technical and environmental studies would provide evidence to inform the detailed assessment of the Project's positive and negative social impacts.

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Glossary and abbreviations

Acronym	Meaning
ABS	Australian Bureau of Statistics
Aurecon	Aurecon Australasia Pty Ltd
BESS	Battery Energy Storage System
CSP	Community Strategic Plan
CSSI	*Critical State Significant Infrastructure*
DPE	Department of Planning and Environment
DPHI	Department of Planning, Housing and Infrastructure
EIS	Environmental Impact Statement
GHG	Greenhouse Gas
km	kilometres
kV	kilovolt
LEG	Lithgow Environment Group Inc
LGA	Local Government Areas
LSPS	Local Strategic Planning Statement
LCVIA	Landscape, Character and Visual Impact Assessment
m	metres
MW	Megawatts
MWh	Megawatts per hour
NEM	National Electricity Market
NSW	New South Wales
Preliminary SIA	Preliminary Social Impact Assessment
REZ	Renewable Energy Zone
SAL	Suburbs and Localities
SEARs	Secretary's Environmental Assessment Requirements
SIA	Social Impact Assessment
SIA Guideline	NSW Department of Planning and Environment (DPE) Social Impact Assessment Guideline
SSD	State Significant Development
Tetris Energy	Tetris Energy Pty Ltd
the Project	Mount Lambie Wind Farm
UCL	Urban Centres and Localities
WTGs	Wind turbine generators

1 Introduction

1.1 Project overview

Tetris Energy Pty Ltd, as trustee for the Tetris Energy Unit Trust (Tetris Energy), proposes to build the Mount Lambie Wind Farm, about 12 kilometres (km) south-west of Wallerawang in the Central Tablelands of New South Wales (NSW) (the Project). Aurecon is supporting Tetris Energy in the scoping phase of the Project.

The Project would include the construction and operation of up to 20 wind turbine generators (WTGs) with a generating capacity of approximately 200 megawatts (MW) and an on-site battery energy storage system (BESS) with a capacity of up to 100 MW with a duration of two to six hours of storage (up to 600 megawatt hours (MWh)). Ancillary infrastructure, including transmission connection infrastructure, temporary construction infrastructure and operational infrastructure would be part of the Project, with infrastructure spread over an area of around 2,540 hectares.

The Project would be situated on land owned by Freehold landowners, Local Government Authorities and Crown land within the Lithgow City Local Government Area (LGA). The Project area contains eight receivers, of which one of these is associated with the Project, and seven are associated (under negotiation). The location of the Project is shown in Figure 2-1, Figure 2-1 and Figure 2-2.

The Project is a renewable energy development with a generation capacity of up to 200 MW, enough to power about 115,000 households per year. The Project includes the installation of one 100 MW capacity BESS with a duration of 2 to 6 hours (up to 600 MWh) within the Project area. The Project is currently in the early stages of development, including stakeholder engagement and concept design.

The Project is State significant development (SSD) as defined under the State Environmental Planning Policy (Planning Systems) 2021 and will require development consent under Part 4 of the *Environmental Planning and Assessment Act 1979*.

1.2 The applicant

Tetris Energy Pty Ltd, as trustee for the Tetris Energy Unit Trust (Tetris Energy) is the applicant for the Project and is an Australian renewable energy company developing a range of wind, solar and storage projects in Australia. Tetris Energy was established in 2018 and has a focus on the long-term viability of regional communities.

Tetris Energy's team have successfully delivered over 650 MW of renewable projects and have another 2,700 MW of wind projects under development in the Australian market.

1.3 Project benefits

The Project would involve the development of WTGs, a BESS and supporting infrastructure at the proposed Project location south-west of Wallerawang in the Central Tablelands of NSW. This would increase the amount of renewable and dispatchable energy in the National Electricity Market (NEM) in the context of the closure of coal-fired power stations across NSW and Australia.

The Project would have the following benefits:

- Supporting the transition from thermal generation to renewable energy in Lithgow City LGA
- Contributing towards Australia's 2050 net zero targets, as legislated in the *Climate Change Act 2022*
- Contributing towards NSW's 2050 net zero targets, as legislated in the *Climate Change (Net Zero Future) Act 2013*
- Providing economic benefits, including 150 construction and six to eight operational jobs that would be created as a result of the Project

- Supporting policies, such as the *NSW Electricity Strategy* and *2024 Integrated System Plan*, which aim to increase the uptake of renewable energy generation in NSW and Australia.

1.4 Purpose of this report

This Social Impact Assessment (SIA) aims to provide a preliminary assessment of the Project's potential positive and negative social impacts. This preliminary SIA report will assist in identifying any potential social risks to the Project, supports Tetris Energy's request to the NSW Department of Planning, Housing and Infrastructure (DPHI) for Secretary's Environmental Assessment Requirements (SEARs), and will inform the preparation of an environmental impact statement (EIS) and SIA for the Project.

This preliminary SIA has been prepared per the provisions of the NSW Department of Planning and Environment (DPE) Social Impact Assessment Guideline (SIA Guideline) (February 2023).

2 The Project

This section provides an overview of the Project, including the following:

- Description of the site identified for development
- High-level description of the key features of the Project
- Anticipated Project staging and construction activities
- Operational aspects of the Project
- Project decommissioning.

2.1 Location

The Project is located in the Central Tablelands of NSW, approximately 200 km west of Sydney and within the Lithgow City LGA (refer to Figure 2-3). It is located 15 km west of the Blue Mountains National Park, which is of World Heritage significance, and 12 km south-west of Wallerawang.

The Project location was selected due to the Project area's wind generation daily profile, with elevated areas and acceptable access, suitable for WTG siting.

2.2 Project area

The Project area covers approximately 2,540 hectares in the Lithgow City LGA. The Project area includes one associated receiver, seven associated (under-negotiation) receivers, and is located across the following 37 lots:

- Lot 3 DP1129492 – Freehold Landowner
- Lot 4 DP1129492 – Freehold Landowner
- Lot 2 DP1022552 – Local Government Authority
- Lot 204 DP755794 – Freehold Landowner
- Lot 22 DP1039032 – Freehold Landowner
- Lot 1 DP748805 – Freehold Landowner
- Lot 2 DP817970 – Freehold Landowner
- Lot 117 DP755794 – Freehold Landowner
- Lot 107 DP755794 – Freehold Landowner
- Lot 126 DP755794 – Freehold Landowner
- Lot 18 DP755794 – Freehold Landowner
- Lot 212 DP722328 – Freehold Landowner
- Lot 68 DP755794 – Freehold Landowner
- Lot 84 DP755794 – Freehold Landowner
- Lot 28 DP755794 – Freehold Landowner
- Lot 1 DP1134343 – Freehold Landowner
- Lot 7300 DP1133240 – Crown
- Lot 1 DP995950 – Freehold Landowner
- Lot 2 DP995950 – Freehold Landowner
- Lot 3 DP844060 – Freehold Landowner
- Lot 3 DP995950 – Freehold Landowner
- Lot 4 DP995950 – Freehold Landowner
- Lot 6 DP755794 – Freehold Landowner
- Lot 7 DP755794 – Freehold Landowner
- Lot 9 DP755794 – Freehold Landowner
- Lot 13 DP837978 – Freehold Landowner
- Lot 19 DP755794 – Freehold Landowner
- Lot 20 DP755794 – Freehold Landowner
- Lot 23 DP837978 – Freehold Landowner
- Lot 24 DP837978 – Freehold Landowner
- Lot 24 DP1067481 – Freehold Landowner
- Lot 25 DP755794 – Freehold Landowner
- Lot 25 DP837978 – Freehold Landowner
- Lot 31 DP837978 – Freehold Landowner
- Lot 32 DP837978 – Freehold Landowner
- Lot 98 DP755794 – Freehold Landowner
- Lot 99 DP755794 – Freehold Landowner.

2.3 Project description

The Project is seeking approval for up to 20 WTGs, as well as a BESS and associated infrastructure. The WTGs will have blade-tip heights of between 250 metres (m) and 285 m above ground level and a generating capacity of between 7 to 10 MW each. The BESS infrastructure would allow for the capture and storage of dispatchable energy to be distributed to the electricity grid as required. The power generated by the Project (from WTG or released from battery storage) would feed into the existing transmission network via the existing 132 kilovolt (kV) overhead transmission lines.

The key components of the Project are as follows:

- Up to 20 WTGs, with blade-tip heights of between 250 m and 285 m above ground level
- Up to two temporary meteorological masts
- One 100 MW capacity BESS with a duration of 2 to 6 hours (up to 600 MWh)
- One or two substation and transmission connection points
- Temporary infrastructure areas, including construction compounds, a worker accommodation facility and laydown and stockpile areas
- Approximately 27 km of internal access tracks (combination of upgrades to existing and construction of new tracks) throughout the Project area (minimum width of 5.5 m on straight tracks, widened to 6 m on corners)
- Internal collector cable network (electrical connections between the proposed WTGs and the substation), which is expected to be underground
- Site access, including access points from Great Western Highway and/or Curly Dick Road
- Public road upgrades to facilitate the delivery of WTG components to the development footprint (required upgrades will be determined during preparation of the EIS)
- Other operational and maintenance infrastructure including site offices, parking, amenities, laydown areas, and operational and maintenance facilities such as storage and equipment sheds.

Wherever possible, existing access tracks within the Project area would be used during the construction and operation of the Project to minimise the environmental impacts associated with the construction of new access tracks. It is expected that some vegetation clearing would be required to widen existing access tracks. New access tracks within the Project area would be constructed where there are no existing access tracks. The chosen transport and access routes would be subject to a detailed traffic assessment.

Existing 132 kV transmission lines run through the northern Project area. Connection to the Transgrid owned transmission line would be through the construction of the substation and connection point, which would be co-located with the BESS. An existing 500 kV transmission line runs through the centre of the Project area, however, no connection to this transmission line is proposed. Essential Energy also own and operate another 132 kV line which also connects into Wallerawang substation, this in an alternative connection point should it make sense to connect to both lines.

The preliminary layout of the Project is included in Figure 2-1 and Figure 2-2. The indicative Project operational components and approximate dimensions and quantities are provided in Table 2-1. All Project components will be subject to further refinement as part of ongoing design development, stakeholder consultations and the planning approval process. The preferred access routes, BESS and substation location options would be confirmed based on ongoing property negotiations, and further design development as a result of technical assessments. The options identified have been located where possible in areas which limit environmental and social impacts, to the greatest extent possible.

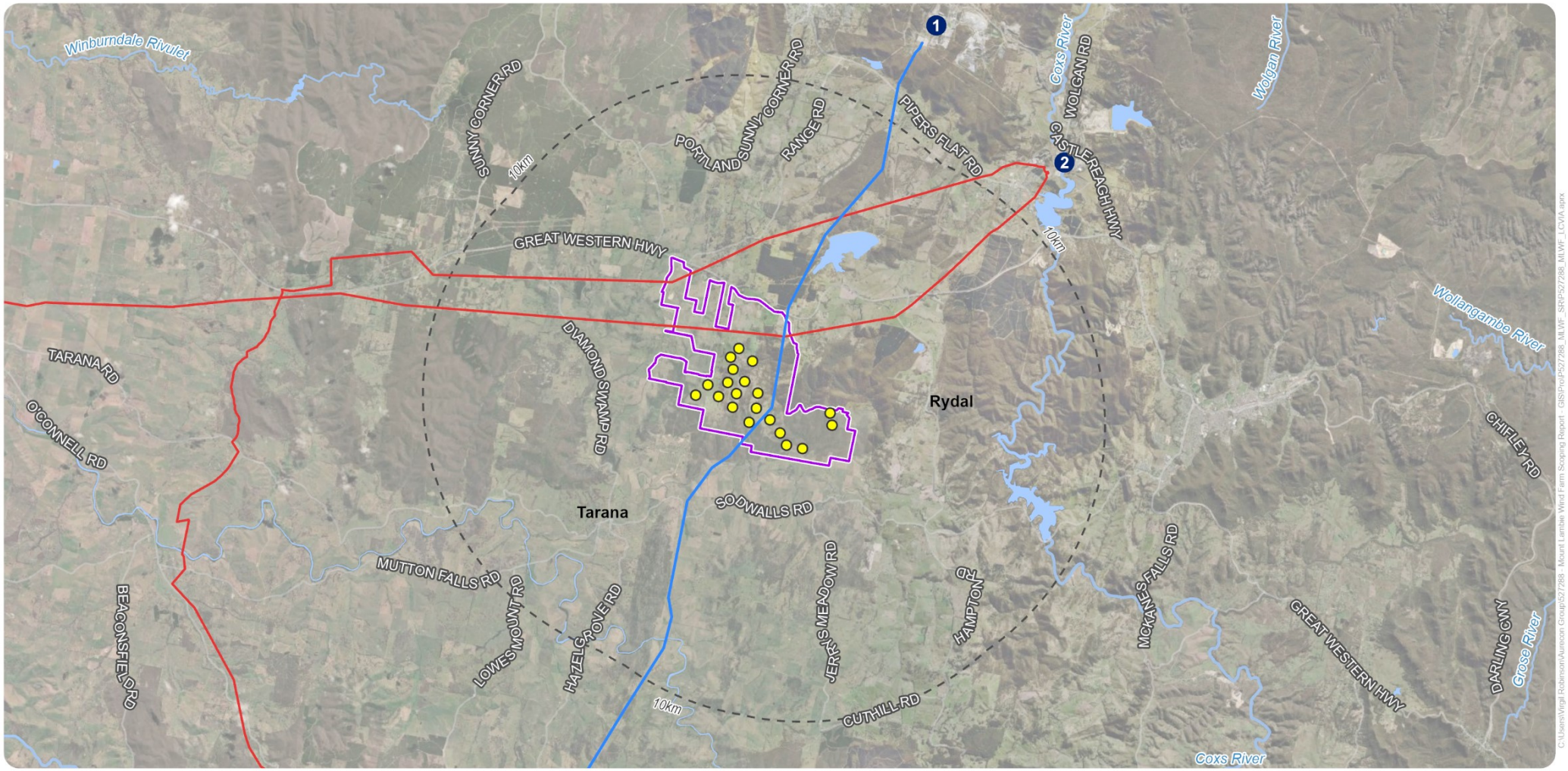
The temporary construction facilities required for the Project are described in Section 2.5.1.

Figure 2-3 provides a regional context and Project overview map showing the Project in relation to nearby key towns.

Table 2-1 Indicative operational components and approximate dimensions

Project component(s)	Approximate dimensions	Quantity
WTGs		
WTG height	252 m or 285 m	Up to 20
Rotor diameter	172 m or 202 m	
Upper most blade tip	252 m or 285 m	
Lower most blade tip	80 m	
Hub height	166 m or 185 m	
WTG foundations	30 m diameter	
Ancillary infrastructure		
Operations and maintenance facility	O&M Option 1 - 100 m x 75 m O&M Option 2 - 160 m x 115 m	1
Main (on-site) 132 kV substation	Substation Option 1 - 180 m x 70 m Substation Option 2 - 80 m x 60 m Substation Option 3 - 115 m x 100 m Substation Option 4 – 170 m x 60 m	Up to two
Internal cable network (33 kV)	19.21 km	NA
Internal access tracks	26.95 km (10.9 km of new access tracks and 16.06 km of existing access tracks)	NA
Primary site access points	Access points off the Great Western Highway and Curly Dick Road.	Number of access points to be determined as the design is developed
BESS		
Facility/compound	BESS Option 1 - 100 m x 70 m BESS Option 2 - 170 m x 130 m BESS Option 3 - 110 m x 100 m	1
Capacity	100 MW/2 to 6 hr (up to 600 MWh)	NA

The Project is anticipated to be operational by 2028 and would operate for up to 35 years. Around six to eight workers would be required for operation and maintenance of the Project.



