ARK ENERGY

Bowmans Creek Wind Farm Stage 2

Environmental Impact Statement

FINAL
August 2026



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Bowmans Creek Wind Farm Stage 2

Environmental Impact Statement

Final

Prepared by
Umwelt (Australia) Pty Limited

On behalf of
Bowmans Creek Wind Farm Pty Ltd

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Report No.:	23307 / R11
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Document Status

Rev No.	Reviewer Name	Date	Approved for Issue Name	Date
Final	Thomas Young	27 August 2026	Nathan Baker	28 August 2026

Executive Summary

Project Overview

Bowmans Creek Wind Farm Pty Ltd (BCWF) proposes to develop the Bowmans Creek Wind Farm Stage 2 project (i.e. the Project) to provide a reliable and affordable source of energy for the people of New South Wales (NSW). The Project will connect directly to Stage 1 of the approved Bowmans Creek Wind Farm project (i.e. Bowmans Creek Wind Farm Stage 1, the Stage 1 project) to further increase its capacity to contribute to reducing greenhouse gas (GHG) emissions associated with energy generation.

The majority of the Project Area falls within the Muswellbrook LGA, while the south-eastern extent of the Project Area falls within the Singleton Council LGA. The closest larger population centres are Muswellbrook (21 km west of the Project Area), Singleton (25 km south of the Project Area), and Scone (30 km north-west of the Project Area). In June 2024, the Australian Electoral Commission (AEC) exhibited a federal redistribution of electoral divisions, which shows the Muswellbrook LGA in the New England Electorate, as opposed to the Hunter Federal electorate which was relevant at the time of submission of the Scoping Report (2024).

The key components of the Project include:

- Up to 21 (three (3) blade) wind turbine generators (WTGs), with a maximum blade-tip height of 250 metres (m) above ground level (AGL).
- Power infrastructure providing connection to the National Electricity Market (NEM), including:
    - One (1) on-site 330 kilovolt (kV) substation and associated medium voltage transmission line connecting the on-site substation to the Stage 1 project electrical reticulation network.
    - One (1) overhead transmission line connecting the proposed WTGs in the south of the Project Area to the Stage 1 project electrical reticulation network.
    - An internal electrical reticulation network (i.e., underground 33 kV transmission lines) connecting all Stage 2 WTGs to the Stage 1 project electrical reticulation network.
- Permanent ancillary infrastructure including internal roads, hardstands, a substation, underground and overhead electricity transmission lines and poles, telecommunications facilities and utility services, permanent meteorological masts and water storage tanks.
- Off-site road works to facilitate upgrades and alterations to the existing road network along the proposed oversize overmass (OSOM) transport route, including the expansion on those already approved for the Stage 1 project. This is to enable the safe transportation of large infrastructure components (e.g., WTG blades, towers etc.), and other heavy vehicle usage to and from the Project Area.
- Temporary facilities including a temporary meteorological mast, environmental management and monitoring measures and signage.

The proposed Project layout is shown on **ES Figure 1**.

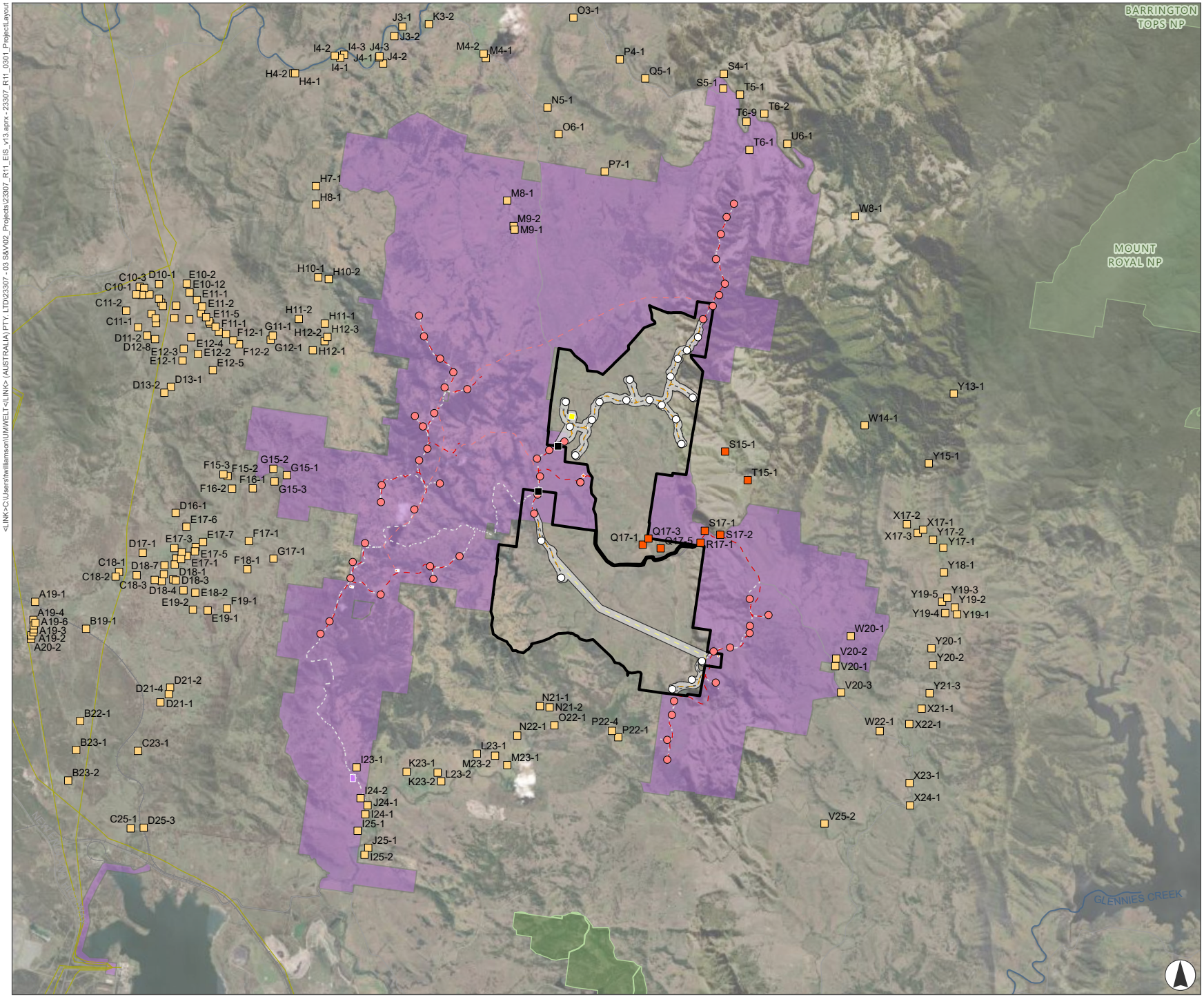


FIGURE ES.1
Project Layout

Legend

- Road
- Railway Line
- River/Stream
- Electricity Transmission Line
- NPWS Reserves
- State Forest

Dwellings

- Non-Associated
- Associated

Project

- Project Boundary
- Development Corridor
- Substation
- Laydown Area
- Batch Plant
- Overhead Reticulation Network
- Underground Reticulation
- Internal Roads
- Wind Turbine Generators
- Main Site Access

Stage 1 Project

- Project Boundary
- Construction Compound
- Batch Plant
- O&M Facility
- Overhead Reticulation Network
- Underground Reticulation
- Internal Roads
- Wind Turbine Generators

0 2.5 5
Kilometres

Scale 1:140,000 at A4
GDA2020 MGA Zone 56

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Image Source: ESRI Basemap (2026) | **Data Source:** NSW DFSI (2026), SLR (2026), Ozark (2026), Ark Energy (2026)

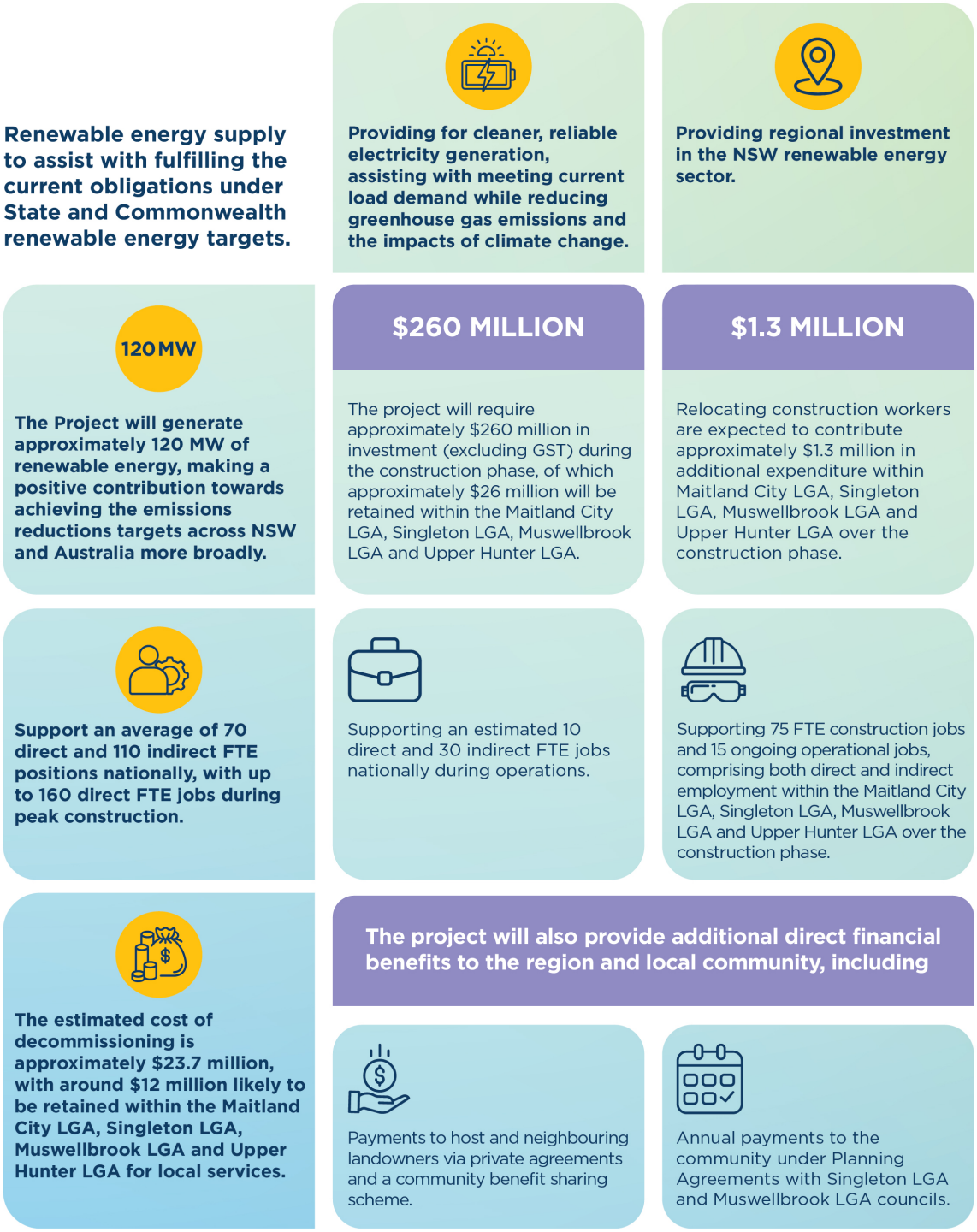
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Project Need

The NSW Government's Electricity Strategy and Electricity Infrastructure Roadmap set out a plan to deliver the State's first five (5) Renewable Energy Zones (REZs). These REZs will play a vital role in delivering affordable, reliable energy generation to help replace the State's existing power stations as they come to their scheduled end of operational life.

The Project is strategically located within the Hunter-Central Coast REZ, which has an intended network capacity of one (1) gigawatt (GW).

Although not connecting directly to the Hunter-Central Coast REZ, the Project will nonetheless deliver a range of social and economic benefits to NSW and to regional and local communities as illustrated in **ES Figure 2** below.



ES Figure 2 Project Social and Economic Benefits

Source: Umwelt

Proponent Overview

Ark Energy Projects Pty Ltd (the sole owner of BCWF) was established in 2021 through the acquisition of Australian wind and solar developer Epuron Projects Pty Ltd and owns a growing portfolio of wind and solar energy projects in Queensland, NSW and Tasmania.

Ark Energy Projects Pty Ltd is an Australian subsidiary of Korea Zinc Co Ltd, the world's largest producer of zinc, lead and silver. Ark Energy Projects Pty Ltd is the Proponent of 18 renewable energy projects across Australia which are at various phases of the development process from construction through to energy generation.

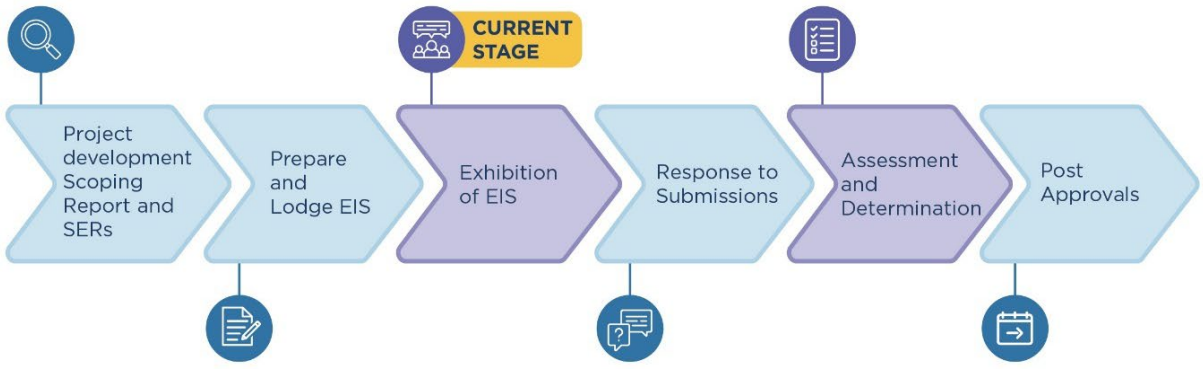
Approval Pathways and Assessment Process

The Project is State Significant Development (SSD) as defined under *State Environmental Planning Policy (Planning Systems) 2021* and requires development consent under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The NSW Planning Secretary's Environmental Assessment Requirements (SEARs) for the Project (SSD-73123714) were issued on 22 May 2025.

The Project has also been declared a controlled action (EPBC 2024/10013) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) based on potential impacts to EPBC Act listed threatened species and communities. The Project will be assessed by the NSW Government under the Bilateral Agreement between NSW and the Commonwealth (Amending Agreement No. 1). Supplementary SEARs for the Project addressing Commonwealth assessment requirements were issued on 24 March 2025.

This Environmental Impact Statement (EIS) provides an assessment of the environmental, social and economic impacts of the Project, in accordance with the SEARs (22 May 2025) and Supplementary SEARs (24 March 2025). The purpose of this EIS is to assist the community, Councils, government agencies and other key stakeholders to understand the Project and its benefits and impacts. This EIS is also intended to provide the necessary information to the consent authority to make an informed decision on the overall merits of the Project.

ES Figure 3 below provides an overview of the key stages in the SSD process.



Note: Stages shaded in blue are undertaken by BCWF. Stages shaded in purple are undertaken by DPHI (or the Independent Planning Commission where required).

ES Figure 3 Key Stages of SSD Process

Stakeholder Engagement

Since the inception of the Project, BCWF has been committed to genuine and meaningful engagement with the community, with a focus on:

- Establishing enduring community partnerships based on shared values.
- Avoiding, minimising and mitigating impacts to environmental and cultural values in collaboration with impacted stakeholders.
- Bringing communities together and delivering intergenerational community benefits through the State's transition to renewable energy.

The community were first engaged by Epuron Projects during delivery of the Stage 1 project of in 2018, and engagement for the Stage 2 Project began in March 2024 by BCWF. BCWF engagement has sought to build relationships and understand perspectives and needs in the region through meetings with local landowners, neighbouring property owners, Councils, First Nations groups, local service providers and relevant Government agencies.

BCWF has used a range of mechanisms for reaching stakeholders, including personal meetings, briefings and interviews, community information sessions, media releases, maintaining a Project website, providing regular Project updates and newsletters, conducting surveys, and participating in community events.

As part of this engagement process, BCWF has reached an agreement with the host landowner and select neighbours regarding the Project and mitigation of Project related amenity impacts, noting that impact based agreements are in place where unavoidable residual impacts were identified. As a result, the most significant visual impact to non-associated residences due to the Project have been assessed as 'low', and noise and blade throw impacts have been assessed at acceptable levels. These agreements demonstrate BCWF's focus on proactive engagement, mitigating the impacts and sharing the benefits of the Project.

In addition to consultation with community stakeholders, ongoing consultation has been undertaken with the Muswellbrook Shire, Singleton and Hunter Shire Councils, State and Federal Government agencies, functional stakeholders (e.g. service providers), businesses and various non-government organisations and interest groups. This includes an engagement process undertaken with the local First Nations stakeholders. This engagement has informed the design of the Project and has been ongoing throughout the assessment process, and if the Project is approved, the engagement will be ongoing during the life of the Project.

This ongoing engagement has resulted in numerous changes to the Project design and has assisted in development of implementation plans for the Project including the management and mitigation measures proposed throughout this EIS. Key stakeholder concerns and resulting changes to the Project are summarised in the section below and presented in detail in **Section 2.6.3**.

Project Refinement

The Project has been designed and progressively refined through a comprehensive process that incorporates community and stakeholder feedback, and the findings of environmental and social studies to maximise positive environmental, social and economic outcomes while avoiding or minimising interactions with key site constraints.

At each stage of the design process, from Project inception, through Project Scoping and the development of this EIS, the following hierarchy (in order of priority) has been applied by BCWF:

- **Avoid** – in the first instance, all efforts were made to avoid potential environmental, cultural and social impacts.
- **Minimise** – where potential impacts could not be avoided, design principles sought to minimise impacts, as far as reasonably practicable.
- **Mitigate** – mitigation strategies have been identified and will be implemented to manage the extent and severity of the remaining impacts.
- **Offset** – environmental offsets are only used following all efforts to first avoid, minimise and mitigate impacts.

Project design changes to avoid key environmental constraints informed by the outcomes of technical assessments and as raised by community are summarised in **ES Table 1** below.

ES Table 1 Responses to Key Community Concerns and Site Constraints

Theme	Key Design Changes	Strategies to Avoid, Minimise, Mitigate and Offset Residual Impacts
Biodiversity	• Re-designing the Development Corridor and Disturbance Footprint to avoid impacts to potential serious and irreversible impact (SAII) entities, including Box Gum Woodland (woodland form) and potential Large-eared Pied Bat breeding habitat. • Refining the Development Corridor and Development Footprint to avoid and minimise impacts to native vegetation, particularly threatened ecological communities. • Minimising interactions with Biodiverse Riparian Land by reducing the number of watercourse crossings, where possible.	• BCWF has committed to the design and implementation of a comprehensive biodiversity mitigation strategy to minimise the unavoidable impacts of the Project. The following Management Plans will be prepared post approval as part of the Biodiversity Management strategy: ○ Bird and Bat Adaptive Management Plan (BBAMP). ○ Construction Environmental Management Plan (CEMP). ○ Operational Environmental Management Plan (OEMP). ○ Biodiversity Management Plan (BMP). • BCWF will also develop a detailed Biodiversity Offset Strategy to offset the impacts of the Project in accordance with the NSW Biodiversity Conservation Act 2016 and Biodiversity Offset Scheme, including investigation of local Biodiversity Stewardship Sites.
Heritage	Minimising interactions with areas of higher potential archaeological significance by reducing the number of watercourse crossings, where possible.	• Continued prioritisation of areas within the Project Area and Development Corridor that have been identified as low Aboriginal archaeological sensitivity. • Historical, prioritise design to avoid impacts on nearby items of historical heritage significance, including nearby items identified as being of local or State heritage significance.
Amenity Impacts (including Visual, Noise and Dust)	Siting of proposed WTGs to maximise the screening effects of existing vegetation.	• Compliance with relevant NSW visual, noise and dust policy and guidelines, or impact based agreements where required. BCWF has negotiated agreements with all non-associated residences where any potential amenity-based impact was predicted. • BCWF has negotiated agreements with five (5) of the seven (7) residences located within 3.3 km of a WTG proposed under the Stage 2 Project, noting that the two (2) remaining residences within 3.3 km (i.e. P22-1 and P22-4) are compliant with the relevant NSW visual, noise and dust policies and guidelines as per the text above and do not require a negotiated agreement.

Theme	Key Design Changes	Strategies to Avoid, Minimise, Mitigate and Offset Residual Impacts
		• Additionally, all residents located within 3.3 km to 5 km of a WTG will be eligible for BCWF's Neighbour Benefit Sharing Scheme. • Measures to mitigate and manage residual visual, noise and dust impacts are outlined within this EIS and will be reflected in environmental management plans for the construction, operational and decommissioning phases of the Project.
Transport (including road safety)	Numerous public road upgrades to improve road safety and facilitate OSOM vehicle movement to the Project Area.	• Limiting impacts to the existing road reserve to the fullest extent possible, and minimising additional impacts to the Stage 1 project. • BCWF has committed to develop a comprehensive Traffic Management Plan (TMP) as a component of future environmental management plans for the construction, operational and decommissioning phases of the Project.
Bushfire	Relocating the on-site substation to allow for a greater Asset Protection Zone (APZ).	• BCWF has committed to a range of bushfire mitigation and management strategies, including the establishment of infrastructure-specific APZs, maintaining bushfire fighting equipment and a static water supply on site, and establishing detailed emergency management procedures, including shutdown procedures to enable safe aerial firefighting and to ensure free access around the site for fire fighting vehicles.

Key Assessment Outcomes

ES Table 2 provides a summary of the key assessment outcomes of this EIS.

ES Table 2 Summary of Key Assessment Findings

Aspect	Key Findings
Landscape and Visual 	A comprehensive **Landscape Character and Visual Impact Assessment (LCVIA)** has been completed to inform this EIS, as documented in **Appendix 6**. The key findings of that assessment are as follows: • A Landscape Character Study Area (LCSA) has been established and includes all land within a 25 km radius from the Project WTGs. Five (5) Landscape Character Zones (LSZs) were identified within this radius and the landscape character assessment determined the Project would have a very low or low impact on these landscapes. • The Visual Study Area for the Project is 7,160 m and the Visual Setback distance for the Project is 1,579 m. No non-associated dwellings are located within the setback distance, and 59 non-associated dwellings are located with the Visual Study Area. Ten (10) public viewpoints have been selected to represent a range of views and landscape character typologies from within the Visual Study Area. All of these non-associated dwellings and public viewpoints were within the cumulative impact zone for the Project and the Stage 1 project. • Per the Visual Technical Supplement, simple assessments were undertaken for all non-associated dwellings, of which 27 dwellings required intermediate assessments to occur. A detailed assessment was then undertaken for two (2) of the non-associated dwellings within the Visual Study Area. It was determined that one (1) dwelling would not have visibility of the Project and the other will have a low visual impact. Three (3) public viewpoints were determined to have a moderate visual impact, of which all three (3) viewpoints have a significant sight line to surrounding ridge lines, and as such, inclusion of any additional visual mitigation measures were deemed unnecessary. • An assessment of night lighting was undertaken to determine the impact of Aviation Hazard Lighting (AHL) on potential receivers. Given the turbines' high elevation and the use of light shields, any AHL would likely appear as low-level ambient glow rather than a direct light source when viewed from nearby locations.

Aspect	Key Findings
Noise and Vibration 	A comprehensive **Noise and Vibration Assessment (NVA)** has been completed to inform this EIS, as documented in **Appendix 7**. The key findings of that assessment are as follows: • A total of 71 non-associated receivers were identified within 8 km of the Project wind turbines. • An assessment of operational noise indicate that the Project is capable of being designed and operated to comply with the operational wind turbine noise requirements of the Technical Supplement for Noise and Wind Energy Guideline. • no exceedances of the highly noise affected management level were expected for any of the assessed tasks, and that construction noise and vibration can be appropriately managed using standard good practice measures. • The assessment identified that no vibration generating works were expected to occur within the established minimum working distances.
Biodiversity 	A comprehensive **Biodiversity Development Assessment Report (BDAR)** has been completed to inform this EIS, as documented in **Appendix 8**. The key findings of that assessment are set out below. The Project would directly impact up to 163.58 hectares (ha) of native vegetation within the Disturbance Footprint. An additional 0.38 ha of native vegetation would be directly impacted in the areas impacted by the proposed off-site road works. The Project would directly impact listed threatened ecological communities (TEC), including: • 0.31 ha of Lower Hunter Valley Dry Rainforest in the Sydney Basin and NSW North Coast Bioregions listed under the BC Act. • 9.10 ha of Central Hunter Ironbark – Spotted Gum – Grey Box Forest in the NSW North Coast and Sydney Basin Bioregions listed under the BC Act and EPBC Act. • 34.48 ha of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions under the BC Act. Of this, 3.02 ha is listed under the EPBC Act. In terms of impacts on Serious and Irreversible Impact (SAII) entities: • One (1) SAII entity has been identified as being impacted by the Project, being the White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions (Box Gum Woodland). A total area of 34.48 ha is present within the Disturbance Footprint and will be directly impacted by the Project. • A second potential SAII entity – breeding habitat for the Large-eared Pied Bat – has also been recorded within the Development Corridor. To avoid potential impacts on this habitat, a no-go zone has been established and no ground-disturbance, vegetation removal, or vegetation trimming will occur within this no-go zone.

Aspect	Key Findings
	In accordance with BAM credit calculations, the proposed offset obligation based on the Disturbance Footprint is1,006 ecosystem credits and 1,647 species credits. An additional three (3) ecosystem credits are required as additional offsets for the offsite transport route upgrades.
Aboriginal Cultural Heritage 	A comprehensive **Aboriginal Cultural Heritage Assessment Report (ACHAR)** has been completed to inform this EIS, as documented in **Appendix 9**. The key findings of that assessment are as follows: • No Aboriginal sites were identified within the Disturbance Footprint. • The Disturbance Footprint was confirmed to comprise almost entirely of steep slopes and crests subject to natural erosive processes exacerbated by ongoing agricultural operations and vegetation clearing. • Additionally, no cultural values specific to the Disturbance Footprint, Development Corridor, or lands within the Project Boundary more broadly were raised by Aboriginal community members that attended the survey or during consultation. • Accordingly, no further archaeological investigation is required within the Development Corridor as all landforms are assessed as having very low archaeological potential.
Historical Heritage 	A comprehensive **Historic Heritage Impact Assessment (HHIA)** has been completed to inform this EIS, as documented in **Appendix 10**. The key findings of that assessment are as follows: • The Project will result in no physical or visual impacts on the Former Roman Catholic Church (LEP I156). • The Project is also expected to have a negligible impact on the heritage values of other State Heritage Register (SHR) and LEP-listed items. Database searches and field inspections confirmed that no historic heritage items are located within the Project Boundary or Disturbance Footprint. Additionally, it is considered unlikely that the proposed works at the offsite road works locations would impact any items of historic heritage significance. • Consequently, it is considered very unlikely that significant historic heritage items will be encountered during the Project.
Transport 	A comprehensive **Traffic and Transport Impact Assessment (TTIA)** has been completed to inform this EIS, as documented in **Appendix 11**. The key findings of that assessment are as follows: • The construction phase of the Project is likely to generate the highest levels of vehicle movements. The peak construction period of the Project has been identified as month 7-8, consisting of 186 one-way daily trips of which approximately 25 one-way trips are heavy vehicles. The workforce is expected to be distributed by 50% Newcastle and 50% Muswellbrook. The key roads accessing the Project site will be Hebden Road (north and south) via New England Highway. • The Hebden Road (south) / New England Highway intersection is expected to operate within acceptable capacity levels across all scenarios. However, the Hebden Road (north) / New England Highway intersection operates over capacity on the Hebden Road (north) approach during the PM peak hour of the projected future year 2027 before the addition of Project traffic. To address this capacity issue on the Hebden Road (north) approach, during the PM peak hour all workers heading towards Muswellbrook will be

Aspect	Key Findings
	instructed to turn left onto the New England Highway and make a U-turn using the highway interchange at the Bayswater Power Station. • During operational phase, there are expected to be up to 40 personnel on-site. The level of traffic generated during the operation of the Project is considerably lower than that assessed as part of the construction phase, and is unlikely to result in adverse road conditions. During the decommissioning phase, traffic levels are anticipated to be lower than the construction phase due to a number of services not being required. • A high level approach to traffic management has been developed for the critical areas and activities for the Project. This includes the future preparation of a Traffic Management Plan, Stakeholder Management Plan and Driver Code of Conduct, identifying hours of construction activities and internal site management. • The Project proposes to utilise the same OSOM Transport Route as approved under the Stage 1 project from the Port of Newcastle. This transport route would be utilised to deliver Project components, including WTG towers and blades, to the Project Area. However, the WTG dimensions proposed under the Stage 2 Project are larger than those assessed and approved under the Stage 1 project and as such, a new Route Study Report has been undertaken by Rex J Andrews Engineered Transportation (RJA) (**Appendix 26**). • Strategic Concept Designs have been prepared by Stantec (2026) for the proposed offsite road works identified in the Route Study Report (**Appendix 26**). The Strategic Concept Designs are provided in **Appendix 3, Section A3.3**, and a consolidated set of road upgrades is provided in **Appendix 25**.
Water Resources 	A comprehensive **Water Resources Impact Assessment (WRIA)** has been completed to inform this EIS, as documented in **Appendix 12**. The key findings of that assessment are as follows: • Construction activities have the potential to mobilise sediments and/or pollutants into rainfall runoff, which could enter local watercourses, including Bowmans Creek, Muscle Creek, and Yorks Creek. An erosion hazard predicts that most of the Project corresponds to a very low erosion hazard. Sections with steeper access tracks or exposed soils have higher erosion potential, and these areas will be managed using standard and supplementary erosion and sediment control (ESC) measures. • A preliminary assessment of water demands estimates total water usage during the 22-month construction period to be approximately 42.5 to 55.0 ML. • The majority of water required for the Project would be sourced from commercial suppliers and, where available, from on-site dams or water tanks under agreement with landholders. All water supplied from existing groundwater sources will be obtained under agreement with relevant landholders, ensuring compliance with any applicable water access licences or approvals. • Flooding within the project area is generally limited, with flood behaviour largely confined to existing watercourses and local depressions, and most of the disturbance footprint experiencing low hazard classifications during the 1% AEP event. More

Aspect	Key Findings
	extreme events may inundate low-lying riparian areas with increased depths, but overall impacts are minor, with negligible operational risk and only temporary, manageable risks during construction (e.g. stockpile inundation and drainage line crossings). • Generally, impacts to groundwater resources, including groundwater dependent ecosystems (GDEs) are very unlikely given that the groundwater table is not expected to be intercepted during Project construction or decommissioning.
Air Quality 	A comprehensive **Air Quality Impact Assessment (AQIA)** has been completed to inform this EIS, as documented in **Appendix 13**. The key findings of that assessment are as follows: • An assessment of dust determined that, with mitigation, the substantial distance between the Disturbance Footprint and the nearest sensitive receptors, the overall risk of dust impacts on amenity and human health is low. • There is potential for dust generation during construction of the road modifications at the offsite road work areas along the OSOM Transport Route. Any dust-related impacts would be managed in accordance with an Air Quality Management Plan (AQMP) which will be developed post approval. • No additional, operation-specific air quality management measures are recommended beyond standard good practice.
Land 	A comprehensive **Soil, Land and Agriculture Impact Assessment (SLAIA)** has been completed to inform this EIS, as documented in **Appendix 14**. The key findings of that assessment are as follows: • The impacts on agriculture as a result of the Project range from short-term temporary impacts to longer-term impacts for the duration of the Project, with no permanent or irreversible impacts anticipated. Project will temporarily disturb approximately 180 ha of land currently subject to agricultural land use (i.e. the Disturbance Footprint), representing approximately 5% of the overall Project Area. Agricultural land use is anticipated to be re-established over the Disturbance Footprint at the time of decommissioning. • The temporary reduction in land used for agriculture on the LGA scale, represents approximately 0.04% of agricultural land in Muswellbrook Shire and 0.01% in Singleton LGA. The temporary impact of the Project on agricultural productivity, based on the change in land use for the duration of the Project, is estimated to be up to $217,673 per year. Overall, the Project will result in a minor impact on agricultural land and productivity within the Project Area, and a negligible impact on agricultural industries operating within the wider region. • The Land Use Conflict Risk Assessment (LUCRA) (Appendix 1 of **Appendix 14**) determined that the Project can maintain an acceptable level of land use compatibility with the community, while effectively managing specific conflicts with immediate neighbours as part of standard operations.

Aspect	Key Findings
Hazards 	A comprehensive assessment of hazards has been undertaken to inform this EIS. The key findings of those specialist assessment are as follows: • **Aviation (**refer **Appendix 15)**: the Project satisfies relevant aviation safety requirements. It will not create incompatible intrusions, adversely affect, or compromise the safety of existing airports and associated navigation and communication facilities. • **Telecommunications (**refer **Appendix 16)**: the Project will not result in any significant adverse impacts on identified telecommunication services. • **Electric and Magnetic Fields (EMF,** refer **Appendix 17)**: EMF levels associated with the Project are generally within accepted safety limits. For the 330 kV transmission line, compliance with ICNIRP guidelines will be achieved through adherence to recommended clearance distances during detailed design. • **Bushfire (**refer **Appendix 18)**: a variable Asset Protection Zone (APZ) ranging from 10 m to 36 m will be established around the proposed substation, meeting or exceeding the APZ requirements for a Bushfire Attack Level (BAL) of less than 29 kW/m^2 at the substation perimeter. Additionally, the APZ established by BCWF surrounding all other infrastructure meets or exceeds the 10m APZ required by the Planning for Bush Fire Protection 2019 (PBP). There is a threat to construction personnel or firefighters from fast moving bushfire events which may impact the Project Area, however this able to be mitigated through the development and implementation of a Bushfire Emergency Management & Operations Plan (BEMOP) and Bushfire Emergency Response Plan (BERP). The Project does not present a significant risk to aerial firefighting operations and as proposed is in line with the guidance presented by the Wind Farms and Bushfire Operations document. • **Blade Throw (**refer **Appendix 19)**: all dwellings are located outside the maximum exclusion zone, and as such, there is no probability of impact from a WTG on any landowner. • **Other Hazards**: the Project will require the use and short-term storage of fuels and explosives during construction (including potential blasting material), which poses a potential hazard although are proposed to be below regulatory screening thresholds. The Project is not considered as 'potentially hazardous' with respect to dangerous goods storage and transportation.
Social and Economic Impacts 	Comprehensive **Social Impact Assessment (SIA)** and **Economic Impact Assessment (EIA)** have been completed to inform this EIS, as documented in **Appendix 20** and **Appendix 21**. The key findings of that assessment are as follows: • The combined construction and operational phases of the Project are estimated to generate economic benefits of approximately $61 million within the Economic Study Area (ESA). Additional community benefits will also be delivered through the Proponent's benefit-sharing commitments. • During engagement, stakeholders identified a range of perceived social impacts (both positive and negative impacts) relating to the Project. In response to perceived negative impacts, BCWF has committed to a range of measures to mitigate and management impacts to biodiversity and cultural heritage values, amenity, agricultural productivity and to minimise hazards, consistent with the recommendations of the respective specialist assessment reports.

Aspect	Key Findings
	• A Preliminary Social Impact Management Framework was developed to manage residual negative impacts and to maximise positive impacts to affected communities. This framework is outlined in the sections below, and comprises: ○ Neighbour Benefit Sharing. ○ Community Benefit Sharing Program. ○ Complaints management system (CMS). ○ A Community and Stakeholder Engagement Strategy. ○ Accommodation and Employment Strategy (AES), and associated Accommodation and Employment Implementation Plan (AEIP).
Waste 	An assessment of waste has been completed as documented in **Section 6.14** of this EIS. The key findings of that assessment are as follows: • Construction and operational waste will be reused and disposed of in conjunction with the Stage 1 project. The construction period of the Project will result in the largest contribution of waste, most of which will be required to be disposed of off-site. During operations waste generation would be limited to minor quantities of waste from staff amenities, redundant equipment and maintenance activities. • As part of the detailed design for the Project, a Waste Management Plan (WMP) will be prepared which will include a detailed breakdown of waste types and quantities in accordance with relevant legislation and guidelines. • A detailed Decommissioning and Rehabilitation Plan (DRP) will be prepared for the Project in consultation with key stakeholders, to guide the decommissioning of the Project and the rehabilitation of the site, and to mitigate any negative legacy impacts to the community.
Contamination 	A comprehensive **Preliminary Site Investigation (PSI)** has been completed to inform this EIS, as documented in **Appendix 22**. The key findings of that assessment are as follows: • A Preliminary Site Investigation (PSI) was undertaken, involving a desktop information review and site inspection. Based on the findings of the PSI, no potential sources of contamination were identified and there is no indication that the site has been contaminated by current or historical land use activities that require further investigation. • There were no current or historical land use practices identified on, or within the immediate vicinity of the site that are considered to represent a potential source of contamination for the Project. In the absence of potential sources of contamination, no migration or exposure pathways were identified and no receptors were identified.

Aspect	Key Findings
Cumulative Impacts 	An assessment of cumulative impacts has been undertaken to evaluate the potential impacts of the Project in combination with other existing and planned developments, as documented in **Section 6.16** of this EIS. The key findings of that assessment are as follows: • The Project is located within the Hunter-Central Coast REZ and the broader Hunter region of NSW, an area characterised by a high concentration of existing mining operations and proposed renewable energy developments. • Cumulative impacts are anticipated in association with the approved Stage 1 project and the proposed Stage 1 BESS modification. Additional nearby projects likely to contribute to cumulative impacts include the New England REZ Transmission Project and the Queensland–Hunter Gas Pipeline. Key potential cumulative impacts relate to biodiversity, Aboriginal cultural heritage, traffic, visual amenity, noise, and social and economic impacts. • The Project is also expected to contribute to cumulative impacts in relation to competition for labour, accommodation, and other resources linked to major infrastructure projects being delivered concurrently in the region. Most cumulative impacts are anticipated to arise from workforce demand and associated accommodation requirements.
Development Rights 	An assessment of development rights has been completed as documented in **Section 6.17** of this EIS. The key findings of that assessment are as follows: • Seven (7) lots with potential dwelling entitlements were identified and considered for further assessment. All identified lots form part of a single property holding with a total area of approximately 705.5 ha. • An assessment of the potential impact of the development on existing land uses both on the site and on adjoining land was then undertaken. The assessment concluded it is unlikely that the Project would substantially impact on the right for neighbouring landholders to develop their land for the purpose of residential accommodation, tourist and visitor accommodation, or an eco-tourist facility.

Conclusion

As a renewable energy project located within the Hunter-Central Coast REZ, the Project is located within a defined area planned for renewable energy development by the NSW Government. The NSW government has indicated that REZs will play a vital role in delivering affordable energy generation to help prepare the State for the expected retirement of thermal power stations over the coming decades. The Project will contribute to meeting these Federal and NSW Government objectives and is appropriately located.

The Project is consistent with the objectives of the NSW Electricity Strategy and Infrastructure Road Map (NSW Government, 2020), in aiming to provide large-scale renewable electricity generation that is affordable and reliable. Although not contributing directly to the generation capacity indicated for this REZ, the Project will assist in providing a reliable energy source and associated GHG emission reductions, consistent with the broader NSW Electricity Strategy and Infrastructure Road Map.

The Project has been designed and progressively refined in collaboration with key stakeholders to avoid and minimise impacts to key environmental, cultural and social values where practicable, and to maximise potential benefits to impacted communities.

The assessment findings outlined in **Section 6.0** indicate that while there will be environmental and social impacts associated with the Project, the extent of impact has been minimised through the design process and where impacts are predicted, BCWF has committed to management, mitigation and offset measures to address these residual impacts.

The Project will provide long-term, strategic benefits to NSW, and at the regional and local levels, including:

- Renewable energy supply to assist with fulfilling the current obligations under State and Commonwealth renewable energy targets.
- Providing for cleaner reliable electricity generation and assisting with meeting current load demand, while reducing GHG emissions and the impacts of climate change.
- Providing regional investment in the NSW renewable energy sector.
- The Project would require approximately $260 million in investment (excluding GST) during the construction phase (of which approximately $26 million will be retained in the ESA).
- Ongoing economic stimulus associated with the operation of the Project is estimated at approximately $50.9 million over 30 years (CPI adjusted) relating to land holder leasing payments, operational wage stimulus, and community payments, minus the agricultural productivity loss impact.
- Supporting 70 direct and 110 indirect FTE positions in the national economy (on average) over the construction period, with 160 FTE jobs during peak construction. Of which, a minimum of 55 FTEs are expected to be sources from the local LGAs of Singleton, Muswellbrook, Upper Hunter and Maitland, increasing to approximately 130 FTE jobs at the Project's peak.
- Supporting an estimated 10 direct FTE jobs nationally during operations, equating to 40 FTE across the Stage 1 and Stage 2 projects collectively.

- An estimated $1.3 million in economic stimulus is expected to be directed to local businesses and service providers due to the temporary migration of non-local workers during the construction period.
- The Project will also provide additional direct financial benefits to the region and local community, including:
    - Payments to host and neighbouring landowners via private agreements and a community benefit sharing scheme.
    - Annual payments to the community under Planning Agreements with both Singleton and Muswellbrook Councils.

On this basis, and subject to the implementation of the mitigation, management and offsetting commitments outlined in this EIS, it is considered that the Project is consistent with the objects and requirements of the EP&A Act and is in the public interest.

Abbreviations

Abbreviation	Meaning
ABS	Australian Bureau of Statistics
AHCAR	Aboriginal Cultural Heritage Assessment Report
AEMO	Australian Energy Market Operator
AES	Accommodation and Employment Strategy
AIA	Aviation Impact Assessment
Applicant	Bowmans Creek Wind Farm Pty Ltd (BCWF, also referred to as the Proponent)
APZ	Asset Protection Zone
AQIA	Air Quality Impact Assessment
BAM	Biodiversity Assessment Method
BBUS	Bird and Bat Utilisation Survey
BC Act	NSW *Biodiversity Conservation* Act *2016*
BDAR	Biodiversity Development Assessment Report
BESS	Battery Energy Storage System
BoM	Bureau of Meteorology
BCS	Biodiversity Conservation and Science [former]
BCWF	Bowmans Creek Wind Farm Pty Ltd (i.e. the Proponent or Applicant as discussed in the EIS and associated technical studies)
BSAL	Biophysical Strategic Agricultural Land
BTA	Blade Throw Assessment
CASA	Civil Aviation Safety Authority
CEEC	Critically Endangered Ecological Community
CIA	Cumulative Impact Assessment
CLM Act	NSW *Contaminated Land Management Act 1997*
CPHR	Conservation Programs, Heritage and Regulation division of NSW DCCEEW (formerly BCS)
Crown Land Act	NSW *Crown Land Management Act 2016*
CSEP	Communications and Stakeholder Engagement Plan
Cth DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DA	A development application made seeking consent for a development under Part 4 of the EP&A Act
dBA	A-weighted noise or sound power level in decibels
DPE	NSW Department of Planning and Environment [former]
DPHI	NSW Department of Planning, Housing and Infrastructure [current]
DPIE	NSW Department of Planning, Industry and Environment [former]
EEAP	NSW Energy Efficiency Action Plan
EDC	Estimated Development Cost (formerly ‘Capital Investment Value’)

Abbreviation	Meaning
EEC	Endangered Ecological Community
EIA	Economics Impact Assessment
EIS	Environmental Impact Statement
EL	Exploration License
EMF	Electromagnetic Field
EMI	Electromagnetic Interference
EnergyCo	Energy Corporation of NSW
EPA	NSW Environment Protection Authority
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
EPL	Environment Protection Licence
GDE	Groundwater dependent ecosystem
GHG	Greenhouse Gas
GIS	Geographic Information System
GW	Gigawatts
Ha	Hectares
HHIA	Historical Heritage Impact Assessment
kV	Kilovolt
km	Kilometres
LALC	Local Aboriginal Land Council
LCVIA	Landscape Character and Visual Impact Assessment
LEP	Local Environmental Plan
LGA	Local Government Area
LVIA	Landscape and Visual Impact Assessment
m	Metres
MNES	Matter of National Environmental Significance
MP	Member of Parliament
MW	Megawatt
MWh	Megawatt Hour
MWTT	Multiple Wind Turbine Tool
NDC	Nationally Determined Contributions
NEM	National Electricity Market
NPfI	Noise Policy for Industry 2017
NPW Act	NSW *National Parks and Wildlife Act 1974*
NPWS	National Parks and Wildlife Services
NSW	New South Wales
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
NVA	Noise and Vibration Assessment
OSOM	Over-size, over-mass

Abbreviation	Meaning
PCT	Plant Community Type
POEO Act	NSW *Protection of the Environment Operations Act 1997*
Proponent	Bowmans Creek Wind Farm Pty Ltd (BCWF, also referred to as the Applicant)
RAAF	Royal Australian Air Force
REZ	Renewable Energy Zone
RFS	NSW Rural Fire Service
Roads Act	NSW *Roads Act 1993*
SAT	Spot Assessment Technique
SEARs	Secretary's Environmental Assessment Requirements
SIA	Social Impact Assessment
SISR	Social Impact Scoping Report
SLAIA	Soil, Land and Agricultural Impact Assessment
SSD	State Significant Development
SSDA	State Significant Development Application
Stage 1 Project	The approved Bowmans Creek Wind Farm project (SSD-10315)
Stage 2 Project	The proposed Bowmans Creek Wind Farm Staged 2 project (SSD-73123714) (i.e. the Project)
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened Ecological Community
TfNSW	Transport for NSW
TIA	Telecommunications Impact Assessment
TTIA	Traffic and Transport Impact Assessment
Umwelt	Umwelt (Australia) Pty Ltd
WM Act	NSW *Water Management Act 2000*
WRIA	Water Resources Impact Assessment
WSP	Water Sharing Plan
WTG	Wind Turbine Generator (including the tower, blades and associated components)

Key Project Terms

Term	Meaning
Ancillary Infrastructure	All permanent infrastructure necessary for the construction and operation of the wind farm with the exception of WTGs, including but not limited to internal roads, hardstands, substation, underground and overhead electricity transmission lines and poles, communications cables, and water storage tanks.
Assessment Area	The Assessment Area as defined in the Biodiversity Development Assessment Report (BDAR) comprises land within a 500 m buffer along each side of the centre line of the Subject Land. The Subject Land is as defined in the BDAR is equivalent to the Development Corridor.
Associated landholder	The owner(s) of an associated residence. An associated landholder has reached a private agreement with BCWF in relation to the Project and management of impacts. For the purposes of this EIS, there are eight (8) associated landholders with residences described as associated residences/receivers throughout this report, including (Q17-1, Q17-3, Q17-5, R17-1, S17-1, S17-2, T15-1 and S15-1). This includes host landholders, who are the owner(s) of a host residence that have reached an agreement with BCWF to host Project infrastructure within their landholdings and in relation to the management of impacts.
Associated residence	A residence on privately-owned land in respect of which the owner has reached a private agreement with BCWF in relation to the Project and management of impacts. This also includes host residences, which are residences on privately-owned land in respect of which the owner has reached an agreement with BCWF to host Project infrastructure and in relation to the management of impacts.
Benefit sharing	Benefit sharing aims to distribute benefits generated by a project between the Proponent and the community through mutually agreed opportunities such as funding or sponsoring local community initiatives, programs or projects.
Construction	The construction of the Project, including but not limited to the construction of WTGs, ancillary infrastructure but excluding pre-construction works.
Decommissioning	The removal of WTGs and ancillary infrastructure.
Development Consent	Consent to carry out the Project granted by the consent authority as nominated under the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).
Development Corridor	This is the area within which all proposed Project infrastructure will be placed, and all Project-related ground disturbance will occur. The Development Corridor is of variable width to avoid key site constraints and has been designed to provide some flexibility for micro-siting of infrastructure. The Development Corridor is shown in **Figure 3.1** of this EIS.
Disturbance Footprint	This is the actual disturbance area required for the Project. The Disturbance Footprint is shown conceptually in **Figure 3.1**. The actual location and extent of the Disturbance Footprint will be determined prior to construction, subject to the micro-siting provisions outlined in this EIS.

Term	Meaning
Dwelling	A room or suite of rooms occupied or used as a separate domicile as well as a building that meets the criteria outlined in Section 1.3 of Wind Energy Guideline – Technical Supplement for Landscape and Visual Impact Assessment.
Ground Disturbance	Activities that cut into the existing ground surface. To avoid any doubt this does not include activities that occur on the ground surface including but not limited to driving vehicles on the ground, parking vehicles, placing infrastructure or materials such as stockpiles on the ground.
Heavy Vehicle	As defined under the Heavy Vehicle National Law (NSW), but excluding light and medium rigid trucks (less than eight (8) tonnes and with no more than two (2) axles) and buses containing more than 12 seats.
Internal Roads	Roads established and/or upgraded within the Project Area for the purposes of constructing, operating, maintaining and decommissioning the Project, and includes all waterway crossings where located within the Project Boundary, but does not include off-site road works areas.
Light Vehicle	A car or rigid truck up to eight (8) tonnes gross vehicle mass or a bus containing up to 12 seats.
Micro-siting	The process of locating WTGs, ancillary infrastructure and temporary infrastructure during detailed design without further approval, providing that: • ground disturbance is wholly contained within the Development Corridor, with the exception of meteorological masts • no WTG is moved more than 100 m from the relevant GPS coordinates listed in **Appendix 3** • the revised location of the blade of a WTG is at least 50 m from the canopy of existing hollow-bearing trees; or, where the proposed location of the blade of a WTG is already within 50 m of the canopy of existing hollow-bearing trees, the revised location is not any closer to the existing hollow-bearing trees.
Non-associated Landholder	The owner of a non-associated residence.
Non-associated Residence	A residence on privately-owned land in respect of which the owner has not entered into a private agreement with BCWF in relation to the Project's impacts. Or A residence on privately-owned land in respect of which the owner has reached an agreement with BCWF in relation to the Project's impacts, but the agreement does not cover the relevant impact, or the performance measure for such impact (under that agreement) has been exceeded.
Off-site Road Works	Upgrades and alterations to the existing road network along the proposed oversize overmass (OSOM) transport route, including the expansion on those already approved for the Stage 1 project. This is to enable the safe transportation of large infrastructure components (e.g., WTG blades, towers etc.), and other heavy vehicle usage to and from the Project Area. These are discussed in detail in **Section 3.2.9**.

Term	Meaning
Pre-construction Works	Includes the following activities: • surveys (i.e. geotechnical surveys) • building/road dilapidation surveys • investigative drilling, excavation or salvage • minor clearing or translocation of native vegetation • establishing temporary site office and compounds • installation of environmental impact mitigation measures, fencing, enabling works, meteorological masts • flora and fauna investigations and pre-clearing surveys, inspections, specific habitat feature removal and relocation • adjustments to services/utilities, signage etc. including associated vegetation • removal and heritage artefact salvage • off-site road works.
OSOM Transport Route	The transport route extending from the Port of Newcastle to the Project required to deliver WTG and large Project-related components to the Project, as shown conceptually on **Figure 3.11**.
Project Area	The Project Area encompasses all land within and including the Project Boundary.
Project Boundary	The outer boundary of the Project Area. The Project Boundary is the maximum spatial extent of potential land access defined by the boundaries of the host landholder property (i.e. all agreed lots owned by the host landholder).
Rehabilitation	The restoration of land disturbed by the Project to its former condition (as much as practicable), to ensure it is safe, stable, and non-polluting.
Residence	Has the same meaning as a 'dwelling' as defined under the Standard Instrument – Local Environmental Plan, and also includes: • residences that have development consent, but have yet to commence or complete construction • proposed residences that are subject to a development application that has been lodged prior to the DA for the Project but is yet to be determined • a residence does not include moveable dwellings (i.e. tents, caravans or other portable devices used for human habitation), or any derelict dwelling or dwelling that has been built illegally, as confirmed by the relevant Council.
Substation	Infrastructure required to collect the internal electrical reticulation to increase the voltage for transmission to connect to the grid. Typically includes step-up transformers, an array of cable marshalling, busbars, various voltage and current transformers, operation and facilities building (with parking), communication facilities and tower, diesel generator, lighting, a buried earth grid, lightning masts, power conditioning equipment, a reactive power control system, and network support equipment as required and agreed with Transgrid (or other transmission network system operator).

Term	Meaning
Telecommunications Facility	A telecommunications facility is any part of the infrastructure of a telecommunications network or any line, cable, optical fibre, equipment, apparatus, tower, mast, antenna, dish, tunnel, duct, hole, pit, pole or other structure in connection with a telecommunications network. Telecommunications facilities provide for transmission of voice, data, image, graphic and video information between or among points by wire, cable, optical fibre, microwave, radio, satellite or similar facilities.
Temporary Facilities	Temporary facilities used for the construction, repowering and/or decommissioning of the Project, including but not limited to minor construction access roads, environmental management and monitoring, and signage.

EIS Declaration

Project Details

Required Information	Details
Project Name	Bowmans Creek Wind Farm Stage 2
Application Number	SSD-73123714
Address of the land in respect of which the development application is made	Bowmans Creek Road, Bowmans Creek, NSW 2330

Proponent Details

Required Information	Details
Proponent Name	Bowmans Creek Wind Farm Pty Ltd
Proponent Address	Level 2/275 George St, Sydney NSW 2000

Details of Person by Whom this EIS was Prepared

Required Information	Details
Name	Nathan Baker
Address	Suite 1101, Level 11/213 Miller St, North Sydney NSW 2060
Professional Qualifications	Master of Design Science, University of Sydney, Australia, 2007 Certified Environmental Practitioner (CEnvP), EIANZ

Declaration by Registered Environmental Assessment Practitioner

Required Information	Details
Name	Paul Douglass
Registration Number	#9060
Organisation registered with	Planning Institute of Australia
Declaration	The undersigned declares that this EIS: • has been prepared in accordance with the Environmental Planning and Assessment Regulation 2021; • contains all available information relevant to the environmental assessment of the development, activity or infrastructure to which the EIS relates; • does not contain information that is false or misleading; • addresses the Planning Secretary's environmental assessment requirements (SEARs) for the project;

Required Information	Details
	• identifies and addresses the relevant statutory requirements for the project, including any relevant matters for consideration in environmental planning instruments; • has been prepared having regard to the Department's State Significant Development Guidelines – Preparing an Environmental Impact Statement; • contains a simple and easy to understand summary of the project as a whole, having regard to the economic, environmental and social impacts of the project and the principles of ecologically sustainable development; • contains a consolidated description of the project in a single chapter of the EIS; • contains an accurate summary of the findings of any community engagement; and • contains an accurate summary of the detailed technical assessment of the impacts of the project as a whole.
Signature	
Date	28/08/2026

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1.0 Introduction

Bowmans Creek Wind Farm Pty Ltd (BCWF) proposes to develop the Bowmans Creek Wind Farm Stage 2 project (i.e. the Project or the Stage 2 Project) (SSD-73123714) to provide a reliable and affordable source of energy for the people of New South Wales (NSW).

The Project will connect directly to Stage 1 of the approved Bowmans Creek Wind Farm project (i.e. Bowmans Creek Wind Farm Stage 1, the Stage 1 project) (SSD-10315) to further increase its capacity to contribute to reducing greenhouse gas (GHG) emissions associated with energy generation[1].

BCWF is the proponent for the state significant development application (SSDA) and is wholly owned by Ark Energy Projects Pty Ltd (Ark Energy). For ease of reference, the proponent will be referred to as BCWF. More information on the proponent is provided in **Section 1.4**.

The majority of the Project Area falls within the Muswellbrook local government area (LGA), while the south-eastern extent of the Project Area falls within the Singleton Council LGA, within the broader Upper Hunter Region of NSW. The closest larger population centres are Muswellbrook (21 km west of the Project Area), Singleton (25 km south of the Project Area), and Scone (30 km northwest of the Project Area).

The Project is strategically located on land immediately adjacent to the Stage 1 project, with the Project's eastern, northern and southern boundaries abutting the Stage 1 project boundary, as shown in **Figure 1.1** below.

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

This Environmental Impact Statement (EIS) provides an assessment of the environmental, social and economic impacts of the Project. This document is intended to assist the community, Councils, government agencies and other key stakeholders to understand the Project and its benefits and impacts. This EIS is also intended to provide the necessary information to the consent authority to make an informed decision on the overall merits of the Project.

[1] The Stage 1 project is an approved development that would be operated in conjunction with the Project, and is considered to be 'related development' as defined by the NSW Government – Department of Planning, Housing and Infrastructure (DPHI) - State Significant Development Guidelines (i.e. SSD Guidelines) (DPHI, 2026a). This is discussed further in **Section 1.2** below.

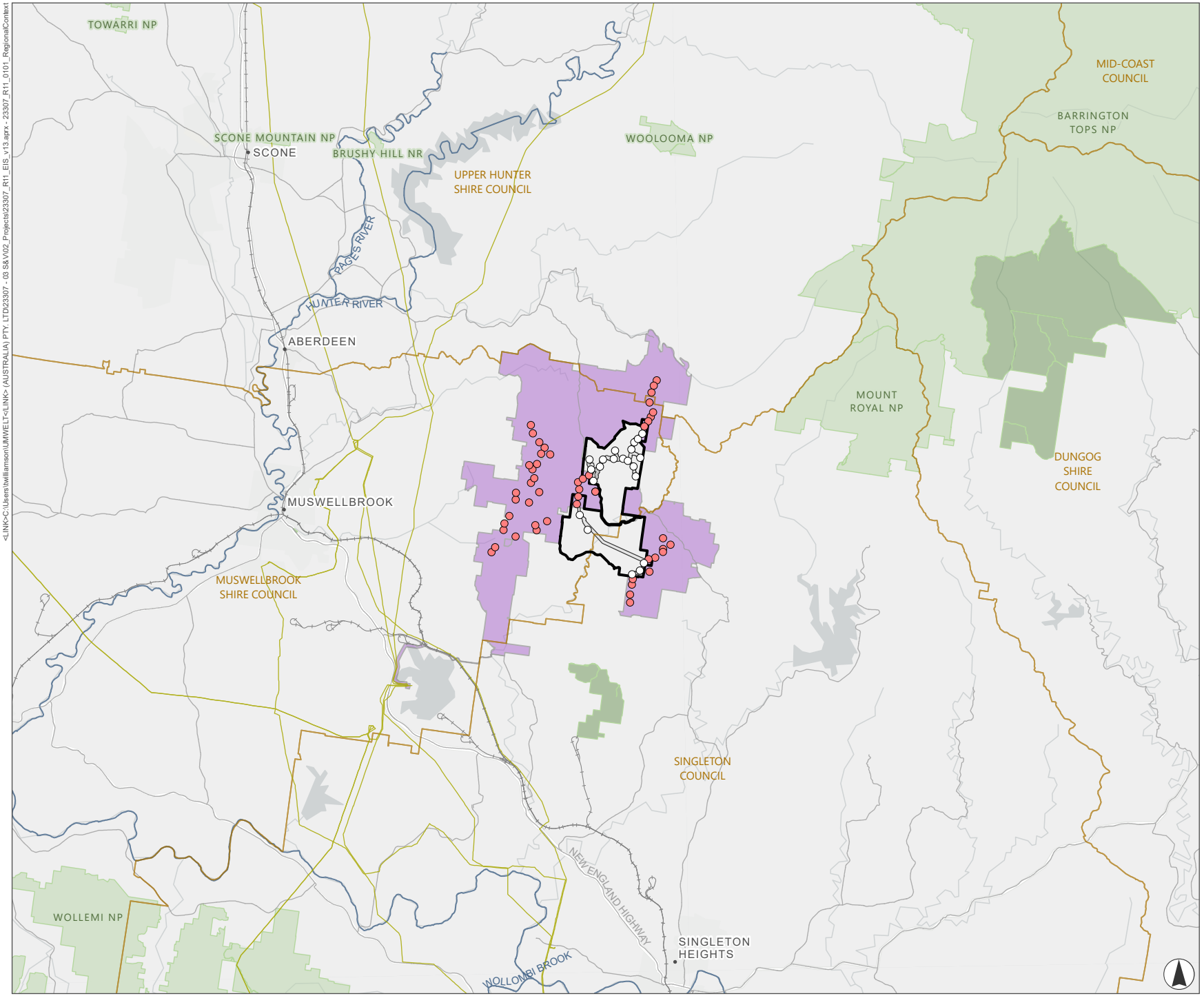


FIGURE 1.1
Regional Context

Legend

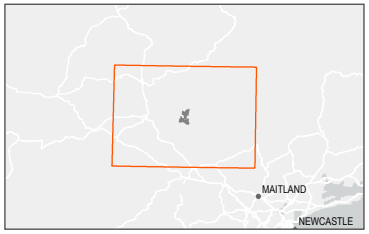
- Populated Place
- Road
- Railway Line
- River/Stream
- Electricity Transmission Line
- Local Government Area
- NPWS Reserves
- State Forest

Project

- Project Boundary
- Development Corridor
- Wind Turbine Generators

Stage 1 Project

- Stage 1 Project Area
- Wind Turbine Generators



0 2.5 5
Kilometres

Scale 1:350,000 at A4
GDA2020 MGA Zone 56

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Image Source: ESRI Basemap (2026) | **Data Source:** NSW DFSI (2026), SLR (2026), Ozark (2026), Ark Energy (2026)

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1.1 Project Overview

The Project will include the installation, operation, maintenance and decommissioning of up to 21 wind turbine generators (WTGs), ancillary infrastructure and temporary facilities associated with construction of the Project.

The key components of the Project include:

- Up to 21 (three (3) blade) WTGs, with a maximum blade-tip height of 250 metres (m) above ground level (AGL).
- Power infrastructure providing connection to the National Electricity Market (NEM), including:
    - One (1) on-site 330 kV substation and associated medium voltage transmission line connecting the on-site substation to the Stage 1 project electrical reticulation network.
    - One (1) overhead transmission line connecting the proposed WTGs in the south of the Project Area to the Stage 1 project electrical reticulation network.
    - An internal electrical reticulation network (i.e., underground 33 kV transmission lines) connecting all Stage 2 WTGs to the Stage 1 project electrical reticulation network.
- Permanent ancillary infrastructure including internal roads, hardstands, a substation, underground and overhead electricity transmission lines and poles, telecommunications facilities and utility services, permanent meteorological masts and water storage tanks.
- Off-site road works to facilitate upgrades and alterations to the existing road network along the proposed oversize overmass (OSOM) transport route, including the expansion on those already approved for the Stage 1 project. This is to enable the safe transportation of large infrastructure components (e.g., WTG blades, towers etc.), and other heavy vehicle usage to and from the Project Area. These are discussed in detail in **Section 3.2.9**.
- Temporary facilities including a temporary meteorological mast, materials laydown areas, concrete batching plant, environmental management and monitoring measures and signage.
- Project construction and grid connection will occur via the Stage 1 project infrastructure. The southern section of the Project will connect via an on-site collector substation and an overhead transmission line to connect the proposed WTGs the Stage 1 project electrical reticulation network. The northern section of the Project will connect via a low voltage 33 kV transmission network connecting to the Stage 1 project electrical reticulation network.

Temporary construction facilities proposed to facilitate the construction of the Stage 1 project will be utilised for the construction of this Project (i.e. Stage 2), including:

- Construction compound/s and site office buildings and storage areas, including fencing and screen as required.
- On-site concrete batching plants for use during the construction phase.
- Laydown areas used for wind turbine installation and storage of wind turbine components.
- Potential construction material areas such as borrow pits, quarry and rock crushing facilities.

The Project would also utilise the operations and maintenance (O&M) facility approved under the Stage 1 project.

The Project also seeks the option for subdivision and boundary adjustments to occur. These may be required to subdivide lands for the onsite collector substation which will connect the proposed WTGs to the Stage 1 project electrical reticulation network. From the Stage 1 project on-site substation, both the Project and the Stage 1 project will connect to the 330 kV Liddell Substation adjacent to the decommissioned Liddell Power Station. Other subdivisions may be required following the detailed design of the Project e.g. where physical roads do not follow the road easement.

The Project has been designed through a comprehensive process that incorporates community and stakeholder feedback, and the findings of technical studies to maximise positive environmental, social and economic outcomes while minimising adverse impacts. BCWF has undertaken extensive engagement with local landholders and other community stakeholders throughout the Project planning and assessment process. The Project has been designed using an iterative approach incorporating community and other stakeholder feedback from the ongoing engagement undertaken by BCWF since March 2024, with the design of the Project changing as a result of this feedback and to avoid impacts to key planning, environmental and social constraints, as detailed in **Section 2.6.3**.

1.2 Related Development

Related development, as outlined in the SSD Guidelines (DPHI, 2026) and described in the SSD Guidelines – Preparing an Environmental Impact Statement – Appendix B (i.e. SSD EIS Guideline), dated March 2026 (DPIE, 2026b), refers to any existing or approved development that would be incorporated into, or operated in conjunction with the Project. Related development can also include development by a proponent that is required for a project, but is subject to a separate development approval process.

The Project is a proposed extension to (and would operate in conjunction with) the Stage 1 project, which was approved by the NSW Independent Planning Commission (IPC) in February 2024.

The Stage 1 project is directly related to the Project and has been considered accordingly throughout this EIS, including the way in which the Project will physically connect to the Stage 1 project (refer to **Section 3.1**), and with respect to potential cumulative environmental, social and economic impacts.

A summary of the Stage 1 project and how it relates to the Project is provided in **Section 1.2.1** below.

Although related to the Stage 1 project, the Project should be assessed as a separate SSD project on its own merits due to the following reasons:

- The nature and extent of the changes associated with the Project are not considered to readily meet the “substantially the same development” test under section 4.55(2) of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).
- The Project involves a notable increase in development scale, with the total number of turbines increasing from 54 to 75 across both projects. This is considered to materially alter the character and scale of the approved Stage 1 project.
- The Project is likely to result in different environmental impacts that have not been previously assessed under the Stage 1 project.

Consideration of related development as described in the SSD EIS Guidelines (DPHI, 2026b) has been undertaken in **Section 4.3**, including any mandatory considerations under the Act and associated *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation) in **Appendix 4**.

1.2.1 Bowmans Creek Wind Farm – Stage 1

The Stage 1 project (SSD-10315) involves the construction, operation, maintenance and decommissioning of the following key project components:

- Up to 54 WTGs with a maximum tip height of 220 m, consisting of:
  - A three (3) blade rotor and nacelle mounted onto a tubular tower.
  - Crane hardstand area.
  - Laydown areas.
- Electrical infrastructure, including:
  - Up to two (2) collector substations and associated transmission line(s) to transmit the generated electricity into the existing high voltage network.
  - Connections between the WTGs and the collector substation/s, which will include a combination of underground cables and overhead powerlines.
- Operations and Maintenance Facility (O&M Facility).
- Storage facilities and laydown areas.
- Unsealed access tracks.
- Ongoing use of two (2) temporary wind monitoring masts and the installation of up to four (4) permanent monitoring masts.
- Temporary construction facilities (including concrete batching plant and rock crushing facilities).
- Minor upgrades to the road network to facilitate delivery of oversize or overmass (OSOM) loads to the Stage 1 project site, and to facilitate the construction of the transmission line.
- Administrative activities (including boundary adjustments and subdivisions).

As discussed in **Section 1.1**, the Project will rely on components of the approved Stage 1 project to facilitate connection to the grid, including portions of the approved electrical reticulation network, temporary construction facilities (construction compounds, site offices and storage areas, concrete catching plants, laydown areas etc.) and the O&M Facility. Each of these Stage 1 infrastructure components and facilities are within areas already assessed and approved for impact, as per the SSD-10315 project approvals documentation and development consent.

A detailed description of the approach to sharing infrastructure with the Stage 1 project is provided in **Section 3.1** and **Section 3.2.6**.

1.3 Project Objectives

The objectives of the Project are to:

- Establish a reliable and affordable source of energy for the people of NSW and contribute to reducing GHG emissions associated with energy generation.
- Positively contribute to State and Commonwealth renewable energy goals and targets.
- Align with the NSW Government's emissions reduction targets and the Electricity Strategy (as discussed in **Section 2.1.4**).
- Maintain partnerships with stakeholders and the community to minimise environmental, social and economic impacts (including potential cumulative impacts) and maximise benefits.

- Create employment opportunities during Project construction, operations and decommissioning in addition to community benefit sharing, assist to diversify the local economy; create training and employment opportunities for the local community; create business opportunities for local suppliers; and provide a significant investment in local infrastructure.
- Ensure that the highest safety and environmental standards are met during construction, operation and decommissioning of the Project.

1.4 The Proponent

Bowmans Creek Wind Farm Pty Ltd (i.e. BCWF) is the Proponent for the SSDA. As noted in **Section 1.0**, Ark Energy is the owner of BCWF.

Ark Energy was established in 2021 through the acquisition of Australian wind and solar developer Epuron Projects Pty Ltd (Epuron Projects) and owns a growing portfolio of wind and solar energy projects in Queensland, NSW, Northern Territory and Tasmania.

Ark Energy is an Australian subsidiary of Korea Zinc Co Ltd (Korea Zinc), the world's largest producer of zinc, lead and silver. Through its subsidiary, Sun Metals Corporation Pty Ltd, Korea Zinc has operated the Townsville Zinc refinery, which is the largest private employer in Townsville and has made a significant contribution to the regional economy of North Queensland for more than two-decades.

As shown by Korea Zinc's Sun Metals Refinery in Townsville, Korea Zinc's companies deliver strong regional economic investment. This is planned to continue through a portfolio of renewable energy projects across Australia.

Ark Energy is driven by the overarching goal of advancing decarbonisation in the energy sector. As a part of the Korea Zinc group, a pioneering member of the RE100 initiative, Ark Energy is dedicated to achieving 100% reliance on renewable energy for its global operations by 2050. Through their subsidiary organisation BCWF, Ark Energy aims to contribute significantly to the broader mission of decarbonising the energy supply, aligning with the global imperative to transition towards sustainable electricity sources.

Ark Energy is the proponent of 18 renewable energy projects across Australia which are at various phases of project delivery, including pre-approval design and assessment, construction, through to energy generation through operations.

Ark Energy is committed to achieve positive outcomes for the communities and environment within which its projects are developed in. To achieve this, Ark Energy, via BCWF, is committed to building strong relationships with key stakeholders and local communities as well as integrate consideration of environmental constraints into the Project design.

The Proponents details are summarised in **Table 1.1** below

Table 1.1 Proponent Details

Requirement	Details
Full Name/s	Bowmans Creek Wind Farm Pty Ltd
Postal Address	Level 2/275 George St, Sydney NSW 2000
Street Address	Bowmans Creek Road, Bowmans Creek 2330 NSW
ABN	64 655 242 274
Nominated Contact	Rebecca Riggs

1.5 Structure of this EIS

This EIS has been prepared in accordance with the requirements of Part 8, Division 5 of the NSW *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation). This EIS has been prepared in consideration of the:

- NSW Government – DPHI – Wind Energy Guideline (the Wind Energy Guideline), dated November 2024 (DPHI, 2024a).
- NSW Government – DPHI – Wind Energy Guideline – Technical Supplement for Landscape and Visual Impact Assessment, dated November 2024 (DPHI, 2024b).
- NSW Government – DPHI –Wind Energy Guideline–Technical Supplement for Noise Impact Assessment, dated November 2024 (DPHI, 2024c).

It has also been prepared with due regard to the SSD Guidelines (DPHI, 2026a), including where relevant:

- NSW Government – DPHI – State Significant Development Guidelines – Preparing an Environmental Impact Statement – Appendix B (SSD EIS Guideline), dated March 2026 (DPIE, 2026b).
- NSW Government – DPIE – Social Impact Assessment Guideline for State Significant Projects (the SIA Guideline), dated March 2026 (DPHI, 2026b).
- NSW Government – DPHI – Undertaking Engagement Guidelines for State Significant Projects (the Engagement Guidelines), dated March 2024 (DPHI, 2026c).
- NSW Government – DPIE – Cumulative Impact Assessment Guidelines for State Significant Projects (the CIA Guidelines), dated March 2026 (DPHI, 2026d).

Table 1.2 below outlines the overall structure of this EIS, having regard to the SSD EIS Guideline.

Table 1.2 EIS Structure

Component	Description	Relevant Section
Introduction	Introduces the Project, the Proponent and provides an outline of the structure of the document.	**Section 1.0**
Strategic Context	Outlines the strategic context for the Project, including the justification for the Project, a summary of the locality in which the Project is undertaken and an overview of the environmental, social and economic context.	**Section 2.0**
Description of the Project	Contains a description of the Project, including an overview of alternatives considered and strategies to avoid and minimise environmental impacts.	**Section 3.0**
Statutory Context	Summarises the relevant State and Commonwealth statutory context applicable to the approval process for the Project.	**Section 4.0** and **Appendix 4**
Engagement	Describes the stakeholder engagement program for the Project, outlines the environmental, social and economic matters identified by stakeholders and how they have been considered in this EIS.	**Section 5.0**

Component	Description	Relevant Section
Assessment of Impacts	Contains analysis of the environmental, social and economic matters relevant to the Project and the specialist assessments which have been undertaken for this EIS.	**Section 6.0**
Project Justification	Provides a justification and evaluation for the Project, having regard to the economic, environmental and social impacts of the Project and the principles of ecologically sustainable development.	**Section 7.0**
References	Provides a list of references within this EIS.	**Section 8.0**
SEARs Table	Provides a summary of the SEARs and how they have been addressed in this EIS. Additionally, this appendix includes the Commonwealth's Controlled Action Decision under the EPBC Act.	**Appendix 1**
Schedule of Land	Identifies all land parcels on which the development is proposed to occur.	**Appendix 2**
Detailed maps and plans	Provides maps and plans of the proposed Project, as well as GPS coordinates and elevations for the proposed WTG locations. Also included here are: • Maps showing the key constraints identified across the Project Area. • Strategic Concept Desings prepared by Stantec (2026) for the proposed road upgrades.	**Appendix 3**
Statutory compliance table	Provides a summary of all statutory requirements relevant to the assessment of the Project.	**Appendix 4**
Mitigation measures table	Provides a consolidated summary of all environmental, social and economic mitigation and management measures which will be implemented for the Project, consistent with the findings of this EIS and specialist assessments.	**Appendix 5**
Specialist assessment reports	Refer to **Table 1.3** below.	**Appendix 6** to **Appendix 22**
Cumulative Impact Scoping Summary	Provides an overview of potential cumulative impacts with approved and proposed major developments in the vicinity of the Project.	**Appendix 23**
Estimated Development Cost (Executive Summary)	Provides confirmation of the Project's Estimated Development Cost (EDC), based on a detailed EDC Report prepared by a suitably qualified Quantity Surveyor in accordance with the requirements of the SEARs. The full EDC report includes confidential information and has not been appended to this EIS but provided to DPHI separately.	**Appendix 24**
Consolidated Road Upgrades	Provides a consolidated list of road upgrades proposed for the Project. This includes reference to the Strategic Concept Designs for the road upgrades prepared by Stantec (2026), as included as part of **Appendix 3**.	**Appendix 25**

This EIS is also supported by the specialist assessment reports listed in **Table 1.3** below.

Table 1.3 Specialist Assessment Reports

Report	Author	Relevant Appendix
Landscape and Visual Impact Assessment (LCVIA)	Moir Studio	**Appendix 6**
Noise and Vibration Assessment (NVA)	Marshall Day Acoustics	**Appendix 7**
Biodiversity Development Assessment Report (BDAR)	SLR Consulting	**Appendix 8**
Aboriginal Cultural Heritage Assessment Report (ACHAR)	OzArk Environment & Heritage	**Appendix 9**
Historical Heritage Impact Assessment (HHIA)	OzArk Environment & Heritage	**Appendix 10**
Traffic and Transport Impact Assessment (TTIA)	Stantec Australia	**Appendix 11**
Water Resources Impact Assessment (WRIA)	WRM Water and Environment	**Appendix 12**
Air Quality Assessment (AQIA)	Zephyr Environmental	**Appendix 13**
Soil, Land and Agricultural Impact Assessment (SLAIA)	Minesoils	**Appendix 14**
Aviation Impact Assessment (AIA)	Aviation Projects	**Appendix 15**
Telecommunications Impact Assessment (TIA)	Middleton Group	**Appendix 16**
Human Health Assessment (EMF)	Middleton Group	**Appendix 17**
Bushfire Assessment Report (BAR)	Blackash Consulting	**Appendix 18**
Blade Throw Assessment (BTA)	Middleton Group	**Appendix 19**
Social Impact Assessment (SIA)	Umwelt	**Appendix 20**
Economic Impact Assessment (EIA)	Colliers International	**Appendix 21**
Preliminary Site Investigation (PSI)	Cavvanba Consulting	**Appendix 22**
Port of Newcastle to Project Route Study	Rex J Andrews Pty Ltd	**Appendix 26**

2.0 Strategic Context

2.1 Renewable Energy Market and Policy Context

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

The state's four (4) existing coal fired power stations being Bayswater, Eraring, Mount Piper, and Vales Point currently provide approximately three-quarters of NSW's electricity supply and two-thirds of the capacity required during peak demand, such as summer heat waves. All four (4) of these coal-fired power stations are scheduled to retire within the next 15 years (DPIE, 2020) by 2040, which began with the closure of the Liddell Power Station in 2023. The NSW Government is taking action to lead investment in new renewable generation to ensure an orderly transition away from coal (EnergyCo NSW, 2023).

The NSW Government's Electricity Strategy (DPIE, 2019) and Electricity Infrastructure Roadmap (the Roadmap) (NSW Government, 2020) set out a plan to deliver the State's first five (5) Renewable Energy Zones (REZs). These REZs will play a vital role in delivering affordable, reliable energy generation to help replace the State's existing power stations as they come to their scheduled end of operational life. These are discussed in detail in **Section 2.1.4** below.

Energy Corporation of NSW (EnergyCo), a NSW Government statutory authority, has been appointed under the *Electricity Infrastructure Investment Act 2020* as the Infrastructure Planner responsible for delivering the REZ's, including the Hunter-Central Coast REZ as discussed in **Section 2.1.4.4** below. EnergyCo is responsible for coordinating REZ transmission, generation, firming and storage projects to deliver efficient, timely and coordinated investment (EnergyCo, 2022a). Various government strategies, plans and policies such as Australian Energy Markey Operator's (AEMO) Integrated Systems Plan (ISP) (AEMO, 2024), the NSW Transmission Infrastructure Strategy (DPE, 2018) and NSW Electricity Infrastructure Roadmap identify the importance of the REZs in providing an effective way to integrate new generation, storage and transmission development (EnergyCo, 2023).

Coal-fired power generation across Australia's electricity mix fell to 52.7% in 2023, down from 54.6% in 2022. Similarly, gas-fired power generation currently generates 7.3% of energy, down from 8.9% in 2022. These incremental reductions in fossil fuels are a result of increasing renewable energy project added to the electricity mix (Clean Energy Australia, 2024). The share of renewables such as wind and solar in Australia's energy mix is expected to continually increase.

NSW has a strong pipeline of renewable energy projects which have the potential to contribute to achieving the current transition targets. However, significant investment is required from the private sector to achieve sufficient renewable energy supply that will support NSW's transition to renewable energy and the retirement of the existing fossil fuel generated supply.

The Project will contribute to meeting the NSW Government objectives of providing a secure electricity supply for the people of NSW. The Project fits within the current strategic direction of the NSW and Australian energy generation market and will assist in achieving the planned transition to more renewable energy to meet Australia's energy needs.

As a renewable energy project located within the Hunter-Central Coast REZ, the Project is located within a defined area planned for renewable energy development by the NSW Government. Alignment with global, Commonwealth and State GHG reduction and renewable energy commitments are discussed in the subsequent sections below.

2.1.1 United Nations Sustainable Development Goals (SDGs)

The United Nations 2030 Agenda for Sustainable Development includes Sustainable Development Goals (SDGs) is designed to build for a sustainable resilient future. There are 17 SDGs targeting 169 individual measures designed to improve economic, social and environmental sustainability.

All members of the United Nations agreed to work towards achieving the SDGs by 2030. Goal 7 and Goal 11 relate to energy access and an increase in renewables and then reducing the adverse impacts of cities with a focus on air quality and waste.

The Project will provide a source of renewable energy, increasing the proportion of renewable energy generation in Australia. It will also assist to reduce reliance on fossil fuels for energy generation, resulting in a reduction of GHG emissions and improve air quality.

2.1.2 United Nations Framework Convention on Climate Change (UNFCC) Conference of Parties (COP29)

The COP 29 UN Climate Change Conference in Baku, Azerbaijan, was the 29th conference of the UNFCCC. The objectives of the conference were to secure new, global climate goals and to decide new efforts to reduce the greenhouse gas emissions to ensure global warming remains under 1.5 degrees Celsius (UN Climate Change, 2024). A new climate finance goal of at least $300 billion annually by 2035, tripling the previous target as well as efforts to mobilise $1.3 trillion per year to support reducing greenhouse gasses in developing nations (Waskow, 2024).

Key messages from the conference were to focus on building key private and public sector relationships to achieve the $1.3 trillion investment in developing nations.

Australia committed $125 million to Pacific renewable energy initiatives and $2.5 million to the Pacific Climate and Health Resilience Package. Australia also contributed $50 million to the Fund for Responding to Loss and Damage as well as an investment of $126 million to boost climate-focused businesses across Southeast Asia, South Asia, and the Pacific (DCCEEW, 2024).

An objective of the Project is to support the transition away from fossil fuels and contribute to reducing GHG emissions associated with energy generation, which generally aligns with the objectives and outcomes of COP29.

2.1.3 Commonwealth Renewable Energy Commitments

Australia is one of the 194 parties from around the world (comprising 193 States and the European Union) signed to the international climate change agreement (i.e. the Paris Agreement). The Paris Agreement aims to:

- Hold the increase in the global average temperature to below 2°C above pre-industrial levels, and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels.

- Increase the ability (of nations) to adapt to the adverse impacts of climate change and foster climate resilience and low GHG emissions development, in a manner that does not threaten food production.
- Make finance flows consistent with a pathway towards low GHG emissions and climate resilient development.

The Paris Agreement seeks to meet its objectives by developing programs and mechanisms that:

- Require participating parties to prepare and communicate GHG mitigation contributions. Parties were expected to set mitigation targets for 2020 and then develop new targets every five (5) years. Each successive target is expected to represent a larger mitigation effort than the previous target.
- Promote climate change resilience and adaptation.
- Provide mitigation and adaptation funding to developing countries.
- Foster mitigation and adaptation technology transfer between Parties.
- Require participating Parties to report progress towards their mitigation contributions on an annual basis.

Australia signed the Paris Agreement on 22 April 2016. The obligations under the Paris Agreement are driving national GHG policy between 2020 and 2030. Australia's commitment to the Paris Agreement includes reducing GHG emissions by 43% on 2005 levels by 2030 (Evans, 2022).

In 2022, the Commonwealth Government stated its ambition to achieve net zero emissions by 2050 (IEA , 2021). Australia's Nationally Determined Contribution (NDC) prescribes an unconditional economy-wide target to reduce greenhouse gas emissions, and states that future policies will target emissions generated from energy use, industrial processes, agriculture, landuse, land-use change, forestry and waste.

The Project, as a large-scale renewable energy project, will contribute to achieving Australia's GHG emission reduction targets through reducing emissions from energy production in NSW.

2.1.3.1 National Electricity Market

The National Electricity Market (NEM) is a wholesale market through which electricity is traded in Australia. The NEM incorporates 40,000 km of transmission lines and cables and spans the eastern and south-eastern coasts, including QLD, NSW, ACT, SA, VIC and TAS (AEMO, 2022). It delivers around 80% of all electricity consumption in Australia (DCCEEW, 2023).

The NEM facilitates the exchange of electricity between generators and retailers. Retailers resell the electricity to businesses and households. AEMO controls the NEM and is responsible for monitoring electricity consumption and for the security and reliability of the power system.

AEMO recognises the NEM needs to be modernised to accommodate and respond to changes in electricity generation (i.e. retirement of coal-fired power stations and replacement with renewable energy generation), combined with transmission integration and storage technologies, such as batteries. Replacement with renewable energy ensures there is sufficient capacity in the system to address peak demand events and to ensure price competition in electricity markets. There is also an increasing demand from consumers and financiers for greener energy production.

NSW's reliability outlook remains delivery-dependent: coal exits remove large volumes of energy and essential system services, while replacement capacity must arrive ahead of closures and be supported by transmission and system-security assets. AEMO's latest Electricity Statement of Opportunities (AEOM, 2025) indicates the near-term NSW reliability gap previously associated with Eraring's 2025 closure is no longer forecast, reflecting updated closure timing and additional committed/anticipated supply. However, AEMO emphasise that risks re-emerge later this decade if projects (generation, storage, transmission and consumer energy resources) are not delivered on schedule, with NSW expected to face a forecast shortfall from 2027–28 under some scenarios, and further shortfalls later as larger coal units approach retirement.

The Project represents an investment in large scale renewable energy production which will provide essential input into the Australia's electricity mix needed in the transition from coal-fired generation to renewable generation.

2.1.3.2 National Renewable Energy Priority List

The National Renewable Energy Priority List (Priority List) has been developed by the Australian Government in collaboration with the State and Territory Governments. The Priority List aims to provide coordinated support to planning and approval processes for select priority renewable energy projects across Australia, identifying projects that will receive additional regulatory support from both the Commonwealth, and State and Territory Governments.

The inaugural Priority List identified a list of 56 priority projects across Australia, consisting of 24 transmission projects and 32 generation and storage projects.