Project area
10km to turbine
Waterbody

Major power stations
1 Mt Piper
2 Wallerawang

Mount Lambie Wind Farm Infrastructure
Turbine location

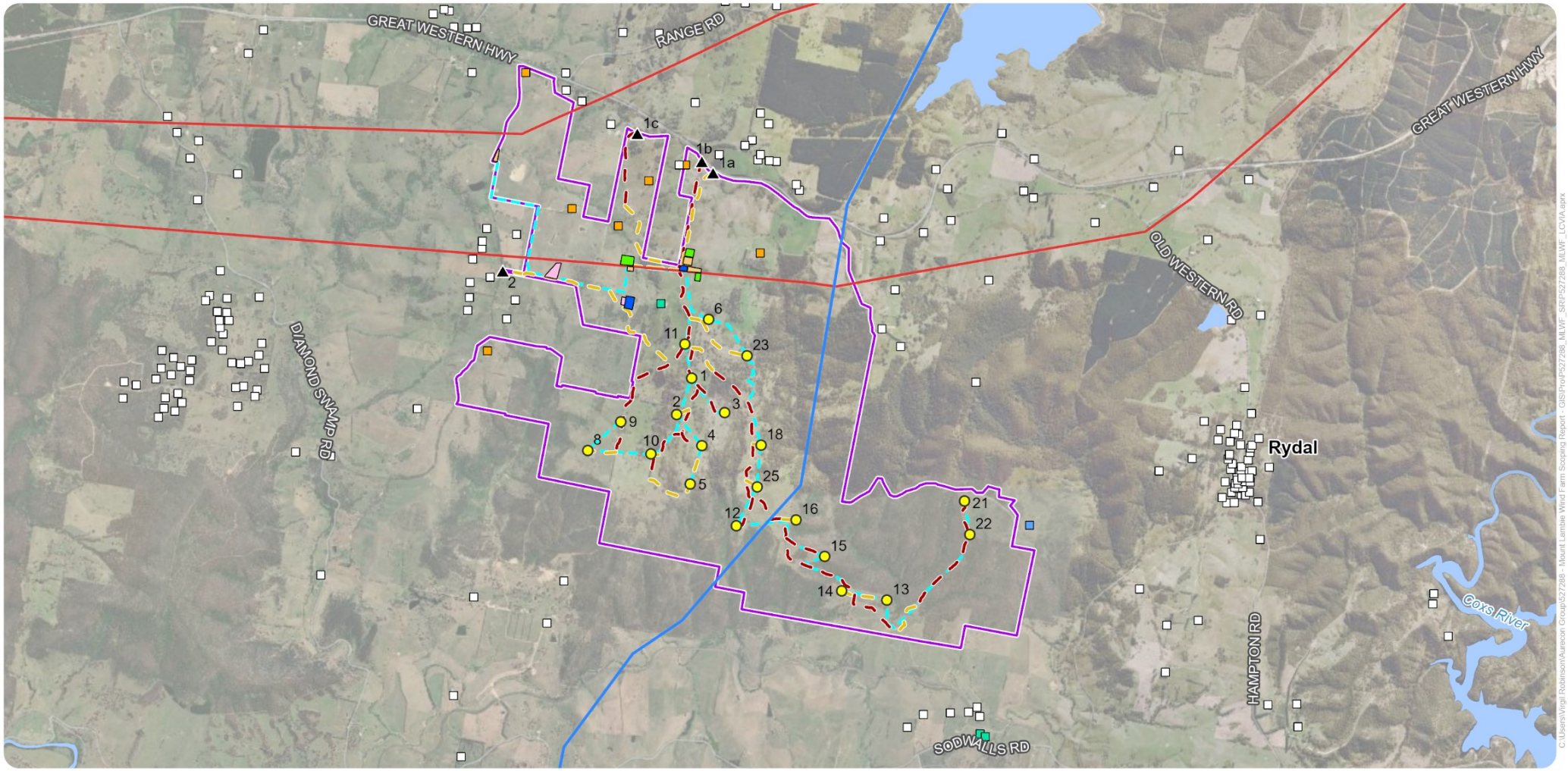
Existing transmission
132kV line
500kV line

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:210,000
0 2.5 5 km

Projection: GDA2020 MGA Zone 55

Figure 2-1: Preliminary Project layout



Project area
Waterbody
Associated dwelling
Associated (under negotiation)
Non-associated (under negotiation)
Non-associated dwelling

Mount Lambie Wind Farm Infrastructure

Turbine location
Access point
New access track
Existing access track to be utilised
Underground cabling
Temporary construction compound / Laydown area
Operation and maintenance facility
Substation
BESS infrastructure

Existing transmission

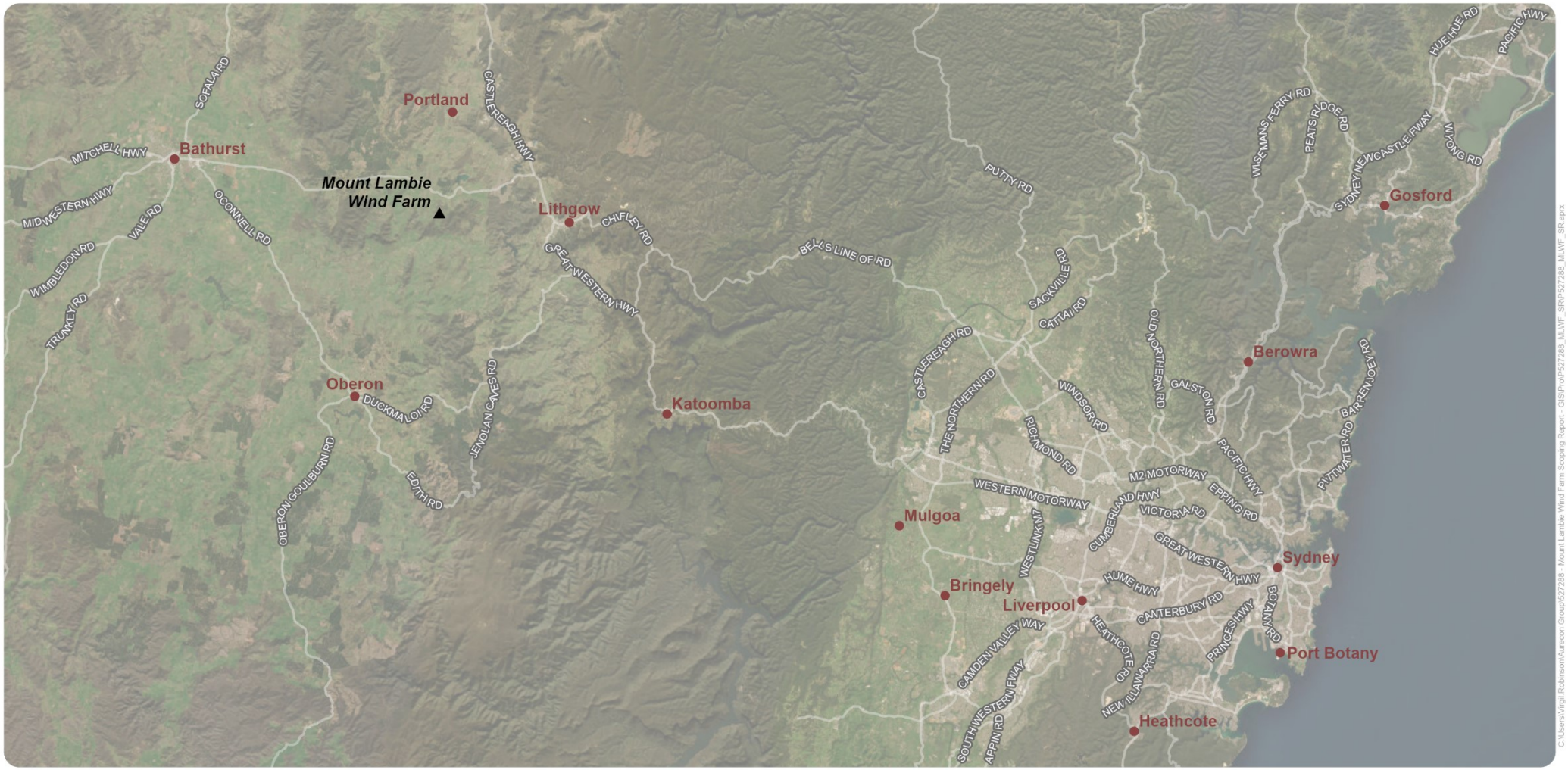
132kV line
500kV line

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:75,000
0 0.9 1.8 km

Projection: GDA2020 MGA Zone 55

Figure 2-2: Preliminary Project layout - detailed view



▲ Mount Lambie Wind Farm

● City or town

Major road

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:775,000

0 10 20 km

Projection: GDA2020 MGA Zone 55

Figure 2-3: Project location

2.4 Project staging and timing

Construction works will commence as soon as practicable following Project approval (estimated to be in 2026). The timing of construction would be driven by additional permits and authorisations, contractor selection, detailed design and procurement processes and a final investment decision.

The construction phase of the Project is anticipated to be 18 to 24 months. The Project has an operational life of up to 35 years after which it may be decommissioned or repowered. The anticipated timeframes for the Project are:

- Planning and approvals: in progress and aiming to be complete by 2026
- Detailed design and securing finance: 2027
- Construction and commissioning: planned to commence in 2027, for around 18 months
- Operation: planned to commence in 2028

Tetris Energy aims to construct the Project as a single development phase.

2.5 Construction

2.5.1 Construction features

Key components for Project construction are shown in Figure 2-2 and detailed in Table 2-2.

Table 2-2 Indicative construction compounds and approximate dimensions

Project component(s)	Approximate area (ha)	Quantity
Temporary worker accommodation facility	Subject to capacity requirements[2]	1
Construction compound/laydown area	Option 1 - 0.53 Option 2 - 2.43	2
Stockpiles and materials storage compound	Subject to construction requirements	

Up to two temporary meteorological masts (up to 160 m high) would be used during construction of the Project.

2.5.2 Construction hours

Construction of the Project would take place during standard working hours as per the *Interim Construction Noise Guideline* (Department of Environment and Climate Change NSW, 2009) This includes:

- Monday to Friday: 7 am to 6 pm
- Saturday: 8 am to 1 pm
- Sunday and public holidays: no work

[2] Further consultation with community stakeholders, Council and unions would be required to determine the feasibility of this accommodation facility, including its capacity.

2.5.3 Construction workforce

It is estimated that 150 full-time equivalent workers would be required during the peak of construction activities. A temporary worker accommodation facility is anticipated to be required on-site. However, further consultation with community, landowners and regulatory stakeholders would be required to determine the feasibility of this accommodation facility, including capacity. Other alternative existing accommodation options at Wallerawang, Lithgow and Bathurst would also be investigated during the preparation of the EIS.

2.5.4 Transport access routes

WTGs, BESS infrastructure and substation components would likely be delivered to the Port of Newcastle and then transported by oversized and/or overmass vehicles via the Golden Highway, Castlereagh Highway and Great Western Highway. Alternative routes are currently being investigated via a route survey assessment and may include Port Botany (Sydney) or Geelong (Victoria).

Primary access options to the Project area include from the Great Western Highway, Lawsons Lane, or via Curly Dick Road.

Four site access options have been identified to provide access to the Project area, with the final number of access points to be determined as the detailed design is progressed. Access point options include:

- A new access track off the Great Western Highway to the east of the unnamed Crown access road, situated on predominantly cleared land.
- An existing privately owned, unnamed Crown access road. Vegetation clearing and widening of the Crown access road would be required. The Crown road is a one-lane unsealed road.
- A track from Lawsons Lane, which connects to the Great Western Highway. This may include utilising part of an existing unsealed access track, as well as construction of new sections of track.
- Construction of a new access track connecting to an existing driveway off Curly Dick Road.

The transport route of infrastructure components and other Project related materials would be investigated further during the preparation of the EIS with the outcomes considered as part of the Project traffic study. Indicative transport routes near the Project area are outlined in Figure 2-4.

Investigations into whether road upgrades would be required for the delivery of WTG and other infrastructure components, including swept path analyses, would be carried out during the EIS phase.

2.6 Decommissioning

Decommissioning the Project would involve dismantling the WTGs, site office and any other ancillary infrastructure and transporting them offsite for disposal or reuse and ensuring the new access tracks and foundation pads are rehabilitated as required. In line with the indicative timeframes for the Project outlined in Section 2.4, this would occur after the estimated operational life of up to 35 years. Decommissioning activities may result in noise, dust and traffic impacts. However, these are anticipated to be minimal, given the location of the Project. The land for the Project would then be revegetated and returned to its previous condition as far as practicable.

Extensive and robust decommissioning obligations are covered in the conditions of the land agreements.

▲ Mount Lambie Wind Farm

● City or town

Major road

Indicative transport routes

Port of Newcastle to Mount Lambie (OSOM)

Port Botany to Mount Lambie

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:2,000,000

0 25 50 km

Projection: GDA2020 MGA Zone 55

Figure 2-4: Indicative transport routes

3 Methodology

3.1 Social impact assessment requirements

This preliminary SIA forms part of the Project Scoping Report and Request for Secretary's Environmental Assessment Requirements (SEARs) to be lodged with NSW Department of Planning, Housing and Infrastructure (DPHI). Consequently, it has been prepared in accordance with the provisions of the DPE SIA Guideline (February 2023) as part of the Scoping Report process.

The SIA Guideline requires that SIA scoping be completed, and the findings incorporated into the proponent's Scoping Report. This preliminary SIA includes the following:

- An understanding of the Project's Social Locality
- Initial analysis of the defining characteristics of the communities within the Project's social locality including any vulnerable groups (the social baseline)
- Initial evaluation of likely social impacts for different groups in the social locality
- How the engagement strategy will help to identify and assess social impacts.

3.2 Technical assessment framework

3.2.1 DPE SIA Guideline

The SIA Guideline provides a consistent framework and approach to the assessment of social impacts associated with State significant projects and developments in NSW.

This preliminary SIA has applied the relevant assessment categories from the SIA Guideline to assess, group and report on anticipated impacts (refer to Section 8). It has also considered the information gathered through the social baseline analysis, along with community views gained through a traditional and social media scan to assess the Project's relative impacts according to the specified social categories.

3.3 Scoping likely social impacts

The SIA Guidelines include specific impact magnitude levels to describe the impacts of a project on communities, infrastructure, services, and health. The magnitude levels outlined in the SIA Guidelines have been used in this section to describe the social impacts of the proposal. The scoping of likely social impacts resulting from the Project has been guided by the SIA Guideline and regarding the social impact categories presented in Table 3-3.

The scoping of likely social impacts included:

- Gaining an understanding of the Project's social locality.
- Reviewing and considering community opinions and sentiments toward the Project activities through desktop research of traditional and social media scans.
- Considering the characteristics of the communities within the social locality (the social baseline), that is, identifying individuals and communities who are likely to experience social impacts associated with the Project, with a particular focus on temporary construction activities.
- Preliminary identification and assessment of the potential social impacts of the project's construction and operation on local communities – including sensitive receivers and community assets, values, and infrastructure to determine the social impacts significance rating.
- Preliminary identification and assessment of management and mitigation measures to avoid, minimise, manage, or mitigate the identified impacts.

The scoping has informed the identification of the preliminary SIA social locality and will be refined and updated accordingly to Project changes and further investigation of impacts during the detailed social impact assessment phase.

3.3.1 Determining the level of SIA assessment

A key objective of the SIA scoping phase is to identify the level of assessment required for identified social impacts and to inform the Project design and planning approvals. The approach used to determine the level of assessment required for the identified social impacts has been completed following the SIA Guideline.

A significance assessment was undertaken using the SIA Guideline risk matrix (refer to Appendix A). The risk matrix considers social impact likelihood and magnitude by assessing the identified project impact extent, duration, intensity, and sensitivity of the potentially affected stakeholder group. A significance rating has been assigned from the risk matrix in the SIA Guideline (refer to Appendix A).

The level of assessment helps to determine the extent of effort and data required to evaluate the impact during the detailed assessment. The levels of assessment and the indicative data requirements are shown in Table 3-1. The scoped social impacts and their required level of assessment are outlined in Section 8.

Table 3-1 Level of assessment

Level of Assessment		**Secondary data**	**Primary data *Consultation***	**Research**
Detailed	The Project may result in significant social impacts, including cumulative impacts.	Required	Broad consultation	Targeted research
Standard	The Project is unlikely to result in significant social impacts, including cumulative impacts.	Required	Targeted consultation	Potentially targeted research
Minor	The Project may result in minor social impacts	Required	Limited – if required (e.g. local council)	Not required
Not relevant	The Project will have no social impact, or the social impacts of the Project will be so small that they do not warrant consideration.			

Source: (DPE, 2023)

3.4 Determining the social locality

This preliminary SIA considers social impacts in the 'social locality', seen in Figure 3-1. The approach used to determine the preliminary SIA social locality considered who is most likely to experience direct and indirect impacts because of the Project. The social locality has been construed based on the Project's nature and impact.

The SIA Guideline outlines the key components that should be considered in determining the social locality and describing the social baseline. Several factors have been considered in determining the social locality for the Project, including:

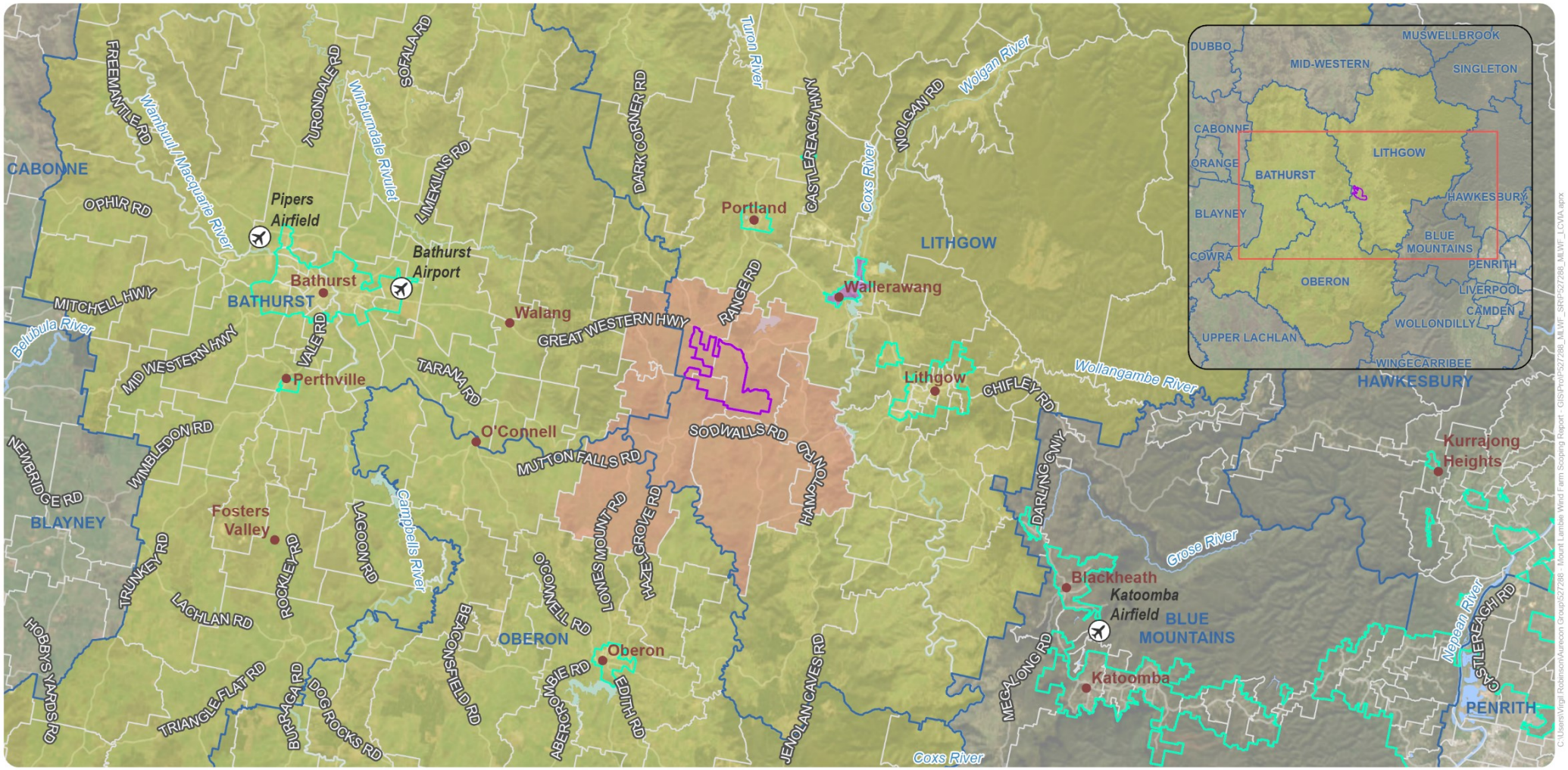
- The nature and scale of the Project and its associated activities.
- The characteristics of surrounding communities and how positive and negative impacts may be reasonably perceived or experienced by different stakeholders, including those who may be vulnerable or marginalised.
- The potentially affected built or natural features located near the Project that have social value or importance.
- Cumulative impacts that may impact affected communities because of other projects or operations near the Project area.
- The history of the proposed Project area and any similar experiences people near the Project have had.

- The broader (indirect) area of social influence of communities that future incoming workforces, business opportunities, construction access and supply chain routes will impact.

The Project's social locality is defined as:

- The Project area and immediate surrounding areas, including landholdings, property owners and residents of associated dwellings and properties to be used for the Project area and any ancillary facilities, are located within the Suburbs and Localities (SAL) of Tarana (SAL13775), Mount Lambie (SAL12784) and Meadow Flat (SAL12559). Rydal (SAL13467) and Sodwalls (SAL13584) have been included within the Project's social locality due to the Project boundary's proximity to the respective SALs – while there are no direct works occurring within Rydal or Sodwalls, it is important to consider any potential social impacts, including to health and wellbeing. Where applicable, SAL data has been used to identify key baseline indicators for the Social Locality. Additionally, LGA-level data for the Lithgow City LGA and state-level data for NSW are used to provide an understanding of the broader and comparative social context within which the Project is located.
- The Wallerawang Urban Centre and Locality (UCL) is the closest and most prominent town to the Project, with accessibility via major highways. Wallerawang would likely be the primary town providing goods and services to support the Project's construction phase.
- The host LGA of Lithgow includes transportation routes along the Great Western Highway (A32) and the Castlereagh Highway (B55), as well as access to the Project area via Bonaventure Road.
- The regional context comprises the Lithgow City LGA, Bathurst LGA and Oberon LGA. The Project area is located within the Lithgow City LGA and adjoining the others.

The social locality may extend beyond these boundaries as the Project planning progresses to include the places of residence of the future construction and operational workforce and where materials may be sourced for the Project. The social locality will be further refined as required during the Scoping Report and EIS. Figure 3-2 shows approximate distances from the current Project area to nearby towns and key features of the area and provides a regional context.



Project area
Waterbody
Waterway
Airport
Local Government Area (LGA)
Urban Centre and Locality (UCL)
Suburb and Locality (SAL)

Project social locality

Wallerwang UCL
Mount Lambie SAL, Meadow Flats SAL, Tarana SAL, Rydal SAL, Sodwalls SAL
Lithgow LGA, Bathurst Regional LGA, Oberon LGA

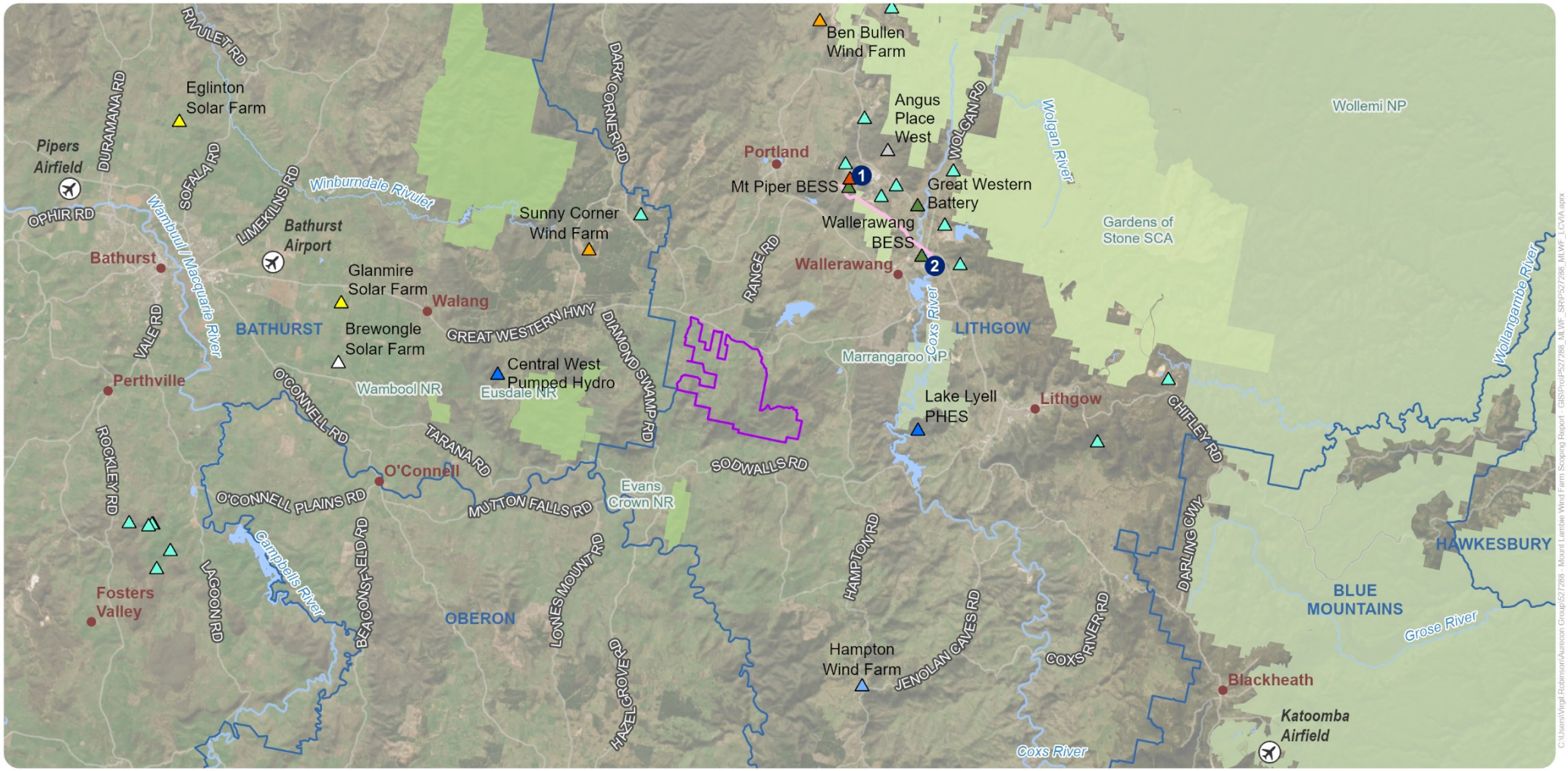
Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:500,000
0 5 10 km

Projection: GDA2020 MGA Zone 55

Mount Lambie Wind Farm **Preliminary Social Impact Assessment**

Figure 3-1: Project social locality



- Project area
- Local Government Area
- Waterbody
- Waterway
- Airport
- Mount Piper to Wallerawang Transmission Line Upgrade

Major power stations

1. Mt Piper
2. Wallerawang

Underground mines

- Existing
- Proposed

Nearby energy projects

- Battery - In Planning
- Coal - Operational
- Hydro - In Planning
- Solar - In Planning
- Solar - Withdrawn
- Wind - In Planning
- Wind - Operational

NPWS Estate

- National Park
- Nature Reserve
- State Conservation Area

Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:350,000
0 3.5 7 km

Projection: GDA2020 MGA Zone 55

Figure 3-2: Regional context and related development

3.5 Describing the social baseline

This preliminary SIA describes the Project's existing environment (social baseline profile). It gathers knowledge from both primary and secondary data sources to understand the existing social environment in which the Project is being proposed and of potentially affected communities. The social baseline profile provides the basis for assessing and predicting the Project's social impacts. The description includes:

- Review of statutory planning and legislative requirements, including existing State and local government strategies relevant to the social and economic environment of the social locality to understand better the key strategic drivers relevant to the Project.
- Analysis of key population and demographic indicators, including data from the 2021 Australian Bureau of Statistics (ABS) Census of Population and Housing.
- Desktop audit of community facilities, public services, and places of special interest, drawing on the Council's database to identify likely locations of community activity and the distribution of services and facilities likely to be accessed by communities within the social locality.
- A review of regional planning policies and strategies was conducted to contextualise the Project.

The description of the social baseline provides a summary of the social locality, including a high-level overview of regional demographic characteristics, social backgrounds, land use, key industries, and social infrastructure.

The initial social baseline, including land use context and demographic, economic and social infrastructure overview, presented in this section is mainly based on ABS 2021 Census Data. Table 3-2 outlines the primary ABS datasets that provide key demographic data across the Project's social locality.

Table 3-2 Relevant ABS datasets and description of locations

Location	State	2021 ABS Census data reference	Description
Project area	NSW	Lot 1 DP748805 – Freehold Lot 1 DP995950 – Freehold Lot 1 DP1134343 – Freehold Lot 2 DP817970 – Freehold Lot 2 DP995950 – Freehold Lot 2 DP1022552 – Local Government Authority Lot 3 DP844060 – Freehold Lot 3 DP995950 – Freehold Lot 3 DP1129492 – Freehold Lot 4 DP995950 – Freehold Lot 4 DP1129492 – Freehold Lot 6 DP755794 – Freehold Lot 7 DP755794 – Freehold Lot 9 DP755794 – Freehold Lot 13 DP837978 – Freehold Lot 18 DP755794 – Freehold Lot 19 DP755794 – Freehold Lot 20 DP755794 – Freehold Lot 22 DP1039032 – Freehold Lot 23 DP837978 – Freehold Lot 24 DP837978 – Freehold Lot 24 DP1067481 – Freehold Lot 25 DP755794 – Freehold Lot 25 DP837978 – Freehold Lot 28 DP755794 – Freehold Lot 31 DP837978 – Freehold Lot 32 DP837978 – Freehold	The Project area is comprised of 37 separate lots. One lot is Crown land, and one is owned by the Lithgow City Local Government Authority. The remaining 35 lots are all freehold. The area is about 2,540 hectares in size and predominantly rural residential.

Location	State	2021 ABS Census data reference	Description
		Lot 68 DP755794 – Freehold Lot 84 DP755794 – Freehold Lot 98 DP755794 – Freehold Lot 99 DP755794 – Freehold Lot 107 DP755794 – Freehold Lot 117 DP755794 – Freehold Lot 126 DP755794 – Freehold Lot 204 DP755794 – Freehold Lot 212 DP722328 – Freehold Lot 7300 DP1133240 – Crown	
Mount Lambie SAL, Tarana SAL and Meadow Flat SAL	NSW	SAL12784, SAL13775 and SAL12559	The Project area spans three suburbs: Mount Lambie, Tarana and Meadow Flat. The suburbs are predominantly zoned as rural land and are populated by a total of 608 people or 2.9% of the Lithgow City LGA.
Rydal SAL and Sodwalls SAL	NSW	SAL13467 and SAL13584	The Project area is within proximity to two suburb boundaries: Rydal and Sodwalls. The suburbs, similar to those encompassing the Project boundary, is predominantly zoned as rural agricultural production. It is populated by a total of 257 people, or 1.2% of the Lithgow City LGA.
Wallerawang UCL	NSW	UCL115151	Wallerawang is the closest urban centre to the Project area and is populated by 2,079 people. Since the Wallerawang power station closed in 2015, Lake Wallace has become the notable landmark within the town. Wallerawang sits at the intersection of the Castlereagh highway and the Great Western Highway. The Main Western railway line intersects the town of Wallerawang and splits to the north and south.
Lithgow City LGA	NSW	LGA14870	The Lithgow City LGA is located roughly 140 km west of the Sydney CBD and is approximately 4,551 square kilometres in size. The local government area is populated by 20,842 people with majority of its population living in the town of Lithgow (11,197). The LGA contains rail infrastructure and public transport via bus routes.
Regional social locality	NSW	LGA14870 LGA10470 LGA16100	The regional social locality is comprised of three local government areas. These local government areas are the Lithgow City LGA (20,842 people), Bathurst LGA (43,567 people) and Oberon LGA (5,580 people). Much of the construction and work force is likely to be sourced from the regional social locality. Within this regional social locality there are several notable key communities: ▪ Lithgow (UCL) - 11,197 ▪ Bathurst (UCL) - 36,230 ▪ Oberon (UCL) - 2,540 ▪ Portland (NSW) (UCL) - 1,841

3.6 Assessment of impacts

The impact assessment identifies and analyses the likely changes to the existing social environment of the identified social locality because of the Project's footprint, construction, and operation. The assessment of impacts addresses the SIA Guideline requirements by:

- Analysing the extent and nature of social impacts against the baseline conditions and other technical assessments findings.
- Proposing appropriate and justified responses to avoid or mitigate the identified social impacts.

3.6.1 Social categories for assessment

According to the SIA Guideline, as outlined in Table 3-3, social impacts can be grouped into several categories and may involve changes to people's way of life, community, accessibility, culture, health and wellbeing, surroundings, livelihoods, and decision-making systems.