To be eligible for inclusion in the inaugural Priority List, projects were required to have a capacity of greater than 30 MW, in pre-construction, on-grid, and scheduled for completion by 31 December 2031 along with key transmission projects to support the integration of renewables into the grid. The Priority List is being regularly updated to support continued facilitation of projects through required regulatory pathways.

The Project (and the Stage 1 project BESS that is being progressed as a separate modification) has been identified for inclusion in the Priority List, reflecting its strategic importance in supporting the energy transition and advancing national climate and energy objectives. As a designated priority project, it is expected to contribute to increasing renewable energy generation capacity and enhancing energy security.

This designation also recognises the potential of the Project to deliver broader economic and social benefits, including regional employment, infrastructure investment, and support for local communities. Inclusion on the Priority List strives to provide coordinated support for regulatory planning and environmental approval processes, while maintaining comprehensive evaluation of potential impacts on biodiversity, land use, water resources, the wider community and cultural heritage.

Overall, the Project represents a key component of national efforts to accelerate renewable energy deployment, while balancing environmental protection and sustainable development outcomes.

2.1.4 NSW Renewable Energy Commitments

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

This framework is being delivered through:

- the Climate Change Fund
- developing an economic appraisal methodology to value GHG emissions mitigation
- embedding climate change mitigation and adaptation across government operations
- building on NSW's expansion of renewable energy
- developing action plans and strategies.

In 2013, the NSW Government released the Renewable Energy Action Plan (REAP) and the NSW Energy Efficiency Action Plan (EEAP).

The REAP aimed to increase the generation, storage and use of renewable energy in NSW, at least cost to customers and with maximum benefits to NSW. The three (3) core goals of the REAP were to attract renewable energy investment, build community support for renewable energy and attract and grow expertise in renewable energy. Based on the implementation of the REAP, renewable energy is now well-placed to play a leading role in meeting NSW's energy needs into the future.

2.1.4.1 Renewable Energy in NSW

As at 2025–2026, NSW has more than 15 GW of installed and approved renewable electricity generation, with renewables now supplying around 35–45% of the State's electricity in strong quarters. Renewable capacity continues to expand rapidly as coal-fired generation progressively retires (NSW Government, 2026), (Clean Energy Regulator, 2026).

The change in the contribution of renewable energy between 2008 and 2024 is illustrated below in **Figure 2.1**. The contribution of renewable energy includes sources such as large scale and rooftop solar, hydro power stations, wind power and biomass power stations.

The growth in renewable energy has been assisted by the NSW Government's Electricity Infrastructure Roadmap (refer to **Section 2.1.4.4**), which aims to transform the electricity system into one that is cheap, clean and reliable.

The NSW Government is leveraging opportunities for more private-sector investment in renewable energy and dispatchable supply to build a reliable and self-sufficient renewable energy supply into the future.

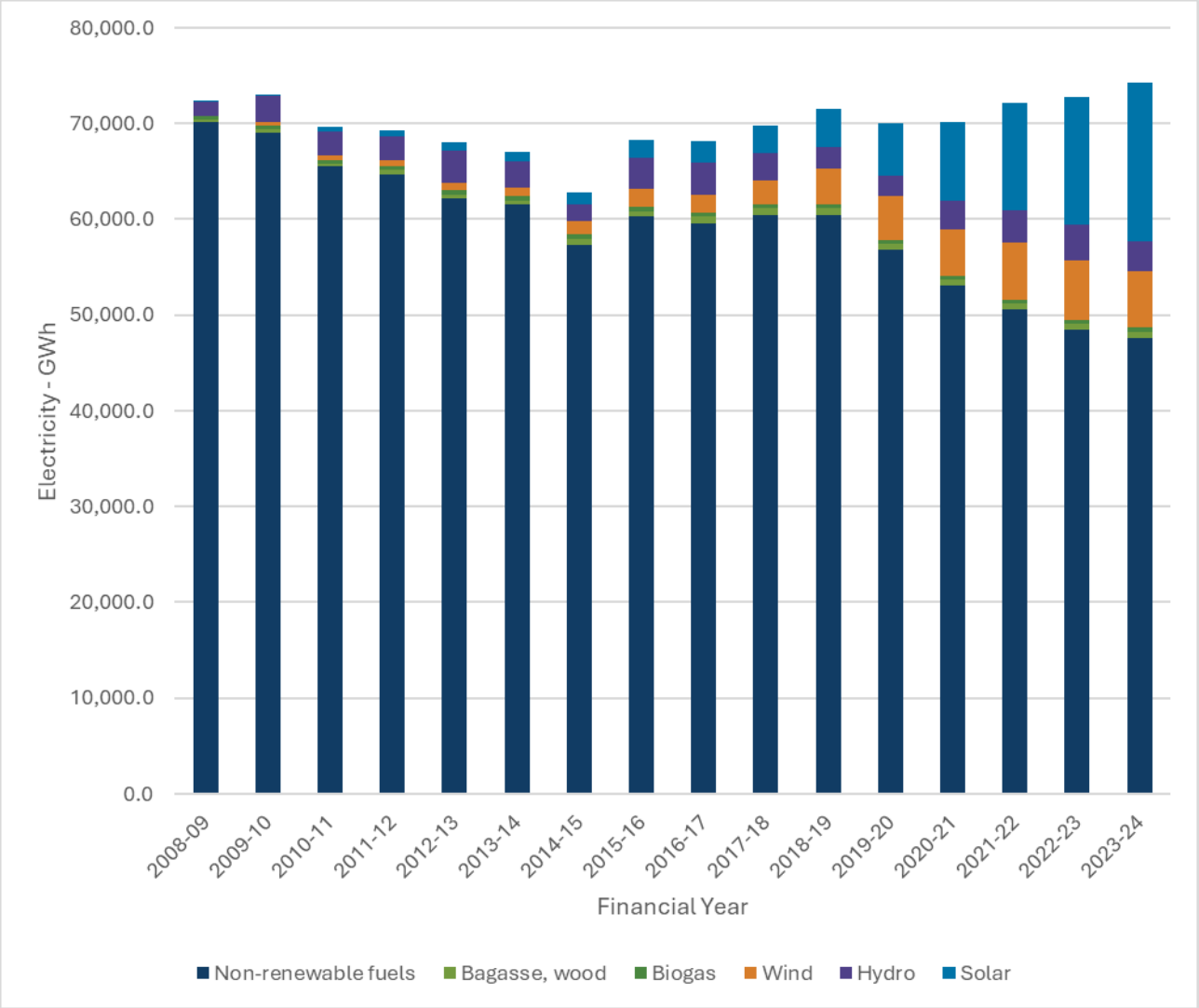


Figure 2.1 Electricity Fuel Sources for NSW (2008 to 2024)

Source: (DCCEEW, 2024)

2.1.4.2 NSW Net Zero Plan Stage 1: 2020–2030

The NSW Net Zero Plan – Stage 1: 2020–2030 (DPIE, 2020) sets out how the NSW Government will deliver near-term action to place the State on a credible pathway to achieving net zero GHG emissions by 2050, while maintaining economic growth, jobs and quality of life. The plan's core aim is to reduce NSW emissions by 35% below 2005 levels by 2030 through measures that improve productivity and affordability rather than imposing abrupt economic restrictions on private industry. It frames climate action as an opportunity to modernise the economy, lower energy costs and support regional and industry growth, while preparing NSW for further emissions reductions beyond 2030.

The plan's main actionable outcomes focus on accelerating the uptake of proven, cost-effective emissions reduction technologies across electricity, transport, buildings, industry and agriculture, as these are expected to deliver the majority of abatement this decade. Complementing this, the Government commits to empowering households and businesses with better information, incentives and market signals so they can make choices that reduce emissions and living costs at the same time.

The plan also prioritises targeted investment in innovation and emerging low-emissions technologies to ensure NSW remains competitive and capable of deeper decarbonisation after 2030 and commits the NSW Government to lead by example by reducing emissions from its own operations. Delivery is supported through a coordinated set of funded initiatives, backed by approximately $2 billion in NSW and Commonwealth investment over 10 years, providing certainty for industry and investors while laying the foundation for NSW's longer-term net zero transition.

The Project is consistent with the objective of the NSW Net Zero Plan Stage 1: 2020–2030.

2.1.4.3 NSW Electricity Strategy

The NSW Electricity Strategy (DPIE, 2019) outlines the NSW Government's comprehensive plan to ensure a reliable, affordable, and sustainable electricity system. The primary goals of the strategy are to improve the efficiency and competitiveness of the electricity market, reduce electricity bills for consumers, and support the transition to a cleaner energy mix. This involves leveraging market forces to deliver firmed renewables, which are now the most cost-competitive form of new generation.

A major component of the strategy is the creation of REZs, which are designed to coordinate the development of renewable energy projects and associated infrastructure. This approach aims to attract private investment, reduce barriers to entry for new generation, and ensure the construction of new generation capacity to replace retiring power stations

The expected outcomes of the NSW Electricity Strategy are significant. By implementing these measures, the government anticipates a reduction in household electricity bills by approximately $40 per year, the creation of at least 1,200 jobs, and the attraction of $8 billion in private investment, primarily in regional areas (DPIE, 2019). Furthermore, the strategy aims to maintain the reliability of the electricity system and improve environmental outcomes by increasing the share of renewable energy in the state's electricity mix (DPIE, 2019).

Looking ahead, the next steps for the NSW Government involve continuing to support the market in delivering reliable and affordable electricity while protecting natural resources and communities. This includes ongoing efforts to reduce regulatory barriers, promote innovation in energy technologies, and ensure the successful implementation of the REZ's.

2.1.4.4 NSW Electricity Infrastructure Roadmap

The NSW Electricity Infrastructure Roadmap builds on the framework set out in the NSW Electricity Strategy taking an integrated approach to all demand and supply options, including action by households and small businesses, demand management and investment in large-scale, affordable and reliable generation.

The Electricity Infrastructure Roadmap (NSW Government, 2020) aims to support the private sector to deliver at least:

- 12 GW of new renewable electricity generation.
- 2 GW of long-duration storage, such as pumped hydro.

This is to be achieved through the delivery of five (5) REZs, comprising the Central West Orana, South West, New England, Hunter-Central Coast and Illawarra REZs. These zones will serve as 'modern day power stations', combining:

- new renewable energy infrastructure, including generators (such as wind and solar farms)
- storage (such as batteries and pumped hydro)
- high-voltage transmission infrastructure.

The development of the REZs is expected to deliver a range of benefits both within the REZs and to NSW as a whole (EnergyCo, 2023), including:

- energy bill savings from reduced wholesale electricity costs
- emissions reduction from a cleaner energy sector
- reliable energy from significant amounts of new energy supply
- host community benefits through strategic planning and best practice engagement and formalised benefit sharing arrangements.

The Project is consistent with the objectives of the NSW Electricity Strategy and Infrastructure Road Map, in aiming to provide large-scale renewable electricity generation that is affordable and reliable.

Hunter-Central Coast REZ

The Hunter-Central Coast REZ was formally declared by the Minister for Energy under section 19(1) of the *Electricity Infrastructure Investment Act 2020* and published in the NSW Gazette on 9 December 2022 (EnergyCo, 2022).

The location of the Hunter-Central Coast REZ was selected based on its excellent renewable energy resources and can utilise existing power stations, rehabilitated mining land, electricity network infrastructure, port and transport infrastructure and a skilled workforce (EnergyCo, 2023).

The Hunter-Central Coast REZ has an intended network capacity of 1 GW. Importantly, the capacity of the Hunter-Central Coast REZ is likely to increase over time with the retirement of coal-fired power stations, re-purposing of mining land and the growth of offshore wind.

Between December 2021 and February 2022, EnergyCo ran a Registration of Interest (ROI) process for the Hunter-Central Coast REZ. This was the first step in engaging with industry on the design of the REZ.

The Hunter-Central Coast REZ attracted a significant response with commercial interest in renewable generation and storage projects representing almost 40 gigawatts and more than $100 billion of potential investment.

In summary, these commercial parties registered interest in:

- 24 solar energy projects
- 13 onshore and seven (7) offshore wind energy projects
- 35 large-scale batteries
- eight (8) pumped hydro projects.

The Project is strategically located within the Hunter-Central Coast REZ, as shown in **Figure 2.2** below. Although not contributing directly to the generation capacity indicated for this REZ, the Project will assist in providing a reliable energy source and associated GHG emission reductions, consistent with the broader NSW Electricity Strategy and Infrastructure Road Map.

2.1.5 Regional and Local Renewable Resources

Wind energy is known to be one of the cheapest forms of new build large-scale energy generation and NSW has significant wind resources. The Hunter-Central Coast REZ has been identified as a suitable location to support wind energy development with consistently high average wind speeds and close proximity to existing and planned transmission infrastructure (EnergyCo, 2022). The wind resource for the Project Area and its immediate surrounds is identified in **Figure 2.3** below.

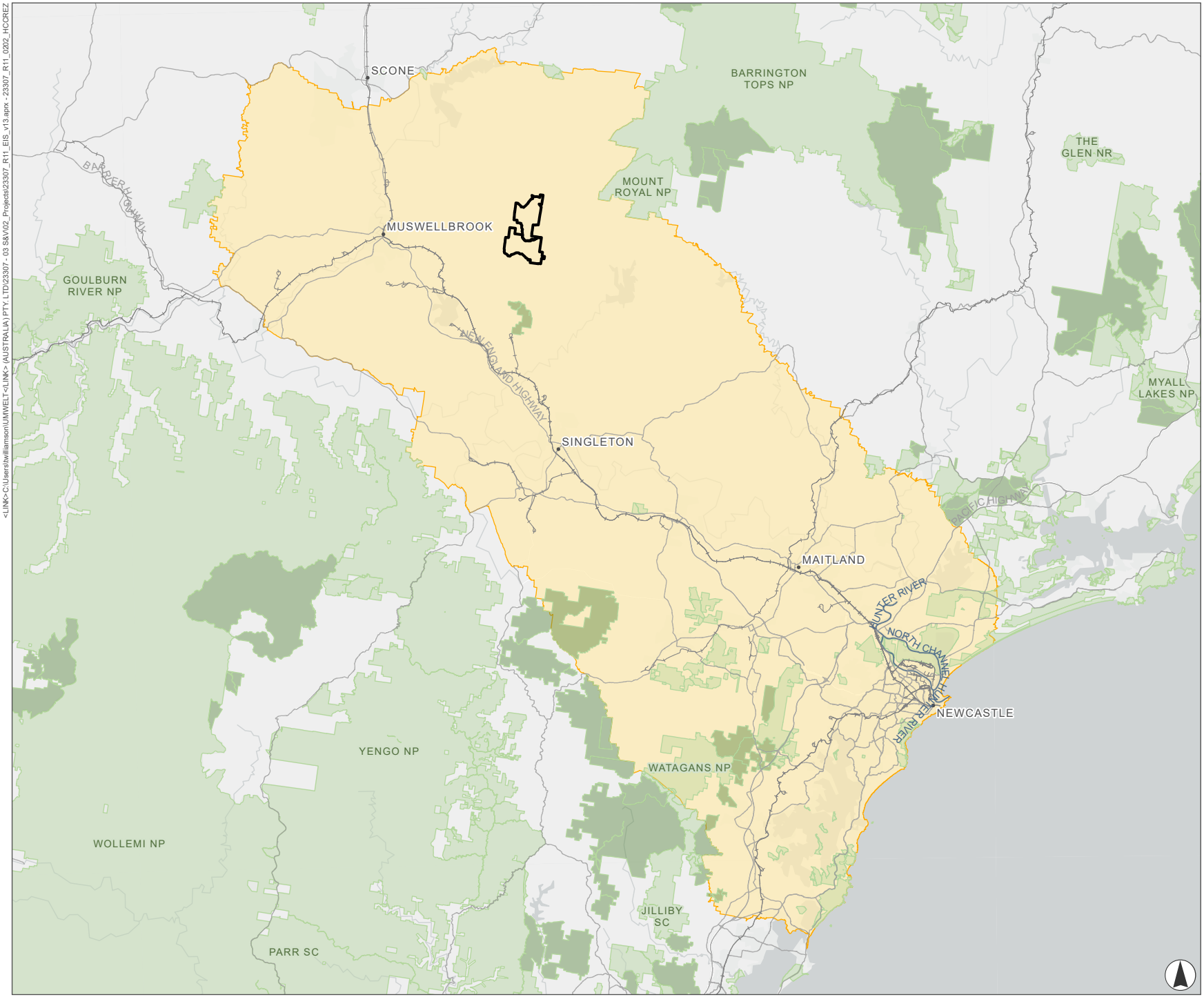


FIGURE 2.2

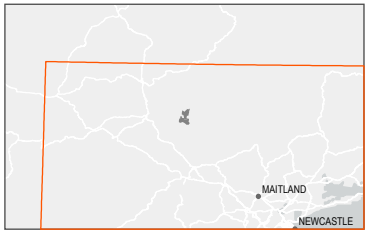
Hunter-Central Coast Renewable Energy Zone

Legend

- Populated Place
- Road
- Railway Line
- River/Stream
- NPWS Reserves
- State Forest
- Hunter-Central Coast Renewable Energy Zone

Project

- Project Boundary



0 10 20

Kilometres

Scale 1:800,000 at A4
GDA2020 MGA Zone 56

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Image Source: ESRI Basemap (2026) | **Data Source:** NSW DFSI (2026), SLR (2026), Ozark (2026), Ark Energy (2026)

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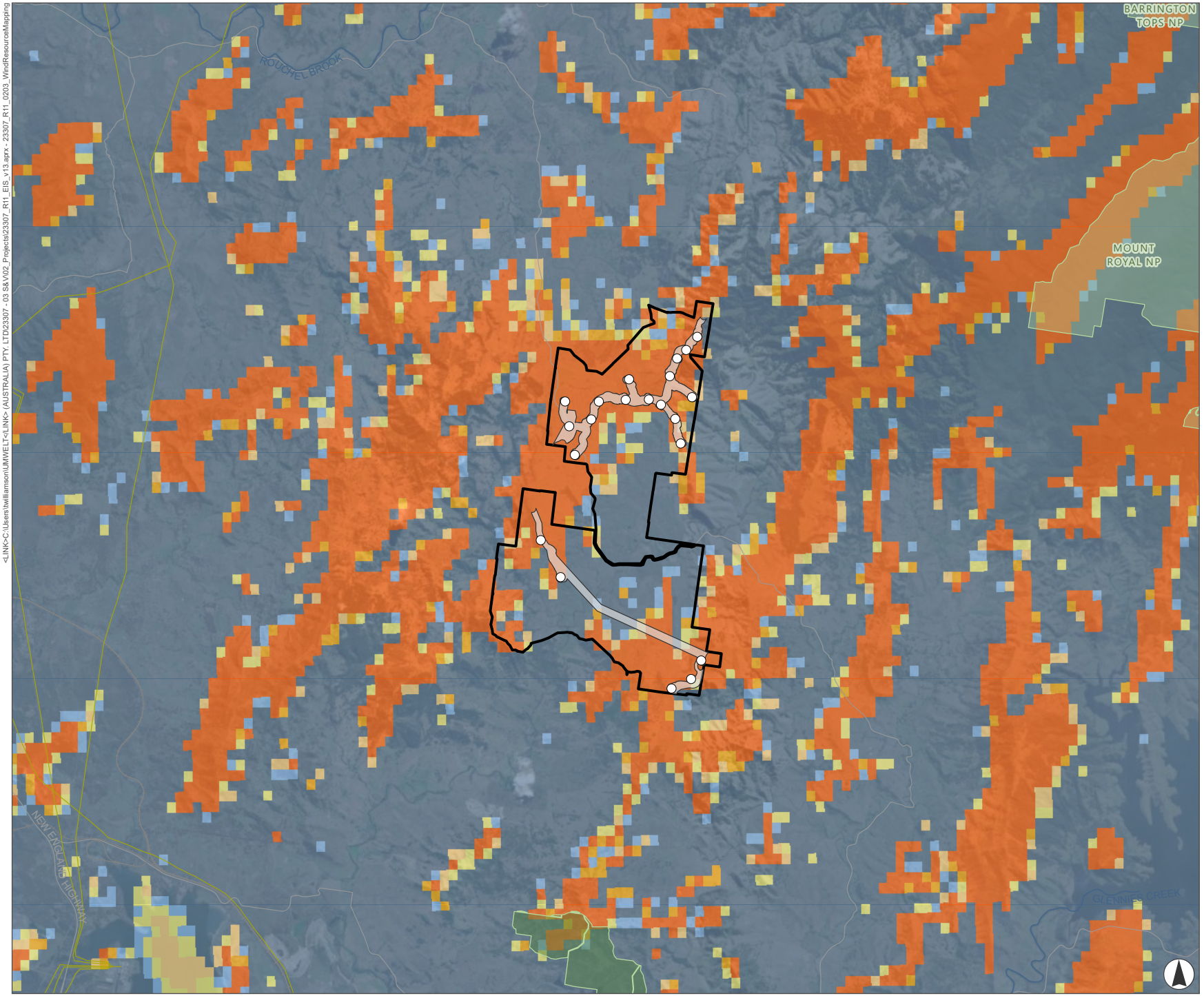


FIGURE 2.3
Wind Resource Mapping

Legend

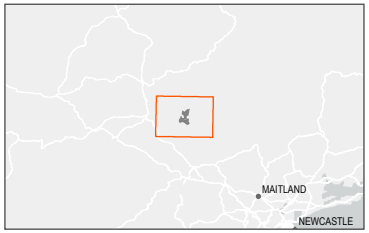
- Road
- Railway Line
- River/Stream
- Electricity Transmission Line
- NPWS Reserves
- State Forest

Project

- Project Boundary
- Development Corridor
- Wind Turbine Generators

Wind Speed 100m Above Ground Level (m/s)

- <6.65
- 6.65 - 6.7
- 6.7 - 6.75
- 6.75 - 6.8
- 6.8 - 6.85
- >6.85



0 2.5 5

Kilometres

Scale 1:140,000 at A4
GDA2020 MGA Zone 56

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2.2 Regional and Local Strategies and Plans

2.2.1 Hunter Regional Plan 2041

The Hunter Regional Plan 2041 was published in 2022 and is a comprehensive 20-year land use strategy developed in accordance with the EP&A Act (NSW DPE, 2022). It encompasses the LGAs of Cessnock, Dungog, Lake Macquarie, Maitland, MidCoast, Muswellbrook, Newcastle, Port Stephens, Singleton, and Upper Hunter. By integrating each council's local strategic planning statements, the plan acknowledges shared council and community strategic plans.

The primary goal of the Hunter Regional Plan 2041 is to establish a strategic land use framework that promotes sustained economic growth and diversification in one of Australia's most diverse and liveable regions. It aims to unlock sustainable growth opportunities, attract investment, and provide a variety of housing and lifestyle options. This will help maintain the Hunter Region's status as a leading regional economy in Australia.

The plan outlines how the former DPE (now DPH) will work collaboratively with councils, local Aboriginal land councils (LALCs), state agencies, and other stakeholders. This collaboration focuses on regionally significant growth areas to achieve the plan's vision and objectives efficiently. By doing so, the plan seeks to ensure that the Hunter Region continues to thrive and develop in a sustainable and inclusive manner.

The Project aligns and furthers the region towards three (3) of the nine (9) objectives of the Hunter Regional Plan 2041 as outlined below:

- **Objective 1:** Diversify the Hunter's mining, energy and industrial capacity. The Project increases the regions electricity generation capacity by up to 120 MW and introduces on average, 70 direct FTE construction positions and approximately 10 direct FTE operational positions. As well as increasing energy generation and construction jobs for the region, the Project will diversify the commercial industries traditionally conducted in the region.
- **Objective 7:** Reach net zero and increase resilience and sustainable infrastructure. Comparative to traditional electricity generated through coal mining, the Project will produce energy with minimal greenhouse gas emissions. While energy developed from renewable source, significantly reduce carbon emissions compared to fossil fuels, they are not inherently net zero by themselves. As well as reduce the contribution of the regions carbon emissions, the Project offers a sustainable source of electricity as well as increases the resilience of the region through diversification of the economic profile of the Hunter region.
- **Objective 9**: Sustain and balance productive rural landscapes. The Project will enable the continued agricultural use of the Project Area for the existing agricultural activities. As outlined in **Section 6.13.2.2**, the Project will result in a $99,905 reduction in agricultural output for host landholders while increasing the financial resilience of existing landholders' operations through lease arrangements for hosting Project assets. Therefore, the Project increases the net productivity of the rural landscape while balancing the financial position of landholders.

2.2.2 Upper Hunter Community Strategic Plan 2027

The Upper Hunter Community Strategic Plan (CSP) 2027 was developed in 2017 and outlines a vision for the next 10 years, focusing on what the community values and aspires to achieve (Upper Hunter Shire Council, 2017). It is built around four (4) key pillars of sustainability: Environmental, Social (referred to as Community Life), Economic (referred to as Economy and Infrastructure), and Leadership and Community Engagement. The plan emphasises the importance of community engagement to ensure diverse views are represented. To achieve this, the Council has adopted a new approach to reach out to traditionally hard-to-reach groups, encouraging participation from all community members. This inclusive strategy aims to frame the conversation and identify key issues that need to be explored, ensuring the plan truly reflects the community's aspirations and needs.

The CSP strategies fall under nine (9) goals developed through this inclusive approach to community participation. These goals include:

- A supported community.
- Promote wellbeing and a connected, healthy and happy community.
- Protect the natural environment.
- Plan for a sustainable future.
- A sustainable and prosperous economy.
- Increase, enhance and maintain civil infrastructure, Community assets and open spaces to meet the needs of current and future generations.
- Enhance and improve the road network and bridges to meet the needs of current and future generations and communicate priorities and progress to the community.
- Provide community leadership.
- Advocate for the community.

Each of the goals is supported by community strategies which provide minor targets to aid in reaching the broader CSP goals. In total, there are 42 community strategies, and the Project aligns with at least seven (7) of these strategies, as summarised below:

- CS10: Advocate for, facilitate and support programs that protect and sustain our diverse environment for our future generations.
- CS11: Encourage and support active Community participation within our Community to care for our environment and provide for a sustainable future.
- CS12: Ensure that all actions, decisions and policy response to natural hazards and climate change remain current and reflect capacity, Community expectations and changes in environmental and climate change information.
- CS15: Plan, facilitate and provide for a changing population for current and future generations.
- CS18: Encourage a diverse economy whilst promoting and preserving our agriculture and equine industries.
- CS20: Encourage and support innovative industry and a diversity of businesses that provide a range of services and employment opportunities for current and future generations.
- CS27: Maintain and upgrade the road network and bridges.

2.2.3 Upper Hunter Land Use Strategy 2017

The Upper Hunter Land Use Strategy 2024–2041 was developed to address the evolving needs of the Upper Hunter region in NSW (NSW Government, 2017). This strategy emerged from extensive community consultation and stakeholder engagement, reflecting a collective vision for sustainable development. The background of this strategy is rooted in the region's rich agricultural heritage, significant mining activities, and the need to balance these with environmental conservation and community well-being.

The vision of the strategy is to create a resilient and prosperous Upper Hunter region that harmonises economic growth with environmental stewardship. It aims to support diverse industries, including agriculture, mining, and tourism, while ensuring that natural resources are managed sustainably. The strategy envisions a future where the region's unique landscapes and biodiversity are preserved, and communities thrive with improved infrastructure and services.

The core objectives of the Upper Hunter Land Use Strategy 2024-2041 include promoting sustainable land use practices, enhancing economic opportunities, and protecting the environment. It seeks to provide clear guidelines for land use planning, ensuring that development is compatible with the region's ecological and cultural values. Additionally, the strategy aims to mitigate land use conflicts, particularly between agricultural and mining activities, by implementing rigorous assessment and regulatory frameworks. Ultimately, the strategy strives to foster a balanced and sustainable approach to land use that benefits all stakeholders in the Upper Hunter region.

The Upper Hunter Land Use Strategy 2024–2041 emphasises the development of renewable energy projects, such as wind and solar farms, by identifying suitable locations and streamlining approval processes. It aims to balance these developments with the preservation of agricultural land and natural habitats. The strategy also encourages the adoption of innovative technologies to enhance energy efficiency and reduce greenhouse gas emissions, supporting research and fostering partnerships to drive sustainable energy initiatives.

Overall, the Project aligns with the Upper Hunter Land Use Strategy 2024–2041 as it envisions the Upper Hunter region as a leader in renewable energy, contributing to sustainability goals and providing economic benefits and job opportunities for local communities.

2.2.4 Muswellbrook Shire Council Local Strategic Planning Statement 2020–2040

The Muswellbrook Shire Council Local Strategic Planning Statement 2020-2040 (LSPS) was developed to guide the region's growth and development from 2020 to 2040 (Muswellbrook Shire Council, 2020). The background of this strategy is rooted in the need to address the unique challenges and opportunities faced by the Muswellbrook Shire, particularly in relation to its significant role in the energy sector and its rich agricultural heritage. The LSPS acknowledges the traditional custodians of the land, the Wanaruah and Kamilaroi people, and aims to respect and incorporate their cultural heritage into future planning.

The vision of the LSPS is to create a sustainable, innovative, and resilient community that embraces technology and innovation while preserving its natural and cultural heritage. The strategy envisions a future where the Shire is a leader in environmental sustainability, economic diversity, and social inclusivity. It aims to balance growth with the protection of valuable agricultural land and the responsible transition of mining and power generation sites.

The Project aligns with the core objectives of the LSPS that are centred around several key themes:

- Firstly, it aims to foster economic prosperity by encouraging technological advancements and innovation. This includes planning for the transition of mine and power station sites before their closure to ensure they are repurposed effectively.
- Secondly, the strategy emphasises the importance of protecting important agricultural land to maintain the Shire's agricultural productivity.
- Thirdly, it seeks to ensure that the mineral resource and power generation industries are productive, accountable, and considerate of surrounding land uses.
- Lastly, the LSPS focuses on enhancing community wellbeing by promoting social equity, cultural vitality, and environmental sustainability.

2.2.5 Singleton Shire Council – Local Strategic Planning Statement 2041

The Singleton Shire Local Strategic Planning Statement was endorsed by the Singleton Council in July 2020 and is an overarching strategy which outlines the twenty-year vision for land use and development for the Singleton Shire Council LGA (Singleton Council, 2020).

The Singleton Shire Local Strategic Planning Statement states that "*in order to minimise impacts on employment rates from downturns in the mining industry, as well as to plan for the eventual winding down of coal mining activities in the LGA, steps need to be taken during the life of this plan to grow other industries in the LGA, so as to better balance the local industry base.*"

Furthermore, it has identified opportunities in the higher altitude areas of the LGA to generate electricity from wind power.

The Project is consistent with the vision of the Singleton Shire Local Strategic Planning Statement, supporting diversity of local industries within the LGA, and contributing to the generation of renewable energy through wind power.

2.2.6 Singleton Shire Council – Community Strategic Plan 2022–2032

The Singleton Shire Community Strategic Plan recognises that responding to the changing environment is key in delivering upon the United Nations Sustainable Development Goals (SDGs), and notes that preserving and sustaining the environment and the longevity of natural resources, while driving an increase in the use of renewable energy, are key opportunities where the region can respond (Singleton Council, 2022).

The Project will support the key relevant goals and objectives presented in the regional and local plans and strategies presented above.

2.3 Environmental Context

The following sections provide an overview of the regional and local environmental context for the Project. **Section 2.3.1** to **Section 2.3.6** and supporting figures provide general environmental context for the Project Area, including land use (**Figure 2.4**), land ownership (**Figure 2.5**), land use zoning (**Figure 2.6**), topography and drainage features (**Figure 2.7**), groundwater (**Figure 2.8**), and land and soil capability (**Figure 2.9**).

2.3.1 Land Use and Ownership

The Project Area and its surrounds are characterised by existing agricultural land uses with associated rural residences. Land within and surrounding the Project Area has been subject to extensive historical vegetation clearing associated with agricultural land uses. Agriculture is the predominant land use in the Project Area, primarily grazing of modified pastures, as well as small areas of residential and farm infrastructure, and other minimal use, as shown on **Figure 2.4**.

The EIS and relevant specialist assessments have identified two (2) categories of residences, as summarised below and shown on **Figure 2.5**.

- **Associated residences**, including:
    - Receivers Q17-1, Q17-3 and Q17-5, for which the landowner has reached an agreement with BCWF to host Project infrastructure and in relation to the management of impacts.
    - Receivers R17-1, S15-1, S17-1, S17-2 and T15-1, for which the landholders have reached a private agreement with BCWF in relation to the Project and management of impacts, but will not host any Project infrastructure on their land.
- **Non-associated residences** (all other residences), being a residence on privately-owned land in respect of which the owner has not entered into a private agreement with BCWF in relation to the Project's impacts, or, a residence on privately-owned land in respect of which the owner has reached an agreement with BCWF in relation to the Project's impacts, but the agreement does not cover the relevant impact, or the performance measure for such impact (under that agreement) has been exceeded.

For the purposes of this EIS, an associated and non-associated residence is also described using the equivalent term "receiver" where an amenity impact is being discussed.

A sub-set of identified residences proximal to the Project are "associated" with the Stage 1 project. As an agreement has not been reached specifically for the Project (i.e., Stage 2) these residences are considered "non-associated" in this EIS and all relevant technical assessments.

The Project Area also includes some small areas of Crown roads with enclosure permits.

There are no mining leases or explorations licences identified within the Project Area, or within five (5) km of the Project Boundary at the time of preparing this EIS (Regional NSW, 2026).

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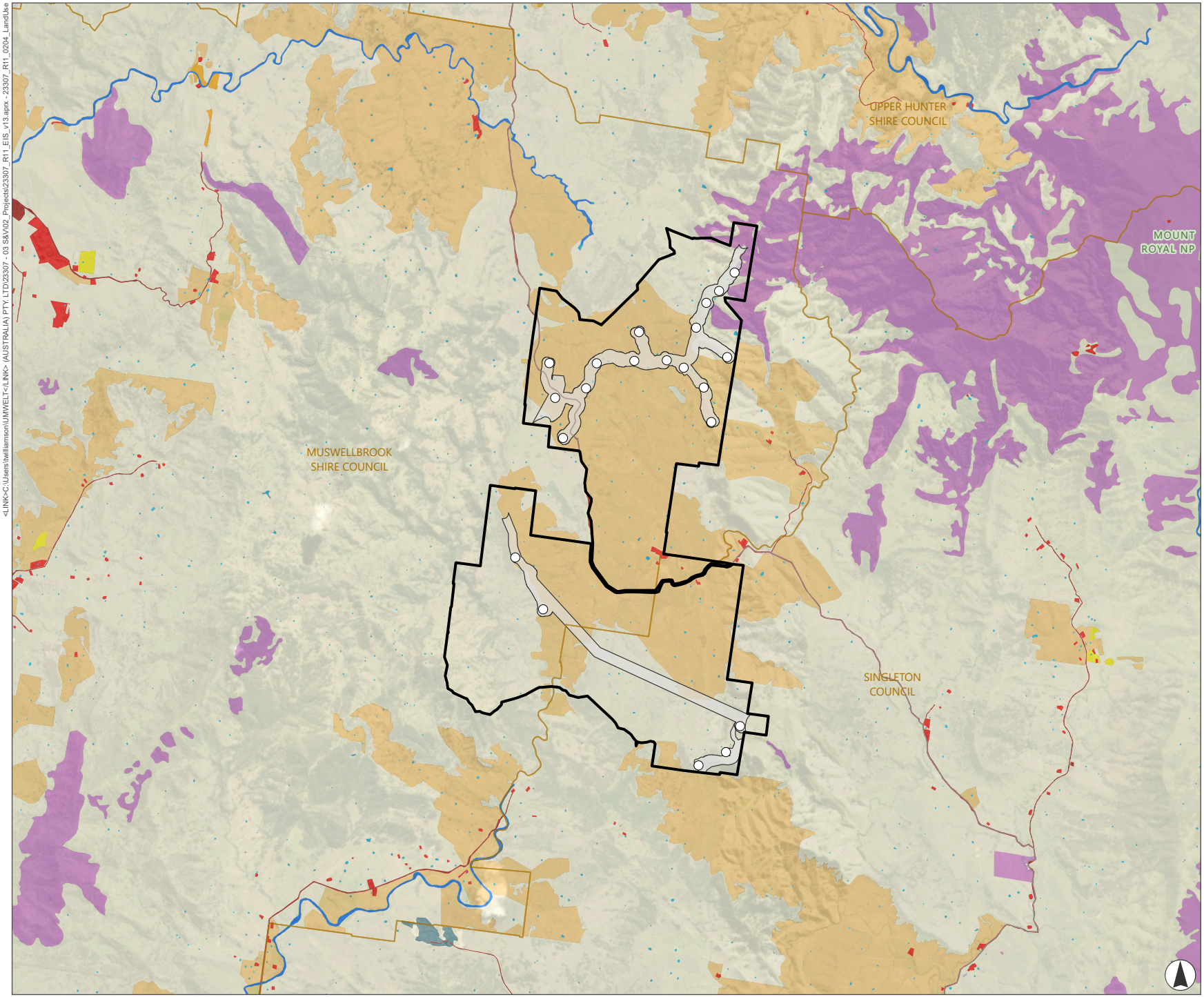


FIGURE 2.4
Land Use

Legend

- Road
- Local Government Area
- NPWS Reserves

Project

- Project Boundary
- Development Corridor
- Wind Turbine Generators

Land Use (2017)

- 1.1.0 Nature conservation
- 1.2.0 Managed resource protection
- 1.3.0 Other minimal use
- 2.1.0 Grazing native vegetation
- 3.2.0 Grazing modified pastures
- 3.3.0 Cropping
- 4.2.0 Grazing irrigated modified pastures
- 5.4.0 Residential and farm infrastructure
- 5.5.0 Services
- 5.7.0 Transport and communication
- 5.8.0 Mining
- 6.2.0 Reservoir/dam
- 6.3.0 River



0 2.5 5

Kilometres

Scale 1:100,000 at A4
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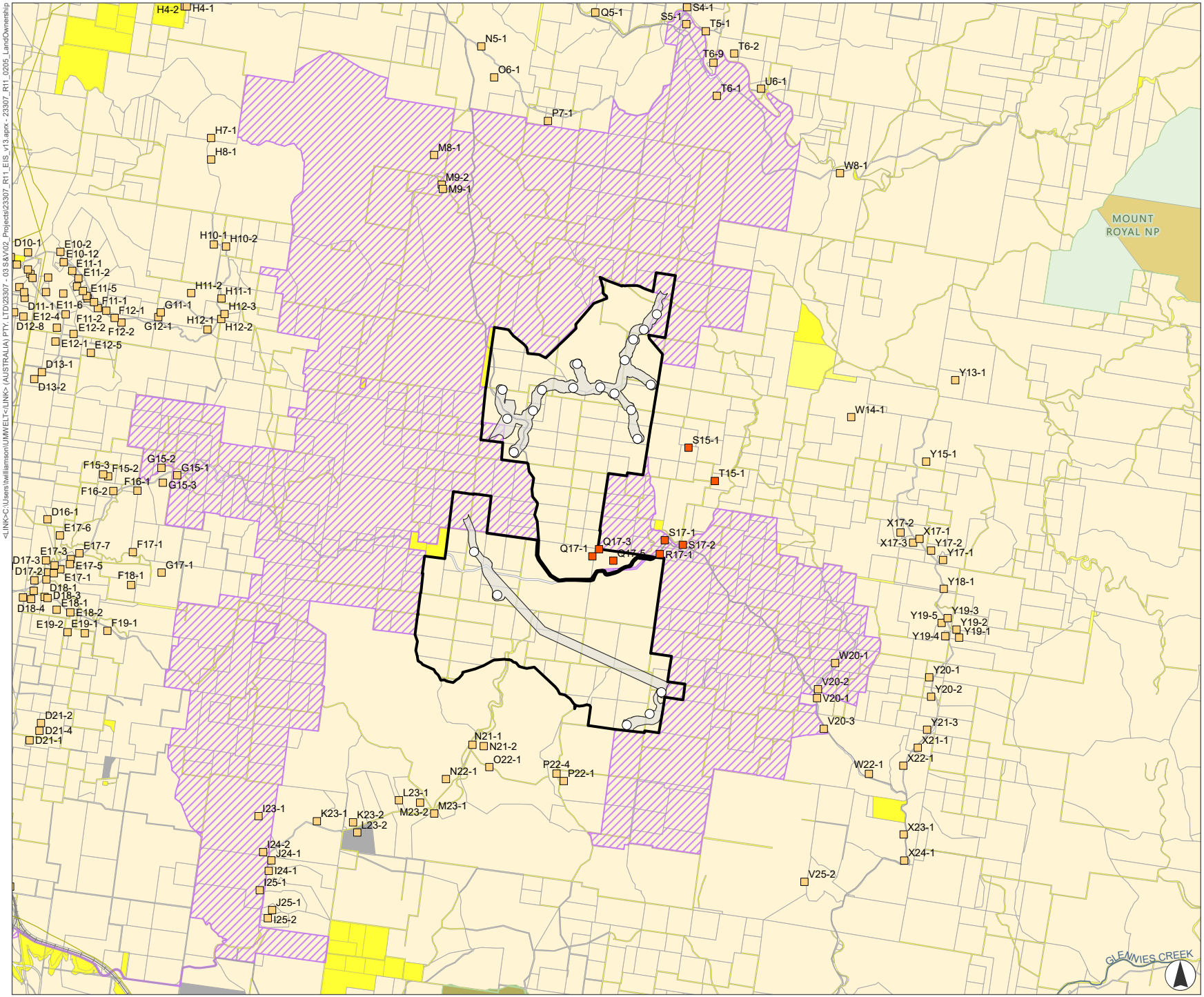


FIGURE 2.5
Land Ownership

Legend

- Road
- Railway Line
- River/Stream
- Electricity Transmission Line
- NPWS Reserves
- State Forest

Dwellings

- Non-Associated
- Associated

Project

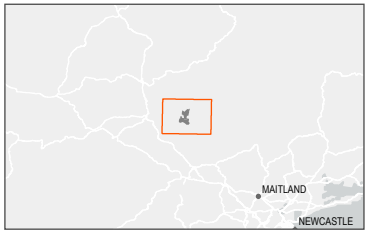
- Project Boundary
- Development Corridor
- Wind Turbine Generators

Stage 1 Project

- Project Boundary

Land Ownership

- Unknown
- Freehold
- Crown
- NSW Government



0 2.5 5

Kilometres

Scale 1:120,000 at A4
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2.3.2 Land Use Zoning

The Project Area is located within the Muswellbrook and Singleton LGAs and is zoned RU1 within the Muswellbrook Local Environmental Plan 2009 (Muswellbrook LEP) and Singleton Local Environment Plan 2013 (Singleton LEP), as shown on **Figure 2.6** below.

The objectives of the RU1 zone under the Muswellbrook LEP are:

- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.
- To encourage diversity in primary industry enterprises and systems appropriate for the area.
- To minimise the fragmentation and alienation of resource lands.
- To minimise conflict between land uses within this zone and land uses within adjoining zones.
- To protect the agricultural potential of rural land not identified for alternative land use, and to minimise the cost to the community of providing, extending and maintaining public amenities and services.
- To maintain the rural landscape character of the land in the long term.
- To ensure that development for the purpose of extractive industries, underground mines (other than surface works associated with underground mines) or open cut mines (other than open cut mines from the surface of the flood plain), will not—
    - destroy or impair the agricultural production potential of the land or, in the case of underground mining, unreasonably restrict or otherwise affect any other development on the surface, or
    - detrimentally affect in any way the quantity, flow and quality of water in either subterranean or surface water systems, or
    - visually intrude into its surroundings, except by way of suitable screening.
- To protect or conserve (or both)—
    - soil stability by controlling development in accordance with land capability, and
    - trees and other vegetation, and
    - water resources, water quality and wetland areas, and their catchments and buffer areas, and
    - valuable deposits of minerals and extractive materials by restricting development that would compromise the efficient extraction of those deposits.

The objectives of the RU1 zone under the Singleton LEP are:

- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.
- To encourage diversity in primary industry enterprises and systems appropriate for the area.
- To minimise the fragmentation and alienation of resource lands.
- To minimise conflict between land uses within this zone and land uses within adjoining zones.

The Project is compatible with the objectives of the RU1 zoning under each council, as it seeks to:

- Facilitate co-existence of both renewable energy generation and agriculture, by maintaining existing grazing activities concurrent with Project operations.
- Diversify income streams for agricultural operators through host and negotiated agreements with impacted landholders, and proximal neighbours who are participating in the Projects neighbourhood benefit sharing scheme.
- Minimise potential land use conflicts through careful Project design and the implementation of mitigation and management measures to address residual impacts to nearby landholders.

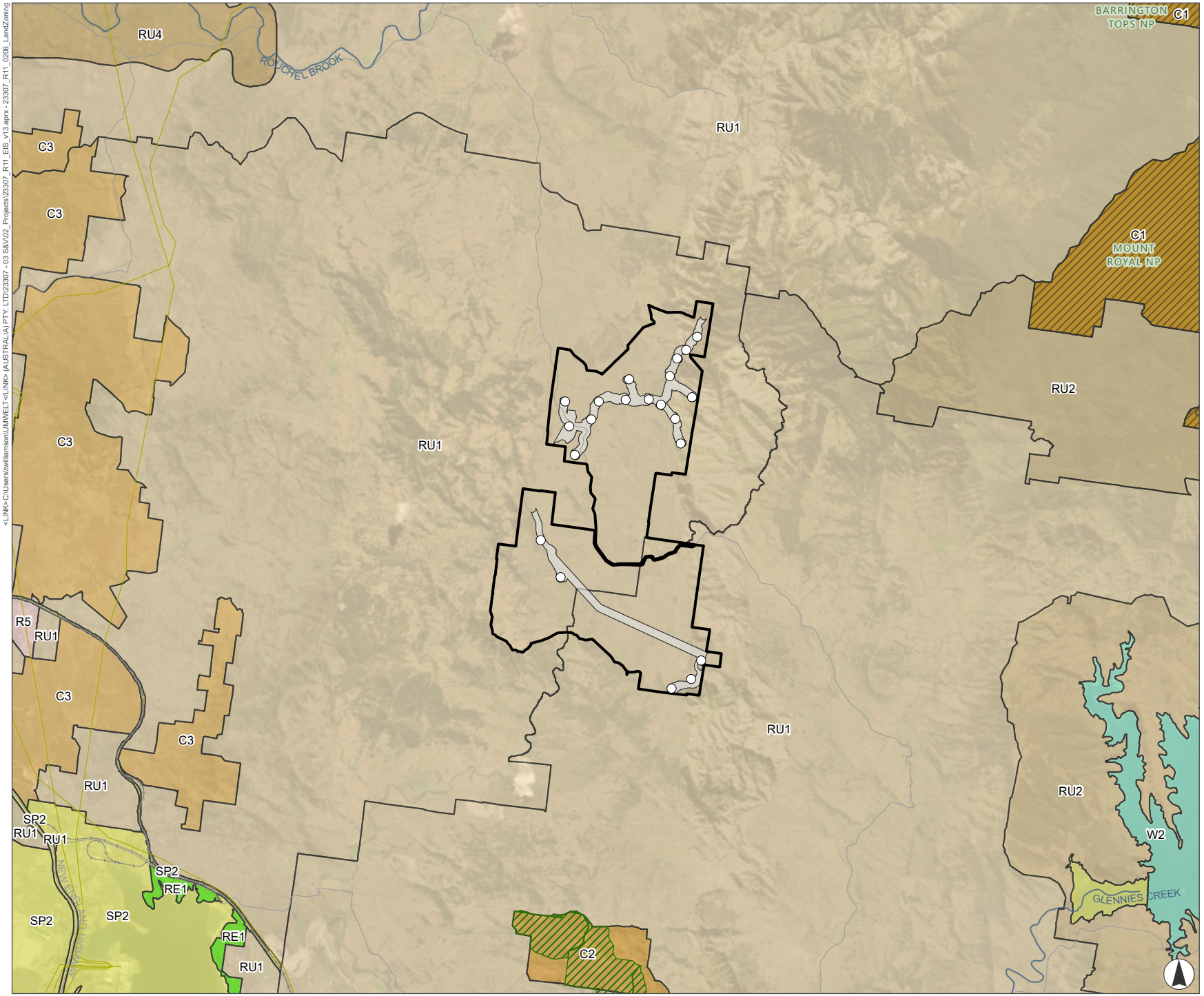


FIGURE 2.6
Land Zoning

Legend

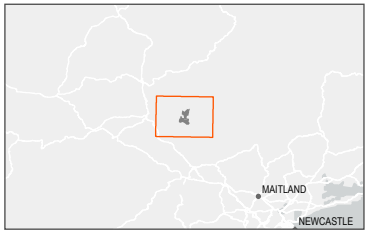
- Road
- Railway Line
- River/Stream
- Electricity Transmission Line
- NPWS Reserves
- State Forest

Project

- Project Boundary
- Development Corridor
- Wind Turbine Generators

Land Zoning

- C1 - National Parks and Nature Reserves
- C2 - Environmental Conservation; C2, Environmental Management
- C3 - Environmental Management
- R5 - Large Lot Residential
- RE1 - Public Recreation
- RU1 - Primary Production
- RU2 - Rural Landscape
- RU4 - Primary Production Small Lots
- SP2 - Infrastructure
- W2 - Recreational Waterways



0 2.5 5

Kilometres

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2.3.3 Built Environment

The Project is located at Bowmans Creek, approximately 21 km east of Muswellbrook and 120 km northwest of the Port of Newcastle in NSW. Nearby rural communities include Bowmans Creek, Davis Creek, Goorangoola, Greenlands, Hebden, McCullys Gap, Muscle Creek, and Rouchel Brook.

This is an area of significant power generation and industry within NSW. Several approved coal mines and quarries are located within 30 km of the Project Boundary, including Muswellbrook Coal Mine to the west, Liddell Coal Mine, and Mount Owen Complex to the south. There are no extractive industries or mining tenements issued under the *Mining Act 1992* within the Project Area.

Idemitsu Australia Resources (Idemitsu) owns and operates Muswellbrook Coal Mine, located 17 km west of the Project Boundary. This open-cut coal mine was approved to produce 2 million tonnes of coal per annum (Mtpa) until 2022, with rehabilitation activities continuing beyond this date. Muswellbrook Coal Mine employed 158 full-time equivalent (FTE) employees (MCC, 2019).

Liddell Coal Operations (LCO) is an established open-cut mine at Ravensworth, approximately 10 km south of the Project Boundary. LCO is approved to extract up to 8 Mtpa of run-of-mine (ROM) coal until December 31, 2028, and currently employs up to 460 people (SLR, 2013).

Mount Owen Continued Operations (MOCO) comprises two (2) open-cut mining areas (Mount Owen and Ravensworth East) and is located approximately 11 km south of the Project Boundary. MOCO is approved to extract up to 14 Mtpa of ROM coal until December 31, 2031, and currently employs up to 1,200 FTEs (Umwelt, 2015).

There are two (2) operational quarries located proximally to the Project Boundary, including:

- SCE (Hebden) Quarry: An operating hard rock quarry located approximately 4 km south of the Project Boundary. It supplies aggregates, road base, crusher dust, rocks, and ballasts. It is approved to operate for 20 years and utilises Pictons Lane (in Hebden, NSW) for material transport.
- East Quarry: An operating quarry located approximately 5 km south of the Project Boundary. Public information on the quarry's lifespan or employment numbers is not available.

2.3.4 Regional Environmental Characteristics

2.3.4.1 Landscape Character

The Project Area is positioned on the south-western edge of the Mount Royal Range which features the Mount Royal National Park, the Barrington Tops National Park and the Barrington Tops State Conservation Area. Its surroundings are primarily characterised by undulating to rolling hills with narrow valleys transitioning to wide valleys adjoining creeks and rivers to the south of the Project Area.

2.3.4.2 Climate

The region has a temperate climate with warm summers and no distinct dry season (NSW National Parks and Wildlife Service, 2003). As per the information on the Lostock Dam weather station (061288), January is the hottest month with an average maximum temperature of 29.3°C, while July is the coldest with an average minimum of 6.5°C. The region receives an average annual rainfall of 975.3 mm, with March being the wettest month (134.7 mm) and August the driest (39.8 mm).

Morning (9 am) winds prevail from the west and afternoon (3 pm) winds prevail from the west in the cooler months and the south east in the warmer months (BOM, 2026).

2.3.4.3 Geology

The geology of the region features Permian and Devonian bedrocks linked to the New England Fold Belt. Faulting has caused small intrusions of granite and granodiorite within the sedimentary rocks. The Project Area mainly consists of red podzolic soils, classified as Chromosols, which are the most commonly used soils for agriculture and primarily fall under the lower land and soil capability (LSC) classes. LSC is discussed further in **Section 2.3.6.3**.

2.3.4.4 Elevation

Elevations range from approximately 210 m in the valley flats to 610 m along the ridgelines associated with Mount Royal Range in the north-eastern portion of the Project Area, as shown on **Figure 2.7**. Undulating to steep foothills and ridgelines associated with the Mount Royal Range National Park occur to the northeast of the Project Area. Ridgelines within the Project Area run north to south with three (3) high points. One (1) in the north east at 607 m ABS, another in the centre of the northern section of the Project Area at 572 m ABS and the third in south western portion of the Project Area at 571 m ABS.

2.3.4.5 Hydrology

The Project is situated within the broader Hunter River catchment area, within the sub-catchments that feed into Bowmans Creek, Sandy Creek, and Muscle Creek. The Hunter River serves as the primary watercourse in the Hunter Region. Water flow in the Upper Hunter is controlled by Glenbawn Dam and Lake St Clair (also referred to as “Glennies Creek Dam”). Within a 20 km radius of the Project, there are three (3) significant water storages: Glenbawn Dam, Lake Liddell, and Lake St Clair.

Water generally flows north to south across the Project Area although a ridgeline in the northern portion of the Project Area directs tributaries of Sandy Creek north-west. Bowmans Creek, a 5th order Strahler Stream, is the major drainage line within the Project Boundary and delivers water to the Goorangoola Creek to the south. Lincolns Creek, a 3rd order Strahler Stream, intersects Bowmans Creek 160 m from the southern boundary of the Project Area.

Groundwater

There is limited groundwater level monitoring data available from within the Project Area.

A review of groundwater monitoring bores within approximately 20 km of the Project Area was undertaken to inform this EIS and shows that groundwater levels are inconsistent, and range from 0.21 m (lowest depth) to 38.1 m (highest water depth) below ground level, being an average of approximately 5.7 to 9.8 m (lowest to highest) below ground level.

The nearest groundwater bore with recorded water depth data is over 6 kilometres from the Project Boundary and has measured water depth ranging between 3.55 m and 4.98 m. Given the distance between the Project Boundary and the nearest groundwater bore with water depth readings, this data does not provide an accurate depiction of the groundwater depth across the Project Area and should be considered an indication of the potential depth of the water table.

Table 2.1 below provides a summary of groundwater bores within 20 km of the Project Area, and includes recorded groundwater levels at each of the groundwater bores, the range of groundwater levels at each bore, the distance to the Project Boundary and how long the bore has been in place.

Given the uncertainty of groundwater levels within the Project Area, groundwater levels will be defined through geotechnical investigations during the detailed design phase of the Project. Any construction works with potential to interact with the groundwater table would be subject to further hydrological investigations following approval of the Project.

Table 2.1 Goundwater Bores within 20 km of the Project Area

Bore ID	Distance to the Project Boundary (km)	Bore Depth (m)	Latest Water Level (m)	Date Range	Lowest Water Level (m)	Highest Water Level (m)	Purpose
GW056389.1.1	6.17	7.3	3.56	2001–2008	3.55	4.98	Monitoring
GW080542.1.1	6.21	100	2.29	2004–2008	3.1	14.3	Water Supply
GW037131.1.1	7.21	6.4	3.47	2004	3.47	3.47	Stock and Domestic
GW080969.1.1	7.23	36	3.78	2005–2011	1.75	31.2	Monitoring
GW043666.1.1	7.37	15.8	4.04	1998–2002	3.36	10.52	Water Supply
GW080971.1.1	9.02	30	3.33	2005–2011	2.7	4.62	Monitoring
GW080902.1.1	9.74		6.75	2004	6.75	6.75	Unknown
GW043782.1.1	10.09	18.2	7.79	1975–2004	6.4	7.79	Water Supply
GW080970.1.1	10.14	36	2.32	2005–2011	1.97	2.87	Monitoring
GW080900.1.1	10.53	6.47	6.47	2004–2004	6.47	6.47	Unknown
GW080903.1.1	11.25	1.4	1.4	2004–2004	1.4	1.4	Monitoring
GW054802.1.1	11.30	38.1	6.17	1981–2009	5.5	6.17	Irrigation
GW078465.1.1	11.57	13	11.77	2004	11.77	11.77	Stock and Domestic
GW018870.1.1	12.71	53.9	25.82	1961–2008	23.72	38.1	Stock and Domestic
GW080100.1.1	12.93	6.1	4.42	2002–2008	4.89	5.38	Irrigation
GW056379.1.1	13.38	19.8	10.17	1982–1993	10.17	12.2	Water Supply
GW049693.1.1	13.51	6.7	5.5	2004–2004	5.5	5.5	Unknown
GW080972.1.1	14.32	24	1.42	2008–2024	0.21	3.19	Monitoring

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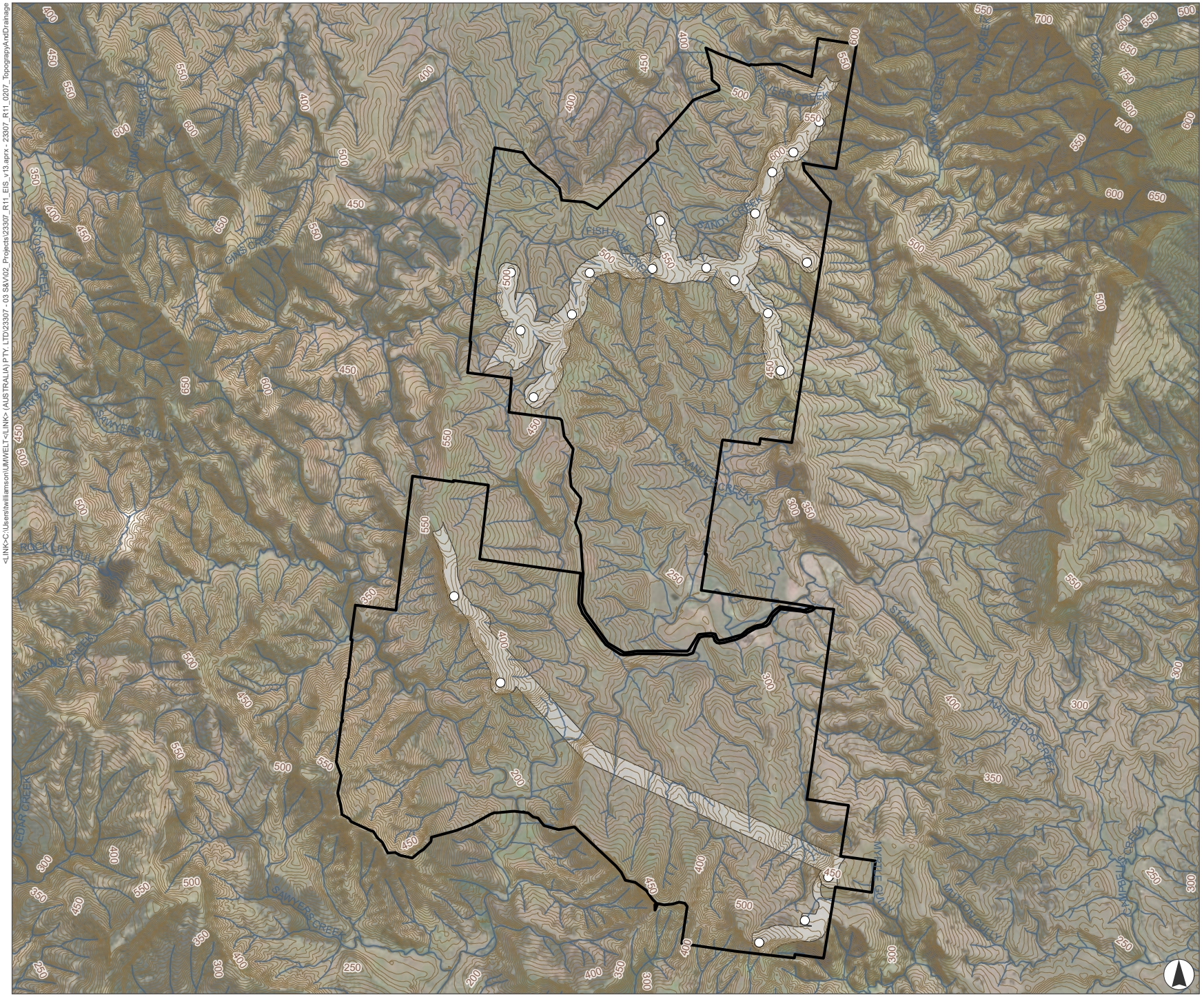


FIGURE 2.7

Topography and Drainage

Legend

- Road
- River/Stream
- Contours (50m)

Project

- Project Boundary
- Development Corridor
- Wind Turbine Generators

0 1.5 3

Kilometres

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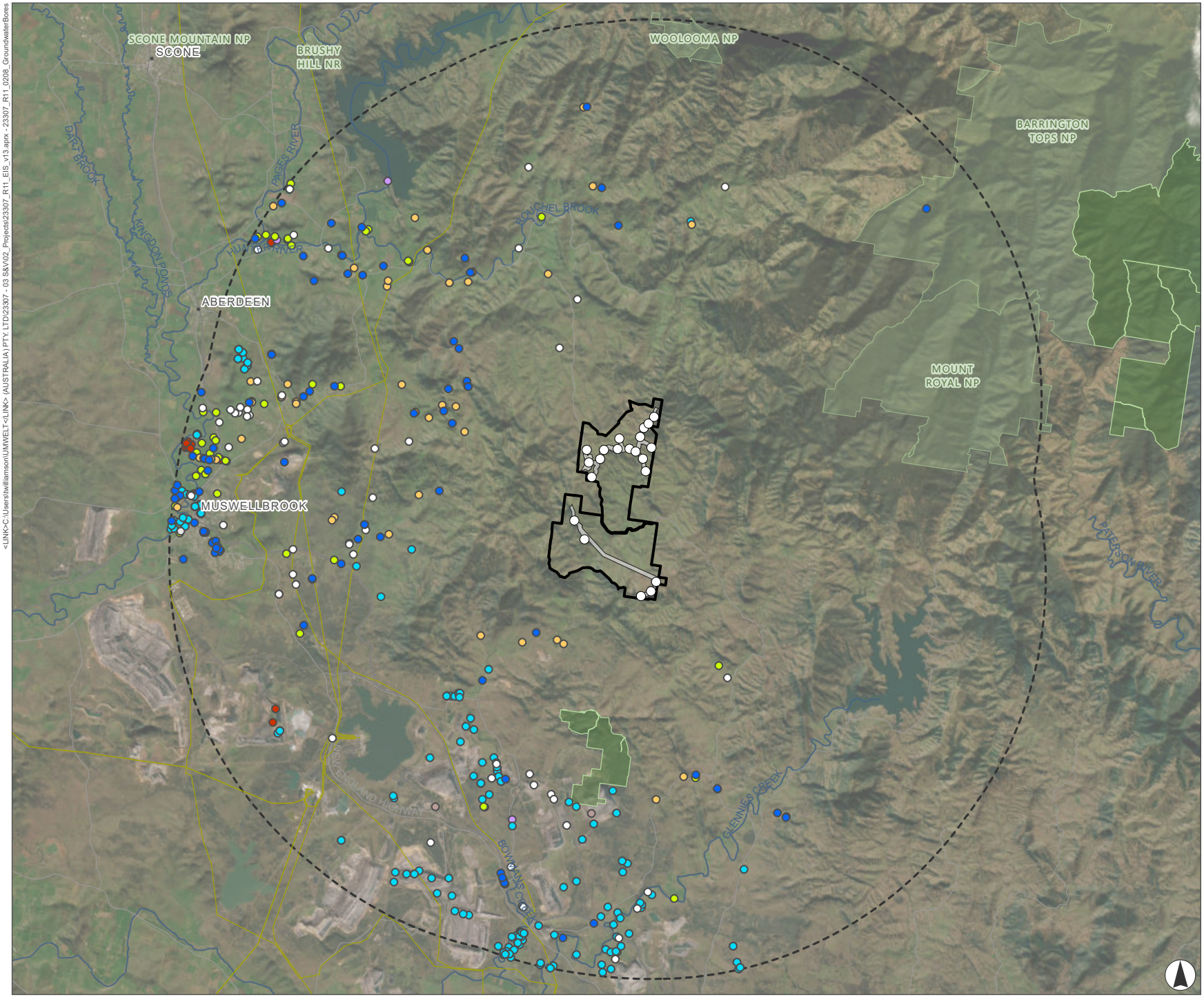


FIGURE 2.8

Goundwater Bores within 20 km of the Project Area

Legend

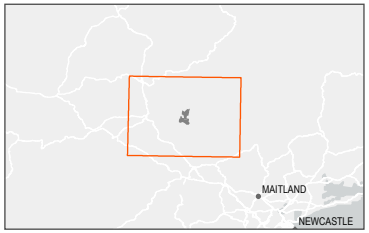
- Populated Place
- Road
- Railway Line
- River/Stream
- Electricity Transmission Line
- Project Area 20km Buffer
- NPWS Reserves
- State Forest

Project

- Project Boundary
- Development Corridor
- Wind Turbine Generators

Groundwater Bores (BoM)

- Commercial and Industrial (14)
- Dewatering (3)
- Exploration (3)
- Irrigation (41)
- Monitoring (173)
- Other (1)
- Stock and Domestic (49)
- Unknown (59)
- Water Supply (87)



0 5 10

Kilometres

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2.3.5 Cultural and Historical Heritage Context

2.3.5.1 Ecological Context

The Project Area is located within the Interim Biogeographic Regionalisation for Australia (IBRA) NSW North Coast Bioregion, and the Upper Hunter and Tomalla sub regions.

The NSW North Coast bioregion extends along the state's east coast from north of Newcastle to south of Grafton before continuing inland toward the Queensland border, encompassing diverse climates, landforms, soils and vegetation. The Tomalla subregion is characterised by elevated, rugged terrain typical of the Barrington/North Coast ranges, while the Upper Hunter subregion contains a mix of floodplains, rolling hills and rugged mountain edges.

The Project Area contains various streams that range from 1st order to 6th order, as per the Strahler System of ordering watercourses. The main stream passing through the Development Corridor is Bowmans Creek, which runs perpendicular to the transmission corridor in the southern portion of the Project Area. The lower order creeks are largely ephemeral while higher order creeks, including Bowmans Creek appear to have intermittent flow.

No important wetlands listed in the Directory of Important Wetlands in Australia are present in the Project Area. The closest important wetland is the Barrington Tops Swamps, located approximately 30 km north-east of the northernmost point of the Project Area.

A fauna corridor occurs in the north-eastern parts of the Project Area. The vegetation in this corridor lies at the western extent of a band of dense vegetation that extends generally eastwards towards Mount Royal National Park.

No karsts, caves, crevices, cliffs or areas of geological significance have been identified within the Development Corridor. Two (2) small rock faces were identified within the Project Area although outside the Development Corridor. These are not considered to be a major geological feature but have conservatively been considered as potential habitat for the microchiropteran bat species known to utilise cliffs and caves, as outlined in the BDAR (**Appendix 8**).

The Project Area consists of a mixture of native vegetation including primarily derived native grasslands (DNG) and exotic/cleared lands for agricultural purposes. There are small areas of native remnant woody vegetation. This is described in detail in **Section 6.4** and **Appendix 8**.

2.3.5.2 National Parks

There are no National Parks or State Forests within or immediately adjacent to the Project Boundary. Mount Royal National Park is situated 8 km north-east of the nearest WTG 93, discussed below. The World Heritage-listed Gondwana Rainforest, located within Mount Royal National Park, is over 25 km north-east of the nearest WTG 93. The closest State Forest, Ravensworth State Forest, is more than 8 km south of the nearest WTG 73.

Mount Royal National Park

Mount Royal National Park was gazetted in 1997 as a protected area in the Hunter region of NSW. The park covers 6,920 ha and is part of the Gondwana Rainforests of Australia World Heritage Area, which was inscribed in 1986.

This National Park was established to preserve its biodiversity values, including species such as the:

- Parma Wallaby (*Notamacropus parma*) listed as vulnerable under BC Act and vulnerable under the EPBC Act.
- Rufous Scrub bird (*Atrichornis rufescens*) listed as vulnerable under BC Act and endangered under the EPBC Act.
- Glossy black-Cockatoo (*Calyptorhynchus lathami lathami*) listed as vulnerable under BC Act and vulnerable under the EPBC Act.

Before its designation as a national park, portions of Mount Royal National Park were subject to logging. It is available to visitors for camping and hiking although restricts access after heavy rains and does not allow pets.

2.3.5.3 Biodiversity Values

No areas of outstanding biodiversity value have been mapped within the Development Corridor.

The majority of the Project Area is primarily comprised of native grassland with a smaller proportion of the vegetation consisting of a mosaic of open woodland, riparian areas and dry rainforests. The Development Corridor comprises a total of 394.54 ha of native vegetation comprised of eight (8) Plant Community Types (PCT) across 12 vegetation zones. Three (3) Threatened Ecological Communities (TEC) listed under the *Biodiversity Conservation Act 2016* (BC Act) and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) were identified within the Development Corridor. Further detail on the biodiversity values of the Project Area is provided in **Section 6.4**.

2.3.6 Key Risks or Hazards

The iterative design process and the assessments undertaken for this EIS have supported the Project design to, wherever possible, avoid, minimise and mitigate potential risks and hazards. Notwithstanding, the nature of the Project (i.e. a wind farm) is such that some risks or hazards cannot be entirely mitigated through design, management or mitigation measures.

The Project Area:

- has not been identified as containing contaminated land
- is not located on land classified as a mine subsidence district
- is not located within a coastal zone.

2.3.6.1 Flood Hazard

There is limited flooding information available in respect of the Project Area, due to the lack of prior studies. However, flood hazard is generally considered a low risk at the Project Area due to the limited watercourse and streams that traverse the Project Area, and significant topography (i.e. elevation above water levels) that the majority of Project infrastructure is situated on.

Consideration of flooding has been included where applicable within the Water Resource Impact Assessment (WRIA) prepared as **Appendix 12** of this EIS and summarised in **Section 6.8.1.2**.

2.3.6.2 Bushfire Hazard

The Project Area is partially mapped as bushfire prone land on the NSW Rural Fire Service (RFS) bushfire prone land mapping (RFS, 2021), with Category 3 (Grassland) being present. A Bushfire Hazard Assessment (BHA) has been undertaken for the Project. The findings of this assessment are presented in **Appendix 18** and summarised in **Section 6.11.4**.

BCWF will implement a range of measures to manage bushfire risks on site, including the establishment and maintenance of suitable Asset Protection Zones (APZ), and the supply of dedicated water supplies for bushfire fighting purposes.

2.3.6.3 Land and Soil Capability (LSC)

There is no Biophysical Strategic Agricultural Land (BSAL) present within or in the vicinity of the Project Area. The Project Area predominately consists of LSC class 7 land and LSC class 5 land, with a small extent of LSC class 5 land and a very limited extent of LSC class 3 land and LSC class 8 land, as shown on **Figure 2.9**. Further information regarding soil characteristics and existing land management practices is provided in the Soil, Land and Agricultural Impact Assessment (SLAIA) prepared as **Appendix 14** of this EIS.

Other key Project risks and hazards, as well as the associated management and mitigation measures, have been considered and are described in detail in **Section 6.0.** In accordance with the SEARs, relevant assessments have been undertaken of risks and hazards associated with the Project, including:

- Aviation safety, via the Aviation Impact Assessment (refer **Appendix 15**)
- Telecommunications (EMI), via the Telecommunications Impact Assessment (refer **Appendix 16**).
- Electric and magnetic field (EMF), via the Human Health Assessment (EMF) (refer **Appendix 17**).
- Blade Throw, via the Blade Throw Assessment (refer **Appendix 19**).

Where a hazard or risk was unable to be avoided entirely, BCWF has endeavoured to implement all reasonable and feasible management and mitigation measures, as set out in **Appendix 5** and summarised within **Section 6.0**.

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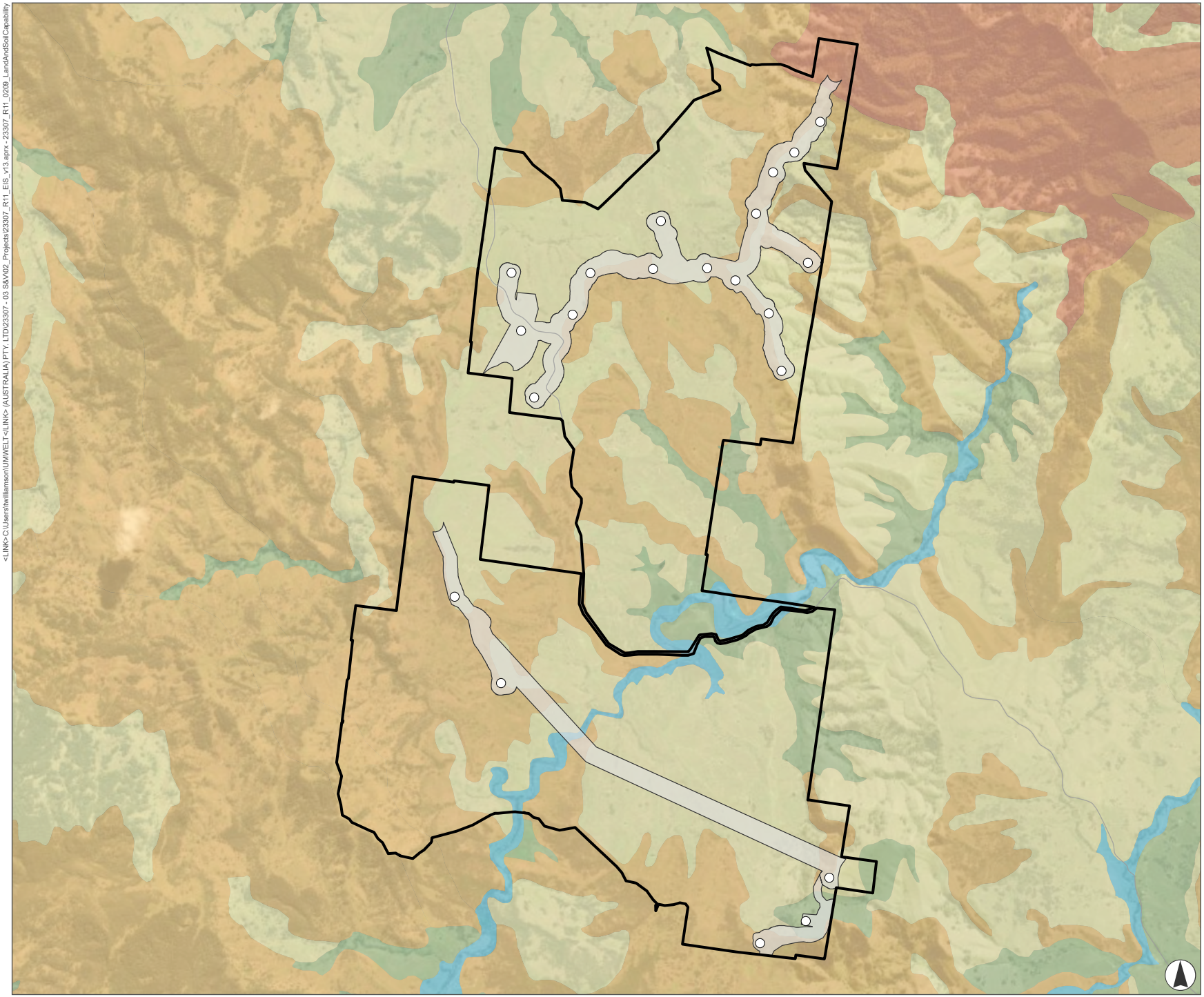


FIGURE 2.9

Land and Soil Capability

Legend

Road

Project

Project Boundary

Development Corridor

Wind Turbine Generators

Land and Soil Capability

3

5

6

7

8



0 1.5 3

Kilometres

Scale 1:60,000 at A4
GDA2020 MGA Zone 56

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2.4 Cumulative Impacts

This EIS and associated technical studies have been prepared to address the requirements of the CIA Guidelines (DPHI, 2026d). Further context and information pertaining to proximal developments is provided in the subsections below.

2.4.1 Consideration of the Hunter-Central Coast REZ

The Project is located within the north-western portion of the Hunter-Central Coast REZ shown on **Figure 2.2**. Although not contributing directly to the generation capacity indicated for this REZ, the Project will assist in providing a reliable energy source and associated GHG emission reductions, consistent with objectives of the REZ, and the NSW Electricity Strategy and Infrastructure Road Map more broadly.

Because of the Projects location within the Hunter-Central Coast REZ and hence proximity to the multiple renewable energy developments that are anticipated, proposed to occur or approved for operations, the Hunter-Central Coast REZ has been a focus of the CIA undertaken for the Project.

2.4.2 Proximal Developments

The CIA Guidelines for State Significant Projects (DPHI, 2026) requires consideration of a project together with the impacts of other relevant future and existing projects in order to determine potential cumulative impacts. The NSW Wind Energy Guideline (DPHI, 2024) also identifies the requirement to address cumulative impacts in relation to any other proposed, approved or operating wind energy projects in the vicinity particularly with regard to landscape, noise, biodiversity and traffic impacts.

The CIA Guideline indicates the following future projects should be considered in the cumulative impact assessment:

- changes to existing projects (expansion, modification, closure)
- approved projects (approved but construction has not commenced)
- projects under assessment (application for the project has been exhibited and is currently under assessment)
- related development (development that is required for the project but subject to separate assessment).

Table 2.2 below lists the various approved and proposed state and regionally significant renewable energy developments known to exist in the region within a 60 km buffer of the Project Area. It includes Bowmans Creek Wind Farm (SSD-10315) (i.e., the Stage 1 project) that per SSD definitions is related development. General information relating to those developments, estimated construction periods and approximate distances to the Project are then provided.

Cumulative impact assessments for each relevant technical study have considered this list and addressed potential environmental and social impacts accordingly. These cumulative impact assessments are documented in each of the relevant technical studies noted throughout this report.

Figure 2.10 shows the location of these developments based on information reviewed up to and including March 2026 in relation to the Project. **Figure 2.11** below then visually illustrates the average cumulative construction workforce for key projects in the region across a 33 month timeframe.

Overall assessment outcomes are provided in **Section 6.0**, with a cumulative impact summary table provided in **Appendix 23**, and a summary of cumulative impact assessment findings provided in **Section 6.15**.

Table 2.2 Approved and Proposed State and Regionally Significant Developments in the Vicinity of the Project

Project Name	Application ID	Project Status	Description	Estimated Construction Period	Approximate Distance from Project
Bowmans Creek Wind Farm	SSD-10315	Approved	An SSD project involving the construction and operation of a wind farm with up to 60 wind turbines and associated infrastructure. Expected to generate up to 156 full time equivalent (FTE) jobs during construction and 15 FTE jobs during operations. • Scoping Report lodged May 2019 • SEARs issued in July 2019 • EIS lodged in March 2021 • Approved in February 2024.	• Construction expected to commence in March 2029 • Construction period of approximately 27 months • Construction estimated to be completed in May 2031.	Adjacent
Bowmans Creek Wind Farm Stage 1 – MOD 1 BESS	SSD-10315-Mod-1	In planning	An SSD modification to Bowmans Creek Wind Farm Stage 1 (SSD-10315) involving the addition of a Battery Energy Storage System (BESS) and modifications to sections of the main access route to accommodate OSOM vehicles. Estimated to generate up to 50 additional FTE jobs during construction. No additional operational FTE jobs are expected. No SEARs are expected for a modification.	• Construction expected to commence in November 2028 • Construction period of approximately 24 months • Construction estimated to be completed by November 2030.	Adjacent
Queensland-Hunter Gas Pipeline	MP06_0286		A Critical State Significant Infrastructure (CSSI) project, which includes the construction and operation of the Narrabri to Newcastle section of Queensland-Hunter Gas Pipeline. On 5 May 2025, DPHI accepted a staging approach to the delivery of this project. The Stage 2 portion of the project involves the construction of 413 km of new pipeline between Narrabri to Newcastle, and is of relevance to the Project. Stage 2 is anticipated to generate up to 350 FTE jobs during construction.	As of April 2026, there is no clear indication as to when Stage 2 will commence construction, noting that this would occur once the route is finalised and all secondary approvals are obtained.	2.8 km south of the Project Area.

Project Name	Application ID	Project Status	Description	Estimated Construction Period	Approximate Distance from Project
			• Approved 2009 • Modification to extend application in January 2019 • Approval from DPHI to deliver the project on a staged basis • December 2023, construction of Stage 1a commences • 30 January 2026, construction of Stage 1b commences.		
New England REZ Transmission Project	SSI-74175972	In planning	An SSI transmission line project, which includes the construction and operation of new high voltage electricity transmission infrastructure that is required to connect energy generation and storage projects within the New England REZ to the NEM. • Expected to generate up to 1,400 jobs during construction • SEARs issued September 2024 • Revised Scoping Report lodged December 2025.	• Construction to be undertaken across two (2) stages • Stage 1 to be operational in 2032, and Stage 2 to be operational in 2034.	3 km west of the Project Area
Liddell Battery and Bayswater Ancillary Works	SSD-8889679	Under construction	An SSD project involving the construction and operation of a 500MW/2GWh BESS, and the decoupling of the Liddell and Bayswater power stations. Expected to generate up to 250 jobs during construction. • Scoping Report lodged August 2020 • SEARs issued September 2020 • EIS lodged March 2021 • Approved March 2022.	• Construction being undertaken across three (3) stages commencing in 2021 • Construction of each stage to take up to 12 months • Construction works originally estimated to be completed in 2026.	13 km southwest of the Project Area

Project Name	Application ID	Project Status	Description	Estimated Construction Period	Approximate Distance from Project
Muswellbrook Solar Farm	SSD-46543209	Approved	An SSD solar farm, consisting of up to 300,000 solar panels, ancillary infrastructure, and a total generation capacity of 135 MW. The project also includes a BESS with a capacity of up to 135 MWac. Expected to generate 200 FTE during construction and nine (9) FTE jobs during operations. • Scoping Report lodged July 2022 • SEARs issued September 2022 • EIS lodged July 2023.	• Construction originally estimated to commence in Q4 2024 • Construction period of approximately 31 months • Commissioning expected 2028.	15 km west of the Project Area
Muswellbrook Pumped Hydro Energy Storage	SSI-76014961	In planning	An SSI Pumped Hydro Energy Storage Project, which includes the development of a 500 MW pumped hydro power station, upper and lower reservoirs, grid connection and ancillary infrastructure. Expected to generate up to 250 FTE jobs during construction and 20 FTE jobs during operations. • Scoping Report lodged December 2023 • SEARs issued November 2025	• Construction reported to commence 2026 although EIS is yet to be lodged.	15.4 km north-west of the Project Area
McCullys Gap Battery Energy Storage System	SSD – 81555720	In planning	Construction, operation, and decommissioning of a Battery Energy Storage System with a capacity of approximately 400 MW/1,600 MWh, and ancillary infrastructure. The project would create up to 150 FTE jobs during construction and provide about 10–15 FTE jobs once operational. • Scoping Report lodged November 2021 • SEARs issued December 2021	• Construction to commence in 2026 take approximately 18 months.	16 km north-west of the Project Area

Project Name	Application ID	Project Status	Description	Estimated Construction Period	Approximate Distance from Project
Muswellbrook Battery Energy Storage System	SSD-29704663	Under construction	An SSD BESS with a capacity of 150 MW / 300 MWh and associated infrastructure. Expected to generate up to 75 jobs during construction and 203 jobs during operations. • Scoping Report lodged November 2021 • SEARs issued December 2021 • EIS lodged August 2022 • Approved July 2023.	• Construction commenced in late 2023 • Construction period of approximately 12 months • Commissioning expected in early 2025.	17 km west of the Project Area
Maxwell Solar Farm	SSD-9820	Approved	An SSD Solar Farm with a capacity of 25 MW and associated infrastructure. Expected to generate up to 50 FTE jobs during construction and up to 2 FTE jobs during operations. • SEARs issued March 2019 • Determination August 2020 • Construction began August 2025.	• Construction commenced in August 2025 • Construction period of approximately 12-18 months • Commissioning unknown.	18 km west of the Project Area
Hunter Transmission Project	SSI-70610456	In planning	An SSI project involving the development of a new double circuit 500 kV overhead transmission line between the proposed Bayswater and Olney State Forest substations, and connections to the existing 500 kV transmission network. Expected to generate approximately 830 FTE jobs during peak construction, and 10 FTE jobs during operations. • SEARs issued in August 2024 • EIS submitted in August 2025 • Currently at the Response to Submissions stage.	• Construction expected to commence in 2027 • Project to be operational by the end of 2029 • Construction period of approximately 2.5 years.	18 km southwest of the Project Area

Project Name	Application ID	Project Status	Description	Estimated Construction Period	Approximate Distance from Project
Upper Hunter Battery Energy Storage System	SSD-61707209	In planning	An SSD BESS with a capacity of 400MW/800MWh and associated infrastructure. Expected to generate up to 100 FTE jobs during construction and five (5) FTE jobs during operations. • Scoping Report lodged August 2023 • SEARs issued September 2023.	• Construction dates unknown • Construction period of approximately 18–24 months • Commissioning date unknown.	20 km west of the Project Area
Kayuga Solar Farm	SSD-69489708	In planning	An SSD project involving the construction, operation and decommissioning of an 80-100MW solar farm, 50MW/100MWh battery energy storage system and associated infrastructure. Expected to generate 250 jobs during peak construction and 5-10 jobs during operations. • Scoping Report lodged March 2024 • SEARs issued May 2024.	• Construction dates unknown • Construction period of approximately 18–24 months • Commissioning date unknown.	24 km west of the Project Area
Denman Battery Energy Storage System	SSD-76189216	In planning	An SSD project involving the construction, operation, and decommissioning of a BESS with a capacity of 2.4GW/4.8GWh and ancillary infrastructure. Expected to generate 75 FTE jobs during construction and 10 FTE jobs during operations. • SEARs issued October 2024 • EIS submitted July 2025.	• Construction estimated to commence in 2026 (subject to approval) • Construction period of approximately 6–9 months.	24 km southwest of the Project Area
Maison Dieu Solar Farm	SSD- 48160216	In planning	An SSD project involving the development of a 150MW solar farm, 50MW/150MWh BESS and associated infrastructure. Expected to generate up to 350 jobs during construction and 5-8 jobs during operations. • Scoping Report lodged in August 2022 • SEARs issued in October 2022	• Construction estimated to commence in Q2 2025 (subject to approval) • Construction period of approximately 18 months	25 km south of the Project Area

Project Name	Application ID	Project Status	Description	Estimated Construction Period	Approximate Distance from Project
			• EIS lodged in June 2024.	• Commissioning expected in Q4 2024 (subject to approval).	
400 Denman Road Denman– Solar Farm (aka. Denman Solar Park)	DA 2020/49	Approved	A DA for the construction and operation of a solar farm with a maximum capacity of 22MWac. The project is located at 400 Deman Road, Denman within the Muswellbrook LGA. Expected to generate 35 jobs during construction and 2-4 jobs during operations. • DA lodged in June 2020 • Approved September 2021 by the Hunter and Central Coast Regional Planning Pannel	• Construction dates unknown • Construction period of approximately 6 months • Commissioning date unknown.	30 km west of the Project Area
Edderton Solar Project	SSD-69965958	In planning	An SSD project involving the construction, operation and decommissioning of a solar photovoltaic energy generating facility with an estimated capacity of 350 MW and BESS. Expected to generate up to 400-450 FTE roles during construction and 10-15 FTE roles during operations. • Scoping Report lodged in April 2024 • SEARs issued in May 2024.	• Construction dates unknown • Construction period of approximately 20 months • Commissioning date unknown.	31 km southwest of the Project Area
Upper Hunter South Solar Farm	SSD-65996959	In planning	An SSD project involving the construction, operation and decommissioning of a 90MW solar farm, 30MW / 60 MWh BESS and associated infrastructure. Expected to generate between 150-200 jobs during construction. • Scoping Report lodged in December 2023 • SEARs issued in January 2024.	• Construction estimated to commence in 2025 (subject to approval) • Construction period of approximately 12-18 months • Commissioning expected in 2027 (subject to approval).	32 km southwest of the Project Area

Project Name	Application ID	Project Status	Description	Estimated Construction Period	Approximate Distance from Project
105 Merriwa Road Denman– Battery Energy Storage System	DA 2023-66	In planning	A DA for the construction and operation of a BESS with a capacity of 4.98MW and associated shed structures. The project is located at 105 Merriwa Road, Denman within the Muswellbrook LGA. Expected number of jobs to be generated unknown. • DA lodged in June 2023 • Project approved in August 2024.	• Construction dates unknown • Construction to occur off-site with delivery and erection to occur over a 4-6 hour period • Commissioning date unknown.	38 km west of the Project Area
Upper Hunter Energy Park (Kyoto Wind Farm)	MP06_0055	Under construction	An SSD project comprising 18 wind turbines and associated infrastructure. Expected to create 200 jobs during construction and 3-5 jobs during operations. • Director-General's requirements (DGRS) request lodged in May 2007 • Environmental Assessment requirements issued in May 2007 • Environmental Assessment (EA) lodged in November 2008 • Approved January 2010.	• Construction expected to commence in late 2025 • Construction period of approximately 20 months. • Commissioning expected in mid-2027.	41 km northwest of the Project Area
Sandy Hollow Solar Farm	DA 102/2019	Approved (Mod 2 under assessment)	A DA for the construction and operation of a solar farm at 1333 Merriwa Road, Denman within the Muswellbrook LGA. Mod 1A proposes a solar farm with a capacity of 4.95MW (AC) and approximately 16,200 solar panels. Mod 2 is currently under assessment. Mod 2 proposes minor amendments. Expected to generate approximately 30 jobs during construction and 1 job during operations. • DA lodged November 2019 • DA Approved May 2020	• Construction dates unknown • Construction period of approximately 9 months • Commissioning date unknown.	47 km west of the Project Area

Project Name	Application ID	Project Status	Description	Estimated Construction Period	Approximate Distance from Project
			• Mod 1A lodged in April 2024 • Mod 1a approved in June 2024 • Mod 2 lodged in April 2025 and currently under assessment.		
Allandale Solar Farm	8/2021/21907	Approved	A DA for the construction and operation of a 5 MW AC solar farm with battery storage at 1026 Lovedale Road, Annandale, within the Cessnock LGA. Expected number of jobs to be generated unknown. • DA lodged in October 2021 • Project approved in May 2022.	• Construction dates unknown • Construction period unknown • Commissioning date unknown.	53 km southeast of the Project Area

Note 1: The Muswellbrook Thermal Solar Facility (SSD-88560713) is an SSD project located approximately 9 km west of the Project Area. This project has been excluded from the table as it is currently understood to be on hold as of May 2026, with construction dates not specified in the Scoping Report prepared for this project.

Note 2: The surrounding projects with potential for cumulative impacts are considered within the table above and addressed in the relevant sections of this EIS. This is however a point in time reference and it is expected that other projects may exist within the broader 60 km buffer of the Project, but are unlikely to result in significant cumulative environmental, social and/or economic impacts.

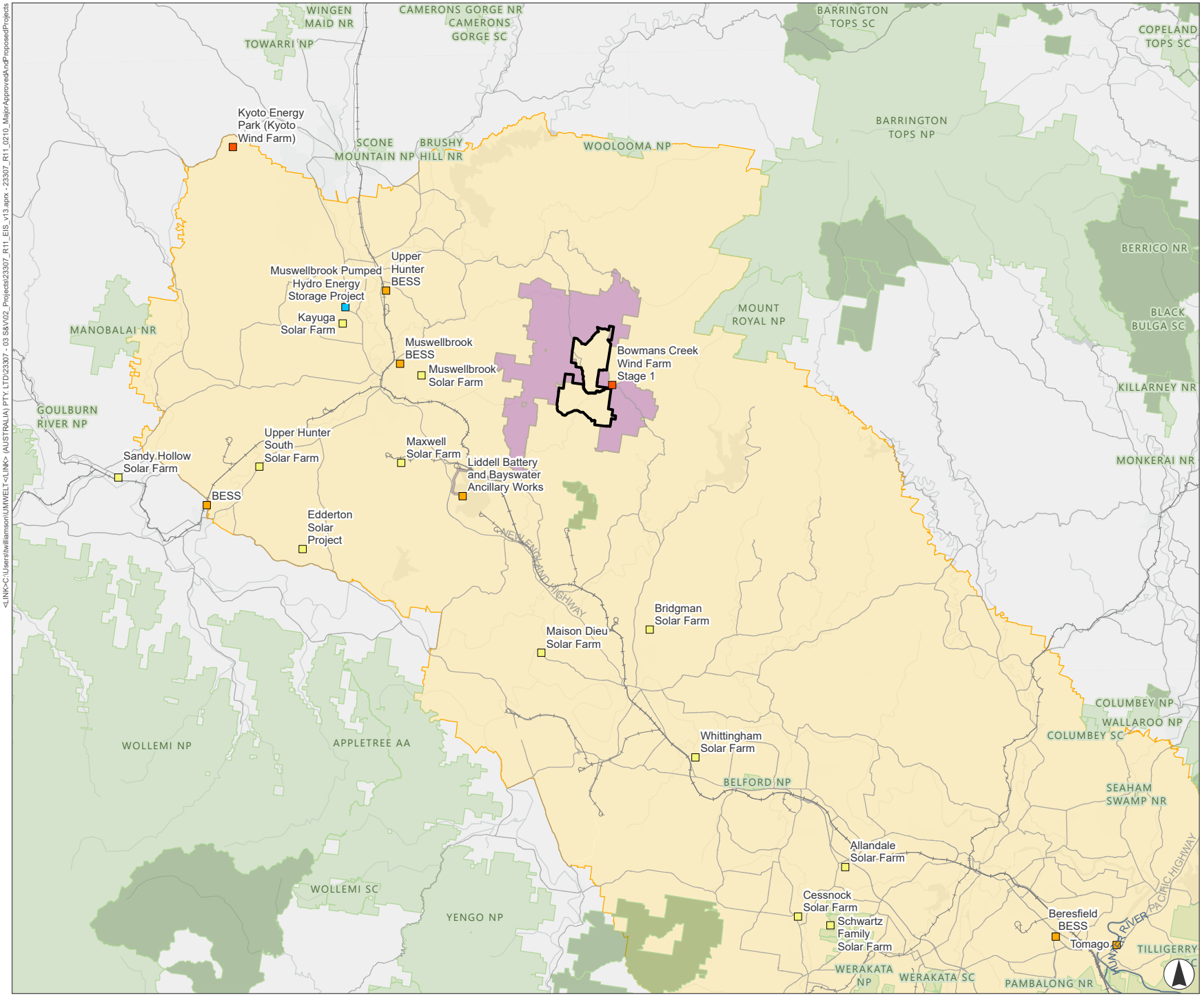


FIGURE 2.10

Major Approved and Proposed Development in the Vicinity of the Project

Legend

- Road
- Railway Line
- River/Stream
- Hunter-Central Coast Renewable Energy Zone
- NPWS Reserves
- State Forest

Project

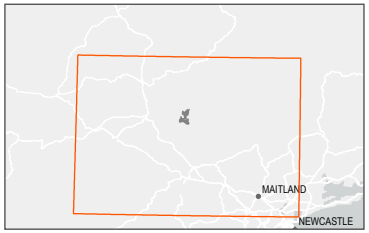
- Project Boundary

Stage 1 Project

- Stage 1 Project Area

Major Projects

- BESS
- Pumped Hydro
- Solar Farm
- Wind Farm



0 5 10

Kilometres

Scale 1:550,000 at A4
GDA2020 MGA Zone 56

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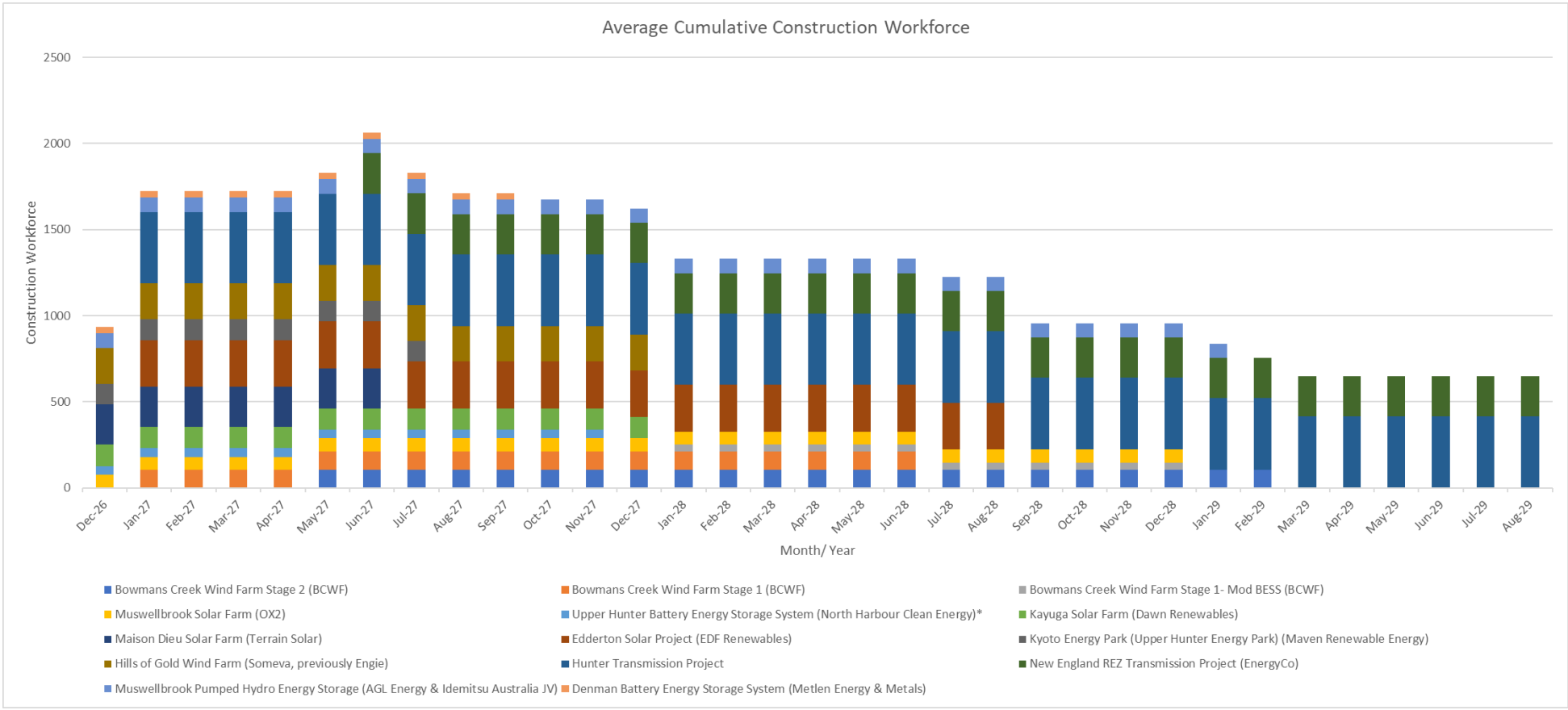


Figure 2.11 Average Cumulative Construction Workforce for Key Projects in the Region

Source: Bowmans Creek Wind Farm Stage 2 Social Impact Assessment (Umwelt, 2026)

2.5 Project Related Agreements and Benefit Sharing

Through the Project design and stakeholder engagement process, BCWF has developed and implemented several Project related agreements which are summarised below.

2.5.1 Host Agreements

BCWF and the host landholder have entered into an agreement to host Project-related infrastructure on the host landholders land. The host landholder will receive annual lease payments to host wind farm infrastructure. These payments are confidential between BCWF and the host landowner and address the Project-related impacts on these land holdings and dwellings. One (1) landholder owns all landholdings across the Project Area, across three (3) residences, being Q17-1, Q17-3 and Q17-5, as shown on **Figure 2.5**.

The host landowner will continue to undertake agricultural activities on their land excluding the specific areas hosting infrastructure and some disruption during construction work. The impacts of the Project on the host landholders, whilst noted in some of the technical assessments as relevant, are managed by the agreement in place.

2.5.2 Impact Agreements

BCWF has negotiated private impact based agreements with five (5) neighbouring landholders on the basis of potential amenity (visual and noise) impacts to their respective residences (S17-2, S15-1, T15-1, S17-1 and R17-1).

For the purposes of this EIS, there are eight (8) associated landholders with residences described as associated residences/receivers throughout this EIS, including Q17-1, Q17-3, Q17-5, R17-1, S17-1, S17-2, T15-1 and S15-1, which includes the three (3) host residences described in **Section 2.5.1** above. All associated residences are shown on **Figure 2.5** below.

These agreements were developed in accordance with the Wind Energy Guidelines and have been agreed between BCWF and each relevant landholder. The impacts of the Project on these residences, whilst noted in the technical assessments as relevant, are addressed by the agreements in place.

It is noted that two (2) non-associated residences (i.e. P22-1 and P22-4) are present within 3.3 km of a Project WTG. However, these residences compliant with the relevant NSW visual, noise and dust policies and guidelines and do not require negotiated agreements.

2.5.3 Community Benefit Sharing

BCWF is committed to being a positive contributor to the communities where it works and share the benefits of its projects by supporting communities over the long term and providing a positive and lasting contribution to the region. The initiatives that BCWF is proposing developing for the Project are discussed below, and are consistent with the requirements set out in the NSW DPHI Benefit-Sharing Guideline (DPHI, 2024d).

2.5.3.1 Neighbour Benefit Sharing

BCWF will establish a neighbour benefit sharing scheme which will provide payments to non-associated landholders whose residences are located within between 3.3 km and 5 km of a WTG. This scheme provides a mechanism for benefit sharing with neighbouring landholders who are not eligible for impact agreements under the Wind Energy Guidelines (based on the assessment of noise and visual impacts).

The scheme offers annual rebates on electricity charges as follows:

- residents between 3.3–4 km from a wind turbine will be eligible for an annual rebate of $1,000 on their household electricity costs
- residents between 4–5 km from a wind turbine will be eligible for an annual rebate of $500 on their household electricity costs.

Participation in the program does not prevent residents from expressing their opinion and views of the project, privately or publicly, at any time.

2.5.3.2 Community Grants

Since 2019, BCWF has delivered a range of community benefits through its support for local organisations and events. These include:

- Donation to the Men of League Foundation (2019 – $1,000).
- New cameras for the local RFS shed after the previous cameras were destroyed (2019 – $120).
- Donation to the Leukaemia Foundation in the name of a local child battling leukaemia (2022 – $2,100).
- Sponsorship of the Hunter New Energy Symposium (2024 – $5,000).

As part of BCWF ongoing community and stakeholder engagement outlined in **Section 5.0**, BCWF will continue to investigate opportunities to support the community through consultation during subsequent stages of the Project.

2.5.4 Planning Agreements

BCWF is committed to entering into planning agreements for the Project with Singleton and Muswellbrook Shire Councils. BCWF has been working with the Councils on the proposed terms of the planning agreements, which would be consistent with the quantum presented in the Renewable Energy Framework and associated Benefit Sharing Guideline.

BCWF provided a letter of intent to each council to enter into a planning agreement. The general terms of this offer are to provide annual payments divided evenly between each council, based on the number of MW's installed in each LGA.

2.6 Project Alternatives

During the planning and design phase of the Project, various alternatives were considered by BCWF with changes made to the Project based on community feedback and to minimise environmental, social and economic impacts while maximising the potential for electricity generation. The alternatives considered included the 'do nothing option' (i.e., not developing the Project), alternative locations and various Project layouts. These alternatives are discussed in the subsequent sections below.

2.6.1 Do Nothing Option

The Project Area is currently used primarily for livestock grazing. The 'do nothing option' would allow for the continued use of the whole Project Area for agricultural purposes. The 'do nothing option' would also mean that the Project is not developed and would therefore forgo the Project's identified benefits as outlined in **Section 2.7**, namely:

- Assisting in meeting the NSW and Commonwealth government's objectives of transitioning to renewable electricity generation.
- Increased energy security and supply into the NEM.
- Significant social and economic benefits created through capital investment and provision of direct and indirect employment opportunities during the construction and operation of the Project.
- Project related agreements and community benefit sharing initiatives, as described in **Section 2.5**.
- Further, the 'do nothing option' would also result in a lost opportunity for the landholders to diversify their income streams.

The 'do nothing option' would avoid the environmental and social impacts associated with the construction, operation and decommissioning of the Project, such as biodiversity, noise, traffic, social amenity and visual impacts amongst others. Whilst impacts will occur with the construction, operation and decommissioning of the Project, these impacts will be managed to acceptable levels through the careful design of the Project and the implementation of the management and mitigation measures outlined throughout **Section 6.0** and in **Appendix 5.**

The 'do nothing option' was considered but the decision was made by BCWF to proceed with the Project to enable the benefits in **Section 2.7** to be realised.

2.6.2 Site Selection and Alternative Locations

Alternative locations were considered during the Project feasibility stage. However, the Project location was ultimately selected based on numerous factors, including but not limited to:

- Proximity to the approved Stage 1 project and the ability for utilise infrastructure such as sections of the reticulation network, select substations, batching plants, rock crushing facilities, the O&M facility and temporary construction infrastructure, resulting in a substantial reduction in impacts should these features have been required for the Project.

- Ability to connect to the NEM via the approved Stage 1 project. The Stage 1 project electrical reticulation network, which consists of 21 km of overhead and underground transmission lines extending to the 330 kV Liddell Substation adjacent to the decommissioned Liddell Power Station, will be utilised to enable connection to the grid. This results in a significant reduction in impacts should a new connection to the grid be required.
- Its strategic position within the Hunter-Central Coast REZ, an area identified by the NSW Government as ideal for renewable energy development.
- The reliability of the wind resource.
- The low density of potentially affected residences within the surrounding area, relative to other areas of the broader Hunter region.
- Proximity to existing and approved transmission infrastructure and the existing road network.
- Generally supportive or neutral attitudes towards the Project from potentially affected landholders.

2.6.3 Refinement of the Project Layout

The Project design presented in **Section 3.0** and used for the purposes of assessment within this EIS has been developed and refined through an iterative process, in response to key planning, environmental and social constraints and feedback from key stakeholders. The key stages of this design refinement process are set out below in **Figure 2.12**.

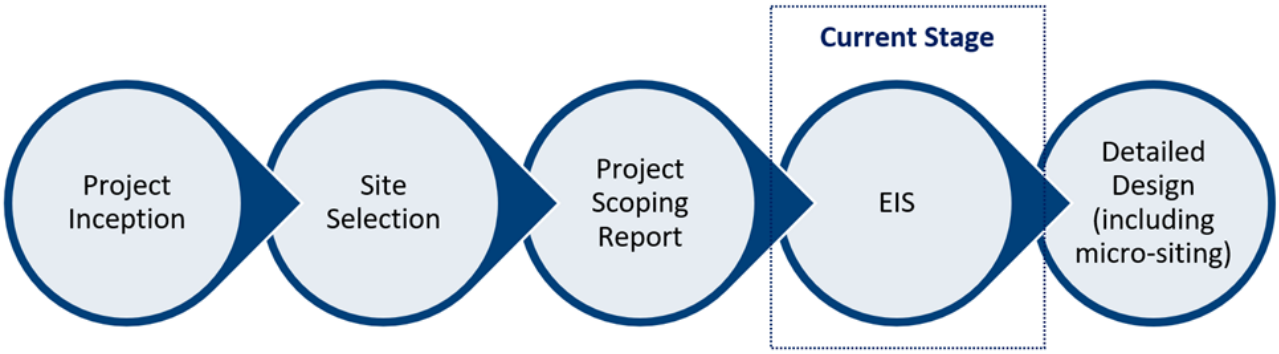


Figure 2.12 Project Design Process–Key Stages

At each stage of the design process, from Project inception, through Project Scoping and the development of this EIS, the following principles of the avoidance hierarchy were adopted:

- **Avoid** – in the first instance, all efforts were made to avoid potential planning. environmental and social impacts.
- **Minimise** – where potential impacts could not be avoided, design principles sought to minimise impacts, as far as reasonably practicable.
- **Mitigate** – mitigation strategies have been identified and will be implemented to manage the extent and severity of the remaining impacts.
- **Offset** – environmental offsets are only used following all efforts to first avoid, minimise and mitigate impacts.

In addition, the following Project-specific refinements were undertaken throughout the design of the Project to avoid and minimise impacts to key environmental and social features:

- **Minimising impacts to potential Serious and Irreversible (SAII) entities:** preparation of threatened species polygons was undertaken in accordance with the NSW Biodiversity Assessment Method (BAM) as a component of the Biodiversity Development Assessment Report (BDAR), which identified areas of the Disturbance Footprint that interacted with potential SAII entities, including the critically endangered Box Gum Woodland (woodland form) threatened ecological community (TEC) in the southern portion of the Project Area, and potential breeding habitat for Large-eared Pied Bat (LEPB) in the northern portion of the Project Area between WTGs 82 and 83, and potential LEPB breeding habitat along the overhead transmission line in the southern portion of the Project Area. With this information, BCWF undertook Project design refinements to avoid interacting with areas of potential SAII as far as reasonably practical, including:
    - the complete avoidance of the potential LEPB breeding habitat buffer in the northern portion of the Project Area,
    - design of the overhead transmission line to avoid siting transmission line towers within LEPB breeding habitat and enable adequate height clearance of the transmission line cables from the potential LEPB habitat (described further in **Section 2.6.3.3** below), and
    - avoiding impact to the majority of the woody vegetation component of the Box Gum Woodland. As outlined in the BDAR, 34.48 ha of Box Gum Woodland grassland form are identified for impact, with only 3.02 ha of woodland form being impacted.
- **Avoiding and minimising impacts to native vegetation, particularly threatened ecological communities:** from Project inception, regional vegetation mapping was integrated into BCWF's model for WTG placement to focus on avoiding high and medium value vegetation and areas of threatened ecological communities. As biodiversity fieldwork progressed and a more detailed understanding of the biodiversity values of the Project Area became available, the Development Corridor was progressively refined, and the indicative Disturbance Footprint was designed such that impacts to native vegetation and particularly impacts to threatened ecological communities were reduced as far as reasonably practicable.
- **Minimising interactions with Biodiverse Riparian Land**: BCWF has sought to avoid placement of WTGs and other key infrastructure within groundwater dependent ecosystems (GDE) along the proposed overhead transmission line alignment in the southern portion of the Project Area. The placement of transmission poles has been designed to avoid direct impacts to riparian woodland and Derived Native Grassland (DNG). Several stream crossings are still required; however, these have been minimised as far as reasonably practicable.
- **Continued protection of heritage values:** BCWF has designed the Project to minimise interactions with areas of higher potential archaeological significance by reducing the number of watercourse crossings, where possible.
- **Minimise amenity impacts to residences:** BCWF has sought to minimise amenity impacts, including visual and noise impacts, as far as reasonably practicable, and in line with the NSW Wind Energy Guideline (DPHI, 2024). As far as practicable, Project-related infrastructure has been located away from nearby residences and adjoining properties.

- **Protect agricultural values:** the iterative design process has considered and addressed, as far as practicable, landowner feedback on agricultural values and land use. BCWF's design objective was to maintain the existing agricultural values, by enabling wind farm operations to co-existing with grazing activities and to avoid impacts to irrigated cropping areas within the Host landholdings.

Table 2.3 below provides a summary of design refinements made by BCWF during the development of the Project. These changes were implemented to avoid, minimise and mitigate impacts in accordance with the hierarchy and specific principles outlined above.

Although there are some instances where Project elements have increased, this reflects layout changes made to avoid key environmental features (i.e. potential SAII entities) in other areas across the Project, whilst maintaining Project viability from an access and engineering perspective.

A detailed overview of the Project refinement process is then provided in the following sections.

Table 2.3 Refinement of Project Design – Summary (Pre Scoping to the EIS Project)

Project Element	Design A: Pre-Scoping (2023)	Design B: Scoping (July 2024)	Design C: Pre-EIS (December 2024)	Design D: The EIS Project (April 2026)
Project Area	3552 ha	3,552 ha	3,552 ha	3,592 ha
Development Corridor	532 ha	428 ha	421 ha	419 ha
Disturbance Footprint	253 ha	168 ha	179.1 ha	179.6 ha[1]
WTGs	31	21	21	21

Note: rounded to 180 ha in this EIS. This minor increase in Disturbance Footprint was required to fully avoid potential breeding habitat for LEPB, and a 179 ha Disturbance Footprint could not be maintained. The minor additional area of impact did not interact with any other key constraints and hence avoidance of potential breeding habitat for LEPB was prioritised.

2.6.3.1 Refinement of Project Design – Pre Scoping (2023) to Scoping (July 2024)

Project design considerations between 2023 and the finalisation of the preliminary Project design for the submission of the Scoping Report in July 2024 include:

- Establishment of a defined no-go area beyond which WTGs and ancillary infrastructure would not occur, informed by a comprehensive review of all waterbodies and the application of standard buffers (including ~100 m setbacks from project boundaries and road reserves, with limited exceptions).
- Application of land-use compatibility criteria, ensuring WTG locations were placed in areas compatible with host residences' existing land uses, including recognition of residences already associated with the Stage 1 project.
- Completion of a reconnaissance survey to identify ecological constraints early and refine or reduce the Development Corridor accordingly.
- Relocation of WTGs and ancillary infrastructure to cleared land where feasible, to avoid or minimise native vegetation clearing.
- Reduction of the overall Project Area to exclude areas of unfavourable topography, thereby avoiding unnecessary environmental and construction impacts.

- Co-location and infrastructure sharing with Stage 1, including siting WTGs and access tracks to utilise existing infrastructure where possible, reducing the incremental footprint and disturbance associated with Stage 2.

The above impact minimisation strategies resulted in the following design changes:

- Development Corridor decreased by 104 ha.
- Disturbance Footprint decreased by 85 ha.
- Removal of nine (9) WTG from the northern portion of the Project Area.
- Removal of one (1) WTG from the southern portion of the Project Area .
- The Development Corridor allowance around WTGs was reduced from a radius of 100 m to a minimum buffer area of approximately 30 m.
- No change to the Project Area.

2.6.3.2 Refinement of Project Design–Scoping (July 2024)–to Pre-EIS (December 2024)

Project design considerations between the Scoping design in July 2024 and a preliminary design in December 2024 include:

- Reduction in the Development Corridor in the north-eastern near WTG 93 and southern portions of the Project Area near WTG 77 to avoid areas of high biodiversity value. This includes areas of mapped Box Gum Woodland TEC (woodland form) which represents a potential SAII entity.
- Investigation of an alternative access point to WTG 84 in the northern portion of the Project Area.

The above design considerations resulted in the following design changes:

- Development Corridor decreased by 7 ha.
- Disturbance Footprint increased by 11.1 ha.
- No change to the Project Area.

2.6.3.3 Refinement of Project Design–December 2024 to EIS Project Design

A whole of Project engineering design review was undertaken by BCWF prior to determining the Project design used for the purpose of assessment within this EIS. This resulted in several changes to the Project design which were considered necessary from an engineering standpoint to enable all sections of the Development Corridor to be accessed safely, and to ultimately deliver a viable Project.

Additionally, key Project-specific design refinements occurred to avoid and minimise impacts to the LEPB breeding habitat, a candidate SAII entity, as discussed below.

Project design refinements between the Pre-EIS design (December 2024) and the current EIS design (April 2026) include:

- Adjustments to the Disturbance Footprint between WTG 82 and 83 in the northern portion of the Project Area to entirely avoid a habitat feature which has potential to support LEPB breeding habitat, as identified by SLR during ecological surveys undertaken to support the BDAR, included as **Appendix 8** of this EIS. A breeding habitat buffer for this species was generated which represents a potential SAII entity, and has been fully avoided through this design refinement.

- Redesign of the overhead transmission line in the southern portion of the Project Area to avoid a LEPB breeding habitat buffer. This is discussed in detail below.
- Removal of the proposed access option to turbine 84 to avoid impacts to key environmental features (including ecological values and a watercourse crossing) and unfavourable topography, which removed approximately 22 ha of Development Corridor in the northern portion of the Project Area between WTGs 82 and 84.
- The Development Corridor and Disturbance Footprint were increased in the south-eastern portion of the Project Area to allow for the construction of access tracks between turbined 75 and 74.
- Adjust the subdivision location approximately 50 m north.
- Various Project Boundary amendments to ensure that all disturbance associated with the connection of access tracks and electrical reticulation between the Stage 2 and Stage 1 projects were accounted for within the Project SSDA. This includes:
    - An addition of 22.3 ha to the north eastern portion of the Project Boundary.
    - An addition of 15.1 ha to the south eastern portion of the Project Boundary.
    - An additional 0.2 m to the south eastern portion of the Project Boundary north of the overhead transmission line.
    - An additional of 20 m to the southern portion of the Project Boundary.
- Minor adjustment to various WTG locations, as identified in **Table 2.4** below.

Table 2.4 WTG Adjustments Since December 2024 to EIS Project

Turbine	Distance (m)	Direction
73	39.6	South
74	203.2	North-west
75	4.3	South-south-west
76	28.1	North-north-west
77	29.7	North-west
78	13.1	North-east
79	26.3	South-west-west
80	1.9	North-east
81	82.4	North-east
82	14.9	South-south-west
83	42.1	South-east
84	4.6	South-south-west
85	17.5	North-east-east
86	1.8	South-west
87	37.3	North-east
88	2.5	South-east
89	290.3	North
90	26.2	North-west-west

Turbine	Distance (m)	Direction
91	5.6	North-north-east
92	1.0	North-west-west
93	13.0	South-east

The above design considerations resulted in the following design changes:

- Development Corridor decreased by 2 ha.
- Disturbance Footprint increased by 0.5 ha.
- Project Area increased by 40 ha.
- Adjustment to the WTG locations as noted in **Table 2.4** above.

Each key design iteration discussed above have been visually represented in **Figure 2.13** to **Figure 2.15**.

FIGURE 2.13

Project Layout Refinement - 2023 to Scoping (July 2024)

Legend

Road

Project

Project Boundary

Scoping Design Iteration (21 WTG)

Turbines

Access Tracks

Disturbance Footprint

Development Corridor

21 WTG Design

Disturbance Footprint

Development Corridor

25 WTG Design

Turbines

Tracks

Disturbance Footprint

Development Corridor

29 WTG Design

Turbines

Tracks

Disturbance Footprint

Development Corridor

31 WTG Design

Tracks

Disturbance Footprint

Development Corridor

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Kilometres

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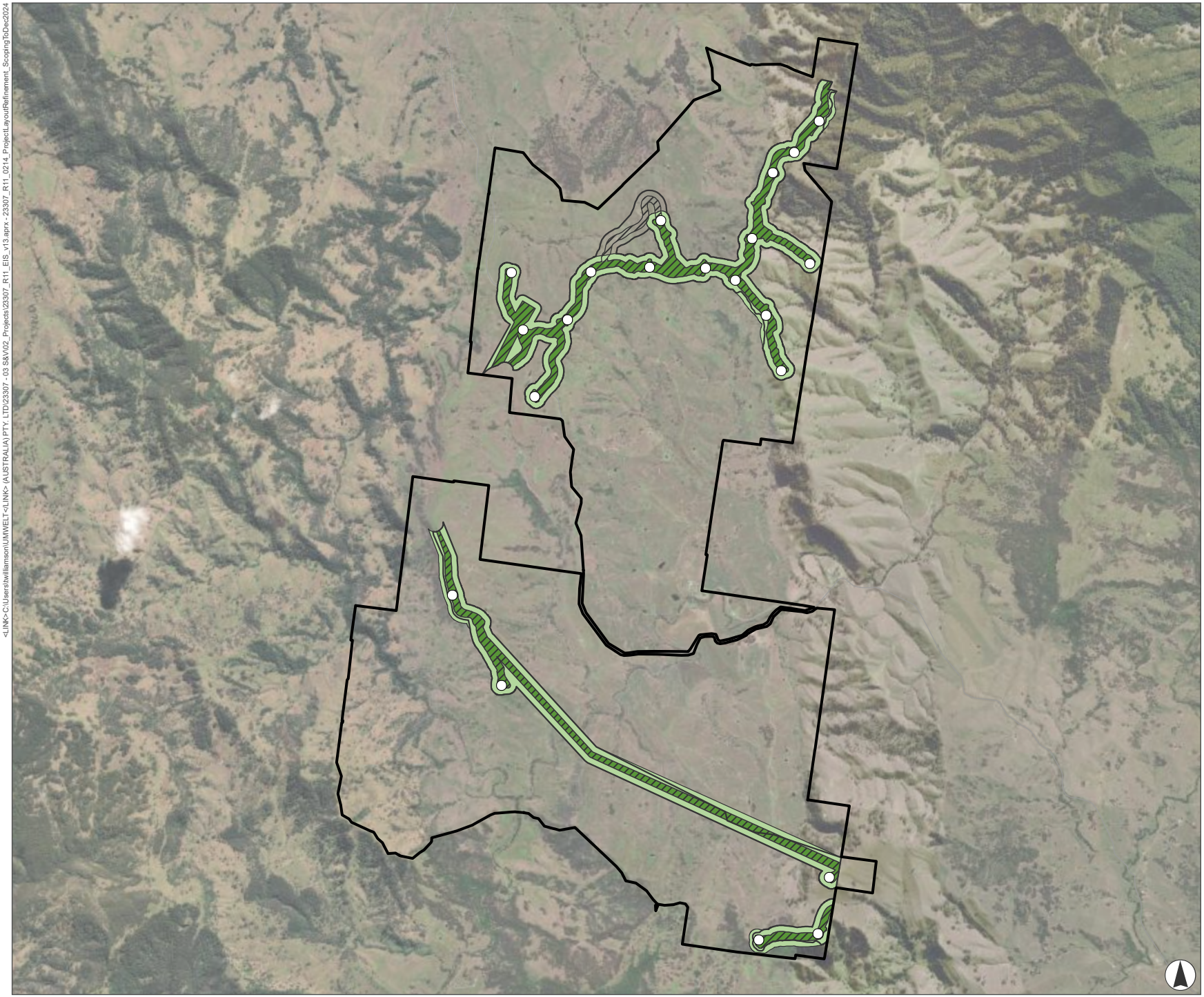


FIGURE 2.14

Project Layout Refinement – Scoping Phase (July 2024) to December 2024

Legend

Road

Project

- Project Boundary
- Development Corridor
- Development Footprint
- Turbines

Scoping Design Iteration (21 WTG)

- Turbines
- Disturbance Footprint
- Development Corridor



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Kilometres

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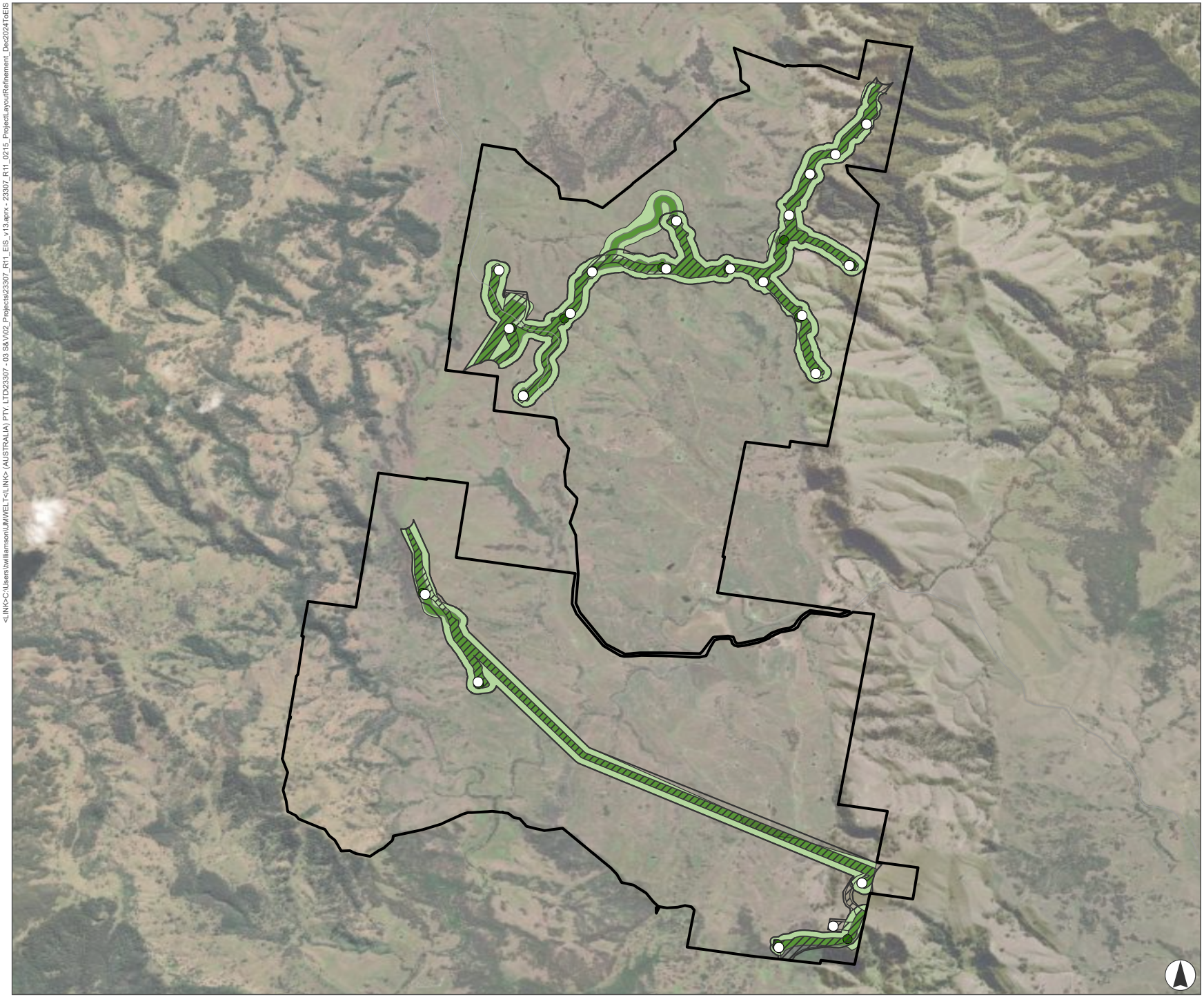


FIGURE 2.15

Project Layout Refinement – December 2024 to EIS Project

Legend

Road

Project

- Project Boundary
- Development Corridor
- Disturbance Footprint
- Turbines

Stage 2 Design Iteration - December 2024

- Turbines
- Development Footprint
- Development Corridor



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Kilometres

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Overhead Transmission Line Design Refinements to Avoid LEPB Breeding Habitat

As discussed in **Section 2.6.3.3** above, a key Project design refinement was undertaken during the EIS phase to avoid potential impacts to LEPB breeding habitat, a candidate SAII entity.

This involved modifying the design of the proposed overhead transmission line in the southern portion of the Project Area to avoid interacting with an area of LEPB breeding habitat that was mapped along the transmission line corridor. This occurred via three (3) key steps:

- Establishment of a 'LEPB Avoidance Area' based on the LEPB breeding habitat polygon as defined in the BDAR (**Appendix 8**), as illustrated on **Figure 2.16**[2] below. No ground-disturbance, vegetation removal, or vegetation trimming would occur in this area.
- Relocation of a proposed overhead transmission line tower to fully avoid the LEPB avoidance area. This involved re-siting a transmission line tower approximately 100 m north west.
- Redesign of the connection between two (2) transmission line towers to enable adequate clearance from the transmission line cables to the LEPB breeding habitat, as described below.

BCWF worked with collaboratively Umwelt and SLR to generate a targeted concept design for the pole arrangements and transmission line alignment at this location, incorporating the topographical profile and estimated height of the vegetation in this area to enable the transmission line to safely span the variable terrain while maintaining required clearances to vegetation and associated LEPB breeding habitat. This design is illustrated in **Figure 2.17** below.

The design illustrates a conceptual longitudinal profile of the proposed overhead transmission line traversing the variable topography within this portion of the Project Area. The span between the two (2) transmission line towers in this location is approximately 300 m across sloping terrain with ground elevations varying from approximately 300 m to 206 m AHD, with the identified LEPB breeding habitat present along a rock face in between these two (2) towers at approximately 224 m AHD. The design also includes a conceptual transmission line cable sag which was calculated by BCWF.

The design incorporates precautionary inputs from SLR with regard to key biodiversity features, and incorporates the topographical profile and estimated maximum future vegetation height to demonstrate the vertical clearance achieved. It identifies that a vertical clearance of 47 m is achieved between the LEPB breeding habitat and the lowest point of the transmission line (allowing for sag) and for context 27 m to any surrounding vegetation.

Figure 2.17 has been prepared to illustrate that the proposed transmission line design can maintain appropriate clearances to the mapped LEPB breeding habitat and associated vegetation while accommodating site-specific topographical variation, and demonstrates that although the proposed transmission line corridor passes through the LEPB Avoidance Area as shown in **Figure 2.16**, appropriate measures have been made to avoid this potential SAII entity.

This is discussed further in the BDAR (**Appendix 8**) and as summarised in **Section 6.4.6**.

[2] This figure also shows the LEPB breeding habitat that was avoided via design refinements in the northern portion of the Project Area

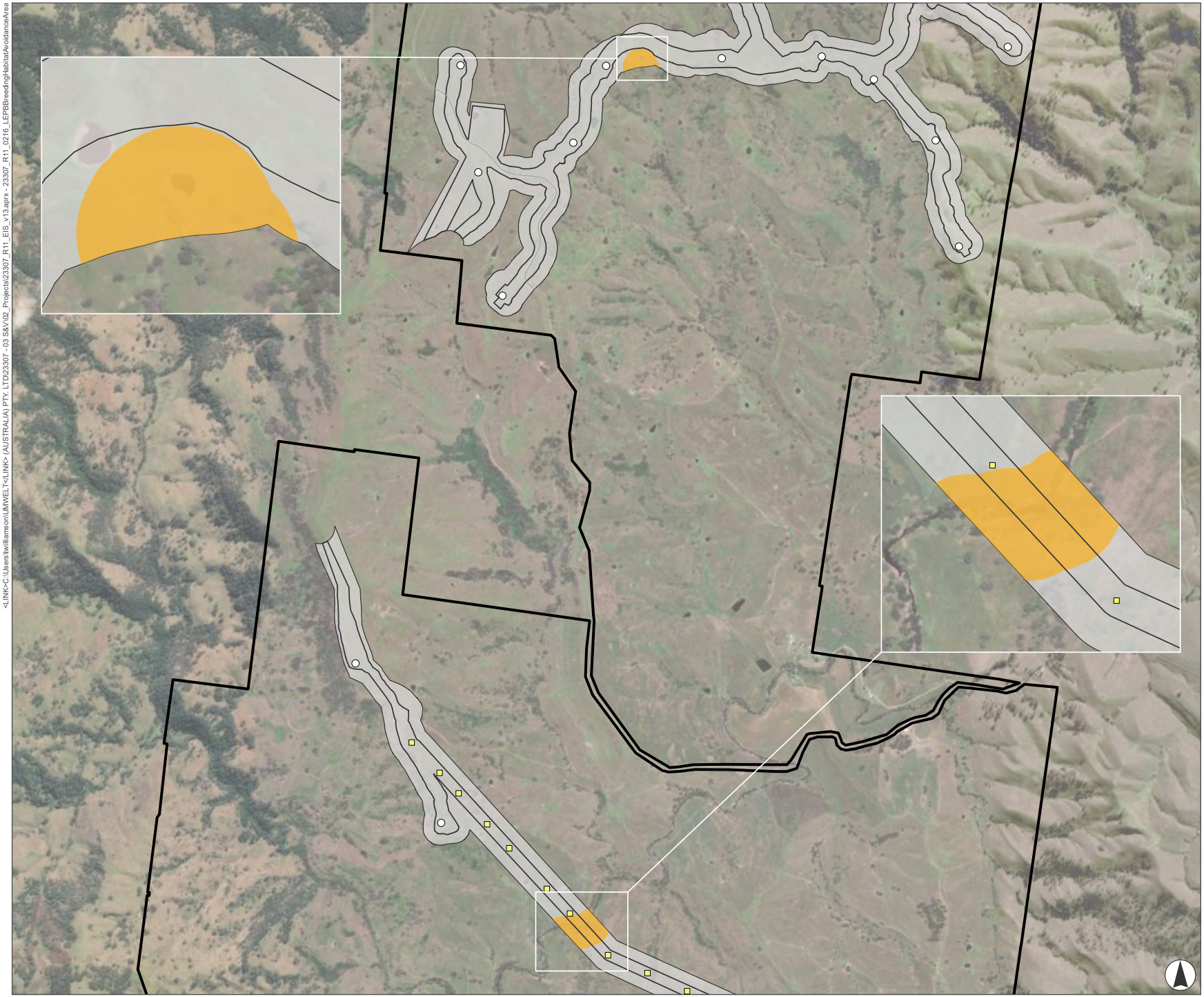


FIGURE 2.16

LEPB Breeding Habitat Avoidance Area

Legend

- Road
- Large Eared Pied Bat Breeding Habitat

Project

- Project Boundary
- Disturbance Footprint
- Development Corridor
- Wind Turbine Generators
- Power Poles



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Kilometres

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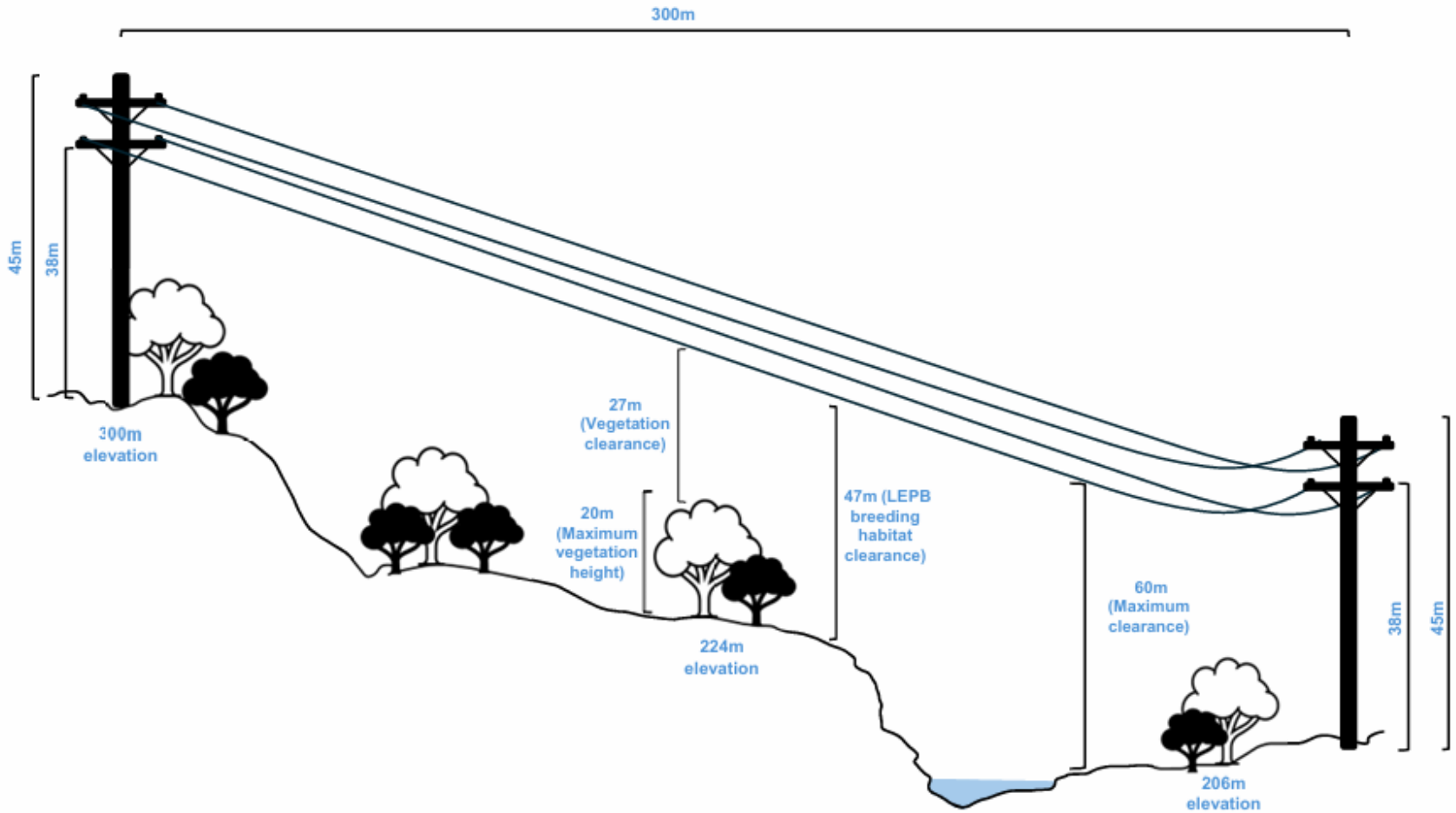
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Parameter	Value	Symbol / Formula	Notes
Span length	300 m	-	Between poles
High pole ground elevation	300 m	-	Upper terrain
Low pole ground elevation	206 m	-	Lower terrain
Elevation difference	94 m	-	Very steep span
Tree location	200 m from high pole	-	Critical point
Tree ground elevation	224 m	-	Local high ground
Tree height	20 m	-	-
Tree top elevation	244 m	-	Clearance reference
Conductor type (typical)	ACSR (e.g. Dog)	—	Typical 33 kV line
Weight per unit length	12 N/m	W	Approx. 1.2 kg/m
Horizontal tension	30000 N (30 kN)	T	Moderate operating tension
Span length	300 m	L	-
Sag at tree point	~4.0 m	Wx(L - x) / 2T	At x = 200 m
Straight-line height @ tree	275.4 m	1/3 H_1 + 2/3 H_2	Before sag
Conductor height @ tree	271.4 m	(above − sag)	Actual position
Tree top elevation	244 m	-	-

Parameter	Value	Symbol / Formula	Notes
Conductor height @ tree	271.4 m	-	-
Worst-case scenario (heat and swing) clearance	23m	-	-
Final clearance	27.4 m	-	

Parameter	Value	Symbol / Formula	Notes
Poles	High Pole	Low Pole	Notes
Pole height	45 m	45 m	Physical structure
lowest Conductor attachment height	38 m	38 m	Below pole top
lowst Conductor elevation	338 m	244 m	Ground + attachment

Data Source: BCWF Pty Ltd

FIGURE 2.17

Pole Arrangement and Transmission Line Concept Design (LEPB SAII Avoidance Area)



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2.7 Project Justification and Benefits

Development for the purposes of renewable energy generation aligns with both Commonwealth and NSW commitments to increase renewable energy generation and reduce carbon emissions across the NSW and Australian economies. By developing the Project, BCWF aims to provide cleaner reliable energy generation to assist with meeting current load demand while simultaneously reducing GHG emissions and the impacts of climate change.

As discussed in **Section 2.1.4.4**, as a renewable energy project located within the Hunter-Central Coast REZ, the Project is located within a defined area planned for renewable energy development by the NSW Government. The NSW government has indicated that REZs will play a vital role in delivering affordable energy generation to help prepare the State for the expected retirement of thermal power stations over the coming decades. The Project will contribute to meeting these Federal and NSW Government objectives and is appropriately located.

The Project is consistent with the objectives of the NSW Electricity Strategy and Infrastructure Road Map (NSW Government, 2020), in aiming to provide large-scale renewable electricity generation that is affordable and reliable. With a proposed capacity of approximately 120 MW, the Project will make a material contribution to the broader NSW emission reduction targets.

The Project will also contribute significant capital investment within the Hunter region, generate jobs during the construction, operational and decommissioning phases, provide indirect benefits to local services throughout the life of the Project (e.g. indirect employment creation in local and regional economies would include jobs supported through transportation, trade supplies, services, accommodation, catering, retail services, etc.), deliver additional income to host and other associated landowners, and provide benefits to the local community through the implementation of planning agreements with local Councils and the community. This is discussed in detail within the Social Impact Assessment (SIA) and Economics Impact Assessment (EIA) included in this EIS as **Appendix 20** and **Appendix 21**, respectively.

BCWF has refined the Project based on feedback received from relevant stakeholders throughout its development, as outlined in **Section 2.6**, **Section 5.4.3** and **Section 5.4.4**. BCWF has considered a range of alternatives in planning the Project and in determining the concept layout included in this EIS. The preliminary WTG layout and infrastructure design was subject to several iterations to minimise environmental and social impacts.

The assessment findings outlined in **Section 6.0** indicate that while there will be environmental and social impacts associated with the Project, the extent of impact has been minimised through the design process and where impacts are predicted, BCWF has committed to management, mitigation and offset measures to address these residual impacts.

The Project will provide long-term, strategic benefits to NSW, and at the regional and local levels, including:

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

- Approximately $260 million in investment during the construction phase.
- Ongoing economic stimulus associated with the operation of the Project is estimated at approximately $50.9 million over 30 years (CPI adjusted) relating to land holder leasing payments, operational wage stimulus, and community payments, minus the agricultural productivity loss impact.
- Supporting 70 direct and 110 indirect FTE positions in the national economy (on average) over the construction period, with 160 FTE jobs during peak construction.
- Supporting an estimated 10 direct and 30 indirect FTE jobs nationally during operations across both the Stage 1 and Stage 2 projects.
- An estimated $1.3 million in economic stimulus is expected to be directed to local businesses and service providers due to the temporary migration of non-local workers during the construction period.
- The Project will also provide additional direct financial benefits to the region and local community, including:
    - Payments to host and neighbouring landowners via private agreements and a community benefit sharing scheme.
    - Annual payments to the community under Planning Agreements with each of the two (2) Councils.

2.7.1 Climate Change and Greenhouse Gas Benefits

GHG emissions are associated with the construction, operation and decommissioning of onshore wind projects, primarily due to the manufacturing of materials including steel and concrete, the transport of components including shipping and Port to project OSOM vehicle movements and construction activities. GHG emissions life-cycle assessment studies have demonstrated that emissions (if energy inputs are generated from fossil fuel sources) required in the above activities are low compared to the renewable energy generated during operations.

For onshore wind, a single kilowatt hour (kW/h) of electricity required the input of approximately 9.7–10.8 g CO_2 inclusive of all life-cycle stages (Pimentel Pincelli, 2024). This is compared to the typical lifecycle estimates for coal electricity which is approximately 900–1,200 g CO_2-e/kWh, depending on coal type (i.e. brown vs black) (Clean Energy Regulator, 2024).

When compared with fossil fuel-based electricity generation, wind energy carbon requirements are offset within a short period of operation, with greenhouse gas payback times for onshore wind projects reported to range from approximately two (2) to 23 months, with an average of approximately five (5) months depending on wind resource and turbine characteristics (Dammeier, 2019).

Accordingly, over the Project's 30-year operational life, renewable energy generation is expected to avoid approximately 11–15 million tonnes of CO_2 compared with coal-fired electricity on a life-cycle basis. Coal fired electricity substantially exceeds the CO_2 associated with the Project's construction, operation and decommissioning.

3.0 Description of the Project

The Project has been designed and refined through a comprehensive process that incorporates community and other stakeholder feedback to maximise positive environmental, social and economic outcomes while minimising impacts.

The key components of the Project include:

- Up to 21 (three (3) blade) WTGs, with a maximum blade-tip height of 250 m above ground level (AGL).
- Power infrastructure providing connection to the NEM, including:
    - One (1) on-site 330 kV substation and associated medium voltage transmission line connecting the on-site substation to the Stage 1 project electrical reticulation network.
    - One (1) overhead transmission line connecting the proposed WTGs in the south of the Project Area to the Stage 1 project electrical reticulation network.
    - An internal electrical reticulation network (i.e., underground 33 kV transmission lines) connecting all Stage 2 WTGs to the Stage 1 project electrical reticulation network.
- Permanent ancillary infrastructure including internal roads, hardstands, a substation, underground and overhead electricity transmission lines and poles, telecommunications facilities and utility services, and water storage tanks.
- Off-site road works to facilitate upgrades and alterations to the existing road network along the proposed oversize, overmass (OSOM) transport route, including the expansion on those already approved for the Stage 1 project. This is to enable the safe transportation of large infrastructure components (e.g., WTG blades, towers etc.), and other heavy vehicle usage to and from the Project Area.
- Temporary facilities including a temporary meteorological mast, materials laydown areas, concrete batching plant, environmental management and monitoring measures and signage.

The proposed Project layout is shown on **Figure 3.1**. Key components of the Project are summarised in **Table 3.1** and are described in further detail in the sections below.

Select infrastructure including up to five (5) WTGs and associated transmission lines from the Stage 1 project are sited within the Stage 2 Project Area. This Stage 1 project infrastructure has been assessed and approved under the Stage 1 project approval (i.e. SSD-10315) and does not form part of the SSDA for the Project. More information regarding the use of Stage 1 project infrastructure is presented in **Section 3.1**.

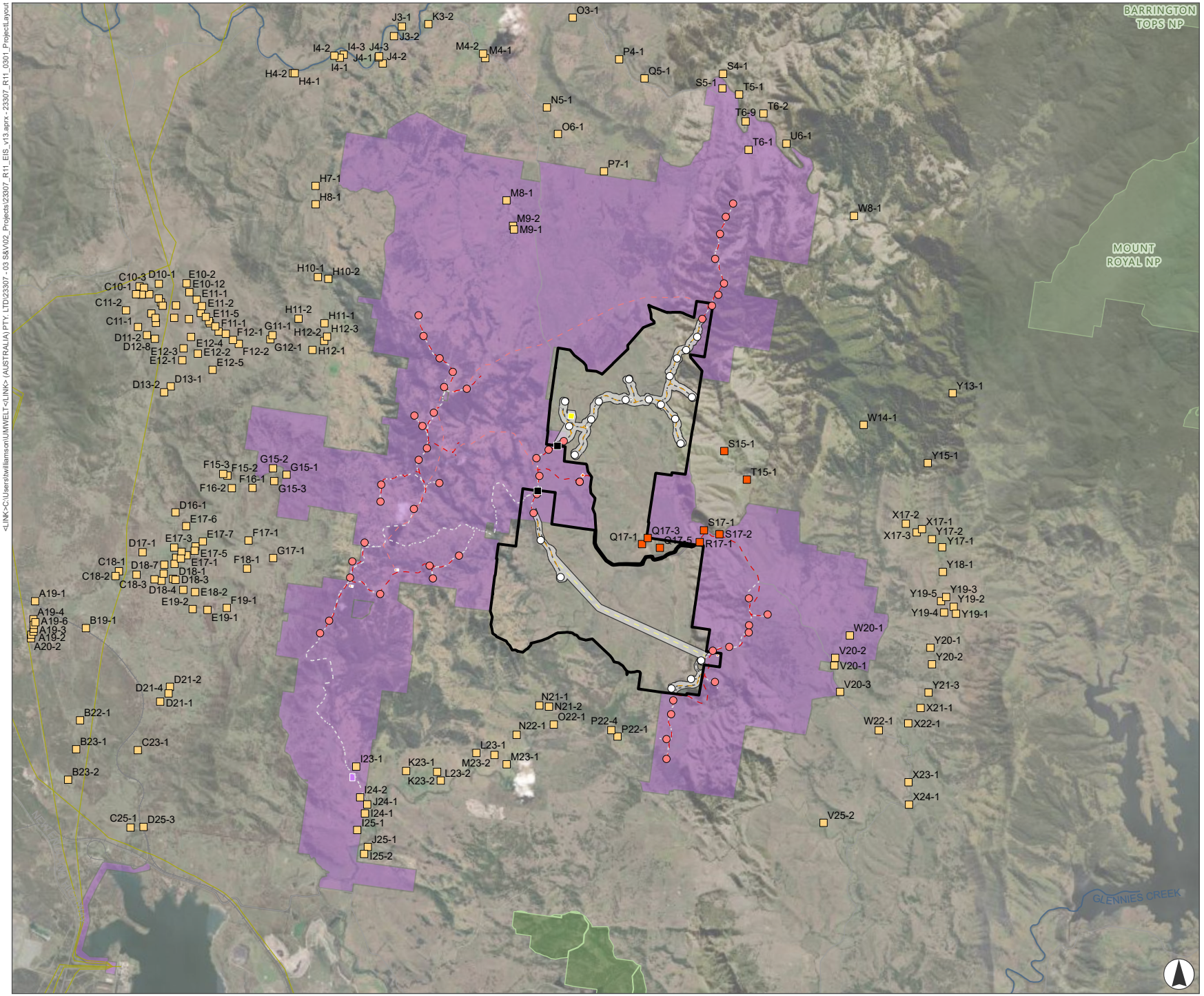


FIGURE 3.1
Project Layout

Legend

- Road
- Railway Line
- River/Stream
- Electricity Transmission Line
- NPWS Reserves
- State Forest

Dwellings

- Non-Associated
- Associated

Project

- Project Boundary
- Development Corridor
- Substation
- Laydown Area
- Batch Plant
- Overhead Reticulation Network
- Underground Reticulation
- Internal Roads
- Wind Turbine Generators
- Main Site Access

Stage 1 Project

- Project Boundary
- Construction Compound
- Batch Plant
- O&M Facility
- Overhead Reticulation Network
- Underground Reticulation
- Internal Roads
- Wind Turbine Generators

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Table 3.1 Project Overview

Project Element	Summary of the Project	Relevant Figure
Life of Project	30 years	Not applicable
Project Area	Approximately 3,592 ha	**Figure 3.1**
Development Corridor	Approximately 419 ha	**Figure 3.1**
Disturbance Footprint (a subset of the Development Corridor)	Approximately 180 ha	**Figure 3.1**
Offsite Road Works – Disturbance Footprint	Approximately 2.5 ha	**Figure 3.12**
Generating Capacity	Up to 120 MW	N/A
WTGs	Up to 21 (three (3) blade) WTGs	**Figure 3.1**
WTG Capacity	Up to 7.2 MW	N/A
Ancillary Infrastructure	Ancillary infrastructure for the Project includes, but is not limited to: • internal roads • hardstands • underground and overhead transmissions lines and poles • telecommunications facilities and utility services • water storage tanks.	**Figure 3.1**
Temporary Facilities	Select temporary construction facilities from the Stage 1 project are proposed to be re-used to facilitate the construction of the Project. These include primary and secondary construction compounds, site office buildings and storage areas, on-site concrete batching plants including rock crushing facilities, and laydown areas used for WTG installation and storage of WTG components. This results in minimal additional temporary facilities being required for the Project, including minor construction access roads, substation and transmission line poles, and environmental management and monitoring measures (i.e. for erosion and sediment control, etc.) and signage.	**Figure 3.1**
Subdivision/other	The Project seeks the option for subdivision and boundary adjustments to occur. These may be required to subdivide lands for the 330 kV substation connecting the proposed WTGs to the Stage 1 electrical reticulation network, and/or other subdivisions that may be required following the detailed design of the Project e.g. where physical roads do not follow the road easement.	**Figure 3.7**

Project Element	Summary of the Project	Relevant Figure
OSOM Transport Route	The OSOM Transport Route will utilise that approved for the Stage 1 project, which follows Scrumlo Road, Hebden Road (south), the New England Highway, the Hunter Expressway, John Renshaw Drive, Maitland Road, and Industrial Drive, which provides connection to the Port of Newcastle. Additional upgrades and alteration to the road network are however required for the Project (as a result of an updated route study, and when compared to the Stage 1 project) and these have been addressed in this EIS.	**Figure 3.11**
General Construction, Quarry and Water Transport Routes	General transport route to be utilised for light vehicles, heavy vehicles required for general construction, as well as for quarried material and water required during construction. This route utilises the State road network and extends north and south along the New England Highway towards Muswellbrook and Newcastle respectively, and accesses the Project Area using the approved Stage 1 project site access point at Scrumlo Road.	**Figure 3.10**
Site Access	Primary access to the Project will be via the main Project site access point (as approved for the Stage 1 project) at Scrumlo Road, in Hebden, NSW. Project vehicles will follow the respective routes described in the rows above to reach the approved Stage 1 site access point. From here, project vehicles would use the Stage 1 project access tracks, which traverses (north to south) the southern extent of the Stage 1 project area before heading east towards Albano Road. At this point, a northern track connects to the northern Stage 2 access point, and a southern track connects to the southern Stage 2 access point. Within the Project Area and the Stage 1 project area, public roads will be used to facilitate transport throughout the Project areas, including Albano and Bowmans Creek Roads. Albano Road continues north through the northern extent of the Project Area, and south connecting to Bowmans Creek Road. Bowmans Creek Road passes through the central/southern portions of the Project Area, and the eastern portion of the Stage 1 project area.	**Figure 3.10**
Obstacle Lighting	Lighting of select WTGs with 200 candela medium-low intensity steady red obstacle lighting, as outlined in the Obstacle Lighting Plan (OLP) prepared as Annexure 6 of the AIA (**Appendix 15**).	**Figure 3.8**
Shared Infrastructure with Stage 1	Select Stage 1 project infrastructure and components are proposed to be utilised to facilitate the construction and operation of the Stage 2 Project, including: • Up to two (2) substations and select overhead and underground reticulation network infrastructure • Construction compound/s and site office buildings and storage areas • On-site concrete batching plants and mobile rock crushing facilities	**Figure 3.2**

Project Element	Summary of the Project	Relevant Figure
	• Laydown areas used for WTG installation and storage • Operations and Maintenance (O&M) Facility.	
Construction Workforce	Peak of approximately 160 FTE positions (estimated average 68 FTE positions over the duration of construction).	N/A
Operational Workforce	10 FTE operational positions, resulting in a total of 40 operational FTE across the Stage 1 and Stage 2 projects.	N/A
Hours of Operation (Construction and Decommissioning Phases)	Construction and decommissioning activities will occur between 7:00 am to 6:00 pm Monday to Friday, and 8:00 am to 1:00 pm Saturday, except during specific circumstances, as detailed in **Section 3.2.3**.	N/A
Hours of Operation (Operational Phase)	24 hours, seven (7) days per week	N/A
Construction Timeframe	Approximately 22 months, indicatively commencing in mid-2029.	N/A
Estimated Development Cost (EDC)	$257,692,859.15 (excl. GST).	N/A

3.1 Shared Stage 1 Project Infrastructure

Select Stage 1 project infrastructure and components are proposed to be utilised to facilitate the construction and operation of the Project. These components are summarised below, with each component described in detail in **Section 3.2.6**.

- Up to two (2) substations and select overhead and underground reticulation network infrastructure to facilitate connection to the Stage 1 project, and ultimately the grid (via the Liddell 330 kV Substation).
- Construction compound/s and site office buildings and storage areas, including fencing and screening as required.
- On-site concrete batching plants for use during the construction phase, including mobile rock crushing facilities.
- Laydown areas used for WTG installation and storage of WTG components.
- O&M Facility

The Stage 1 project infrastructure proposed for use to support the Stage 2 Project are summarised in **Table 3.2**, and visually presented on **Figure 3.2**.

Each of these Stage 1 project infrastructure components and facilities are within areas already assessed for impact, as per the SSD-10315 project approvals information and development consent received 6 February 2024. As such, no additional impact would occur at these locations as a result of the Project.

Table 3.2 Summary of Shared Stage 1 Project Components and Approximate Dimensions

Project Component(s) / Infrastructure	Approximate Dimensions	Quantity
Main (on-site) substations/switchyards to support grid connection	150 m x 150 m (no additional disturbance due to Stage 2)	Up to two (2)
Electrical reticulation network to support grid connection	• ~2 km of underground reticulation connecting the Stage 1 WTGs to the overhead reticulation line • ~7 km of overhead reticulation connecting to the Stage 1 substation • ~21 km of powerline connecting the Stage 1 substation to the Liddell 330 kV Substation	N/A
O&M Facility	50 m x 50 m (no additional disturbance due to Stage 2)	One (1)
Permanent meteorological masts	110 m to 150 m high	Four (4)
Main Construction Compound	140 m x 200 m (no additional disturbance due to Stage 2)	One (1)
Construction site compounds, including: • Construction laydown areas for equipment and supplies • Construction compounds, site office, etc.	100 m x 110 m (no additional disturbance due to Stage 2)	Up to two (2)
On-site concrete batching plants (including rock crushing facilities)	50 m x 50 m	Up to three (3)
Site compound and office	50 m x 50 m (no additional disturbance due to Stage 2)	Within construction site compounds
Stockpiles and materials storage compounds	Subject to construction requirements	As above
Laydown Areas	Subject to construction requirements	As above
Main Site Access Point on Scrumlo Road	Subject to construction requirements	One (1)

Small portions of land (across six (6) lots) within the northeastern, southeastern and western sides of the Project Area are already approved to host infrastructure under the Stage 1 project development consent, including five (5) WTG's and associated electrical transmission infrastructure. The Stage 2 Project will also host infrastructure on a portion of these lands. The Stage 2 Project is proposing to connect to the approved electrical transmission infrastructure on these lands to facilitate connection to the grid.

The land parcels associated with this area are as follows, as identified on **Figure 3.2** below:

- Lots 120 and 124 of DP752465.
- Lots 9, 10 and 11 of DP127321.
- Lot 145 of DP752465.
- Lot 473 of DP1240509.

These areas form part of the schedule of lands for the Project Area, as identified in **Appendix 2**.

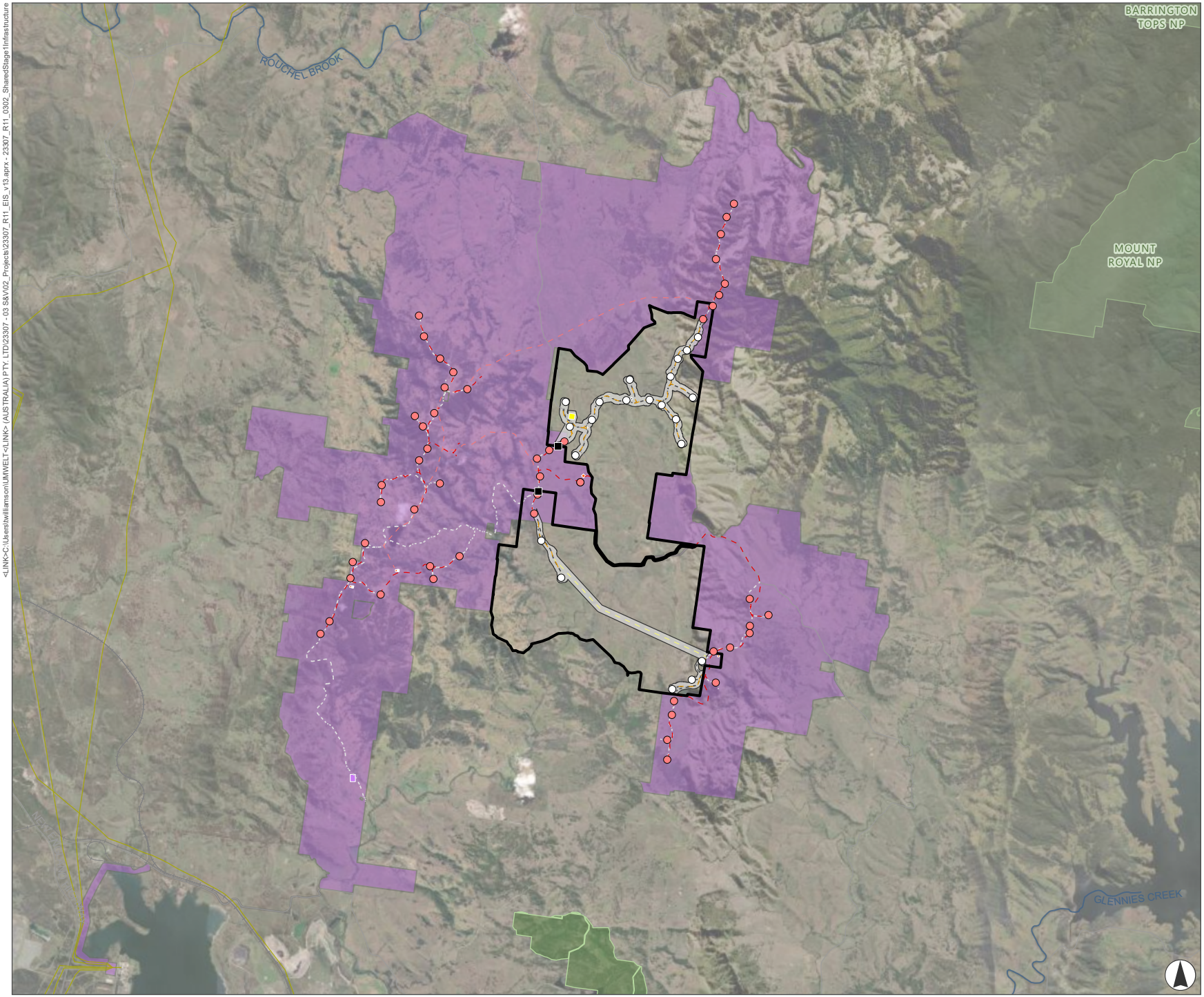


FIGURE 3.2

Shared Stage 1 Project Infrastructure (General)

Legend

- Main Site Access
- Road
- River/Stream
- Railway Line
- Electricity Transmission Line
- State Forest
- NPWS Reserves
- Project Boundary Stage 1

Project

- Project Boundary
- Development Corridor
- Batch Plant
- Laydown Area
- Substation
- Overhead Reticulation Network
- Underground Reticulation
- Internal Roads
- Wind Turbine Generators

Stage 1 Project Infrastructure to be used for Stage 2 Project

- Construction Compound
- Batch Plant
- O&M Facility
- Underground Reticulation
- Overhead Reticulation Network

Other Stage 1 Infrastructure

- Wind Turbine Generators
- Internal Roads

0 2.5 5

Kilometres

Scale 1:140,000 at A4
GDA2020 MGA Zone 56

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3.2 Project Elements

3.2.1 Overview of Project Phases and Anticipated Timing

Table 3.3 below provides an overview of the key phases of the Project.

Table 3.3 Overview of Project Phases

Project Phase	Proposed Activities
Pre-construction Minor Works	• Surveys, including road dilapidation surveys. • Off-site road works (refer to **Section 3.2.9**). • Geotechnical investigative drilling, excavation of test pits and bore holes. • Installation of environmental management and monitoring measures, fencing and signage. • Biodiversity investigations, pre-clearance surveys and habitat feature relocation (where required). • Minor adjustments to telecommunications facilities and utility services. • Minor clearing of native vegetation to facilitate the minor works described above.
Construction Works	• Includes all physical works to enable the operation of the development, including, but not limited to, the installation of WTGs, permanent ancillary infrastructure and any temporary facilities which were not already established as part of the pre-construction minor works.
Operations	• Ongoing operation, monitoring (on-site and remote monitoring) and maintenance of all Project infrastructure and land within the Development Corridor during the operational lifespan of the Project. • Replacement of major components, such as WTG blades, as required (including the use of cranes and ancillary equipment to enable replacement).
Decommissioning	• Includes all physical works required for the dismantling and transportation of Project infrastructure and rehabilitation of the Development Corridor, except where infrastructure (such as internal roads) may be required for ongoing farming and/or bushfire fighting purposes.

Anticipated timeframes for the Project are outlined in **Table 3.4** below. These timeframes are indicative only and may be influenced by a range of factors, including timeframes for Project approval.

Table 3.4 Anticipated Project Timeline

Phase	Approximate Duration and Indicative Timing
Pre-construction Minor Works	Approximately six (6) to eight (8) months[1], commencing with geotechnical investigations
Construction Works	Approximately 22 months, nominally commencing in Q2 2027
Operations	30 years
Decommissioning	After 30 year Project life, unless a new approval is sought to repower the Project

[1]Pre-construction minor works may overlap with construction works

3.2.2 Future Land Subdivisions

The Project seeks the option for subdivision and boundary adjustments to occur. These may be required to subdivide lands for the 330 kV substation connecting the proposed WTGs to the Stage 1 project electrical reticulation network, and/or other subdivisions that may be required following the detailed design of the Project e.g. where physical roads do not follow the road easement.

3.2.2.1 Subdivision/s

The network operator, at their request, requires freehold title to the substation and/or switchyard lot/s to proceed with the construction of the relevant electrical connections and infrastructure. Subdivision is therefore proposed for the main substation location within the Project Area, within Lot 143 of DP752465.

The new freehold lot/s created by this subdivision will enable the ownership of the substation to be transferred to the network operator. The network operator will obtain freehold title either through transfer, dedication or acquisition.

The subdivision/s are administrative activities that do not involve any physical works and no new dwelling entitlements will be created as a result of the subdivision/s.

Figure 3.7 shows the indicative locations where subdivision is proposed. For the purpose of this EIS, indicative subdivision layouts are provided, however the final layouts will be determined during detailed design and in consultation with the host landholder.

Detailed plans will be prepared to accompany applications for subdivision works certificates, that under Section 6.13 of the EP&A Act are required before subdivision work can be carried out in accordance with a development consent.

Subdivisions may also be required following the detailed design of the Project where it is identified that a physical road does not follow the road easement.

3.2.2.2 Long Term Leases

In order to carry out the Project, BCWF will require separate long-term leases to be granted by the host landholder over parts of existing lots where Project infrastructure will be constructed.

3.2.3 Hours of Operation

3.2.3.1 Construction and Decommissioning

Generally, the Project will undertake construction or decommissioning activities between:

- 7:00 am to 6:00 pm, Monday to Friday.
- 8:00 am to 1:00 pm, Saturdays.

However, works may be undertaken outside these standard hours under any of the following circumstances:

- the activities are inaudible at non-associated residences

- the delivery or dispatch of materials as requested by the NSW Police Force or other public authorities for safety reasons
- the activities are necessary to avoid the loss of life, property or prevent material harm to the environment
- the out of hours activities are authorised by the Planning Secretary of DPHI.

An example of activities that are necessary to avoid loss of property and to prevent material harm to the environment is the installation of WTGs. WTG installation is intended to fit into the six (6) day working week. However, due to the designed sequencing of component lifts certain stage/elements need to be completed in a specified order which may require early starts or late finishes, considerate of wind conditions. When erecting the tower, once the top of the tower is attached, the nacelle must go on without delay due to the risk of tower self-oscillation. Unfavourable weather can cause delays in mounting the nacelle. Continuing this work outside of standard construction hours will ensure that risk to people, property and the surrounding environment is mitigated. The Project Area is naturally a high wind area and as such, works outside of standard construction hours may be needed to make up for high wind days during the week.

Similarly, once concrete pouring commences on a given day, pouring cannot be halted and may need to be completed outside of standard hours. Out of hours activities may be authorised by the Planning Secretary of DPHI on a case by case or activity specific basis, subject to justification being provided by BCWF or its contractors. This would include, for example, assessment of potential noise generating activities associated with the out of hours works, evidence of consultation with potentially affected non-associated residences, and details of reasonable and feasible noise mitigation measures which are to be implemented.

3.2.3.2 Operations

Once the WTGs are commissioned, the Project will operate 24 hours per day, seven (7) days per week except where cessation of operations is required, for example, in the event of an emergency.

3.2.4 Project Workforce

During the construction period, the Project's workforce is expected to peak at approximately 160 FTE personnel at the height of construction, with an average construction workforce of 68 FTE personnel throughout the construction phase of the Project, as shown indicatively in **Figure 3.3**. The operational workforce is expected to be approximately 10 FTE, resulting in a combined total of 40 FTE across the operational phases of Stage 1 and Stage 2 projects.

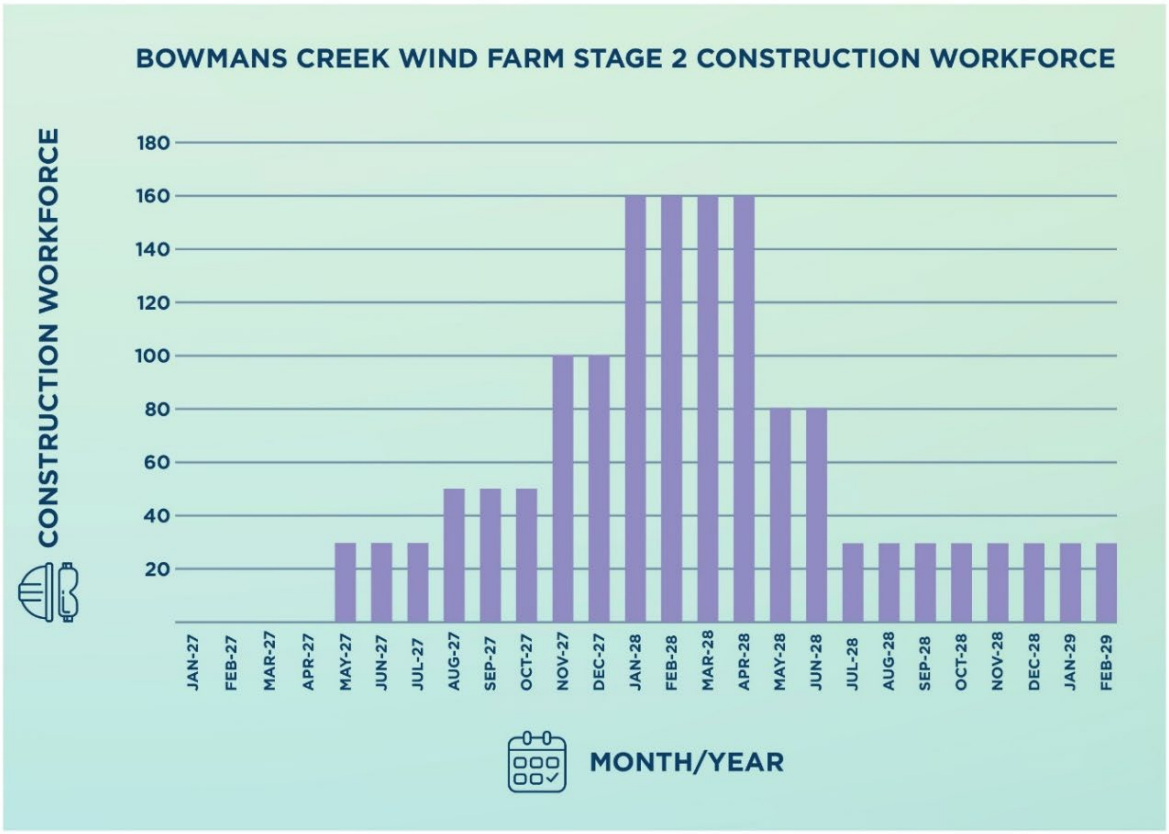


Figure 3.3 **Indicative Project Construction Workforce Histogram (per month)**

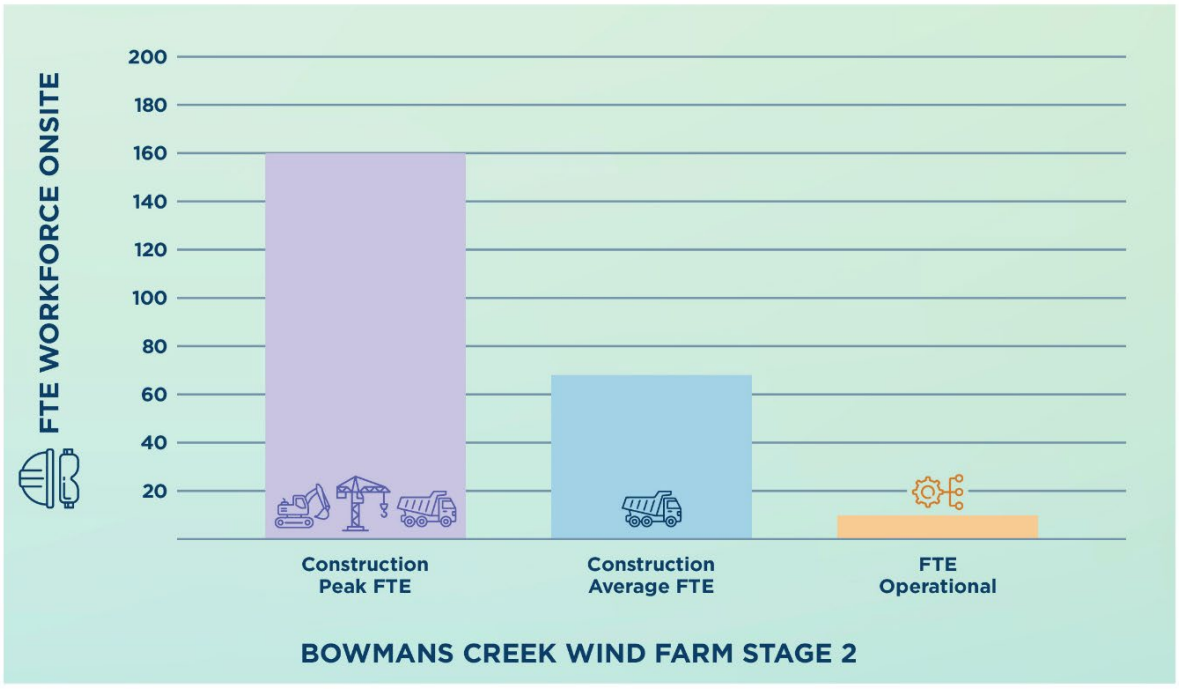


Figure 3.4 **Indicative Project Workforce Histogram (total)**

3.2.5 Project Elements

Table 3.5 to **Table 3.7** below provide a summary of the key physical elements of the Project, including their respective quantities and approximate dimensions. These elements are specific to the proposed Project (i.e. Stage 2) and are in addition to the infrastructure and components that would be utilised from the Stage 1 project, as summarised in **Table 3.2** above.