Table 3-3 Social impact categories

Categories	Meaning
Way of life	How people live, how they get around, how they work, how they play, and how they interact daily
Community	Composition, character, cohesion, function, and sense of place
Access	How people access and use infrastructure, services, and facilities, whether provided by local, state, or federal governments or by for-profit or not-for-profit organisations or groups
Culture	Both Aboriginal and non-Aboriginal culture, including shared beliefs, customs, values, and stories, and connections to country, land, waterways, places, and buildings
Health and wellbeing	Physical and mental health, especially for those who are highly vulnerable to social exclusion or substantial change, plus wellbeing of individuals and communities
Surroundings	Access to, and use of, services that ecosystems provide, public safety and security, access to and use of the natural and built environment, and its aesthetic value and amenity
Livelihoods	People's capacity to sustain themselves, whether they experience personal breach or disadvantage, and the distributive equity of impacts and benefits
Decision-making systems	Whether people experience procedural fairness; can make informed decisions, have power to influence decisions, and can access complaint, remedy, and grievance mechanisms.

3.6.2 Significance of impacts

This preliminary SIA applies the impact grading matrix presented in Table 3-6 to assess the significance for potential negative impacts only. Positive impacts are assessed and discussed as appropriate.

The significance of each potential social impact arising from the construction and operation of the Project was assessed as a function of the magnitude of the impact and sensitivity of the receiver.

- **Magnitude** refers to the scale, duration, intensity, and scope of the overall proposal including how it will be constructed and operated. This can be influenced by such things as the geographical area affected, the type, frequency and duration of works, level of interest or concern from the community, and how adaptable or resilient the potentially affected people would be when exposed to the changes brought on by the proposal. This is shown in Table 3-5.

  The levels of magnitude also range from negligible to high. Negligible can be classified as having no distinct change caused by the impact (i.e. is like what is currently experienced at the social baseline). High magnitude is considered a change that dominates over existing social baseline conditions. The change is widespread or persists over many years or is effectively permanent.

- **Sensitivity** refers to the qualities of the receptor which influence its vulnerability to change and capacity to adapt. Sensitivity ranges from negligible to high. If impacts to sensitivity are considered negligible, this means that no vulnerability is expected and/or receptors are likely to be able to absorb or adapt to change. High sensitivity is when there is the potential for multiple vulnerabilities to occur and/or receptors would have very little capacity to absorb or adapt to change.

Each identified social impact has been given an overall significance rating based on the 5-point scale as per the impact grading matrix. Ratings of both sensitivity and magnitude take into consideration both subjective and objective components, depending on people's individual experiences and/or perceptions, background data and professional judgement.

Table 3-4 Defining likelihood levels of social impacts

Likelihood Level	Meaning
Almost certain	Definite or almost definitely expected (e.g. has happened on similar projects)
Likely	High probability
Possible	Medium probability
Unlikely	Low probability
Very unlikely	Improbable or remote probability

Table 3-5 SIA Guideline defining magnitude levels for social impacts

Magnitude level	Meaning
Transformational	Substantial change experienced in community wellbeing, livelihood, infrastructure, services, health, and/or heritage values; permanent displacement or addition of at least 20% of a community.
Major	Substantial deterioration/improvement to something that people value highly, either lasting for an indefinite time or affecting many people in a widespread area.
Moderate	Noticeable deterioration/improvement to something people value highly, either lasting for an extensive time or affecting a group of people.
Minor	Mild deterioration/improvement, for a reasonably short time, for a small number of people who are generally adaptable and not vulnerable.
Minimal	Little noticeable change experienced by people in the locality

The Social Impact Assessment ultimately results in a Social Significance Rating for each social category, per the matrix set out within the SIA Guideline. This rating is based on the likelihood of the impact occurring and the consequences (magnitude of impact) should it occur.

Table 3-6 Social impact significance matrix

Likelihood level		Magnitude Level				
		1	2	3	4	5
		Minimal	Minor	Moderate	Major	Transformational
A	Almost certain	Low	Medium	High	Very High	Very High
B	Likely	Low	Medium	High	High	Very High
C	Possible	Low	Medium	Medium	High	High
D	Unlikely	Low	Low	Medium	Medium	High
E	Very unlikely	Low	Low	Low	Medium	Medium

3.6.3 Identification of management and mitigation measures

The proposed measures to avoid, minimise, mitigate, or manage the identified social impacts are listed in Section 8. These preliminary measures were formulated based on the findings of the social baseline study and outcomes of the community sentiment scan, and were developed using adaptive management principles, recognising that impacts may change over time, and that ongoing monitoring of impacts would provide the flexibility to accommodate such changes. The process for identifying recommended management measures included:

- A review of management measures provided by other technical specialists informing the Project.
- Consideration of stakeholder feedback to identified suggested opportunities to mitigate perceived impact.

3.7 Data sources

Information used to inform the preliminary assessment of social impacts is from the following sources:

- Census of Population and Housing (ABS, 2016 and ABS, 2021).
- ABS Table Builder Datasets
- NSW Government strategic planning reports and plans
- NSW and City Council reports and strategies
- NSW Government strategic planning reports and plans
- NSW Department of Planning and Environment population and dwelling projections
- Specialist technical reports for the Project
- A media scan, which involved gathering and analysing information from traditional and non-traditional media, including print, broadcast, social media, was undertaken to better understand community sentiment on the Project.
- Direct communication, such as face to face meetings, phone calls, mail, e-mail, and/or SMS (as appropriate), was utilised to inform, consult, and involve key stakeholders on the Project.

3.8 Assumptions and limitations

- The desktop assessment for this preliminary SIA is based on the Project description and spatial data provided to Aurecon in November 2024.
- The preliminary SIA is based on the Project Layout shown in Figure 2-1 and Figure 2-2.
- As this SIA is preliminary in nature, it makes assumptions based on the desktop assessment and the outcomes from other preliminary assessments prepared for the Scoping Report.
- No site inspection has been undertaken as part of this preliminary SIA. Its scope has been based on a current knowledge scan and desktop review only, informed by some discussions with key Tetris Energy personnel.
- Stakeholder engagement, including with Traditional Owners, is recommended for the Project. It is recommended that predicted impacts be validated in subsequent phases of the assessment.
- The review of community and stakeholder perspectives associated with the Project was informed by the findings from a social and traditional media scan. An extensive media scan, referenced where appropriate, has also informed the identification of community values, issues, and trends.
- During the scoping stage of the Project, consideration has been given to a ‘do nothing’ scenario and a ‘Project scenario’. This preliminary SIA assesses the potential social impacts that may arise under the Project scenario, as described in Section 2.
- The Project layout would be subject to further refinement during the EIS and ongoing design development and informed by further technical and environmental studies and stakeholder engagement.
- Design modifications will continue through the EIS process as detailed impact assessments are undertaken, ensuring the final design avoids impacts to the greatest extent possible. A detailed assessment of potential social impacts would be conducted to inform the EIS and validate this preliminary SIA's findings.

4 Policy framework

The review of National, State and local plans, policies and strategies highlighted a series of strategy drivers for the Project. Overall, the Project aligns with the state-focused goals and local strategic plan accountabilities. Table 4-1 provides an overview of the Project's alignment with crucial Government planning documents and strategies.

Table 4-1 Summary of energy policies in NSW and their relevance to the Project

Policy document	Detail	Relevance
Climate Change (Net Zero Future) Act 2023	The NSW Climate Change (Net Zero Future) Act 2023 legislates NSW's targets to reduce greenhouse gas (GHG) emissions by 50 per cent by 2030 and 70 per cent by 2035 to achieve net zero GHG emissions by 2050. The Act identifies NSW's approach to addressing climate change as a whole of government approach with the objective for NSW to be more resilient to a changing climate.	The Project would contribute to emissions reductions through increased uptake of renewable energy in the NEM. This would contribute to the emissions reductions required under this legislation.
NSW Net Zero Plan Stage 1: 2020-2030 (2020)[3]	The NSW Government aims to achieve net zero emissions by 2050 by creating new jobs, cutting household costs, and attracting investment. The Net Zero Plan Stage 1: 2020–2030 sets out how the government will deliver on this objective over the next decade. The forecast is to deliver a 35% emissions reduction in NSW by 2030 compared to where we were in 2005. A priority area of the plan is to drive the uptake of proven emissions-reduction technologies that grow the economy, create new jobs, or reduce the cost of living. Some low-emission technologies, such as firm renewable generation and home energy efficiency products, are now the most cost-competitive new ways to generate power and reduce electricity bills.	The Project would contribute to the state's emissions reduction targets by providing renewable energy. It would also likely create new jobs and positively impact the local economy.
NSW Electricity Infrastructure Roadmap (2020)[4]	The NSW Electricity Infrastructure Roadmap is the state's plan to transition the electricity sector. The vision is for NSW consumers to enjoy some of the cheapest, cleanest, most reliable energy in the world. The aim is to have a modern electricity system that is built on five foundational pillars: 1. Driving investment in regional NSW: supporting the regions as the state's economic and energy powerhouse. 2. Delivering energy storage infrastructure: supporting stable, long-term energy storage in NSW. 3. Delivering Renewable Energy Zones (REZ): coordinating regional transmission and renewable generation in the right places for local communities. 4. Keeping the grid secure and reliable: backing the system with gas, batteries or other reliable sources as needed. 5. Harnessing opportunities for industry: empowering new and revitalised industries with cheap, reliable and low emissions electricity. It is expected that the roadmap will deliver $32 billion in private sector investment by 2030 and support 6,300 construction jobs and 2,800 ongoing jobs mostly in regional NSW in 2030.	The Project would support the roadmap through the provision of cheap and clean renewable energy. The Project would allow for local construction and operational jobs to be created in the Lithgow City LGA and would enable a greater share of the electricity supplied to the NEM to come from renewable sources in the context of the closure of the State's coal-fired power stations. The Project would contribute to the state's vision of a modern electricity system and provide low-emission electricity.

[3] (Department of Planning, Industry and Environment, 2020)
[4] (Department of Planning, Industry, and Environment, 2020)

Policy document	Detail	Relevance
NSW Electricity Strategy (2019)[5]	The strategy is the NSW Government's plan for a reliable, affordable, sustainable electricity future. The NSW Government has three objectives for the electricity system: reliability, affordability and sustainability. The NSW Government's preference is for the market to deliver the investment required to ensure reliable and affordable electricity. The NSW Government will support the development of new transmission to connect low-cost generation to the electricity system by developing its Renewable Energy Zones (REZ). New generation is considered essential to improving the affordability and reliability of the electricity system and protecting the environment. The NSW Electricity Strategy identifies 'delivering more resilient electricity supplies' as a key action towards supporting a competitive and low-cost electricity market. It plans to do so through initiatives such as setting an energy security target and avoiding electricity emergencies.	The Project would contribute to the NSW Electricity Strategy by providing new, renewable energy generation to support the state's electricity system. The Project would increase the supply of electricity to the market and contribute to providing a more sustainable electricity future. The inclusion of the BESS in the Project would also improve the reliability of electricity supply in the context of increasing non-dispatchable sources of energy.
NSW Climate Change Policy Framework (2016)[6]	The NSW Climate Change Policy Framework outlines the state's long-term objectives to achieve net-zero emissions by 2050 and to make NSW more resilient to a changing climate. It guides the NSW Government's policy and programs. The aim of the framework is to maximise NSW's economic, social, and environmental well-being in the context of a changing climate and current and emerging international and national policy settings and actions to address climate change. There are two key objectives: 1. Achieve net-zero carbon emissions by 2050; and 2. Be more resilient to a changing climate.	The Project would provide the state with a renewable energy source, contributing to the two key objectives.
Central West and Orana Regional Plan 2041 [7]	The Central West and Orana Regional Plan 2041 is a 20-year vision for Central West NSW. The Plan recognises the value of landscapes and their important role in leveraging opportunities for new economic ventures. It includes considerations to support a more sustainable and lower-carbon future as well as steps to transition away from coal mining and coal-fired power generation in Lithgow. Five regionally focused Parts underpin the Plan: ■ Part 1: Region-shaping investment ■ Part 2: A sustainable and resilient place ■ Part 3: People, centres, housing and communities ■ Part 4: Prosperity, productivity and innovation ■ Part 5: Local government priorities Objective 2 of Part 1 involves supporting the State's transition to net zero by 2050 and delivering the Central-West Orana renewable energy zone. It is understood that within 15 years, 75% of the state's coal powered electricity generation is expected to reach the end of its technical life. Replacing these energy sources and building the infrastructure needed to connect new energy sources is essential.	The region offers potential for renewable energy industries with vast open spaces and higher altitude tablelands suitable for wind power generation, large-scale solar energy, bioenergy generation and pumped hydro. Increasing renewable energy investment, the expected closing of coal mines and coal-fired power generation in the Lithgow area and investment in new technology such as green hydrogen, will contribute significantly to a reduction in emissions. The Project would contribute to the Plan's aim to encourage growth in renewable energy while supporting economic growth in the region.

[5] (Department of Planning, Industry and Environment, 2019)
[6] (Office of Environment and Heritage, 2016)
[7] (NSW Department of Planning and Environment, 2022)

Policy document	Detail	Relevance
Lithgow Regional Economic Development Strategy – 2023 Update	The Lithgow Regional Economic Development Strategy – 2023 Update is a blueprint to drive sustainable, long-term economic growth in regional NSW. The Plan recognises the value of economic diversification and includes plans for regional NSW to support emerging trends including renewable energy. The Plan highlights that a shift towards net zero will present both challenges and opportunities as part of the overall effort to promote diversification in the region's economy.	Electricity supply represents a specialisation for the region, contributing $73 million to GVA in 2020. Although this specialisation has historically been based on coal-fired power generation, the ongoing focus on exploring potential renewable energy opportunities, such as battery storage and pumped-hydro generation, demonstrates the sector can continue to play an important role in the Lithgow economy
Lithgow City LGA Local Strategic Planning Statement 2040 (2020)[8]	The council's Local Strategic Planning Statement (LSPS) provides an overarching strategic direction of how Lithgow City Council plans for the present and the future. The LSPS sets the 20-year vision for land use in the local area, including how future growth and change will be managed. The vision is for Lithgow to be an attractive, healthy, and caring environment to live, work, and play. This will be achieved in partnership with the community through initiative, foresight, and leadership. Lithgow City Council is actively investigating policies and procedures to enhance the resilience of the LGA to climate change following the NSW Government's Climate Change Policy for NSW. This is in conjunction with the overarching aim of achieving the state government's goal of achieving net zero emissions by 2050.	The Project would contribute to the diversification of energy supply within the Lithgow City LGA through the construction of a wind farm in Mount Lambie. The LSPS also acknowledges the need for provisions to support renewable energy projects from further encroaching residential accommodation forms. The Project would include the provision of a worker accommodation facility, however further consultation with community stakeholders, Council and unions would be required to determine the feasibility of this accommodation facility, including its capacity
Lithgow City LGA Community Strategic Plan – 2035 (2017-2022)[9]	The Lithgow Community Strategic Plan (CSP) sets out the community's vision for the strategic direction of the Lithgow City LGA. It provides an overarching vision for the council's planning framework and sets the strategic direction for the future of this LGA to 2035. The Plan identifies the community's priorities and aspirations for the future, including strategies for achieving these. It has been developed with considerable community input and guides all other strategies and plans. The Plan is divided into five key themes and integrates social, environmental, economic, and civic leadership issues. Each theme is supported by a mission statement, directions, benefits, and measures to assist the Council and the community achieve its objectives. The themes are: ■ Caring for our Community ■ Strengthening our Economy ■ Developing our Built Environment ■ Enhancing our Natural Environment ■ Responsible Governance and Civic Leadership	The Project would establish renewable energy generation within the Lithgow City LGA which would contribute to sustainable outcomes across the community. Additionally, the construction and operation of the Project would potentially allow for increased local employment opportunities, thereby improving economic outcomes in the local community.

[8] (Lithgow City Council, 2020) (Lithgow City Council, 2022)
[9] (Lithgow City Council, 2022)

Policy document	Detail	Relevance
Bathurst Regional Council Renewable Energy Action Plan (2020)[10]	The Bathurst Regional Council Renewable Energy Action Plan sets out the strategy and action plan to minimise its dependence on fossil fuel energy sources. It primarily focuses on alternatives to grid-sourced electricity but also considers and recommends transitioning away from natural gas and liquid fossil fuels. The plan employs an energy management hierarchy that prioritises actions related to energy efficiency. The plan includes an electricity efficiency target of 15% compared to 2018-19 electricity consumption of 15,069 MWh. The plan also sets the following renewable electricity targets: ■ Renewable Target 1 - 25% of Council's electricity consumption to be from renewable sources by 2023 ■ Renewable Target 2 - 50% of Council's electricity consumption to be from renewable sources by 2025	The Project would contribute to achieving the Bathurst Regional Council's renewable electricity targets.
Bathurst 2040 Community Strategic Plan (2022)[11]	The Community Strategic Plan (CSP) represents the blueprint for the future, describing the focus of all Council activities. It also recognises that others in the community (individuals, businesses, governments, and agencies) must help achieve those outcomes. The Bathurst community has identified renewable energy generation as one of the Council's top three action areas, with 73.6% of people rating this as moderately to extremely important (Bathurst Regional Council, 2020) The CSP commits Bathurst Regional Council to continue supporting the pursuit of energy efficiency measures at its facilities and to offset its energy use through renewable energy projects. Bathurst Regional Council aims for a declining trend in the total greenhouse emissions from Council facilities to increase its reliance on renewable energy sources and energy efficiency gains. Bathurst Regional Council is working towards reducing its total electricity consumption per resident.	The Project would contribute to the Bathurst CSP's goal of generating more renewable energy projects in the LGA.
Oberon Council Local Strategic Planning Statement 2040[12]	This Local Strategic Planning Statement (LSPS) sets out a 20-year vision for the land use planning framework for Oberon Council's economic, social, and environmental needs over this period. It addresses the planning and development issues of strategic significance to the Council through planning priorities and actions, spatial land use direction, and guidance. Oberon Council's 20-year plan vision will leverage the area's agricultural, locational (proximity to Sydney, Bathurst, and Lithgow), environmental, tourism, and manufacturing strengths to generate economic and social growth opportunities while continuing to recognise the importance of agriculture and our rural assets.	The Project would support establishing alternative energy sources, such as wind farming, and enable potential future opportunities to generate economic growth for the LGA through the creation of new jobs.

[10] (Bathurst Regional Council, 2020)
[11] (Bathust Regional Council, 2022)
[12] (Oberon Council, 2020)

Policy document	Detail	Relevance
Western Sydney Energy Program[13]	The Western Sydney Energy Program is a collaboration between nine Western Sydney councils, including Lithgow, to increase energy, cost, and emission savings opportunities for councils and their communities. The program has four strategic focus areas: 1. **Renewable energy transformation**: Installation of low cost, low emission energy generation and storage 2. **Transport**: Transport infrastructure that enables an innovative and low emissions future 3. **Supporting our community**: Helping the community access services to reduce energy costs 4. **Facilities and precincts**: Implementing best practice in energy planning and design for key precincts and facilities This program aspires to deliver an additional 1-2% reduction of Western Sydney's annual community-scale emissions. This equates to 200,000 tonnes of CO2e reductions each year.	The Project would contribute to Strategic Focus Area One that involves the collaboration on renewable energy electricity procurement. The Project would also contribute to the aspiration to reduce annual community-scale emissions by 1-2%.
Wind Energy Guidelines DPHI 2024 (Renewable Energy Planning Framework 2024)	The *Renewable Energy Planning Framework 2024* provides a suite of policies that will guide the planning and assessment process for renewable energy infrastructure and development, and is applicable to SSD wind projects. The framework is designed to: - provide clearer, more transparent assessment to ensure the level of assessment matches the level of risk and to help speed up assessments - help the industry make informed investment decisions by providing more objective development standards - make sure that development is guided by meaningful consultation with affected communities - introduce clear setbacks and visual impact criteria to allow communities to anticipate change - provide more transparency about the likely costs of decommissioning solar and wind energy development so the industry and landowners can make more informed investment decisions - provide greater support to applicants and landowners entering into agreements to host infrastructure or manage the impacts of development - make sure the benefits of energy development are directly realised by the localities and regions that host the infrastructure The Wind Energy Guideline, implemented under the Renewable Energy Planning Framework, provides guidance on visual impacts, noise, decommissioning, biodiversity, aviation safety and other issues.	Site selection and impact assessment considerations in line with the Wind Energy Guideline (DPHI, 2024) and its technical supplements have been considered for this Project's Scoping Report, including the preliminary noise and visual impact assessments.
Community Engagement Review 2023 (DCCEEW)	The Australian Energy Infrastructure Commissioner conducted an independent Community Engagement Review which identified opportunities to ensure community support and participation in Australia's renewable energy transition. The review made nine recommendations for renewable energy projects in the following areas: - encourage best practice and select reputable developers for new projects - reduce unnecessary and onerous community engagement by improving the way project sites are selected - make engagement more efficient by revising planning and approval processes - improve complaint handling processes - keep communities informed about the transition, including its goals, benefits and requirements - equitably share the benefits of the transition.	The Project aims to support the NSW and Commonwealth Governments in achieving the recommendations from this review by undertaking best practice community engagement and helping the community understand the need for the Project in the context of the energy transition in the Mount Lambie area. The Project would also engage the community to identify opportunities and enable sustainable benefit sharing, including potential local economic development and potential opportunities that will benefit the broader community.

[13] (Western Sydney Regional Organisation of Councils Ltd, 2021)

5 Social baseline overview

This section describes the social baseline for the Project and the social context without the Project. It documents the existing social environment and defines the characteristics of the communities within the Project's social locality, including any vulnerable groups.

5.1 Demographic overview

The Project is located over an area of around 2,540 hectares in the Lithgow City LGA. The Project area is located around 12 km south-west of Wallerawang. The population of Mount Lambie is around 65 people, while the population of Wallerawang is around 2,000. Additionally, the Project's social locality is characterised by[14]:

- A more sparsely distributed population among the LGA and UCLs reflects the region's rural nature.
- A slightly older population in the Lithgow City LGA compared to the state, particularly in the Mt Lambie SAL.
- A slightly higher proportion of Aboriginal and Torres Strait Islander population within the Lithgow City LGA than the state, with the highest concentration in the Wallerawang UCL.
- A less culturally diverse population than the rest of the state based on the number of persons born overseas.
- A significantly higher incidence of long-term health conditions within the LGA when compared to the state.
- A marginally higher median weekly income within the Project suburbs compared to the Lithgow City LGA, reflecting relative economic advantage for the immediate Project area and relative disadvantage for the wider LGA and Wallerawang UCL.
- Practically no unemployment within the Project suburbs and high rates of volunteering, suggesting a large proportion of retirees.

Table 5-1 draws on the ABS datasets listed in Table 3-2 to provide a demographic overview of the Project's social locality. Refer to Table 3-2 for the demographic indicators across the Project's social locality in comparison to the state of NSW.

Table 5-1 Insights into demographics

Topic	Insights into demographics
Population size	▪ The Lithgow City LGA has a significantly higher population (20,842) than the closest UCL to the Project area (Wallerawang - 2079). This indicates that the population is dispersed across multiple UCLs within the LGA. The suburbs of Mount Lambie, Tarana and Meadow Flat, where the Project is located, have small population counts (65, 187 and 356, respectively). The suburbs of Rydal and Sodwalls, where the Project social locality extends to, also have small population counts (163 and 94, respectively). This reflects the rural nature of the Project area and social locality.
Older and ageing population	▪ The median age in the Wallerawang UCL (38) is considerably lower when compared to the Lithgow City LGA (46), Mount Lambie (55), Tarana (48) Meadow Flat (45), Rydal (53), or Sodwalls (52). This suggests the closest UCL to the Project area has a younger demographic when compared to the state of NSW (39), while the Project area and LGA has an aging population. ▪ These median ages are reflected in the proportion of the population over 65 years of age. There is 25% of the Lithgow City LGA population with an age of 65 years or over, this is higher than NSW (18%), Wallerawang UCL (18%), Mount Lambie (17%), Tarana (23%) Meadow Flat (16%), Rydal (31%), or Sodwalls (16%). This indicates that the suburb of Tarana has the highest proportion of aged residents within the Project area, while Rydal has the highest proportion of aged residents within the Project social locality area.

[14] Due to the small population for the Mount Lambie SAL, limited information has been provided. It is noted that small random adjustments have been made by the ABS to all cell values, this was completed to protect the confidentiality of data. These adjustments may cause the sum of rows or columns to differ by small amounts from the table totals.

Topic	Insights into demographics
Aboriginal and Torres Strait Islander population	▪ The Aboriginal and Torres Strait Islander population is notable at 8% for the Lithgow City LGA, compared to the state of NSW (3.4%). Therefore, it is recommended to consider Aboriginal perspectives and interests in making planning decisions that influence the Project area. ▪ Due to the small population sizes of the suburbs, the proportion of Aboriginal and Torres Strait Islander population can significantly differ. The Mount Lambie proportion is 0%, while the Tarana and Meadow Flat proportions are 2% and 7% respectively. Rydal's Aboriginal and Torres Strait Islander population is around 6%, while Sodwalls is around 3%. 10% of the Wallerawang UCL population is comprised of Aboriginal and Torres Strait Islander people.
Overseas born population	▪ The population in the Lithgow City LGA is predominantly of Australian descent. While there is some cultural diversity, with 18% of the population born overseas, the Lithgow population is less culturally diverse than NSW (34.6% of the population born overseas). The overseas born population is lowest in the Mount Lambie SAL (5%). ▪ The top languages besides English include Italian, Mandarin, Thai, Cantonese and German.
Long-term health conditions	▪ The percentage of people with long-term health conditions is 39% in the Lithgow City LGA, significantly more than in NSW (27%). Conversely, 15% of people have long-term health conditions in the Mount Lambie SAL, 31% in the Tarana SAL and 32% in the Meadow Flat SAL, suggesting that this vulnerable group is more densely situated in the town or other suburbs within the LGA. Thirty-nine per cent of Rydal's population have long-term health conditions, while 32% of Sodwalls' population have long-term health impacts, suggesting this group, while outside the Project area, is still vulnerable within the social locality. There may be a prevalence of sensitivity to external factors that are perceived to cause or contribute to adverse health and well-being impacts.
Employment	▪ The most common industries of employment in the Lithgow City LGA include Coal Mining (6.9%), Aged Care Residential Services (3.4%), Supermarket and Grocery Stores (3.1%), State Government Administration (3%) and Local Government Administration (2.9%). Refer to Appendix B for more information on occupations and employment industries. ▪ The unemployment rate of 6% in the Lithgow City LGA is marginally higher than that of NSW (4.9%), suggesting that there is likely to be more disadvantage in the community. There are no unemployed residents within the Project area and a high rate of volunteering for each of the Project suburbs (77% for Mount Lambie, 30% for Tarana and 20% for Meadow Flat). Sodwalls also has a 0% unemployment rate, however 6% of Rydal's population is unemployed. ▪ The proportion of people who travelled to work by car as driver or passenger is substantially higher within the study area compared to the state of NSW. For comparison, 47% of the workforce in NSW travel to work by car as driver or passenger, compared to 68% for the Lithgow City LGA.
Median weekly household income	▪ The median weekly household income is highest in the Meadow Flat SAL ($2,083), followed by the Sodwalls SAL, Tarana SAL and Mount Lambie SAL ($1,937, $1,875 and $1,874 respectively). Rydal's weekly household income is slightly lower ($1,325). The NSW median ($1,829) is higher than the median for the Wallerawang UCL and Lithgow City LGA ($1,441 and $1,196, respectively). This suggests that the Project area and NSW median are relatively economically advantaged compared to the Lithgow City LGA and Wallerawang UCL.

5.2 Economic overview

The top industry of employment in the Lithgow City LGA from the 2021 Census was coal mining. Table 5-2 outlines the key industries and areas of employment for the Project's social locality.

Table 5-2 Key occupations and industries in the social locality in comparison to the state

Location	Key occupations and industries
Mount Lambie (SAL)	▪ Of the 65 residents in this SAL, the labour force accounts for 61.2%. There is 0% of the labour force as unemployed workers. ▪ The most common occupations are Managers (32.1%), Technicians and trades workers (21.4%), Community and personal service workers (14.3%), Machinery operators and drivers (14,3%) and Labourers (10.7%). ▪ The top industries of employment are Beef Cattle Farming (Specialised) (6.9%), Landscape Construction Services (5.9%), Special School Education (5%), Sheep-Beef Cattle Farming (4%) and Tiling and Carpeting Services (4%).

Location	Key occupations and industries
Tarana (SAL)	▪ Of the 187 residents in this SAL, the labour force accounts for 68%. There is 0% of the labour force as unemployed workers. ▪ The most common occupations are Managers (29.7%), Professionals (18.8%), Community and Personal Service Workers (18.8%), Technicians and Trades Workers (17.8%) and Clerical and Administrative Workers (9.9%). ▪ The top industries of employment are Electricity, Gas, Water and Waste Services (25%), Agriculture, Forestry and Fishing (14.3%), Wholesale Trade (14.3%), Retail Trade (14.3%) and Health Care and Social Assistance (10.7%).
Meadow Flat (SAL)	▪ Of the 356 residents in this SAL, the labour force accounts for 60%. There is 0% of the labour force as unemployed workers. ▪ The most common occupations are Professionals (20.8%), Community and Personal Service Workers (14.9%), Managers (14.3%), Technicians and Trades Workers (14.3%) and Clerical and Administrative Workers (11.9%). ▪ The top industries of employment are Beef Cattle Farming (Specialised) (6%), Coal Mining (4.8%), Correctional and Detention Services (3.6%), Fossil Fuel Electricity Generation (3%) and Electricity Distribution (3%).
Rydal (SAL)	▪ Of the 163 residents in this SAL, the labour force accounts for 55%. There is 6.2% of the labour force as unemployed workers. ▪ The most common occupations are Professionals (18.7%), Community and Personal Service Workers (17.3%), Machinery Operators and Drivers (16%), Managers, (14.7%), Labourers (14.7%), Technicians and Trades Workers (10.7%), and Sales Workers (4%)/ ▪ The top industries of employment are Coal Mining (16%), Accommodation (12%), Tiling and Carpeting Services (8%), Pubs, Taverns and Bars (8%), and Primary Education (8%).
Sodwalls (SAL)	▪ Of the 94 residents in this SAL, the labour force accounts for 55%. There is 0% of the labour force as unemployed workers. ▪ The most common occupations are Managers (31%), Professionals (27.7%), Labourers (16.6%), Clerical and Administrative Workers (11,1%), and Technicians and Trades Workers (5.5%). ▪ The top industries of employment are Agriculture, Forestry and Fishing (20.4%), Public Administration and Safety (10.6%), Wholesale Trade (7.4%), Electricity, Gas, Water, and Waste Services (7.4%), and Mining (5.6%).
Wallerawang (UCL)	▪ Of the 2,079 residents in this UCL, the labour force accounts for 58.1%. 6% of the labour force is unemployed. ▪ The most common occupations are Technicians and Trades Workers (18.4%), Community and Personal Service Workers (16.1%), Machinery Operators and Drivers (14.3%), Clerical and Administrative Workers (13.9%) and Labourers (11.3%). ▪ The top industries of employment are Coal Mining (7.9%), Supermarket and Grocery Stores (3.5%), Aged Care Residential Services (3.5%), Other Social Assistance Services (3.5%) and State Government Administration (3.1%).
Lithgow City LGA	▪ Of the 20,842 residents in this LGA, the labour force accounts for 50.4%. 6% of the labour force is unemployed. ▪ The most common occupations are Technicians and Trades Workers (16.6%), Community and Personal Service Workers (14%), Professionals (13.4%), Clerical and Administrative Workers (12.8%) and Labourers (11.4%). ▪ The top industries of employment are Coal Mining (6.9%), Aged Care Residential Services (3.4%), Supermarket and Grocery Stores (3.1%), State Government Administration (3%) and Local Government Administration (2.9%). The high proportion of mining industries likely indicates there is a significant transient workforce established within the LGA.
Bathurst LGA	▪ Of the 43,567 residents in this LGA, the labour force accounts for 60.2%%. There is 4.1% of the labour force as unemployed workers. ▪ The most common occupations are Professionals (19.1%), Community and Personal Service Workers (15%), Technicians and Trades Workers (14.2%), Managers (12.1%) and Clerical and Administrative Workers (11.9%). ▪ The top industries of employment are Hospitals (except Psychiatric Hospitals) (4.2%), Other Social Assistance Services (4%), State Government Administration (3.3%), Aged Care Residential Services (3%) and Supermarket and Grocery Stores (2.6%).