Importantly, some aspects of the Project design may change during the detailed design. For example, the WTG model may change as technology evolves. Additionally, the exact component dimensions and quantities of ancillary infrastructure and temporary construction facilities may change with regard to those specified in **Table 3.6** and **Table 3.7**.

This flexibility will allow the final Project design to be optimised and the most appropriate and efficient infrastructure selected while still ensuring the Project's impacts remain generally in accordance with (or less than) those assessed in this EIS. All Project infrastructure will remain wholly located within the Development Corridor and will connect to infrastructure already assessed and approved as a component of the Stage 1 project. Where components of the physical layout of the Project have the potential to change over time, further detail is provided in the following sections.

Importantly, however, the total number and dimensions of WTGs will not exceed those specified in **Table 3.5** below and compliance with all relevant performance criteria (including noise limits) will be maintained. Relevant assessments in this EIS have considered the 'worst case' for each of the Project components (such as WTG height and blade length, etc.), noting that in some instances technical assessments have taken a precautionary approach and considered WTG dimensions that include a safeguard allowance. Examples of these precautionary measures are:

- "blade length" of 87.5 m (including nacelle allowance), and
- "rotor diameter" of 180 m (including a 5 m safeguard).

These precautionary dimensions do not infer that BCWF is seeking flexibility for a blade length or rotor diameter in excess of the dimensions stated in **Table 3.5**, which are the limits of WTGs dimensions being sought for approval.

A lowermost blade tip of 45 m is however proposed as part of the Project (and has been assessed where relevant) in the event that a smaller WTG model is progressed, consistent with the dimensions of the WTG approved under the Stage 1 project.

Table 3.5 Key Project Elements: WTGs

Infrastructure	Approximate Dimensions[1]
WTG quantity	Up to 21
WTG height	Up to 250 m AGL
Rotor diameter	Up to 175 m (incl. nacelle)
Hub height	Up to 162.5 m AGL
Blade length	Up to 86 m (excl. nacelle)
Uppermost blade tip	Up to 250 m AGL
Lowermost blade tip	45 m AGL
WTG foundations	30 m x 30 m

Note 1: rounded to the nearest whole number.

Table 3.6 Key Project Elements: Ancillary Infrastructure

Infrastructure	Approximate Dimensions	Quantity
Internal access roads	Approximately 16.2 km in length and approximately seven (7) m wide.	As per approximate dimensions presented in conceptual Project layout
Turbine hardstands	Variable dimensions (based on the hardstand type that is to be determined) but typically 90 m long and 40 m wide, with a combined area of approximately 7.6 ha across 21 WTG locations.	Up to 21
On-site Substation	160 m x 150 m.	One (1)
Overhead Reticulation Line (north-west)	Approximately 630 m of overhead 330 kV line, with a pole height of generally between 45 –60 m and a typical span length of between 200-400 m, connecting the on-site Stage 2 substation to the Stage 1 reticulation network.	As per approximate dimensions
Overhead Reticulation Line (south-east)	Up to 5 km of overhead 33 kV line in the southern portion of the Project Area, with a pole height of generally between 45–60 m and a typical span length of between 200-400 m, connecting the Stage 2 reticulation network to the Stage 1 reticulation network.	As per approximate dimensions
Underground cables	Approximately 17.5 km of internal underground cables connecting Stage 2 WTGs, and providing connection to the Stage 1 reticulation network.	As per approximate dimensions
Water storage tanks	At least one (1) 100,000 litre dedicated water storage tank for bushfire fighting purposes, plus storage for small quantities of potable and non-potable water required for operations, including staff amenities.	To be confirmed during detailed design

Table 3.7 Key Project Elements: Temporary Facilities

Temporary Facilities	Approximate Dimensions	Quantity
WTG / blade laydown areas	240 m x 70 m	21
Substation laydown area	55 m x 80 m (approx. 0.4ha)	1
Generic laydown area	300 m x 65 m (approx. 1.4 ha)	1
Blade Laydown area	300 m by 50 m (14 ha)	1

Section 3.2.5.1 to **Section 3.2.5.6** below provide further detail regarding the key components of the Project.

3.2.5.1 Wind Turbine Generators

The Project is designed to accommodate up to 21 WTGs of up to 250 m in height (to the uppermost blade tip). This enables a conservative assessment allowing for advances in WTG technology between the time of assessment for the Project and the commencement of construction. WTGs will have a maximum capacity of up to 7.2 MW.

The key components of a WTG are shown on **Figure 3.5** and include:

- foundations
- towers
- nacelle (hub)
- rotor
- blades (three (3) blades per WTG).

Additionally, each WTG will have an internal ladder or lift and a generator transformer.

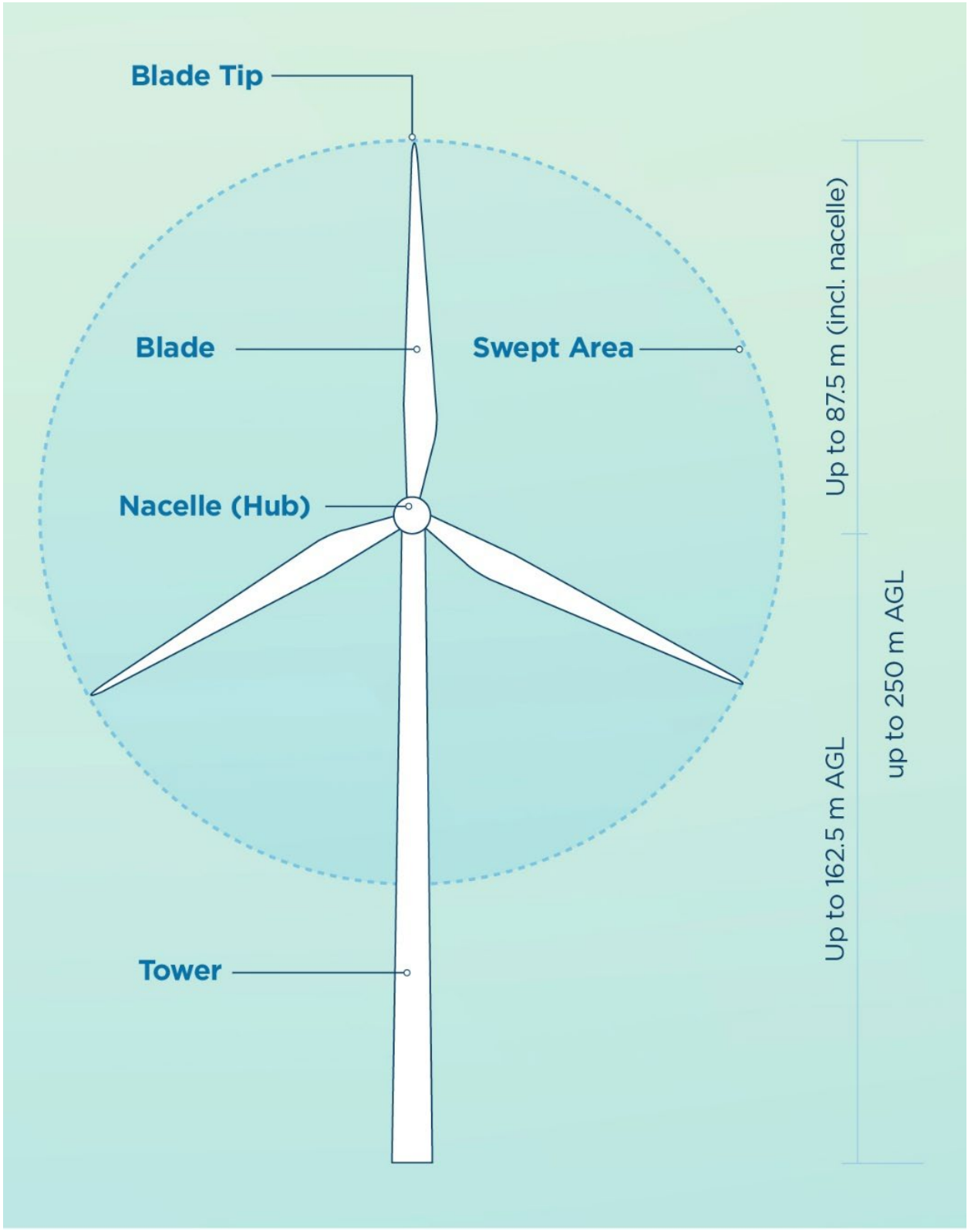


Figure 3.5 WTG Components and Maximum Proposed Dimensions

Note: the maximum proposed dimensions of the WTG blade is approximately 86 m (excl. nacelle) and 87.5 m (incl. nacelle).

The indicative coordinates and elevation of each WTG is provided in **Appendix 3**. The WTGs would be installed at final locations to be confirmed within a 100 m micro-siting buffer of the proposed locations identified in this EIS, with the current conceptual locations shown on **Figure 3.1**.

To minimise the visual impacts of the Project, the WTGs will:

- be uniform in the colour, design, height and rotor diameter
- finished in matt-white and non-reflective material to reduce visibility
- not have any unnecessary signage or lighting.

WTG Foundations

Foundations for the WTGs will consist of either concrete slabs or rock anchors, pending geotechnical investigation of the ground conditions across the Project Area. More than one (1) type of WTG foundation may be required for the Project, which will be determined during the detailed design phase. The excavation required for both types of foundations will be approximately 90 m by 40 m to a depth of up to four (4) m. Blasting may be required for the establishment of the WTG foundations, which has been considered in the NVA included in **Appendix 7**.

Photo 3.1 shows a typical WTG foundation under construction.



Photo 3.1 Typical WTG Foundation Under Construction

Source: BCWF

Towers and Nacelle

The tower structure of a WTG is typically constructed out of welded steel, concrete or a concrete steel hybrid. The towers will be fitted with an internal ladder and/or lift to facilitate access to the nacelle. A range of tower heights are under consideration with the final selection to be undertaken during detailed design, to accommodate the proposed maximum blade tip height of up to 250 m. At the top of each tower will be a nacelle to which the rotor will be mounted.

The nacelle is a housing constructed of steel and fibreglass which encloses the gearbox, generator, transformers, motors, brakes, electronic components, wiring and hydraulic and lubricating oil systems for the WTG. Weather monitoring equipment located on top of the nacelle will provide data on wind speed and direction for the automatic operation of the WTG, and obstacle lighting will be provided on top of the nacelle/hub as per the proposed obstacle lighting as described in Annexure 6 of the AIA, included in **Appendix 15.**

Blades

WTG blades are typically made from fibreglass reinforced with epoxy or plastic attached to a steel hub and include lightning protection inside the blade. The Project has been designed and assessed based on a maximum hub height of up to 162.5 m AGL, and a rotor diameter of up to 180 m consisting of the blades and nacelle. A maximum blade length of up to 87.5 m (including nacelle radius) has been assessed. **Photo 3.2** shows the typical process of attaching blades to the WTG.



Photo 3.2 Typical Blade Attachment Process

Source: BCWF

3.2.5.2 Permanent Ancillary Infrastructure

Permanent ancillary infrastructure required to support the Project is presented in **Table 3.6** above and includes but is not limited to internal roads, hardstands, substation, underground and overhead electricity transmission lines and poles, communications cables and water storage tanks. It is noted that here, the term 'permanent' means that the proposed infrastructure is expected to remain in place for the life of the development (subject to ongoing maintenance, upgrading or replacement), until such time as the Project is decommissioned and rehabilitated.

Internal Roads

Internal roads will be established within the Project Area for the construction, operation, and decommissioning of the Project. Internal roads will be constructed to a width of approximately seven (7) m, plus an additional buffer to accommodate roadside drainage and construction impacts, creating a total disturbance area of up to 6.5 m wide. The proposed internal road network is approximately 16.2 km in length. This disturbance is accommodated within the proposed Development Corridor and associated Disturbance Footprint for the Project.

Generally internal roads will be constructed using compacted crushed rock/roadbase, however some segments of the internal roads may need to be surfaced with asphalt to enable haulage of heavy WTG components.

All watercourse crossings will be designed for a 10% Annual Exceedance Probability (AEP) rain event. Additionally, the detailed design of any bridge upgrades (or proposed temporary bridges) and culvert structures will have regard to the following guidelines:

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

Creek crossings may also be required to support machinery access during the construction phase. Crossings not required for future operational activities will be decommissioned following the completion of construction works. Those that are required for ongoing use during operations will be designed and constructed in accordance with relevant standards. The Project has been designed to limit works within watercourses as much as possible, as discussed in **Section 2.6.3**, including locating transmission towers required for the overhead transmission line in the southern portion of the Project Area outside of the Bowmans Creek riparian corridor.

Hardstands

Hardstands are required adjacent to each WTG location for the assembly, erection, maintenance, and decommissioning of the WTGs. Hardstand dimensions are variable and will depend on detailed design, topography, construction methods and the selected WTG model. Hardstands will be surfaced with pavement material consistent with internal access roads and be maintained throughout the construction and operational life of the Project.

Figure 3.6 shows a typical hardstand area adjacent to a WTG footing. **Photo 3.3** shows a typical WTG hardstand area for a completed wind farm project.

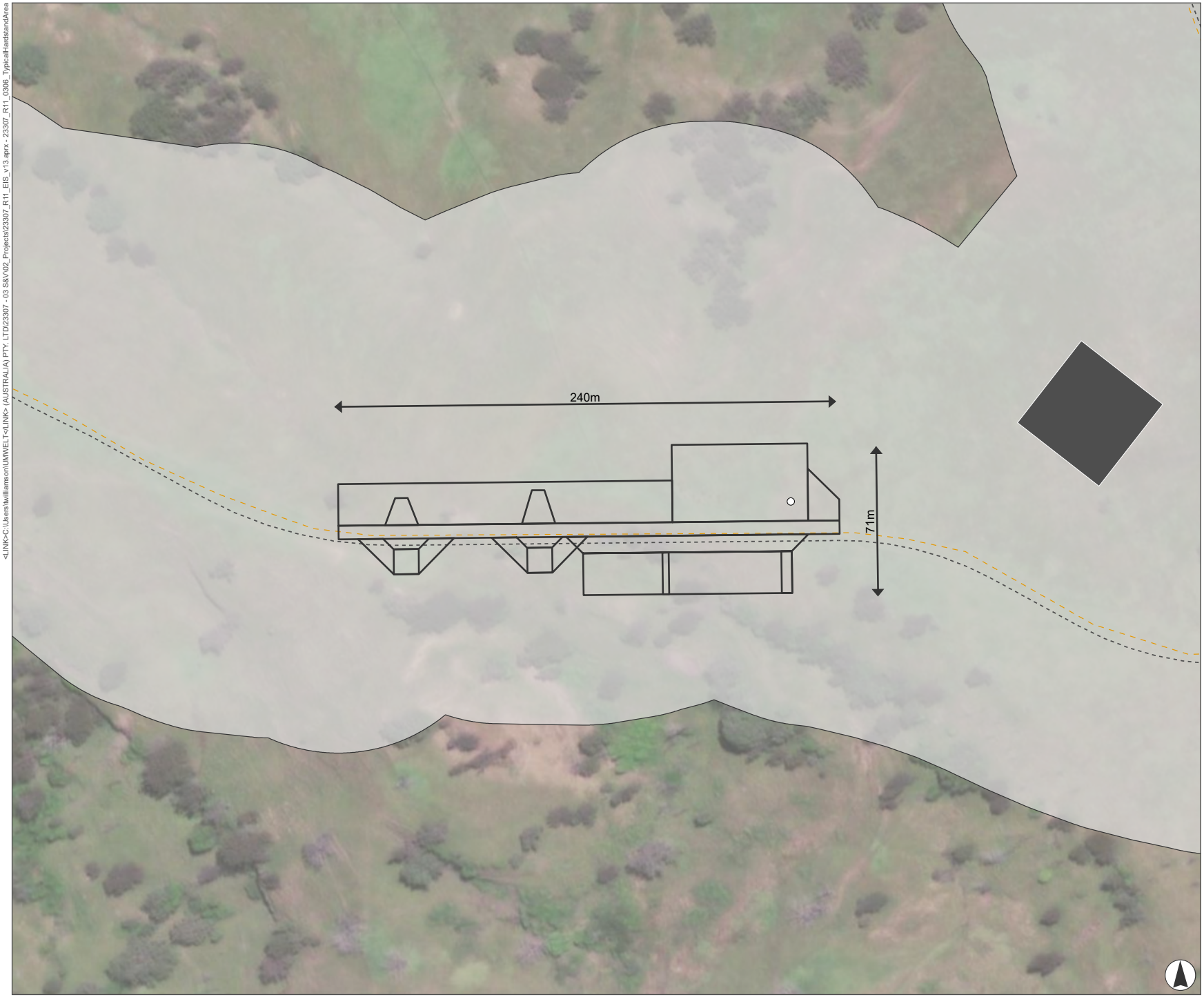


Photo 3.3 Typical WTG Hardstand Area

Source: BCWF

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FIGURE 3.6
Typical Hardstand Area



Legend

Project

- Project Boundary
- Development Corridor
- Batch Plant
- Hardstand Area
- Underground Reticulation
- Internal Roads
- Wind Turbine Generators

0 50 100

Metres

Scale 1:2,500 at A4
GDA2020 MGA Zone 56

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Image Source: ESRI Basemap (2026) | **Data Source:** NSW DFSI (2026), SLR (2026), Ozark (2026), Ark Energy (2026)

Substation

An on-site substation and transmission line to connect the proposed WTGs to the Stage 1 project electrical reticulation network is located in the north-western portion of the Project Area on the northern side of Albano Road. The substation compound measures approximately 160 m x 150 m and will connect to the Stage 1 project main substation via an approximately 630 m overhead 330 kV voltage transmission line. For the purposes of assessment in the EIS, the cut depth at the substation will be up to 17 m and a maximum fill depth of 11 m, subject to change throughout detailed design.

A typical substation layout is shown in **Photo 3.4** below. The substation compound would include transformers, voltage controls, switchgear, equipment storage facilities and a communication tower. The substation compound will be located on a pad constructed of road base (or similar) and enclosed with security fencing. Emergency backup power will be supplied by an on-site diesel generator and/or batteries to maintain network communications and electrical protection capability in the event of an outage.



Photo 3.4 Typical Substation

As the substation transformers may each contain upwards of 50,000 L of oil, the detailed Project design will include primary and secondary containment measures so that any spills are captured. The substation has been designed to minimise the visual impact of the Project by siting the infrastructure away from both associated and non-associated residences as far as practicable whilst meeting the practical and operational needs of the Project. Following construction, and if warranted, raised earthwork perimeters and/or small areas of native tree planting (subject to consideration of hazards) may be undertaken to screen any parts of the substation or switchyard that are visible from sensitive receptors and roadside vantage points.

Security lighting required within the substation compound will be designed and installed to comply with AS 4282 Control of Obtrusive Effects of Outdoor Lighting (Standards Australia, 2019) and any additional requirements as advised by the Civil Aviation Safety Authority (CASA), and with due regard to the National Light Pollution Guidelines for Wildlife (Commonwealth Department of the Environment and Energy (former), 2020).

3.2.5.3 Underground and Overhead Transmission Lines and Poles

A series of underground and overhead electrical network lines are proposed to deliver the electricity generated by the WTGs to the substation and to the Stage 1 project electrical reticulation network. The proposed electrical reticulation network specifications are provided in **Table 3.6** above, summarised below and a subsect represented in **Figure 3.7**.

- Overhead reticulation lines: Includes approximately 630 m of overhead 330 kV lines in the north western portion of the Project Area connecting the on-site substation to the Stage 1 project reticulation network, and up to 5 km of overhead 330 kV lines in the southern portion of the Project Area connecting the southern WTGs to the Stage 1 project reticulation network via direct connection to 'Substation 2' (as approved under Stage 1).
- Underground cables: Approximately 17.5 km of internal underground cables connecting Stage 2 WTGs, and providing connection to the Stage 1 project reticulation network.

The approved Stage 1 project grid connection transmission line extends approximately 21 km from the Stage 1 project on-site substation to the 330 kV Liddell Substation adjacent to the decommissioned Liddell Power Station.

A grid connection enquiry has been undertaken by BCWF which identified that there is sufficient space for a new bay in the northwest corner of the switchyard at the existing Liddell Substation to support the Projects connection to the grid.

The Project's proposed electricity transmission infrastructure (i.e. that required for Stage 2) will be located within the Project Area, although connection to the grid is reliant on select Stage 1 project infrastructure (refer to **Section 3.1**). Select Stage 1 project electrical reticulation infrastructure required to support the Projects connection to the grid is located within the Project Area, however this infrastructure has been assessed and approved within the Stage 1 project approval (i.e. SSD-10315) and does not form part of this SSDA.

Any subdivision of land for the purpose of grid connection and electricity reticulation will be subject to a separate application with the network operator, as discussed in **Section 3.2.2**.

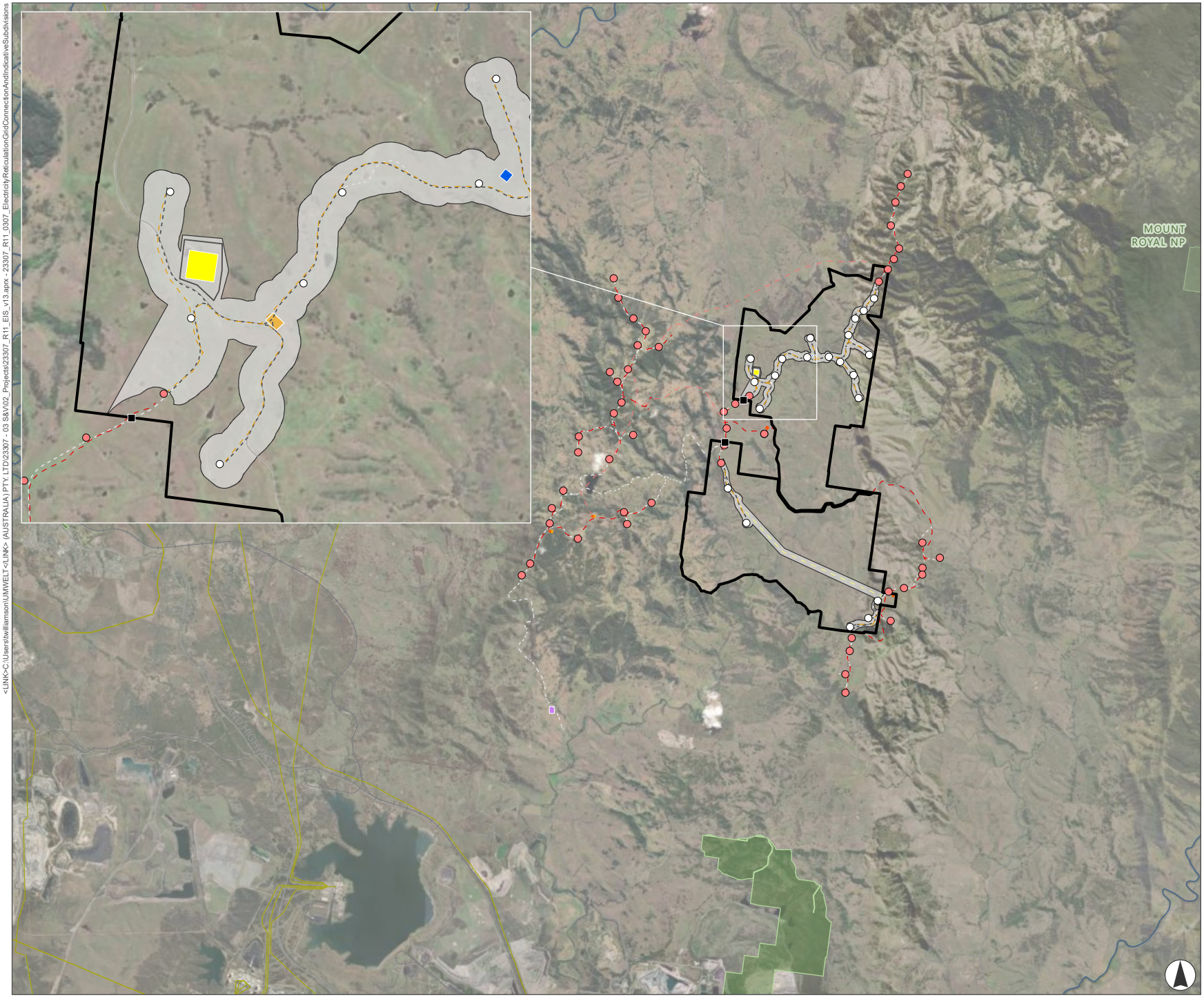


FIGURE 3.7

Electricity Reticulation, Grid Connection (via Stage 1) and Indicative Subdivisions

Legend

- Populated Place
- Road
- Railway Line
- River/Stream
- Electricity Transmission Line
- NPWS Reserves
- State Forest

Project

- Project Boundary
- Development Corridor
- Substation Subdivision
- Substation
- Batch Plant (Stage 2)
- Laydown Area
- Overhead Reticulation Network
- Underground Reticulation
- Internal Roads
- Main Site Access

Stage 1 Project Infrastructure to be used for Stage 2 Project

- Construction Compound
- Batch Plant
- O&M Facility
- Overhead Reticulation Network
- Underground Reticulation

Other Stage 1 Infrastructure

- Wind Turbine Generators
- Internal Roads

0 2.5 5

Kilometres

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3.2.5.4 Telecommunications Facilities and Utility Services

Table 3.8 below summarises the telecommunications facilities and utility services which will support the operational phase of the Project. Where possible, any ground disturbance associated with the installation and maintenance of telecommunications facilities and utility services will be located within the Development Corridor, and all ground disturbance will be sited to avoid key environmental constraints.

Table 3.8 Telecommunications Facilities and Utility Services

Service	Approximate Duration and Indicative Timing
Telecommunications	Telecommunications facilities providing for transmission of voice, data, image, graphic and video information are proposed to be installed within the Project Area, both at standalone locations and attached to Project infrastructure such as a permanent meteorological mast, where applicable. Telephone communications facilities (i.e. optic fibre and microwave) will be required to be installed within the substation to enable safe remote monitoring and control of the Project.
Electricity Supply	The Project will be connected to the transmission network and, when not generating, will draw a minor amount of electricity from the grid. Backup and emergency power at the substation may be supplied by a local electrical distribution line, and/or a standalone diesel generator.
Operational Water Supply	Operational water requirements will be provided to the proposed facilities and auxiliary services buildings from storage tanks designed to collect water from roof drainage and augmented by potable water delivered by tankers.
Operational Waste Disposal	Approved septic systems or composting systems will be installed to treat minor quantities of wastewater associated with operation of the Project, subject to securing the relevant authorisations. Other wastes will be classified and removed from the Project Area to an approved facility (landfill, recycling etc). Waste management is described further in **Section 6.14** of the Project EIS.

3.2.5.5 Temporary Facilities

Temporary facilities required to support the construction phase of the Project include a temporary meteorological mast, materials laydown areas, concrete batching plant, environmental management and monitoring measures and signage.

These temporary construction facilities are described in the following subsections. All temporary facility sites that are not required for the ongoing operation of the Project will be rehabilitated once they are no longer required. BCWF will also undertake geotechnical investigations as part of the construction of the Project. These works will occur throughout the Development Corridor as required to inform detailed design and construction activities.

Temporary Laydown Areas

Temporary laydown areas will be required to facilitate the construction and installation of the WTGs, the main Stage 2 substation, and the overhead transmission line. These areas would be located within the Development Corridor and Disturbance Footprint discussed within this EIS, and do not result in additional impacts outside of those assessed in this EIS. These temporary facilities are shown on **Figure 3.1**.

Minor Construction Access Roads

Construction roads, tracks and use of unformed access paths (e.g. light vehicle movements over farmland areas) will be required to facilitate some parts of the Project including, for example, the erection of overhead transmission lines and maintaining environmental management measures. Construction roads that were assessed within the Development Corridor and are not required for the ongoing operation and maintenance works of the Project would be removed and rehabilitated on completion of the construction phase, unless landowners request the roads to remain.

Batching Plants

One (1) batching plant is proposed for the Project to produce the concrete required for construction activities in conjunction with the two (2) batching plants proposed for the Stage 1 project, as described in **Section 3.2.6.2**.

The batching plant will include loading bays, hoppers, cement and silos, truck loading hardstand, water tank and aggregate stockpiles. Coarse aggregate required for concrete production may be sourced from the on-site rock crushers or an external source. Concrete will be transported across the Disturbance Footprint using concrete mixer trucks.

The batching plant is proposed to be located near turbine 83 in the northern portion of the Project Area.

Environmental Management and Monitoring

BCWF will implement a comprehensive range of environmental management and monitoring measures, as outlined in **Appendix 5** of the Project EIS. These measures will include, but not be limited to the establishment and maintenance of erosion and sedimentation control structures and the establishment and maintenance of APZ around critical Project infrastructure.

Signage

Traffic signage required as part of traffic safety for the Project will be installed in compliance with relevant regulations and in accordance with any permits obtained for traffic management. Signage will be erected at critical locations from the outset of construction, directing all vehicles to the Project Site office located within the Stage 1 project area. Additional signage would be located at or near entry points, providing information about the Project, the companies involved and essential safety information and telephone numbers.

Consultation with relevant local Councils and Transport for NSW (TfNSW) will be initiated to determine final signage locations, following Project approval.

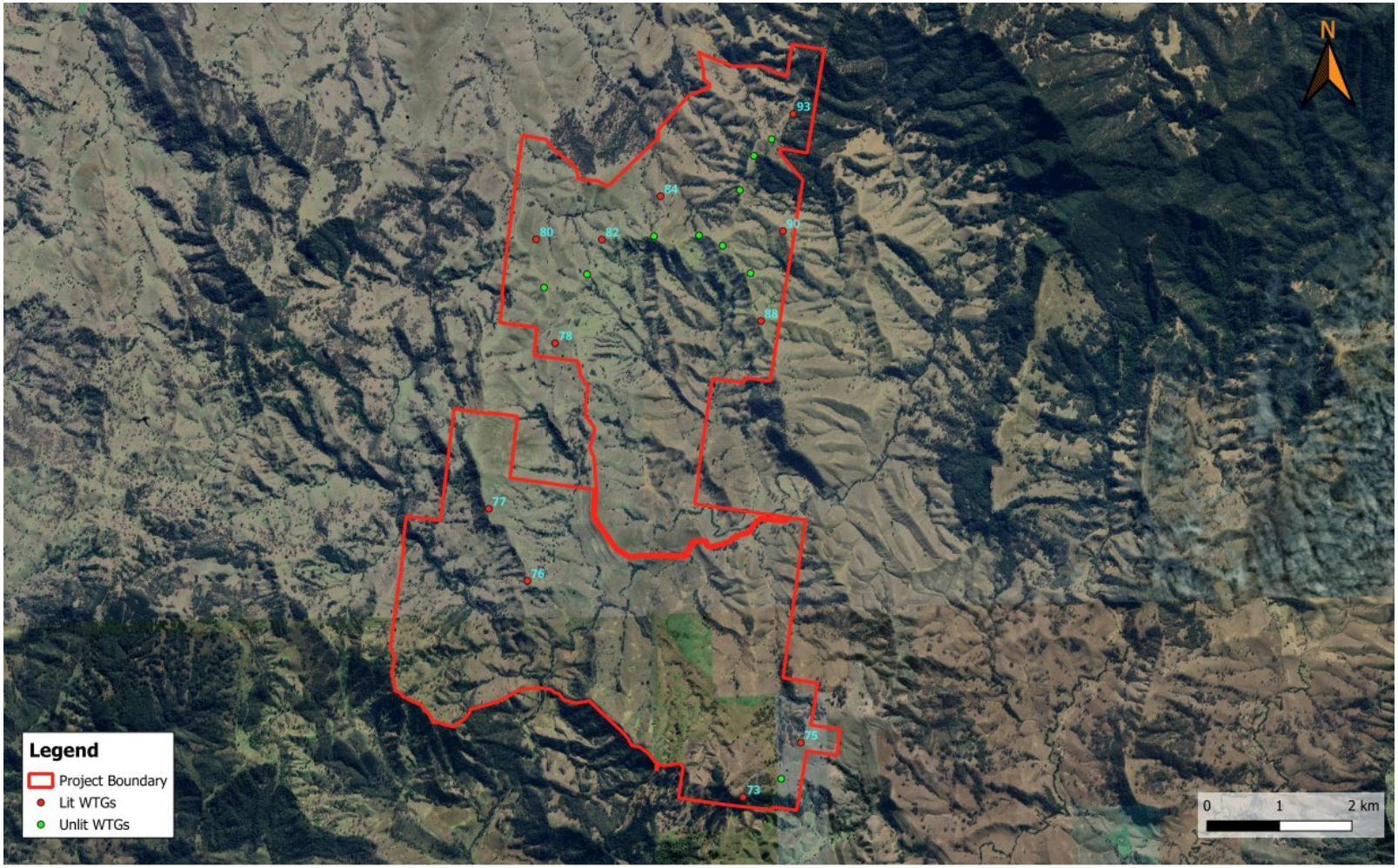
3.2.5.6 Obstacle Lighting

In line with recommendations presented in the Wind Energy Guideline (DPHI, 2024), the Project will include the installation of 200 candela medium-low intensity steady red obstacle lighting on select WTGs in accordance with the National Airports Safeguarding Framework Guideline D ‘Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation’ National Airports Safeguarding Framework Principles and Guidelines and section 9.31 of Part 139 Aerodromes Manual of Standards Part 139 (Aerodromes) Manual of Standards 2019.

Lighting of select WTGs is documented in response to CASA regulatory requirements is included as an Obstacle Lighting Plan contained in Annexure 6 of the AIA (refer to **Appendix 15** of this EIS). The OLP conceptually illustrates the obstacle lighting proposed for the Project, noting that this is subject to change through detailed design of the Project, and following continued consultation with CASA.

The inclusion of obstacle lighting and potential for amenity-based impacts has been assessed within the Landscape and Visual Impact Assessment prepared in **Appendix 6** to support this EIS.

Additionally, in developing the Project OLP, BCWF has considered the requirements of Australian Government – Department of Climate Change, Energy, the Environment and Water (Cth DCCEEW)– National Light Pollution Guidelines for Wildlife (May 2023, V2.0) included in Appendix I of the BDAR (**Appendix 8**).



Bowmans Creek Wind Farm - Stage 2	Project:	Prepared by	Version	Date	AVIATION PROJECTS
Obstacle Lighting Plan	102228-02.1	L Wang	v0.2_260313	13/03/2026	

Figure 3.8 Obstacle Lighting Plan

Source: Aviation Projects (2026)

3.2.6 Shared Stage 1 Project Infrastructure

As noted in **Section 3.1** above, select Stage 1 project infrastructure is proposed to be utilised to support the construction and operation of the Project, to avoid and minimise further impacts associated with the Project. This includes infrastructure used by the Project to physically connect to the Stage 1 project reticulation network, as well as other related Stage 1 project infrastructure used to support the delivery of the Project more broadly.

The specific infrastructure is described in the subsequent sections below. The location of shared Stage 1 project infrastructure is broadly presented in **Figure 3.2**.

3.2.6.1 Physical Infrastructure to be Shared

Underground Internal Reticulation Network

The approved Stage 1 project underground electrical reticulation network will be utilised to connect all Stage 1 and Stage 2 WTGs together, with a voltage of 33 kV. Direct connection to the Stage 1 project underground cables in the south eastern portion of the Stage 1 project area is proposed to facilitate the connection of the Stage 2 southern WTGs to the Stage 1 project reticulation network. Similarly, direct connection to the Stage 1 project underground cables in the central western portion of the Stage 1 project area is proposed to connect the on-site Stage 2 substation to the Stage 1 project reticulation network. Both direct connection locations have been highlighted on **Figure 3.9**.

The total length of the approved Stage 1 project underground electrical transmission network is 39.5 km. With 17.5 km of proposed Stage 2 underground electrical reticulation network, this would result in a total underground electrical reticulation network across both Stage 1 and Stage 2 projects of approximately 57 km.

As per the Stage 1 project approval, the underground cables will be trenched at a depth of approximately 1.2 m below the ground surface with a broader work area of approximately five (5) to six (6) m wide either side of the trench to accommodate the excavator and stockpiling of soil. The trenches for the cables will be backfilled with excavated material and covered with topsoil post-installation. The surface above the transmission line will be rehabilitated on completion of construction activities in consultation with landholders.

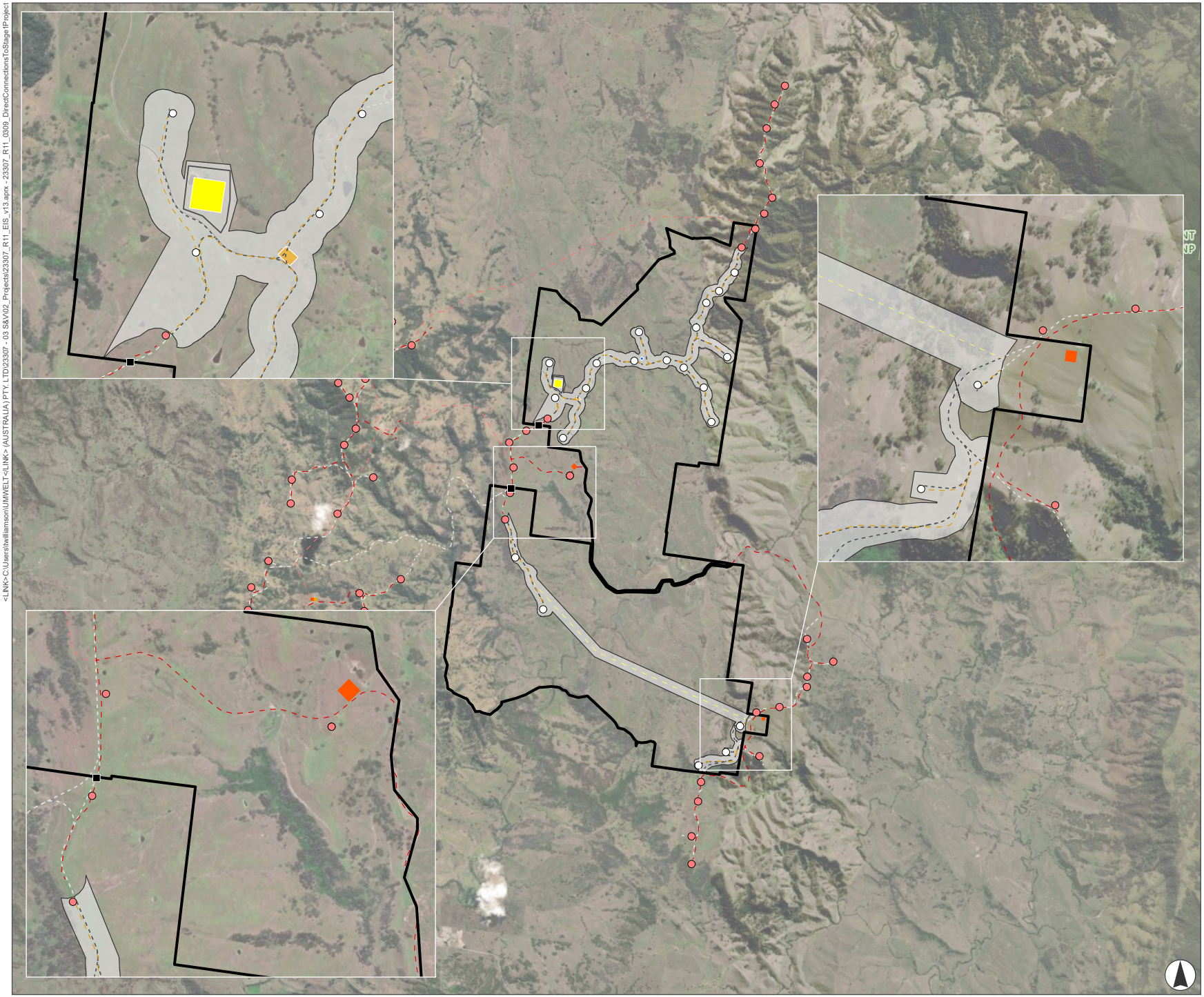


FIGURE 3.9

Direct Connections to the Stage 1 Project

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3.2.6.2 Other Stage 1 Infrastructure Required to Support the Stage 2 Project

Substations

There are three (3) substation locations approved under the Stage 1 project, of which two (2) are currently proposed for construction to facilitate the Stage 1 project. These two (2) substations would be utilised by the Stage 2 Project to support connection to the grid but would not be physically interacted with as a result of the Project.

As described in the Stage 1 project EIS (Epuron Projects Pty Ltd, 2021), the substations will occupy an area of 150 m x 150 m per substation and include a transformer to 'step up' the reticulation voltage (i.e. from 33 kV to 330 kV). The substations will also be equipped with circuit breakers, control and protection systems, smaller voltage and current transformers, communications equipment and fire protection. Connections to the required telecommunications services will be facilitated through cables, optical fibres and/or electromagnetic transmissions. The substations' backup power supplies will include a connection to the local electricity network.

This will result in a total of three (3) substations across both Stage 1 and Stage 2 projects.

Overhead Internal Reticulation Network

Underground cables connect WTGs to the overhead reticulation line, which provides connection to the substations across both Stage 1 and Stage 2 projects. The total length of the approved Stage 1 project overhead reticulation network is 17 km. The inclusion of the overhead internal line proposed under Stage 2 results in a total overhead reticulation network across both Stage 1 and Stage 2 projects of approximately 22 km.

As per the Stage 1 project approval, the overhead transmission network will be supported by single pole steel or concrete structures. The towers will be approximately 45 m tall and spaced at intervals of 200 m to 300 m, depending on topography. The transmission lines will be constructed within a 60 m wide easement. All land within the easement has been conservatively assumed to be cleared (i.e., full impact) as a result of the Project, but in reality impacts would only be required at select areas of land within the easement where actual disturbance will occur (e.g. at pole locations, construction benches, etc.).

Grid Connection Overhead Line

The electricity produced by the Project will connect to the existing Transgrid substation via the Stage 1 project transmission network as described in the Stage 1 project EIS (Epuron Projects Pty Ltd, 2021). The total length of the approved Stage 1 project grid connection transmission network is 21 km, including 14 km and 7 km of overhead and underground transmission lines, respectively. No additional grid connection overhead line is proposed for the Stage 2 Project.

As per the Stage 1 project approval, new single or double circuit transmission line(s) will be constructed to export electricity generated from the Stage 1 project to the TransGrid network via the Liddell substation. The voltage of the proposed transmission line will be up to 330 kV.

Batching Plants

The three (3) approved Stage 1 batching plants as described in the Stage 1 project EIS (Epuron Projects Pty Ltd, 2021) will assist the Project in producing the concrete required for construction activities across both Stage 1 and Stage 2 projects.

As per the Stage 1 project approval, the batching plants include loading bays, hoppers, cement and silos, truck loading hardstand, water tank and aggregate stockpiles. Coarse aggregate required for concrete production may be sourced from the on-site rock crushers or an external source. Concrete will be transported across the Disturbance Footprint using concrete mixer trucks.

The two (2) nearest Stage 1 project batching plants are located approximately 300 m and 400 m to the east and west of the Stage 2 Disturbance Footprint, respectively. No physical changes to the batching plants as described the Stage 1 project approval are proposed under Stage 2.

Rock Crushing Facilities

Mobile rock crushing facilities as described in the Stage 1 project EIS (Epuron Projects Pty Ltd, 2021) will be used to crush bedrock excavated during the construction of the WTG sites for both Stage 1 and Stage 2 projects. These mobile rock crushing locations will not be within the Stage 2 Project Disturbance Footprint, though the gravel produced will be used for other construction activities (i.e. road base for access tracks) required for the Project.

No physical changes to rock crushing facilities as described in the Stage 1 project approval are proposed under Stage 2.

Operations and Maintenance (O&M) Facility

The O&M Facility as described in the Stage 1 project EIS (Epuron Projects Pty Ltd, 2021) is proposed as the main administration building during the operational phase of both the Stage 1 and Stage 2 projects.

As per the Stage 1 project approval, the O&M Facility will include (at a minimum) a main control room, offices, amenities, storage areas (for equipment and materials), water tank(s), laydown/storage areas, septic system(s) and a car park.

No physical changes to the O&M facility as described the Stage 1 project approval are proposed under Stage 2.

Temporary Construction Infrastructure

Temporary construction infrastructure as described in the Stage 1 project EIS (Epuron Projects Pty Ltd, 2021) is proposed to be used to facilitate construction of the Project. This temporary construction infrastructure as approved under Stage 1 project includes power supply, select roads, communications, temporary offices, amenities and car parking spaces for construction personnel, as well as laydown and storage areas for construction materials and equipment. Construction compounds will be fenced to prevent unauthorised access by trespassers and livestock.

No physical changes to the temporary construction infrastructure as described the Stage 1 project approval are proposed under Stage 2.

3.2.7 Project Resources

3.2.7.1 Quarried Material

Importation of quarried materials including cement, gravel, aggregate and sand will be required for the construction of hardstands and WTG foundations and to support Project infrastructure, including internal access roads, laydown areas and installation of electrical cabling. To provide a worst-case assessment of traffic impacts, this EIS has conservatively assumed that 100% of cement, gravel, aggregate and sand would be sourced externally from existing operating quarries.

BCWF has identified five (5) regional quarry options to supply quarried material for Project construction. **Table 3.9** below provides details of the potential quarries, including name, location and resources available. The indicative transport routes for quarried materials are described in **Section 3.2.8** and shown in **Figure 3.10**.

Each of the identified quarries holds relevant approvals for the extraction, processing and transport of quarry products to the State road network. All vehicle trips associated with the construction of the Project would be carried out within the respective limits of the quarry approvals (where applicable).

The preferred source and transport routes for quarried materials will be confirmed prior to the commencement of construction. Due to the cumulative demand for construction materials within the Hunter Central Coast REZ and broader Hunter region of NSW, BCWF is seeking flexibility to source quarried materials from alternative quarry locations or to utilise alternative routes than those identified in **Figure 3.10** as required, subject to all relevant State and local approvals being obtained by the relevant quarry operator for extraction, processing and transport.

Table 3.9 Regional Quarry Options Considered by the Project

Quarry Name	Address	Resource
Hebden Quarry	Picton Lane, Hebden NSW 2330	Assorted aggregates, road base, crusher dust, rocks and ballasts
Wild Quarries & Civil	8440 New England Hwy, Muswellbrook NSW 2333	Assorted hard rock, blue metal, road base etc.
StoneCo Hunter Limestone	12 Makybe Diva St, Scone NSW 2337	Various lime products
Focono Quarry	481 Scrumlo Rd Hebden 2330	Hard rock
Karuah East Quarry	Blue Rock Close, Karuah NSW 2324	Aggregates, speciality rock materials, base materials, sand

3.2.7.2 Water Supply

A mixture of potable and non-potable water will be required to facilitate construction and operation of the Project. It is estimated that approximately 90 kL of non-potable water would be required during construction of the Project. This would be used for a combination of road construction/ compaction, dust suppression, and concrete batching across the construction period.

Raw/non-potable water required to meet Project water demands would be sourced via a combination of piped water from local dams and piping from groundwater bores to an on-site water storage dam (e.g. turkey nest or similar).

If required, supplementary raw/non-potable water sources may include:

- Groundwater from licenced bores under agreement with host or neighbouring landholders, separate discussion and agreement.
- Harvested runoff from disturbed areas captured in excavations or sediment basins/traps constructed to prevent sediment transport off-site.
- Recycling and reusing water.

Any water supplied to the Project from existing groundwater bores would be sourced and transported under agreement with relevant landholders while ensuring any water access licences (WALs), works approvals and water use approvals required under the *Water Management Act 2000* (WM Act) are obtained.

Potable water supply for construction, operation and decommissioning will be sourced from commercial suppliers in the nearby region and transported to the Project Area via tanker truck.

BCWF have identified three (3) external water sources located proximally to the Project which may be utilised to obtain potable water, noting this is not an extensive list and is subject to change during the detailed design phase, post approval:

- More Water (www.morewater.net.au).
- The Water Truck (www.thewatertruck.com.au).
- Cessnock Water Supplies (www.cessnockwater.com.au).

The indicative transport route proposed for water deliveries to the Project Area is provided in **Figure 3.10**. It is noted that this route utilises the State road network to connect to the proposed Project transport route discussed in **Section 3.2.8** below.

A site water balance for the Project is provided in Appendix 13 of the Project EIS. Further details regarding site water usage and water licensing requirements are provided in **Section 6.8** and **Appendix 12** of the EIS.

3.2.8 Transport Routes

Transport routes for OSOM vehicles and general workforce traffic are consistent with those approved under the Stage 1 project. These routes have been summarised below:

- **All vehicles.** Access the Project Area via the approved site access point on Scrumlo Road.
- **Light vehicles.** Access the Project Area via the approved site access point, using the following route: New England Highway, Hebden Road (south) and Scrumlo Road. Light vehicles may also use Hebden Road (north) to access the approved site access point, subject to traffic management arrangements as described in the TTIA (**Appendix 11**).
- **Heavy vehicles:** Access the Project Area via the approved site access point, using the following route: New England Highway, Hebden Road (south) and Scrumlo Road.
- **OSOM vehicles requiring escort.** Access the Project Area via the approved site access point using the following route: Port of Newcastle via Hunter Expressway, New England Highway, Hebden Road (south) and Scrumlo Road.

Where adjustments to these approved routes are required as a result of the Stage 2 Project, these have been discussed in the subsequent sections below.

3.2.8.1 General Construction, Quarry and Water Transport Routes

Consideration of the proposed general construction workforce, quarry and water transport route has been undertaken within the TTIA, included as **Appendix 11** of this EIS. It is noted that these routes utilise the State road network before connecting to the approved transport route from the New England Highway, discussed above.

As noted in **Section 3.2.7.1**, quarry locations have been identified north and south of the Project Area. As such, quarry trucks may approach the Project from the north and south along the New England Highway from Muswellbrook and Newcastle, respectively. This approach is consistent for the general construction workforce, however as approved under the Stage 1 project, general construction workforce traffic (i.e. light vehicles) can also access the approved site access point using Hebden Road (north), as assessed in the TTIA.

As noted in **Section 3.2.7.2**, potable water is proposed to be sourced from Cessnock, and as such water trucks would approach the Project from the south along the New England Highway from Cessnock.

This general construction workforce (light vehicle), quarry and water transport routes are presented on **Figure 3.10** below.

Light vehicles required for operations and maintenance are also permitted to use Hebden Road (south or north) to access the approved site access point.

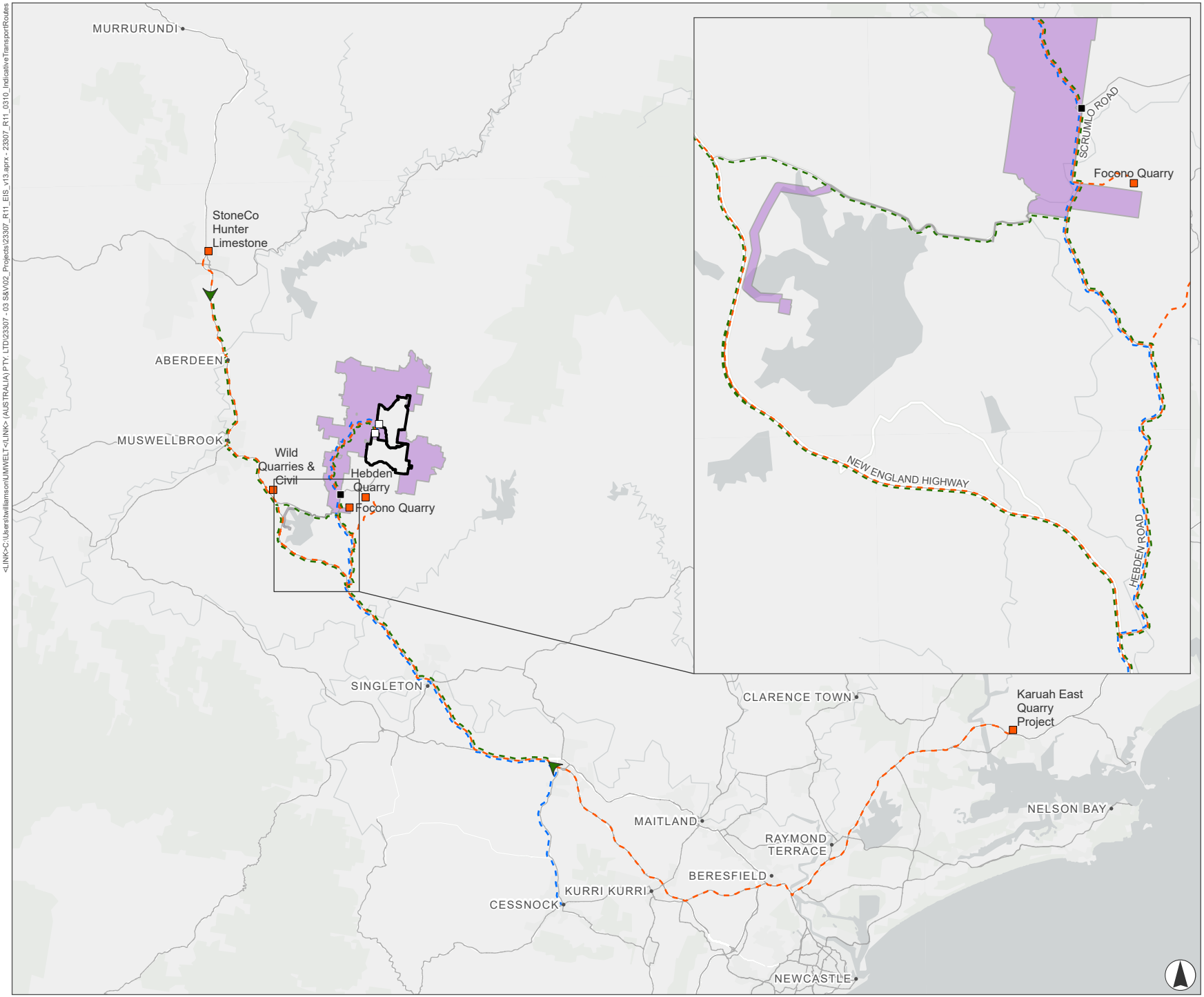


FIGURE 3.10

Indicative Workforce, Quarry and Water Transport Routes

Legend

- Populated Place
- Quarry
- Road
- Workforce (light vehicles) Route*
- Quarry Route
- Water Supply Route

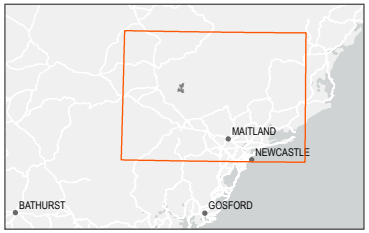
Project

- Project Boundary
- Main Site Access

Stage 1 Project

- Project Boundary
- Main Site Access

*The local workforce is expected to travel to the site from the north (towards Muswellbrook) and from the south (towards Newcastle)



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Kilometres

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3.2.8.2 OSOM Transport Route

The Project proposes to utilise the same OSOM Transport Route as approved under the Stage 1 project. The OSOM Transport Route is shown in **Figure 3.11**.

However, the WTG dimension proposed under the Stage 2 Project are larger than those assessed and approved under the Stage 1 project. As such, a new Route Study Report has been undertaken by Rex J Andrews Engineered Transportation (RJA) for the respective route options from the Port of Newcastle, based on a maximum blade length of up to 87.5 m. The Port of Newcastle to Project Route Study is attached as **Appendix 26** and is further discussed in **Section 6.7** and in the TTIA (**Appendix 11** of this Project EIS).

This transport route would be utilised to deliver Project components, including WTG towers and blades, to the Project Area. Typical delivery of these WTG components is shown on **Photo 3.5** below.

The Route Study (**Appendix 26**) identified numerous locations requiring road works to enable the safe transportation of large Project components. Further consideration of these offsite road work areas is provided in **Section 3.2.9** below.



Photo 3.5 Delivery of Typical WTG Tower

Source: BCWF

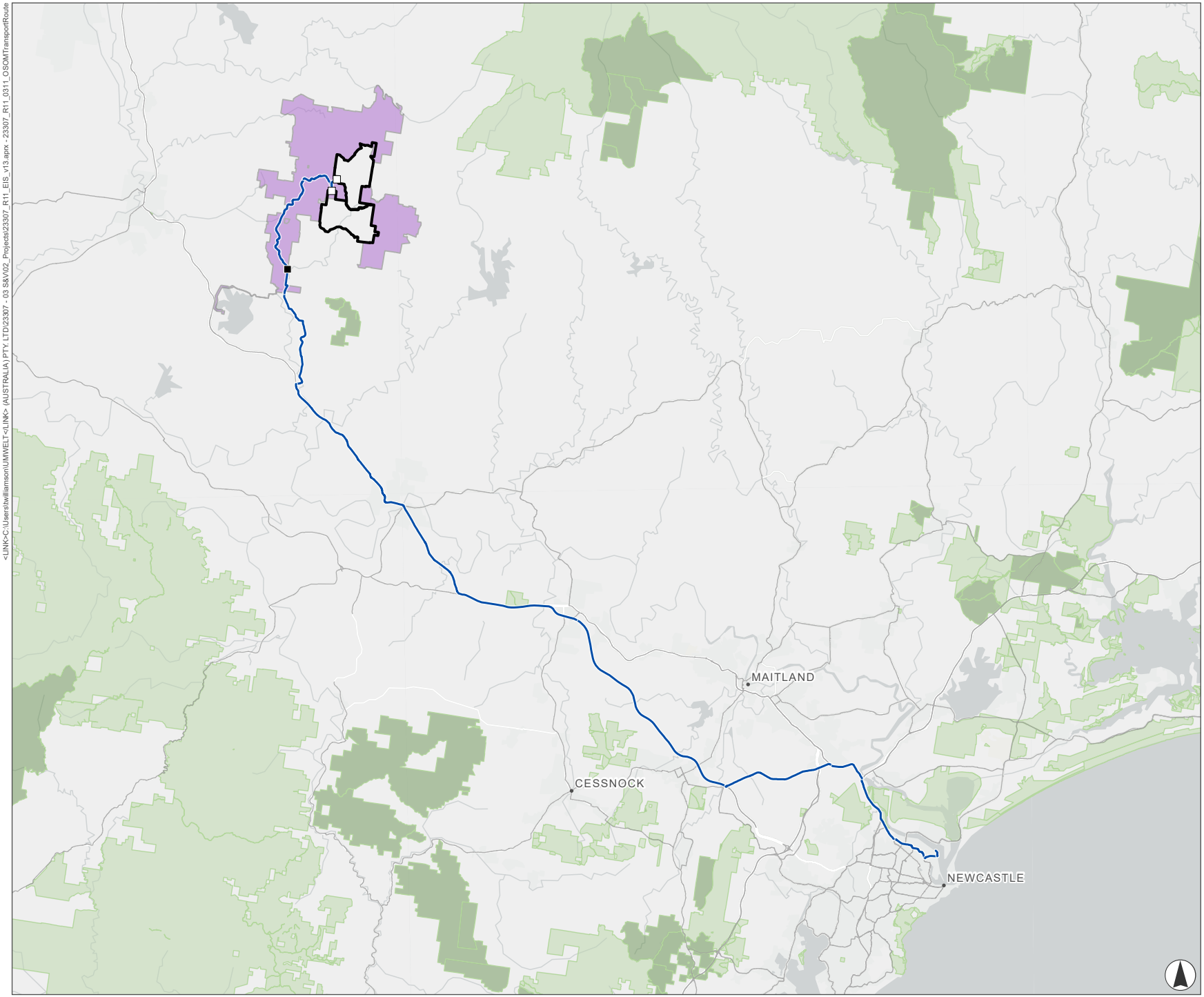


FIGURE 3.11
OSOM Transport Route

Legend

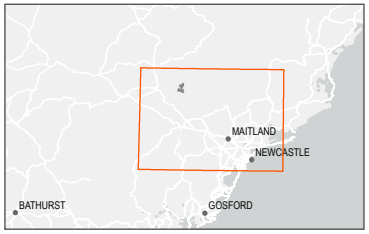
- Populated Place
- Road
- Site Acces From Port
- NPWS Reserves
- State Forest

Project

- Project Boundary
- Main Site Access

Stage 1 Project

- Project Boundary
- Main Site Access



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3.2.9 Offsite Road Works

As noted in **Section 3.2.8.2** above, road modifications are required to enable the safe transportation of OSOM vehicles to the Project Area. A qualitative assessment of potential environmental impacts has been undertaken at each of the offsite road work areas and used to determine whether detailed assessment is required to further consider potential for impacts to biodiversity and Aboriginal cultural (and historic) heritage values. These off-site road works are described in **Table 3.10** and shown on **Figure 3.12**.

A consolidated list of road upgrades proposed on the State and local road network is then provided in **Appendix 25**. Consultation with relevant landowners and road authorities on the proposed upgrades and treatments is occurring and will be ongoing throughout the assessment phase of the Project.

Where the proposed off-site works include physical changes to the road pavement, including the installation of additional hardstand, or changes to existing traffic islands, roundabouts or kerbs, a strategic concept design for the proposed works has been undertaken and is provided in **Appendix 3**. Chainage for the road upgrades have been compiled as two (2) components per the Rex J Andrews Route Study (**Appendix 26**).

Road upgrades proposed within the road reserve will be subject to a separate approval process under Section 138 of the *Roads Act 1993*, which would be undertaken following approval of the Project.

A range of road upgrades along Hebden Road (south), Scrumlo Road, Albano Road and Bowmans Creek Road were assessed and approved as part of the Stage 1 project to facilitate transportation of WTGs and large project components to the Stage 1 project area. No consideration and assessment of impacts has been undertaken within this EIS where offsite road works proposed for the Project overlap and sit entirely within the road work areas approved as part of the Stage 1 project approval (SSD-10315). Where offsite road works required for the Project partially overlap the approved Stage 1 project road work areas, consideration of the road work areas required for the Project that are located outside those approved under the Stage 1 project has been undertaken.

No offsite road works are required to facilitate transport of quarried materials or water as described in **Section 3.2.7**.

Table 3.10 Offsite Road Works

Road / Intersection	Chainage (km from Port)	Treatment	Environmental Context	Further Assessment Required?
Route 1A Study: Newcastle Port to Hebden	-	-	-	-
Mayfield #4 berth onto Selwyn Street Refer to Drawing No. 300305740-03-04 of the strategic concept design (**Appendix 3**)	0.0 km	Consists of two (2) hardstand areas, including one (1) on Selwyn Street and one (1) on David Baker Road. The hardstand area located on the southern side of Selwyn Street is required to be extended slightly to the east towards the road intersection. The hardstand on the eastern side of David Baker Road (labelled Mayfield No. 4) is required to be extended to the south. Proposed road modifications require the relocation of one (1) gate and one (1) fence on David Baker Road.	• Two (2) key work areas identified, including one (1) hardstand on the southern side of Selwyn Road and one (1) hardstand on the eastern side of David Baker Road. These are mostly contained within the Port to REZ hardstands. No additional environmental, planning, or heritage constraints identified. • The works location is within a heavily disturbed industrial area in Tighes Hill, NSW, adjacent to the roads and railway lines. Unlikely to be PCTs or native vegetation present.	Potential impacts to biodiversity have been assessed within Appendix J of the BDAR (**Appendix 8**), within the Small Area BDAR (Sydney Basin). Potential impacts to Aboriginal cultural heritage have been assessed within the ACHAR (**Appendix 9**).

Road / Intersection	Chainage (km from Port)	Treatment	Environmental Context	Further Assessment Required?
Selwyn Street onto Industrial Drive via George Street Refer to Drawing No. 300305740-03-03 of the strategic concept design (**Appendix 3**)	1.3 km	Proposed road modification includes amendment to traffic island on Industrial Drive to be made trafficable/replaced with painted lines, and one (1) hardstand area at the intersection of Selwyn Street and George Street.	• One (1) key work area identified on the corner or Selwyn Street and George Street. This work area is almost entirely contained within the Port to REZ hardstand area. Slight differences in the boundaries have been identified, which may be due to mapping. • Directly to the north of the work area is the curtilage of an item on the State Heritage Register, the BHP Administration Precinct. A local heritage item (I126, Newcastle LEP) is located to the west of the work area, to the south of George Street and the west of Industrial Drive. This item is unlikely to be affected by the proposed works. • To the north of the work area is mapped as containing Aquatic GDE: Northern Floodplain Paperbark Fern Swamp Forest. The work area appears to be clear of any vegetation. Areas to the north outside of the work area are mapped as PCT 4020: Coastal Creekflat Layered Grass-Sedge Swamp Forest.	Potential impacts to biodiversity have been assessed within Appendix J of the BDAR (**Appendix 8**), within the Small Area BDAR (Sydney Basin). Potential impacts to Aboriginal cultural heritage have been assessed within the ACHAR (**Appendix 9**). Potential impacts to local heritage item I286 have been assessed within the HHIA (**Appendix 10**).
Industrial Drive onto Maitland Road	5.5 km	Proposed road modifications include signs to be relocated or made removable at two (2) locations on Maitland Road, and islands to be made trafficable/replaced with	• Located at the intersection of Maitland Road and Industrial Road. Both are Crown roads. • There is one (1) local heritage item located approximately 100 m to the north though is unlikely to be affected by the proposed works.	The proposed works for Stage 2 are wholly contained within the approved clearance area of Stage 1. No further assessment is required.

Road / Intersection	Chainage (km from Port)	Treatment	Environmental Context	Further Assessment Required?
		painted lines at two (2) locations on Industrial Drive.	• Works contained within existing roadways. No vegetation clearing is required.	
John Renshaw Drive onto the Hunter Expressway Refer to Drawing No. 300305740-03-02 of the strategic concept design (**Appendix 3**)	28.7 km	Proposed modifications include vegetation to be trimmed for blade oversail clearance, and a hardstand to be installed on the off ramp.	• Comprises two (2) key work areas, including proposed vegetation trimming on the John Renshaw Drive roundabout, and a new hardstand on the exit ramp onto the Hunter Expressway. • Vegetation trimming and removal works have already been undertaken at this location by EnergyCo as part of Port to REZ project, which includes the development of hardstand at this location as well associated veg trimming and removal. Any excess trimming required would be minor in nature, and in a heavily disturbed environment. • Works along the offramp to the Hunter Expressway within a highly disturbed road reserve with no native PCT assigned. The total area of disturbance comprises approximately 62 m^2. • There is the potential for native vegetation to be present at the John Renshaw Drive roundabout works area, where vegetation trimming/removal works have been undertaken by EnergyCo. Any additional trimming required is expected to be minimal.	Potential impacts to biodiversity have been assessed within Appendix J of the BDAR (**Appendix 8**), within the Small Area BDAR (Sydney Basin). Potential impacts to Aboriginal cultural heritage have been assessed within the ACHAR (**Appendix 9**).

Road / Intersection	Chainage (km from Port)	Treatment	Environmental Context	Further Assessment Required?
New England Highway onto Hebden Road Refer to Drawing No. 300305740-03-01 of the strategic concept design (**Appendix 3**)	96.8 km	Proposed modifications include a power pole to be relocated out of swept path and signs to be relocated or made removable with flush bases. Vegetation to be removed and hardstand roadway constructed on inside of corner.	• The proposed works are mostly contained within the road reserve and the southern corner of Hebden Road (south). The works area intercepts some vegetation which is mapped as PCT:0 on SVTM. • A locally listed historic heritage item is situated on the northern corner of the Hebden Rd (south) intersection, the former Ravensworth Public School (I42). • Works for Stage 2 are contained within the approved clearance area for Stage 1. • There is no PCT assigned at this location. Vegetation is present within the impact area, which appears to be a mixture of native and exotic grasses within the road reserve, and trees.	Potential impacts to Aboriginal cultural heritage have been assessed within the ACHAR (**Appendix 9**). Potential impacts to heritage item I42 have been assessed within the HHIA (**Appendix 10**).
Bend on Hebden Rd Refer to Drawing No. 300305740-03-05 of the strategic concept design (**Appendix 3**)	97.5 km	Proposed modification includes a guard rail to be modified and hardstand installed on outside of corner. Landholder permission required for blade over sail and vegetation to be trimmed.	• Works for Stage 2 are contained within the approved impact area for Stage 1. • Work areas are centred around Bowmans Creek. Hardstand areas appear to be clear of any vegetation. Vegetation trimming required on the eastern side of Hebden Road, which is mapped as *PCT4073 Lower North Hinterland River Oak Forest*.	Potential impacts to biodiversity have been assessed within Appendix J of the BDAR (**Appendix 8**), within the Small Area BDAR (Sydney Basin). Potential impacts to heritage item I42 have been assessed within the ACHAR (**Appendix 9**).
Bend on Hebden Road	101.8 km	Proposed modification requires vegetation to be trimmed or removed for blade clearance.	• Area is contained within the curtilage of a local heritage item, I41 on the Singleton LEP 2013 (Ravensworth Homestead). • Areas to the east of the vegetation trimming area are mapped as containing	Potential impacts to biodiversity have been assessed within Appendix J of the BDAR (**Appendix 8**), within the Small Area BDAR (Sydney Basin).

Road / Intersection	Chainage (km from Port)	Treatment	Environmental Context	Further Assessment Required?
			Aquatic GDE: *PCT4015 Central Hunter Swamp Oak Riparian Forest*. • NSW State vegetation PCT mapping identifies the area as containing PCT 3431: Central Hunter Ironbark Grassy Woodland which conforms to an EEC under the NSW BC Act. This PCT has no Commonwealth significance. • Area has been mapped as belonging to the following PCTs: PCT 1602: Spotted Gum–Narrow-leaved Ironbark shrub–grass open forest of the central and lower Hunter; and PCT 618: White Box x Grey Box–red gum–Rough-barked Apple grassy woodland on rich soils on hills in the upper Hunter Valley. Smaller areas are mapped as containing exotic vegetation.	Potential impacts to heritage item I42 have been assessed within the HHIA (**Appendix 10**).
Bend on Scrumlo Road Refer to Drawing No. 300305740-03-06 and 300305740-03-07 of the strategic concept design (**Appendix 3**)	109.5 km	Proposed modifications include a fence to be modified and hardstand bypass installed on inside of corner. Landholder permission required. Vegetation to be trimmed and hardstand installed on inside and outside of corner. Landholder permission required for blade over sail.	• The majority of the Stage 2 hardstand areas are contained within the approved hardstand areas for Stage 1. Exceedances exist on the southern, and western sides of Scrumlo Road. These areas appear to be clear of vegetation. The work area to the south is within a Crown Road reserve (Scrumlo Road). • Both additional work areas for Stage 2 are mapped as containing exotic vegetation.	Potential impacts to biodiversity have been assessed within Appendix J of the BDAR (**Appendix 8**), within the Small Area BDAR (Sydney Basin). Potential impacts to Aboriginal cultural heritage have been considered within the ACHAR (**Appendix 9**).

Road / Intersection	Chainage (km from Port)	Treatment	Environmental Context	Further Assessment Required?
Clydsdales Bridge over Foy Creek Brook on Scrumlo Road Refer to Drawing No. 300305740-03-08 of the strategic concept design (**Appendix 3**)	110.3 km	Bridge to be widened to accommodate the weight. Width and vertical curves of all proposed loads.	• This work area covers the area surrounding Clydsdales Bridge, which travels across a higher order stream, Bowmans Creek. • Biodiversity values are present. A section of the work area has been mapped as belonging to PCT 486: River Oak moist riparian tall open forest of the upper Hunter Valley, including Liverpool Range. Other areas within the road corridor are mapped as containing exotic vegetation. • The work area is mapped as BSAL, however no impacts to agricultural activities are anticipated given the work would occur within the road reserve.	Potential impacts to biodiversity have been assessed within Appendix J of the BDAR (**Appendix 8**), within the Small Area BDAR (Sydney Basin). Potential impacts to Aboriginal cultural heritage have been considered within the ACHAR (**Appendix 9**).
Route 1B Study: Stage 1 To Stage 2 Via Albano Road	-	-	-	-
Right Hand Bend on Albano Road Refer to Drawing No. 300305740-03-09 of the strategic concept design (**Appendix 3**)	0.25 km	Proposed modification include a roadway to be widened to accommodate trailer swept path, and vegetation to be trimmed or removed for blade clearance. Trailer to oversail fence or fence to be modified. Blade to oversail embankment or embankment to be trimmed back.	• There are five (5) areas of vegetation trimming required and one (1) new hardstand required for Stage 2. Proposed works include amendments involving the trailer to oversail the fence, or the fence to be relocated. There is a Crown Road located to the north, but not adjoining the works area or vegetation trimming areas. • The proposed new hardstand area for Stage 2 is mapped as containing exotic vegetation.	Potential impacts to Aboriginal cultural heritage have been assessed within the ACHAR (**Appendix 9**).

Road / Intersection	Chainage (km from Port)	Treatment	Environmental Context	Further Assessment Required?
			• The majority of the areas identified for vegetation trimming are mapped as containing exotic vegetation.	
Left Hand Bend on Albano Road, Right hand bend on Albano Road Refer to Drawing No. 300305740-03-10 of the strategic concept design (**Appendix 3**)	0.95–1.1 km	Blade to oversail fence. Vegetation to be removed and embankment trimmed back to accommodate swept path. Blade to oversail embankment or embankment to be trimmed. Roadway to be widened to accommodate swept path.	• One (1) new hardstand is required on the southern side of Albano Road. Two (2) areas of vegetation clearing are required, both on the northern side of Albano Road. • The entirety of the new hardstand area for Stage 2 is mapped as containing exotic vegetation. • The two (2) vegetation clearing areas are mapped as containing exotic vegetation, excluding a very small area at the tip of the northern clearing area, which is mapped as belonging to *PCT1607: Blakely's Red Gum–Narrow-leaved Ironbark–Rough-barked Apple shrubby woodland of the upper Hunter*.	Potential impacts to biodiversity have been assessed within Appendix I of the BDAR (**Appendix 8**), within the Small Area BDAR (North Coast). Potential impacts to Aboriginal cultural heritage have been assessed within the ACHAR (**Appendix 9**).
Right Hand Bend on Albano Road	1.8 km	Proposed modification includes vegetation to be trimmed or removed for blade clearance. Roadway to be widened to accommodate swept path.	• Both the proposed hardstand and the area identified for vegetation trimming both covered by area approved for Stage 1. • Hardstand area mapped as containing exotic vegetation. The majority of the area identified for vegetation clearing is mapped as belonging to *PCT1602: Spotted Gum–Narrow-leaved Ironbark shrub–grass open forest of the central and lower Hunter*, and a smaller section mapped as exotic vegetation.	The proposed works for Stage 2 are wholly contained within the approved clearance area of Stage 1. No further assessment is required. However, potential impacts to Aboriginal cultural heritage have been considered within the ACHAR (**Appendix 9**).

Road / Intersection	Chainage (km from Port)	Treatment	Environmental Context	Further Assessment Required?
Right Hand Bend on Albano Road	2.4 km	Proposed modification includes vegetation to be trimmed or removed for blade clearance. Roadway to be widened to accommodate swept path.	• Stage 2 hardstand area within the area approved for Stage 1. There are small sections that appear outside of the Stage 1 approved area, likely a reflection of how these polygons have been mapped. • Majority of the new hardstand area for BOW2 was mapped as containing exotic vegetation. The middle section has been mapped as belonging to *PCT 1608: Grey Box–Grey Gum–Rough-barked Apple–Blakely's Red Gum grassy open forest of the central Hunter*.	The proposed works for Stage 2 are wholly contained within the approved clearance area of Stage 1. No further assessment is required. However, potential impacts to Aboriginal cultural heritage have been considered within the ACHAR (**Appendix 9**).
Right Hand Bend on Albano Road	2.8 km	Proposed modifications include an embankment to be trimmed back and roadway widened to accommodate swept path.	• Stage 2 hardstand area is contained within the area approved for Stage 1. • Entirety of the new hardstand area for BOW2 is mapped as containing exotic vegetation.	The proposed works for Stage 2 are wholly contained within the approved clearance area of Stage 1. No further assessment is required. However, potential impacts to Aboriginal cultural heritage have been considered within the ACHAR (**Appendix 9**).
Left Hand Bend on Bowmans Creek Road Over Bowmans Creek Refer to Drawing No. 300305740-03-11 of the strategic concept design (**Appendix 3**)	5.3 km	Proposed modification includes a floodway to be upgraded to accommodate the weight, width, vertical curves and swept path for all proposed loads. Vegetation to be trimmed or removed. Embankment on entry to be trimmed back and hardstand installed.	• Works require the construction of a large hardstand on the southern side of Bowmans Creek Road. Only appears to be slight crossover with the Stage 1 approved hardstand area. Approx 0.025 ha of vegetation trimming is also required adjacent to the south of the hardstand, in addition to a smaller area to the north of Bowmans Creek Road within the approved Stage 1 area.	Potential impacts to biodiversity have been assessed within Appendix I of the BDAR (**Appendix 8**), within the Small Area BDAR (North Coast). Potential impacts to Aboriginal cultural heritage have been assessed within the ACHAR (**Appendix 9**).

Road / Intersection	Chainage (km from Port)	Treatment	Environmental Context	Further Assessment Required?
			• The small area identified for vegetation clearing is mapped as belonging to *PCT 438: River Oak moist riparian tall open forest of the upper Hunter Valley, including Liverpool Range*. The 0.025 ha area identified for vegetation clearing to the south of Bowmans Creek Road is not mapped though appears to be grazing land. • A small section of the proposed Stage 2 hardstand area is mapped as containing exotic vegetation, with the remaining area unmapped.	
Right Hand Bend on Bowmans Creek Road, Right hand bend on Bowmans Creek Road, Left hand bend on Bowmans Creek Road Refer to Drawing No. 300305740-03-12 and 300305740-03-13 of the strategic concept design (**Appendix 3**)	5.4–5.6 km	Proposed modifications include vertical curves on entry and exit to be adjusted oversail, and the roadway to be widened to accommodate swept path. Landholder permission required for blade oversail and fence modification. Vegetation to be trimmed for blade clearance.	• Approximately half of the required hardstand areas for Stage 2 are contained within the approved hardstand areas for Stage 1. Exceedances exist on the northern and western sides of Bowmans Creek Road. No planning or environmental risks identified within the locality. • The approved Stage 1 hardstand areas and the proposed Stage 2 hardstand areas are mapped as containing exotic vegetation. A section of the proposed Stage 2 hardstand area is not mapped, through appears to be clear of vegetation.	Potential impacts to biodiversity have been assessed within Appendix I of the BDAR (**Appendix 8**), within the Small Area BDAR (North Coast). Potential impacts to Aboriginal cultural heritage have been assessed within the ACHAR (**Appendix 9**).
Left Hand Bend on Bowmans Creek Road over Bowmans Creek Road	6.3 km	Proposed modification includes a floodway to be upgraded to accommodate the weight, width, vertical	• The entirety of the proposed Stage 2 hardstand area on the northern side of Bowmans Creek Road is within the area approved for Stage 1. Vegetation trimming	Potential impacts to biodiversity have been assessed within Appendix I of the BDAR

Road / Intersection	Chainage (km from Port)	Treatment	Environmental Context	Further Assessment Required?
		curves and swept path for all proposed loads. Vegetation to be trimmed or removed. Embankments on entry to be trimmed back and culvert upgraded.	is required on the southern side of Bowmans Creek Road. • Areas beyond to the north and east of the works areas are mapped as containing *PCT 4073 Lower North Hinterland River Oak Forest*. • The entirety of the proposed Stage 2 hardstand area has is mapped as containing exotic vegetation. A smaller section of the vegetation trimming area is mapped as containing exotic vegetation, with the remaining area unmapped.	(**Appendix 8**), within the Small Area BDAR (North Coast). Potential impacts to Aboriginal cultural heritage have been assessed within the ACHAR (**Appendix 9**).
Right Hand Bend on Bowmans Creek Road	7.4 km	Proposed modification includes vegetation to be trimmed or removed. Embankment to be trimmed back for clearance and roadway widened for swept path. Land holder permission required for oversail.	• The entirety of the Stage 2 hardstand area on the southern side of Bowmans Creek Road is within the area approved for Stage 1. Vegetation trimming is required on the northern side of Bowmans Creek Road. • The entirety of the proposed Stage 2 hardstand area is mapped as containing exotic vegetation. Sections of the area identified for vegetation trimming are also mapped as containing as exotic vegetation, with the remaining area unmapped. • NSW PCT mapping identifies the vegetation trimming area as belonging to *PCT3241 Lower North White Mahogany-Spotted Gum Moist Forest*.	Potential impacts to biodiversity have been assessed within Appendix I of the BDAR (**Appendix 8**), within the Small Area BDAR (North Coast). Potential impacts to Aboriginal cultural heritage have been assessed within the ACHAR (**Appendix 9**).

Road / Intersection	Chainage (km from Port)	Treatment	Environmental Context	Further Assessment Required?
Left Hand Bend on Bowmans Creek Road Refer to Drawing No. 300305740-03-14 of the strategic concept design (**Appendix 3**)	7.5 km	Proposed modification includes a power pole and sign to be relocated out of swept path. Vegetation to be removed. Roadway to be widened and embankment trimmed back for blade clearance.	• The Stage 2 hardstand clearance area on the southern side of Bowmans Creek Road is within the area approved for Stage 1. • The entirety of the proposed Stage 2 hardstand area is mapped as containing exotic vegetation. Sections of the area identified for vegetation trimming have also been mapped as containing exotic vegetation.	Potential impacts to biodiversity have been assessed within Appendix I of the BDAR (**Appendix 8**), within the Small Area BDAR (North Coast). Potential impacts to Aboriginal cultural heritage have been assessed within the ACHAR (**Appendix 9**).
Right Hand Bend Over Bowmans Creek Road on Bowmans Creek Road	7.8 km	Proposed modification includes a culvert to be assessed and upgraded as required. Vertical curves on entry and exit to be adjusted to accommodate all proposed loads. Vegetation to be trimmed for blade clearance.	• No new hardstands are required for Stage 2. Some vegetation clearing is required on both the northern and southern sides of Bowmans Creek Road. • A local heritage item is located beyond to the north of the works areas, though is unlikely to be affected by the proposed works. • The area identified for vegetation trimming is mapped by Cumberland Ecology as containing exotic vegetation. The area directly to the south of the vegetation trimming area was mapped by Cumberland Ecology as belonging to *PCT 486 River Oak moist riparian tall open forest of the upper Hunter Valley, including Liverpool Range*. • NSW State PCT mapping identifies the area immediately to the north as belonging to *PCT 4073 Lower North Hinterland River Oak Forest*.	Potential impacts to biodiversity have been assessed within Appendix I of the BDAR (**Appendix 8**), within the Small Area BDAR (North Coast).