Location	Key occupations and industries
Oberon LGA	■ Of the 5,580 residents in this LGA, the labour force accounts for 54.9%. There is 3.5% of the labour force as unemployed workers. ■ The most common occupations are Managers (17.8%), Technicians and Trades Workers (15%), Machinery Operators and Drivers (13.2%), Professionals (12.8%) and Labourers (12.8%). ■ The top industries of employment are Wooden Structural Fitting and Component Manufacturing (6.3%), Log Sawmilling (3.8%), Beef Cattle Farming (Specialised) (3.4%), Sheep-Beef Cattle Farming (2.8%) and Local Government Administration (2.8%).

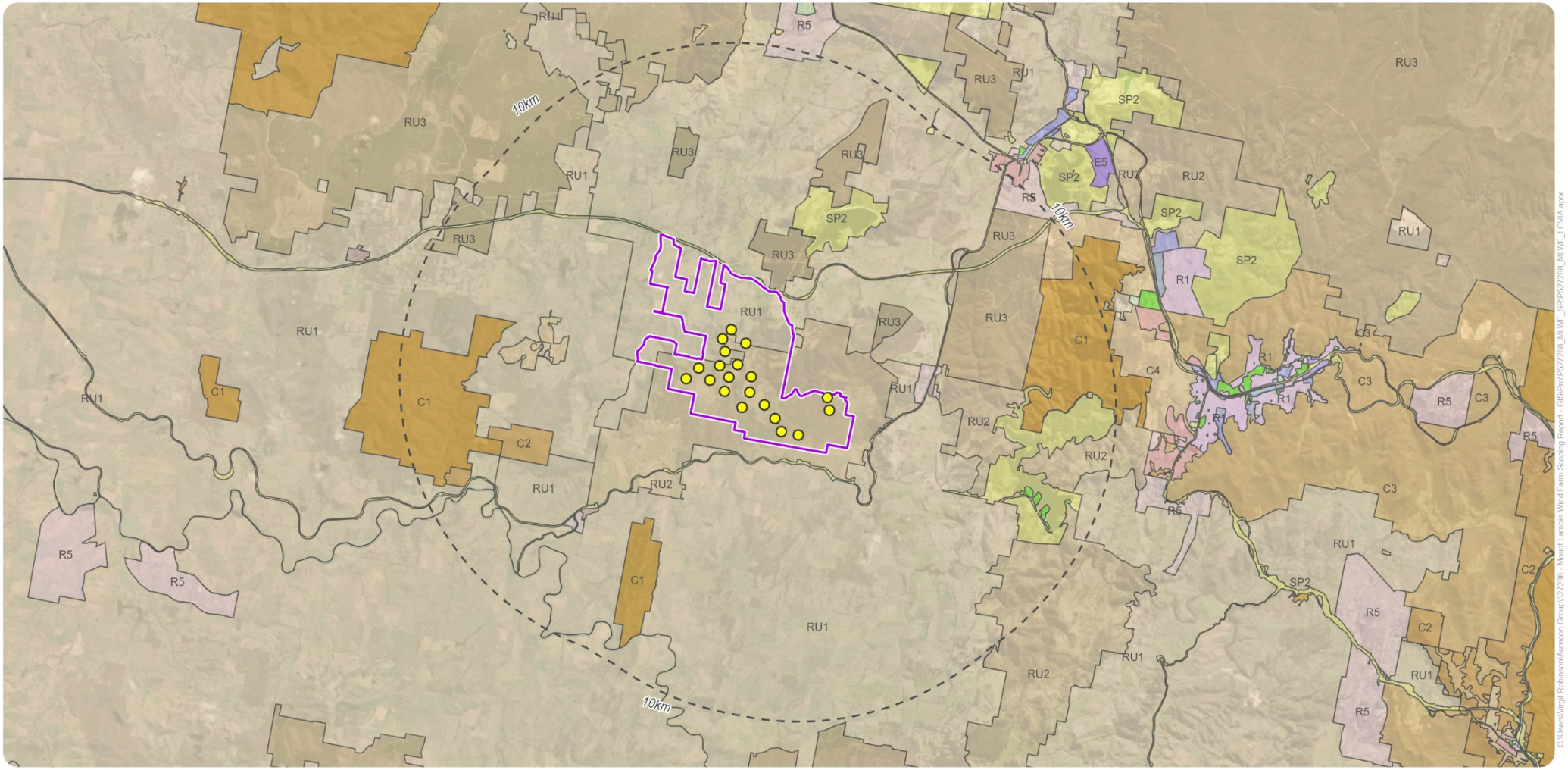
5.3 Land use context

The Project is in the Central Tablelands of NSW, about 12 km south-west of Wallerawang and Portland within the Lithgow City Local Government Area (LGA). The Project area adjoins the Great Western Highway (A32) to the north and Curly Dick Road to the west. The Project's immediate surroundings comprise rural land with areas of uncleared remnant vegetation. The Project area is zoned as RU1 and RU2 land as shown in Figure 5-1 below.

The Project area features 37 separate lots, including residences, sheds, tanks, and access tracks. The Project area landscape is scattered with native vegetation riparian lands and watercourses and flora.

The Project area is located on land primarily used for agricultural and farming purposes with surrounding land uses including agriculture, forestry, coal mining and nature conservation. Mt Piper Power Station and the former Wallerawang Power Station are approximately 11 km and 12 km respectively north/northeast of the Project area. There are also a number of renewable energy generation and storage projects proposed in the local area, including Sunny Corner Wind Farm, Great Western BESS (SSD12346552), Wallerawang BESS (SSD–14540514), Mt Piper BESS (SSD50903958) and Tetris Energy's Ben Bullen Wind Farm (SSD-79294216)The current Project area contains eight dwellings, of which one is associated with the Project and seven are associated (under negotiation), as well as farming infrastructure, including sheds, tanks, and farming equipment. The Great Western Highway is north of the Project area, and existing 500 kV and 132 kV transmission lines run through the Project area. The Project is planning to connect to the existing 132 kV transmission line/s which connect into the NEM. The grid connection would not require development of further offsite transmission infrastructure.

The Main Western Railway is approximately 400 m to the south of the Project area's southern and southeastern edge and supports public transport and freight trains. The entire site is constrained by bushfire-prone land -vegetation category 1 or 2.



Sources: Aurecon, Tetris Energy, Spatial Services (DCS), Esri Basemap

1:200,000
0 2.5 5 km

Projection: GDA2020 MGA Zone 55

Figure 5-1: Land zoning

5.4 Social infrastructure overview

Social infrastructure refers to the community facilities, services, and networks that help individuals, families, groups, and communities meet their social needs, maximise their potential for development, and enhance community well-being. Social infrastructure in the social locality comprises schools and other educational institutions, medical services, emergency services, recreational facilities, and community facilities.

Most of the social infrastructure within the Project's social locality is in Lithgow City LGA. Educational institutions include two public primary schools, two public secondary schools, and two Catholic schools (St Patrick's Primary School and La Salle Academy Secondary School). There is also a TAFE vocational college. Western Sydney University has a campus located in Lithgow.

Lithgow Hospital is the leading medical centre in town. It has a 24-hour emergency department and 46 inpatient beds. It provides a range of Allied health, Medical, Surgical, Antenatal care and other health care services. Lithgow Hospital is also home to the following clinics, centres and services:

- Lithgow Community Health Centre
- Lithgow Community Private
- Lithgow Health Service Specialist Medical Centre
- Three Tree Lodge Aged Care Service
- The University of Notre Dame Australia Lithgow Clinical School.

Regarding emergency services, in addition to the Lithgow Hospital for medical emergencies, Lithgow houses the NSW Rural Fire Service, two Lithgow Fire and Rescue Stations, and the Lithgow Police Station.

Recreational facilities in Lithgow include the JM Robson Aquatic Centre, a skate park, paintballing, go-karting, national parks, a range of sporting fields and picnic areas, theatres, galleries, historical attractions, public parks, and a bowling club. Water recreation can be found at both Lake Lyell and Lake Wallace.

The Lithgow City LGA includes World Heritage-listed National Parks and State Forests, making it a popular leisure destination for Sydney residents.

Lithgow offers many opportunities for outdoor activities such as bushwalking, mountaineering, camping, orienteering, hang gliding, horse riding, off-road four-wheel driving, fishing, sailing, and water skiing.

6 Community sentiment and values

Understanding the community sentiment towards the Project and values of the community in the social locality is fundamental in identifying what is essential for residents' quality of life and well-being. It provides context and insight into how the community may perceive the impacts of the overall Project. Values often relate to local amenity, social cohesion, and social well-being and can be associated with social infrastructure. Community values are those elements held as being important to quality of life and wellbeing. This includes physical elements such as parks and landscapes, and social elements, such as belonging and diversity.

A social media scan was undertaken to gauge community sentiment toward wind farm projects in the Lithgow City LGA and surrounding areas. Based on a media scan undertaken in August 2024, local support for renewable energy projects in the Lithgow region exists. This can be seen in the Lithgow City Council's Facebook page (which has 6,500 followers) and the Lithgow Environment Group Inc's Facebook page (which has 2,700 followers).

The Lithgow City Council's[15] Facebook page is managed by local council workers to create a space to keep the community informed of events and matters concerning the Lithgow City LGA. It has posted numerous times about the NSW government proposition to develop a Nuclear Power Plant in the LGA. This proposal has created some negative opinion towards nuclear power and a positive opinion towards alternative renewable energy sources. Although the Facebook page has not posted specifically about wind farm development, the Lithgow City Council's page has gathered a generally supportive stance from the community towards renewable energy initiatives.

The Lithgow Environment Group Inc (LEG)[16] Facebook page was created by a group of residents who are involved in environmental and conservation issues affecting the Lithgow City LGA. LEG is committed to working towards a 100% renewable future. This page is intended to collaborate with the Lithgow residents and business communities, Lithgow City Council, scientific and industry groups and state agencies. On this social media page, members post content they deem relevant to other members in the Lithgow community.

LEG often posts news articles published by *Renew Economy* such as "NSW secures another $4.2 billion in wind, solar and storage to help shift from coal'. RenewEconomy.com.au[17] is one of Australia's leading new sources with a focus on green energy transition. The goal of this website is to discuss the ideas, analyse the trends, the new technologies and the policies that will drive transformation to a net zero economy. The reactions to these posts are positive. The comments from the community posted on the *Renew Economy* website in response to this article demonstrate a mixed opinion regarding wind farms.

6.1 Key community values, needs and aspirations

Lithgow City Council has undertaken significant amounts of community consultation regarding its strategic planning duties to gauge public interest and values. In 2016, Lithgow City Council carried out a visioning workshop to identify the key values, strengths and challenges of the Lithgow City Council area to be included in the Community Strategic Plan (CSP)[18].

The values of the Lithgow community were derived from previous consultations for the Lithgow CSP in 2016, Land Use Strategy 2010-2030 and the Lithgow 2040: Our Place Our Future survey[19].

In summary, participants agreed that the most valued aspects of the Lithgow area are:

- The community, specifically its friendliness and spirit.
- The location of Lithgow allowing for a rural lifestyle whilst still being relatively close to Sydney.

[15] (Facebook, 2024)
[16] (Facebook, 2024)
[17] (RenewEconomy, 2024)
[18] (Lithgow City Council, 2022)
[19] (Lithgow City Council, 2022)

The strengths that participants felt should be supported and sustained were:

- The sense of community as most respondents are fairly satisfied/very satisfied with the quality of life they have living in the Lithgow City LGA.
- Tourism and its potential to grow and increase revenue for the LGA.

Participants of the workshop saw the greatest challenges over the next 10 years for the Lithgow City LGA as being:

- Increasing employment opportunities
- Encouraging new businesses to the area
- Engaging youth - supporting and keeping them in Lithgow
- Managing change whilst retaining the natural heritage and rural community spirit of the area
- The shift to energy efficiency/alternative energy.

6.2 Stakeholder engagement for the Project

Tetris Energy is committed to ongoing and genuine engagement with the local community and Project stakeholders to build strong relationships and establish a socially sustainable project.

Consequently, Tetris Energy has started targeted stakeholder engagement and will continue to engage with neighbours and broaden the consultation effort to include the wider community and stakeholders throughout the planning process as more assessments and investigations are completed and detailed information becomes available.

Tetris Energy has developed a comprehensive community and stakeholder engagement plan and framework to identify, address, and coordinate consultations with relevant parties. The identified community stakeholders include local, State, and Commonwealth Government authorities, infrastructure and service providers, community groups, First Nations communities, neighbours, and affected landowners. Engagement for the Project's scoping phase has included face-to-face meetings and briefings, phone calls and emails, community fact sheet distributions, community surveys, and a website and email contact. Consultations will aim to inform, involve, and collaborate with key stakeholders to identify potential concerns, impacts, opportunities, and benefits as a result of the Project. Communication of the Project's process and key findings will also be shared with stakeholders, and findings from consultations will directly inform the preliminary social impact assessment detailed in Section 8, with respect to the impact significance for each potential positive or negative impact identified.

Table 6-1 lists the stakeholders who may be interested in the Project as it progresses through approvals, as well as the potential areas of interest and concern relevant to the social impact assessment.

Table 6-1 Project stakeholders and potential areas of interest/concern

Stakeholder group	Potential interest/concerns
Associated landowners	Discussions on the Project, land access, Project impacts including operational impacts, visual amenity, safety concerns, impact on current land uses, construction disruption, remuneration and Project impacts on land value. Decommissioning.
Nearby residents within 5 km	Discussions on the Project, updates, Project construction and operation impacts. Stakeholder consultation, community wellbeing and benefit sharing initiatives, impacts to property values and local amenity, economic benefits, and job creation opportunities.
Traditional owners	Potential impacts to cultural heritage values. Management of local Indigenous values. Project related opportunities.
Nearby development	Workforce availability, cumulative impacts, project interfaces.
Local industry, tourism, business, agricultural organisations	Economic impacts, job and revenue creation opportunities, opportunities for tourism and local business activation. Project related workforce impacts to accommodation and provision of local services. Economic growth and opportunities, impact on farming operations, work opportunities, impacts on operations, delays on road network, supply and contract opportunities, employment, and training opportunities.

Stakeholder group	Potential interest/concerns
Federal, State, Local government	Community consultation, project impacts, jobs, economic impacts, opportunities for tourism and industry benefits, impact to residents, local business. Benefit sharing initiatives, community benefits and wellbeing. Community consultation and investment on local roads and infrastructure. Encouraging growth and development of the locality and region.
Emergency services	Project impacts, including community access to services and road access in the event of emergency, bushfire mitigation and increased services demand by increased workforce, construction impacts on health and safety, training opportunities, safety plans.
Interest groups and community services and facilities	Discussions on the Project, stakeholder consultation, business opportunities, environmental impacts, Project construction and operation impacts, impacts on local roads and community infrastructure, increased workforce, and training opportunities.

7 Development context

This section draws on several data sources to build an understanding of the development context within the region, and the social locality in which the Project is located.

The Project is in a major current Energy Generation Zone, located near the former Wallerawang Power Station and current Mt Piper Power Station and the coal mines that supply these.

The closest operating wind farm to the Project is Hampton Wind Park, about 14 km south of the Project. The next closest proposed wind farms are Sunny Corner Wind Farm, proposed to be located about 3.5 km north-west of the Project area, and Ben Bullen Wind Farm, which is proposed to be located in Lithgow City LGA about 25 km north of the Project. Other renewable energy developments proposed, approved or operating located near the Project include the Central West Pumped Hydro Project, Lake Lyell Pumped Hydro Energy Storage Project, Mount Piper BESS, Wallerawang BESS, Great Western Bess and Glanmire Solar Farm.

The Central West Orana Renewable Energy Zone (REZ) is centred by Dubbo and Dunedoo. The Project is located about 80 km south of the REZ. The closest renewable energy developments to the Project within the Central West Orana REZ include the Crudine Ridge Wind Farm, Burrendong Wind Farm and the Orana Wind Farm, which would be located around 62, 160 and 190 km north-west of the Project, respectively. The location of these projects, REZs and other relevant projects are included in Figure 3-1.

Table 7-1 lists existing and proposed energy projects in or near the Project social locality. Understanding the locality's historical response to change assists in predicting how the Project may be perceived and accepted locally and the degree to which the Project aligns with community values and local sentiment.

Although the following projects could boost the local economy, they could also add to the Project's potential cumulative impacts. Workforce requirements and possible overlap of construction activities for proposed developments could also increase demand for skills, accommodation, and community services arrangements.

Table 7-1 Renewable projects in or near the social locality

Other renewable energy projects in or near the social locality	
Sunny Corner Wind Farm	The Sunny Corner Wind Farm is a proposed wind farm to be located about 3.5 km north-east of the Project area within Sunny Corner State Forest. The project is expected to have an output of about 500 MW and have a lifespan of approximately 30 years. **Status**: Scoping Report submitted and awaiting SEARs **Expected Construction Commencement**: 2028 **Owner/Operator**: Mainstream Renewable Power/ Someva Renewables
Central West Pumped Hydro[20]	The Central West Pumped Storage Hydro Project is a proposed energy storage facility to be located in Yetholme, between Bathurst and Lithgow in the Central West region of NSW. The project is expected to have a total output of 325 MW, with an eight-hour, 2,600 MWh storage capacity. The reservoir will be three gigalitres in capacity. Transmission will be via the Transgrid network. **Status**: Detailed planning **Expected Construction Commencement**: 2024 **Owner/Operator**: ATCO
Mount Piper Battery Energy Storage System [21]	Energy Australia is investigating the development of a new BESS on a preferred site adjacent to our operating Mt Piper power station near Lithgow. The Development Application for this project was submitted to the DPHI for review in June 2024. The Mt Piper BESS proposes to utilise nearby existing electricity infrastructure to develop a grid-scale battery with the capacity to dispatch up to 500 MW of power to the electricity network over up to four hours. **Status:** Approved **Expected Construction Commencement**: 2025 **Owner/Operator**: EnergyAustralia

[20] (ATCO, 2024)
[21] (Infrastructure Partnerships Australia, 2024)

Other renewable energy projects in or near the social locality	
Lake Lyell Pumped Hydro Energy Storage Project [22]	*Energy Australia* is investigating the feasibility of a utility-scale pumped hydro energy storage project on land and waterways near Lithgow, in NSW. The project would use water from Lake Lyell (an artificial lake originally built to support local power stations) and existing transmission infrastructure and see the development of a purpose-built upper reservoir behind the southern ridge of Mount Walker (not visible to the majority of Lithgow). Expected to operate for up to 80 years, this project will generate 335 MW of electricity for 8 hours at a time – offering more reliable and affordable energy to support homes and business in the Central West region, and across the state. **Status**: Detailed planning **Expected Construction commencement**: 2025 **Owner/Operator**: EnergyAustralia
Mount Piper to Wallerawang Transmission Line Upgrade Project [23]	TransGrid is proposing to deliver a new 330 kV transmission line between the existing Mount Piper and Wallerawang substations, located in the LGA of Lithgow and on the lands of the Wiradjuri people. The Mount Piper to Wallerawang Transmission Line Upgrade Project will upgrade the transmission network in the State's Central Tablelands to support the NSW Government's delivery of the Central-West Orana Renewable Energy Zone (REZ). On 3 July 2024, the Mount Piper to Wallerawang Transmission Line Upgrade Project was declared *Critical State Significant Infrastructure* (CSSI). CSSI projects are declared when a project is essential for NSW for economic, environmental and social reasons. **Status**: Development **Expected Construction Commencement**: 2026 **Owner/Operator**: TransGrid
Wallerawang Battery Energy Storage System [24]	*Shell Energy* has acquired the development rights for a 500 MW/1,000 MWh Battery Energy Storage System project, located within the former Wallerawang Power Station site, near Lithgow in Central West NSW. The project will also include a transmission line connection between the BESS and the nearby TransGrid Wallerawang 330 kV substation. Ancillary upgrades will also be made to the existing Wallerawang substation as part of the project. Development approvals are already in place, and the site provides access to important infrastructure. While there is further work required to get to a Final Investment Decision, once built, the BESS will be connected to the adjacent 330 kV Wallerawang Substation. **Status**: Detailed Planning **Expected Construction Commencement**: Unknown **Owner/Operator**: Shell Energy
Ben Bullen Wind Farm	Tetris Energy is proposing to deliver a 500 MW wind farm, associated infrastructure and battery energy storage system project, located approximately 25 km north of the Project area. A scoping report has been submitted. SSD-79294216 **Status:** SEARs issued **Expected Construction Commencement:** 2028 **Owner/ Operator:** Tetris Energy
Great Western Battery Energy Storage System [25]	The Great Western Battery is a proposed 500 MW stand-alone battery in NSW. The project is being developed by *Neoen* and will use existing network infrastructure near the decommissioned Wallerawang Power Station to connect to the national grid. The battery will be able to provide a variety of services to the grid including frequency control and load shifting, which are both necessary for the development of more renewable energy. **Status**: Approved **Expected Construction Commencement**: Unknown **Owner/Operator**: Neoen

[22] (EnergyAustralia, 2024)
[23] (Transgrid, 2024)
[24] (Infrastructure Partnership Australia, 2024)
[25] (Neoen, 2024)

Table 7-2 Renewable energy projects in the broader region

Other renewable energy projects in the broader region	
Crudine Ridge Wind Farm	Crudine Ridge Wind Farm is a 135 MW wind farm consisting of up to 106 WTGs with a maximum tip height of 160 m. The project will connect into a 132 kV Transgrid transmission line 15 km east of the Crudine ridgeline. The project proponent is Crudine Ridge Wind Farm Pty Ltd (a wholly owned subsidiary of Wind Prospect Group and Continental Wind Partners). The project is located in Bathurst Regional LGA, about 62 km north-west of the Project. **Status:** Operational **Owner:** Crudine Ridge Wind Farm Pty Ltd
Burrendong Wind Farm[26]	Ark Energy is proposing a 500 MW wind farm in Yarrabin, NSW within the Central-West Orana Renewable Energy Zone. The project will connect to the NEM by an existing TransGrid 330 kV transmission line on the western side of Lake Burrendong. **Status**: Proposed **Expected Construction Commencement**: Unknown **Owner**: Ark Energy
Paling Yards Wind Farm[27]	The proposed Paling Yards Wind Farm is a 310 MW wind farm consisting of 47 WTGs with a maximum tip height of 240 m. The wind farm will connect to the Mount Piper to Bannaby 500 kV transmission line via a new switching substation. The project proponent is Global Power Generation Australia, and the wind farm will be located in the NSW Central Tablelands region, approximately 60 km south of Oberon, 60 km north of Goulburn and 140 km west of Sydney within the Oberon Local Government Area. **Status**: Proposed **Expected Construction Commencement**: Unknown **Owner**: Global Power Generation Australia
Orana Wind Farm[28]	Orana Wind Farm, proposed by ACCIONA Energy, is a generation and storage project to be located between Dunedoo, Tallawang, and Cobbora. It has an intended generation capacity of 524 MW. The scope of the works includes 92 WTGs, up to three sub-stations, overhead and underground electrical connections, up to two Battery Energy Storage Systems, with up to 100 MW/200 MWh capacity, and permanent and temporary ancillary infrastructure. The wind farm will be located in the Central-West Orana Renewable Energy Zone (REZ). The project has planned connections to the REZ transmission network. **Status**: Proposed **Expected Construction Commencement**: 2025 **Owner/Operator**: ACCIONA

Table 7-3 Resource projects in or near the social locality

Other resource projects in or near the social locality	
Angus Place West [29]	Centennial Coal's Angus Place colliery is an underground coal mine in the Western Coalfields. After almost 70 years of mining, Angus Place has been under care and maintenance since early 2015. Centennial is seeking approval to extend its underground mining operations at Angus Place. The proposed Angus Place West Project aims to secure a long-term coal resource in close geographic proximity to local power stations. In July 2021, Centennial submitted a proposal to the Department of Planning Industry and Environment for the Angus Place West project, a small underground, bord and pillar mine west of the Angus Place pit. As of 2023, an EIS is being prepared. **Project Status:** Proposed (pre-permit) **Expected Construction Commencement:** Unknown **Owners:** Centennial Springvale Pty Ltd (50%) and Boulder Mining Pty Ltd (50%) **Operator:** Angus Place Pty Limited

[26] (Infrastructure Partnerships Australia, 2024)
[27] (GPG Naturgy Group, 2024)
[28] (Acciona Energia, 2024)
[29] (Centennial, 2023)

Other resource projects in or near the social locality	
The Pines Wind Farm	The Pines Wind Farm is a proposed wind farm located about 43 km south of the Project. The draft layout of the project indicated approximately 250 wind turbines would be developed within the permit area of the State's softwood pine plantations. The permit covers plantation areas in Gurnang, part of Mt David, and parts of Vulcan south of Black Springs. The Pines Wind Farm is proposed to connect to the existing transmission network via a new switching station on the 500 kV transmission line that traverses the Investigation Permit Area. **Project Status:** Proposed (pre-permit) **Expected Construction Commencement:** 2028 **Owner and Operator:** Tag energy

8 Preliminary social impact assessment

The social and economic impact assessment approach used for this preliminary SIA follows DPE's SIA guidance on evaluating the likely significance of positive and negative impacts. Refer to Section 3.6 for the risk assessment criteria. This preliminary assessment has identified a range of key social impacts of relevance to near neighbours, local community residents, and other key stakeholders concerning the Project. Additionally, mitigation and management measures have been recommended. The identified potential impacts must be ground-truthed and reviewed against any changes associated with further design development after issuing of the Project SEARs.

Table 8-1 Preliminary impact evaluation – Potential negative (N) impacts

No.	Social impact category	Impact	Description	Timing	Impact significance	Recommended mitigation and benefit optimisation measures	Level of assessment
N1	Community	Influx of workforce causing changes in the composition and character of the community.	The influx of workforce for construction activities may increase anxiety and stress regarding the scale of development and change, including added pressure to access affordable housing, accommodation, and community services (including medical facilities) due to the temporary increase in population. It is expected that the increase in construction workforce (a peak of 150 jobs during construction and 6-8 jobs during operation) may seek accommodation in the local community and would provide a positive impact to the local economy. However, the influx of people on higher wages can drive up property and commodity prices beyond the reach of local residents. Given the existing largely transient population of the Lithgow City LGA due to the proportion of mining jobs, it is anticipated that the influx of workers because of the Project would not have a major impact on community dynamics and social networks. However, other projects are being planned for the region, which could add to the potential for cumulative impacts. Ultimately, the influx of the workforce may alter the composition of the community and potentially impact community character.	Construction	Medium	Consider targeted engagement with Council to assess opportunities associated with potential population growth in the area due to construction activities and assess appropriate accommodation facilities opportunities. Investigate provision of temporary workforce accommodation to support the Project. Coordinate efforts and liaise with key stakeholders to coordinate provision of accommodation and other services and supplies.	Detailed

No.	Social impact category	Impact	Description	Timing	Impact significance	Recommended mitigation and benefit optimisation measures	Level of assessment
N2	Community	Negative perceptions regarding Project opportunities and increased risk of distributive inequity perceptions	Differing perceptions on renewable energy and Project benefits, and resident population changes, can create distributive inequity perceptions where stakeholders believe that landholders who host WTGs are compensated while neighbouring landholders must experience the Project impacts with no direct compensation. Stakeholder consultation findings support this negative perception, as neighbouring/adjoining landowners have expressed concerns regarding financial incentives offered to hosting landholders. The community expressed a perceived inequity between landholders who would host WTGs, compared to those who would not host during the construction and/or operation phase of the project.	Operation	Medium	Undertake stakeholder engagement to highlight the Project benefits and proactively address the potential for negative community perceptions around perceived distributive inequity of Project benefits and impacts. Undertake stakeholder engagement to co-design benefit sharing initiatives and address negative perceptions around perceived distributive inequity. Consider establishing neighbour agreements to ensure that the Project benefits are fairly and consistently distributed across landholders and the community. Undertake active involvement with the community to provide opportunities to improve social outcomes and manage perceived and real impacts due to the influx of transient workforces within the region to support the Project construction and operational phases.	Detailed
N3	Surroundings	Temporary reduction in social amenity due to dust, vibration and noise impacts during construction which could have more significant health impacts on older people or those living with illness or disability	The Project area is marginally economically advantaged compared to NSW; however the Lithgow City LGA is moderately disadvantaged with a median weekly income of $1,441. Perceptions may differ for vulnerable groups, particularly those who are unemployed or have long-term health conditions. There may be cumulative impacts due to other projects in the region (refer to Section 7), however impacts are anticipated to be minimal given the isolated location of the Project. The resulting dust, noise and vibration impacts may negatively impact vulnerable community members.	Construction	Low	Continue stakeholder engagement and assess opportunities to develop a benefits scheme or good neighbour programs including financial compensation to support identified vulnerable groups. Further assess property impacts and mitigation measures to address stakeholder issues on a case-by-case basis. Engage stakeholders to inform the construction management controls and ensure minimal disturbance associated with Project construction activities.	Standard

No.	Social impact category	Impact	Description	Timing	Impact significance	Recommended mitigation and benefit optimisation measures	Level of assessment
N4	Surroundings	Impacted amenity and visual aesthetics due to construction and operation activities, increased traffic, potential hoarding on access roads	Construction of the Project would involve the establishment of WTGs, a BESS facility, temporary construction compounds and associated infrastructure. Refer to section 2 of this preliminary SIA. Due to the distance of the nearest sensitive receivers, vibration and noise impacts during construction and operation would be able to be appropriately managed to minimise any impacts to an acceptable level.	Construction	Low	The Project Preliminary Landscape Character and Visual Impact Assessment (LCVIA) identifies that landscape character and visual impacts may be up to low and moderate respectively. It is recommended to continue stakeholder engagement to manage perceived Project visual impacts.	Detailed
N5	Surroundings	Increased public safety risks due to increased heavy vehicles on the local road network and changed road conditions	With a car-reliant community, particularly in the Project area and Lithgow City LGA, increased road hazards may have significant effects. Traffic increases would largely be associated with the workforce entering and leaving the Project area each day and are not anticipated to result in major disruption to the local road network. There may be cumulative impacts due to other projects in the region (refer to Section 7).	Construction	Medium	A traffic and transport impact assessment would be prepared for the EIS.	Detailed
N6	Access	Impacted social infrastructure and availability of services due to increased population/demand for services	It is estimated that 150 workers would be required at the peak during the construction phase. The temporary increase in population (construction workers) may add strain to the existing availability of services, including accommodation.	Construction	Medium	The dwelling occupancy rate is relatively low, and therefore there may not be a significant strain on housing and accommodation because of the temporary increase in population. However, it is recommended to consult closely with key stakeholders to assess whether existing accommodation facilities in the social locality have sufficient capacity for the Project's construction workforce. Develop a local participation plan and workforce accommodation strategy. Engage local service providers to develop a strategy for addressing increased demand on services e.g. accommodation, health, recreation etc.	Detailed

No.	Social impact category	Impact	Description	Timing	Impact significance	Recommended mitigation and benefit optimisation measures	Level of assessment
						As part of a detailed Social Impact Assessment, undertake a social infrastructure audit to determine existing availability and capacity to accommodate upcoming workforce.	
N7	Access	Increased travel times causing day-to-day disruption due to increased traffic and potential road closures or detours	The transportation of WTGs, BESS and transmission components would result in a temporary increase in the number of heavy vehicles on either Great Western Highway and/or Curly Dick Road. The preferred access routes would be identified as the design is developed. These heavy vehicles would need to access the site via the Wallerawang UCL or Lithgow City LGA, meaning minor delays for vehicles using main and local roads would be experienced. Impacts would be minor given the low existing traffic levels in the nearby UCL's. However, with a car-reliant community, particularly in the Project area, drivers and passengers may be easily frustrated with increased travel times. Stakeholder investigation findings support this impact. Some neighbouring/adjoining landowners, as well as host landowners, have expressed concerns with the access route logistics potentially impacting traffic movements.	Construction	Low	Pending assessment of construction activities and generated traffic volumes, haulage routes and distribution of construction traffic, and the impact of activities on road network performance, road access and safety, public and active transport, a traffic and transport impact assessment would be prepared for the EIS.	Standard

No.	Social impact category	Impact	Description	Timing	Impact significance	Recommended mitigation and benefit optimisation measures	Level of assessment
N8	Access	Access disruptions	The Project is located in a rural area and is surrounded by rural residential properties. Construction-related traffic moving through the Wallerawang UCL or Lithgow UCL may affect local amenity. New access from the public road network may be required during the Project construction. Access to the Project area would be via Great Western Highway (A32), and/or via Curly Dick Road. There would be a minor increase in the number of heavy and light vehicles accessing the Project area, which would be associated with workforce transport routes and the delivery of equipment. Impacts would be minor given the isolated nature of the site and the low existing traffic levels on Curly Dick Road and in the Wallerawang UCL. Stakeholder investigation findings support this impact. Some neighbouring/adjoining landowners, as well as host landowners, have expressed concerns with the access route logistics potentially impacting traffic movements.	Construction	Low	A traffic and transport impact assessment would be prepared for the EIS.	Standard
N9	Way of life	Influx of workforce and potential impacts to existing community dynamics in the local community and social networks	The impact of new-comers – including potentially from overseas – is an important social consideration, in relation to services capacity, as well as local social cohesion, and community sensitivities about what this means for the long-term composition and cohesiveness of their community. The dwelling occupancy rate is relatively low, and therefore there may not be a significant strain on housing and accommodation because of the temporary increase in population.	Construction	Medium	Develop local employment and procurement plan. Assess housing and service provision options for the incoming workforce. It is recommended that a program of community and stakeholder engagement is undertaken to inform the detailed assessment of social impacts. This would help build positive community relationships, to the benefit of the Project and the future workforce who will temporarily or permanently live in the social locality and interact with local community members in the future. Consider opportunities to install local opportunities and provide direct and indirect employment and commercial opportunities for residents, and businesses.	Detailed