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FIGURE 3.12a

Offsite Road Work Areas

Legend

- Road
- Railway Line
- River/Stream
- OSOM Transport Route (Stage 1 and Stage 2)

Project

- OSOM Route Hardstand

Stage 1 Project

- Approved Stage 1 Disturbance Footprint

Port to REZ

- Port to REZ Disturbance Footprint

0 0.1 0.2

Kilometres

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FIGURE 3.12b

Offsite Road Work Areas

Legend

- Road
- Railway Line
- OSOM Transport Route (Stage 1 and Stage 2)

Project

- OSOM Route Hardstand

Stage 1 Project

- Approved Stage 1 Disturbance Footprint

Port to REZ

- Port to REZ Disturbance Footprint

0 0.1 0.2

Kilometres

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FIGURE 3.12c
Offsite Road Work Areas

Legend

- Road
- River/Stream
- OSOM Transport Route (Stage 1 and Stage 2)

Project

- OSOM Route Hardstand
- OSOM Route Veg Trimming

Stage 1 Project

- Approved Stage 1 Disturbance Footprint

Port to REZ

- Port to REZ Disturbance Footprint

0 0.1 0.2
Kilometres

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FIGURE 3.12d

Offsite Road Work Areas

Legend

- Road
- Railway Line
- River/Stream
- OSOM Transport Route (Stage 1 and Stage 2)

Project

- OSOM Route Hardstand
- OSOM Route Veg Trimming

Stage 1 Project

- Approved Stage 1 Disturbance Footprint
- Ecological Clearance Envelope

0 0.1 0.2

Kilometres

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FIGURE 3.12e

Offsite Road Work Areas

Legend

- Road
- OSOM Transport Route (Stage 1 and Stage 2)

Project

- OSOM Route Veg Trimming

Stage 1 Project

- Approved Stage 1 Disturbance Footprint

0 0.1 0.2

Kilometres

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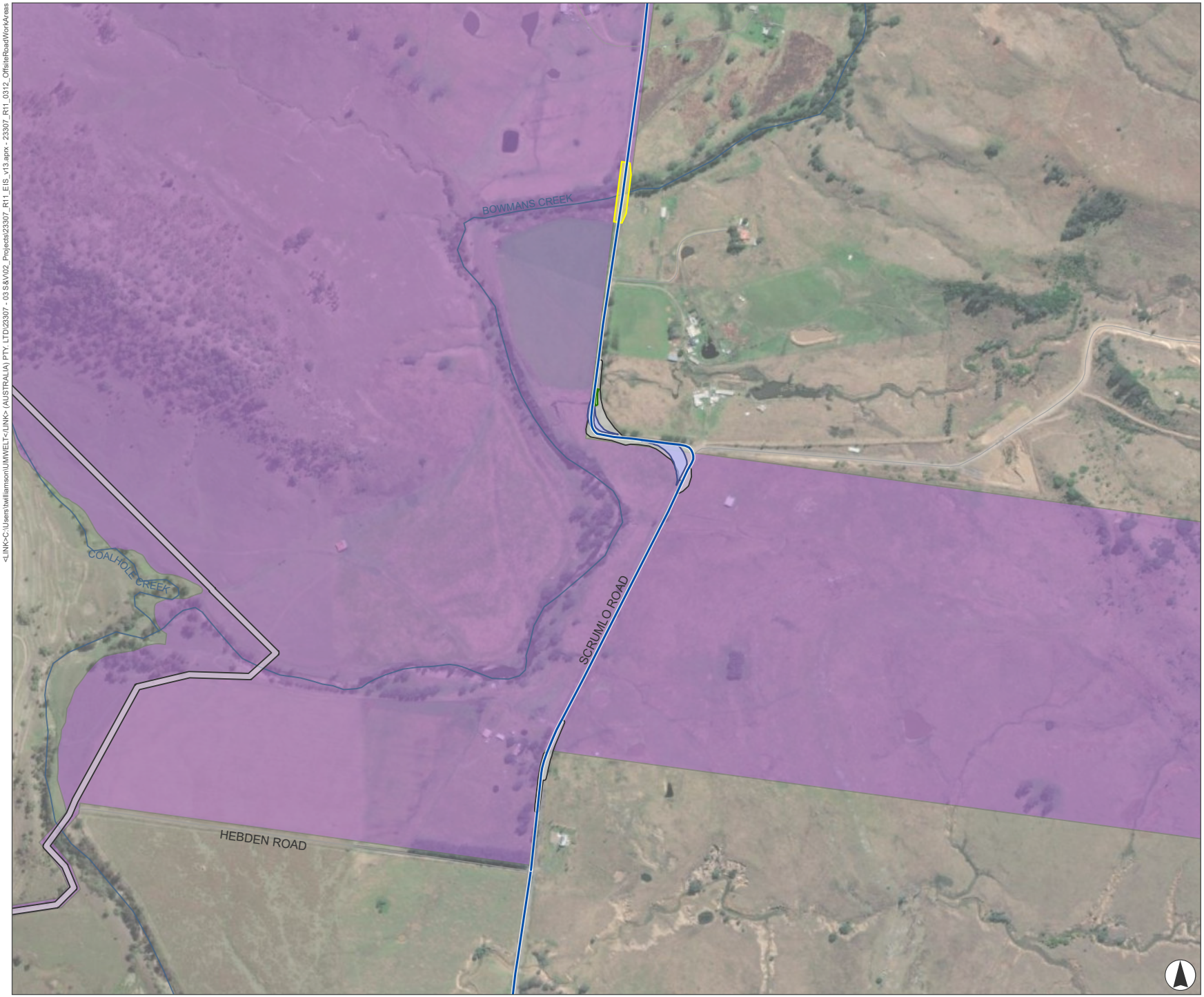


FIGURE 3.12f

Offsite Road Work Areas

Legend

- Road
- River/Stream
- OSOM Transport Route (Stage 1 and Stage 2)

Project

- OSOM Route Hardstand
- OSOM Route Veg Trimming
- Clydsdales Bridge Upgrade

Stage 1 Project

- Approved Stage 1 Disturbance Footprint
- Ecological Clearance Envelope

0 0.1 0.2

Kilometres

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FIGURE 3.12g

Offsite Road Work Areas

Legend

- Road
- Main Site Access
- OSOM Transport Route (Stage 1 and Stage 2)

Project

- Project Boundary
- Development Corridor
- OSOM Route Hardstand
- OSOM Route Veg Trimming

Stage 1 Project

- Approved Stage 1 Disturbance Footprint
- Ecological Clearance Envelope

0 0.1 0.2

Kilometres

Scale 1:7,500 at A4
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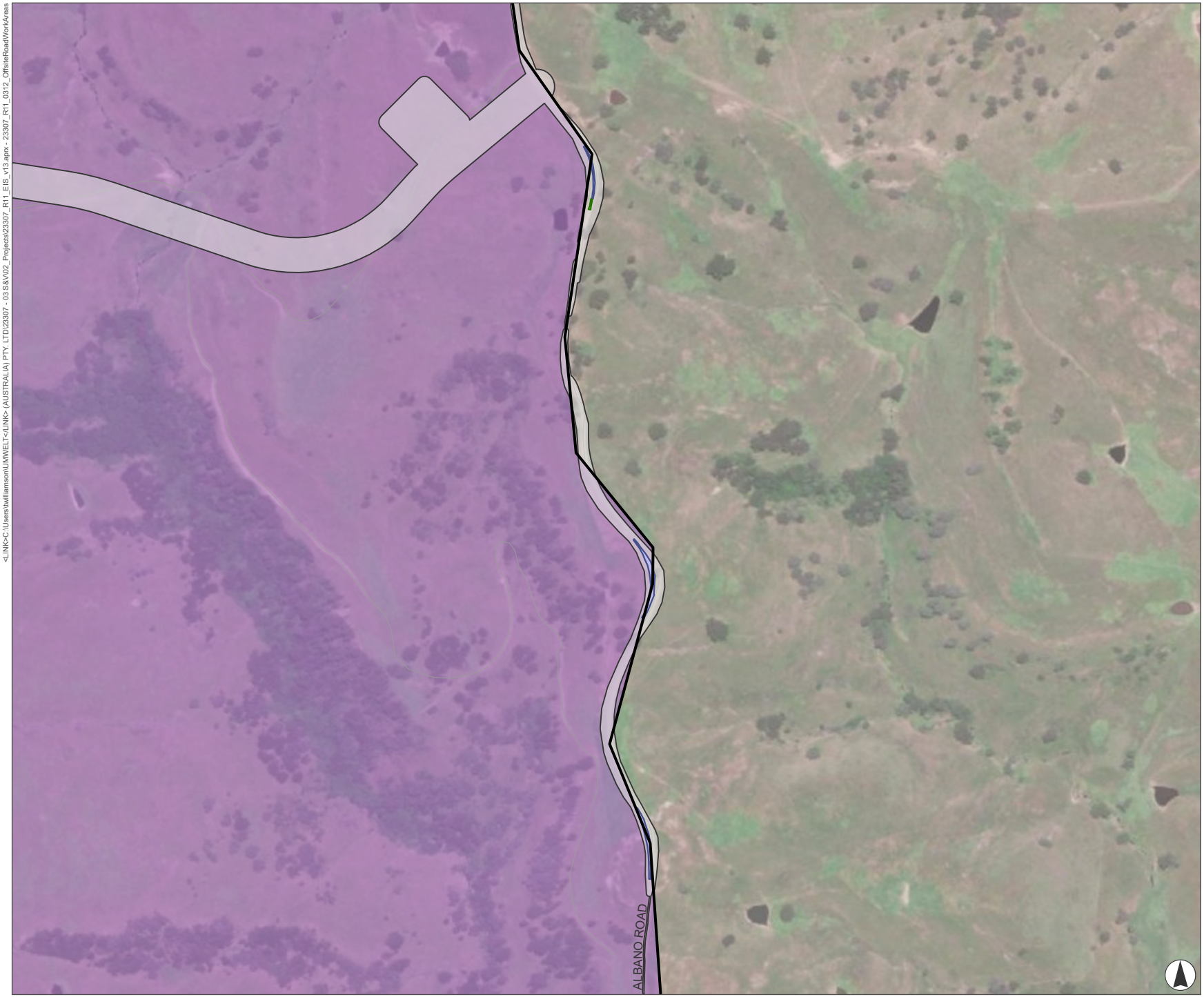


FIGURE 3.12h

Offsite Road Work Areas

Legend

Road

Project

Project Boundary

OSOM Route Hardstand

OSOM Route Veg Trimming

Stage 1 Project

Approved Stage 1 Disturbance Footprint

Ecological Clearance Envelope

0 0.1 0.2

Kilometres

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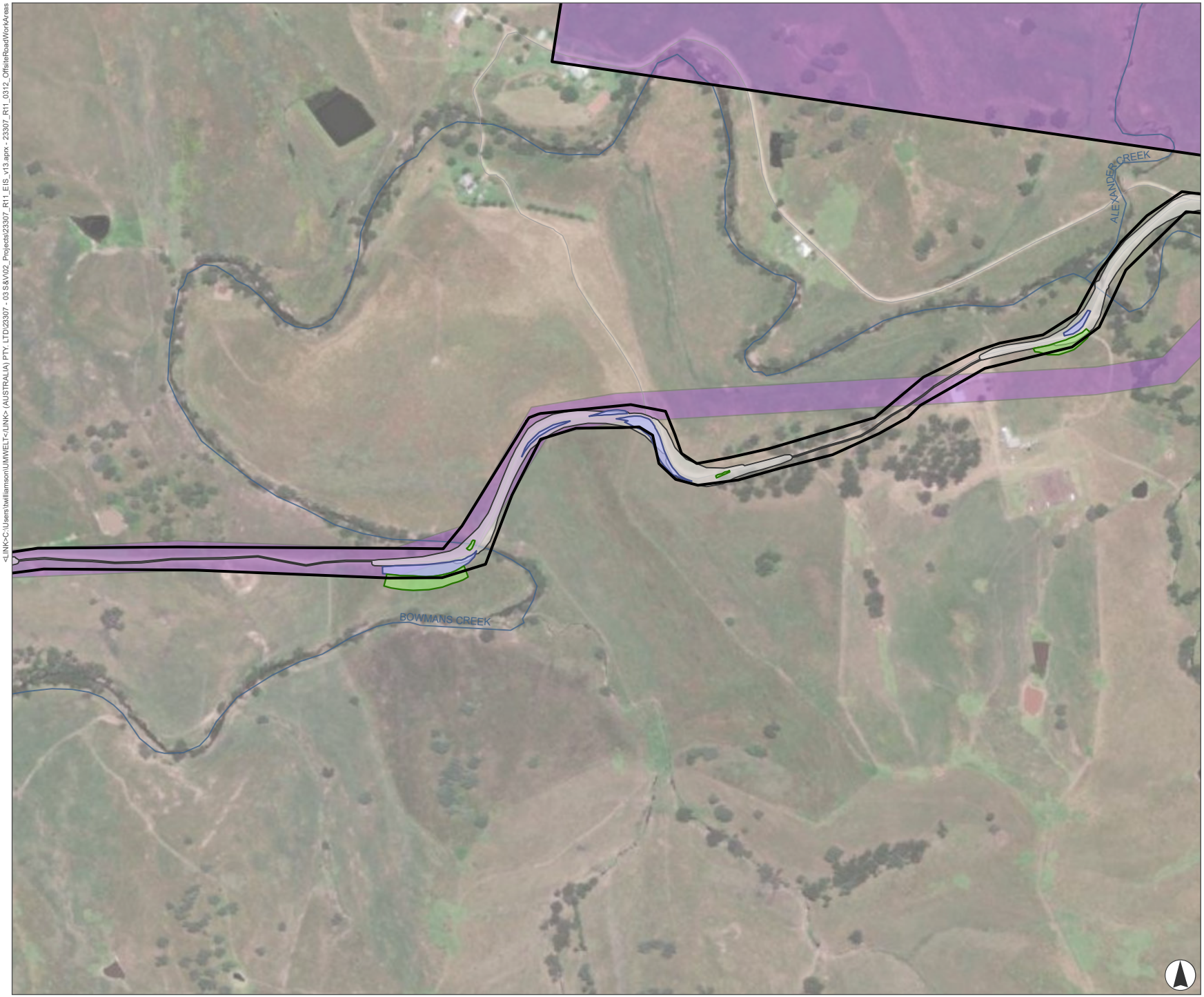


FIGURE 3.12i

Offsite Road Work Areas

Legend

- Road
- River/Stream

Project

- Project Boundary
- OSOM Route Hardstand
- OSOM Route Veg Trimming

Stage 1 Project

- Approved Stage 1 Disturbance Footprint
- Ecological Clearance Envelope

0 0.1 0.2

Kilometres

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FIGURE 3.12j

Offsite Road Work Areas

Legend

- Road
- River/Stream

Project

- Project Boundary
- OSOM Route Hardstand
- OSOM Route Veg Trimming

Stage 1 Project

- Approved Stage 1 Disturbance Footprint
- Ecological Clearance Envelope

0 0.1 0.2

Kilometres

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3.2.10 Commissioning

Pre-commissioning checks will be carried out on the high voltage electrical equipment prior to connection to the transmission network. When the Project's electrical system has been energised, the WTGs will be commissioned and put into service. WTGs are commissioned sequentially enabling some WTGs to commence operation prior to the completion of wind farm construction. For the purposes of assessment in this EIS, the commissioning phase is considered to commence during construction and will end once the final WTG and electrical compound have been fully commissioned.

3.2.11 Operational Phase

Once operational, the Project would be monitored both by on-site staff and through remote monitoring. Aspects of the Project operation to be dealt with by on-site staff would include safety management, environmental condition monitoring, landowner management, routine servicing, malfunction rectification and site visits. Those functions to be overseen by remote monitoring include WTG performance, Project reporting, remote resetting and maintenance coordination.

Proactive computer control systems will monitor the performance of the WTGs and reticulation network so that any issues can be dealt with by on-site staff, as appropriate. Maintenance staff will be on-site throughout the year, making routine checks of the WTGs and ancillary infrastructure on an ongoing basis. Major planned servicing would be carried out approximately twice a year on each WTG. Each major service visit would potentially involve a number of service vehicles on-site.

Replacement of major components, such as WTG blades, may require the use of cranes and ancillary equipment. Management of regrowth and existing vegetation will be necessary within the overhead transmission line corridors to reduce the threat of fire and physical damage to the transmission line, and to allow access for maintenance vehicles. Occasionally, access by medium and heavy vehicles may be required to repair or maintain overhead transmission line components.

3.2.12 Decommissioning Phase

The WTGs have an expected operating life of approximately 30 years, and the agreement with the host landholder provide for the operations to continue past 30 years. At the end of that 30-year period, three (3) options will be considered:

- continued use of the Project Area as a wind farm utilising the existing WTGs and other facilities (subject to contractual agreement with the host landholder and condition of equipment)
- replace the WTGs with technology current at that time and continue the wind farm operation for a further term (subject to contractual agreement with the host landholder and further development consent)
- decommission the wind farm and remove the WTGs and other infrastructure.

Should decommissioning be required, key stakeholders including relevant landholders would be consulted regarding the decommissioning and rehabilitation plan. All costs associated with decommissioning will be borne by BCWF or their representative.

All above ground structures not required for the ongoing agricultural use of the land, including the WTGs and the substation, will be removed and the land rehabilitated so that it can return to agricultural use. Internal roads, if not required for ongoing farming purposes or fire access, would also be removed, as well as access gates. The host landholder will be involved in any discussion regarding the removal or hand-over of infrastructure on their properties. Below ground infrastructure, including WTG foundations, hardstands and some cabling may be left in-situ and covered in clean fill material, with the land returned to near prior condition and use, as far as practicable.

The decommissioning phase would require similar equipment and activities to those required throughout the construction phase, including mobile and heavy equipment (e.g. cranes, earthworks machinery, compressor and rock crusher). Prior to the commencement of decommissioning activities, BCWF would prepare a detailed Decommissioning and Rehabilitation Plan (DRP) in consultation with DPHI and the relevant Councils to guide the implementation of the decommissioning works.

3.2.13 Repowering

This EIS has assessed only up to decommissioning and does not include repowering. After approximately 30 years of operation (or sooner, if deemed economically viable) the Project may be repowered, utilising contemporary equipment. This would be subject to a subsequent project approval process.

3.2.14 Project Components That May Change

Although 21 WTGs are proposed, commercial considerations and technological advancements may lead to fewer than 21 WTGs being constructed and operated, at the discretion of BCWF. All 21 WTG locations have been included in this EIS in order to assess worst-case impacts and to allow the flexibility to determine the optimal Project layout within the limits of the development consent, generally in accordance with this EIS.

The proposed Project layout presented in this EIS is a product of BCWF's commitment to avoid environmental and social impacts and mitigate any remaining impacts to the maximum extent practicable. This is further emphasised through the shared use of select project infrastructure from Stage 1 project as discussed in detail in **Section 3.2.6**.

If development consent is granted for the Project, preferred suppliers will be selected following a tender and contractor selection process. Any potential supplier will have unique requirements and specifications such as transport vehicle turning radii, access and exit gradients and crane requirements. The final design will only be known following selection of Project components and the completion of the detailed design by the construction contractor post-approval.

3.2.15 Micro-Siting

WTGs, ancillary infrastructure and temporary facilities will be micro-sited post approval during the optimisation, detailed design and construction phase programming. Final micro-siting may not occur until the construction period, immediately prior to the activity or construction of that Project element.

Any micro-siting will be undertaken to meet the following criteria:

- The process of locating WTGs, ancillary infrastructure and temporary infrastructure during detailed design without further approval, providing that:
    - ground disturbance is wholly contained within the Development Corridor
    - no WTG is moved more than 100 m from the relevant GPS coordinates listed in **Appendix 3**.
    - the revised location of the blade of a WTG is at least 50 m from the canopy of existing hollow-bearing trees; or where the proposed location of the blade of a WTG is already within 50 m of the canopy of existing hollow-bearing trees, the revised location is not any closer to the existing hollow-bearing trees.

3.2.16 Environmental Management System

An Environmental Management System (EMS) will be developed for the Project. Opportunities for continuous improvement will be implemented where practical. The EMS will be developed in general accordance with the International Organization for Standardization 14001–Environmental Management Systems (ISO14001) and will include all required management plans, procedures and protocols required as per the Development Consent (if approved) or as required via a risk assessment process.

The EMS will integrate policy, procedures and processes for training of personnel, monitoring, summarising, and reporting of environmental performance information to internal and external stakeholders. It will guide the environmental management activities of the Project throughout construction, operation, maintenance and decommissioning. Environmental risks will be identified via a risk assessment process, and mitigation and/or management measures determined to avoid or minimise environmental impacts.

The EMS will describe measures to monitor and publicly report on environmental performance via the Project website and will generally include a summary of monitoring results in accordance with the Development Consent (if approved), all required approved management plans and programs.

4.0 Statutory Context

This section outlines the key planning and approval pathways for the Project under State and Commonwealth legislation. Relevant statutory requirements under other State and Commonwealth legislation are considered in detail in the Statutory Compliance Table, provided in **Appendix 4**.

4.1 NSW Approval Pathway

The EP&A Act is the primary instrument which regulates the environmental impact assessment and approval process for development in NSW.

The Project will require development consent under Part 4 of the EP&A Act. Being development for the purpose of electricity generation with a capital investment value of more than $30 million, the Project is declared to be SSD under the provisions of the *State Environmental Planning Policy (Planning Systems) 2021* (Planning Systems SEPP).

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 (EPIs), 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.

In accordance with Part 8, Division 5 of the *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation), an SSDA must be accompanied by an EIS which complies with the Planning SEARs for the Project, along with other general requirements as outlined in Part 8, Division 5 of the EP&A Regulation.

The NSW Planning Secretary issued updated SEARs for the Project on 22 May 2025. **Appendix 1** outlines the requirements set out in the SEARs and how these requirements have been addressed within this EIS.

4.1.1 Consent Authority

Under Section 4.5(a) of the EP&A Act the consent authority for SSD is the Minister for Planning and Public Spaces, or the Independent Planning Commission (IPC) if the development is of a kind for which the Commission is declared the consent authority by an environmental planning instrument.

In accordance with clause 2.7(1) of the Planning System SEPP, the IPC is the consent authority if any of the criteria identified below are exceeded:

- Muswellbrook Shire Council or Singleton Council object to the application.
- 50 submissions (other than from the Councils noted above) are made objecting to the Project.
- BCWF discloses a reportable political donation.

If none of the above criteria are triggered, DPHI will determine the development application on behalf of the Minister.

4.1.2 Permissibility

As outlined in **Section 2.3.1**, the Project Area is zoned as RU1 Primary Production within the Muswellbrook LEP and Singleton LEP. Electricity generating works are prohibited within the RU1 zone under the respective LEPs. However, Clause 2.36(1)(b) of *State Environmental Planning Policy (Transport and Infrastructure) 2021* (TI SEPP) provides that development for the purpose of electricity generating works may be carried out by any person with consent on any land in a prescribed rural, industrial or special use zone, including RU1. By operation of Clause 2.7(1) of the TI SEPP, the SEPP prevails to the extent of any inconsistency with an LEP. Therefore, the Project is permissible with development consent under Clause 2.36(1)(b) of the TI SEPP.

As noted in **Section 3.2.2**, the Project includes future land subdivision/s, including the creation of new freehold lots containing the on-site substation. These lots will be smaller than the 80 ha minimum lot size under the Muswellbrook LEP. However, the proposed subdivision is permissible under Section 4.38(3) of the EP&A Act. It is submitted that consent for the subdivision should be granted on the basis that:

- The proposed subdivision/s would not change any existing dwelling entitlements or result in the fragmentation of agricultural land.
- The subdivision/s would facilitate a permissible land use (being electricity generating works).

4.2 Commonwealth Legislation

4.2.1 Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The EPBC Act provides a framework for protection of the Australian environment, including its biodiversity and its natural and culturally significant places. Any action which will or is likely to have a significant impact on a matter of national environmental significance (MNES) is a Controlled Action which requires assessment and approval under the EPBC Act:

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

On 24 March 2025, the Project was declared a Controlled Action under section 75 of the EPBC Act on the basis of likely significant impacts to listed threatened species and communities (section 18 and 18A) under the EPBC Act. It was further determined that the Project will be assessed under the Bilateral Agreement between NSW and the Commonwealth (Amending Agreement No. 1). The Controlled Action Decision (2024/10013) is provided in **Appendix 1**.

Supplementary SEARs were subsequently issued by DPHI. The Supplementary SEARs are included in **Appendix 1**, along with a list of protected matters identified by the Commonwealth Department of Climate Change, Energy, the Environment and Water (Cth DCCEEW) as relevant to the Project. These requirements are addressed in detail within the BDAR included in **Appendix 8** of this EIS.

4.3 Statutory Requirements

The statutory requirements addressed within this EIS are summarised in **Table 4.1**, with a detailed statutory compliance table provided in **Appendix 4**.

Table 4.1 Statutory Requirements Summary

Category	Comment
Power to grant approval	Section 4.38 of the EP&A Act provides the power to grant approval for SSD. The Project is SSD as it involves development for the purpose of electricity generating works (using wind power) and has an estimated cost of more than $30 million (refer to Schedule 1, Clause 20 of the Planning Systems SEPP).
Permissibility	The Project is permissible with development consent under Clause 2.36(1)(b) of the TI SEPP as it involves development for the purpose of electricity generating works may be carried out by any person with consent on any land in a prescribed zone, being RU1.
Commonwealth Approvals	The Project has been declared a controlled action under the EPBC Act (EPBC 2024/10013). The Project will be assessed by the NSW Government under the Bilateral Agreement between NSW and the Commonwealth (Amending Agreement No. 1). The Commonwealth Controlled Action Decision and Supplementary SEARs are provided in **Appendix 1** and are addressed in the BDAR (refer to **Appendix 8**).
Other State Approvals	The Project will require an Environment Protection Licence under the NSW *Protection of the Environment Operations Act 1997* (POEO) and consent from relevant roads authorities under Section 138 of the NSW *Roads Act 1993* for works within public road reserves. As per Section 4.42 of the EP&A Act, these approvals cannot be refused if development consent is granted and the approvals must be substantially consistent with the development consent. Other State approval requirements are discussed further in **Appendix 4**.
Pre-conditions to exercising the power to grant consent	Refer to **Appendix 4** for a summary of all relevant pre-conditions to exercising the power to grant consent for the Project and where these have been addressed in the EIS.

Category	Comment
Mandatory matters for consideration	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, and submissions received and the public interest. All relevant matters are addressed in the EIS based on the outcomes of environmental assessments to be undertaken (refer to **Section 6.0**). Mandatory matters for consideration have been addressed in detail in **Appendix 4**.
Related Development	Matters relating to related development are addressed in **Table 4.2** below.

4.3.1 Related Development

Matters relating to related development are addressed in **Table 4.2** below, consistent with the requirements of Section 3.2 of the SSD EIS Guidelines (DPHI, 2026b).

Mandatory considerations under the EP&A Act and EP&A Regulation relating to related development are also addressed in **Appendix 4** of this EIS, where required.

Table 4.2 Related Development

Requirement	Compliance
A description of any related development, including any:	-
• existing or approved development (including any existing use rights or continuing use rights) that will be incorporated into the project, allowing some or all of the existing development consent or rights for this development to be surrendered if the SSD project is approved and the project is to operate under a single SSD development consent	• The existing development consent or rights for the approved Stage 1 project (SSD-10315) would not be surrendered if the Project is approved. • The Project would operate under a separate SSD development consent to the Stage 1 project.
• existing or approved development (including any existing use rights or continuing use rights) that will be operated in conjunction with the project under a separate development consent or approval	• The Project will be operated in conjunction with the approved Stage 1 project but under a separate development consent. • See **Section 3.2.6** for an overview of shared Stage 1 project infrastructure.
• development that is required for the project but is proposed to be subject to a separate assessment (e.g. new or upgraded ancillary infrastructure, approvals for subsequent stages of the project)	• N/A – aside from the approved Stage 1 project, no other development is required for the Project that is proposed to be subject to a separate assessment.
• concept consents, approved subsequent stages of development under a concept, or any related applications that are yet to be determined.	• N/A – there are no concept consents, approved subsequent stages of development under a concept, or related applications that are yet to be determined.

5.0 Engagement

Since inception of the Project, BCWF has been committed to genuine and meaningful engagement with the community, with a focus on:

- establishing enduring community partnerships based on shared values
- avoiding, minimising and mitigating impacts to environmental and cultural values in collaboration with impacted stakeholders
- bringing communities together and delivering intergenerational community benefits through the State's transition to renewable energy.

The local community were first engaged by Epuron Projects regarding the Stage 1 project in 2018 and engagement for the Stage 2 Project began in March 2024 by BCWF. Through engagement, BCWF has sought to build relationships and understand perspectives and needs in the region through meetings with local landowners, neighbouring property owners, Councils, First Nations groups, local service providers and relevant Government agencies. This ongoing engagement has resulted in numerous changes to the Project design (refer to **Section 2.6.3**) and has assisted in development of implementation plans for the Project including the management and mitigation measures proposed.

As discussed in **Section 2.5**, as part of this engagement process, BCWF has also reached agreements with the host landowner and select neighbours regarding the Project and mitigation of Project related impacts, noting the most significant visual impacts to non-associated residences due to the Project have been assessed as 'low'. These agreements demonstrate BCWF's focus on proactive engagement, mitigating the impacts and sharing the benefits of the Project.

In addition to consultation with community stakeholders, ongoing consultation has been undertaken with the Singleton, Muswellbrook Shire and Upper Hunter Shire Councils, State and Federal Government agencies, functional stakeholders (e.g. service providers), businesses and various non-government organisations and interest groups. This includes an engagement process undertaken with the local First Nations stakeholders. This engagement has informed the design of the Project and has been ongoing throughout the assessment process, and engagement will be ongoing during the life of the Project if approved.

In accordance with the SEARs, this EIS must:

- Detail how engagement undertaken was consistent with the Engagement Guidelines (DPHI, 2026c).
- Describe the consultation process and the issues raised, and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, a short explanation should be provided.
- An overview of the Stakeholder Engagement Program including the identified stakeholders, engagement undertaken, and the outcomes of the consultation process is provided below.

In addition to the engagement undertaken by BCWF, further engagement has been undertaken as part of the Social Impact Assessment (SIA) undertaken to support the Project EIS in **Appendix 20** in accordance with the requirements of the NSW Government guidelines and assessment standards including, but not limited to, the SIA Guideline, the Engagement Guidelines, the NSW Government Benefit Sharing Guideline and the SEARs.

Engagement was undertaken throughout the assessment process using a proportionate and fit-for-purpose approach that reflected the scale, complexity and potential social impacts of the Project. The engagement program, as outlined in the subsequent sections below, included stakeholder and rights holder identification, targeted landholder and stakeholder interviews, community surveys, information sessions and ongoing opportunities for stakeholders to obtain information and provide feedback. Engagement outcomes informed the development of the social baseline, identification and evaluation of social impacts, and the preparation of mitigation and enhancement measures.

Consistent with the objectives of the Engagement Guideline, engagement undertaken for the Project followed a transparent, evidence-based and participatory assessment process, and establishes a framework for ongoing engagement, monitoring and adaptive management throughout the life of the Project, as documented in the SIA (**Appendix 20**) and associated Community and Stakeholder Engagement Plan (CSEP; Appendix B of **Appendix 20**).

All consultation information relevant to this EIS has been summarised in **Section 5.1** to **Section 5.4**, with ongoing engagement activities outlined in **Section 5.5**. Additionally, **Appendix 1 (Section A1.2)** outlines the expectations for engagement that are to be met by the proponent (and have been met by BCWF) in accordance with Appendix A of the Engagement Guidelines, during the 'Preparing the EIS Phase'.

Appendix Table A1.5 outlines the engagement implemented throughout the EIS assessment phase of the Project, and how it aligns with the expectations of the Engagement Guidelines. It provides specific information in relation to what mechanism was applied, its timing, relevant details of the engagement, what Engagement Guideline expectations were addressed, target Stakeholder Groups and the quantity of stakeholders engaged in each instance. Additionally, **Appendix Table A1.6** has been prepared to identify the key issues raised during community engagement undertaken for the Project, and indicates where these matters have been addressed in the EIS.

5.1 Social Baseline

Section 3.1 of the SIA (**Appendix 20**) defines the social locality of relevance to the Project and provides a baseline context for the Project. An understanding of the Project baseline is important in providing a foundation from which social impacts relating to the Project can be evaluated and predicted, and have been utilised to define engagement activities. As presented in Section 3.0 of **Appendix 20**, a community capitals framework was utilised to structure the baseline and understand the respective economic, political, social, human, physical and natural capital assets of the locality.

The social baseline profile was compiled based on the definition of the Project's social locality or 'area of social influence' as detailed in **Appendix 20**. The social locality for the Project has been defined at both a localised and regional scale, given the likely social impacts that may be experienced because of the Project both locally and across the broader region. The social locality is detailed in Table 3.1 of **Appendix 20**.

5.2 Community and Stakeholder Engagement Plan

BCWF has prepared and implemented a Community and Stakeholder Engagement Plan (CSEP) for the Project (refer to Appendix B of **Appendix 20**) that outlines the objectives and has guided the approach to community engagement.

A stakeholder identification process was undertaken early in the Project to support the planning and delivery of community and stakeholder consultation, and to inform the SIA. This process involved identifying stakeholders with an interest, or those potentially directly and indirectly affected by the Project, including identifying any potentially vulnerable or marginalised groups.

Through the implementation of the CSEP, BCWF aims to:

- Support the building of relationships with local stakeholders to establish a socially sustainable project.
- Guide and support a strategic and coordinated approach to engagement, including specific mechanisms, timeframes and responsibilities during the planning and assessment phase of the Project.
- Facilitate transparent and meaningful information exchange on the Project.
- Identify key stakeholders and communities relevant to the development of the Project.
- Support the Project's understanding of its local context, identification of stakeholders, including vulnerable community groups, stakeholder expectations and project alignment with local aspirations.
- Facilitate the genuine involvement of stakeholders in the planning and approvals process as well as in developing responses to impacts.
- Ensure that community and stakeholder inputs are effectively integrated into the technical assessments within the EIS and inform refinements to project design and plans.
- Meet regulatory requirements for public, stakeholder and community consultation.
- Collaborate with local stakeholders on local benefit sharing strategies to ensure they are co-designed, targeted, and appropriate to the Project's operating context.
- Align with BCWF's values and principles around timely, open, inclusive, and meaningful engagement.

The CSEP provides an overview of BCWF's approach to stakeholder engagement throughout all stages of the Project, outlines the Project and the relevant stakeholders, provides detail on the consultation undertaken to date and outlines various community benefits. The CSEP and engagement undertaken to date for the Project is consistent with the requirements of the Engagement Guidelines (DPHI, 2024).

5.3 Summary of the Stage 1 Project Engagement

Key stakeholder engagement methods and outcomes for the Stage 1 project, as completed by Epuron Projects, are summarised below.

5.3.1 Community Engagement

Community engagement for the Stage 1 project aimed at informing residence and community groups of key Project details and milestones while identifying opportunities and issues pertinent to the Project design and implementation.

Engagement on the Stage 1 project began in 2018 with the distribution of information letters to all residence within five (5) km of the original 'investigation area' and offers for face-to-face interviews with all residence within three (3) km of the investigation area.

Between 2018 and 2020, BCWF conducted more than 100 meetings and discussions via various forums, six (6) newsletters and 11 community information sessions to gather community sentiment related to the Stage 1 project.

For stakeholders located within four (4) km of the Stage 1 project investigation area, the key issues in order of frequency raised included visual and lighting, noise and property value. For stakeholders beyond four (4) km of the Stage 1 project investigation area, the key issues in order of frequency raised included visual and lighting, noise and bushfire.

5.3.2 Regulatory Engagement

Epuron Projects engaged with local, state and federal agencies during the Scoping and EIS Phases for the Stage 1 Project. Agency consultation began in January 2019 prior to preparation of the scoping report and continued until January 2021.

Stage 1 project briefings with Muswellbrook, Singleton and Upper Hunter Shire Councils, and subsequent communications focussed on introductions to the Project, road upgrades within each LGA and the details of voluntary planning agreements (VPA's) and contributions the relevant Councils.

State government departments and agencies consulted during the Stage 1 project engagement included:

- Former Department of Planning, Industry and Environment (DPIE).
- Former Biodiversity and Conservation Division (BCD).
- Mining, Exploration and Geoscience (MEG).
- NSW Environment Protection Authority (EPA).
- TfNSW.
- NSW Telco Authority (Telco Authority).

Consultation focused on introducing each department and agency to the Project, discussion of agency SEARs requirements and lodgement process required by the former DPIE.

5.3.3 Other Stakeholders

Other stakeholders engaged during the Stage 1 project assessment phase include:

- Australian Rail Track Corporation (ARTC).
- AGL Energy Limited (AGL).
- Airservices Australia (Airservices).
- Former Department of Industry (DoI).
- TransGrid (TransGrid).
- Local Land Services (LLS).

- Department of Defence (DoD).
- Civil Aviation Safety Authority (CASA).
- Nearby Mining Projects.
- NBN Co Limited.
- NSW Rural Fire Service (NSW RFS).
- Real Estate Agents.
- Television and Radio Stations.
- Aerial Service Providers.

5.3.4 Aboriginal Community Engagement

Consultation with the Aboriginal community was undertaken throughout the Stage 1 project assessment phase in accordance with the 'Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010' (DECCW, 2010). In total, 29 Aboriginal stakeholder groups or individuals had expressed an interest in the Stage 1 project, all of whom were accepted as Registered Aboriginal Parties (RAPs) to inform the Stage 1 project ACHAR.

5.4 Summary of the Project (i.e. Stage 2) Engagement

Key stakeholder engagement methods and outcomes for the Project as conducted by BCWF are detailed below.

5.4.1 Key Stakeholders

Figure 5.1 below identifies key stakeholders for the Project, building on the stakeholder base developed through the community and stakeholder engagement consultation program undertaken for the Stage 1 project, as well as through additional stakeholder identification undertaken during the Stage 2 Project Scoping Report (Umwelt, 2024).



Figure 5.1 Key Stakeholders

5.4.2 Summary of Engagement Undertaken

BCWF has been consulting with local landholders and stakeholders on the Stage 2 Project since 2024. The outcomes of community engagement activities undertaken by BCWF during the Scoping and EIS phases were reviewed and consolidated to inform the SIA and to understand the range of community views, concerns, interests and feedback provided on the Project. This existing information has been complemented by a targeted consultation program for the SIA, undertaken by Umwelt in collaboration with BCWF.

BCWF has also consulted with Government agencies during the preparation of this EIS. Consultation with Government agencies has been undertaken through various mechanisms throughout the assessment process to keep agencies informed of progress and outcomes of the Project. Consultation included Project briefings, discussion of the scope of the specialist assessments and SEARs requirements, and reporting of results of the specialist assessments. BCWF sought relevant Government agency advice throughout the assessment process in order to understand and meet their assessment requirements in order to produce robust assessments to address key issues.

The following stakeholders were identified as requiring consultation in relation to potential aviation-related impacts associated with the Project: Airservices Australia, the Department of Defence, the Royal Newcastle Aero Club, the Royal Flying Doctor Service, NSW Parks and Wildlife Service, Fire & Rescue NSW, the NSW Rural Fire Service, the Westpac Life Saver Rescue Helicopter Service, and Global Airspace Solution.

A summary of the consultation activities undertaken during the stakeholder engagement program is presented in **Table 5.1**.

Table 5.1 Summary of Stakeholder Engagement Program

Mechanism	Objective	Details	First Round Consultation (Scoping Phase)	Second Round of Consultation (SIA / EIS Phase)
Project Website	To inform the community about key Project information and assessment update and provide an outlet for feedback.	A dedicated project website page to provide project information and updates. Website: https://arkenergy.com.au/wind/bowmans-creek	Project website established to provide project updates throughout Project life for all stakeholders.	Project website continued to operate throughout the EIS phase.
Project Information Sheet	To inform stakeholders about key Project milestones, key assessment outcomes and invitations to community information sessions.	Distribution of Project updates and information on project technology throughout the proximal community.	40 physical copies were made available at the community information session.	BCWF uploaded five (5) information sheets in August 2025 titled: Project Overview, Involving the Community, NSW Energy Market, Economic Opportunities and Battery Energy Storage Systems (BESS). Each Information sheet provided information regarding both Stage 1 and/or the Project (Stage 2). Additional Project updates providing invitations to community session and updates on key assessment milestones were uploaded to the website in: • May 2025 • July 2025 • August 2025 • November 2025 • December 2025.

Mechanism	Objective	Details	First Round Consultation (Scoping Phase)	Second Round of Consultation (SIA / EIS Phase)
Key Stakeholder Interviews	To collaborate with host and neighbouring landholders regarding the Project and the social impacts and opportunities.	Telephone, online or in-person meetings with individual key stakeholders or small groups.	One-on-one phone interviews with nearby and adjacent landholders took place with 5 landholders in April 2024. 40 landholders were contacted by phone or emails to be involved in an interview or complete the survey.	13 targeted SIA interviews were undertaken with neighbouring landholders and key representatives from local government, Traditional Owners, service providers, and community groups across 77 contacted.
Community Information Session	To inform various stakeholder groups of key Project information.	A drop-in information session to present information and updates on the project with invites distributed to the broader community through several mediums.	An initial community information session was held on 3 April 2024 from 4–6pm at the Mount Olive Community Centre. An invitation to attend the session was included in the March 2024 newsletter, which was sent to all residences within 8 km of a Stage 2 WTG. 28 community members attended.	Subsequent community information sessions were held on 21 July 2025, and 12 and 13 August 2025, to discuss the EIS phase of the Project and associated technical assessments. BCWF also used the opportunity to discuss the newly proposed battery energy storage system (BESS) which is proposed as a modification to the Stage 1 project approval. • Muswellbrook Shire Council Community Info Session – 21/07/2025. • Hebden Info Session – 12/08/2025 – Hebden Community Hall. • Mt Olive Info Session – 13/08/2025 – Mt Olive Community Hall. • Muswellbrook Shire Council Community Info Session – 13/05/2026.
Survey		An online survey to gain feedback from key stakeholders and the broader community on the project and community	There were 15 surveys completed between the 5 April and 23 April 2024. Surveys were either completed during the community	There were 25 surveys completed between 8 May 2025 and 2 February 2026. Surveys were completed during the community information session, via phone with an Umwelt representative or online.

Mechanism	Objective	Details	First Round Consultation (Scoping Phase)	Second Round of Consultation (SIA / EIS Phase)
		needs and values, to be advertised and distributed through various mechanisms.	information session, via phone with an Umwelt representative or online.	
Service Provider Survey		N/A	N/A	14 service providers were contacted between 19 November 2025 and 1 December 2025. One (1) service provider interview was completed online with an Umwelt representative.
Media Releases	To inform the broader community about key Project milestones and extend invitations to community information sessions.	Media statement to outline key messages for local media.	Appearance on ABC Newcastle Radio Station on 2 April 2024 to provide a Project update and details on the upcoming community information session.	N/A
Community and Special Interest Group Interviews	To collaborate with key stakeholder groups to inform the development of the Project and SIA, identify impacts and develop mitigation strategies.	SIA targeted interviews with key community and special interest groups regarding the Project and to gain feedback regarding the current community and regional context.	N/A	11 community and special interest groups were contacted between 19 November 2025 to 1 December 2025. Contact attempts were made, but no interviews were conducted.
Project Briefings (Council and elected officials)	To collaborate with various stakeholder groups to inform the development of the Project, identify impacts and develop mitigation strategies.	Engagement with local councils and elected officials to introduce and discuss the Project.	Phone calls and interviews between 15 March 2024 and 30 April 2024 conducted to introduce the Project to: • Mayor – Muswellbrook Shire (Steve Reynolds). • Singleton Council (Mary-Anne Crawford).	Meetings have been held with local councils including: • Upper Hunter Shire Council on 19 February 2026. • Singleton Council on 16 April 2026. • Further information is provided in **Section 5.4.4**.

Mechanism	Objective	Details	First Round Consultation (Scoping Phase)	Second Round of Consultation (SIA / EIS Phase)
			• Muswellbrook Shire Council (Sharon Pope). • Member for Hunter (Dan Repacholi). • Member for Upper Hunter (Dave Layzell). • Mayor – Singleton Council (Sue Moore). • Alongside phone calls, a newsletter was issued to further introduce the Project.	
Project Briefings (State and Federal Government)	To collaborate with various stakeholder groups to inform the development of the Project, identify impacts and develop mitigation strategies.	Project briefings with State and Federal levels of Government regarding SEARs requirements and Project information.	The following meetings were held with state and federal government agencies: • DPHI on the 17 May 2024. • Commonwealth DCCEEW in June 2024. The discussion with Commonwealth DCCEEW was a pre-EPBC Act Referral lodgement meeting to discuss potential MNES matters.	Engagement has been undertaken with the state and federal government agencies as per the Project SEARs, with proportionate levels of consultation occurring, as defined by the complexity and extent of environmental and social impacts addressed in this EIS. Further information is provided in **Section 5.4.4**.
AES Interviews	To gather qualitative data on availability, demand trends, challenges and opportunities, as well as level of interest in potentially hosting some of the construction workforce.	Key stakeholder interviews were held online and via phone with identified accommodation and employment stakeholders to gain insight into the current accommodation and employment conditions of the region.	N/A	A sample of 25% (21) of accommodation providers were selected to provide a representative overview of available accommodation and occupancy rates. 81% (n=17) completed either the phone or online survey. Interviews were held between the week commencing 8 December 2025 and concluded 05 January 2026.

Mechanism	Objective	Details	First Round Consultation (Scoping Phase)	Second Round of Consultation (SIA / EIS Phase)
Involvement in careers events	To promote careers in the renewable energy industry.	Attendance at various government-sponsored events to encourage a career in renewable energy.	N/A	BCWF participated in the Launch Your Career (LyC) program delivered by the NSW Department of Education and TAFE NSW, including involvement in filmed videos, workshops and panel discussions in 2025. BCWF also attended a LyC panel session. BCWF also participated in the Renewable Energy Skills and Careers Expo organised by EnergyCo and held in Warners Bay, NSW on 26 August 2025.

5.4.2.1 Host Landholders and Proximal Neighbours

BCWF's consultation with the host landholder has been ongoing since engagement activities began on the Stage 1 project in 2018.

BCWF has leveraged relationships with proximal neighbours established during the consultation conducted during the Stage 1 project. BCWF reached out to non-associated neighbours situated within 7.2 km of a Project WTG to open dialogue to discuss the Project, associated impacts and potential agreements. This approach was taken to align with the Wind Energy Guideline (DPHI, 2024) which stipulates that WTGs with a tip height of 250 metres may result in visual impacts extending up to 7.2 km.

5.4.3 Outcomes of Community Consultation

This section provides an overview of stakeholder feedback collected over the course of the Stakeholder Engagement Program.

Figure 5.2 and **Figure 5.3** illustrate the frequency of perceived negative and positive (respectively) impacts raised throughout engagement undertaken by BCWF and Umwelt which has informed this EIS and the SIA. This data was collected using a range of engagement mechanisms including online and hard copy surveys, personal interviews, and community information sessions as described in **Table 5.1**.

In accordance with the EIS Guideline, perceived impacts and community views on the Project have been considered in the following categories:

- The strategic context, including identifying the key natural and built features that are valued in the area and could be affected by the Project.
- The design of the Project and any alternatives considered.
- Any relevant statutory issues.
- Community engagement (e.g. the level or quality of engagement carried out during the preparation of this EIS, the community engagement that should be carried out if the Project is approved).
- The economic, environmental and social impacts of the Project.
- The justification and evaluation of the Project as a whole (e.g. consistency of project with Government plans, policies or guidelines; merits of the Project).
- Issues that are either beyond the scope of the Project (e.g. broader policy issues) or not relevant to the Project.



Figure 5.2 Summary of Perceived Negative Impacts

Note: Data is based on a sample of n = 35 respondents, with multiple responses allowed Source: ©Umwelt, 2026

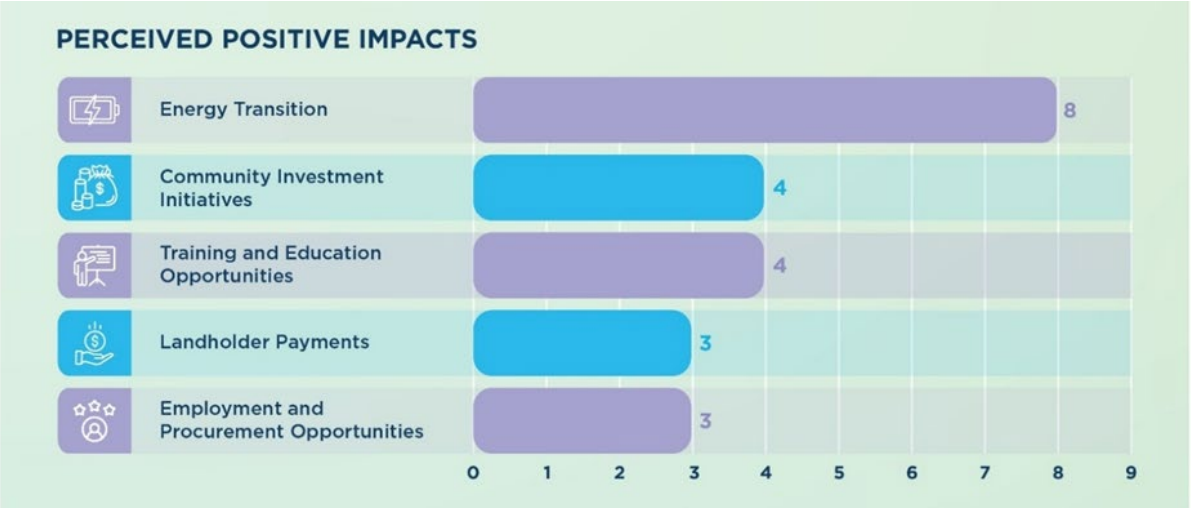


Figure 5.3 Summary of Perceived Social Impacts

Note: Data is based on a sample of n = 35 respondents, with multiple responses allowed. Source: Umwelt, 2026

5.4.4 Outcomes of Government Agency Consultation

Consultation with government agencies has been undertaken through various mechanisms throughout the assessment process to keep agencies informed of progress, to confirm assessment requirements and discuss assessment outcomes for the Project.

No significant issues were raised during consultation with any of the agencies or authorities, however, guidance was provided on matters to be assessed in this EIS. Consultation included Project briefings, discussion of the scope of the specialist assessments and SEARs requirements and reporting of specialist assessment results. **Table 5.2** provides a summary of key agency consultation outcomes for the Project. Key consultation outcomes with councils is outlined in **Table 5.3**.

Table 5.2 Key Outcomes of Government Agency Consultation

Agency	Key Outcomes	Section Addressed
• NSW Aboriginal Land Council • Wanaruah Local Aboriginal Land Council • Wonnarua Nation Aboriginal Corporation • NSW DCCEEW – Heritage NSW Group	These agencies were consulted as part of the Heritage Report (HR) process. Prior to commencement of EIS activities, and as part of BCWF's broader consultation and engagement plans for the Project, both Heritage NSW and Wanaruah LALC were consulted through written correspondence and phone calls between commencement of engagement in 2024 and EIS submission in 2026. This consultation continued following receipt of SEARs, and the commencement of engagement and survey activities associated with the Aboriginal Cultural Heritage Assessment technical study. Representatives from the Wanaruah LALC participated in field surveys.	**Section 6.5** and **Appendix 9**
NSW DPHI	Pre-EIS lodgement meeting held on 22 April 2026 to provide an overview of the EIS and the outcomes of key technical assessments, and to understand any final matters required for inclusion in the EIS prior to lodgement.	-

Agency	Key Outcomes	Section Addressed
NSW DCCEEW Conservation Programs, Heritage and Regulation (CPHR), referred to as NSW DCCEEW – Biodiversity Conservation and Science Group in the Project SEARs	Consultation was undertaken with NSW DCCEEW CPHR during early stages of the BDAR and broader EIS delivery to discuss the proposed Bird and Bat Utilisation Survey (BBUS) program, as well as other biodiversity-related queries. Multiple rounds of consultation and clarifications were provided as part of the BDAR development via helpdesk enquiries and written engagement. Outcomes of this consultation are presented in the BDAR (refer to **Appendix 8**).	**Section 6.4** and **Appendix 8**
NSW DCCEEW - Renewable Energy Biodiversity Support (REBS)	Project briefing provided, acknowledging the consultation undertaken to date with CPHR, as noted in the row above.	**Section 6.4** and **Appendix 8**
EnergyCo	Ongoing consultation has been undertaken with EnergyCo regarding the nearby New England Transmission Line and coordination within the Hunter Central Coast REZ.	-
Transgrid	BCWF has undertaken ongoing engagement with Transgrid regarding grid connection requirements for the project. A connection enquiry was initially submitted in September 2021. To reflect changes to the Project, BCWF commenced discussions with Transgrid's connections team to refresh and update the original enquiry. A pre-connection enquiry meeting was subsequently held with Transgrid in February 2026 to discuss the updated project parameters and connection requirements.	-
Bureau of Meteorology (BoM)	The BoM was consulted as part of the TIA (refer **Appendix 16**) development and replied initially with high-level constraints data and to seek further detailed assessment occurring. BCWF then consulted directly with BoM on this matter and has committed to undertaking the detailed assessment suggested by BoM, post-approval and during the detailed design of the Project should it be required. This commitment is reflected in mitigation measure EMI02 of **Appendix 5**.	**Section 6.11.2** and **Appendix 16**

Agency	Key Outcomes	Section Addressed
• Fire & Rescue NSW • NSW Rural Fire Service • Commonwealth Department of Defence • Civil Aviation Safety Authority • Airservices Australia	Notification has been provided to these agencies as part of the Aviation Impact Assessment (AIA) (**Appendix 15**).	**Section 6.11.1** and **Appendix 21**
• NSW Local Land Services • NSW DCCEEW – Water Group • NSW DCCEEW – Natural Resource Access Regulator • Environment Protection Authority • Crown Lands • Department of Primary Industries and Regional Development – NSW Resources • Department of Primary Industries and Regional Development – Agriculture division • Department of Primary Industries and Regional Development – Fisheries division • Transport for NSW • NSW Telco Authority	Each agency or entity referenced here was provided a written briefing on the Project, and notification of the EIS process and planned lodgement. Feedback from these agencies was not received during the EIS phase, however Project consultation will occur (and is committed to by BCWF) as part of the SSD process i.e., Submissions Phase, and ongoing development of the Project.	-

Table 5.3 provides a summary of key consultation outcomes with councils for the Project. Landowner's consent was received from Singleton Council and Muswellbrook Shire Council in August 2026 for road upgrades proposed within the public local road network that is not Crown Road, as defined in the *Roads Act 1993*.

Table 5.3 Key Outcomes of Council Consultation

Council	Key Outcomes
Singleton Council	• Meeting held on 16 April 2026 to discuss the Project, VPAs and the proposed EIS lodgement. • Notification was issued to Council regarding the proposed road upgrades within the Singleton LGA on 7 May 2026. • Landowners consent was received from Singleton Council on 20 August 2026. During the Submissions phase, BCWF will undertake additional targeted consultation, with Singleton Council (and TfNSW), including the preparation of formal responses to agency advice as required.
Upper Hunter Shire Council	Meeting held on 19 February 2026 to discuss the Project and the proposed Stage 1 BESS Modification[1].
Cessnock City Council	• Notification was issued to Council regarding the proposed road upgrades within the Cessnock LGA on 7 May 2026. • A response was received on 13 May 2026 advising that consultation should be undertaken with TfNSW. During the Submissions phase, BCWF will undertake additional targeted consultation, with Cessnock City Council (and TfNSW), including the preparation of formal responses to agency advice as required.
Newcastle City Council	• Notification was issued to Council regarding the proposed road upgrades within the Newcastle LGA on 7 May 2026. • An automated response was received acknowledging receipt. • A subsequent notification was issued to Council regarding the proposed road upgrades within the Newcastle LGA, and intended lodgement of the EIS on 27 August 2026. During the Submissions phase, BCWF will undertake additional targeted consultation, with Newcastle City Council (and TfNSW), including the preparation of formal responses to agency advice as required.
Muswellbrook Shire Council	• Notification was issued to Council regarding the proposed road upgrades within the Muswellbrook LGA on 7 May 2026. • A response was received on 13 May 2026 acknowledging receipt. • Landowners consent was received from Muswellbrook Shire Council on 21 August 2026. During the Submissions phase, BCWF will undertake additional targeted consultation, with Muswellbrook Shire Council (and TfNSW), including the preparation of formal responses to agency advice as required.

Note 1: there is no proposed Project infrastructure within the Upper Hunter Shire LGA. Similarly, there are no proposed road upgrades within the Upper Hunter Shire LGA, and hence a notification was not provided in this regard.

5.5 Ongoing Engagement

If the Project is approved, BCWF will continue to engage with the community throughout the construction, operation and decommissioning phases of the Project. The approach for ongoing community engagement and public participation will be guided by the following industry and government standards and frameworks:

- The International Association for Public Participation (IAP2) Spectrum of Public Participation (2018).
- Clean Energy Council's Enhancing Positive Social Outcomes from Wind Farm Development: Evaluating community engagement and benefit sharing in Australia (2018).
- NSW Government's Undertaking Engagement Guidelines for State Significant Projects (DPHI, 2026c).
- Clean Energy Council (2019) A Guide to Benefit Sharing Options for Renewable Energy Projects. This guide includes strategies and case studies on different forms of benefit sharing.
- Clean Energy Council (2018) Community Engagement Guidelines for the Australian Wind Industry. This document provides a comprehensive, best practice approach to community engagement that addresses six (6) key stages of the wind farm lifecycle and offers practical advice for action.
- Clean Energy Council (2018) Best Practice Guidelines for Implementation of Wind Energy Projects in Australia. These practical guidelines are designed primarily for use by wind farm proponents, owners, and operators.
- Clean Energy Council (2018) Enhancing Positive Social Outcomes from Wind Farm Development. This research report provides a snapshot of current community engagement and benefit-sharing practices in Australian wind farms.
- Clean Energy Council (2024) Leading Practice Principles: First Nations and Renewable Energy Projects. This is a leading practice guide for engaging with Australia's First Nations peoples on renewable energy projects.
- Dyer, Andrew Australian Energy Infrastructure Commissioner (2023) Community Engagement Review Report, on behalf of the Department of Climate Change, Energy, the Environment and Water, Canberra. This document sets out the findings and recommendations of an extensive review into community engagement practice in the renewable energy sector in Australia.
- The key regional and local strategies and plans discussed in **Section 2.2**.
- Farmers for Climate Action (2023) Farm Powered: Opportunities for regional communities in the renewable energy boom. This plan outlines the requirements to make sure farmers and farming communities can benefit from the roll-out of renewable energy at all levels.
- NSW Department of Planning and Environment (2024) Benefit Sharing Guideline: Guidance for state significant renewable energy development. This guideline provides advice to applicants, councils and the broader public on how to plan and implement community benefit sharing in relation to large-scale renewable energy generation in NSW.

- NSW Department of Planning and Environment (2024) Wind Energy Guideline: Guidance for state significant wind energy development. The guideline identifies key planning considerations relevant to wind energy development and provides updated policy and technical guidance for key issues including visual, noise and biodiversity impacts.
- NSW Office of Energy and Climate Change (2022) First Nations Guidelines: increasing income and employment opportunities from electricity infrastructure projects. These guidelines set out the expectations for increasing employment and income opportunities for Aboriginal peoples and communities in the construction and operation of new electricity infrastructure projects in NSW delivered under the NSW Electricity Infrastructure Roadmap.
- NSW Office of Energy and Climate Change (2024) First Nations Guidelines: Hunter Central Coast. These guidelines set out the expectations for increasing employment and income opportunities for Aboriginal peoples and communities in the Hunter Central Coast REZ.
- Queensland Farmers Federation (2023) Queensland Renewable Energy Landholder Toolkit. This document provides information, guidance and insights for landholders considering hosting renewable energy projects.
- Re-alliance (2023) Building Stronger Communities: How community benefit funds from Renewable Energy Projects support local outcomes. This report investigates community benefit funds (CBFs) – funds made in the form of voluntary payments by renewable energy companies to communities.
- Re-alliance (2023) Community Benefits Handbook: How regional Australia can prosper from the clean energy boom. This handbook is to equip local community leaders with information and ideas to think big about how to leverage the renewables boom into local opportunities that address local needs and desires.

BCWF will update the existing CSEP for the Project prior to construction commencing. The CSEP will include requirements to regularly monitor, review and adapt ongoing community engagement strategies over time to ensure it remains effective and encourages community participation. Other ongoing engagement activities will include:

- Regular updates to the Project website.
- Distribution of newsletters/Project updates, information sheets, fact sheets and/or FAQs to the local community.
- Phone calls and ongoing face to face meetings with local landowners, including hosts, associated landowners and non-associated landowners.
- Community drop-in sessions and attendance at local Shows and events.
- Letter box drops.
- Operation of the free call community enquiry line.
- Maintenance of a complaints register.
- The Project email address and free call number will remain in place, and BCWF representatives will continue to take responsibility for addressing feedback and concerns as and when they arise.

BCWF will also ensure that relevant information is publicly available for the life of the Project on its website. This will include, but is not limited to:

- The final layout plans for the Project.
- Current statutory approvals for the Project.
- Approved strategies, plans or programs required under conditions of consent.
- A comprehensive summary of the monitoring results.
- A complaints register.
- Any independent environmental audits.

6.0 Assessment of Impacts

This section provides a summary of the impact assessments conducted for the EIS, first providing a preliminary environmental risk analysis and then targeted assessments for each key issue as described in **Section 6.1** below.

6.1 Preliminary Environmental Risk Analysis

A review of the environmental and social matters relevant to the Project was conducted as part of the Scoping Report (Umwelt, 2024) to determine which issues needed to be assessed as part of this EIS and the level of assessment required. The review was undertaken with reference to the categories of assessment matters identified by the Scoping Report Guideline (DPE, 2022).

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

The Scoping Report (Umwelt, 2024) identified that the following key issues as requiring further assessment as part of this EIS, which aligns with the key assessment requirements outlined in the Project SEARs:

- **Visual Amenity** – specifically the potential for the Project to impact the landscape character of the locality and result in loss of visual amenity to surrounding landholders (refer to **Section 6.2**).
- **Noise Amenity**– specifically the noise disturbance to surrounding landholders associated with the operation of the proposed WTGs and associated infrastructure, also traffic and construction activities (refer to **Section 6.3**).
- **Biodiversity** – the Project will result in disturbance to native vegetation and loss of habitat, and has the potential to impact threatened and endangered species including through bird and bat strike (refer to **Section 6.4**).
- **Aboriginal Cultural and Historic Heritage** – specifically an assessment to determine whether the construction and operation of the Project has the potential to impact Aboriginal cultural and historic heritage values present within the Project Area (refer to **Section 6.5** and **Section 6.6**).
- **Traffic and Transport** – the Project will result in increased traffic associated primarily with the construction phase, including OSOM vehicles (refer to **Section 6.7**).
- **Water Resources** – specifically, impacts to water resources through increased demand for water, particularly during the construction period, and potential impact to surface water quality, the quality and quantity of groundwater resources and local flooding regimes (refer to **Section 6.8**).
- **Air Quality** – further assessment to be undertaken in accordance with relevant NSW guidelines in relation to construction via a qualitative assessment, including specifying relevant construction phase air quality controls (refer to **Section 6.9**).

- **Soils, Land Capability and Agriculture** – impacts to soil and land capability within the Project Area as well as potential land use conflicts associated with the operation of the wind farm on local agricultural operations (refer to **Section 6.10**).
- **Hazards and Risks** – operation of the proposed WTGs and associated infrastructure requires assessment of potential hazards, including a preliminary hazard assessment regarding the proposed battery storage, bushfire, telecommunications, electromagnetic fields, blade throw and aviation safety (refer to **Section 6.11**).
- **Socio-Economic Impacts** – the Project has the potential to result in both positive and negative social and economic impacts. Potential positive impacts resulting from social and economic benefits through significant capital expenditure, the implementation of community and neighbour benefit programs, employment generation and use of services, and the potential for some negative social impact due to potential impacts to nearby landholders and demand on the workforce and services (refer to **Section 6.12** (social impacts) and **Section 6.13** (economic impacts).
- **Waste Management** – specifically, waste generation associated with the construction, operation and decommissioning of the Project (refer to **Section 6.14**).
- **Cumulative Impacts** – the construction and operation of the Project has the potential to result in cumulative impact within the Hunter-Central Coast REZ due to the existence of some other existing and proposed land uses including other renewable energy related projects (refer to **Section 6.15**).

In addition, an assessment of development rights has also been undertaken as part of this EIS in accordance with the Project SEARs, as outlined in **Section 6.17**.

Table 6.1 outlines the matters that are considered to not require further assessment in this EIS based on the scoping phase assessment, along with a comment justifying why no further assessment is required.

Table 6.1 Matters Not Requiring Assessment

Matter	Identified Stakeholders
Greenhouse gas and energy	Over the operational life of the Project, the generation of renewable energy is expected to offset emissions associated with construction, operation and decommissioning through reduced reliance on higher-emission energy sources. While GHG emissions are not specifically assessed in this chapter, the Project's contribution to meeting emissions targets is discussed in **Section 2.1** and **Section 7.0**.
Port and airport facilities	The Project does not result in any change to port or airport facilities, other than the delivery of Project components to the nominated port. The transportation of Project components to the Project Area has been assessed as part of the TTIA (refer to **Section 6.7** and **Appendix 11**).
Rail facilities	The Project does not propose to utilise any rail facilities.
Odour	The Project is not anticipated to cause any odour.
Coastal hazards	The Project is not located within a coastal zone and will not result in any impacts to coastal zones.
Dam safety	The Project does not require the construction or maintenance of a dam.
Land movement	The Project is not anticipated to result in any land movement. The Project results in relatively minor excavation works only.

6.2 Landscape and Visual

The SEARs require a detailed assessment of the visual impacts of all components of the Project (including turbines, transmission lines, substations, battery storage and any other ancillary infrastructure) in accordance with the Wind Energy Guideline and supporting Technical Supplement for Landscape Character and Visual Impact Assessment (Visual Technical Supplement).

A comprehensive Landscape Character and Visual Impact Assessment (LCVIA) was undertaken by Moir Studio (Moir) to address the requirements of the SEARs and in accordance with the Visual Technical Supplement.

The LCVIA is provided in **Appendix 6** and the key findings, including performance against the relevant objectives under the Visual Technical Supplement, are summarised below.

6.2.1 Landscape Character Assessment

6.2.1.1 Baseline Analysis

In accordance with the Visual Technical Supplement, a visual baseline study was undertaken to establish the landscape character of the Landscape Character Study Area (LCSA) and its sensitivity. The LCSA for the LCVIA includes all land within a 25 km radius from the Project WTGs.

The baseline analysis identifies and describes features of the LSCA including:

- Physical Influences: The LCSA is located on the southern boundary of the North Coast Biogeographic Regionalisation of Australia (IBRA) Bioregion. This bioregion is characterised by a diversity of geological and topographical variations across the region including coastal sand barriers, low foothills and ranges, to the steep slopes and gorges of the Great Escarpment.
- Ecological Characteristics: Native vegetation is concentrated along the hills, ridgelines, and valleys of the Mount Royal National Park foothills, with remnant forests and open woodlands dominated by Eucalypt species and She-oak. In contrast, accessible agricultural areas are mostly cleared grasslands used for grazing, with larger creeks like Bowmans Creek and Davis Creek retaining upper-storey riparian vegetation while smaller tributaries are largely cleared.
- Human Influence: Human influences shaping the LCSA include visually dominant extractive industries to the west and south—such as the Liddell and Mount Owen coal mines and the Bayswater Power Station—with Muswellbrook functioning as a regional service hub connected by a rail corridor and the New England Highway. Within the Project Boundary and neighbouring allotments, the landscape transitions to low-use sealed and unsealed secondary roads and rural properties.
- Key Landscape Features, Aesthetics & Heritage: Seven (7) sites in Muswellbrook are listed on the State Heritage Register, along with two (2) Aboriginal Places, being St Clair Aboriginal Mission and Redbournberry Hill. The natural landscape features undulating hills and narrow valleys opening into broader floodplains, with elevations ranging from about 200 m to 800 m and a visual transition from the mining-dominated character to more rural, undulating farmland further away.

- Landscape Condition: The LCSA includes the Singleton and Muswellbrook LGAs, where land is primarily used for grazing across partially cleared, undulating terrain, with most of the area zoned RU1 – Primary Production and smaller portions zoned RU2 – Rural Landscape or C2 – Environmental Conservation. As the landscape transitions outward, Mount Royal National Park remains largely unmodified and conserved, while areas to the southwest support mining and power generation activities.
- Large Scale Energy Development: The Project is within the Hunter Central Coast REZ which is expected to receive numerous renewable energy developments as a part of the state's transmission to renewable energy. The LCVIA considers potential cumulative impacts with other major projects situated within the LSCA, including the Stage 1 project.

6.2.1.2 Landscape Character Zones

The LCSA was categorised into five (5) Landscape Character Zones (LSZs) in line with the Visual Technical Supplement. The LSZs are defined by shared visual traits shaped by the relationship between landforms, vegetation, waterbodies, and land-use patterns, define the key features that distinguish one landscape from another.

The LCZs were informed by land use patterns, vegetation coverage, topographical maps, site images and site inspection and are described in **Table 6.2** and shown in **Figure 6.1**.

The scenic quality classes of all LCUs have been rated as low/very low with the exception of LCZ01– Vegetated Slope, which is rated as moderate.

A scenic quality rating has been applied to each LCZ based on the scenic quality frame of reference and the visual reference for scenic quality values provided in the Technical Supplement.

Table 6.2 Landscape Character Zone Description and Scenic Quality Rating

LCZ	Description	Scenic Quality Rating
LCZ01 – Vegetated Slope	Prominent vegetated hills and peaks are visually striking and an expansive landscape feature providing a backdrop to immediate region.	Moderate
LCZ02 – Agricultural	Gentle undulating landforms have largely been cleared for agricultural uses such as grazing, with remnant vegetation remaining in scattered patches. The modified pasture hills and ridges create a moderately scaled landscape, partially enclosed by vegetated ridge lines and distant prominent hills and mountains. These undulations form distinct backdrops to the surrounding area. Rural properties are dispersed throughout the landscape and generally sit comfortably within the landform, occupying everything from flat ground to sloping hillsides, with only a few located in more elevated positions.	Low

LCZ	Description	Scenic Quality Rating
LCZ03 – Riparian and Lakes	The landforms within this LCZ are defined by vegetated creek corridors and their surrounding areas, including several lakes. Vegetation is characterised by She-oak and Eucalypt communities along the creek lines. As the creeks transition into the surrounding agricultural areas, they become more modified through damming and vegetation clearing. Lake Liddell is highly modified, whereas Lake St Clair is more picturesque, positioned at the foothills of the Mount Royal National Park.	Low
LCZ04 – Mining and Electrical Infrastructure	Mining operations create visually prominent, medium to large-scale landscape features that are discernible at various distances. The presence of mining and electrical infrastructure introduces visual changes and, in some areas, contrasts, depending on the appearance of the excavated materials. Constructed bunds and overburden stockpiles are commonly used to contain excavated voids, influencing the overall visual character of the landscape.	Very Low
LCZ05 – Town	The townships of Aberdeen and Muswellbrook display a landscape character typical of the Upper Hunter region. Their main streets are lined with commercial and retail activity, while residential and recreational areas extend into adjoining grid-patterned neighbourhoods. Nineteenth-century heritage buildings reflect the area's agricultural history following European settlement. From elevated locations and the outskirts of both towns, views toward surrounding mining operations are also evident.	Low

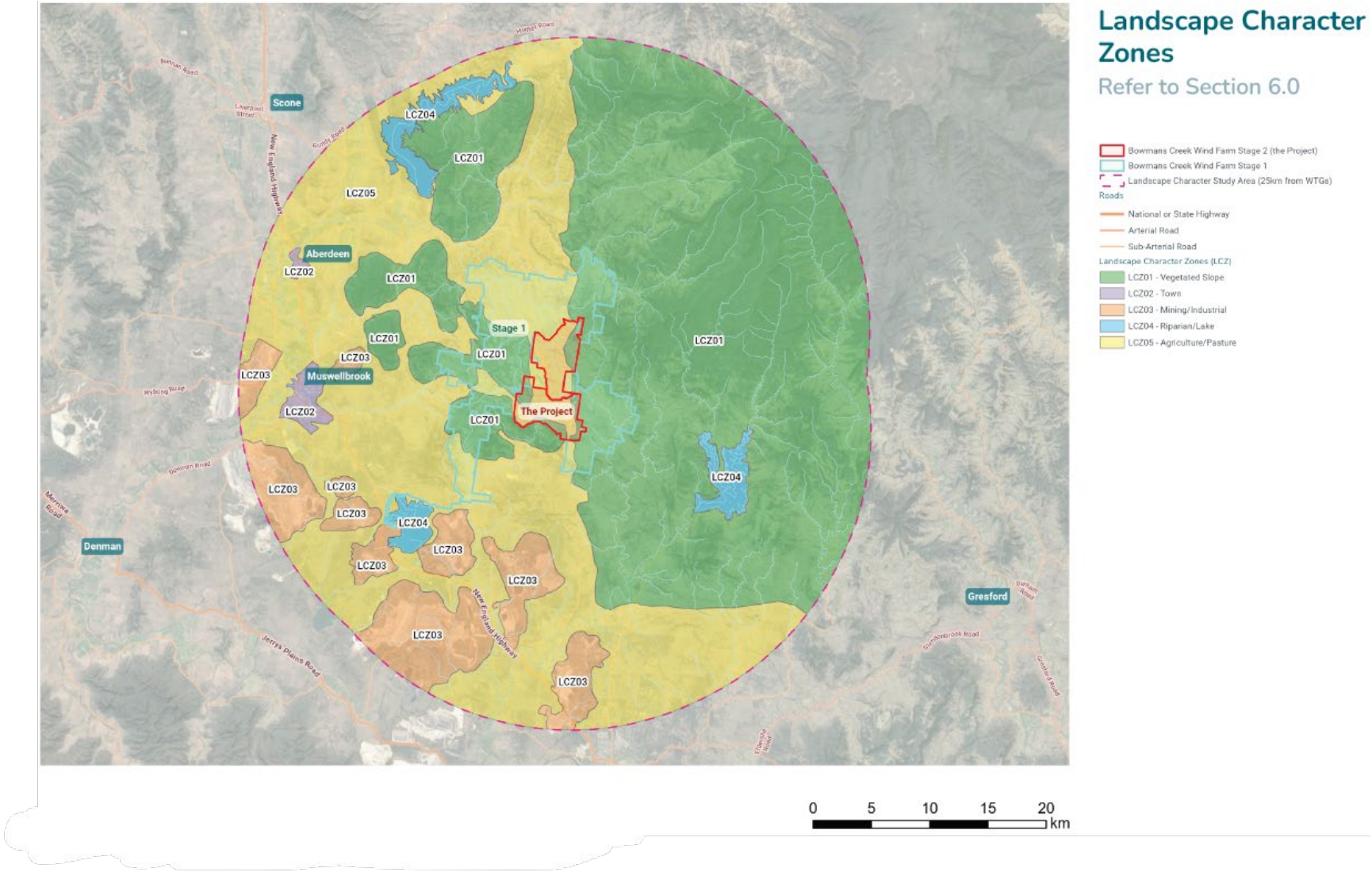


Figure 6.1 Landscape Character Zones

Source: Moir (2026)

Landscape Character Assessment

Table 6.3 provides the outcomes of the landscape character assessment (adopted from Table 07 of the LCVIA), which evaluates how the Project affects each landscape character zone by considering both the sensitivity of the landscape and the magnitude of potential change. Together, these factors inform the overall impact rating for each zone, providing a clear basis for understanding how the Project interacts with the surrounding landscape.

Table 6.3 Landscape Character Assessment

LCZ	Scenic Quality Rating	Sensitivity	Magnitude	Landscape Character Rating
LCZ01	Moderate	**Moderate** The vegetated hills and peaks in this LCZ create a striking, expansive natural backdrop, with subtropical rainforest linking to Barrington Tops National Park. Recreational areas are distant and mostly enclosed by forest, meaning views toward the Project would be negligible or entirely screened.	**Low** Due to the distance and the screening provided by the surrounding national park forest, the magnitude of change is expected to be low.	Low
LCZ02	Low	**Low** This LCZ is characterised by gently undulating agricultural hills, where vegetation has been largely cleared for grazing. Small remnant pockets of vegetation remain, mostly concentrated on hilltops.	**Low** Some change will occur along Albano Road within the Project area, but surrounding landscapes will experience minimal effects because the undulating terrain will largely screen views of the turbines.	Low
LCZ03	Low	**Low** This LCZ consists of creek corridors and lakes lined with She-oak and Eucalypt communities, becoming increasingly modified through damming and vegetation clearing as they pass into agricultural land. Lake Liddell is highly altered with low scenic quality, while Lake St Clair remains more picturesque at the foothills of Mount Royal National Park.	**Low** Views of the turbines from creek corridors are expected to be very limited due to their low-lying valley positions, and neither Lake St Clair nor Lake Liddell will have visibility of the turbines because of their significant distance and intervening topography.	Low
LCZ04	Very Low	**Very Low** This LCZ is dominated by a large-scale, highly modified industrial landscape, characterised by the Bayswater coal-fired power station and several surrounding coal mining operations.	**Very Low** Due to the distance, this LCZ will experience little to no visibility of the Project, and therefore no notable change to the landscape character is expected.	Very Low

LCZ	Scenic Quality Rating	Sensitivity	Magnitude	Landscape Character Rating
LCZ05	Low	**Low** This LCZ is characterised by typical regional country towns of the Upper Hunter Region, with main streets surrounded by residential neighbourhoods. A number of heritage buildings are present, reflecting the area's post-settlement agricultural history.	**Low** Due to the distance, this LCZ will experience little to no visibility of the Project, and therefore no notable change to the landscape character is expected.	Low

6.2.1.3 Community Consultation

In line with the Visual Technical Supplement, BCWF in consultation with Umwelt, conducted community consultation with residents and stakeholders from Singleton, Muswellbrook, Upper Hunter Shire, and surrounding areas. The objective of the consultation in preparation of the LCVIA was to:

- Establish key landscape features significant to the community;
- Define areas of scenic quality; and
- Identify key public viewpoints valued by the community.

Respondents placed value on the fertile valleys, forest areas, rolling hills, mountain ridges, and picturesque views such as Lake St Clair and Barrington Tops. Concerns were raised about the visual impact of the Project, especially due to its proximity to homes and properties, with some residents raising concern the Project could spoil natural views and local character. Suggestions to mitigate impact included using smaller turbines, tree screening (though some doubt its effectiveness) and moving turbines out of sight.

6.2.2 Visual Impact Study Method and Overview

6.2.2.1 Setback Distance and Visual Study Area

In accordance with the Visual Technical Supplement, a setback distance has been derived based on the distance a person must stand for the highest vertical extent of the tip of the WTG to be within nine (9) degrees of their field of view. If a private dwelling or public viewpoint is located within the setback (and not subject to a negotiated agreement), a photomontage must be prepared according to the requirements in Appendix D of the Visual Technical Supplement. The LCVIA setback distance has been based on a worst case scenario with a WTG tip height of 250 m. The Visual Setback distance for the Project is calculated as 1,579 m.

The Visual Study Area for the Project includes all residence and public viewpoints with a view of the highest vertical extent of the tip of the WTG within two (2) degrees of a person's field of view at each location. The Visual Study Area for the Project is 7,160 m.

Dwellings Identified for Assessment

No non-associated dwellings are located within the setback distance, and 59 non-associated dwellings are located with the Visual Study Area and have been subject to further assessment within the LCVIA. The setback distance and Visual Study Area are presented on **Figure 6.2**.

Public Viewpoints identified for Assessment

Ten (10) public viewpoints have been selected to represent a range of views and landscape character typologies from within the Visual Study Area.

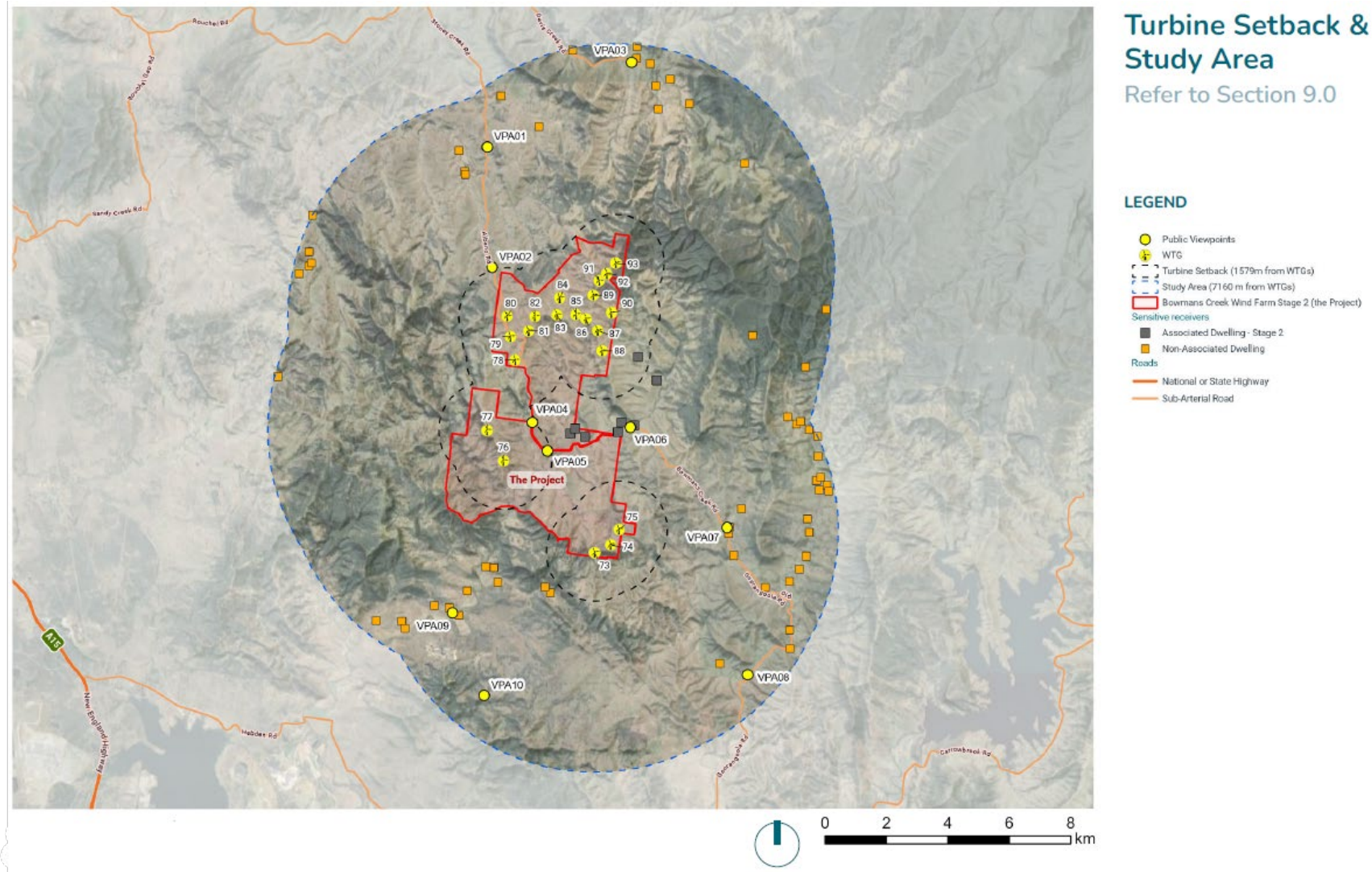


Figure 6.2 Turbine Setback and Visual Study Area

Source: Moir (2026)

6.2.2.2 Cumulative Visual Impact Zone

The cumulative impact zone captures receivers (private dwelling and public viewpoints) within the Visual Study Area of multiple Projects. The only nearby Project with an overlapping Visual Study Area to the Project is the Stage 1 project. For receivers within the cumulative impact zone, the cumulative impact of the proposed WTG from the Project and the Stage 1 project were assessed. 59 non-associated dwellings and all 10 of the public viewpoints identified in **Section 6.2.2.1** are within the Stage 1 Visual Study Area, as shown on **Figure 6.3**.

6.2.2.3 Assessment of potential Development Rights

The SEARs require an assessment of the potential impact of the development on existing land uses on the site and adjoining land to address the requirements set out in Section 6.0 of the Wind Energy Guideline (DPHI, 2024). This was undertaken in detail in Section 6.17 and includes consideration of potential blade throw-related impacts on neighbouring properties.

As per the methodology described in Section 6.0 of the Wind Energy Guideline (DPHI, 2024), this process involved the identification of an initial search radius around Project WTGs to conservatively capture key planning and environmental constraints. This involved preparing a 1,579 m buffer around all Stage 2 WTGs which reflects the visual setback area as outlined in the LCVIA (**Appendix 6**).

The assessment then focused on lands that are not contained within or associated with either the Project or Stage 1 project areas. Each lot was compared against the minimum lot size as set out in the respective LEP, to determine whether a dwelling entitlement exists. The resultant lots requiring further consideration are summarised in **Table 6.4**.

There were seven (7) non-associated land parcels that were identified within an environmental constraints buffer and were identified for further consideration. Of these, four (4) lots were identified within the visual setback buffer and were subject to further consideration. This includes Lots 256, 225, 224 and 273 of DP752460, which all form part of one (1) non-associated landholder property holding. An overview of visual impact on these lots is provided in **Table 6.4**.

Table 6.4 Evaluation of Visual Impact on Lots Subject to Further Consideration

Lot	Impact	Evaluation
224	Lot 224 is wholly located within the turbine setback area and is entirely included within the viewshed for both project stages. The landform rises toward the western edge of the lot, which is closest to the project boundary. The lot is largely cleared, with clusters of trees present in some areas. Any future dwelling would likely be oriented toward the north-eastern aspect to capture views across the broader landscape and to access the existing track. Due to the site's landform and elevation, views toward the wind farm would be restricted, and views of the project from the site are therefore considered unlikely.	• There is no opportunity for a dwelling to be located outside the turbine setback. As noted, they form part of a single, non-associated landholder property holding. • The total area of the combined holding (all four (4) lots considered) is approximately 705.5 ha, with an estimated 76.6 ha affected by the Project, and included within the visual setback. • A dwelling could instead be located on a neighbouring lot outside the setback, with future development able to be designed, sited, and oriented to minimise potential impacts. Lots to the east of the affected area fall outside the visual setback buffer.