No.	Social impact category	Impact	Description	Timing	Impact significance	Recommended mitigation and benefit optimisation measures	Level of assessment
N10	Way of life and livelihoods	Construction workforce influx	With an increase in employment in the renewable energy sector, there may be a negative shift impacting the community's way of life. Sourcing of local employment may be challenging because the most common industry of employment in the Lithgow City LGA is Coal Mining. Community members may be concerned that there would be limited employment opportunities due to the specific skillset required by the Project throughout the construction and operational phases. There is a potential that some stakeholders would question the scale of benefit likely to be experienced locally given the expected small operational workforce numbers.	Construction and Operation	Low	Engage key stakeholders to co-design a local employment and procurement plan. Engage community stakeholders to establish programs that encourage and incentivise reskilling and upskilling of local workers to remain in the region. Foster social procurement and employment opportunities for women, First Nations people and people with disabilities. Engage key stakeholders to provide training and education opportunities through sourcing of local employment.	Detailed
N11	Surroundings	Impacts to sense of place and community	Perceived impacts and concerns about changes to rural amenity due to new infrastructure development impacting people's sense of place.	Construction	Medium	Engage stakeholders to develop a Community Benefits Strategy to support community initiatives following the Clean Energy Council guidance on matters concerning community and First Nations engagement. Assess opportunities to provide local employment through the hiring of local service providers and opportunities to create a legacy in the community by investing in housing, education, road upgrades, and adding social value to the local community.	Detailed

No.	Social impact category	Impact	Description	Timing	Impact significance	Recommended mitigation and benefit optimisation measures	Level of assessment
N12	Culture	Increased perceived visual and character impacts to Aboriginal cultural heritage items due to the Project	Seven Aboriginal sites are located within 1 km of the Project area, and two of these Aboriginal sites are located within the Project area. The Project Preliminary LCVIA identifies that Aboriginal heritage sites within the Project area and within 1 km of the Project area are localised and are not considered of specific relevance to the visual amenity or protected views of the Landscape Character Study area. It is anticipated that the Project construction would have a very low potential of impacting Aboriginal heritage and historic heritage sites or areas of archaeological potential present within the Project area.	Construction	Low	Representatives from the Local Aboriginal Land Council, corporations and groups would be engaged during the EIS to ensure the Project incorporates their views on project design and delivery.	Standard
N13	Culture	Increased perceived impacts to Aboriginal cultural heritage and historic heritage items due to the Project	The construction of the Project would involve soil disturbance for the establishment of WTG foundations, collector systems and a BESS, as well as temporary construction infrastructure. A desktop heritage due diligence assessment indicated that there are known Aboriginal sites within the Project area and there is potential for unregistered Aboriginal cultural heritage material to be present within the Project area. Additionally, 12 historic heritage items were identified within a 1 km radius of the Project area.	Construction	Medium	In accordance with the NPW Act and the Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales 2010 (DECCW 2010b), an Aboriginal Cultural Heritage Assessment would be required as part of the planning approval phase for a wind farm development at Mount Lambie. It is also recommended to undertake a Historic Heritage Assessment of the Project area to ground truth the presence or absence of historic heritage sites as discussed in the predictive model. This should involve stakeholder engagement and Representatives from the Local Aboriginal Land Council, Corporation or group.	Detailed

No.	Social impact category	Impact	Description	Timing	Impact significance	Recommended mitigation and benefit optimisation measures	Level of assessment
N14	Health and wellbeing	Increased anxiety and stress regarding scale of development and impacts to local community's future	Community members may experience high levels of stress and anxiety due to a fear of the unknown and feelings of uncertainty about how the Project may affect people.	Construction and Operation	Medium	Undertake stakeholder engagement and keep stakeholders informed about Project activities. Undertake to proactively engage with the community and promptly respond to any stakeholders' concerns. Establish a community consultation program including mechanisms to respond to complaints, breaches and grievances or to inform the community. Assess and implement culturally appropriate engagement and training opportunities for Indigenous people.	Detailed
N15	Surroundings	Impacts to visual amenity	Impacted visual aesthetics due to WTGs as part of landscape and reduced local amenity with changes in how people experience their surroundings. Stakeholder consultation findings support this negative impact, as several identified stakeholder groups, including State Government, host landowners, and adjoining/neighbouring landowners, have expressed concern with the potential loss of visual amenity with respect to the landscape.	Operation	Low	The Project Preliminary LCVIA is still being drafted therefore this impact is a placeholder. It is anticipated there is potential for low to very low visual and landscape character impacts. It is recommended that consultation with residents and further visual assessment from selected sensitive viewpoints on private property be undertaken, with further assessment of landscape character and/or visual impacts. A detailed LCVIA to be prepared as part of the EIS.	Detailed
N16	Livelihoods	Impacts to telecommunications, navigation and radar services	Increased potential of and perceived impacts to telecommunications, navigation and radar services due to operation of WTGs.	Operation	Low	A Signal Strength Survey will be completed by independent specialists to help inform the planning and detailed Project design.	Standard

No.	Social impact category	Impact	Description	Timing	Impact significance	Recommended mitigation and benefit optimisation measures	Level of assessment
N17	Surroundings	Perceived impacts on local biodiversity	Increased perceived impacts on local biodiversity values, threatened species, native flora, vegetation and hollow-bearing trees and fauna (birds and bats) due to construction activities, operational WTGs and change in land use.	Construction and Operation	Medium	Proactively engage key stakeholder groups in the development of environmental plans and to support and protect local environmental values. Keep community stakeholders informed about biodiversity assessments outcomes. Undertake a biodiversity assessment for the EIS. Develop and implement an Environmental Management Plan, bird and bat utilisation surveys across multiple seasons, and a Bird and Bat Strike Management Plan.	Detailed
N18	Health and wellbeing	Perceived impacts on health and wellbeing	Increased perceived impacts on health and wellbeing, including electromagnetic interference (EMF), shadow flicker, blade throw and noise due to operation of WTGs. Noise pollution due to internal cooling systems and balance of systems (BOS) components such as inverters and transformers due to operation of BESS facilities may also increase perceived impacts on health and wellbeing.	Operations	High	Detailed impact assessments (e.g. noise, visual) would be required as part of the EIS to assess impacts to sensitive receivers. Consider detailed LCVIA and EMF, Shadow Flicker assessments to assess potential visual impacts and health issues and risks associated with EMF produced by the Project and its associated electrical infrastructure within and near the Project area. As the Project progresses, a noise assessment will be required to confirm the predicted noise levels achieve compliance with NPI requirements. If necessary, contingency measures such as shielding structures around key noise sources at ancillary infrastructure sites would be implemented.	Detailed

No.	Social impact category	Impact	Description	Timing	Impact significance	Recommended mitigation and benefit optimisation measures	Level of assessment
N19	Decision-making systems	Limited social licence to operate due to the perceived tokenistic character of community engagement	There is often a risk during consultation for the Project, that stakeholders may have concerns that people who do not support the Project will have little influence on the planning process.	Construction and Operation	Low	The recommendation is to undertake broader stakeholder engagement and consistently inform stakeholders about the elements of Project design, including informing them on which aspects are negotiable and non-negotiable. Ensure all groups (especially vulnerable or marginalised groups) participate in the detailed social impact assessment process. Foster opportunities for people to have a say in the Project's community investment decisions and benefit sharing program. Provide accessible and effective complaint and remedy procedures.	Standard
N20	Community	Increased concerns due to environmental impact of WTGs at end-of-life	Stakeholders may be concerned that decommissioning activities may result in noise, dust, traffic impacts, and waste production, resulting in environmental impacts. Stakeholders may be concerned that there are limited WTG recycling options to minimise waste at decommissioning. Noise, dust, and traffic impacts are anticipated to be minimal given the isolated location of the Project. The land used for the Project would then be rehabilitated back to previous use in consultation with the relevant landholders.	Decommissioning	Medium	An environmental management plan would be prepared for the EIS. Undertake stakeholder engagement and assess opportunities for sustainable solutions at WTGs' end-of-life.	Detailed

Table 8-2 Preliminary impact evaluation – Potential positive (P) impacts

No.	Social impact category	Impact	Description of impact	Timing	Impact significance	Recommended mitigation and benefit optimisation measures	Level of assessment
P1	Livelihoods	Improved livelihoods of local business owners due to increased economic activity from temporary increase in population	The Project would create a new industry in the Lithgow City LGA and would potentially provide opportunities for increased local employment in the renewable energy sector. The Project would increase opportunities for small local businesses to increase services and flow on economic benefits during construction and operation. Stakeholder consultation findings support this positive impact, as local business groups have expressed an interest in participating in and working with provided renewable opportunities.	Construction and Operation	Medium	Design and implement a Consultation Program that highlights Project opportunities, anticipated impacts and mitigations and proactively engage stakeholders to design and deliver the Project.	Detailed
P2	Community	Improved sustainability and enhanced resilience due to community investment initiatives as part of the Project	The Project would contribute to the emissions reductions required to support those being affected by climate change, including in central NSW.	Operation	High	Design and implement a Consultation Program that fosters opportunities to gather stakeholder feedback on benefit sharing initiatives to support the local community e.g. sponsorship of the local rugby league football club.	Detailed
P3	Community and Way of Life	Intergenerational equity	Improved intergenerational equity due to windfarms being used as an alternate energy source, providing economic opportunities, climate resilience, and environmental protection to the local community. Increased community cohesion and positive changes to the way the community functions due to increased renewable energy solutions.	Operation	High	Consider opportunities to highlight the Project's economic benefits. Consider increasing opportunities for community feedback to design a benefit-sharing program that increases the Project's social licence.	Detailed
P4	Livelihoods	Sustainable and resilient communities	The most common industry of employment in the Lithgow City LGA is Coal Mining. With an increase in employment in the renewable energy sector, there may be a positive shift towards a more sustainable and resilient community which may change the way the community interacts.	Construction and Operation	Low	Consider opportunities to increase training and upskilling of local employment pool during the construction phase. Continue stakeholder engagement to highlight the Project benefits.	Detailed

No.	Social impact category	Impact	Description of impact	Timing	Impact significance	Recommended mitigation and benefit optimisation measures	Level of assessment
P5	Livelihoods	Community wellbeing associated with local employment, procurement, and training opportunities	It is expected that a total of six to eight workers will be employed during the Project's operational phase. Job creation and increased opportunities for vulnerable groups can have a positive impact on community wellbeing and cohesion.	Operation	Low	Consider opportunities to upskill and employ local workforce during operation, specifically stakeholders from vulnerable groups.	Detailed
P6	Livelihoods and Decision-making systems	Community wellbeing associated with benefit sharing initiatives Potentials to enhance the local community ability to participate in the Project decision-making process	Enhanced wellbeing from job opportunities and training, including increased opportunities for vulnerable groups, and opportunities to co-design a Benefit-Sharing Scheme and potential participation agreements for nearby dwellings.	Operation	Medium	Continue stakeholder engagement and consider opportunities to co-design a Benefits Sharing Scheme. Consider opportunities for benefit sharing initiatives such as investment in road upgrades, community grants, and providing support to local sporting and cultural groups.	Detailed
P7	Livelihoods and Health and wellbeing	Improved livelihoods due to increased job opportunities and training for local workers, including for vulnerable groups.	It is anticipated the Project construction phase will require a peak of approximately 150 workers. Unemployment is relatively low for the social locality; however, job opportunities may be beneficial for the locality's vulnerable groups.	Construction	Low	Consider opportunities to offer jobs and training to local workers. Consider opportunities to upskill and employ local workforce during operation. Proactive support for the establishment of programs that encourage and incentivise upskilling of local workers to remain in the region.	Standard
P8	Community and Way of Life	Improved resilience of the regions electrical supply and infrastructure network leading to an improved quality of life	Additional transmission lines, electrical infrastructure and sources of energy in the region may lead to a more resilient energy grid. The provision of a BESS and hence a more resilient energy grid can lead to an improved way of life and residents spending less time being impacted by power outages.	Operation	Low	Continue stakeholder engagement and consider opportunities to improve network resiliency.	Standard

9 Conclusion

This Preliminary Social Impact Assessment (preliminary SIA) report has identified and profiled the social locality and has documented preliminary social impacts and opportunities associated with the Mount Lambie Wind Farm (the Project).

The preliminary SIA is part of a suite of technical investigations supporting the Scoping Report for the Project. The initial assessment of social impacts will inform and support the refinement of the Project design to reduce negative project impacts and enhance positive project benefits. It will also inform the issue of SEARs for the Project.

This preliminary SIA has included the compilation of a social baseline profile for the Project, and incorporated outcomes of early community and stakeholder consultation to inform the scoping of Project-related social impacts and opportunities, and preliminary social impact prediction and evaluation.

A detailed assessment of social impacts would be required as part of the EIS and must be informed by stakeholder consultation. As part of the EIS, future stages of the social impact assessment for this Project would include a detailed prediction and assessment of positive and negative impacts. Informed by stakeholder consultation, a detailed social impact assessment would identify relevant strategies to mitigate the Project's potential negative impacts and opportunities to enhance its positive impacts.

This preliminary SIA aims to inform the Project Communications and Stakeholder Engagement Plan so Tetris Energy can further engage with community members and key stakeholders on critical social impact areas.

A

Demographic indicators

Appendix A
Demographic indicators

Table A-1 Demographic indicators across the Project's social locality in comparison to the state

Indicator	Mount Lambie (SAL)	Tarana (SAL)	Meadow Flat (SAL)	Rydal (SAL)	Sodwalls (SAL)	Wallerawang (UCL)	Lithgow City LGA	NSW State (1)
Population	65	187	356	163	94	2079	20842	8072163
Median age (years)	55	48	45	53	52	38	46	39
Population over 65 years	17%	23%	16%	31%	16%	18%	25%	18%
Diversity								
Aboriginal and Torres Strait Islander population	0%	2%	7%	6.7%	3%	10%	8%	3%
Overseas born population	5%	14%	21%	4.9%	17%	11%	18%	35%
Income and wellbeing								
People with need for assistance	0%	2%	4%	4%	5%	7%	8%	6%
People with long-term health conditions	15%	31%	32%	39.3%	32%	38%	39%	27%
Unemployment rate	0%	0%	0%	6.2%	0%	6%	6%	5%
Voluntary work	77%	30%	20%	23.9%	12.8%	12%	15%	13%
Median weekly household income	$1,874	$1,875	$2,083	$1,325	$1,937	$1,441	$1,196	$1,829
Households								
Families	94%	72%	86%	61%	70%	71%	64%	71%
Singles	0%	28%	14%	39%	11%	27%	34%	25%
Group	0%	0%	0%	0%	0%	3%	2%	4%
Housing tenure								
Dwelling occupancy rate	76%	77%	91%	85%	39%	91%	87%	91%
Dwelling tenure (owned outright)	25%	51%	43%	58%	23%	35%	42%	32%
Dwelling tenure (mortgaged)	56%	44%	43%	33%	11%	38%	30%	33%
Dwelling tenure (rented)	0%	10%	12%	6%	3%	25%	24%	33%

Indicator	Mount Lambie (SAL)	Tarana (SAL)	Meadow Flat (SAL)	Rydal (SAL)	Sodwalls (SAL)	Wallerawang (UCL)	Lithgow City LGA	NSW State (1)
Education								
Bachelor's degree level and above	14%	19%	22%	16%	12%	7%	12%	28%
Advanced Diploma and Diploma level	0%	9%	10%	10%	6%	7%	8%	9%
Certificate level	2%	21%	18%	25%	27%	28%	23%	15%
Vehicles and travel								
Average motor vehicles per dwelling	2.8	2.4	2.7	2.1	3.2	2.1	1.9	1.8
People who travelled to work by car as driver or passenger	86%	52%	69%	60%	32%	77%	68%	47%

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