Lot	Impact	Evaluation
225	A moderate proportion of the site is located within the turbine setback area, with the nearest turbine (T90) situated approximately 1.15 km from the site. A significant portion of the site is included within the viewshed for both project stages. Access to the existing track off Marshalls Road is available from the north-eastern portion of the site, outside the turbine setback. The site's landform suggests future development would likely be oriented north-east to capture views across the wider landscape. The ridgeline to the south-west restricts views toward the wind farm, suggesting views of the project from the site are considered unlikely.	• A desktop assessment of the lot identified there are opportunities to site a dwelling outside of the turbine set back. • It is determined a dwelling could be sited on the lot with no significant level of visual impact resulting from the Project.
256	A large proportion of the lot is located within the turbine setback area and is wholly included within the viewshed for Project Stage 1, with a large portion also within the viewshed for Project Stage 2. Future dwelling likely to be oriented towards the north-east to capture views across the broader landscape. Areas outside of the turbine setback are located closest to the existing access track and are suitable locations for development.	• A desktop assessment of the lot identified there are opportunities to site a dwelling outside of the turbine set back. • It is determined a dwelling could be sited on the lot with no significant level of visual impact resulting from the Project.
273	A small portion along the western lot boundary is located within the turbine setback area, and the site is wholly included within the viewshed for both project stages. A large proportion of the lot comprises undulating terrain with dense vegetation, indicating that the area within the setback is the most likely location for any future dwelling opportunity with orientation directed towards the project. The area within the setback corresponds with the lowest point of the lot and is situated closest to the existing access track. Due to the surrounding landform and topographical screening, direct views towards the wind farm are obstructed, and views to the project from the site are considered unlikely.	• There is opportunity for a dwelling to be located outside the turbine setback, noting that the most suitable dwelling location is within the setback and oriented towards the development. • The total area of the combined holding (all four (4) lots considered) is approximately 705.5 ha, with an estimated 76.6 ha affected by the Project, and included within the visual setback. • A dwelling could alternatively be located on a neighbouring lot outside the setback, in a more suitable location.

6.2.2.4 Viewshed Mapping

In accordance with the Technical Supplement, viewshed mapping was undertaken to identify areas from which the Project has the potential to be viewed in consideration of topography and line of site to WTG based on a tip height of 250 m for the Project and 220 m for the Stage 1 project. Viewshed mapping was undertaken to eliminate viewpoint locations that will not have a line of sight to the proposed WTGs of both the Project and the Stage 1 project, as shown on **Figure 6.4**.

It is important to note that the viewshed map provides an assessment based on topography alone and does not consider intervening elements such as vegetation and structures. Therefore, the viewshed map represents a theoretical worst-case scenario.

The following provides a summary of the viewshed map assessment:

- 25 non-associated dwellings of the 59 identified within the Visual Study Area have no visibility of the Project and can be excluded from further assessment.
- 34 non-associated dwellings of the 59 identified within the Visual Study Area have potential visibility of the Project and the Stage 1 project and require further assessment.
- 10 public viewpoints have visibility of the Project and the Stage 1 project and require further assessment.

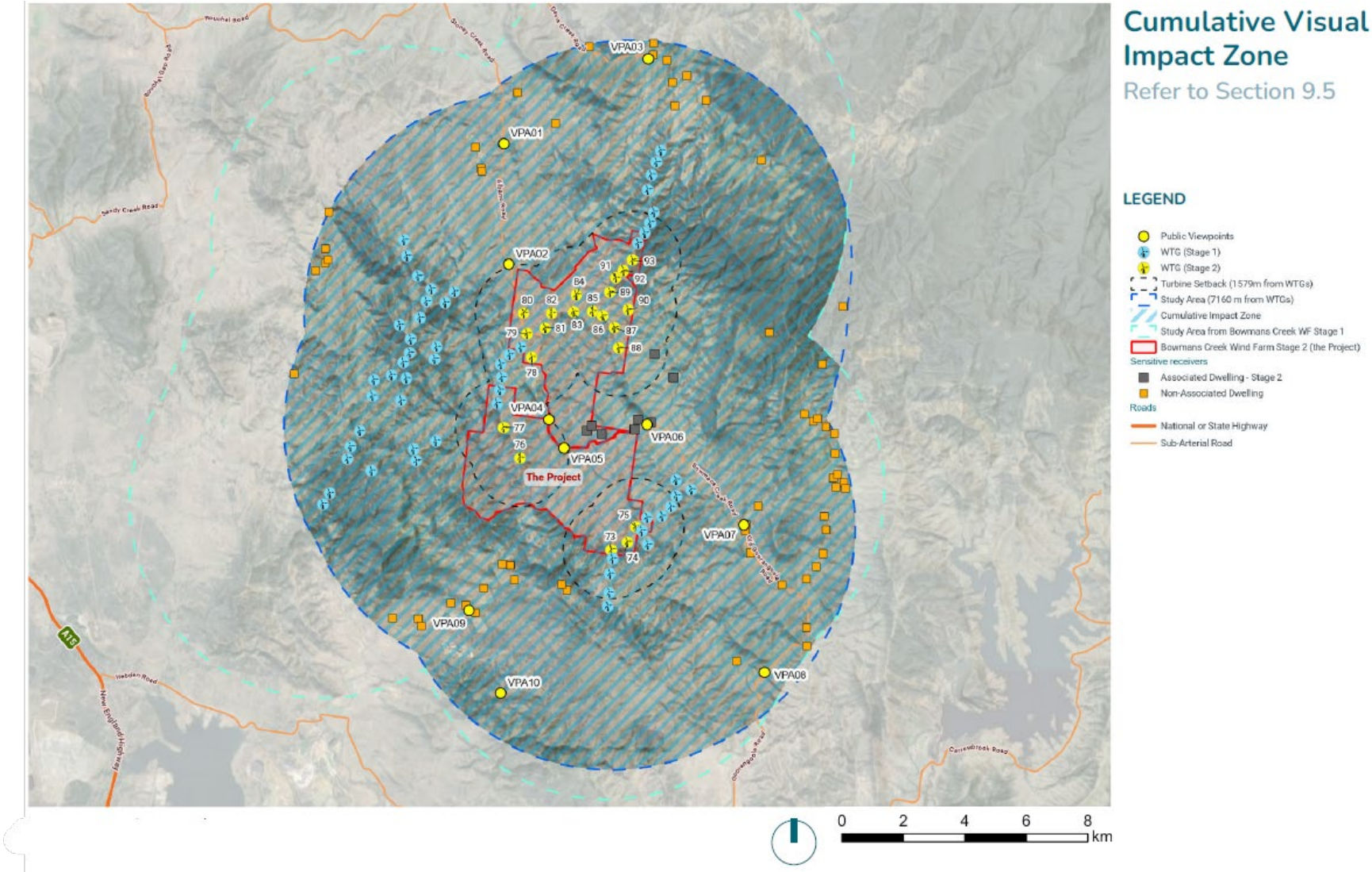


Figure 6.3 Cumulative Visual Impact Zone

Source: Moir (2026)

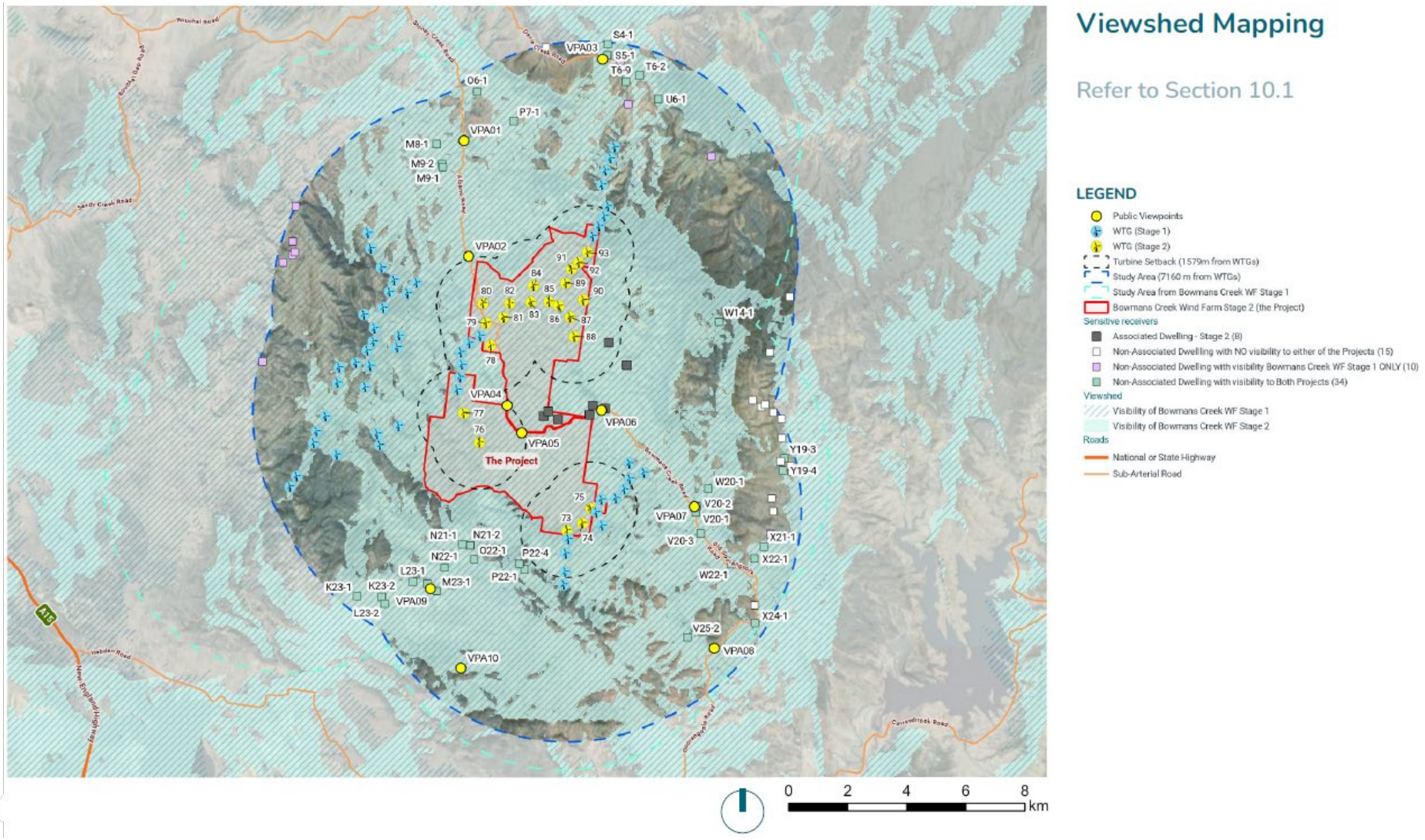


Figure 6.4 Viewshed Mapping

Source: Moir (2026)

6.2.3 Proportionate Visual Impact Assessment

As per the Visual Technical Supplement, a Simple Assessment has been conducted for all receivers within the Visual Study Area, and receivers with a moderate/high impact rating requiring an Intermediate Assessment. Similarly, receivers with a moderate to high impact rating after the Intermediate Assessment are subject to a detailed assessment and those with a moderate to high impact rating after the detailed assessment are assessed against the performance objectives as defined in the Visual Technical Supplement.

For each assessment type, receivers are evaluated based on how many cells fall within their field of view. Each cell represents a one-degree by one-degree area, defined by one (1) degree of elevation and one (1) degree of latitude. The number of occupied cells indicates how much of the view is affected at that location.

Figure 22 of **Appendix 6** provides an overview of the assessment process.

6.2.3.1 Simple Assessment

The Simple Assessment is a desktop assessment which considers the visual sensitivity and visual magnitude from each receiver to determine the preliminary visual impact. In line with the Visual Technical Supplement, it is assumed that all views from rural dwellings are primary views and are therefore considered to have a moderate sensitivity.

The visual magnitude relies on a theoretical calculation which accounts for the height of the proposed WTGs and the distance of the nearest turbine from each receiver. This potential magnitude is a conservative and worst-case scenario that ignores mitigating factors, including topography, vegetation and buildings.

The results of the Simple Assessment are summarised below:

- 34 non-associated dwellings were identified within the Visual Study Area, with a line of sight to the Project and the Stage 1 project.
- 27 non-associated dwellings require an Intermediate Assessment.
- Four (4) Public Viewpoints require an Intermediate Assessment.

The complete results of the Simple Assessment can be found in Appendix A of **Appendix 6**.

6.2.3.2 Intermediate Assessment

The Intermediate Assessment involves undertaking a more accurate assessment of the visual magnitude of the Project. This assessment utilises 3D modelling to account for factors including intervening topography, distances at which turbines will be visible, and spacing between individual and clusters of turbines.

A summary of the results from the Intermediate Assessment has been provided in **Table 6.5** for non-associated dwellings and **Table 6.6** for public viewpoints.

Following the intermediate assessment, two (2) private dwellings and three (3) public viewpoints required a Detailed Assessment, as discussed in **Section 6.2.3.3** below.

Table 6.5 Results of Intermediate Assessment – Non-associated Dwellings

Dwelling ID	Distance to Nearest Turbine (km)	Total Occupied Cells–Cumulative Stage 1 & 2	Viewpoint Magnitude–Cumulative Stage 1 & 2	Overall Visual Sensitivity	Visual Impact	Detailed Assessment Required?
W22-1	4.28	7	Very Low	Moderate	Low	No
K23-2	4.86	10	Low	Moderate	Low	No
K23-1	4.35	4	Very Low	Moderate	Low	No
N22-1	4.09	18	Moderate	Moderate	Moderate	**Yes**
O22-1	3.12	26	High	Moderate	Moderate	No
L23-1	4.76	10	Low	Moderate	Low	No
M23-1	4.32	22	Moderate	Moderate	Moderate	No
N21-1	3.47	12	Low	Moderate	Low	No
N21-2	3.26	19	Moderate	Moderate	Moderate	**Yes**
V25-2	4.56	11	Low	Moderate	Low	No
M23-2	4.64	12	Low	Moderate	Low	No
X22-1	4.74	9	Low	Moderate	Low	No
X21-1	4.78	7	Very Low	Moderate	Low	No
Y19-4	4.72	1	Very Low	Moderate	Low	No
Y19-3	4.80	3	Very Low	Moderate	Low	No
T6-9	2.26	7	Very Low	Moderate	Low	No
M8-1	3.18	29	High	Moderate	Moderate	No
M9-1	3.34	33	High	Moderate	Moderate	No
M9-2	3.43	34	High	Moderate	Moderate	No
P22-1	1.39	31	High	Moderate	Moderate	No
P22-4	1.57	15	Moderate	Moderate	Moderate	No

Dwelling ID	Distance to Nearest Turbine (km)	Total Occupied Cells–Cumulative Stage 1 & 2	Viewpoint Magnitude–Cumulative Stage 1 & 2	Overall Visual Sensitivity	Visual Impact	Detailed Assessment Required?
U6-1	2.20	17	Moderate	Moderate	Moderate	No
V20-1	2.22	34	High	Moderate	Moderate	No
V20-2	2.12	35	High	Moderate	Moderate	No
V20-3	2.81	23	Moderate	Moderate	Moderate	No
W14-1	4.67	0	N/A	Moderate	N/A	No
W20-1	2.25	34	High	Moderate	Moderate	No

Table 6.6 Results of Intermediate Assessment – Public Viewpoints

Dwelling ID	Distance to Nearest Turbine (km)	Total Occupied Cells–Cumulative Stage 1 & 2	Viewpoint Magnitude–Cumulative Stage 1 & 2	Overall Visual Sensitivity	Visual Impact	Detailed Assessment Required?
VPA02	**1.99**	**107**	**Very High**	**Very Low**	**Moderate**	**Yes**
VPA04	**1.50**	**105**	**Very High**	**Very Low**	**Moderate**	**Yes**
VPA05	**1.48**	**57**	**Very High**	**Very Low**	**Moderate**	**Yes**
VPA06	2.04	27	Moderate	Very Low	Very Low	No

6.2.3.3 Detailed Assessment

The Detailed Assessment involves undertaking a comprehensive assessment of the visual magnitude of the Project for viewpoints identified as moderate or high impact in the Intermediate Assessment. The Detailed Assessment involves a site visit to ascertain the extent to which a project is filtered or screened by intervening buildings or vegetation. The scenic quality, viewpoint sensitivity and overall visual sensitivity of the receivers are also further refined using on-site observations.

Building on the assessment outputs from an Intermediate Assessment, the calculations of magnitude were refined to account for the mitigating factors of existing vegetation or other screening. Additionally, panoramic photos comprising 180 degrees of visibility toward the Project and any Projects within the Study Area were captured which were then rendered with 3D models of the turbines and magnitude grid tool to recalculate the number of occupied cells.

The results of the Detailed Assessment for non-associated dwellings and public viewpoints are shown in **Table 6.7** and **Table 6.8** respectively, and the detailed assessment can be found in Appendix C of **Appendix 6**.

Table 6.7 Results of Detailed Assessment–Non-associated Dwellings

Dwelling ID:	Distance to Nearest Turbine (km)	Total Cells Occupied Stage 2	Total Occupied Cells–Cumulative Stage 1 & 2	Viewpoint Magnitude–Cumulative Stage 1 & 2	Overall Visual Sensitivity	Visual Impact	Performance Objective Required?
N21-2	3.26	0	11	NA–no visibility of Stage 2	Moderate	NA–no visibility of Stage 2	No
N22-1	4.09	2	11	Low	Moderate	Low	No

Table 6.8 Results of Detailed Assessment–Public Viewpoints

Dwelling ID:	Distance to Nearest Turbine (km)	Total Cells Occupied Stage 2	Total Occupied Cells–Cumulative Stage 1 & 2	Viewpoint Magnitude–Cumulative Stage 1 & 2	Overall Visual Sensitivity	Visual Impact	Performance Objective Required?
VPA02	1.99	38	91	Very High	Very Low	Moderate	Yes
VPA04	1.50	55	94	Very High	Very Low	Moderate	Yes
VPA05	1.48	43	57	Very High	Very Low	Moderate	Yes

Based on the outcomes of the Detailed Assessment, no non-associated dwellings require an assessment against the performance objectives. Three (3) public viewpoints (VPA02, VPA04 & VPA05) returned a **moderate** Visual Impact Rating which have been assessed against the performance objectives in the section below.

6.2.3.4 Assessment Against Visual Performance Objectives

In accordance with the Visual Technical Supplement, each of the public viewpoints (VPA02, VPA04 & VPA05) has been assessed against the relevant performance objective. Each viewpoint is a public road a consideration of driver safety and lines of sight is a central consideration for any proposed mitigation measure (e.g. vegetation screening). Each viewpoint has a significant sight line to surrounding ridge lines, and as such, inclusion of any additional visual mitigation measures has been deemed inappropriate.

6.2.4 Night Lighting Assessment

Obstacle lighting is proposed at eight (8) Project WTGs which has the potential to alter the landscape character of the region. The proposed obstacle lighting (referred to as Aviation Hazard Lighting (AHL) in the LCVIA) will increase the visibility of the Project for aircrafts. An Obstacle Lighting Plan (OLP) for the Project has been prepared as Annexure 6 of the AIA (refer to **Appendix 15**), which specifies the layout and design of the proposed obstacle lighting. The OLP specifies two (2) low intensity 200 candela steady red lights per WTG within the range of wavelengths 655 to 930 nanometres, and at least one (1) of the lights must be visible from every angle on a horizontal plane.

Photo 6.1 to **Photo 6.4** are representative images of aviation lighting installed on turbines at the approved Biala Wind Farm (BWF) project in Biala, NSW. These images have been included in this EIS to help illustrate the appearance of night lighting on a dark rural landscape at before and after sunset at varying distances. The AHL proposed for the Project is a lower candela (brightness as perceived by the human eye) than shown in these reference images. The location of proposed obstacle lighting is illustrated in **Figure 3.8** above and **Figure 6.5** below.

6.2.4.1 Assessment of Night Lighting Impacts

AHL on wind turbines can be visible from more than 20 km away, although actual visibility varies with factors such as light intensity, terrain, vegetation, and weather conditions. The Project Area is largely isolated, with very little existing night lighting except for illumination from mining activities, vehicles, and machinery along access routes. As a result, most receptors within the Visual Study Area currently experience a dark night sky with minimal artificial light.

Those most likely to be affected by aviation lighting include people who spend time outdoors at night—such as stargazers, photographers, campers, and nearby landowners with views toward turbine hubs. Mitigation measures (outlined in **Section 6.2.5**), including the use of shielding, are expected to reduce the visual impact of AHL lighting. Given the turbines' high elevation and the use of shields, any aviation lighting would likely appear as low-level ambient glow rather than a direct light source when viewed from nearby locations.

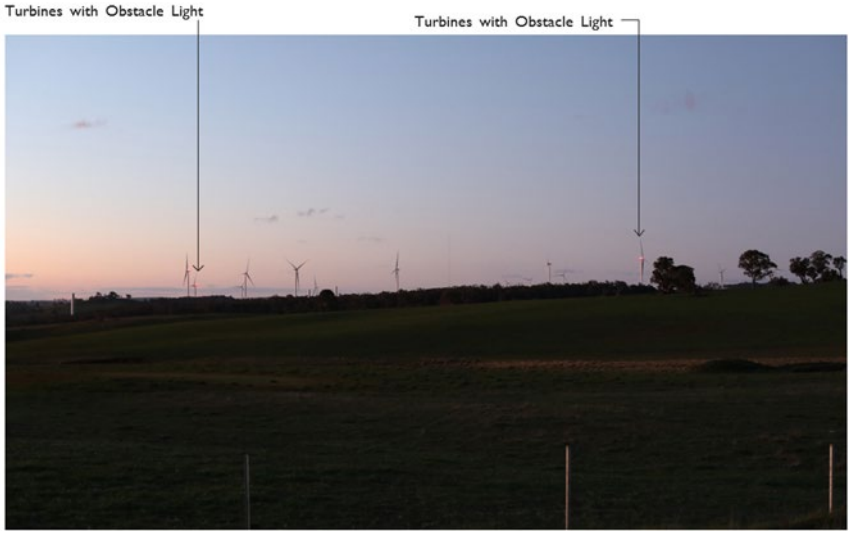


Photo 6.1 View towards BWF – 3.5 km from WTG



Photo 6.2 View towards BWF – 8.5 km from WTG



Photo 6.3 View at night towards BWF – 3.5 km from WTG

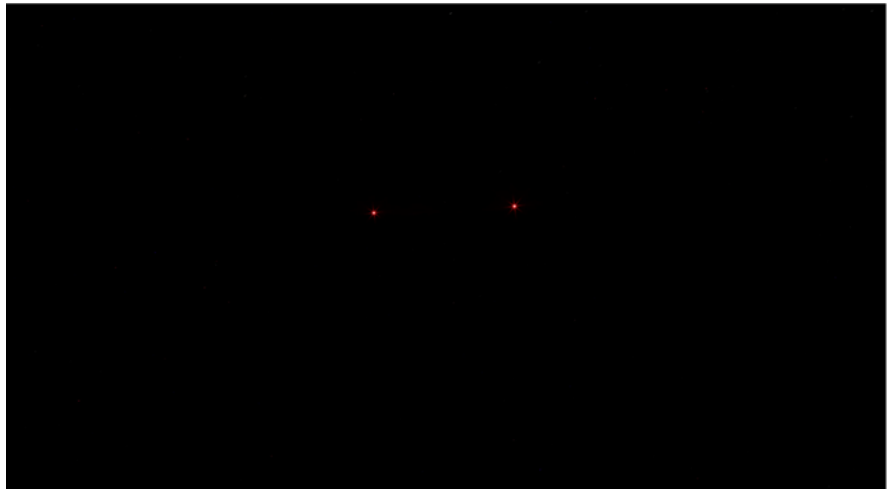
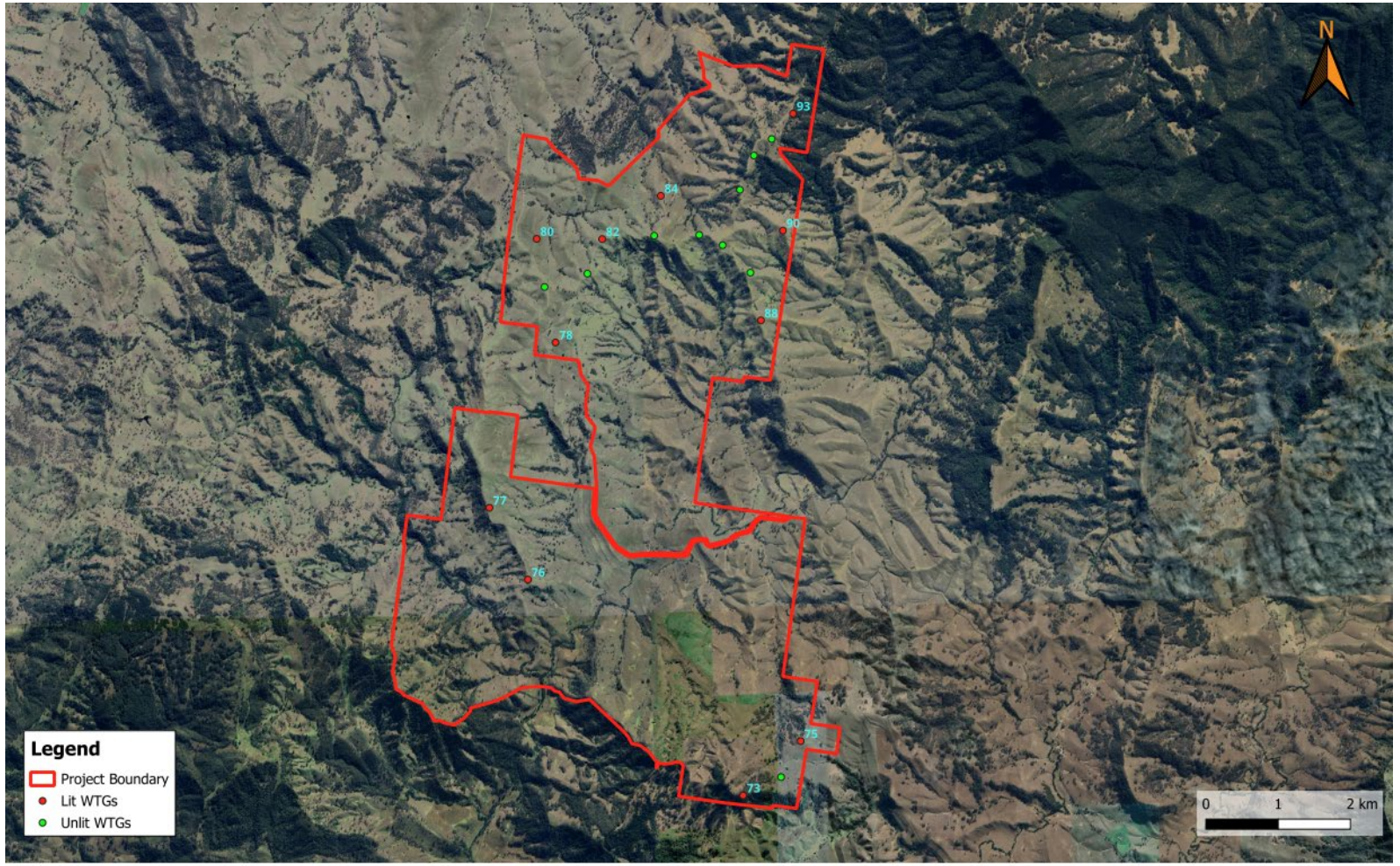


Photo 6.4 View at night towards BWF – 8.5 km from WTG



Bowmans Creek Wind Farm - Stage 2	Project:	Prepared by	Version	Date	AVIATION PROJECTS
Obstacle Lighting Plan	102228-02.1	L Wang	v0.2_260313	13/03/2026	

Figure 6.5 Aviation Hazard Lighting

(Source: Aviation Projects, 2026)

6.2.5 Mitigation Measures

In recognition of the impacts of the Project, and as the key focus for mitigation, BCWF has negotiated impact agreements in respect of five (5) residences located within the Visual Study Area. The agreements provide annual payments to landowners likely to be impacted by the Project, including those affected by visual impacts.

Additionally, BCWF has committed to a range of mitigation and management measures consistent with the recommendations of the LVIA:

LV01: With respect to ancillary infrastructure, the following principles will be applied:

- Avoidance of unnecessary lighting, signage, logos on associated infrastructure.
- Use of subtle colours and a low reflectivity surface treatment on power poles to ensure that glint is minimised.
- Consideration will be given to controlling the type and colour of building materials used.

LV02: With respect to access tracks, the following principles will be applied:

- Any new roads / access tracks will be constructed to minimise cut and fill and avoid the loss of vegetation.
- Allow for the provision for downsizing roads or restoring access tracks to existing condition following construction where possible.
- Utilise local materials where possible and practical.

LV03: With respect to AHL, the following principles will be applied:

- Where possible, careful consideration of WTGs upon which AHL is installed to avoid unnecessary impact upon residences.
- Treatment of the rear of blades with a non-reflective coating to reduce reflection off the rotating blade at night.
- Use of the lowest candela intensity allowed by CASA.
- Permanent light shielding is also an option to reduce impact on residences within two (2) km of the installation.

LV04: With respect to AHL, the following principles will be applied:

- AHL proposed is to be spaced around the outer edges of the Project. Lights are not required on every tower. Careful consideration has been given to the selection of turbines requiring lighting to avoid unnecessary impact upon residences;
- Shielding is to be provided to restrict the downward spill of light to the ground plane by ensuring that no more than 5% of the nominal light intensity should be emitted at or below 5° below horizontal; and
- No light should be emitted at or below 10° below horizontal.

LV05: With respect to construction, BCWF will minimise visual clutter during the construction phase by limiting the number of construction vehicles, cranes, and equipment visible on-site at any given time. Equipment will be stored away from visible areas.

6.3 Noise and Vibration

The SEARs require:

- An assessment of wind turbine noise in accordance with the Wind Energy Guideline, including the supporting Technical Supplement for Noise Assessment;
- An assessment of noise generated by ancillary infrastructure in accordance with the NSW Noise Policy for Industry (EPA, 2017);
- An assessment of construction noise under the Interim Construction Noise Guideline (DECC, 2009);
- An assessment of traffic noise under the NSW Road Noise Policy (DECCW, 2011);
- An assessment of vibration under the Assessing Vibration: A Technical Guideline (DECC, 2006); and
- An assessment of the cumulative noise impacts (considering other developments in the area).

A Noise and Vibration Assessment (NVA) was undertaken by Marshall Day Acoustics (MDA) to address the requirements of the SEARs and in accordance with the policies and guidelines listed above. The NVA is provided in **Appendix 7** and the key findings are summarised below.

6.3.1 Existing Noise Environment

6.3.1.1 Receivers

A total of 79 receivers were identified by BCWF within 8 km of the Project wind turbines have therefore been considered in the NVA. For the purposes of noise assessment, assessed receivers are separated into two (2) distinct categories:

- **Associated** – A residence on privately-owned land for which the owner has reached a private agreement with BCWF in relation to the development and management of noise impacts.
- **Non-associated** – being a residence on privately-owned land for which the owner has not reached a private agreement with BCWF in relation to the development. Or, a residence on privately-owned land for which the owner has reached a private agreement with BCWF in relation to the development, but the private agreement does not include management of noise impacts.

Of the 79 assessed receivers, there are eight (8) associated receivers that are subject to a host or impact agreement with BCWF for the Project, with provisions included to address noise impacts. These receivers are therefore categorised as associated for the purposes of NVA. The remaining 71 receivers are categorised as non-associated with the Stage 2 Project, noting that a subsect of these receivers are associated with the Stage 1 project.

6.3.1.2 Background Noise Levels

The noise compliance strategy for the Project adopts a precautionary approach by demonstrating compliance with the most stringent base noise limit of 35 dBA at all wind speeds, as prescribed in the Technical Supplement for Noise, rather than relying on variable background noise conditions. This fixed-criterion approach applies to all non-associated receivers under all operating scenarios and is deliberately conservative. While the need for additional background noise monitoring was considered, the existing Stage 1 dataset was reviewed and found to be robust, representative, and generally indicative of relatively low background noise conditions.

As the Technical Supplement does not require background noise monitoring where compliance is demonstrated against the base limit and given that additional data would not alter the assessment outcomes, no further monitoring was undertaken. Accordingly, the Stage 1 dataset is considered sufficient to characterise the receiving environment, and this assessment focuses on demonstrating compliance with the prescribed 35 dBA base noise limit as a policy-aligned and conservative basis for evaluation.

6.3.2 Operational Noise Assessment

Although the specific wind turbine model has not been determined for the Project, a candidate wind turbine that is representative of the size and model being considered was selected. The candidate wind turbine for the purpose of the NVA is the Nordex N175/6.X with a Highest sound power of 110.7 dB L_{WA}.

6.3.2.1 Sound Power Level

The noise emissions of a wind turbine are described in terms of the sound power level for different wind speeds. The sound power increases progressively with hub-height wind speed up to 10 m/s, beyond which the turbine reaches rated output and the sound power level stabilises (Table 8 of the NVA, **Appendix 7**). The maximum overall A-weighted sound power level adopted for the assessment is 110.7 dB L_{wA}, which occurs at a hub-height wind speed of 10 m/s and remains constant at higher wind speeds.

As such, the predicted noise levels for the purposes of the impact assessment are for conditions when the wind turbine's noise emissions have reached their highest level (corresponding with hub height wind speeds of 10 m/s for the candidate wind turbine model) and the wind is directed from the Project to each receiver. The predicted noise levels include + 1.0 dB allowance to account for wind turbine sound power level measurement uncertainty.

Reference octave band values are the frequency-by-frequency breakdown of a noise source's sound power and provide a breakdown of where noise energy sits across the audible frequency range. An overview of the octave bands for the candidate wind turbine at 10 m/s are provided in Table 9 of the NVA, **Appendix 7**.

6.3.2.2 Tonality and Low Frequency Noise

Tonality of a wind turbine is when a specific frequency is perceptibly dominant, as opposed to broadband aerodynamic noise that is perceived as a uniform "whooshing" sound. Based on the manufacturer data and experience with contemporary multi-megawatt wind turbine designs, the occurrence of tonal noise is not anticipated for the Project. On this basis, adjustments for tonality have not been applied to the predicted noise levels presented in this assessment.

Adjustments for low frequency noise have not been applied to the predicted noise levels presented in the NVA. A risk assessment was undertaken with respect to low frequency noise as required by the Technical Supplement. The risk assessment indicated calculated low frequency noise levels are below the applicable thresholds for the application of penalties at all non-associated receivers.

6.3.2.3 Non-associated Receivers

The base noise limit applicable to the Project at non-associated receivers is 35 dB L_{Aeq} at any non-associated receiver. Non-associated receivers with predicted noise levels greater than 30 dB $L_{Aeq, 10\ min}$ are shown in **Table 6.9**.

Table 6.9 Predicted Noise Levels at Non-associated Receivers Greater than 30 dB $L_{Aeq, 10\ min}$

Receiver	Distance to Nearest Turbine – m	Predicted Noise Level – dB $L_{Aeq, 10\ min}$
P22-1	1,946	33.2
P22-4	1,972	32.8
N21-2	3,330	30.8
N21-1	3,497	30.5
W14-1	4,674	31.1

Table 6.9 indicates that the predicted wind turbine noise levels at all non-associated receivers are below the Technical Supplement for Noise base noise limit of 35 dB $L_{Aeq, 10\ min}$ by a minimum margin of 1.8 dB.

Predicted noise contours for the candidate wind turbine model are shown in **Figure 6.6**.

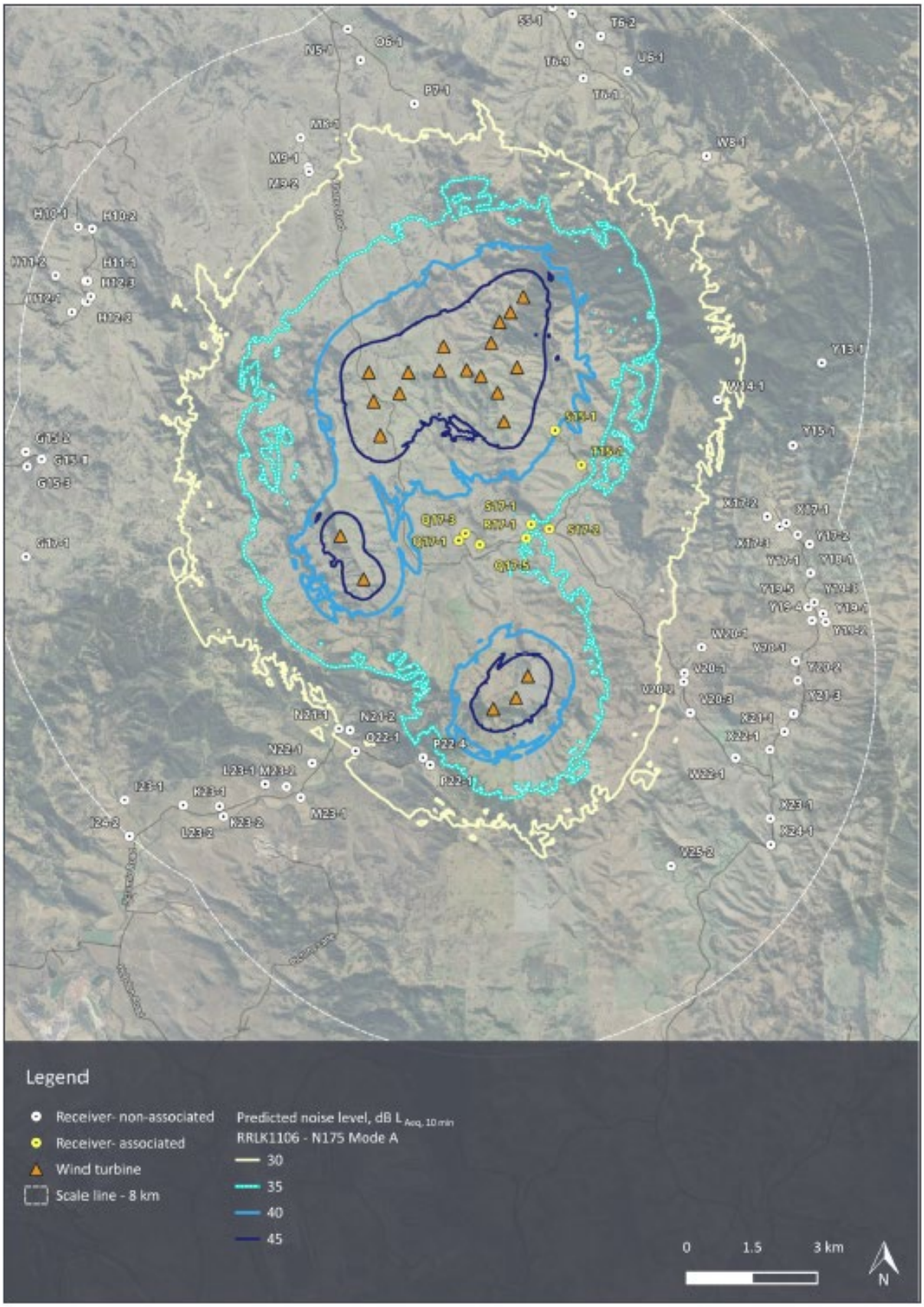


Figure 6.6 Highest Predicted Noise Level Contours (corresponding to hub height wind speed of 10 m/s), dB $L_{Aeq\ 10\ min}$

Source: MDA (2026)

6.3.2.4 Associated Receivers

The predicted noise level at all associated receivers is presented in **Table 6.10.**

Table 6.10 Predicted Noise Levels at Associated Receivers, dB LAeq 10 min

Receiver	Distance to Nearest Turbine – m	Predicted Noise Level
Q17-1	2,366	36.6
Q17-3	2,572	36.4
Q17-5	2,787	36.3
R17-1	2,704	34.9
S15-1	1,201	40.3
S17-1	2,420	35.5
S17-2	2,657	34.2
T15-1	2,033	36.7

As landowners of an associated receiver have entered into a commercial arrangements with BCWF, the Technical Supplement for Noise does not mandate a noise limit at these locations.

6.3.2.5 Ancillary Infrastructure

The NVA included an assessment of ancillary infrastructure noise emitted by the proposed substation, which is the only permanent infrastructure with operational noise. For the purposes of the NVA, all receivers were considered to be rural in nature, as defined in Table 2.2 of the Noise Policy for Industry 2017 (NPfI). As the ancillary infrastructure is proposed to be able to operate at any time of day, the most stringent night-time noise level of 35 dB $L_{Aeq,\ 15\ min}$ was applied in accordance with the NPfI.

The nearest non-associated receiver to the substation is M9-1, located approximately 5.1 km away. The component of the substation that produces sound are the HV transformers. At this stage of the Project, details of the transformer makes and models are yet to be finalised. In the absence of measured sound power level data, reference has been made to the standard maximum method for estimating overall transformer sound power levels for a given power rating described in AS 60076-10:2023, and the power ratings specified for each transformer model by BCWF.

Operational noise sources located at the proposed substation are limited to one high-voltage transformer. The assessment of operational ancillary infrastructure noise demonstrates that substation noise is predicted to be below the most stringent project noise trigger level of 35 dB $L_{Aeq,\ 15\ min}$ at all non-associated receivers by a minimum margin of 25 dB.

6.3.2.6 Cumulative Operational Noise Impacts

Noise levels associated with the operation of the substation have been predicted at all non-associated receiver will experience noise from the substation at or above 10 dB LAeq, 15 min.

With respect to other nearby projects, given the low predicted noise levels associated with the project substation, the risk of cumulative operational noise impact is expected to be negligible.

6.3.2.7 Assessment of potential Development Rights

The SEARs require an assessment of the potential impact of the development on existing land uses on the site and adjoining land to address the requirements set out in Section 6.0 of the Wind Energy Guideline (DPHI, 2024). This was undertaken in detail in Section 6.17 and includes consideration of potential blade throw-related impacts on neighbouring properties.

As per the methodology described in Section 6.0 of the Wind Energy Guideline (DPHI, 2024), this process involved the identification of an initial search radius around Project WTGs to conservatively capture key planning and environmental constraints. This involved preparing a buffer around all Stage 2 WTGs using the 35 dBA operational noise contour spatial data derived from the NVA (**Appendix 7**).

Seven (7) non-associated lots were identified within the 35 dBA operational noise contour which may have a dwelling entitlement which were subject to further consideration. The seven (7) lots all form part of one (1) property holding, referred to throughout the development rights assessment as 'Property Holding A'. The total area of all lots within 'Property Holding A' is approximately 705.5 ha.

The total estimated impact from the Project across 'Property Holding A', being the area of the property holding which falls inside the predicted 35 dBA operational noise contour, is approximately 441.2 ha, or ~62.5%. As a result, approximately 37.5% of 'Property Holding A' could be considered for future development, including lots within this holding that exceed the minimum lot size under the Singleton LEP 2009. This suggests that a future development within 'Property Holding A' could be designed, sited and oriented to avoid or reduce significant impact from the Project, noting that lots east of the impacted lots within this property holding fall outside the predicted 35 dBA operational noise contour.

It is also noted that the NVA (**Appendix 7**) prepared to support this EIS has assessed a conservative design scenario to predict worst case operational noise levels for the Project, and that actual operational noise levels from the Project may not reach the predicted values presented in the NVA.

BCWF has committed to undertaking detailed operational noise modelling following project approval and prior to commencement of construction, when the final Project design and layout has been selected (i.e. mitigation measure NV01 in **Appendix 5**). Additionally, BCWF will prepare an operational noise management plan (ONMP) which will provide appropriate, Project-specific measures to support in the reduction of operational noise levels from the Project (i.e. NV03 in **Appendix 5**). With the implementation of these measures, it is likely that operational noise levels would be reduced below those predicted within this EIS, and would result in a smaller proportion of 'Property Holding A' experiencing noise levels at or above 35 dBA during operation of the Project.

6.3.2.8 Assessment Outcome

The above findings indicate that the Project is capable of being designed and operated to comply with the operational wind turbine noise requirements of the Technical Supplement for Noise and Wind Energy Guideline, and therefore the relevant requirements of the Project SEARs.

6.3.3 Construction Impact Assessment

6.3.3.1 Construction Noise Assessment

Construction Activities

Construction of a wind farm project typically involves tasks such as:

- Access road construction.
- Cable trench digging.
- Construction of overhead transmission lines.
- Construction of ancillary infrastructure, including substations, operational facilities and temporary workers accommodation (where applicable).
- Construction of wind turbine foundations and hardstands.
- Wind turbine and meteorological mast assembly.

An assessment of the construction noise is based on the typical equipment associated with the range of construction stages and the approximate sound power level of each piece of equipment typical construction plant sound power levels range from approximately 99–117 dB LWA.

Based on the groupings of major plant items during key construction tasks, the total aggregated noise emissions for the proposed works stages typically ranges from 110–125 dB LWA. These predictions assume that each item of plant associated with a task operates simultaneously for the entire duration of an assessment period thus providing a conservative approach that is unlikely to occur in practice.

Construction Noise Assessment

Noise levels associated with each of the main construction tasks have been predicted at the nearest non-associated receivers to provide an indication of the upper range of noise levels.

Given that the precise equipment selections and methods of working would be determined once a main contractor is appointed, and that the noise associated with construction plant and activity varies significantly, the predicted noise levels are provided in the following sections as an indicative range of levels which may occur in practice.

The predicted noise level ranges for each of the main construction tasks are provided in Table 21 of the NVA for non-associated and associated receivers. In summary:

- Construction noise levels are predicted to be up to 10 dB above the highly noise affected management level and up to 40 dB above the noise affected management level during the ‘Access road construction’ task.
- Construction noise levels are predicted to be below the highly noise affected management level for non-associated receivers during all other assessed construction tasks.
- Exceedances of the noise affected management level of up to 5 dB are predicted during ‘Cable trench digging’ and ‘Concrete pours’, and up to 10 dB during ‘Excavation and foundation construction’.

- Construction noise levels during all other assessed tasks are predicted to be below the noise affected management level.
- Most construction activities occur near turbine and ancillary infrastructure and are generally more distant from receivers than access track works, resulting in lower predicted noise levels. However, construction noise may still be audible at some receivers under low background noise conditions typical of rural areas. Therefore, NVA found that no exceedances of the highly noise affected management level were expected for any of the assessed tasks, and that construction noise and vibration can be appropriately managed using standard good practice measures.
- Consistent with the ICNG, feasible and reasonable work practices and community notification are required where noise exceeds management levels, with further project-specific assessment and a CNVMP to be prepared once a contractor is appointed if exceedances persist.

6.3.3.2 Vibration Assessment

The NVA includes a planning risk assessment in relation to residential receivers, and having regard to the Assessing Vibration: A Technical Guideline (AVTG) and Construction Noise & Vibration Guideline (CNVG). The AVTG provides guidance with respect to the assessment of human comfort due to vibration from construction works. This guideline distinguishes between intermittent, impulsive, and continuous vibration sources, which can be generated by construction activities. For the purposes of this planning risk assessment only residential receivers are considered.

For intermittent vibration, human disturbance vibration levels are assessed using a vibration dose value (VDV), which is based on the level and the duration of the vibration events. Representative VDV values for construction works are calculated considering the magnitude and duration of vibration events and are highly specific to site conditions, equipment selections and operational durations. As such, calculation of VDV levels is not typical or practical at the planning stage but will need to be considered as part of a later detailed vibration assessment.

6.3.3.3 Blasting

The requirement for blasting will be determined once the project construction plans and methods are established. However, at this stage, it is assumed that blasting will be required as part of the construction of the Project. Blasting is assumed to be required as part of the construction of the WTG foundations. The minimum distance between non-associated receivers and potential blasting locations is 1,939 m. Based on the distance between potential blasting and non-associated receivers, airblast overpressure levels and ground vibration levels are below the criteria set for all blasts at all non-associated receivers.

6.3.3.4 Decommissioning

Similar construction activities to those detailed in **Section 6.3.3.1** are expected to be required during the decommissioning of the project. Decommissioning activities are likely to be less intensive than construction activities and occur over a shorter duration. On this basis no further assessment has been conducted.

6.3.3.5 Cumulative Construction Impact Assessment

The four (4) projects relevant to the cumulative noise assessment are the Stage 1 project, the Stage 1 BESS modification, the NE REZ Transmission Project, and the Queensland-Hunter Gas Pipeline.

The Stage 1 NVA predictions indicate that construction noise levels of 37– 49 dB L_{Aeq} are anticipated at nearby non-associated receivers. When considered against the Project construction noise assessment **Section 6.3.3.1**, exceedances at non-associated receivers are not anticipated.

In terms of the other projects, the assessment indicates that there are no expected cumulative noise impacts resulting from the Project and other identified projects in the area. This includes operational wind turbine noise, operational ancillary infrastructure noise and construction noise.

Therefore, cumulative noise impacts are not expected to be a risk for the Project, though this should be subject to further review during detailed design. This would include further consideration of cumulative construction noise as part of the Construction Noise and Vibration Management Plan (CNVMP) (see **Section 6.3.3.1**), which will address cumulative construction noise.

6.3.4 Construction Traffic Noise Assessment

The NVA considers traffic noise impacts associated with construction of the Project, undertaken in accordance with the NSW Road Noise Policy. Operational traffic volumes are expected to be low and are not anticipated to result in material noise impacts; accordingly, the assessment focuses on construction traffic.

Construction traffic noise was assessed along Scrumlo Road, Hebden Road (north), Hebden Road (south), and the New England Highway using traffic data provided by Stantec who undertook the TTIA. Predicted traffic noise increases on the New England Highway are below the 2 dB screening threshold and are therefore considered negligible. Predicted traffic noise on Hebden Road (north) and Hebden Road (south) are above the 2 dB screening threshold. The detailed assessment was limited to Scrumlo Road Hebden Road (north) and Hebden Road (south), where greater proportional increases in traffic are predicted.

The increase in traffic noise from the already low existing volumes may result in a noticeable increase in noise during some periods of construction. Along Scrumlo Road, there is one (1) receiver located within the predicted day setback zones, and four (4) receivers located within the predicted night setback zones. Noise mitigation options are generally limited for local roads, with community consultation and regular communication being the most effective and practical means of minimising adverse impacts.

6.3.4.1 Sleep disturbance assessment

Sleep disturbance from construction traffic was assessed with a screening criterion of 65 dB LAmax, with consideration limited to potential OSOM vehicle movements during night-time periods. Typical OSOM vehicle noise data indicates that screening levels may be exceeded within approximately 40 m of a vehicle movement. Of the assessed receivers, receiver I24-1 on Scrumlo Road is marginally outside the 40 m setback zone.

6.3.5 Offsite Road Work Areas

As discussed in **Section 3.2.9**, road modifications along the OSOM Transport Routes are required to enable the safe transport of Project components using OSOM vehicles. In some instances, these road modifications result in disturbance outside of the road pavement, which has warranted further assessment of relevant environmental constraints within this EIS.

A noise sensitivity screening process has been undertaken to support the assessment of amenity-based impacts at these offsite road work areas. The screening process involved generating a buffered area around select offsite work areas where more substantive road modifications are proposed (i.e. making the road 'trafficable'), based on a list of assumed plant, equipment and machinery and associated 'time of use' within a 15 minute period needed to deliver the road modifications. These assumptions are provided in **Table 6.11** below.

Table 6.11 Road Modification Construction Noise Assumptions

Plant/equipment	Quantity	Time in use – 15 minute period (resultant dBA reduction)	Base Sound Lower Level (LW)	Adjusted (time in use) Sound Power Level (LW)
Bulldozer (small)	1	50% (-3 dB)	108	105
Dump truck	1	10% (-10 dB)	105	95
Excavator (small)	1	50% (-3 dB)	108	105
Road grader	1	50% (-3 dB)	108	105
Total	**4**	**-**	**-**	**110**

These assumptions result in a total sound power level (LW) of 110 dBA and estimated noise levels that vary depending on the proximity of the receiver to the works, and any shielding already provided by intervening structures. Generally, those closest to the works (e.g. 30 m to 50 m) may experience noise levels of up to approximately 68 dBA to 73 dBA, with receivers further away (but within 400 m of the work area) experiencing noise levels greater than 45 dBA, again depending on any shielding already provided.

This resulted in an estimated 'impact radius' buffer of 400 m being generated around select off-site road works areas. This off-site road work areas buffer has formed the basis of further consideration of potential noise-related impacts to receivers near these works.

Non-associated receivers identified within the 400 m offsite road works area buffer but located on a state road (i.e. a highway or freeway) or proximally to industrial/commercial facilities were assumed to be exposed to elevated ambient and background noise levels associated with frequent traffic movements on the road network, as well as emissions from existing industrial/commercial operations. Anticipated noise levels associated with the proposed road modifications at these locations are temporary in nature, and are not expected to dominate the acoustic environment and are expected to be masked by existing elevated ambient noise levels. As such, these receivers have not been considered further.

The screening process enables a targeted assessment approach by identifying sensitive, non-associated receivers within the area of influence of off-site road works, with assumed low existing ambient and background noise levels, who may be subject to potential amenity-based impacts. The off-site road work areas with assumed low ambient noise levels are located along Scrumlo Road in Hebden.

These sensitive, non-associated receivers within the 400 m off-site road works buffer around the off-site road work areas on Scrumlo Road have been identified and mapped on **Figure 6.7**.

The sensitive, non-associated receivers located within the 400 m off-site road works buffer in an assumed low ambient noise environment may be at risk of experiencing construction noise levels above the noise affected management level as documented in the Interim Construction Noise Guideline (ICNG).

As such, additional measures have been proposed in **Section 6.3.1** and **Appendix 5**.

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FIGURE 6.7

Scrumlo Road Offsite Road Works Area – Sensitive Receivers

Legend

Project
- Project Boundary
- OSOM Route Hardstand
- OSOM Route Veg Trimming
- Clydsdales Bridge Upgrade
- OSOM Transport Route

Stage 1 Project
- Project Boundary
- Ecological Clearance Envelope
- 400m Buffer

Dwellings
- Non-Associated
- Road
- River/Stream

0 0.1 0.2
Kilometres

Scale 1:8,232 at A4
GDA2020 MGA Zone 56

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Image Source: ESRI Basemap (2026) | **Data Source:** NSW DFSI (2026), SLR (2026), Ozark (2026), Ark Energy (2026)

6.3.1 Mitigation and Management Measures

The mitigation measures required to address potential traffic and transport related noise impacts associated with the Project include:

Operational Phase

- **NV01:** The predicted operational wind turbine noise levels will be updated prior to construction with sound power levels of the wind turbine selected for the Project.
- **NV02**: The predicted operational ancillary infrastructure noise levels will be updated prior to construction with the developed design and sound power levels of the final project design and equipment selections.
- **NV03:** an operational noise management plan (ONMP) will be prepared prior to commencement of operations to outline measures to manage operational noise, including verification of compliance with applicable noise criteria.
- **NV04**: post-construction noise compliance monitoring will be undertaken in accordance with the ONMP to verify operational performance and identify any requirement for contingency measures.

Construction Phase

- **NV05**: a CNVMP will be prepared prior to construction to detail measures for managing construction noise and vibration impacts, including those associated with construction traffic. This includes any specific noise management practices at select OSOM Transport Route off-site road work areas for sensitive, non-associated receivers that are identified as experiencing construction noise levels above the noise affected management level in the ICNG. Any targeted noise consultation requirements will be outlined.
- **NV06**: the CNVMP will include site-specific and traffic-specific noise management practices, including consultation, notification, and complaint handling procedures for receivers potentially affected by construction traffic.
- **NV07**: feasible and reasonable work practices will be implemented during construction to minimise noise impacts from construction activities and associated vehicle movements.
- **NV08**: where construction activities or traffic movements are required outside standard construction hours, additional mitigation and community consultation measures will be implemented in accordance with the CNVMP.

Transport and Traffic

- **NV09**: Residents located near Scrumlo Road will be included in consultation prior to and during construction.
- **NV10**: Traffic speeds will be limited along the identified sections of Scrumlo Road, where feasible.
- **NV11**: The maximum number of OSOM movements will be limited to once or twice each night.
- **NV12**: OSOM movements will be schedules for times when adverse impact is less likely, e.g. the very start of the night period and the very end of the night period, to reduce the potential for sleep disturbance.

6.4 Biodiversity

A Biodiversity Development Assessment Report (BDAR) (refer to **Appendix 8**) has been prepared by SLR Consulting (SLR) to inform this EIS. The BDAR addresses the SEARs, Supplementary SEARs issued by Commonwealth DCCEEW, as well as agency advice received from Hunter Central Coast Biodiversity, Conservation and Science (BCS) division of NSW DCCEEW.

The SEARs require:

- An assessment of the biodiversity values and the likely biodiversity impacts of the Project in accordance with Section 7.9 of the Biodiversity Conservation Act 2016 (NSW), in accordance with the Biodiversity Assessment Method (BAM) and documented in a Biodiversity Development Assessment Report (BDAR). The BDAR must:
    - Be prepared using the approved BDAR template;
    - Document the application of the avoid, minimise and offset framework including assessing all direct, indirect and prescribed impacts in accordance with the BAM;
    - Assess impacts associated with transport route road upgrades;
    - Any indirect impacts to nearby conservation areas and nature reserves; and
    - Be finalised by an accredited assessor as BAM-compliant within 14 days of submission.
- An assessment of the impact of the Project on birds and bats from blade strikes, low air pressure zones at the blade tips (barotrauma), and alteration to movement patterns resulting from the turbines and considering cumulative effects of other wind farms in the vicinity;
- An assessment of the likely direct and indirect impacts on listed aquatic threatened species, populations or ecological communities, scheduled under the Fisheries Management Act 1994, and a description of the measures to minimise and rehabilitate impacts;
- A cumulative impact assessment of biodiversity values in the region from nearby developments; and
- If an offset is required, details of the measures proposed to address the offset obligation.

Overall, the BDAR provides an assessment of the biodiversity values within the Project Area (and offsite areas of disturbance), documents the application of the avoid, minimise and offset framework and assesses the likely biodiversity impacts of the Project.

The BDAR has been prepared in accordance with the NSW *Biodiversity Conservation Act 2016* (BC Act) and Biodiversity Assessment Method (BAM) (DPIE, 2020a) under the NSW Biodiversity Offset Scheme (BOS). The Project is regarded as SSD under Division 4.7 of Part 4 of the EP&A Act and is therefore required to be accompanied by a BDAR in accordance with Section 7.9 of the BC Act.

A summary of the BDAR is included in the subsequent sections below.

Two (2) small-area BDARs have also been prepared to assess biodiversity impacts associated with the offsite road work areas described in **Section 3.2.9**. These are included as Appendix I (NSW North Coast IBRA Region) and J (Sydney Basin IBRA Region) of the BDAR (**Appendix 8**) and are summarised in the relevant subsections below.

6.4.1 Existing Biodiversity Values

As the Project is being assessed as a linear project, the Assessment Area as defined in the BDAR comprises land 500 m along each side of the centre line of the Subject Land. The Subject Land is equivalent to the Development Corridor as defined in this EIS.

The Assessment Area is approximately 1,929.60 ha and the Subject Land is 418.6 ha, noting that this has been rounded to 419 ha in this EIS.

The Assessment Area is located within the NSW North Coast Bioregion. Within the NSW North Coast Bioregion, the Assessment Area occurs across two (2) subregions, being Tomalla and Upper Hunter.

The NSW North Coast bioregion extends along the state's east coast from north of Newcastle to south of Grafton before continuing inland toward the Queensland border, encompassing diverse climates, landforms, soils and vegetation. The Tomalla subregion is characterised by elevated, rugged terrain typical of the Barrington/North Coast ranges, while the Upper Hunter subregion contains a mix of floodplains, rolling hills and rugged mountain edges.

The NSW North Coast bioregion runs up the east coast of NSW from just north of Newcastle to just south of Grafton, where it continues inland, north to the Queensland border. There is a wide variety of climate, topography, soils and vegetation within this bioregion.

The Tomalla subregion features elevated, rugged terrain with ecosystems typical of the Barrington/North Coast region, while the Upper Hunter subregion comprises a mix of floodplains, undulating hilly terrain and rugged mountain borders.

The Assessment Area contains several streams that range from 1st order to 6th order streams, as per the Strahler System of ordering watercourses. The main stream passing through the Assessment Area is Bowmans Creek, which runs perpendicular to the transmission corridor in the southern portion of the Project Area. The lower order creeks are largely ephemeral while higher order creeks, including Bowmans Creek appear to have intermittent flow. Riparian corridors have been assigned in accordance with Appendix E of the BAM.

No important wetlands listed in the Directory of Important Wetlands in Australia are present in the Assessment Area. The closest important wetland based on the Directory of Important Wetlands in Australia is the Barrington Tops Swamps, located approximately 30 km north-east of the northernmost point of the Development Corridor.

A fauna corridor occurs in the north-eastern parts of the Assessment Area. The vegetation in this corridor lies at the western extent of a band of dense vegetation that extends generally eastwards towards Mount Royal National Park (NP). The distance between the south-western corner of Mount Royal NP and the north-east parts of the Development Corridor is approximately 8km. However, due to the meandering nature of the corridor, the length of the existing vegetation corridor between from the Development Corridor and Mount Royal NP boundary is approximately 12 km.

No karsts, caves, crevices, cliffs or areas of geological significance have been identified within the Assessment Area. Two (2) small rock faces were identified within the Assessment Area although outside the Development Corridor. These were not considered to be a major geological feature although have been considered as potential habitat for the microchiropteran bat species known to utilise cliffs and caves.

The NSW Mitchell Landscapes that occur in the Development Corridor and Assessment Area include:

- Manning Great Escarpment South; and
- Scone – Gloucester Foothills.

The extent of native vegetation cover within the Development Corridor was confirmed and revised where necessary through surveys of the site by Cumberland Ecology/SLR through 2022 to 2025 in conjunction with available SVTM data. There were no differences found between the mapped vegetation extent and aerial imagery utilised by this assessment.

Native vegetation cover occupies approximately 898.03 ha, which represents 47% of the Assessment Area. The remaining land within the Assessment Area comprises cleared land. The native vegetation extent within the Development Corridor was determined through aerial photograph interpretation, desktop assessments and field surveys.

The native vegetation extent (including DNG) occupies approximately 394.54 ha, which represents approximately 94% of the Development Corridor. The native vegetation extent within the Development Corridor comprises a mix of remnant woody vegetation (85.79 ha or 20%) and DNG (308.75 ha or 74%).

The remaining areas within the Development Corridor are comprised of exotic/cleared areas and the extent of these across the Development Corridor is 24.1 ha (~6%) while the extent across the Disturbance Footprint is 16.02 ha (~9%).

6.4.2 Plant Community Types (PCT)

Identification of the PCTs occurring within the Development Corridor within the Project Area and offsite areas of impact was guided by the results of the Cumberland Ecology/SLR surveys. The data collected during surveys of the Development Corridor was analysed in conjunction with a review of the PCTs held within the VIS database.

A total of eight (8) PCTs were recorded across the Development Corridor, with four (4) of these PCTs occurring in two (2) condition states. Details of these PCTs are provided in Section 4.2 of **Appendix 8**, and are summarised as follows:

- PCT 3240: Lower North Escarpment Red Gum Grassy Forest–Wet Sclerophyll Forests (Grassy sub-formation) in conditional states (Woodland and DNG) present in the Tomalla Subregion and Upper Hunter Subregion.
- PCT 3241: Lower North White Mahogany-Spotted Gum Moist Forest–Wet Sclerophyll Forests (Grassy sub-formation) in conditional states (Woodland and DNG) present in the Tomalla Subregion and Upper Hunter Subregion.
- PCT 3315: Central Hunter Ironbark-Spotted Gum Forest–Grassy Woodlands in conditional states (Woodland and Derived Native Grasslands) present in the Upper Hunter Subregion.
- PCT 3396: Northwest Slopes Box-Blakelys Red Gum Woodland–Grassy Woodlands in conditional states (Woodland and DNG) present in the Tomalla Subregion and Upper Hunter Subregion.
- PCT 3354: Liverpool Range Box-Silvertop Stringybark Forest–Grassy Woodlands in conditional state (Woodland) present in the Tomalla Subregion.
- PCT 3114: Upper Hunter Ranges Moist Gully Forest – Rainforest in conditional states (Dry Rainforest) present in the Tomalla Subregion.

- PCT 4073: Lower North Hinterland River Oak Forest – Grassy Woodland in conditional states (Riparian) present in the Upper Hunter Subregion.
- PCT 3076: Hunter Valley Whalebone Dry Rainforest – Rainforest in conditional states (Dry Rainforest) present in the Upper Hunter Subregion.

The PCTs within the Development Corridor are identified in **Figure 6.8 (a-f)**.



Figure 6.8a Plant Community Types (Section 1)

Source: SLR (2026)

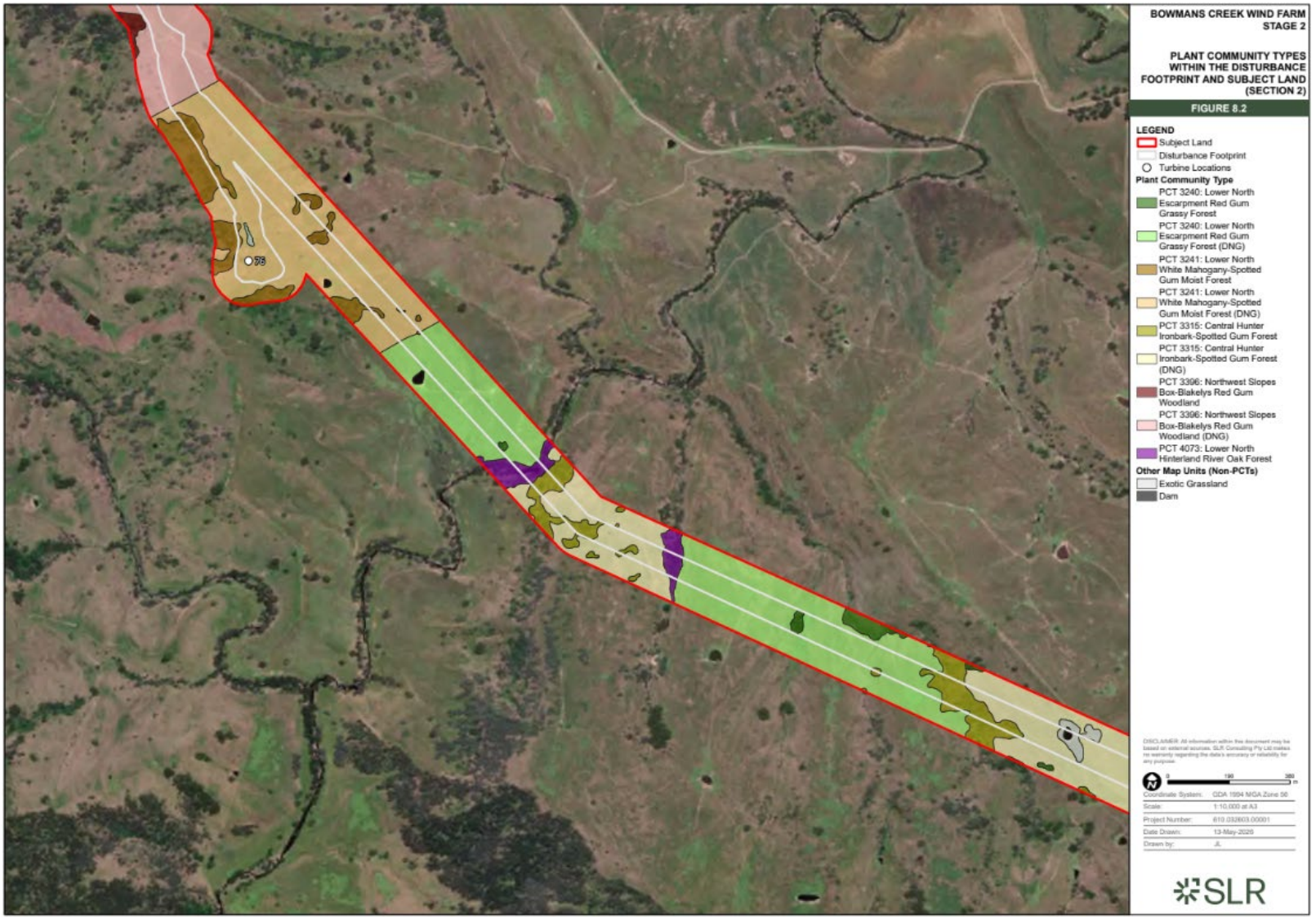


Figure 6.8b Plant Community Types (Section 2)

Source: SLR (2026)



Figure 6.8c Plant Community Types (Section 3)

Source: SLR (2026)

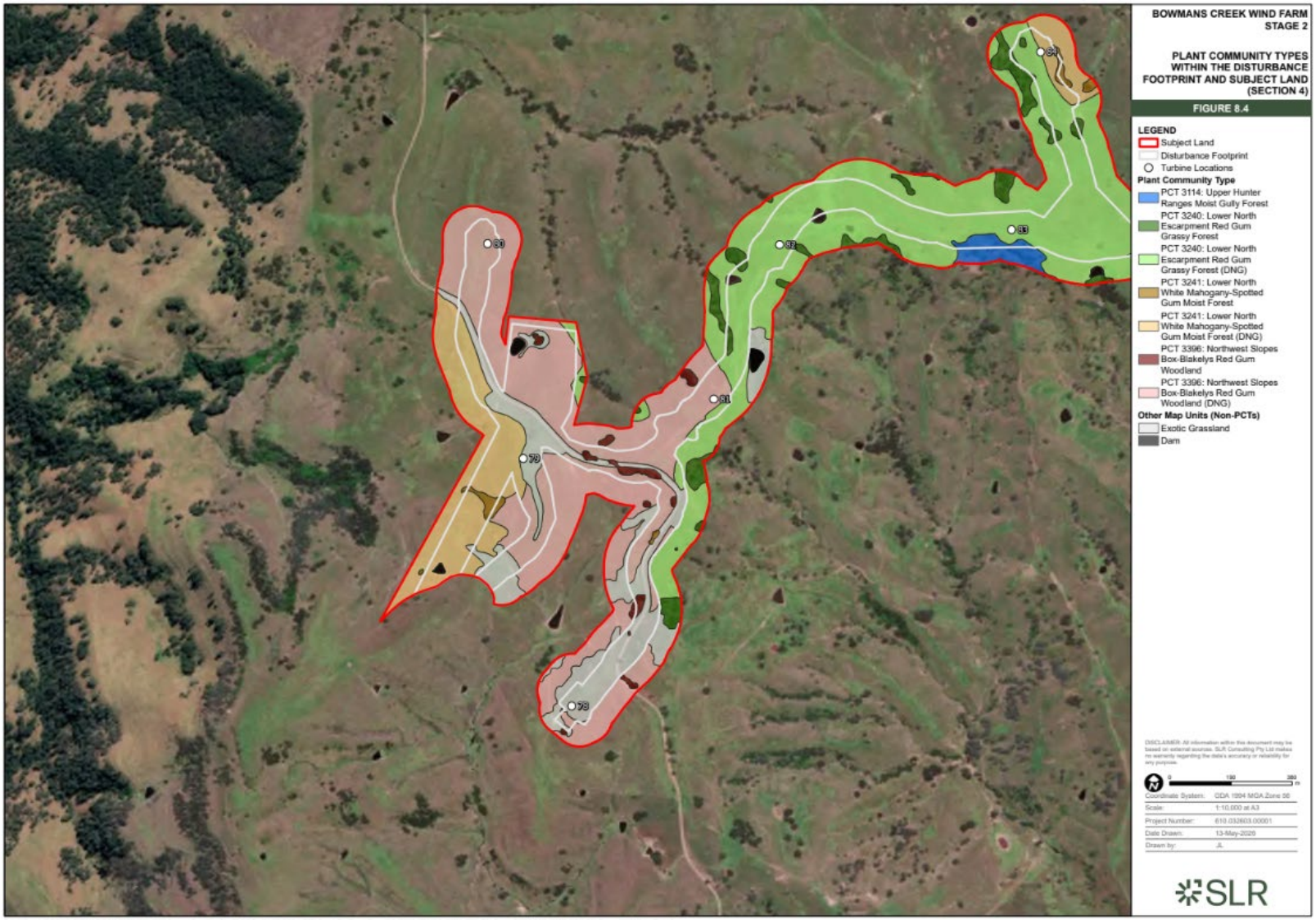


Figure 6.8d Plant Community Types (Section 4)

Source: SLR (2026)

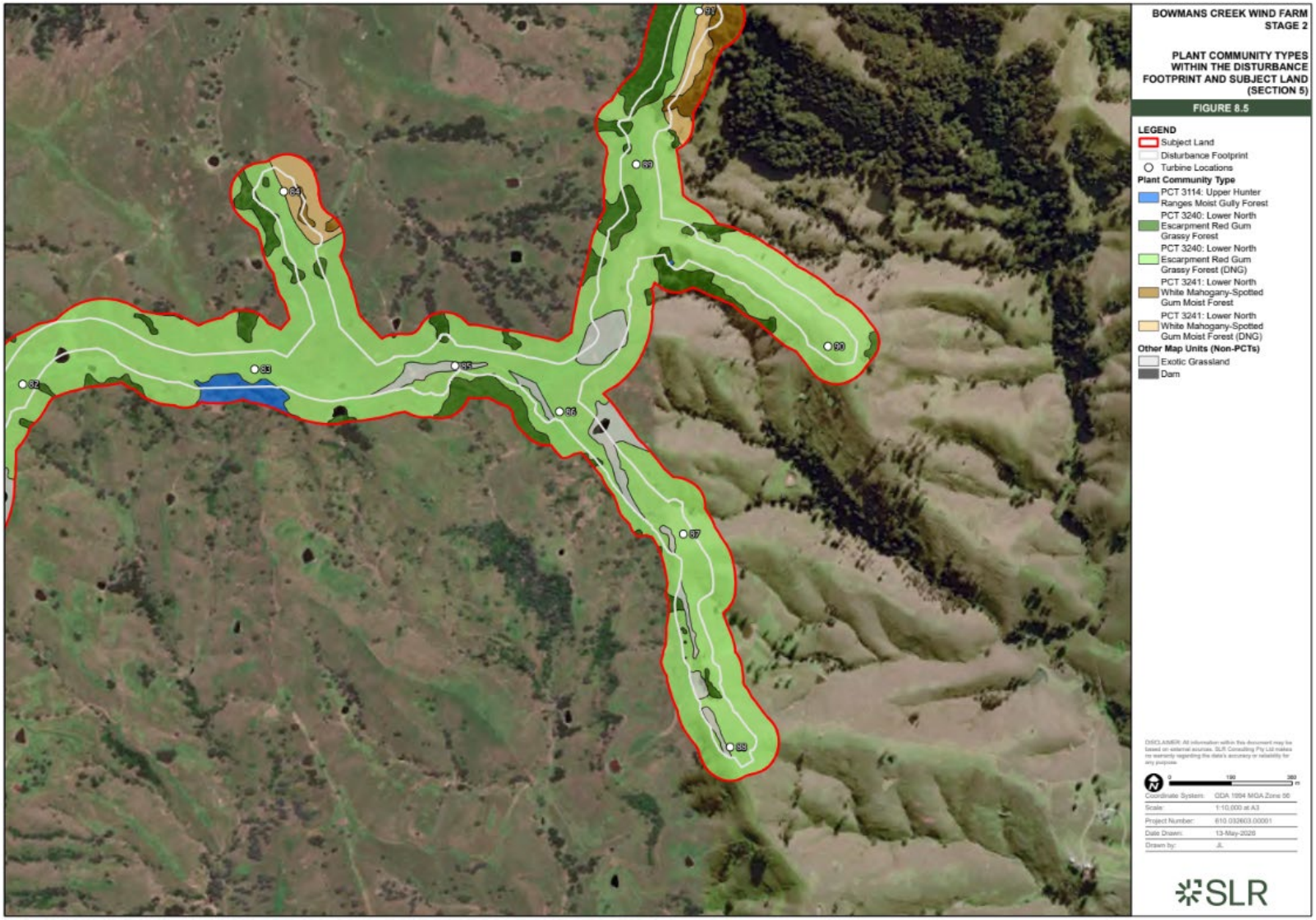


Figure 6.8e Plant Community Types (Section 5)

Source: SLR (2026)

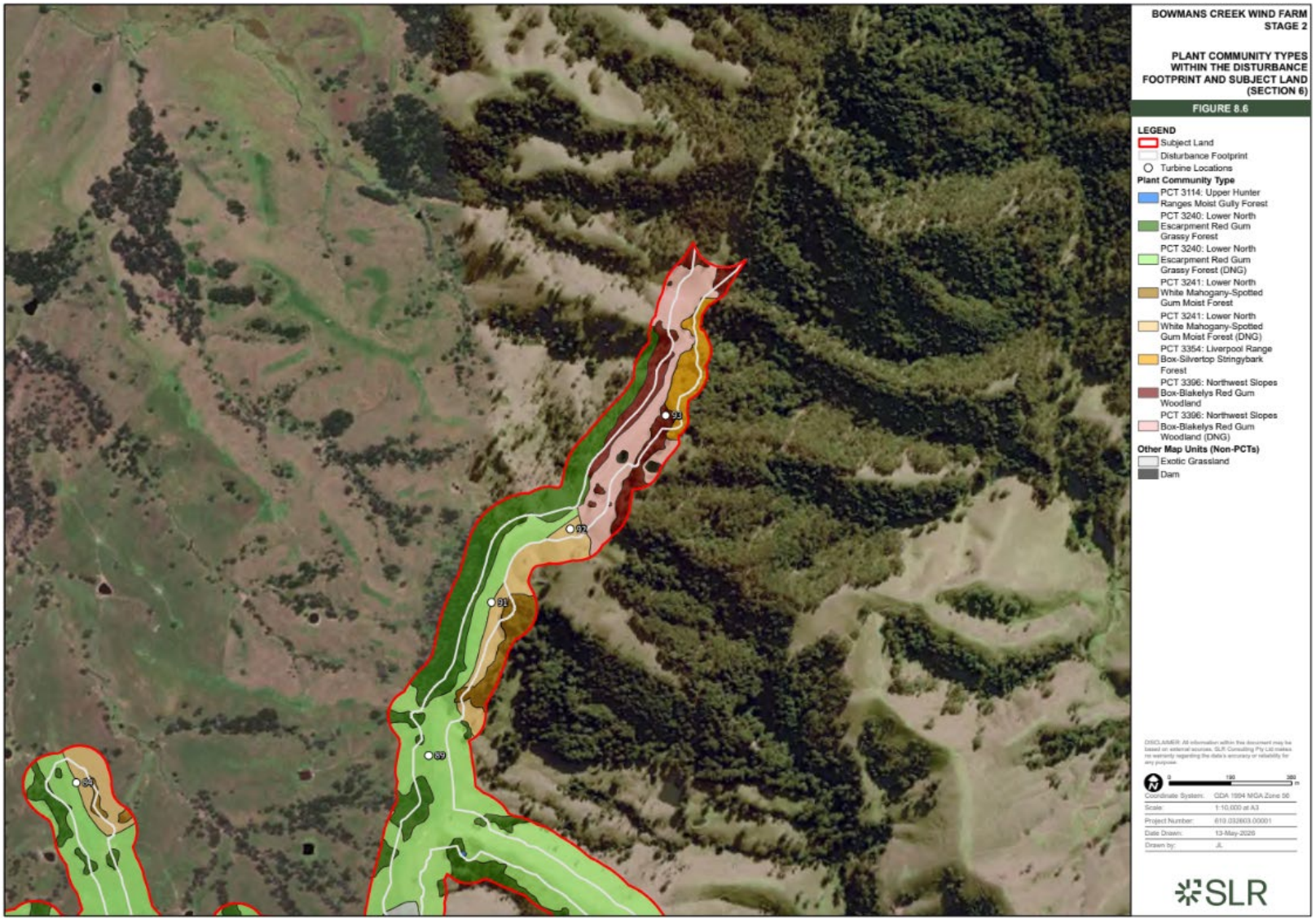


Figure 6.8f Plant Community Types (Section 6)

Source: SLR (2026)

6.4.3 Threatened Ecological Communities (TEC)

PCTs and TECs are different classification systems that have been developed independently of each other. In the BioNet Vegetation Classification database, the relationship between PCTs and TECs are summarised in terms of their potential equivalence to each other where each PCT includes a description of its relationship and degree of fit to both State and Commonwealth listed TECs. However, the PCT-TEC relationships outlined within the BioNet Vegetation Classification database may not necessarily be correct, and therefore vegetation on site must be assessed against the respective Final Determination or Listing Advice for the TEC under both the BC Act and EPBC Act.

The assemblage of species, area of occupancy, and supplementary descriptors outlined within the NSW Scientific Committee's Scientific Determination under the BC Act for each of the potential TECs were compared against each associated PCT present within the Development Corridor. The same activity was also carried out against the listing advice for the TEC under the EPBC Act.

A total of three (3) PCTs within the Development Corridor and Disturbance Footprint have been assessed as conforming to a TEC listed under the BC Act and/or EPBC Act. It should be noted that due to differences in TEC definitions under the BC Act and EPBC Act, some PCTs conform to a TEC under both BC Act and EPBC Act, while others conform to a TEC under one (1) Act only.

Section 4.3 of **Appendix 8** summarises the PCTs identified within the Development Corridor that conform to TECs as listed under the BC Act and the EPBC Act respectively and their distribution is shown on **Figure 6.9 (a-f)**.

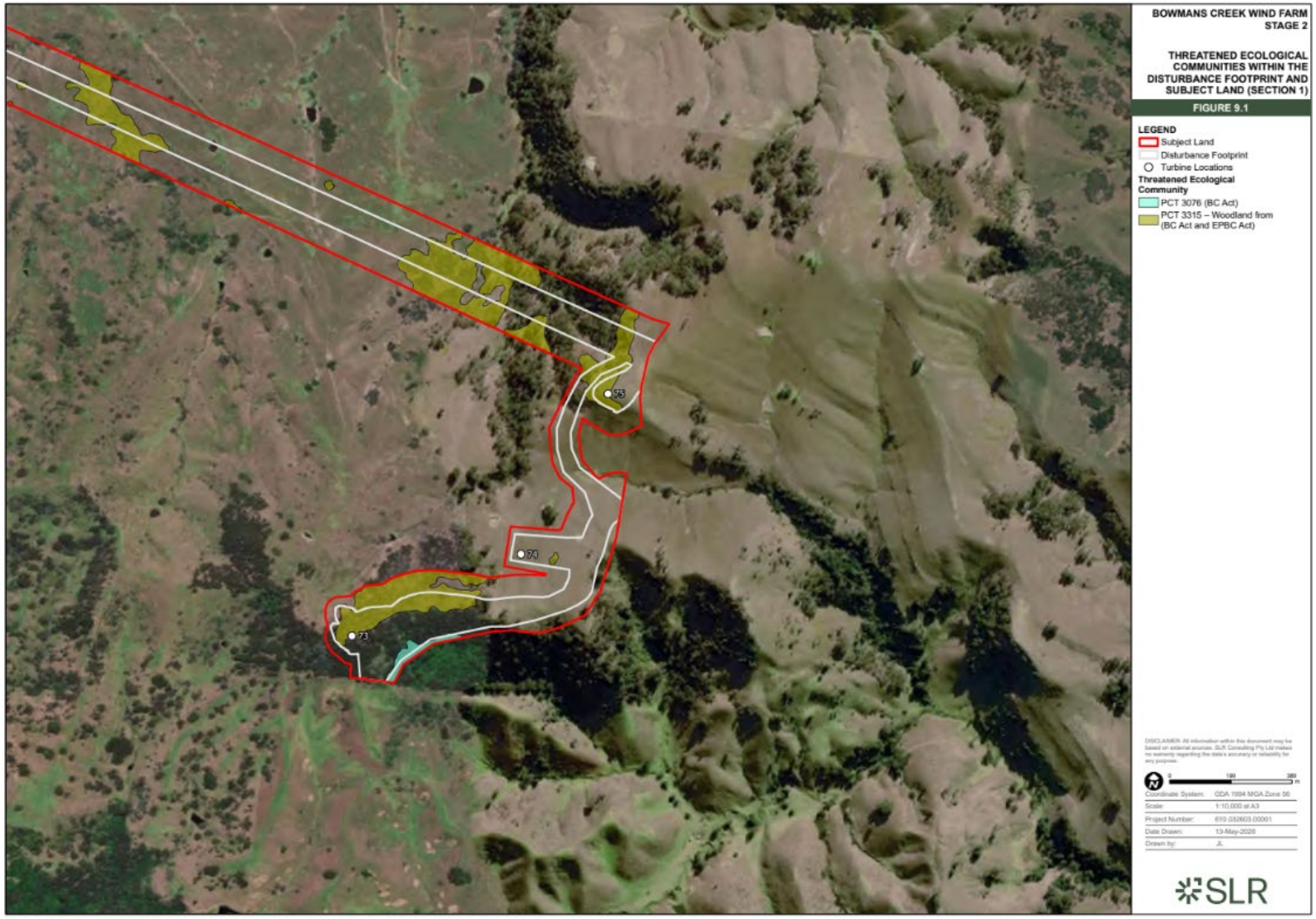


Figure 6.9a Threatened Ecological Communities (Section 1)

Source: SLR (2026)

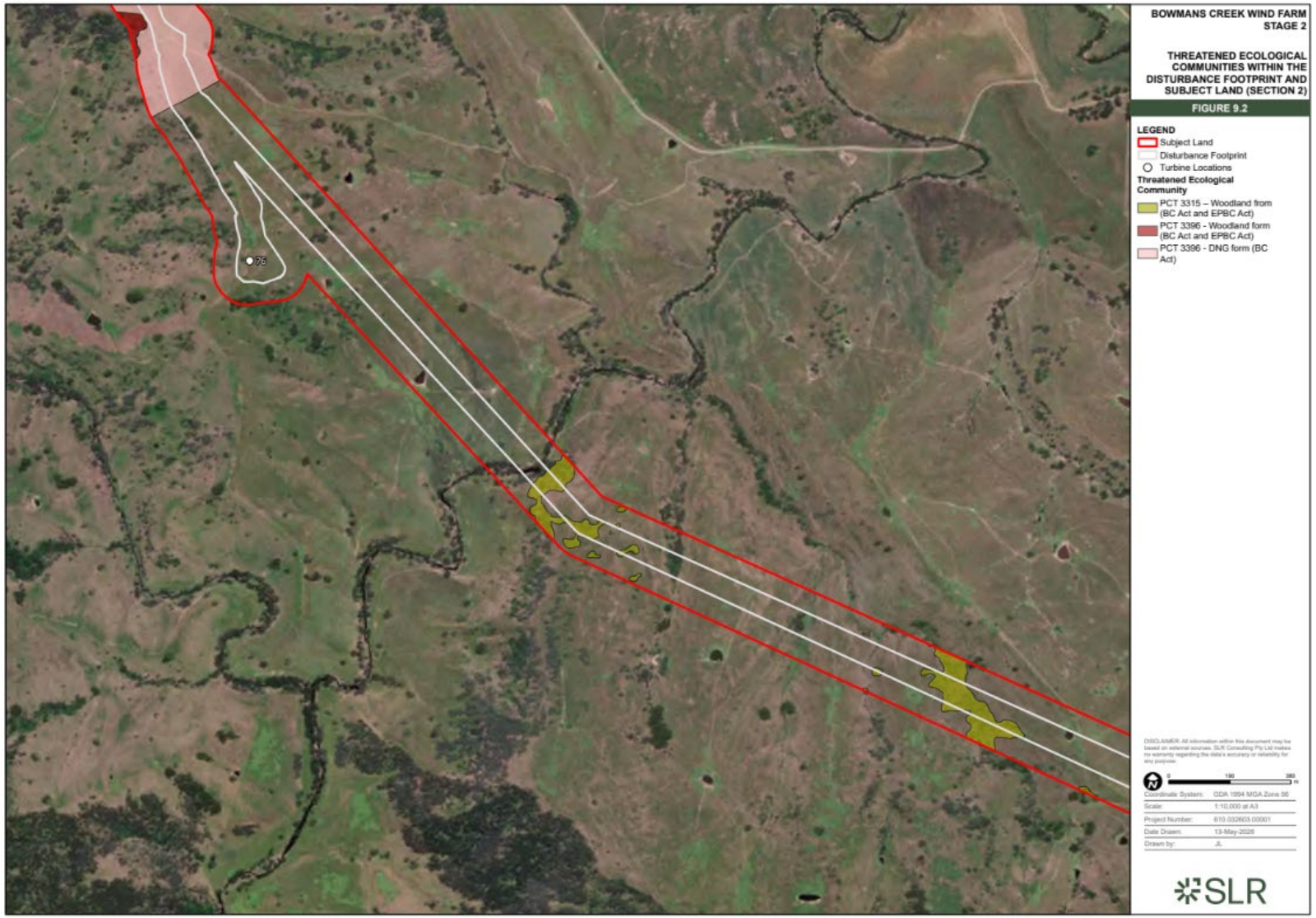


Figure 6.9b Threatened Ecological Communities (Section 2)

Source: SLR (2026)



Figure 6.9c Threatened Ecological Communities (Section 3)

Source: SLR (2026)

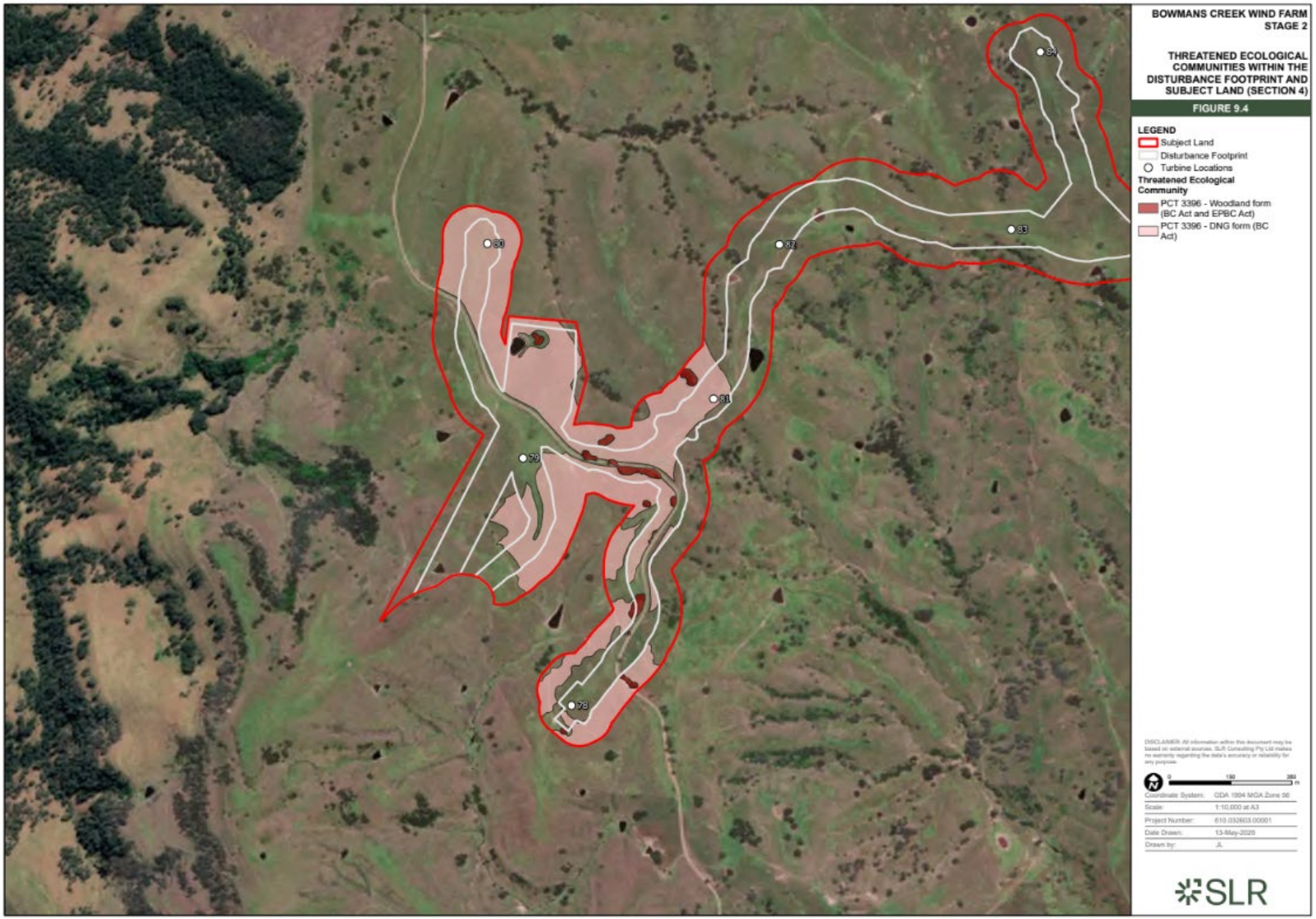


Figure 6.9d Threatened Ecological Communities (Section 4)

Source: SLR (2026)



Figure 6.9e Threatened Ecological Communities (Section 5)

Source: SLR (2026)



Figure 6.9f Threatened Ecological Communities (Section 6)

Source: SLR (2026)

6.4.4 Groundwater Dependant Ecosystems

Groundwater dependent ecosystems (GDEs) rely on the presence of groundwater to function and sustain the resident assemblage of species, populations, and ecological communities. The level of groundwater dependence of vegetation communities in the Development Corridor has been identified using the GDE Atlas (BoM 2024) and the Risk assessment guidelines for groundwater dependent ecosystems (Serov, 2012).

The GDE Atlas delineates and provides information about the following three (3) types of GDEs (BoM 2017):

- Aquatic ecosystems that rely on the surface expression of groundwater – This includes surface water ecosystems which may have a groundwater component, such as rivers, wetlands, and springs. Marine and estuarine ecosystems can also be groundwater dependent, but they are not mapped in the GDEs Atlas.
- Terrestrial ecosystems that rely on the subsurface presence of groundwater – This includes all vegetation ecosystems.
- Subterranean ecosystems – This includes cave and aquifer ecosystems.

Within the terrestrial ecosystem type, an area of vegetation can be classified as either a high potential, moderate potential or low potential GDE. As per the GDE, Atlas the Development Corridor is mapped as containing the following types of GDEs:

- Aquatic–Moderate Potential GDE.
- Terrestrial – High Potential GDE.
- Terrestrial – Low Potential GDE.

Based on the NSW Guidelines GDE classification decision tree and list of possible groundwater dependent vegetation communities for the Hunter-Central Rivers Catchment Management Authority (CMA), the PCTs within the Development Corridor that could potentially comprise Terrestrial GDEs include:

- PCT 4073–Lower North Hinterland River Oak Forest.
- PCT 3076–Hunter Valley Whalebone Dry Rainforest.
- PCT 4073 occurs along creek lines where vegetation primarily relies on soil moisture and surface water available during flow events. Because the creeks in the Development Corridor are mostly ephemeral or intermittent, groundwater contributes little to no baseflow. As a result, PCT 4073 is unlikely to be groundwater-dependent and, at most, functions as an opportunistic GDE—only using groundwater when it is incidentally available.
- As PCT 3076 occurs at relatively high elevations on hillslopes, it is unlikely to be able to access deeper groundwater sources and therefore is considered, at most, to be an opportunistic GDE.

6.4.5 Threatened Species

In accordance with the BAM threatened species have been assessed as predicted or ecosystem credit species and species credit species.

Ecosystem credit species are those threatened species that can reliably be predicted to occur based on the PCTs identified within the Development Corridor. The BAM Calculator (BAM-C) generates a list of predicted ecosystem credit species from numerous inputs such as landscape features and the native vegetation communities present. Species credit species are those threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates and therefore require further consideration through an assessment of habitat suitability. The BAM-C generates a list of species credit species based on numerous inputs such as the distribution of the species occurring within the same IBRA subregion as the Development Corridor and the presence of habitat features and components associated within these species.

A comprehensive process of ecosystem credit species and species credit species identification, habitat assessment and threatened species survey occurred as detailed in **Section 2.2**, **Section 2.3**, and **Section 2.4** of **Appendix 8**.

The BAM-C generated a combined list of 40 ecosystem credit species and 50 species credit species across the two (2) IBRA subregions. These totals include 10 dual credit species which are considered as ecosystem credit species for their foraging habitat and as species credit species for their breeding habitat.

There were 18 ecosystem credit species (or ecosystem components of dual credit species) recorded within the Development Corridor during the field surveys:

- Brown Treecreeper (*Climacteris picumnus victoriae*)–vulnerable under the BC Act and EPBC Act.
- Dusky woodswallow (*Artamus cyanopterus cyanopterus*)–vulnerable under the BC Act.
- Flame Robin (Petroica phoenicea)–vulnerable under the BC Act.
- Glossy black cockatoo (*Calyptorhynchus lathami lathami*)–vulnerable under the BC Act and EPBC Act.
- Grey crowned babbler (*Pomatostomus temporalis temporalis*)–vulnerable under the BC Act.
- Little Eagle (*Hieraaetus morphnoides*)–vulnerable under the BC Act.
- Little Lorikeet (*Parvipsitta pusilla*)–vulnerable under the BC Act.
- Scarlet Robin (*Petroica boodang*)–vulnerable under the BC Act.
- Spotted Harrier (*Circus assimilus*)–vulnerable under the BC Act.
- Square-tailed Kite (*Lophoictinia isura*)–vulnerable under the BC Act.
- Varied Sittella (*Daphoenositta chrysoptera*)–vulnerable under the BC Act.
- White-bellied Sea- Eagle (foraging) (*Haliaeetus leucogaster*)–vulnerable under the BC Act.
- White-throated Needletail (*Hirundapus caudacutus*)–vulnerable under the BC Act and EPBC Act.
- Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*)–vulnerable under the BC Act.
- Large Bent-winged Bat (foraging) (*Miniopterus orianae oceanensis*)–vulnerable under the BC Act.
- Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*)–vulnerable under the BC Act.
- Spotted-tailed Quoll (*Dasyurus maculatus*)–vulnerable under the BC Act, endangered under the EPBC Act.
- Yellow-bellied Glider (*Petaurus australis*)–vulnerable under the BC Act.

A total of 16 threatened flora candidate species credit species were considered to have potential associated habitat within the Development Corridor and were the subject of targeted surveys. No threatened flora species were recorded during the targeted surveys.

A total of 22 threatened fauna species credit species were considered to have potential associated habitat within the Subject Land and were retained for further assessment. A total of 20 of the 22 threatened fauna species credit species retained for further assessment were the subject of targeted surveys. Of these, four (4) threatened fauna species were recorded during the targeted surveys:

- Large-eared Pied Bat (*Chalinolobus dwyeri*)–endangered under the BC Act and EPBC Act.
- Southern Myotis (*Myotis macropus*)–vulnerable under the BC Act.
- Brush-tailed Phascogale (*Phascogale tapoatafa*)–vulnerable under the BC Act.
- Powerful Owl (*Ninox strenua*)–vulnerable under the BC Act.

One (1) threatened fauna species, the Koala (*Phascolarctos cinereus*) was assessed via expert report and confirmed as not occurring within the Development Corridor. The Koala expert report is included as Appendix G of **Appendix 8**.

The modelled distribution maps for the Southern Purple-spotted Gudgeon (*Mogurnda adspersa*) indicate the potential occurrence to the south-west of the Development Corridor. No areas of modelling distribution intersect with the Project.

6.4.6 Avoidance and Minimisation of Impacts

As detailed in **Section 2.6.3** and identified in **Figure 2.13**, **Figure 2.14** and **Figure 2.15**, the Project has been refined to avoid and minimise potential impacts on biodiversity values including:

- **Minimising impacts to potential SAII entities.** Preparation of threatened species polygons as a component of the BDAR identified areas of the Disturbance Footprint that interacted with potential SAII entities, including the critically endangered Box Gum Woodland (woodland form) TEC in the southern portion of the Project Area, potential breeding habitat for the LEPB in the northern portion of the Project Area between WTGs 82 and 83, and potential LEPB breeding habitat along the overhead transmission line in the southern portion of the Project Area. With this information on hand, BCWF undertook Project design refinements to avoid interacting with areas of potential SAII as far as reasonably practical, including
    - the complete avoidance of the potential LEPB breeding habitat buffer in the northern portion of the Project Area,
    - design of the overhead transmission line to avoid siting transmission line towers within LEPB breeding habitat and enable adequate height clearance of the transmission line cables from the potential LEPB breeding habitat (described further in **Section 2.6.3.3** above), and
    - avoiding impact to the majority of the woody vegetation component of the Box Gum Woodland. As outlined in the BDAR, 34.48 ha of Box Gum Woodland grassland form are identified for impact, with only 3.02 ha of woodland form being impacted.

- **Avoiding and minimising impacts to native vegetation, particularly TECs:** from Project inception, regional vegetation mapping was integrated into BCWF's model for WTG placement to focus on avoiding high and medium value vegetation and areas of threatened ecological communities. As biodiversity fieldwork progressed and a more detailed understanding of the biodiversity values of the Project Area became available, the Development Corridor was progressively refined, and the indicative Disturbance Footprint was designed such that impacts to native vegetation and particularly impacts to threatened ecological communities were reduced as far as reasonably practicable.
- **Minimising interactions with Biodiverse Riparian Land**: BCWF has sought to avoid placement of WTGs and other key infrastructure within GDEs along the proposed overhead transmission line alignment in the southern portion of the Project Area. The placement of transmission poles has been designed to avoid direct impacts to riparian woodland and DNG. While one (1) stream crossing is still required, this is limited to the overhead transmission line. The poles are largely located in areas that are highly modified from existing land uses but have nonetheless been minimised as far as reasonably practicable.

BCWF is committed to further avoidance and minimisation of impacts to biodiversity during detailed design, construction, and operation.

6.4.7 Impact Assessment

6.4.7.1 Direct Impacts

Residual Direct Impacts on Native Vegetation and Threatened Species

Direct impacts are described in the BAM as those impacts on biodiversity values and threatened species habitat that relate to clearing native vegetation and impacts on biodiversity values prescribed by the BC Regulation. This includes impacts from activities related to the construction or operational phase of the proposal. Within the Disturbance Footprint, clearance of native vegetation has presumed to result in complete loss of biodiversity values, with complete loss of individuals occupying that area of vegetation and complete loss of any habitat values.

Table 6.12 identifies the proposed impacts to vegetation and threatened species habitat within the Disturbance Footprint.

Of the mapped PCTs/vegetation zones within the Development Corridor, only Zone 11 – 4073 Riparian Woodland constitutes Key Fish Habitat (KFH) under the NSW *Fisheries Management Act 1994* (FM Act). Therefore, a total area of 0.74 ha of KFH may be potentially impacted by the proposed development.

Table 6.12 Summary of residual direct impacts

Entity	BC Act Status	EPBC Act Status	SAII Entity	Project Phase / Timing of Impact	Extent – Total	Extent – Tomalla	Extent – Upper Hunter
Zone 1–3240 Woodland	-	-	No	Construction	7.95	4.11	3.84
Zone 2–3240 DNG	-	-	No	Construction	63.40	52.89	10.51
Zone 3–3241 Woodland	-	-	No	Construction	7.00	0.76	6.24
Zone 4–3241 DNG	-	-	No	Construction	21.56	9.01	12.54
Zone 5–3315 Woodland	EEC	CEEC	No	Construction	9.10	-	9.10
Zone 6–3315 DNG	-	-	No	Construction	16.87	-	16.87
Zone 7–3396 Woodland	CEEC	CEEC	Yes	Construction	3.02	3.02	-
Zone 8–3396 DNG	CEEC	-	Yes	Construction	31.46	29.18	2.28
Zone 9–3354 Woodland	-	-	No	Construction	1.50	1.50	-
Zone 10–3114 Dry Rainforest	-	-	No	Construction	0.68	0.68	-
Zone 11–4073 Riparian woodland	-	-	No	Construction	0.74	-	0.74
Zone 12–3076 Dry Rainforest	VEC	-	No	Construction	0.31	-	0.31

Entity	BC Act Status	EPBC Act Status	SAII Entity	Project Phase / Timing of Impact	Extent – Total	Extent – Tomalla	Extent – Upper Hunter
Large-eared Pied Bat	E	E	Yes–breeding habitat only	Construction	7.65	3.60	4.05
Southern Myotis	V	-	No	Construction	0.85	0.00	0.85
Brush-tailed Phascogale	V	-	No	Construction	28.87	9.38	19.49
Powerful Owl	V	-	No	Construction	4.00	4.00	0.00
Hunter Valley Delma	E	E	No	Construction	163.58	101.14	62.44

Aquatic Habitats

The Project will not involve the construction of any creek crossings and the component of KFH which intersects with Development Corridor comprises the proposed overhead reticulation. The Development Corridor is mapped as an area of disturbance, on ground disturbance will be limited to spaced out poles/masts for the transmission lines. Transmission poles/masts will be cited in open grassland areas outside of the existing Bowmans Creek riparian corridor. Thus, the Project will not block or divert any existing fish passages, as such, it is considered unlikely to significantly impact upon any areas mapped as KFH.

Vegetation Integrity

Table 6.13 details the change in vegetation integrity score for each vegetation zone. The direct impacts of the Project only involve one (1) management zone, being the total clearing of vegetation within the Disturbance Footprint.

As the same plots have been used across both IBRA subregions, the vegetation integrity scores remain the same across both the Tomalla and Upper Hunter subregions.

Table 6.13 Impacts to Vegetation Integtrity

Vegetation Zone	DFA (ha) – Total	DFA (ha) – Tomalla	DFA (ha) – Upper Hunter	Composition (BD)	Structure (BD)	Function (BD)	VI Score (BD)	Composition (AD)	Structure (AD)	Function (AD)	VI Score (AD)	Change in VI Score
Zone 1–3240 Woodland	7.95	4.11	3.84	62.0	67.2	52.0	60.1	0.0	0.0	0.0	0.0	-60.1
Zone 2–3240 DNG	63.40	52.89	10.51	18.4	32.0	0.6	8.4	0.0	0.0	0.0	0.0	-8.4
Zone 3–3241 Woodland	7.00	0.76	6.24	84.0	78.3	85.7	82.6	0.0	0.0	0.0	0.0	-82.6
Zone 4–3241 DNG	21.56	9.01	12.54	23.6	31.9	0.2	9.1	0.0	0.0	0.0	0.0	-9.1
Zone 5–3315 Woodland	9.10	-	9.10	92.4	72.3	61.1	74.2	0.0	0.0	0.0	0.0	-74.2
Zone 6–3315 DNG	16.87	-	16.87	31.5	49.0	0.6	11.6	0.0	0.0	0.0	0.0	-11.6
Zone 7–3396 Woodland	3.02	3.02	-	77.2	86.5	78.1	80.5	0.0	0.0	0.0	0.0	-80.5
Zone 8–3396 DNG	31.46	29.18	2.28	26.7	67.3	0.6	12.2	0.0	0.0	0.0	0.0	-12.2
Zone 9–3354 Woodland	1.50	1.50	-	99.3	99.8	85.7	94.7	0.0	0.0	0.0	0.0	-94.7
Zone 10–3114 Dry Rainforest	0.68	0.68	-	58.7	52.7	36.4	48.3	0.0	0.0	0.0	0.0	-48.3
Zone 11–4073 Riparian woodland	0.74	-	0.74	85.5	89.2	87.2	87.3	0.0	0.0	0.0	0.0	-87.3
Zone 12–3076 Dry Rainforest	0.31	-	0.31	84.3	96.1	74.6	84.5	0.0	0.0	0.0	0.0	-84.5

Note: DFA = Disturbance Footprint Area, BD = Before Development, AD = After Development

6.4.7.2 Indirect Impacts

As per the BAM, indirect impacts are those 'that occur when the proposal affects native vegetation and threatened species habitat beyond the Development Corridor or within retained areas. This includes impacts from activities related to the construction or operational phase of the proposal and prescribed impacts. A summary of the indirect impacts associated with the Project are provided in **Table 6.14** below.

Table 6.14 Indirect Biodiversity Impacts

Indirect Impact	Impacted Entities	Extent	Frequency	Duration	Project Phase / Timing of Impact	Likelihood and Consequences
Inadvertent impacts on adjacent habitat or vegetation	Threatened Ecological Communities (Lower Hunter Valley Dry Rainforest, Central Hunter Ironbark – Spotted Gum–Grey Box Forest in the NSW North Coast and Sydney Basin Bioregions, White Box–Yellow Box–Blakely's Red Gum Grassy Woodland and Derived Native Grassland Habitat for threatened fauna	Disturbance Footprint and Development Corridor	For the duration of construction	Medium term – 2-3 years	Construction	Low likelihood of occurring provided exclusion fencing is in place prior to construction. Disturbance and damage to adjacent vegetation and disturbance to resident fauna; reduction in quality of adjacent vegetation and habitats.
Reduced viability of adjacent habitat due to edge effects	Native vegetation and associated general fauna habitats	Disturbance Footprint and Development Corridor	For the duration of construction	Medium term – 2-3 years	Construction	Low likelihood of occurring; could impact condition of retained vegetation and habitats.
Reduced viability of adjacent habitat due to noise, dust or light spill	Native vegetation and associated general fauna habitats	Disturbance Footprint and Development Corridor	For the duration of construction; possible ongoing lighting impacts due to safety / operational lighting during operations	Medium term – 2-3 years Long term – 35 years	Construction Operation	Dust likely to be deposited in vegetation adjacent to access roads, extending over approximately 5–10 m. Noise potentially resulting in disturbance of fauna over a wider distance. Lighting during operations limited to site buildings and safety requirements. Lighting can attract insects increasing feeding opportunities for microbats.

Indirect Impact	Impacted Entities	Extent	Frequency	Duration	Project Phase / Timing of Impact	Likelihood and Consequences
						Moderate likelihood of occurring; could reduce quality of habitats for foraging and breeding activities of local or resident fauna.
Transport of weeds and pathogens from the site to adjacent vegetation	Threatened Ecological Communities (Lower Hunter Valley Dry Rainforest, Central Hunter Ironbark – Spotted Gum–Grey Box Forest in the NSW North Coast and Sydney Basin Bioregions, White Box–Yellow Box–Blakely's Red Gum Grassy Woodland and Derived Native Grassland Habitat for threatened fauna	Disturbance Footprint and Development Corridor	Daily throughout construction	Medium-term	Construction Operation (to a lesser extent)	Moderate likelihood of occurring and could result in a reduction in native flora diversity and increase in cover and diversity of weeds (including high threat weeds), and function of the adjacent vegetation.
Increased risk of starvation, exposure and loss of shade or shelter	Native fauna (threatened and non-threatened species)	Across vegetation zones: Zone 1, Zone 3, Zone 5, Zone 7, Zone 9, Zone 10, Zone 11 and Zone 12	During clearing	Long-term	Construction Operation (to a lesser extent)	Moderate likelihood of occurring as loss of woody vegetation may increase risk of exposure and a loss of shade/shelter as well as potentially increase the risk of starvation due to increased competition for remaining resources.

Indirect Impact	Impacted Entities	Extent	Frequency	Duration	Project Phase / Timing of Impact	Likelihood and Consequences
Loss of breeding habitat	Native fauna (threatened and non-threatened species)	Across vegetation zones: Zone 1, Zone 3, Zone 5, Zone 7, Zone 9, Zone 10, Zone 11 and Zone 12	Ongoing during clearing works as trees are felled, rare to unlikely following clearing	Long-term	Construction	High Likelihood of occurrence as hollow-bearing trees are present in all woody vegetation zones. Reduction in available breeding habitat of hollow-dependent fauna and increased competition for hollows outside of the Subject Land. Impacts to fauna during clearing works to be managed via implementation of mitigation measures under the BMP.
Rubbish dumping	Native vegetation and associated general fauna habitats	Disturbance Footprint and Development Corridor	Daily during construction and operations	Long term	Construction Operation	Low risk of occurrence with appropriate site management implemented; could result in attraction of pest animal species and scavenger bird species.
Bush rock removal and disturbance	Native fauna (threatened and non-threatened species)	Adjacent parts of Development Corridor	Episodic to rare	Potential long term	Construction	Low risk of occurrence with appropriate delineation of work boundaries.
Increase in predatory species populations	Bird species – WTG collision increases carrion availability leading to increased numbers of predators and scavengers, including bird species that are susceptible to WTG strike	Disturbance Footprint and Development Corridor	Daily	Long term	Operation	Moderate risk of occurrence. There is a high risk of a small number of bird and bat species being impacted by WTG collision. Appropriate monitoring and management of carcasses and implementation of the BBAMP will manage potential impacts.
Increased risk of fire	Native vegetation and associated general fauna habitats	Disturbance Footprint and Development Corridor	Episodic	Medium term	Construction	Use of machinery and flammable materials can increase the risk of fire. Low likelihood of occurring provided appropriate measures in the CEMP are implemented.

6.4.7.3 Prescribed Impacts

Karst, Caves, Crevices, Cliffs, Rocks or Other Geological Features of Significance

No karsts, caves, cliffs or areas of geological significance were identified within or in close proximity to the Development Corridor.

However, two (2) small rock faces were identified within the proposed overhead transmission corridor or in close proximity to the northern portion of the Development Corridor. While these rock faces are not considered to be of major geological significance due to their limited extent and location within a highly cleared agricultural landscape, these areas were nonetheless considered as potential habitat for microchiropteran bat species that are known to utilise rocky areas.

As the rockface to the north lies outside of the Development Corridor, no removal or disturbance to the rockface is proposed.

The rockface recorded in the southern parts of the Project Area lies within the overhead transmission corridor. Although parts of the rockface lies within the Disturbance Footprint, works are limited to installation of spaced out power poles for the overhead transmission line with poles proposed to be located at least 50 m away from the rockface. Thus, no removal or disturbance to the rockface is proposed. Furthermore, BCWF has established a no-go zone to avoid impacting potential Large-eared Pied Bat breeding habitat.

Habitat Connectivity

Vegetation corridors within the Development Corridor are fragmented ranging from dense native vegetation on the steeper slopes to lightly wooded areas on spurs and gentle slopes. The most significant vegetation corridor occurs within the north-eastern portion of Development Corridor which extends generally eastwards towards Mount Royal National Park.

Habitat connectivity will be reduced by the removal of 30.29 ha of woody vegetation from the Disturbance Footprint within vegetation zones 1, 3, 5, 7 and 9-12 which form part of fragmented or stepping-stone habitats and is considered to be a long-term impact.

The Project's linear design and narrow clearance corridors, situated mostly within a disturbed agricultural landscape, provide limited opportunity to sever fauna movement pathways or create substantial new habitat fragmentation. As most of the Disturbance Footprint occurs in cleared grasslands or open woodlands with dispersed tree cover, the proposed clearing is not expected to isolate habitat or significantly impact the movement of mobile fauna species.

Vehicle Strikes

Construction vehicle movements, particularly along the access track, present a risk of collision-related injury or mortality for mobile threatened fauna—mainly mammals and birds associated with PCTs within the Development Corridor—with risk highest during dawn, dusk and night when fauna are active. This risk is greatest during the construction phase due to high vehicle volumes and will be mitigated through site-specific traffic controls and signage implemented under the CEMP to reduce potential fauna mortality.

Wind Turbine Strikes

A Prescribed Impact Assessment that considers potential impacts from WTG strikes on bird and bat species has been prepared and is provided in Appendix H of **Appendix 8**. This assessment has been prepared in accordance with Section 6.1.5 and 8.3.5 of the BAM and has considered species that are considered likely or confirmed to occur within the proposed Rotor Swept Area (RSA). The BBUS is ongoing and an updated risk assessment following completion of the BBUS will be provided.

Species considered include:

- 14 threatened bird species
- 113 non-threatened bird species
- 5 threatened bat species and
- 12 non-threatened bat species.

In some instances, non-threatened species (wetland birds and corvids) were assessed as functional groups as opposed to individual species where similar levels of risk were believed to apply. For the purposes of this preliminary risk assessment, only species determined to be likely or confirmed to occur within the Project Area are presented.

A summary of recorded threatened or key bird and bat species assessed is provided in **Table 6.15** below. Two (2) threatened species, White-throated Needletail and Eastern Coastal Free-tail bat were considered a moderate risk to WTG strike. Three non-threatened (albeit key) species, Wedge-tailed eagle, Nankeen Kestrel and White-striped free-tailed bat, were considered a high to moderate risk to turbine strike.

Table 6.15 Prescribed Impacts – Wind Turbine Strikes

Scientific Name	Common Name	SAII Entity	Status	Likelihood of Blade Strike	Consequence	Risk
Aquila audax	Wedge-tailed Eagle	No	Not listed	**Certain**	Moderate	**High**
Artamus cyanopterus cyanopterus	Dusky woodswallow	No	BC Act–V	Unlikely	Low	Negligible
Calyptorhynchus lathami lathami	Glossy black cockatoo	No	BC Act–V EPBC Act–V	Unlikely	Moderate	Low
Circus assimilus	Spotted Harrier	No	BC Act–V	Unlikely	Moderate	Low
Climacteris picumnus victoriae	Brown Treecreeper	No	BC Act–V EPBC Act–V	Unlikely	Low	Negligible
Daphoenositta chrysoptera	Varied Sittella	No	BC Act–V	Unlikely	Low	Negligible
Falco cenchroides	Nankeen Kestrel	No	Not listed	**Almost Certain**	Moderate	**Moderate**
Haliaeetus leucogaster	White-bellied Sea-Eagle	No	BC Act–V	Unlikely	Moderate	Low
Hieraaetus morphnoides	Little Eagle	No	BC Act–V	Unlikely	Moderate	Low
Hirundapus caudacutus	White-throated Needletail	No	BC Act–V EPBC Act–V	**Almost Certain**	Moderate	**Moderate**
Lophoictinia isura	Square-tailed Kite	No	BC Act–V	Unlikely	Moderate	Low
Ninox strenua	Powerful Owl	No	BC Act–V	Unlikely	Moderate	Low
Parvipsitta pusilla	Little Lorikeet	No	BC Act–V	Unlikely	Low	Negligible
Petroica boodang	Scarlet Robin	No	BC Act–V	Unlikely	Low	Negligible
Petroica phoenicea	Flame Robin	No	BC Act–V	Unlikely	Low	Negligible
Pomatostomus temporalis temporalis	Grey crowned babbler	No	BC Act–V	Unlikely	Low	Negligible
Austronomus australis	White striped Freetail Bat	No	Not listed	**Almost certain**	Moderate	**Moderate**

Scientific Name	Common Name	SAII Entity	Status	Likelihood of Blade Strike	Consequence	Risk
Chalinolobus dwyeri	Large-eared Pied Bat	Yes (breeding habitat only)	BC Act–E EPBC Act–E	Unlikely	Moderate	Low
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	No	BC Act–V	**Likely**	Moderate	**Moderate**
Miniopterus orianae oceanensis	Large Bent-winged Bat	No	BC Act–V	Unlikely	Moderate	Low
Myotis macropus	Southern Myotis	No	BC Act–V	Unlikely	Low	Negligible
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	No	BC Act–V	Unlikely	Low	Negligible

6.4.7.4 Koala Expert Assessment

AustIcon Consulting conducted a specialist assessment to assess the presence or absence or koalas and koala habitat within the Development Corridor and is provided as Appendix G of the BDAR (**Appendix 8**).

Methodology

The assessment method included:

- The examination of contemporaneous koala records within a 50-km radius of the approximate centre of the Development Corridor.
- Identification of areas of suitable habitat within the Disturbance Footprint by the PCT mapping undertaken by SLR Consulting.
- Field surveys on 9th December 2025 across nine (9) field sites. Surveys were conducted to determine both the presence of suitable Koala habitat and were additionally assessed for use by koalas.

Results

- The assessment did not find publicly available records within a 10 km radius of the Development Corridor since 2007. The most recent contemporaneous records are located close to the boundary of Mount Royal National Park ~ 15-km north-east of the northern extremity of the Development Corridor.
- Approximately 20% (85.72 ha) of the ~419 ha Development Corridor potentially qualifies as suitable koala habitat, none of which is considered primary koala habitat.
- Despite the presence of suitable habitat, no evidence of habitat utilisation by koalas was recorded within the proposed Development Corridor. No evidence in the form of diagnostic faecal pellets was located by the field survey.

6.4.7.5 Cumulative Impact

Cumulative impacts occur when the impacts from multiple projects or developments combine and the compounding effects are larger than any one (1) of the projects itself has quantified and assessed. The Project will contribute to cumulative impacts on biodiversity during construction and operation along with other large-scale renewable energy projects (operational, under construction, approved and proposed) in the vicinity and within the Hunter-Central Coast REZ. It is considered likely that cumulative impacts will increase the loss of similar native vegetation and threatened species habitat to the Project in the region.

Multiple wind farms along a migration route can create greater cumulative impacts on migratory bird populations than any single project alone. Although evidence of flight-path disruption is limited, migratory birds are considered most vulnerable because they may need to expend additional energy to divert around turbines. However, due to the lack of publicly available monitoring data from Australian wind farms, cumulative impacts cannot currently be reliably assessed. Detecting these impacts requires broad-scale, coordinated monitoring led by species experts, but no such program has yet been established.

A review of publicly available information available at the time of finalisation of the BDAR (**Appendix 8**), for other developments within approximately 60 km of the Project has been undertaken where suitable information to do so was accessible. Potential cumulative biodiversity impacts are provided **Table 6.16**.

Table 6.16 Potential Cumulative Biodiversity Impacts with Other Projects in the Hunter Central Coast REZ

Project Name	Approximate Distance from Project	Biodiversity Values Impacted	Construction Impacts	Operational Impacts
Bowmans Creek Wind Farm Stage 2 (this project)	n/a	Impacts estimated for 162.97 ha of native vegetation across 8 PCTs. TECs impacted: Lower Hunter Valley Dry Rainforest; Central Hunter Ironbark – Spotted Gum–Grey Box Forest in the NSW North Coast and Sydney Basin Bioregions (Central Hunter Valley Eucalypt Forest and Woodland under EPBC Act); White Box–Yellow Box–Blakely's Red Gum Grassy Woodland and Derived Native Grassland. Threatened species Impacted: Large-eared Pied Bat, Southern Myotis, Brush-tailed Phascogale, Powerful Owl.	Removal of vegetation and habitat for the construction of up to 21 wind turbines and associated infrastructure for approximately 120 MW capacity.	Potential Blade strike or barotrauma and potential change in avifauna/microbat behaviour from operation of up to 21 turbines.
Bowmans Creek Wind Farm Stage 1 (Approved)	Adjacent–connects to current project)	Impacts estimated for 280 ha of native vegetation across 18 PCTs. TECs impacted: Lower Hunter Valley Dry Rainforest; Central Hunter Ironbark – Spotted Gum–Grey Box Forest in the NSW North Coast and Sydney Basin Bioregions (Central Hunter Valley Eucalypt Forest and Woodland under EPBC Act); White Box–Yellow Box–Blakely's Red Gum Grassy Woodland and Derived Native Grassland. Threatened species Impacted: Large-eared Pied Bat, Brush-tailed Phascogale, *Acacia bynoeana; Acacia pendula (Hunter population); Asperula asthenes; Callistemon linearifolius; Cynanchum elegans; Diuris tricolor; Eucalyptus glaucina; Grevillea parviflora subsp. parviflora; Monotaxis macrophylla; Ozothamnus tesselatus; Pomaderris queenslandica; Prasophyllum petilum; Prostanthera cineolifera; Pterostylis chaetophora; Pterostylis gibbosa; Rhodamnia rubescens; Rhodomyrtus psidioides; Rutidosis heterogama; Senna acclinis; Thesium australe.*	Removal of vegetation and habitat for the construction of up to 56 wind turbines and associated infrastructure for approximately 347 MW capacity.	Potential Blade strike or barotrauma and potential change in avifauna/microbat behaviour from operation of up to 56 turbines.

Project Name	Approximate Distance from Project	Biodiversity Values Impacted	Construction Impacts	Operational Impacts
Bowmans Creek Wind Farm Stage 1 – MOD 1 BESS	Adjacent– connects to current project)	No additional TECs or species identified outside of those included in the Stage 1 project above.	-	-
New England REZ Transmission Project (EIS Stage)	3 km west of the Project Area	No detailed documentation to date. However scoping report indicates that up to 67 PCTs, including up to 15 TECs, could occur within the transmission line corridor. Up to 30 threatened flora species, 67 threatened fauna species and 15 migratory are known or predicted to occur across the transmission line corridor.	Currently not applicable as no information on detailed site surveys available to date.	Development of new transmission lines between Bayswater Power Station Substation and New England REZ – part of Critical State Significant Infrastructure Strike risk/barotrauma not relevant as not a wind farm.
Liddell Battery and Bayswater Ancillary Works (Approved)	13 km southwest of the Project Area	Impacts estimated for 42.3 ha of native vegetation across 4 PCTs. TECs impacted: Central Hunter Grey Box – Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions Threatened species Impacted: Southern Myotis, Striped Legless Lizard.	Removal of vegetation and habitat for the construction of ancillary works.	Operation of a power station and battery. Strike risk/barotrauma not relevant as not a wind farm.
Muswellbrook Solar Farm (Approved)	15.0 km west of the Project Area	Impacts estimated for 316 ha of native vegetation across 4 PCTs TECs impacted: White Box–Yellow Box–Blakely's Red Gum Grassy Woodland and Derived Native Grassland. Threatened species Impacted: *Diuris tricolor*; *Cymbidium canaliculatum*–endangered population; Large-eared pied bat; Southern Myotis; Brush-tailed Phascogale; Squirrel glider; Hunter Valley Delma.	Removal of vegetation and habitat for the Construction of a 135 MW solar farm with 135 MW/270 MWh BESS.	Operation of a 135 MW solar farm with 135 MW / 270 MWh BESS. Strike risk/barotrauma not relevant as not a wind farm.

Project Name	Approximate Distance from Project	Biodiversity Values Impacted	Construction Impacts	Operational Impacts
Muswellbrook Pumped Hydro Energy Storage (EIS Stage)	15.4 km north-west of the Project Area	No detailed documentation to date. However scoping report indicates potential impacts across five PCTs. TECs potentially impacted include: Hunter Valley Vine Thicket in the NSW North Coast and Sydney Basin Bioregions, Central Hunter Grey Box—Ironbark Woodland and EPBC Act-listed Central Hunter Valley Eucalypt Forest and Woodland. No threatened species recorded to date though potential habitat does occur.	Currently not applicable as no information on detailed site surveys available to date.	Operation of a 500 MW pumped hydro power station, upper and lower reservoirs. Strike risk/barotrauma not relevant as not a wind farm.
McCullys Gap Battery Energy Storage System (EIS Stage)	16 km west of the Project Area	No detailed documentation to date. However scoping report indicates a project site of up to 13.38 ha. Preliminary assessments have identified two (2) potential PCTs, both of which potentially align to TECs under the BC Act and EPBC Act. One (1) threatened flora specie and two (2) threatened fauna species are known to occur within the project site with several further threatened species predicted to occur.	Removal of vegetation and habitat for the Construction of a 400 MW/1600 MWh BESS.	Operation of a 400 MW/1600 MWh BESS. Strike risk/barotrauma not relevant as not a wind farm.
Muswellbrook Battery Energy Storage System (Approved)	17 km west of the Project Area	Impacts estimated for 0.3 ha of native vegetation across 2 PCTs. TECs impacted: Hunter Valley Footslopes Slaty Gum Woodland in the Sydney Basin Bioregion. Threatened species Impacted: *Cryptostylis hunteriana; Eucalyptus glaucina; Thesium australe*; Hunter Valley Delma.	Removal of vegetation and habitat for the Construction of a 150 MW/300 MWh BESS.	Operation of a 150 MW / 300 MWh BESS. Strike risk/barotrauma not relevant as not a wind farm.
Maxwell Solar Farm (Approved)	18 km west of the Project Area	BDAR waiver granted as site is predominantly cleared of native vegetation and lacks habitat for threatened species.	Not applicable as site lacks biodiversity values and has been granted a BDAR waiver.	Operation of a Solar Farm with a capacity of 25 MW and associated infrastructure. Strike risk/barotrauma not relevant as not a wind farm.

Project Name	Approximate Distance from Project	Biodiversity Values Impacted	Construction Impacts	Operational Impacts
Hunter Transmission Project	18 km southwest of the Project Area	Impacts/Disturbance estimated for ~945 ha across three (3) IBRA subregions. A total of 18 PCTs in different condition states occur within the assessed subject land. TECs impacted: BC Act = Central Hunter Grey Box Ironbark Woodland; Central Hunter Ironbark-Spotted Gum-Grey Box Forest; Lower Hunter Ironbark Spotted Gum Forest; Hunter Floodplain Red Gum Woodland; Hunter Lowland Redgum Forest; Riverflat Eucalypt Forest on Coastal Floodplains, Swamp Sclerophyll Forest on Coastal Floodplains. EPBC Act = Central Hunter Valley Eucalypt Forest and Woodland; Coastal Swamp Sclerophyll Forest of NSW and South East Queensland; Riverflat Eucalypt Forest on Coastal Floodplains of southern NSW and eastern Victoria. Threatened species impacted: Project assessed as having a residual direct impact to 38 threatened flora and 28 threatened fauna species. Impacted species which also occur within the Project include: Large-eared Pied Bat, Southern Myotis and Brush-tailed Phascogale.	Removal/disturbance of vegetation and habitat for the construction of 110 km of new 500 kV overhead transmission lines.	Development of new transmission lines between Bayswater Power Station Substation and Olney State Forest and connection lines to existing 500 kV transmission network – part of Critical State Significant Infrastructure. Strike risk/barotrauma not relevant as not a wind farm.
Upper Hunter Battery Energy Storage System (EIS stage)	20 km west of the Project Area	No PCTs/native vegetation mapped within the Project boundary to date.	Currently not applicable as no native vegetation or habitat for threatened species recorded to date.	Currently not applicable as no native vegetation or habitat for threatened species recorded to date Strike risk/barotrauma not relevant as not a wind farm.

Project Name	Approximate Distance from Project	Biodiversity Values Impacted	Construction Impacts	Operational Impacts
Kayuga Solar Farm (EIS stage)	24 km west of the Project Area	Estimated impacts to 275 ha of native vegetation comprising one (1) PCT/TECs. Suitable habitat potentially present for five (5) threatened flora species and 18 threatened fauna species.	Removal of vegetation and habitat for the Construction of a 100 MW solar farm with 50 MW / 100 MWh BESS.	Operation of a 100 MW solar farm with 50 MW / 100 MWh BESS. Strike risk/barotrauma not relevant as not a wind farm.
Denman Battery Energy Storage System (RtS Stage)	24 km southwest of the Project Area	Impacts estimated for 18.19 ha of native vegetation across one (1) PCT. TECs impacted: Hunter Valley Footslopes Slaty Gum Woodland in the Sydney Basin Bioregion (BC Act)/Central Hunter Valley Eucalypt Forest and Woodland (EPBC Act). Threatened species Impacted: Diuris tricolor, Striped Legless Lizard, Southern Myotis.	Removal of vegetation and habitat for the Construction of a 2.4GW/4.8 GWh BESS.	Operation of a 2.4GW/4.8 GWh BESS. Strike risk/barotrauma not relevant as not a wind farm.
Maison Dieu Solar Farm (RtS Stage)	25 km south of the Project Area	Impacts estimated for 75 ha of native vegetation across 2 PCTs TECs impacted: Central Hunter Grey Box—Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions. Threatened species Impacted: Striped Legless Lizard, Powerful Owl, Southern Myotis, Brush-tailed Phascogale.	Removal of vegetation and habitat for the Construction of a 60 MW solar farm across 75 ha of native vegetation.	Operation of a 60 MW solar farm. Strike risk/barotrauma not relevant as not a wind farm.
Denman Solar Park (Approved)	30 km south-west of the Project Area	The vegetation within the project area has not been allocated to a PCT due to the high level of degradation/clearing. No TECs or threatened species have been recorded within the development footprint for this project.	Not applicable no native vegetation, TECs or threatened species have been recorded within the project development area.	Operation of a 22 MW solar park. Strike risk/barotrauma not relevant as not a wind farm.

Project Name	Approximate Distance from Project	Biodiversity Values Impacted	Construction Impacts	Operational Impacts
Edderton Solar Project (EIS stage)	31 km southwest of the Project Area	No PCTs/native vegetation mapped within the Project boundary to date though both woodland and grassland communities occur on site.	Currently not applicable as no native vegetation or habitat for threatened species recorded to date.	Currently not applicable as no native vegetation or habitat for threatened species recorded to date Strike risk/barotrauma not relevant as not a wind farm.
Upper Hunter South Solar Farm (RtS stage)	32 km southwest of the Project Area	Impacts estimated for 37.62 ha of native vegetation across 1 PCT. TECs impacted: Hunter Valley Footslopes Slaty Gum Woodland Threatened species Impacted: *Diuris tricolor; Cymbidium canaliculatum* (population) Striped Legless Lizard, Southern Myotis.	Removal of vegetation and habitat for the Construction of a 90 MW solar farm with 30 MW / 60 MWh BESS across 37.62 ha of native vegetation.	Operation of a 90 MW solar farm with 30 MW/60 MWh BESS. Strike risk/barotrauma not relevant as not a wind farm.
105 Merriwa Road Denman – Battery Energy Storage System	38 km south-west of the Project Area	The vegetation within the project area has not been allocated to a PCT due to the high level of degradation/clearing. No TECs or threatened species have been recorded within the development footprint for this project	Not applicable no native vegetation, TECs or threatened species have been recorded within the project development area.	Operation of a 4.98 MWh BESS. Strike risk / barotrauma not relevant as not a wind farm Strike risk / barotrauma not relevant as not a wind farm.

Project Name	Approximate Distance from Project	Biodiversity Values Impacted	Construction Impacts	Operational Impacts
Upper Hunter Energy Park (Kyoto Wind Farm) (Approved)	41 km northwest of the Project Area	TECs impacted: White Box–Yellow Box–Blakely's Red Gum Grassy Woodland and Derived Native Grassland Threatened species Impacted: *Cymbidium canaliculatum* (population); Glossy Black Cockatoo, Grey-crowned Babbler, Spectacled Warbler, Grey-headed Flying-fox, Yellow-bellied Sheathtail-bat, Eastern Bentwing-bat, Eastern Cave Bat.	Removal of vegetation and habitat for the construction of up to 34 wind turbines and associated infrastructure.	Potential Blade strike or barotrauma and potential change in avifauna/microbat behaviour from operation of up to 34 turbines.
Sandy Hollow Solar Farm	47 km southwest of the Project Area	Impacts estimated to native vegetation across 1 PCT. No TECs recorded onsite. Threatened species impacted*: Diuris tricolor, Prasophyllum petilum*.	Removal of vegetation and habitat for the Construction of a 4.9 MW solar PV system.	Operation of a 4.9 MW solar PV system. Strike risk/barotrauma not relevant as not a wind farm.
Allandale Solar Farm	53 km	Impacts estimated to native vegetation across 1 PCT. No TECs recorded onsite. No threatened species impacted.	Removal of degraded vegetation for the Construction of a 5 MW solar farm.	Operation of a 5 MW solar farm and battery storage. Strike risk/barotrauma not relevant as not a wind farm.

6.4.7.6 Serious and Irreversible Impacts (SAII)

The determination of a SAII is to be made by the decision maker in accordance with the principles set out in the BC Regulation. Under Clause 6.7 (2) of the BC Regulation, an impact is to be regarded as serious and irreversible if it is likely to contribute significantly to the risk of a threatened species or ecological community becoming extinct because of one of the following four (4) principles:

- Principle 1: The impact will cause a further decline of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to be in a rapid rate of decline.
- Principle 2: the impact will further reduce the population size of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very small population size.
- Principle 3: it is an impact on the habitat of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very limited geographic distribution.
- Principle 4: the impacted species or ecological community is unlikely to respond to measures to improve its habitat and vegetation integrity and therefore its members are not replaceable.

The *Guidance to Assist a Decision-Maker to Determine a Serious and Irreversible Impact* (DPIE 2019b) and the Threatened Biodiversity Profile Data Collection was reviewed to determine the SAII candidates relevant to the assessment.

Entities at risk of an SAII that are relevant to the proposed development are identified in **Table 6.17** below.

Table 6.17 Entities at Risk of a SAII

Common Name	Scientific Name	Reason for Inclusion in Assessment
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	n/a	Included in current list of entities at risk of an SAII and is likely to be impacted by the proposal

Additional impact assessment provisions for the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland TEC

White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland is assessed in the following section. Actions to avoid and minimise direct and indirect impacts are included in **Section 2.6.3** and include locating the development to avoid areas of TEC where possible and maximising use of already cleared land which has a low vegetation integrity. A description of the current status of the Box Gum Woodland is provided in **Table 6.18**.

Table 6.18 Current status – White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

Criteria	Response to Criteria
Current total geographic extent (ha) of the TEC in NSW	According to the NSW Final Determination (Benson, 2006) the Box-Gum Woodland ecological community may have historically occupied somewhere between 51,930 ha and 253,700 ha in NSW. As per the current SVTM extent, 1,056,784 ha of PCTs associated with the TEC as listed in the TBDC.
Estimated reduction in geographic extent of the TEC since 1970	This community is at risk of an SAII as it meets the reduction in geographic extent of ≥90% since 1750 or ≥80% since 1970. There is an up to 96% decline since 1750 in some areas.
Extent of reduction in ecological function, describing the degree of environmental degradation or disruption to biotic processes (Principle 2) indicated by factors listed in BAM Subsection 9.1.1(2.b.)	This community is at risk of an SAII based on Principle 2. It meets the reduction in ecological function of ≥90% since 1750 or ≥80% since 1970 (TSC, 2024). There is an up to 96% decline since 1750 in some areas (TSC, 2024). The Final Determination documents that the White Box–Yellow Box–Blakely's Red Gum Grassy Woodland and Derived Native Grassland show a very large decline in ecological function, with extensive evidence of structural change, loss of characteristic species, and severe disruption of ecological processes such as regeneration, soil function, and understorey dynamics. These changes are driven by long-term clearing, grazing pressure, pasture modification, exotic species invasion, and widespread habitat degradation, including soil erosion, nutrient alteration, and hydrological impacts. The TEC is now highly fragmented, occurring mostly as small, isolated remnants within heavily cleared agricultural landscapes. Despite this, the community's geographic range is not considered restricted, given its large national extent of occurrence and area of occupancy. Overall, the combination of ecosystem degradation, severe functional decline, and fragmentation underpins its Critically Endangered status.
Evidence of restricted geographic distribution (Principle 3) based on the TEC's geographic range in NSW	This community is not at risk of an SAII based on Principle 3. Data is deficient with respect to area of occupancy and total current extent, but the extent of occurrence is not restricted.

An assessment of the impact of the Project on Box Gum Woodland is provided in **Table 6.19**.

Table 6.19 Impact Assessment–White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

Criteria	Response to Criteria
Impact on the geographic extent of the TEC (Principles 1 and 3)	A total of 34.48 ha of the TEC will be impacted by the proposal, comprising 3.02 ha in woodland form and 31.36 ha in DNG form, representing approximately 0.01–0.07% of the current geographic extent in NSW based on the component ranges described in the Final Determination. The proposal involves 34.48 ha of direct clearing, while indirect and prescribed impacts are also expected and are addressed in Sections 8.2 and Section 8.3 of **Appendix 8**, respectively.

Criteria	Response to Criteria
Impacts likely to contribute to further environmental degradation or disruption of biotic processes (Principle 2)	Due to extensive historical clearing associated with past and current land uses, woodland areas exhibit limited stepping-stone connectivity between larger grassland areas, with the woodland form of Box Gum Woodland to be removed occurring on the fringes of existing woodland patches and the DNG form extending into adjoining DNG areas. As the proposal is linear in nature, retained Box Gum Woodland will not be separated from other retained vegetation by gaps greater than 80 m and therefore is not expected to become isolated. The average distance between remnants of Box Gum Woodland prior to the proposal is approximately 240 m, increasing to approximately 260 m following the proposed clearing. Species associated with the TEC disperse via a range of mechanisms—including animals, wind, runoff, and gravity—with highly mobile pollinators such as birds and bats capable of moving pollen over large distances, and native flora species characteristic of the community estimated to disperse at least 1,000 m or more, supporting the maintenance of functional connectivity across the landscape.

The extent of Box Gum Woodland across the Development Corridor is presented in **Figure 6.10**.

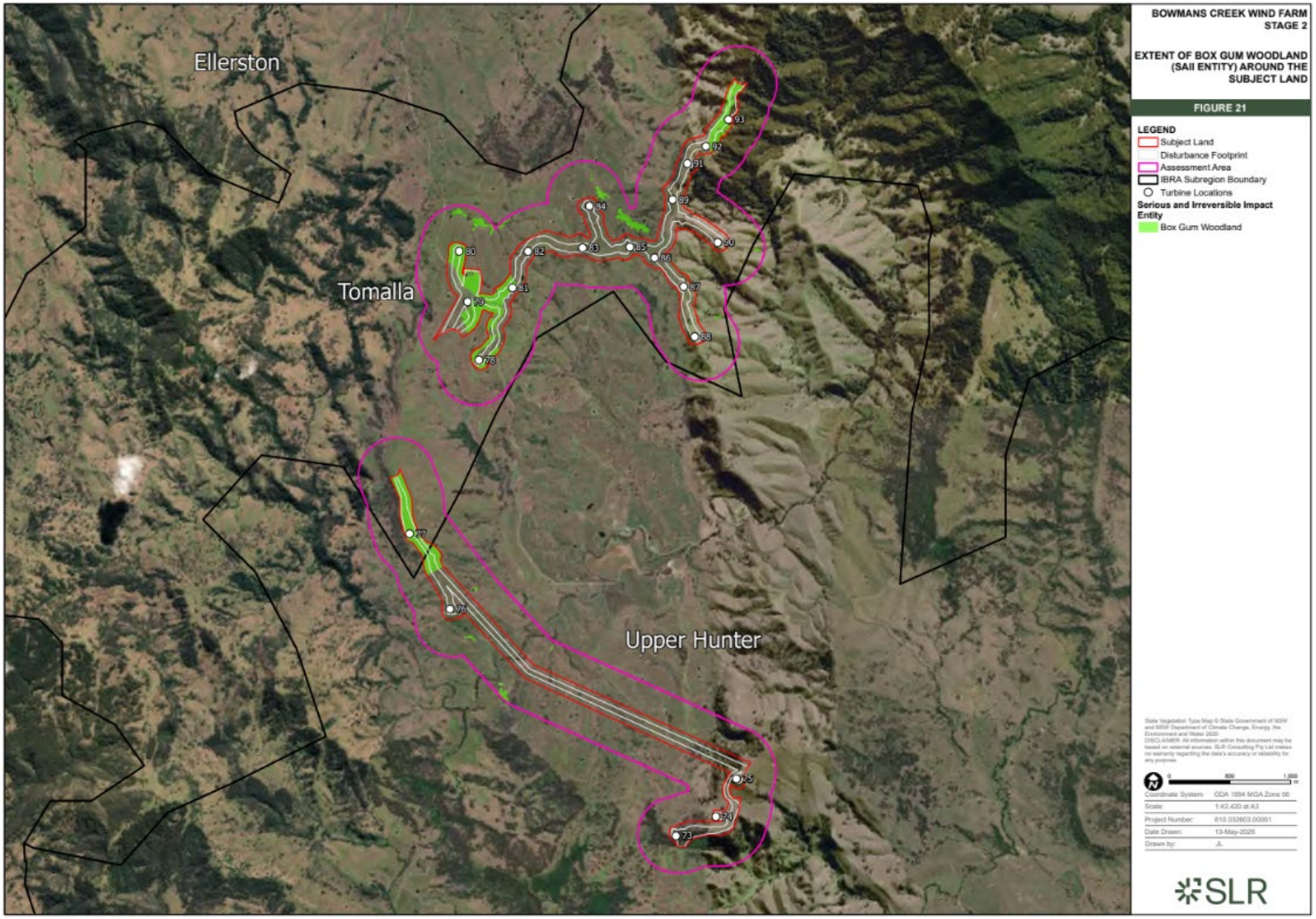


Figure 6.10 Extent of Box Gum Woodland (SAII Entity) within the Development Corridor

Source: SLR (2026)

Justification for No Further Consideration of Potential SAII for LEPB

It is acknowledged that Large-eared Pied Bat (*Chalinolobus dwyeri*) is listed as a candidate entity for SAII. The SAII component is however limited to impacts to breeding habitat only. As previously outlined in Section 7.1.2 of the BDAR:

- the breeding habitat buffer (based on the species polygon) around the **northern rockface** has been fully avoided, and no direct and indirect impacts are anticipated
- per the commitments made in Section 8.5.1 of the BDAR, an avoidance area has been established for the breeding habitat (based on the species polygon) around the **southern rockface**, and no direct and indirect impacts are anticipated.

As per Section 8.5.1 of the BDAR, BCWF commits to ensuring that no ground-disturbance, vegetation removal, or vegetation trimming will occur within the avoidance area, and that adequate vertical clearance to the breeding habitat is maintained. This commitment is reflected in the consolidated mitigation measures presented in **Appendix 5**. This avoidance area is illustrated in **Figure 2.16**.

In regard to vertical clearance of the LEPB breeding habitat (and for context the surrounding vegetation), and as outlined in **Section 2.6.3.3** above, BCWF has prepared a targeted concept design for the pole arrangements and transmission line as it traverses this avoidance area. This was informed by precautionary inputs from SLR with regard to key biodiversity features, and incorporates the topographical profile and estimated maximum future vegetation height to demonstrate the vertical clearance achieved. The outcomes of this additional avoidance exercise are illustrated **Figure 2.17**.

It identifies that a vertical clearance of 47 m is achieved between the LEPB breeding habitat (the relevant SAII component for this species) and the lowest point of the transmission line (allowing for sag etc.), and for context 27 m to any surrounding vegetation.

This targeted avoidance approach demonstrates that there is substantial vertical clearance between the breeding habitat (and surrounding vegetation) and the proposed pole arrangement and transmission line.

Accordingly, no impacts on breeding habitat for the Large-eared Pied Bat will occur.

Nevertheless, the area has been retained within the Subject Land and Disturbance Footprint (rather than being fully excluded) to allow for minor lateral adjustments to the transmission line alignment during detailed design.

Given this approach, and BCWF's commitments to a) implement the avoidance area; and b) maintain adequate vertical clearance, an assessment of SAII for this species is not required. It should be noted that a separate, larger roosting/foraging polygon, which does not comprise a SAII entity is also required to be drawn for LEPB, and the calculation of credits for this species is limited to impacts to the non-SAII roosting/foraging habitat only.

6.4.8 Transport Route Upgrades

As the off-site road upgrades for the Project span two (2) separate IBRA regions, i.e. the NSW North Coast bioregion and Sydney Basin bioregion, two (2) separate Streamlined BDARs have been prepared for each IBRA bioregion.

The Streamlined Assessment Module for Small Area Development under the BAM may be used only where clearing thresholds in Table 12 of Appendix C of the BAM have been met. Although the works are largely confined to the public road corridor, trimming of overhanging vegetation will occur on adjacent allotments, which generally have a minimum lot size of 40 ha under the Muswellbrook and Singleton LEPs. As per Table 12 of Appendix C of the BAM, allotments with a minimum lot size of ≤40 ha, the BAM allows up to ≤2 ha of native vegetation clearing under the small area development module.

The Assessment Area within the NSW North Coast IBRA has a total area of 0.72 ha, with 0.13 ha mapped as native vegetation. The Assessment Area within the Sydney Basin IBRA has a total area of 0.68 ha, with 0.41 ha mapped as native vegetation. Accordingly, the project qualifies for assessment under the Streamlined Assessment Module – Small Area Development, and this BDAR has been prepared in accordance with Appendix C of the BAM.

Location

Turbine components will be transported using the Stage 1 approved route; however, the larger Stage 2 turbines will require additional localised disturbances along Hebden, Scrumlo, Albano and Bowmans Creek roads, including new hardstands and vegetation trimming to accommodate blade oversail.

6.4.8.2 Methodology

Methodology across both small area BDAR included:

- Desktop searches were completed throughout the assessment process to ensure ongoing changes to the Project layout were captured in desktop results.
- An assessment of native vegetation cover was undertaken in accordance with Section 3.2 of the BAM.
- SLR conducted vegetation surveys to revise and update the SVTM mapping within the Subject Land on 17 March 2026.
- As access to adjacent lands was not available, no plot-based vegetation surveys were undertaken within the Subject Land. Instead, existing vegetation integrity plot data collected for the same PCTs within the approved Stage 1 project have been adopted as surrogate data for the purposes of this assessment.
- The assessment of threatened flora and fauna methodology aligned with the methodology as detailed in the main Project BDAR and included a review of existing information, a habitat constraints assessment and field surveys where required were conducted on 17 March 2026.
- No candidate species credit species are assumed to be present within the Subject Land.

6.4.8.3 NSW North Coast IBRA (Appendix I of the BDAR)

Assessment Outcomes

Impacts associated with the OSOM transport route upgrades within the NSW North Coast IBRA are summarised below.

The primary residual direct impact resulting from the Project is the reduction in vegetation cover and associated habitat within the Subject Land. **Table 6.20** identifies the proposed impacts to vegetation and threatened species habitat within the assessed disturbance footprint.

Table 6.20 Impacts that Require an Offset – Ecosystem Credits

Direct Impact	BC Act Status	EPBC Act Status	SAII Entity	Project Phase / Timing of Impact	Extent (ha)
Zone 1 – 3396_Roadside: – trimming of overhanging tree branches	CEEC	n/a does not meet thresholds for listing	Yes	Construction	0.11

Approximately 0.02 ha of PCT 4073 will be impacted by the Project although PCT 4073 is not associated with any TEC listed under the BC Act or EPBC Act or within the BioNet Vegetation Classification database. As the BDAR comprises a Small Area BDAR, impacts to non-dominant PCTs that do not conform to a TEC have not been assessed further in the BAM-C.

As detailed in **Table 6.20**, one (1) vegetation zone exceeds the BAM thresholds and requires ecosystem offsets under BAM Subsection 9.2.1(1).

Zone 1 – Roadside (PCT 3396, Northwest Slopes Box-Blakelys' Red Gum Woodland): A reduction in vegetation integrity of 7.9 results in a requirement for one (1) ecosystem credit.

There are no impacts on threatened species (species credits) that require an offset (as per BAM Subsection 9.2.2(2)).

SLR has determined that all indirect impacts are minor in nature and will be sufficiently mitigated and managed by implementing measures outlined in the Streamlined BDAR. As such, additional biodiversity credits to mitigate indirect or prescribed impacts are not proposed.

Therefore, **the total ecosystem credits required for this disturbance is one (1)**.

6.4.8.4 Sydney Basin IBRA (Appendix J of the BDAR)

Assessment Outcomes

Impacts associated with the OSOM transport route upgrades within the Sydney Basin IBRA are summarised below.

The primary residual direct impact resulting from the Project is the reduction in vegetation cover and associated habitat within the Subject Land. **Table 6.21** identifies the proposed impacts to vegetation and threatened species habitat within the assessed disturbance footprint.

Table 6.21 Summary of Residual Direct Impacts

Direct Impact	BC Act Status	EPBC Act Status	SAII Entity	Project Phase / Timing of Impact	Extent (ha)
Zone 1 – 4015_Roadside: trimming of overhanging tree branches	-	EEC	No	Construction	0.15
Zone 2 – 3431_Roadside: trimming of overhanging tree branches	EEC	CEEC	No	Construction	0.12

Two vegetation zones exceed BAM thresholds and require ecosystem offsets under BAM Subsection 9.2.1(1):

- Zone 1 – Roadside (PCT 4015, Central Hunter Riparian Forest): A reduction in vegetation integrity of 5.9 results in a requirement for one (1) ecosystem credit.
- Zone 2 – Roadside (PCT 3431, Central Hunter Ironbark Grassy Woodland): A reduction in vegetation integrity of 12.0 results in a requirement for one (1) ecosystem credit.

There are no impacts on threatened species (species credits) that require an offset (as per BAM Subsection 9.2.2(2.)).

SLR as determined that all indirect impacts are minor in nature and will be sufficiently mitigated and managed by implementing measures outlined in the Streamlined BDAR. As such, additional biodiversity credits to mitigate indirect or prescribed impacts are not proposed.

Therefore, the total ecosystem credits required for this disturbance is two (2).

6.4.8.5 Mitigation and Management

BCWF has committed to the design and implementation of a comprehensive biodiversity mitigation strategy to minimise the unavoidable impacts of the wider Project. Based on the findings of the overarching BDAR (prepared for the wind farm site), the following Management Plans will be prepared post approval as part of the Biodiversity Management strategy:

- Construction Environmental Management Plan (CEMP).
- Biodiversity Management Plan.
- Bird and Bat Adaptive Management Plan (BBAMP).

These management plans will also encompass the proposed offsite road upgrade works. A range of impact mitigation strategies are proposed to mitigate the impact on ecological values prior to the consideration of offsetting requirements.

6.4.9 Matters of National Environmental Significance

Consideration of impacts to MNES listed under the EPBC Act is provided in Appendix C of **Appendix 8**. Species included for assessment in the MNES Report include those that are listed within the Supplementary SEARs as being potentially impacted by the Project, and any others that have a moderate to high likelihood of occurrence.

The MNES recorded within the Development Corridor are summarised in **Table 6.22**. The majority comprise ecosystem credit species and, in accordance with the BAM, are assumed to occur within associated PCTs. One (1) MNES species – Large-eared Pied Bat – has been assessed as a species credit species in accordance with the BAM. Further assessments in accordance with the supplementary SEARs are provided in Appendix C of **Appendix 8**.

Table 6.22 MNES Species Recorded within the Development Corridor

Scientific Name	Common Name	EPBC Act Status	Credit Type for Assessment	Extent (ha) of Suitable Habitat Impacted within Assessed Disturbance Footprint
Chalinolobus dwyeri	Large-eared Pied Bat	E	Species Credit Species	Associated PCTs = 3240, 3241, 3315, 3396 Total area = 7.65 ha (excludes DNG areas of associated PCTs) Further details are provided in Table 5.7 of **Appendix 8**
Calyptorhynchus lathami	Glossy Black-Cockatoo (foraging)	V	Ecosystem Credit Species (Dual species)	Associated PCTs = 3076, 3114, 3240, 3241, 3315, 3354, 3396, 4073 Total area = 30.29 ha (excludes DNG areas of associated PCTs)
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V	Ecosystem Credit Species	Associated PCTs = 3240, 3241, 3315, 3354, 3396, 4073 Total area = 29.30 ha (excludes DNG areas of associated PCTs)
Hirundapus caudacutus	White-throated Needletail	V	Ecosystem Credit Species	Associated PCTs = 3076, 3114, 3240, 3241, 3315, 3354, 3396, 4073 Total area = 163.58 ha (30.29 ha Woodland, 132.67 ha DNG)
Dasyurus maculatus	Spotted-tailed Quoll	E	Ecosystem Credit Species	Associated PCTs = 3076, 3114, 3240, 3241, 3315, 3354, 3396, 4073 Total area = 163.58 ha (30.29 ha Woodland, 132.67 ha DNG)
Petaurus australis	Yellow-bellied Glider	V	Ecosystem Credit Species	Associated PCTs = 3076, 3240, 3241, 3354, 3396 Total area = 19.78 (excludes DNG areas of associated PCTs)

6.4.10 Mitigation and Management Measures

BCWF has committed to the design and implementation of a comprehensive biodiversity mitigation strategy to minimise the residual impacts of the Project. A Construction Environmental Management Plan (CEMP), Operational Environmental Management Plan (OEMP), and BBAMP will be prepared for the Project.

All plans will describe the avoidance, mitigation and management measures that will be undertaken to manage potential environmental impacts of the Project. They will be prepared to meet the specific requirements of the Project to avoid and minimise impacts on biodiversity values, in accordance with best practice.

Table 6.23 documents the measures to avoid and minimise direct, indirect and prescribed impacts associated with the Project.

Table 6.23 Avoidance and Minimisation Measures for Direct, Indirect and Prescribed Impacts

Action	Outcome	Timing	Responsibility
Limit clearing of native vegetation.	**BIO01:** Minimise overall areas of native vegetation, associated TECs and threatened species habitat to be directly impacted by proposed development.	Design/DA	Proponent, designers
Construction Environment Management Plan	**BIO02:** Reduce potential for impacts from traffic, sedimentation, erosion and stormwater. Increase workforce awareness / education.	Implementation to begin at commencement of construction	Proponent, Lead Contractor, Environmental representative
Biodiversity Management Plan	**BIO03:** Enable protection and enhancement of retained vegetation and reduce the introduction and spread of weeds and noxious species within the Development Corridor and adjacent areas. Minimise impacts of vegetation clearing activities and allow for hollow and foraging resource replacement strategy.	Implementation to begin at commencement of construction	Landowner, project ecologist
Micro siting of development components	**BIO04:** Identification of site-specific constraints and minor amendment of design within previously assessed Development Corridor.	Implementation to begin during final design and commencement of construction	Proponent, designers/engineers
Maintenance of buffers between WTG and vegetation, etc	**BIO05:** Maintain free movement for birds and bats and avoid areas where interactions most likely to occur.	Design/DA	Proponent, designers, project ecologist
Stormwater management	**BIO06:** Minimise indirect impacts on ephemeral habitats.	Implementation to begin at commencement of construction	Proponent, engineers
Prepare and Implement BBAMP	**BIO07:** Assess for impacts resulting from turbine strikes through monitoring and the implementation of adaptive management measures.	Operational phase	Proponent, project ecologist
LEPB Avoidance Area	**BIO08:** Implementation of the LEPB avoidance area and maintenance of adequate vertical clearance between the LEPB habitat and associate vegetation and the overhead transmission line.	Construction and operation	Proponent, Designers, Lead Contractor

6.4.10.1 Mitigating Residual Impacts – Management Measures and Implementation

Proposed biodiversity-related mitigation measures are summarised in **Table 6.24**. Table 8.6 of **Appendix 8** includes information regarding the implementation strategies regarding these mitigation measures.

Table 6.24 Summary of Proposed Mitigation and Management Measures for Residual Impacts (Direct, Indirect and Prescribed)

Impact Type (BAM 8.4)	Mitigation Measure	Method/Technique	Timing	Frequency	Responsibility	Likely Efficacy (including risk of failure)	MNES (when relevant)
Fauna displacement (BAM 8.4.1, 2)	**BIO09:** Timing works to avoid critical life cycle events, such as breeding or nursing.	An ecologist must complete thorough pre-clearance checks, including the inspection of hollow-bearing trees prior to felling. Further details to be included in Fauna Management Plan.	Site clearing and construction	One off	Proponent, construction team	High efficacy, low risk	Yes – threatened species
Fauna displacement (BAM 8.4.1, 2)	**BIO10:** Instigating clearing protocols, including pre-clearing surveys, daily surveys and staged clearing, and using a trained ecologist or licensed wildlife handler during clearing events.	Pre-clearance surveys and daily wildlife capture by a fauna spotter-catcher or suitably qualified ecologist.	Site clearing	Daily	Proponent, construction team, ecologist	High efficacy, low risk	N/A
Fauna displacement (BAM 8.4.1, 2)	**BIO11:** Relocating habitat features (e.g. fallen timber, hollow logs) from the development or clearing site, to adjacent retained vegetation.	Relocate habitat features into adjoining vegetation, where possible.	Site clearing	Daily	Proponent, construction team, ecologist	High efficacy, low risk	N/A
Indirect impacts on native vegetation and habitats (BAM 8.4.1, 3)	**BIO12:** Adoption of clearing protocols that identify vegetation to be retained, prevent inadvertent damage and reduce soil disturbance; for example, a chainsaw is preferable to heavy machinery to remove native vegetation for partial clearing.	Hollow-bearing trees are to be removed one at a time, with a fauna spotter-catcher or suitably qualified ecologist on site during clearing works to complete daily wildlife capture as required.	Site clearing and construction	One off	Proponent, construction team, ecologist	High efficacy, low risk	N/A
Indirect impacts on native vegetation and habitats (BAM 8.4.1, 3)	**BIO13:** Using light shields, or daily/seasonal timing of construction and operational activities to reduce impacts of light spill.	Use of light shields and limiting evening construction works, where possible. Avoid construction activities between dusk and dawn (i.e. nocturnal hours), where possible.	Construction and operational	Daily	Proponent, construction team, site management	High efficacy, low risk	N/A
Indirect impacts on native vegetation and habitats (BAM 8.4.1, 3)	**BIO14:** Using adaptive dust management and monitoring programs to control air quality.	Dust management and monitoring surveys.	Construction	One off	Proponent, construction team	High efficacy, low risk	N/A
Indirect impacts on native vegetation and habitats (BAM 8.4.1, 3)	**BIO15:** Scheduling the timing of construction activities to avoid impacts (e.g. timing the construction for when migratory species are not at the site, or when particular species known to, or likely to use the habitat on the site, are not breeding or nesting).	Avoid clearing and construction between dusk and dawn (i.e. nocturnal hours), where possible.	Construction	One off	Proponent, construction team	High efficacy, low risk	Yes – threatened and/or migratory species
Indirect impacts on native vegetation and habitats (BAM 8.4.1, 3)	**BIO16:** Erecting temporary fencing to protect significant environmental features, such as riparian zones.	Temporary fencing of construction area, and along the proposed access track to temporarily restrict fauna movement into active work site from adjacent intact vegetation.	Construction	One off	Proponent, construction team	High efficacy, low risk	N/A
Indirect impacts on native vegetation and habitats (BAM 8.4.1, 3)	**BIO17:** Using hygiene protocols to prevent the spread of weeds or pathogens between infected and uninfected areas.	Machinery wash down prior to site entry.	Construction	Daily	Proponent, construction team	High efficacy, low risk	N/A
Indirect impacts on native vegetation and habitats (BAM 8.4.1, 3)	**BIO18:** Training staff and conducting site briefings to communicate environmental features to be protected and measures to be implemented.	Environmental site briefings identifying areas of retained native vegetation.	Construction	One off	Proponent, construction team	High efficacy, low risk	N/A

Impact Type (BAM 8.4)	Mitigation Measure	Method/Technique	Timing	Frequency	Responsibility	Likely Efficacy (including risk of failure)	MNES (when relevant)
Indirect impacts on native vegetation and habitats (BAM 8.4.1, 3)	**BIO19:** Preparing a vegetation management plan to regulate activity in vegetation and habitats adjacent to residential developments. The plan may include controls on pet ownership, rubbish disposal, wood collection, fire management, and disturbance to nests and other niche habitats.	Prepare and comply with Biodiversity Management Plan which includes measures to reduce impacts to adjacent vegetation in adjoining lot.	Operational	One off	Occupant, ecologist	High efficacy, low risk	N/A
Indirect impacts on native vegetation and habitats (BAM 8.4.1, 3)	**BIO20:** Providing for the ecological restoration, rehabilitation and/or ongoing maintenance of retained native vegetation habitat on, or adjacent to, the development or clearing site.	Prepare and comply with Biodiversity management plan which includes measures to reduce impacts to threatened fauna and TECs within the Development Corridor.	Operational	One off	Proponent, construction team, ecologist	High efficacy, low risk	Yes – threatened community
Prescribed Impacts (BAM 8.4.2, 1)	**BIO21:** Erecting temporary fencing to protect significant environmental features.	Temporary fencing of construction area, and along the proposed access track to temporarily restrict movement into active work site from adjacent intact vegetation and significant environmental features.	Construction	One off	Proponent, construction team	High efficacy, low risk	N/A
Prescribed Impacts (BAM 8.4.2, 1)	**BIO22:** Using sediment barriers or sedimentation ponds to control the quality of water released from the site into the receiving environment.	Sediment barriers and ponds, where recommended by engineer.	Construction and operation	One off	Proponent, construction team, engineer, site operator	High efficacy, low risk	N/A
Prescribed Impacts (BAM 8.4.2, 1)	**BIO23:** Training staff and conducting site briefings to communicate environmental features to be protected and the measures implemented to protect them.	Environmental site briefings identifying clearing protocols and fauna management protocols.	Construction	Ongoing as staff change	Proponent, construction team	High efficacy, low risk	N/A
Prescribed Impacts (BAM 8.4.2, 1)	**BIO24:** Ecological restoration, rehabilitation actions and/or maintenance of retained native vegetation on, or adjacent to, the Development Corridor.	Rehabilitation survey and implementation, where required.	Post-construction	One off	Proponent, construction team, ecologist	High efficacy, low risk	N/A

6.4.10.2 Adaptive Management Strategy for Uncertain Impacts (where relevant)

The primary uncertain impact for the Project is the extent of blade strike/barotrauma risk to birds and bats. The adaptive management strategy for this uncertain impact is the preparation of a BBAMP. The BBAMP, as a minimum, will include:

- Ongoing bird and bat monitoring in accordance with the Best Practise Guidelines for implementation of Wind Energy Projects to assess the impact of the Project on local and potential migratory bird and bat populations.
- A decision-making framework setting out thresholds and specific actions in relation to impacts to bird/bat populations identified by the monitoring surveys.
- Identification of mitigation measures and implementation timeframes, such as switching off/slowing down of specific turbines at specific timeframes or use of deterrents to reduce potential mortalities if identified during monitoring surveys.
- Consideration of implementation of measures identified in ongoing research (Australian or international studies) that reduce risks of bird/bat strike at wind farms such as use of IdentiFlight cameras or painting single turbine blades black.

Table 6.25 provides the conceptual BBAMP components which includes the uncertain impacts and the potential monitoring activities, examples of appropriate methods to be used and example performance criteria required for each.

Table 6.25 Conceptual BBAMP Components

Component	Description	Timeframe
Objectives of the BBAMP	**Objectives of the BBAMP**	**Objectives of the BBAMP**
Purpose and objectives of the BBAMP	The BBAMP will present a strategy to monitor and mitigate impacts to birds and bats attributable to the construction and operation of the wind farm development. The overall objective of the BBAMP will be to ensure the Project does not result in a significant impact on birds and bats by retaining viable local populations of threatened species	Operational life of the Project
Baseline Survey Programs	**Baseline Survey Programs**	**Baseline Survey Programs**
Bird Utilisation Surveys	In accordance with draft survey guidelines for turbine strike assessment, the commitment to completing a two (2) year BBUS program as part of the impact assessment will form the baseline survey program for bird utilisation. The methodology of this program is detailed in **Section 2.5.1** and **Appendix 8**	Oct 2024; Jan 2025; May 2025; Jul 2025, Nov 2025; Feb 2026; May 2026; Aug 2026
Bat Utilisation Surveys	In accordance with draft survey guidelines for turbine strike assessment, the commitment to completing a two (2) year BBUS program as part of the impact assessment will form the baseline survey program for bird utilisation. The methodology of this program is detailed in **Section 2.5.2** and **Appendix 8**	Nov 2023, Feb 2024, Nov 2025, Mast monitoring Jan 2025–Aug 2026
Avifauna habitat assessments	Detailed habitat assessments recording suitable habitat for avifauna such as stick nests for raptors, presence of hollow bearing trees and suitably large breeding hollows for Owls and cockatoos conducted as part of the impact assessment will form the baseline dataset	Dec 2022, May 2023, Aug 2023, Oct 2024

Component	Description	Timeframe
Operational Monitoring	**Operational Monitoring**	**Operational Monitoring**
Bird Utilisation Surveys	Replication of the BBUS program/methodology undertaken during the impact assessment. In the absence of any substantial Project design changes, the same BBUS sites should be used for operational monitoring for appropriate Before/After comparative analyses	• First year, third year and fifth year (after the commencement of the Project. Surveys to commence within three (3) months of commencement of wind farm operation, i.e., once the following have occurred: ○ all turbines are commissioned and tested (including testing dependent on wind conditions) ○ all turbines have been handed over from the Contractor to the approval holder. • Australian Energy Market Operator (AEMO) testing is complete (grid compliance testing)
Bat Utilisation Surveys	Replication of the BBUS program/methodology undertaken during the impact assessment. In the absence of any substantial Project design changes, the same BBUS sites should be used for operational monitoring for appropriate Before/After comparative analyses	As above
Targeted Bird Surveys	Replication of survey methodology conducted for threatened species as per the BAM	As above

Component	Description	Timeframe
Carcass Search Program	Carcass searches to be undertaken to estimate the frequency of bird and bat mortality due to collision at the Project, from which the total number of collisions can be determined. Searches are undertaken to identify and record any carcasses beneath wind turbines. Carcass searches to be undertaken at approximately 50% of the constructed wind turbines, with the same wind turbines being monitored each event. Carcass searches will be conducted once per month throughout the survey years, involving surveying search zones beneath a subset of wind turbines. Transect intensity will be varied between the vegetation zones with wider spaced transects in grassland zones. Surveys will be completed preferentially by conservation dogs (and handler) with human searches being permissible if conservation dogs are not available. All carcasses recorded as part of this program will be subject to a strict reporting (and timeframe) commitment. All carcasses will be reported to the Environmental Representative as well as to CPHR and/or C-DCCEEW in the event of the impacted species being listed as a threatened species	First and second year initially, starting within 3 months of commencement of operation. The efficacy of the search program to be reviewed two (2) years, with the possibility of extension for up to a further three (3) years, (potential five-year program in total). Requirement for extension of the program if there is clear discrepancy between estimated and realised frequency of bird and bat mortality
Carcass Persistence Trial	Carcass persistence trials are undertaken to estimate persistence rates of different sized carcasses beneath turbines (to aid estimation of mortality rates of birds and bats impacted by turbines). The trial will occur at a subset of wind turbines. A pre-determined number of bird and bat carcasses, varying in size, will be used in the trial. Carcass persistence trials can either be undertaken by human searches or use of remote survey cameras	Completed once per season during the first- and second-year carcass search program
Carcass Detectability Trials	Carcass detectability varies depending on a range of factors such as efficacy of the observer, size of the carcass and type of ground cover. Therefore, carcass detectability trials will be undertaken to determine the efficacy of the conservation dog and handler; or an ecologist undertaking searches at finding carcasses. Determining the probability of the selected trained dog or observers detecting a carcass and how it may vary depending on turbine site ground conditions or carcass size is important to ascertain the correction factor needed to accurately estimate total number of collisions	Completed once per season during the first- year carcass search program

Component	Description	Timeframe
Incidental Finds Protocol	Any carcass, feathers or injured individuals discovered incidentally by site personnel or any contractor during the operational lifetime of the Project will be formally recorded and the find reported to the Environmental Representative as well as to CPHR and/or C-DCCEEW in the event of the impacted species being listed as a threatened species	Operational lifetime of the Project
Mortality Estimation	All data will be analysed to estimate annual number of collisions for birds and bats overall and species. This will be estimated in consideration of the carcass search area and effort, and the observed carcass persistence times and observer detectability rates. Estimates of the number of carcasses per turbine per year will also be determined and 95% confidence intervals around total annual estimates and rates of mortality calculated	During the relevant reporting periods, described below
Impact Trigger and Response Protocols	**Impact Trigger and Response Protocols**	**Impact Trigger and Response Protocols**
Threatened Species	Impact triggers will be determined for threatened species listed under the EPBC Act and/or BC Act, which will relate to a particular number of carcasses, injured individual or featherspot recorded through formal searches or incidentally. Impact trigger criteria will be based on the combination of the following factors: • BC Act Status; • EPBC Act status; • number of individuals impacted; • number of turbines where the species has been impacted; • frequency of impacts for the particular species across monitoring events, • particular season the impact was recorded. In the event of a trigger being recorded, it is the responsibility of the person who discovered the carcass, injured individual or featherspot to notify the Environmental Representative upon discovery with an allowance for identification if required. The Environmental Representative must notify CPHR and/or C-DCCEEW of the trigger event within three (3) working days. Additional actions and mitigation measures may be required in the event of an impact trigger being recorded, these would be determined through consultation	n/a

Component	Description	Timeframe
	with CPHR and/or C-DCCEEW. Due to the large number of variables that should be considered to assess the severity of a particular impact, it is not considered suitable to specify particular mitigation measures for a potential impact within the BBAMP. Rather, following notification of the initial impact trigger, consultation with CPHR/C-DCCEEW will include (but not be limited to) the following: i) An initial meeting within five (5) working days subject to the availability of government agency personnel of the impact trigger being recorded between the consultation stakeholders specified above. Should the impact trigger or consultation period occur during government shutdown periods, this meeting is required to occur within five (5) working days following conclusion of the shutdown period subject to the availability of government agency personnel, and ii) Additional meetings may be required depending on the nature of the consultation. The specific timeframe of this additional consultation will be determined in the initial meeting. The BBAMP will not ascribe numerical values to what should be considered an adverse impact at the total population and/or the local population scale but will describe an assessment process through which an ecologist first prepares an impact investigation that examines whether the event may be regular or may constitute, or lead to, an adverse impact on the species' local or total population. The findings of this impact investigation will determine whether consultation with CPHR and/or C-DCCEEW regarding the need for additional monitoring or mitigation action is required. The minimum requirements of the impact investigation report are: 1) Specify the particular impact trigger level that was recorded including the species and number of individuals; 2) Specify the date/s and location/s of recovered carcasses/featherspot; 3) Discuss any potentially influential ecological factors that may have contributed to the impact trigger such as recent climate, weather, presence of prey species/foraging opportunities or seasonal factors; 4) Estimate whether the event is likely to be rare or regular;	

Component	Description	Timeframe
	5) Verify whether or not the species has been impacted (including number of individuals and frequency) at neighbouring wind farms within a 10 km radius of the Project (if present) by accessing their publicly available annual BBAMP reports. For the purposes of the BBAMP, post-trigger assessment of impacts on threatened and/or migratory species is to be conducted with reference to the species' total population and local population i.e.: 1) Total population refers to the estimated total Australian population or, in the case of international migrants, the relevant subspecies' entire population. Local population refers to the estimated population in the Project Site. Density is to be estimated using data from the pre-construction surveys in combination with existing density estimates from primary literature; 2) Local population estimates are to be derived using vegetation mapping for the Project. Estimates should take into consideration population dynamic assumptions such as, seasonal or inter-annual fluctuations in abundance in the Project Site. The local population of a given species is to be estimated by the contracted ecologist if an impact trigger for that species is met	
Non-threatened species	Impact triggers will not be required for all non-threatened species, and common species such as the Australian Raven and Australian Magpie will not be included. Impact triggers will be determined for Wedge-tailed Eagle in recognition of increased susceptibility of wedge-tailed eagles to turbine strike. No management actions are triggered following mortality of introduced species. In the event of a trigger species being recorded, it is the responsibility of the person who discovered the carcass, injured individual or featherspot to notify the Environmental Representative upon discovery (allowing for identification if required). The Environmental Representative must then notify CPHR of the trigger event within five (5) working days. The BBAMP will not ascribe numerical values to what should be considered an adverse impact at the total population and/or the local population scale but will describe an assessment process through which an ecologist first prepares an impact investigation that examines whether the event may be regular or may constitute, or lead to, an adverse impact on the species' local or total population.	n/a

Component	Description	Timeframe
	The findings of this impact investigation will determine whether consultation with CPHR and/or C-DCCEEW regarding the need for additional monitoring or mitigation action is required. The minimum requirements of the impact investigation report are: • Specify the particular impact trigger level that was recorded including the species and number of individuals; • Specify the date/s and location/s of recovered carcasses/featherspot; • Discuss any potentially influential ecological factors that may have contributed to the impact trigger such as recent climate, weather, presence of prey species/foraging opportunities or seasonal factors; • Estimate whether the event is likely to be rare or regular; • Verify whether or not the species has been impacted at neighbouring wind farms within a 10 km radius of the Project (if present) by accessing their publicly available annual BBAMP reports. • For the purposes of the BBAMP, post-trigger assessment of impacts on non-listed species, is to be conducted with reference to the species' local population only. • Local population estimates are to be derived using vegetation mapping for the Project. Estimates should take into consideration population dynamic assumptions such as, seasonal or inter-annual fluctuations in abundance in the Project Site. The local population of a given species is to be estimated by the contracted ecologist if an impact trigger for that species is met	

Component	Description	Timeframe
Mitigation Measures	Mitigation measures may include consideration of the following: • Carrion removal program; • Pest animal control; • Raptor perch management; • Lighting and Acoustic deterrents; • Alteration of cut-in speeds; • Temporary shutdown of turbines; • Transmission line warning markers; • Increased contract between blades; • Consideration of radar detectors; • Offset requirements. Formal commitment to any particular mitigation measures will only be made in consultation with CPHR and/or C-DCCEEW	Operational lifetime of the Project
Reporting requirements	Carcass search programs will be reported annually for two (2) years. Review of the program will be undertaken following two (2) years of operation. Impact trigger reporting will be required as described above. Annual reports will be prepared for three (3) years and once following the fifth year of bird and bat monitoring. Minor review of the BBAMP will occur once after the first year, following completion of the first annual report. Major review of the BBAMP will occur after the third year, following completion of the first annual report. After the fifth year, following the completion of the annual report	n/a

6.4.11 Biodiversity Credit Summary

The Project will have direct impacts on 163.58 ha of native vegetation within the Disturbance Footprint. Additionally, the impacts will be finalised following the completion of the detailed design and micro-siting of turbines and associated infrastructure. In doing so, BCWF will seek to further minimise impacts to biodiversity values. A range of impact mitigation strategies are proposed to mitigate the impact on ecological values prior to the consideration of offsetting requirements.

Residual impacts that are not able to be managed through mitigation would be offset in accordance with BAM calculations for both ecosystem and species credits. The proposed offset obligation based on the Disturbance Footprint has been calculated to require the following biodiversity credits:

- 1,006 ecosystem credits (BC Act obligation) plus an additional 3 credits required relating to the transport route upgrades detailed in **Section 6.4.8**.
- 84 additional ecosystem credits (anticipated EPBC Act obligation).
- 1,647 species credits (BC Act obligation).

The offset strategy will be implemented in consideration of the process outlined in the BC Act and the final composition of the offset strategy may evolve as the Project progresses.

6.4.12 Biodiversity Offset Strategy

An offset strategy will be implemented in consideration of the process outlined in the BC Act and the final composition of the offset strategy may evolve as the Project progresses. The Proponent will retire the credits required to offset the impacts of the Project as specified in **Section 6.4.11** using the offset options available under the BC Act and BC Regulation including:

- Land based offsets through the establishment of new Stewardship Sites and subsequent retirement of credits.
- Securing (purchasing) credits through the open credit market.
- Paying into to the Biodiversity Conservation Fund (BCF).

As the Project, being a controlled action under the EPBC Act, is being assessed via the Bilateral Agreement between the State of NSW and the Commonwealth, it is assumed that the like-for-like credit requirements for PCTs and species credit species that also comprise MNES entities will satisfy offset obligations under the EPBC Act. Any additional credit obligations under the EPBC Act, compared to those under the BC Act, would be limited to the additional 84 credits for unavoidable impacts to Zone 5 – PCT 3315 Central Hunter Ironbark-Spotted Gum Forest documented in the BDAR (refer **Appendix 8**). These would be incorporated into the Projects offset strategy that will be implemented as described above and with regard to the EPBC Act. The Proponent does not anticipate any additional offsets under the EPBC Act to those summarised here and presented in the BDAR.

6.5 Aboriginal Cultural Heritage

The SEARs require:

- An assessment of the impact to Aboriginal cultural heritage items (archaeological and cultural) in accordance with the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH, 2011) and the Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW (DECCW, 2010), identifying, describing, and assessing any impacts to any Aboriginal cultural heritage sites or values associated with the site (including impacts from any proposed earth works, construction works and road upgrades), including results of archaeological test excavations (where required), undertaken in accordance with the relevant standards and requirements.
- Evidence of adequate consultation with Aboriginal communities in determining and assessing impacts, identifying and selecting options for avoidance of Aboriginal cultural heritage and identifying appropriate mitigation measures (including the final proposed measures), having regard to the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010); including the consultation process outline within.

An Aboriginal Cultural Heritage Assessment Report (ACHAR) was undertaken by OzArk Environment & Heritage (OzArk) to assess the potential impact of the Project on Aboriginal cultural heritage values (both archaeological and cultural) in consultation with Aboriginal communities. The ACHAR was prepared in accordance with the Project SEARs. The full ACHAR is included in **Appendix 9** and key findings are summarised in the sections below.

6.5.1 Existing Cultural Heritage Environment

6.5.1.1 Environmental Context

The Project Area occupies a region with varied terrain from gently to moderately inclined slopes in the south and relatively elevated and rugged terrain with bedrock outcrops and escarpments in the north. As such, the survey units were identified to capture the major topographic features of the Project Area. The designation of survey units provides a basis for a tailored approach to modelling potential Aboriginal land use and archaeological potential. Two (2) landform types were identified within the Project Area:

- Survey Unit 1: flat/ gently undulating landforms.
- Survey Unit 2: moderate/ steep slopes.

Soil variation across the area strongly influences both past human land use and the preservation of archaeological material. Several mapped soil landscapes occur within the Project Area, including the Rosevale, Scrumlo, Bridgelands and Greenland units, each characterised by thin or stony soils on slopes, areas of erosion or degradation, and limited pockets of aggrading alluvium in valley floors. Together, these geological and soil conditions create a landscape of steep hills, broad valleys and patchy alluvial flats that would have constrained land use and shaped the distribution and integrity of archaeological evidence.

Water availability is a major influence on the range of resources available and the suitability of an area for Aboriginal occupation. The main source of water in the Survey Boundary is Bowmans Creek, which traverses the Project Boundary from east to west. It is assumed that in the past Bowmans Creek would have afforded permanent water, particularly as now-lost pools would have retained water into dry period. Beyond Bowmans Creek there are a number of named and unnamed waterways that were likely always ephemeral, providing intermittent water to occupants. The hydrology of the Project Area would have likely only supported short-term or sporadic visits to the region.

The Project Boundary has experienced widespread changes in vegetation during the past century, with the original vegetation essentially removed (for pastoral grazing), resulting in a mainly open area with minimal extant vegetation. The original vegetation of the local area consisted of Savannah woodland, with box, gum and ironbark dominant.

The predominant land use of the Project Area is low intensity grazing. The establishment of the grazing industry involved the widespread clearance of native vegetation and the introduction of heavy, hard hoofed animals. The extent of clearing was noted during the survey where even the steepest slopes have been laboriously cleared. The combination of the steeply sloping terrain, a high rainfall, the loss of trees, and the breaking apart of the soil by cattle has meant that the already thin soils have become much thinner.

6.5.1.2 Cultural Context

The Project Area is located in the border country of the Wonnarua, Geawegal, and Kamilaroi tribal areas of the upper Hunter River valley. The Wonnarua people and their neighbours lived in an environment rich in food resources. Freshwater fish, shellfish, reptiles, mammals, birds, and plant food provide a diverse diet (see Brayshaw 1986). Trade and/or exchange occurred between the coastal and inland groups including visiting by coastal and inland groups for initiations and ceremonies.

6.5.1.3 Archaeological Context

Archaeological research in the upper Hunter Valley commenced as early as the late nineteenth century with rock art recordings on Bulga Creek (Matthews 1898), followed by recordings by Thorpe in 1918 (cited Brayshaw 1986) of the Wallaby Bora Ground, adjacent to Wollombi Brook. Further archaeological studies in the district have been sponsored by the Australian Museum (McCarthy and Davidson in the 1940s, and Moore in 1970).

There have been a significant number of Aboriginal archaeological investigations of the Upper Hunter region and an accepted occupation model for the region has been developed which defines occupation patterns by landforms. The Project Area aligns with three (3) of the five (5) expected occupation patterns including transit, hunting, and small group camps. Of the five (5) occupation classifications, these three (3) have the lowest likelihood of archaeological deposits.

Archaeological studies across the Upper Hunter region have almost exclusively been undertaken in relation to environmental assessments for proposed or ongoing developments, specifically the coal mining industry, required under the NSW *National Parks and Wildlife Act 1974* (NPW Act) and the EP&A Act. While the valley floor of the Hunter Valley is one of the most extensively researched archaeological landscapes in NSW, the findings of these investigations have little bearing on the steep gradient landforms of the Project Area due to the very different topography between the two (2) regions.

An ACHAR was completed for the Stage 1 Project by Ozark in March 2021 to support the Stage 1 project EIS, followed by an amended ACHAR in September 2021. These reports involved both a desktop and field survey of the Stage 1 Development Corridor. During surveys, 15 previously unrecorded Aboriginal sites were located. These sites consist of eight (8) artefact scatters with a low–moderate artefact density and seven (7) isolated artefacts. A strong tendency for sites to be recorded on slopes with less than 10 degrees elevation was identified and artefact scatters were exclusively recorded in landforms with a gentler topography.

A search of the Heritage NSW administered Aboriginal Heritage Information Management System (AHIMS) database on 13 May 2025 returned 43 results for Aboriginal sites within a 10 km radius of the Project Boundary (GDA Zone 56 Eastings: 313203–333011; Northings: 6418712–6438588). The most frequently recorded site types are artefact scatters which contribute 58.1% of the site types in the vicinity of the Project Boundary. Other site types returned in the search area include isolated finds (n=17, 34.9%) and a single grinding groove site. No previously recorded sites are located within the Project Area.

6.5.2 Consultation

A major aim of the ACHAR was to identify any cultural values within the landscape in which the Project is located so that those values can be recognised and incorporated into the Project's management and mitigation measures. The consultation for the Project followed the Consultation Requirements (DECCW 2010b) and a log and copies of correspondence with Aboriginal community stakeholders is presented in Appendix 1 of the ACHAR (refer to **Appendix 9**).

Consultation was undertaken in four (4) main stages, in accordance with the Consultation Requirements. These stages are summarised in **Table 6.26** below.

Table 6.26 ACHAR Consultation Stages

Stage	Details
Stage 1 – Notification and registration of interest	• An advertisement was placed in the Singleton Argus of 27 February 2025 to solicit expressions of interest. • A letter seeking information from various agencies was sent on 27 February 2025. These agencies were: Heritage NSW; the Wanaruah LALC; the Office of The Registrar, *Aboriginal Land Rights Act 1983*; the National Native Title Tribunal; Native Title Services Corporation Limited (NTSCORP); Muswellbrook Shire Council; Singleton Council; Upper Hunter Shire Council and Hunter Local Land Services. • Letters were sent to individuals and groups whose contact details had been provided by the government agencies • By the closing date for registration concerning the Project, nineteen groups or individuals registered to be consulted as RAPs An active consultation process was established whereby Aboriginal parties could contribute to culturally appropriate information gathering and the assessment methodology, provide information to enable the cultural significance of Aboriginal objects and/or places to be determined, and to have input into the development of cultural heritage management options.
Stage 2 – Presentation of information	Information regarding the Project, proposed consultation process and assessment methodology was provided to the RAPs for comment on 12 August 2025.

Stage	Details
Stage 3 – Gathering information about cultural significance	Consultation with RAPs regarding the cultural heritage values of the Project Area included: • a request with the draft assessment methodology for any initial comments regarding the Aboriginal cultural heritage values of the Project Area. • discussion of cultural heritage values during fieldwork activities. • Three responses to the survey methodology were received of which none required changes to be made to the survey methodology.
Stage 4 – Review of the draft ACHA	A copy of the draft ACHAR was provided to all RAPs in February 2026 with an invitation to review and comment on all aspects of the document, noting that information on cultural significance and any recommendations provided from an Aboriginal cultural perspective would be documented in the final ACHRA. Outcomes of this consultation are detailed in the **Appendix 7** specialist study, however no immediate concerns or issues with the ACHAR were identified.

6.5.3 Survey Method

The primary aim of the archaeological survey was to identify and record any existing surface evidence of past Aboriginal occupation within the Project's Development Corridor. Due to the expansive and steep nature of the overall Project Area, the heritage survey exclusively targeted the Project's Disturbance Footprint. The Disturbance Footprint was inspected on foot by an OzArk Project Archaeologist and three (3) representatives from Wanaruah LALC across two (2) deployments.

Some areas of the Disturbance Footprint were unable to be surveyed as it was unsafe to proceed due to the steepness of terrain. The field surveys were undertaken over four (4) days including 30 September 2025 – 1 October 2025 and 21 January 2026 – 22 January 2026.

Effective survey coverage of the Disturbance Footprint represents an approximation of the amount of ground surface able to be seen at any location within specific landform. The effective coverage across to the two (2) landforms within the Project Area ranged from 0.18% to 0.75% ground visibility.

6.5.4 Survey Results

No Aboriginal sites were identified within the Disturbance Footprint. The Disturbance Footprint was confirmed to comprise almost entirely of steep slopes and crests subject to natural erosive processes exacerbated by ongoing agricultural operations and vegetation clearing or loss.

6.5.5 Statement of Heritage Significance

The lack of archaeological evidence from both the current survey and from surveys on adjacent landforms (OzArk, 2022) indicates that the Development Corridor is within a landscape with low archaeological potential. While the Development Corridor may have been used for hunting or transit purposes, these activities do not leave a strong archaeological signature.

It is therefore assessed that the Development Corridor has low archaeological values, low aesthetic values due the historic modification of the landscape, and no known Aboriginal historic value.

6.5.6 Cumulative Impacts Assessment

As no Aboriginal objects were recorded in the Disturbance Footprint, the Project will not add to the cumulative impact to Aboriginal sites in the broader local government areas.

6.5.7 Ecologically Sustainable Development

Ecologically sustainable development principles (ESD) (defined in s.6 of the *Protection of the Environment Administration Act 1991*) requires the integration of economic and environmental considerations (including cultural heritage) in the decision-making process. Regarding Aboriginal cultural heritage, ESD can be achieved by applying the principle of intergenerational equity and the precautionary principle.

6.5.7.1 Intergenerational Equity – Cumulative Impacts

Intergenerational equity is the principle whereby the present generation should ensure the health, diversity, and productivity of the environment for the benefit of future generations. In terms of Aboriginal heritage, intergenerational equity can be considered in terms of the cumulative impacts to Aboriginal objects and places in a region. If few Aboriginal objects and places remain in a region (for example, because of impacts under previous permits), fewer opportunities remain for future generations of Aboriginal people to enjoy the cultural benefits of those Aboriginal objects and places.

6.5.7.2 The Precautionary Principle

The precautionary principle states that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

6.5.7.3 Applicability to the Project

There is a very low impact to Aboriginal cultural heritage values as no Aboriginal sites were recorded, and no intangible heritage values have been identified within the Disturbance Footprint and broader Development Corridor. The results of the surface survey indicate that significant Aboriginal cultural heritage values will not be harmed within the Disturbance Footprint and broader Development Corridor.

6.5.8 Mitigation and Management Measures

Given that no Aboriginal cultural heritage sites were identified during field survey, and the overall low archaeological potential of the broader Development Corridor, no additional Project-specific mitigation measures have been provided. However, the ACHAR has provided generic Aboriginal heritage management measures which are summarised below and captured in the consolidated list of mitigation measures in **Appendix 5**:

- **ACH01:** An Unanticipated Finds Protocol and Skeletal Remains Protocol must be in place during the construction and operation of the Project to guide the process.

- **ACH02:** Should previously unrecorded Aboriginal objects be discovered, an approved Aboriginal Cultural Heritage Management Plan (ACHMP) will be required to appropriately manage the find. The ACHMP will be prepared in consultation with the Registered Aboriginal Parties for the Project.
- **ACH03:** Inductions for work crews should include a cultural heritage awareness procedure to ensure they recognise Aboriginal artefacts.

6.6 Historical Heritage

The SEARs require an assessment of the impacts to historic heritage having regard to the *Guidelines for preparing a statement of heritage impact*.

An Historical Heritage Impact Assessment (HHIA) has been undertaken by OzArk (refer to **Appendix 10**) and key findings are summarised below.

The HHIA has been prepared with reference to the Heritage Council's *Assessing Heritage Significance, A guide to identifying and examining heritage items in NSW* (DPE 2023) and the *Investigating Heritage Significance. A guide to identifying and examining heritage items in NSW* (Heritage Council 2021) to assess whether items of historic significance may be impacted by the Project.

6.6.1 Existing Environment

To inform the HHIA, searches of all relevant historical heritage databases were undertaken. This included searches of:

- National and Commonwealth Heritage Listings.
- State Heritage Register (SHR).
- Local Environmental Plan (LEP).

No items were identified within the Project Boundary, although five (5) locally listed items within 5 km of the Project Boundary were identified. These locally listed items include the 'Hillcrest' (Muswellbrook LEP, I48), 'Timber house' (Singleton LEP, I60), 'Richards Family Cemetery' (Singleton LEP, I38), 'Former Roman Catholic Church' (Singleton LEP, I156), and 'Greylands and outbuildings' (Singleton LEP, I23).

None of the curtilages associated with locally listed heritage items extend into the Project Boundary. However, one (1) heritage item, the *Former Roman Catholic Church* (I156), which is listed under the Singleton LEP 2013, is located proximally to the Project Boundary, although it lies outside it.

A review of historical imagery for the Project Boundary indicates that no substantial structures have been present within the area for at least the past 65 years. In the absence of evidence for earlier structures within the Project Boundary, the potential for significant subsurface historical archaeological deposits is considered to be minimal.

More broadly, the Project is located within a cultural landscape characterised by small rural landholdings containing a range of structures, such as homesteads, which reflect a long history of rural settlement spanning approximately the past 150 years.

6.6.2 Impact Assessment

The Project will result in no physical or visual impacts on the Former Roman Catholic Church (LEP I156). The Project is also expected to have a negligible impact on the heritage values of other State Heritage Register (SHR) and LEP-listed items. Database searches and field inspections confirmed that no historic heritage items are located within the Project Boundary or Disturbance Footprint. Additionally, it is considered unlikely that the proposed works at the offsite road works locations would impact any items of historic heritage significance.

Consequently, it is considered very unlikely that significant historic heritage items will be encountered during the Project.

6.6.3 Mitigation and Management Measures

Given the absence of impacts, no mitigation measures are required for known historic heritage items. However, should potentially significant historic heritage items be unexpectedly discovered during construction, appropriate unexpected finds procedures must be followed, and further investigation, including the preparation of a Statement of Heritage Impact, may be required. This has been reflected as HH01 in the consolidated list of mitigation measures (**Appendix 5**).

6.7 Traffic and Transport

The SEARs require:

- An assessment of the construction, operational and decommissioning traffic impacts of the development on the local and State road network.
- Details of the peak and average traffic volumes (including light, heavy and over-mass / over-dimensional vehicles / heavy vehicles requiring escort and construction worker transportation) and transport and haulage routes during construction, operation and decommissioning, including traffic associated with sourcing raw materials (water, sand and gravel).
- An assessment of the potential traffic impacts of the Project on road network function including intersection performance, site access arrangements, site access and haulage routes, and road safety, including school bus routes and school zones.
- An assessment of the capacity of the existing road network to accommodate the type and volume of traffic generated by the Project (including over-mass / over-dimensional traffic haulage routes from port) during construction, operation and decommissioning.
- An assessment of the likely transport impacts to the site access and haulage routes, site access point, any rail safety issues, any Crown Land, particularly in relation to the capacity and conditions of the roads and use of rail level crossings (and rail safety assessment if required), and impacts to rail underbridges and overbridges.
- A cumulative impact assessment of traffic from nearby developments.
- Details of measures to mitigate and / or manage potential impacts (developed in consultation with the relevant road authorities) including:

- A schedule of all required road upgrades (including resulting from heavy vehicle and over mass / over dimensional traffic haulage routes).
- Clear figures of proposed road upgrades (including the site access point).
- Road maintenance contributions, and any other traffic control measures, developed in consultation with the relevant road and / or rail authority.

A TTIA was undertaken by Stantec to address the requirements of the SEARs. The TTIA is provided in **Appendix 11** and the key findings are summarised below.

6.7.1 Existing Environment

The TTIA includes a description of the existing state, regional and local road network used by the Project, extending from the Port of Newcastle to the Project Area. The road network comprises a mix of state highways, regional roads and low volume local rural roads. Overall, the local road environment is characterised by undulating terrain, variable carriageway widths, limited line marking in places and constrained visibility at bends, crests and creek crossings.

Key roads utilised by the Project include:

- New England Highway, a state road forming the primary regional connection between Newcastle, Singleton and Muswellbrook. It is a sealed highway with posted speed limits generally up to 100 km/h and carries the highest traffic volumes within the study area.
- Hebden Road (north and south), a sealed rural road connecting to the New England Highway at two (2) locations. It forms the principal access route for both OSOM and general construction traffic, with sections of constrained width, bridges and flood-prone low points.
- Scrumlo Road, a sealed local road with limited line marking and variable carriageway width, used to access the approved Stage 1 site entry.
- Bowmans Creek Road, a narrow rural road with sealed and unsealed sections, steep grades, tight bends, causeways and cattle grids, forming part of the internal connection between Stage 1 and Stage 2.
- Albano Road, an unsealed local road with single lane sections, significant gradients and limited sight distances, providing access to turbines in the northern portion of the Project Area.

Traffic volumes on local roads are generally low, particularly on Bowmans Creek Road and Albano Road, with higher volumes recorded on Hebden Road and the New England Highway. Existing traffic conditions reflect predominantly rural land uses, mining operations and limited residential access.

6.7.2 Proposed Transport Routes

As discussed in **Section 3.2.8**, the Port of Newcastle has been identified as the preferred port for OSOM deliveries. The current OSOM Transport Route begins at the Port of Newcastle and directs OSOM vehicles through Singelton via the New England Highway, however it is noted that prior to construction commencing, it is anticipated that construction of the Singleton Bypass will be completed (late 2026). As such, the OSOM Transport Route will incorporate the newly constructed Singleton Bypass, avoiding the Singleton CBD.

OSOM vehicles will turn onto Hebden Road (south) and Scrumlo Road to access the approved Stage 1 access point. Vehicles will move internally via approved Stage 1 access tracks and connect to Albano Road and Bowmans Creek Road to reach the Stage 2 WTG locations.

The general workforce (i.e. light vehicle) transport utilised for construction, operational and maintenance traffic would access the Project Area via the New England Highway, then Hebden Road (north and south), with onward travel along Scrumlo Road, Bowmans Creek Road and Albano Road to reach the Project Area. The general workforce, which makes up the vast majority of light vehicle traffic, is anticipated to be split evenly between Newcastle and Muswellbrook. The workforce from Newcastle is assumed to access the site via Hebden Road (south) and the workforce from Muswellbrook is assumed to access the site via Hebden Road (north).

6.7.3 Impact Assessment

6.7.3.1 OSOM Assessment

Swept Path Route Assessment

The TTIA undertook a swept path assessment to determine impacts associated with the movement of OSOM vehicles from Port to the approved Stage 1 project site access point. A detailed overview of the swept paths for the turbine delivery from the Port of Newcastle to the approved site access point via New England Highway are included in Appendix C of the TTIA (**Appendix 11**). However, it should be noted that these swept paths are provided for reference only. The OSOM transport details are fully described in the OSOM Route Study (**Appendix 26**) and a consolidated set of road upgrades is presented in **Section 3.2.9** and **Appendix 25** of the EIS. In the event of doubt, refer to these as the source of truth in relation to OSOM transportation and any associated road upgrades.

Road Condition Review

A visual review of the transport route (i.e. light vehicle) from the turn off at New England Highway onto Hebden Road (south) was undertaken and was informed by previous inspections and swept-path assessments completed for the Stage 1 project.

The OSOM route from New England Highway via Hebden Road (south) to Scrumlo Road (Route 1A) is generally suitable, with some required roadworks and vegetation trimming to be addressed during detailed design. Existing culverts, causeways, and bridges on Hebden Road are adequate but should be considered in the Traffic Management Plan (TMP) design, along with a recommended dilapidation assessment to monitor condition changes during transport.

Clydesdales Bridge on Scrumlo Road has been identified for widening as part of the Route Study (**Appendix 26**), and concept designs have been prepared and included in this EIS (**Appendix 3)**.

Route 1B (Bowmans Creek Road and Albano Road) is undulating with unsealed surfaces and sections exceeding preferred gradients (20–25%) for OSOM vehicles. These areas will require modification in consultation with Council to satisfy OSOM vehicle requirements.

6.7.3.2 Traffic Generation

Construction Phase

The TTIA conservatively assumed that peak traffic generation for each of the construction activities and material deliveries are to occur simultaneously. This is considered to be the worst-case scenario assessment and in reality, this scenario is likely to occur infrequently, if at all.

The Project is expected to generate approximately 186 daily one-way traffic movements during the peak construction period (months 7–8), of which approximately 14%, or 25, of these trips will be delivery-related heavy vehicles.

Over-dimensioned vehicles will most likely be generated during month 11–16, during which time a peak of 178 to 185 one-way daily vehicles is generated. The delivery of turbines is expected to be grouped to minimise the impact on the road network along its journey and occur outside of peak times during periods accepted by TfNSW and the local Council.

During the peak construction period, a maximum of 160 workers are required on site each day. A worst case scenario has been proposed for workforce generating traffic which involves 50% of the workforce (i.e. 80 employees) traveling from the north (i.e. broadly from Muswellbrook) and 50% traveling from the south (i.e. broadly from Newcastle). Under this assumption, it is assumed that 160 light vehicles will enter the Project Area in both the morning and evening (i.e. 80 from the north and 80 from the south).

Operation Phase

During the operation of the Project, routine maintenance is likely to be carried out by up to 40 people per day across both the Stage 1 and Stage 2 projects. Assuming each person drives themselves to and from the compound, the daily traffic generation would equate to 80 trips.

Decommissioning Phase

The decommissioning of the Project would result in similar traffic movements when compared to the construction phase, however with a significantly reduced workforce and removal of certain material deliveries (e.g. there will be no need for concrete trucks / pours).

6.7.3.3 Traffic Distribution

All vehicles will access the Project site from New England Highway via Hebden Road north or south.

The AM peak hour traffic is anticipated to be 03:30–07:30 with an anticipated traffic volume of 131 vehicles entering the Project Area and 34 vehicles exiting the Project Area. The inverse occurs during the PM peak which is between 17:30–18:30. During each peak hour, it is anticipated that two (2) heavy vehicles will enter the Project Area and two (2) heavy vehicles will depart the Project Area.

OSOM vehicle movements are not expected to be evenly distributed throughout the day or to occur during network peak periods. OSOM deliveries will be scheduled and managed under permit conditions and the TMP, with movements timed to avoid peak traffic hours where practicable.

6.7.3.4 Traffic Assignment

As the construction period is anticipated to begin in 2027, turn volumes were calculated based on projected 2027 volumes for the Hebden Road (south) / New England Highway intersection and the Hebden Road (north) / New England Highway intersection. A full list of assumptions in this projection is defined in Section 4.3 of **Appendix 11**.

The resulting estimated year 2027 turning volumes for the New England Highway / Hebden Road (south) intersection and the Hebden Road (north) / New England Highway intersection are shown in **Figure 6.11** and **Figure 6.12** respectively.

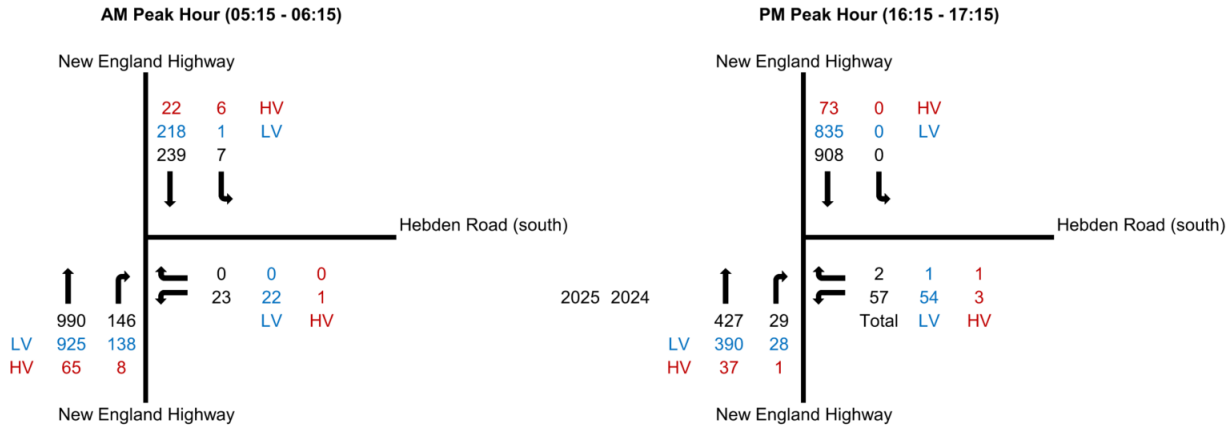


Figure 6.11 Forecast New England Highway onto Hebden Rd (south) – Intersection Turning Volumes

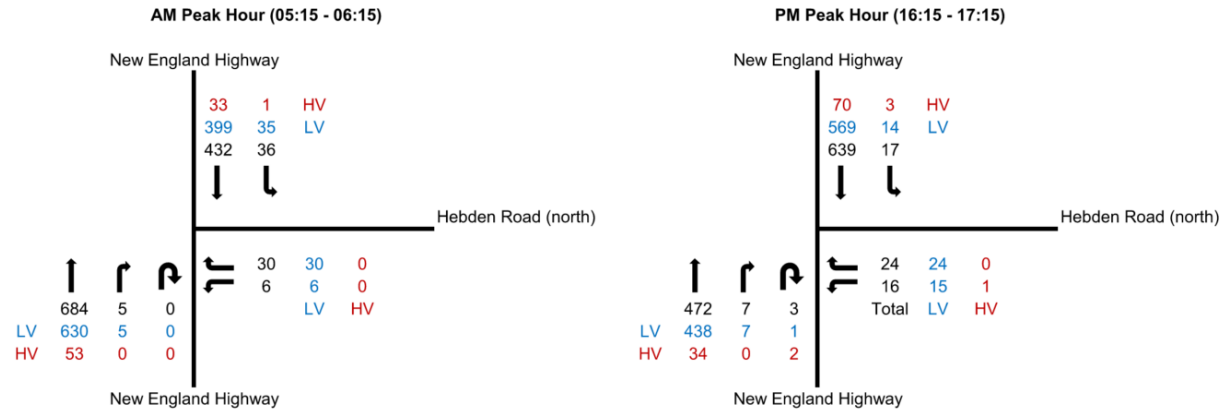


Figure 6.12 Forecast New England Highway onto Hebden Rd (north) – Intersection Turning Volumes

6.7.3.5 Intersection Performance

Intersection performance was assessed using SIDRA, with the Degree of Saturation (DoS) used as the primary indicator of operational performance. For unsignalised intersections, a DoS of approximately 0.90 is generally considered the upper limit of acceptable operation, beyond which delays and queue lengths increase disproportionately. The following intersections have been assessed:

- Hebden Road (south) / New England Highway – T-Intersection.
- Hebden Road (north) / New England Highway – T-Intersection.

Hebden Road (south) / New England Highway

Under projected 2027 traffic conditions, the Hebden Road (south) approach to the New England Highway intersection is forecast to operate in an oversaturated state during the PM peak period, reflecting high delays and queueing on this minor approach. With the inclusion of Project construction traffic, this oversaturation increases, although the New England Highway through movements continue to operate within acceptable limits. The proposed intersection upgrade, involving the introduction of a short right-turn lane on the Hebden Road (south) approach, improves overall intersection performance and reduces the DoS relative to the existing layout under future traffic conditions, effectively mitigating the Project's contribution to intersection impacts.

Hebden Road (north) / New England Highway

Under projected 2027 traffic conditions, the Hebden Road (north) approach to the New England Highway intersection is forecast to operate well within capacity limits during both the AM and PM peak periods. With the inclusion of Project construction traffic, during the AM peak hour this intersection is expected to operate within acceptable limits across all approaches with the addition of traffic. However during the PM peak hour with the addition of Project traffic, the Hebden road (north) approach of the intersection is expected to operate over acceptable limits. This would primarily be caused by the increase in right turn movements onto the New England Highway generated by Project traffic.

Other Intersections

Other nearby intersections are expected to experience lower levels of impact due to comparatively low traffic volumes, with any potential delays primarily affecting right-turn movements from minor roads onto the New England Highway.

6.7.3.6 Turn Warrant Assessment

Turn warrant assessments were undertaken in accordance with the *Austroads Guide to Traffic Management* to determine whether dedicated turning treatments are required at key intersections used by the Project. The assessment considered forecast 2027 peak-hour traffic volumes, including background traffic growth and Project-related traffic.

The existing Hebden Road (south) / New England Highway intersection alignment already features an channelised right turn and auxiliary left turn. As the existing intersection already consists of the adequate turn lane treatments, no further works are required in this instance.

The Project is expected to generate a maximum of two (2) heavy vehicle movements per hour, one (1) inbound and one (1) outbound, across the construction period for both water and quarry deliveries. With such low hourly traffic generation volumes, it is highly unlikely that quarry or water traffic would trigger the requirement for an intersection treatment.

6.7.4 Mitigation and Management Measures

The mitigation measures required to address any traffic related impacts are summarised below from the TTIA:

- **TTIA 01:** A Traffic Management Plan (TMP) will be prepared to manage traffic impacts across all phases of the Project, including construction, operation, maintenance and decommissioning. The TMP will outline measures to minimise disruption to the public road network, manage over-dimensional vehicle movements, maintain access for local road users and emergency services, and ensure compliance with consent conditions and relevant TfNSW and council requirements.
- **TTIA 02:** A Stakeholder Management Plan will be implemented to coordinate communication with affected councils, road authorities, local residents, mining operators and other road users. The plan will provide advance notification of heavy vehicle movements, OSOM deliveries and temporary traffic controls, and establish clear communication channels for addressing complaints or issues arising during construction. This would form part of the ongoing community and stakeholder engagement program discussed in **Section 5.2** and the SIA (**Appendix 20**).
- **TTIA 03:** A Driver Code of Conduct will be enforced for all Project-related vehicle operators to promote safe and considerate driving behaviour. The Code will address speed management, adherence to approved haulage routes, load restraint, fatigue management, and interaction with other road users, and will form part of mandatory site induction requirements.
- **TTIA 04:** Construction traffic will generally be limited to standard working hours to minimise impacts on peak commuter traffic and local road users. Any works or vehicle movements required outside standard hours will be subject to separate approval processes and managed through appropriate mitigation and notification measures.
- **TTIA 05:** All regular heavy vehicle and OSOM drivers accessing the Project site will be required to complete a driver induction prior to commencing works. The induction will cover approved transport routes, permitted travel times, traffic management procedures, speed limits, environmental responsibilities and emergency response requirements to ensure consistent and safe vehicle operations.
- **TTIA 06:** The Project contractor will be responsible for coordinating with transport and delivery contractors to ensure compliance with the TMP and approved traffic routes. This includes confirming that routes are suitable, traffic controls are in place where required, and relevant authorities are consulted prior to the commencement of significant transport activities.
- **TTIA 07:** Vehicle access to the Project site will be limited to approved access points and routes identified in the TTIA. OSOM vehicle movements will be managed under separate permit and escort arrangements, with deliveries scheduled to minimise impacts on the surrounding road network and avoid peak traffic periods where practicable.
- **TTIA 08:** All construction-related parking will be provided within the Project site to prevent spill-over parking on public roads. Parking demand will be monitored throughout construction, with measures such as car-pooling or shuttle services considered if required to reduce traffic volumes and on-road impacts.
- **TTIA 09:** Temporary traffic and warning signage will be installed as required to support safe vehicle movements to and from the Project site. Signage may include reduced speed limits, construction warnings and OSOM movement notifications, and will be implemented in consultation with relevant authorities.

- **TTIA 10:** Traffic management measures will account for local climate conditions that may affect road safety, including heavy rainfall, flooding, dust, bushfire risk and reduced visibility. Construction traffic movements may be adjusted or temporarily suspended during adverse conditions, with drivers and stakeholders notified accordingly.
- **TTIA 11:** To reduce the number of right turn movements at the Hebden Road (north) approach during the PM peak hour, workers will be instructed to turn left onto the New England Highway and make a U-turn at the Bayswater Power Station using the highway interchange. This measure would be captured in the Driver's Code of Conduct (as per **TTIA 03**) and would apply to all light vehicle movements using this intersection.
- **TTIA 12:** Consistent with **AQM02**, where practicable, maintain communications with:
    - the Proponent for Maison Dieu Solar Farm, regarding any simultaneous use of strategic road network routes that could cause cumulative impacts.
    - the Proponents for Queensland Hunter Gas Pipeline, Liddell Battery and Bayswater Ancillary Works and Muswellbrook Solar Farm, regarding timing of any substantial maintenance works that could cause cumulative impacts. In the case of Queensland Hunter Gas Pipeline, reassess cumulative impacts if construction timelines are found to overlap.

6.8 Water Resources

The SEARs require:

- a site water balance for the development, quantify water demand, identify water sources (surface and groundwater), including any licensing requirements, and determine whether an adequate and secure water supply is available for the development (including consultation with suppliers);
- an assessment of the likely impacts of the development (including flooding and flood modelling) on surface water and groundwater resources traversing the site and surrounding watercourses (including their Strahler Stream Order), drainage channels, wetlands, riparian land, farm dams, groundwater dependent ecosystems and acid sulfate soils, related infrastructure, adjacent licensed water users and basic landholder rights, and measures proposed to monitor, reduce and mitigate these impacts;
- where the Project involves works within 40 metres of the high bank of any river, lake or wetlands (collectively waterfront land), identify likely impacts to the waterfront land, and how the activities are to be designed and implemented in accordance with the DPI Guidelines for Controlled Activities on Waterfront Land (2018) and (if necessary) Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (DPI, 2003); and Policy & Guidelines for Fish Habitat Conservation & Management (DPI, 2013); and
- a description of the measures to minimise surface and groundwater impacts, including how works on erodible soil types would be managed and any contingency requirements to address residual impacts in accordance with the Managing Urban Stormwater: Soils and Construction series of guidelines.

A Water Resources Impact Assessment (WRIA) was undertaken by WRM Water & Environment (WRM) to address the requirements of the SEARs and in accordance with the policies and guidelines listed above. The WRIA is provided in **Appendix 12** and the key findings are summarised below.

6.8.1 Existing Environment

6.8.1.1 Surface Water

The Project is located on the south-western edge of the Mount Royal Range within the Hunter River Catchment in the Upper Hunter region of New South Wales. Elevations across the Project range from approximately 200 m Australian Height Datum (AHD) in valley flats to approximately 610 m AHD along ridgelines associated with the Mount Royal Range.

The Project is drained by several perennial and ephemeral watercourses within the Bowmans Creek, Sandy Creek and Muscle Creek sub-catchments. The dominant drainage feature is Bowmans Creek, a perennial fifth-order watercourse that flows southward and discharges to the Hunter River

Key tributaries within or adjacent to the Project include Fish Hole Creek, Sandy Creek, Hilliers Creek and Lincoln Creek, along with numerous first and second order ephemeral drainage lines.

Surface water drainage from the Project generally occurs from north to south, although a ridgeline in the northern portion of the site directs tributaries of Sandy Creek in a north-westerly direction. The Hunter River is a major regulated river within the region and water access and use within the catchment are managed under the relevant Water Sharing Plans (WSP).

6.8.1.2 Flooding

The Project is located within the headwaters of the Hunter River Catchment and is characterised by undulating to steep terrain associated with the Mount Royal Range. The majority of the Project occupies elevated ridgelines and upper slopes, with surface water draining via small headwater creeks and ephemeral drainage lines during rainfall events.

Flood-prone land within the Project is limited to the immediate riparian corridors of Bowmans Creek, Muscle Creek and Yorks Creek. These watercourses are generally confined within incised channels and narrow valley floors. During heavy rainfall events, flows are typically short-duration and confined within channel banks, reflecting the steep gradients and low-order nature of the drainage network. Floodwaters in these creeks may exhibit relatively high velocities but recede rapidly following rainfall.

Anecdotal observations indicate that localised flooding may temporarily affect creek crossings during intense rainfall however, floodwaters do not extend onto elevated ridgelines where Project infrastructure is proposed to be located. There is no known flood mitigation infrastructure within or immediately adjacent to the Project.

6.8.1.3 Groundwater

Groundwater information for the Project was obtained from the Bureau of Meteorology (BoM) Groundwater Atlas. A review of the Groundwater Atlas indicates that there are no registered groundwater bores located within the Project. As discussed in **Section 2.3.4.5**, a review of bores with groundwater monitoring levels available within an approximate 20 km radius of the Project Area was undertaken to assist in informing potential groundwater levels within the Project Area. The groundwater bores within 20 km of the Project Area are presented on **Figure 2.8**.

The Project is located within the North Coast Fractured and Porous Rock Groundwater Sources, specifically within the New England Fold Belt Coast groundwater source. Groundwater resources within this region are managed under relevant Water Sharing Plans prepared in accordance with the *Water Management Act 2000*.

Groundwater vulnerability mapping indicates that the Project lies within a mapped groundwater vulnerability area. GDEs are mapped within the Project, including aquatic GDEs associated with local watercourses and terrestrial GDEs of varying potential within riparian zones as discussed in the BDAR (**Appendix 8**).

6.8.2 Impact Assessment

6.8.2.1 Surface Water

Construction and Decommissioning

During construction and decommissioning of the Project, soils within the Project would be disturbed by vegetation removal, earthworks for access tracks and turbine foundations, excavation, and temporary stockpiling of materials. These activities have the potential to mobilise sediments and/or pollutants into rainfall runoff, which could enter local watercourses, including Bowmans Creek, Muscle Creek, and Yorks Creek.

Potential impacts to surface water quality associated with the Project include:

- increased turbidity and sedimentation in downstream watercourses, farm dams, and ephemeral drainage lines
- accidental spills of fuels, oils, lubricants, or other chemicals associated with construction plant and equipment
- mobilisation of nutrients (e.g., from residual fertilisers or disturbed soils), which could contribute to localised algal growth in stagnant waterbodies
- exposure of historically disturbed or managed soils containing residual herbicides/pesticides, potentially affecting water quality
- loss of topsoil and localised erosion reducing productive land areas and increasing sediment loads downstream
- impacts to water quality in farm dams or minor ponds used for stock watering or irrigation, particularly during high rainfall events.

An erosion hazard assessment conducted using the Revised Universal Soil Loss Equation (RUSLE) in accordance with Managing Urban Stormwater: Soils and Construction (i.e. the Blue Book), predicts that most of the Project corresponds to a very low erosion hazard. Sections with steeper access tracks or exposed soils may have higher erosion potential, and these areas will be managed using standard and supplementary erosion and sediment control (ESC) measures.

ESCs to be applied through construction and decommissioning include:

- diversion of clean water around disturbed areas
- installation of sediment traps and temporary drainage controls

- stabilisation of topsoil stockpiles and disturbed surfaces through seeding, mulching, or soil binder
- maintenance of ESCs after rainfall events to ensure continued effectiveness
- bunded areas for fuel, chemical storage, and concrete washout located away from watercourses (minimum 50 m from streams)
- timing of works near waterways to avoid high-risk erosion periods, where practicable.

Temporary watercourse crossings will be required for some access tracks. These will be designed and constructed in accordance with best-practice guidelines and in consultation with DPI Fisheries. Where crossings are unavoidable within riparian buffers (10 m for first order, 20 m for second order, 40 m for third order streams and above), structures will be fish-friendly, such as culverts or bridges, to maintain aquatic passage and minimise sediment mobilisation.

With the implementation of the ESC measures outlined in the Construction Soil and Water Management Plan (CSWMP), potential water quality impacts during construction and decommissioning are expected to be minor, localised, and temporary. No controlled discharges to surface watercourses are required, and overall catchment yield reductions from containment of runoff are expected to be negligible.

Operations

During the operational phase, potential impacts on surface water quality relate primarily to the small increase in impervious surfaces associated with permanent Project infrastructure. Due to the relatively minor extent and dispersed nature of the infrastructure across the Project, these impacts are expected to be negligible.

Other potential water quality impacts associated with day-to-day operations are limited to:

- stormwater runoff from impervious surfaces, which may cause minor, localised erosion
- accidental spills or discharge from fuels and other chemicals used or stored on-site.

The risk of ongoing erosion post-construction is considered low, provided that disturbed areas are appropriately rehabilitated and any areas showing signs of erosion above background levels are managed. Standard riparian buffer zones will be maintained along all watercourses, where practicable, in accordance with DPI Fisheries.

All hazardous materials will be stored in accordance with relevant Australian standards and guidelines. With these measures in place, operational-phase impacts on surface water quality, stream stability, riparian health, and fish passage are expected to be negligible.

6.8.2.2 Site Water Balance

Water Demands

The Project will require water during both the construction and operational phases. The greatest water demand is expected during construction, primarily for activities such as:

- soil and fill conditioning of temporary laydown areas
- dust suppression and vehicle washdown
- concrete production for footings and pads

- concrete washout
- domestic use (amenities including toilets and showers).

A preliminary assessment of water demands estimates total water usage during the 22-month construction period to be approximately 42.5 to 55.0 ML, shown in **Table 6.27**. Peak demand is expected during the main construction period for access tracks, foundations, and hardstand areas. Water demand during the operational phase is minimal, limited to staff amenities, wash facilities, and fire water supply, estimated at approximately 1 ML per year. A static water tank of 0.1 ML will also be maintained on-site for fire protection.

Table 6.27 Project Water Demands

Feature	Construction Phase Demand (ML)	Operational Phase Demand (ML/y)
Dust suppression (net. Evap)	28.0 to 38.0	Min.
Construction – Stabilised road/hardstand	6.0 to 8.0	-
Construction (concrete)	3.0	-
Washdown–Concrete plant	< 1.0	-
Washdown–Vehicle /Plant	1.5	-
Potable use	< 3.0	1.0
Total	**42.5–55**	**1.1**

Water Supply

The majority of water required for the Project would be sourced from commercial suppliers and, where available, from on-site dams or water tanks under agreement with landholders. Water may also be supplemented by harvesting roof water and recycling where practicable.

All water supplied from existing groundwater sources will be obtained under agreement with relevant landholders, ensuring compliance with any applicable water access licences or approvals. Potable water supplied to the Project will be stored in on-site tanks and routinely tested to ensure compliance with the Australian Drinking Water Guidelines.

An indicative site water balance for the Project is summarised in **Table 6.28**. This demonstrates that water supply sources are sufficient to meet construction and operational demands without impacting local surface water or groundwater availability.

Table 6.28 Project Water Supply

Feature	Construction Phase Demand (ML) – Total	Operational Phase Supply (ML) – Annual
Rainfall	Max Harvestable Right (MHR)	MHR
External potable water	2.5	1.0
External raw water	Balance	Balance
Total supply	**-**	**-**

6.8.2.3 Flooding

The WRIA included the development of a flood model to assess current climate flood behaviour within the Project and inform the siting of flood-vulnerable infrastructure. The assessment considered topography, catchment characteristics, and proposed infrastructure layout, consistent with the methodology applied for the Stage 1 project.

A two-dimensional hydrodynamic model was used to simulate flow behaviour in the Project for the following scenarios:

- 10% Annual Exceedance Probability (AEP) event – representative of a frequent-rare flood event.
- 1% AEP event – representative of the principal flood planning event.
- 0.5% and 0.2% AEP events – representative of a future climate's 1% AEP flood risk.
- Probable Maximum Flood (PMF) – representative of an extreme flood event based on Probable Maximum Precipitation (PMP).

The model results provide the distribution of peak flood levels, depths, velocities, and hazards across the Project for each design flood scenario. No recorded water level data or anecdotal information were available within the Project, and therefore model calibration was not possible.

Summary observations about flood behaviour are as follows:

- 10% AEP: There is generally no widespread flooding within the Project. Active flow paths are confined to watercourses and local depressions. Overland flood depths outside main watercourse alignments are typically shallow (<0.1 m), with maximum depths in channels up to 0.5 m.
- 1% AEP: Flood inundation extents increase, with higher depths and velocities. The 1% AEP event is generally adopted for planning purposes and has been used to determine mitigation measures. The 1% AEP flood extent interacts minimally with the Project's Disturbance Footprint. Areas affected are primarily classified as 'generally safe' (H1), with isolated H2 and H3 hazard pockets where water may accumulate.
- 0.5% and 0.2% AEP: Flood depths are only marginally higher than the 1% AEP event, indicating climate change impacts on inundation are not expected to be significant. Median depths are 0.1–0.15 m, with peak depths up to 1.5 m.
- PMF: Represents the extreme upper limit of design events. Some low-lying riparian areas are inundated, with depths typically up to 0.8 m and peak depths up to 2.0 m. PMF defines the upper limit of flooding that could reasonably occur and is not anticipated to impact elevated infrastructure.

During construction, activities may temporarily traverse ephemeral drainage lines. Potential impacts include temporary access restrictions due to heavy rainfall and the risk of inundation to stockpiles or laydown areas if they are inappropriately sited, which could result in material loss or downstream sedimentation. To mitigate these risks, all temporary compounds and stockpiles will be located outside defined drainage paths, and construction scheduling will incorporate weather monitoring to ensure personnel and equipment can be relocated from low-lying areas prior to significant rainfall events.

During the operational phase, the flood risk is considered negligible. Turbines and the substation are sited on elevated terrain above flood-prone areas, and the small footprints of access tracks and turbine foundations (less than 1.2% of the Project Area) are not expected to have a measurable impact on flood storage or conveyance. The Project does not involve modifications to watercourse geomorphology or the construction of large embankments. The residual operational risk is limited to the trafficability of watercourse crossings for maintenance purposes, which will be managed through design in accordance with DPI Fisheries guidance.

6.8.2.4 Groundwater

Construction and Decommissioning

Generally, impacts to groundwater resources, including GDEs are very unlikely given that the groundwater table is not expected to be intercepted during Project construction or decommissioning. The anticipated depth to groundwater within the Project Area is at least 10 m below ground level (BGL), meaning that in the unlikely event of any hydrocarbon or chemical spills, these are unlikely to infiltrate to the groundwater table. Appropriate spill management measures will be implemented during all phases of the Project.

During construction, excavation will be limited to shallow works, such as site levelling and installation of slab footings, with no deep excavation or driven piles proposed. No groundwater dewatering is planned or envisaged as part of the construction methodology. Any liquids stored on site, including fuels or chemicals, will be contained within bunded areas and subject to regular inspections to minimise the risk of contamination.

Should the final Project design require excavation that may intercept groundwater, further assessment will be undertaken in accordance with the NSW Aquifer Interference Policy (NSW Government, 2022), and appropriate management measures will be implemented to mitigate any potential impacts. During any excavation of borrow pits or other minor on-site works, pit walls will be monitored for seepage to detect interception of localised perched aquifers. Any incidental water take would be accounted for within existing water access licences and reflected in an updated site water balance.

Operations

There is limited scope for the Project to alter groundwater resources during operation. Project operation and maintenance activities are unlikely to intersect the regional water table, and any shallow footing excavations (up to 4 m in depth) are not anticipated to result in measurable impacts to groundwater levels or GDEs. Localised perched aquifers, if intercepted during construction, are expected to recover naturally before the Project reaches its operational phase.

Minimal quantities of dangerous goods, such as transformer oil, will be stored on site during operations, and all storage will comply with relevant Australian Standards (e.g., AS 1940) and bunding requirements. As such, no impacts to groundwater resources, registered bores, or GDEs are expected during the operational phase of the Project.

6.8.3 Mitigation and Management Measures

The mitigation measures required to address any potential surface water impacts that are considered likely for the Project include:

- **WR01**: a CSWMP will be prepared to outline measures to manage soil and water impacts associated with the construction and decommissioning works.
- **WR02**: creation of catch/diversion drains and sediment fences at the downstream boundary of construction activities, where practicable, to support the containment of sediment-laden runoff.
- **WR03**: erosion and sediment control measures will be implemented and maintained at all work sites in accordance with the principles and requirements in Managing Urban Stormwater – Soils and Construction, Volume 1 and Volume 2D of the Blue Book.
- **WR04**: measures to minimise/manage erosion and sediment transport both within areas of disturbance and off-site, including requirements for the preparation of an Erosion and Sediment Control Plan (ESCP) for all progressive stages of construction.
- **WR05**: when works are scheduled during periods when the three-day forecast indicates that rain is likely, erosion control measures should aim to protect disturbed lands with 60% ground cover. Where non-forecast rainfall arrives, site management techniques should endeavour to minimise and mitigate site erosion within 24 hours.
- **WR06**: the storage compound will be constructed of road base (or the like). The ESCP and CSWMP will implement controls that reduce the risk of erosive flows to minimise peak velocities.
- **WR07**: excavation of subsoils should be minimised whenever possible. Any excavated subsoils should be stockpiled and contained to prevent potential dispersion and sediment transfer.
- **WR08**: irrigation canals surround the Project Area. Inspection and monitoring requirements will be implemented, including monitoring of water quality located off-site. The monitoring methodology will be communicated through stakeholder engagement.
- **WR09**: maintenance of suitable ground cover (nominally >60% coverage) and grasses to minimise the potential for erosion and export of sediment.
- **WR10**: all hazardous materials and chemicals will be stored in accordance with relevant Australian standards and other state and local guidelines including the NSW EPA's Storing and Handling Liquids: Environmental Protection–Participants Handbook.
- **WR11**: infrastructure with the potential to cause pollution to be spread due to surface water inundation will be located with a minimum 300 mm freeboard above the 1% AEP flood level. Raising storage infrastructure can occur by situating potential pollutants on top of an earth fill pad or a structural platform.
- **WR12**: the SEARs require that no sensitive infrastructure (e.g., substations) is to be placed within 20 m of any Strahler 3 or above order streams. Sensitive infrastructure will be placed outside the 0.2% AEP flood extent with a minimum 500 mm freeboard to the 1% AEP flood level.
- **WR13**: a water sourcing and monitoring strategy would be prepared to manage potential availability impacts on downstream water users and ensure compliance with legislation relating to water extraction.

- **WR14**: any liquids stored within the Project Area during operation will be contained within a bund and regularly inspected.
- **WR 15**: Further hydrogeology assessments will take place in the event will take place in the event that excavations are planned to occur within 3 m of recorded groundwater levels.
- **WR 16**: In the event that groundwater flows into excavations unexpectedly, any water take would be appropriately licensed in accordance with the requirements of the WM Act, the Water Management (General) Regulation 2018 and relevant Water Sharing Plans (WSPs).

6.9 Air Quality

The SEARs require:

- an assessment of risks of dust generation and propose mitigation measures designed in accordance with the Approved Methods and Guidelines for the Modelling and Assessment of Air Pollutants in New South Wales (DECC, 2005); and
- demonstration of how the development minimises greenhouse gas emissions (reflecting the Government's goal of net zero emissions by 2050).

An Air Quality Impact Assessment (AQIA) has been undertaken by Zephyr Environmental (Zephyr) (refer to **Appendix 13**) and key findings are summarised below.

6.9.1 Existing Environment

The closest meteorological station to the Project is the Bureau of Meteorology Automatic Weather Station (AWS) located at Lostock Dam (AWS 061288), approximately 30 km east of the nearest WTG. However, wind speed and direction data are not publicly available for this AWS. As such, this assessment has been prepared utilising data from the Scone Airport AWS (AWS 61363), located 35 km southwest of the nearest WTG, which is still considered representative of the conditions anticipated at and around the Project Area.

An annual wind rose for the combined five-year period from 2020 to 2024 is presented in **Figure 6.13**. Wind speed and direction are generally consistent between years. On an annual basis, winds most frequently originate from the south and south-south-east. This pattern is broadly reflected across spring, summer and autumn, with the strongest dominance of southerly winds occurring during summer and an increased frequency of north-westerly winds during spring. In contrast, north-westerly winds are dominant during winter. Stronger winds are predominantly from the south and south-south-east, with maximum hourly average speeds reaching 17.7 metres per second (m/s) and occur most frequently during summer. There is a moderate frequency of calm conditions, with wind speeds less than 0.5 m/s occurring approximately 13% of the time.

There are eight (8) associated residences located within 3 km from the Disturbance Footprint. Given their proximity, there is potential for dust impacts at these residences under strong wind conditions, particularly during dominant southerly and south-south-easterly winds for much of the year, and north-westerly winds during winter. Other receptors located to the north of the Project are more than 4 km from the Disturbance Footprint and are therefore unlikely to be affected by dust emissions.

NSW DCCEEW operates several air quality monitoring stations within the region. The closest stations to the Project Area are located at Aberdeen, Camberwell, Muswellbrook and Muswellbrook North-West, all within approximately 18-22 km of the Project. Particulate matter less than 10 microns in diameter (PM_{10}) is measured at these monitoring stations.

A review of monitoring data collected between 2020 and 2024 indicates that annual average PM_{10} concentrations fluctuate between years, tending to be higher in drier years and lower during wetter periods. Across all stations and years, annual average PM_{10} concentrations remained below the NSW EPA annual average assessment criterion of 25 µg/m^3. An overall five-year average PM_{10} concentration of 17.9 µg/m^3 has been adopted for the purposes of this assessment. This value is well below the applicable assessment criterion, and even the highest recorded annual average concentration remains compliant.

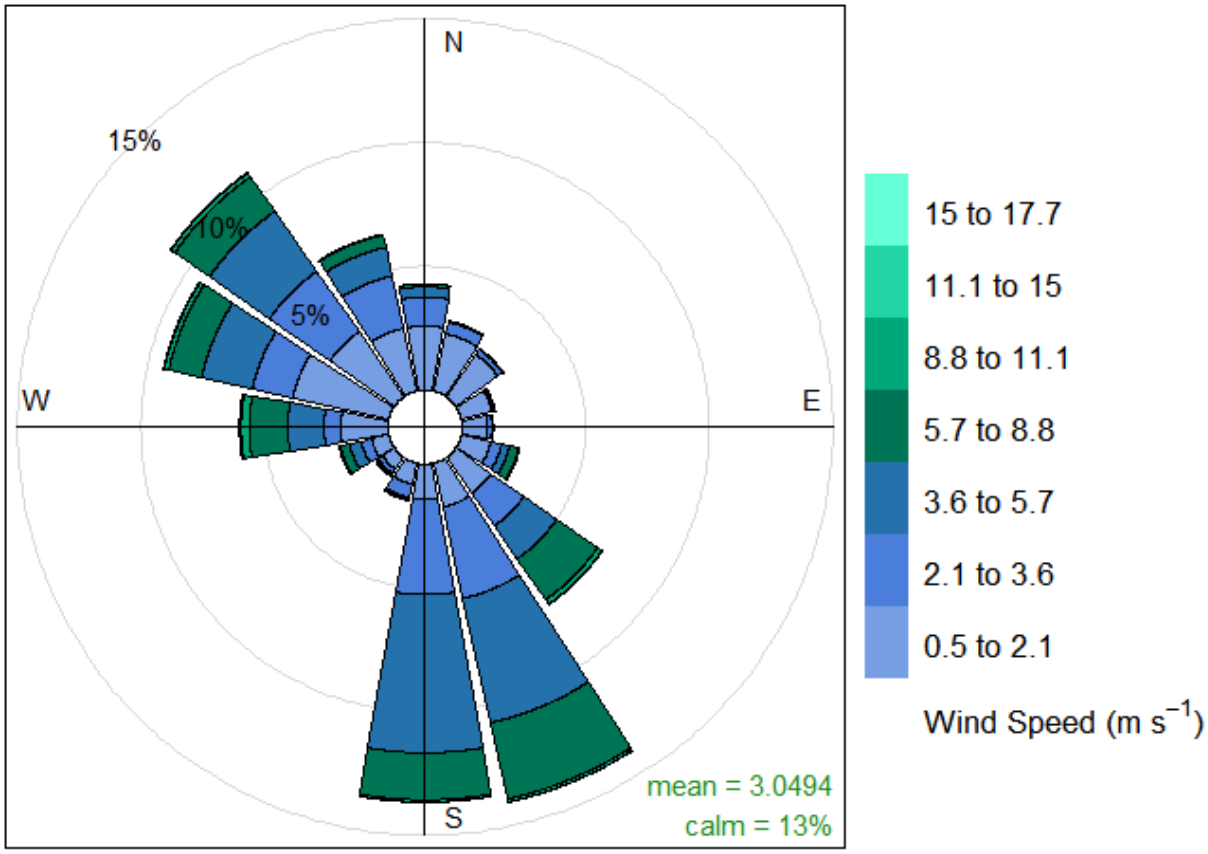


Figure 6.13 Wind Rose for All Data from 2020–2024 at Scone Airport AWS

6.9.2 Impact Assessment

Activities with the potential to generate dust emissions during the Project include land disturbance and earthworks associated with site establishment, construction of access tracks and hardstands, excavation and backfilling for WTG foundations, substation works, underground electrical collector network installation, and the movement of construction plant and vehicles over temporary unsealed roads and disturbed areas. Additional potential sources of dust include vegetation clearing, material handling, concrete batching, borrow pits, quarrying and rock crushing, where required.

The majority of dust-generating activities would occur during the construction phase of the Project. Dust emissions during construction may vary depending on the scale and nature of the works being undertaken, the extent of exposed surfaces, and prevailing weather conditions. Exhaust emissions from on-site plant and site traffic are unlikely to have a significant impact on local air quality and have not been considered for this Project.

Based on the activities proposed, air quality impacts are expected to be primarily associated with construction, and to a lesser extent decommissioning. During construction, any dust impacts are expected to be localised, largely within the Disturbance Footprint and immediately surrounding areas. Given the separation distances between the Disturbance Footprint and surrounding sensitive receptors, dust impacts beyond the Project Area are expected to be limited.

Operations are expected to commence in 2027, with an estimated operational life of approximately 30 years. During this time, operations would occur continuously, 24 hours a day, seven (7) days a week.

6.9.2.1 Construction Impacts

A risk assessment was undertaken as part of the AQIA (refer to **Appendix 13**). This assessment determined that, without mitigation, the potential for dust emissions during construction is large due to the scale of earthworks and associated activities within the 180 ha Disturbance Footprint. However, given the substantial distance between the footprint and the nearest sensitive receptors, the overall risk of dust impacts on amenity and human health is low. With the implementation of mitigation measures outlined in Section 6, any residual risk is expected to be further reduced.

During construction, the aim should be to prevent significant effects through the use of effective dust control measures at the point of emission. This approach has been shown to be achievable on other large infrastructure projects where works are staged over extensive areas. The residual effect will therefore normally be considered 'not significant' (IAQM, 2005). Concrete batching plants and other reused Stage 1 components do not generally represent significant sources of dust but will require management to ensure raw material handling and product delivery are controlled.

Potential impacts associated with off-site disturbance, including OSOM vehicle movements for transporting wind turbine components and other infrastructure, were also considered. Given the nature of these activities and the distances to sensitive receptors, there is limited or no potential for dust annoyance or amenity impacts to occur, provided the recommended mitigation measures are implemented (refer to **Section 6.9.3**).

Offsite Road Work Areas

There is potential for dust generation during construction of the road modifications at the offsite road work areas along the OSOM Transport Route. Any dust-related impacts would be managed in accordance with the measures presented in **Section 6.9.3**. This would include consideration of the offsite road work areas with potential for dust-related impact to nearby non-associated receivers within the Air Quality Management Plan (AQMP) to ensure specific measures are adopted at these locations, as required.

6.9.2.2 Operational Impacts

Potential air quality impacts during the operational phase of the Project would be limited to:

- operational vehicle movements

- maintenance works on Project infrastructure including access tracks, hardstands, and laydown areas
- replacement of WTG components, as required.

The wind turbines' lowest blade tip will be approximately 45 m above ground level. Although rotating blades generate wake turbulence downstream of the turbine, these effects occur well above ground and are not anticipated to be perceptible at ground level.

Dust emissions during operations would largely arise from vehicles using internal access roads. Traffic volumes and intensity will be significantly lower than during construction, so the overall dust risk is correspondingly reduced. Where required, this can be managed effectively through routine road upkeep (e.g., grading and surface conditioning) and sensible speed controls.

Should WTG components be replaced during the operational life, such as through upgrades or due to wear, the management approach should mirror construction-phase dust controls to maintain low risk. On this basis, no additional, operation-specific air quality management measures are recommended beyond standard good practice.

6.9.2.3 Decommissioning

Decommissioning activities would broadly resemble those undertaken for construction, but over a shorter timeframe. Unlike construction, decommissioning would not involve vegetation clearing for site preparation and would include rehabilitation of disturbed areas.

Potential dust generation during decommissioning has been considered within this assessment. The recommended environmental management measures set out in **Section 6.9.3** should be applied during this phase to keep residual risks low. A DRP will be prepared to guide these works and address any further project-specific considerations.

6.9.3 Mitigation and Management Measures

BCWF has committed to implement a comprehensive range of air quality mitigation and management measures for the Project, including:

- **AQM01**: during detailed design (when precise timing of construction activities are known) confirm the anticipated cumulative impacts of the simultaneous construction and operation of both Bowman's Creek Wind Farm (Stage 1) SSD-10315 and proposed BESS MOD 1. Ensure plans regarding construction activities, operational vehicle movements and maintenance works are co-ordinated, dust and particle emissions are minimised across both projects, and interactions of off-site transport / deliveries using the same routes are considered.
- **AQM02**: where practicable, maintain communications with:
    - the Proponent for Maison Dieu Solar Farm, regarding any simultaneous use of strategic road network routes that could cause cumulative impacts
    - the Proponents for Queensland Hunter Gas Pipeline, Liddell Battery and Bayswater Ancillary Works and Muswellbrook Solar Farm, regarding timing of any substantial maintenance works that could cause cumulative impacts. In the case of Queensland Hunter Gas Pipeline, reassess cumulative impacts if construction timelines are found to overlap.

- **AQM03**: develop and implement an AQMP that details the air quality control measures and procedures to be undertaken during construction of the Project (including offsite road work areas), including:
    - air quality and dust management objectives that are consistent with relevant regulatory authority guidelines
    - identification of potential sources of dust
    - mitigation measures to minimise dust impacts on sensitive receptors and the environment (including but not necessarily limited to AQM04 to AQM13 below)
    - a dust monitoring program to assess compliance with the identified objectives
    - contingency plans to be implemented in the event of non-compliances and/or complaints about dust.
- **AQM04**: minimise areas of exposed surface where possible throughout the construction site planning and programming, to reduce the area of potential construction dust emission sources.
- **AQM05**: control measures, such as compaction stabilisation or covering will be implemented in order to minimise dust from stockpile sites.
- **AQM06**: consider the use of dust suppression measures, such as water carts or soil binders, on prolonged exposed surfaces and heavily trafficked access roads as required.
- **AQM07**: all trucks must cover their loads when transporting materials that are potential sources of wind-blown dust, to and from the Project.
- **AQM08**: bulk cement and other fine powder materials should be delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- **AQM09**: activities that generate significant dust will be avoided or modified during high wind periods. This relates mainly to bulk earthworks activities such as excavation, dozing, material handling, and truck movement.
- **AQM10**: work activities will be reviewed if the dust suppression measures are not adequately restricting dust generation.
- **AQM11**: place rumble grids and wheel washes at all site exit points onto public roads.
- **AQM12**: construction plant and equipment will be maintained in good working condition to limit impacts on air quality.
- **AQM13**: where practicable, vehicles will be fitted with pollution reduction devices and switched off when not in use.

6.10 Land

The SEARs require a detailed assessment of potential impacts to land including:

- a detailed justification of the suitability of the site and that the site can accommodate the proposed development having regard to its potential environmental impacts, permissibility, strategic context and existing site constraints;

- an assessment of the potential impacts of the development on existing land uses on the site and adjacent land, including:
    - flood prone land, agricultural land, irrigated lands, Crown lands, travelling stock routes, mining, quarries, mineral or petroleum rights;
    - a soil survey to determine the soil characteristics and consider the potential for erosion to occur;
    - a cumulative impact assessment of nearby developments;
    - a preliminary investigation into potential contamination across the site, in accordance with the *State Environmental Planning Policy (Resilience and Hazards) 2021* (Hazards SEPP) (as required); and
    - the development potential of that land, in accordance with the Wind Energy Guideline.
- an assessment of the compatibility of the development with existing land uses, during construction, operation and after decommissioning, including:
    - consideration of the zoning provisions applying to the land, including subdivision (if required);
    - completion of a Land Use Conflict Risk Assessment in accordance with the Department of Industry's *Land Use Conflict Risk Assessment Guide*; and
    - assessment of impact on agricultural resources and agricultural production on the site and region.

A Soils, Land and Agriculture Impact Assessment (SLAIA) has been undertaken for the Project by Minesoils in accordance with the requirements of the SEARs. The SLAIA is provided in **Appendix 14** and the key findings are summarised below.

6.10.1 Methodology

In the absence of specific guidelines for soil, land, and agricultural assessment for wind farm projects, the soil and land resource survey was undertaken in line with the requirements of the Large-Scale Solar Energy Guideline (LSSE Guideline) (DPHI, 2022). These requirements include conducting a soil survey and verifying Land and Soil Capability (LSC) in accordance with the Land and Soil Capability Assessment Scheme (EOH, 2012).

Minesoils carried out a comprehensive soil and land resource survey to inform the following key tasks throughout the EIS process:

- Soil assessment–identification of soil units, soil qualities, and potential risks such as erosion, acid sulfate soils (ASS), and salinity.
- LSC verification–confirming land capability through both desktop analysis and field verification.
- Development of management and mitigation measures–strategies to minimise soil erosion during construction, operation, and decommissioning phases.

The fieldwork program was designed to meet LSSE Guideline requirements and included:

- Soil survey and mapping – collection of landform patterns, soil profile data, and taxonomic parameters to classify soils within the Disturbance Footprint.
- LSC verification – gathering biophysical data through in situ measurements and regional mapping to support LSC assessment.

- Assessment of soil qualities and risks – recording evidence of erosion (e.g., tunnelling, rill, gully, sheet erosion) and identifying areas requiring specific handling during construction and rehabilitation, as well as observations of ASS and salinity risks.

The survey adopted an integrated free survey approach, which assumes interdependence between land characteristics and uses catena and top sequences to describe gradual soil variation. Survey points were selected based on field judgment to delineate soil boundaries, which may be abrupt or gradual. Soil cores were excavated to depths of approximately 0.8–1.0 m or to refusal, following safety protocols including site clearances and Before You Dig Australia (BYDA) checks.

The survey covered the Development Corridor, assessing 12 sites at an approximate intensity of one (1) site per 35 ha. Soil profiles were logged in accordance with the Australian Soil and Land Survey Field Handbook (NCST, 2009) and classified using the Australian Soil Classification (ASC) Third edition (Isbell, 2021). Detailed profile descriptions were recorded using Minesoils' data sheets, including GPS coordinates and photographs.

Soil samples were collected from each horizon to a depth of 1 m where possible, resulting in 35 samples, of which 12 representative samples were selected for laboratory testing. A full soil profile descriptions and laboratory results provided in **Appendix 14**.

6.10.2 Existing Environment

6.10.2.1 Regional Context

Today, agriculture in the Upper Hunter region is characterised by intensive production on rich alluvial soils along the Hunter River floodplains, transitioning to lower-intensity livestock grazing on the undulating slopes and modified pastures of the surrounding hilly country. The region supports a diverse mix of enterprises including dairy farming, viticulture (particularly associated with the Soldier Settlement legacy), and beef cattle production. The Hunter Valley landscape is a complex mosaic of traditional primary production, large-scale open-cut coal mining operations, and significant energy generation infrastructure, including the Bayswater and former Liddell power stations. While the broader region to the north and northwest contains higher-quality soils and a more diverse horticultural sector, the immediate locality of the Project is defined by a historical shift from dairy and wheat toward robust cattle grazing and viticulture.

The gross value of agricultural enterprises within the Muswellbrook Shire and Singleton LGAs for 2020/2021 is approximately $41 million and $48.4 million respectively. While both LGAs feature significant industrial and mining footprints, they maintain a strong agricultural identity centred on livestock for slaughter and livestock products (primarily milk). At the scale of the LGAs within which the Project lies, as of the last agricultural census of 2020–2021 (ABS, 2022):

- 118,434 ha of land is subject to agricultural activity for the Muswellbrook Shire LGA.
- 82,274 ha of land is subject to agricultural activity for the Singleton LGA.

The area of land used by agricultural type within each LGA is presented in **Table 6.29**, which shows that the grazing of livestock is the dominant land use for both areas, accounting for 91% to 96% of the total area subject to agricultural land use. This is supplemented by smaller pockets of cropping, which represent 3% to 5% of agricultural land use.

Table 6.29 Agricultrual Land Use – Muswellbrook Shire and Singleton LGAs by type (2020-2021)

Agricultural Land Use	Muswellbrook Shire LGA Total ha (%)	Singleton LGA Total ha (%)
Grazing	113,959 (96%)	75,235 (91%)
Cropping	3,341 (3%)	3,718 (5%)
Forestry	1,129 (<1%)	2,106 (3%)
Other	5 (<1%)	1,215 (1%)
Total	**118,434**	**82,274**

The town of Muswellbrook serves as a primary service hub for the regional agricultural industry, providing essential equipment, supplies, and logistics. The Hunter Regional Livestock Exchange in Singleton is a critical economic facility, providing producers with a competitive market and modern selling infrastructure, including undercover facilities and livestock feeding services. The New England Highway and the Golden Highway serve as the key transport links for intra-regional movement, connecting local produce and livestock to processing plants in Scone and Singleton, and onwards to the bulk shipping port at Newcastle via the Main Northern Railway.

6.10.2.2 Project Area Characteristics

The Project Area and its immediate surrounds have a long-standing history of agricultural use, primarily focused on livestock grazing and limited cultivation. This has resulted in a landscape that is highly modified from its natural state, evidenced by historical broad scale clearing of native vegetation to facilitate agricultural production. Currently, the Project Area continues to support rural enterprises, predominantly cattle grazing on a mix of modified and native pastures, with localised areas of more intensive agricultural activity corresponding to the availability of alluvial soils and water resources.

Soil Units

A detailed soil survey was undertaken by Minesoils to characterise the substrate within the Disturbance Footprint. While regional NSW mapping suggests Kurosols are the dominant order in the broader Project Area, the site-specific survey identified five (5) distinct soil mapping units (SMUs) as summarised below:

- **Soil Unit 1: Kandosols** – covering approximately 67 ha. Characterised by lack of a clear or abrupt textural B horizon, with B2 horizons exhibiting massive or weak pedality and a clay content exceeding 15%. These soils typically feature sand to loam profiles with weak to moderate topsoil structure. They are consistently non-saline, strongly acidic and generally sodic. Drainage within this unit ranges from well to imperfectly drained, and depth is anticipated to be very deep. The representative site for this unit, including the detailed laboratory data, is site 5.
- **Soil Unit 2: Chromosols** – covering approximately 62 ha. This unit is defined by a clear or abrupt textural B horizon where the upper B2t horizon is neither sodic nor strongly acidic. These soils are generally characterised by loam and loamy sand topsoils with weak to moderate structure overlying clay loam or heavy clay subsoils with moderate pedality. Typically featuring red subsoils, they are non-saline, non-sodic, and among the most widespread agricultural soils in Australia. They are mostly moderately well-drained, moderately permeable, and deep. The representative site for this unit, including the detailed laboratory data, is site 1.

- **Soil Unit 3: Dermosols** – covering approximately seven (7) ha. These soils lack a clear or abrupt textural horizon and possess B2 horizons with a grade of pedality greater than weak. This unit features heavy to medium clay topsoils with consistently strong structure overlying clay loam to heavy clay subsoils that experience structural decline with depth. pH levels range from mildly to very strongly alkaline, and salinity levels trend from non-saline at the surface to extremely saline at depth. Topsoils are consistently sodic, while subsoils are strongly sodic and frequently contain calcium carbonate nodules in the lower B horizon. The representative site for this unit, including the detailed laboratory data, is site 2.
- **Soil Unit 4: Rudosols** – covering approximately 42 ha. Characterised by minimal pedological organisation, these soils exhibit only rudimentary A1 horizon development with no pedological colour changes or texture shifts with depth. This unit consists of apedal sand topsoils and sandy loam subsoils with weak to no structural development. While topsoils are non-saline, salinity levels become slightly saline at depth. Due to low clay content, these soils are not considered sodic and are rapidly drained, highly permeable and deep. The representative site for this unit, including the detailed laboratory data, is site 11.
- **Soil Unit 5: Sodosols** – covering approximately 2 ha. Sodosols feature a clear or abrupt textural B horizon where the upper B2t horizon is sodic but not strongly acidic. This unit is generally characterised by sandy loam and clay loam topsoils with weak or apedal structure overlying heavy clay subsoils with weak to moderate structure. These soils trend from non-sodic and non-saline at the surface to strongly sodic and highly saline at depth. This unit typically exhibits moderately low fertility and is moderately well to imperfectly drained. The representative site for this unit, including the detailed laboratory data, is site 8.

The Project Area was also subject to a site verification assessment of LSC in accordance with the LSC Guideline. Land capability represents the inherent physical capability of the land to sustain various management practices over the long term without causing degradation to soil, land, or water resources. Management of the Project in alignment with these identified soil characteristics is essential to mitigate risks of soil dispersion, erosion and the subsequent decline in agricultural productivity or infrastructure functionality.

Soil Erodibility

The assessment indicates a range of water erosion and sedimentation risks associated with the topsoils currently present in the Project Area and its surrounds. Unlike flat landscapes, the steep terrain and rolling hills with incised gullies found locally increase this risk due to slope steepness and the potential for concentrated water flow.

Laboratory testing using the Emerson Aggregate Test (EAT) indicates high potential for dispersion across several soil units. Representative sites for Chromosols, Rudosols, and Sodosols recorded EAT Class 2 results, signifying a high risk of complete or partial dispersion when inundated. While Kandosols and Dermosols showed lower inherent risk (Class 4), the potential for dispersive behaviour increases across all units when soil is remoulded or disturbed.

There is a moderate to high potential for dispersion where soils are disturbed by Project construction. Higher impact activities, such as earthworks for WTGs, access tracks, or substation pads, are very likely to result in increased dispersive behaviour when soil is loosened or compacted. Given the chemical instability and topographic relief of the site, erosion risks must be managed through consistent controls across the entire Disturbance Footprint, with particular care taken to avoid or specifically manage areas mapped as Sodosols.

Acid Sulphate Soils (ASS)

The Project Area does not contain any of the five (5) standard risk classes identified on the NSW Acid Sulfate Soil Planning Map. Based on the site's land elevation and significant distance from the coast, the potential risk for ASS is considered very low. This assessment is supported by the site-specific soil survey, which found no physical indicators of ASS, such as soil gleying, characteristic odours, marine sediments, or high concentrations of organic materials.

Land Capability

Following the soil survey, the Project Area was found to contain five (5) LSC classes:

- **LSC class 4:** moderate capability land – covering approximately 41 ha. This land has moderate to high limitations that restrict management options for high-impact uses such as regular cropping or high-intensity grazing. Overcoming these limitations requires specialised management practices and high levels of investment and technology. Within the Disturbance Footprint, the defining constraint for this class is wind erosion.
- **LSC class 5:** moderate-low capability land – covering approximately 10 ha. Class 5 land has high limitations for high-impact land uses, largely restricting use to grazing, some horticulture, forestry, and nature conservation. Limitations must be carefully managed to prevent long-term degradation. The defining constraint to this land class within the Disturbance Footprint is soil acidification.
- **LSC class 6:** low capability land – covering approximately 6 ha. Class 6 land has very high limitations for high-impact land uses. Land use is restricted to low-impact land uses such as grazing, forestry, and nature conservation. Careful management of limitations is required to prevent severe land and environmental degradation. The defining constraints to this land class within the Disturbance Footprint are water erosion, waterlogging, and soil depth.
- **LSC class 7:** very low capability land – covering approximately 10 ha. Class 7 land has severe limitations that restrict most land uses and generally cannot be overcome. On-site and off-site impacts of land management practices can be extremely severe if limitations are not managed. There should be minimal disturbance of native vegetation. The defining constraints to this land class within the Disturbance Footprint are water erosion and soil depth.
- **LSC class 8:** extremely low capability land – covering approximately 112 ha. Class 8 land has limitations so severe that the land is incapable of sustaining any land use apart from nature conservation. There should be no disturbance of native vegetation. The defining constraint to this land class within the Disturbance Footprint is water erosion based on a sloping analysis of the Project Area.

Based on the soil survey the LSC mapping for the Project has been verified as shown in **Figure 6.14** below.

State Significant Agricultural Land

The NSW Department of Primary Industries is currently developing a mapping program to identify State Significant Agricultural Land (SSAL). This initiative is designed to inform agricultural land-use planning by prioritising the state's most productive land for future use. While this mapping remains in an early draft stage, it serves as a critical baseline for planning authorities and developers to identify and protect high-value agricultural resources.

Based on the current draft SSAL mapping, no State Significant Agricultural Land is located within the Disturbance Footprint. The nearest area identified as SSAL is situated approximately 1 km southwest of the Project's proposed Disturbance Footprint. Consequently, the Project has been designed to avoid interaction with land currently identified as being of state significance for agriculture.

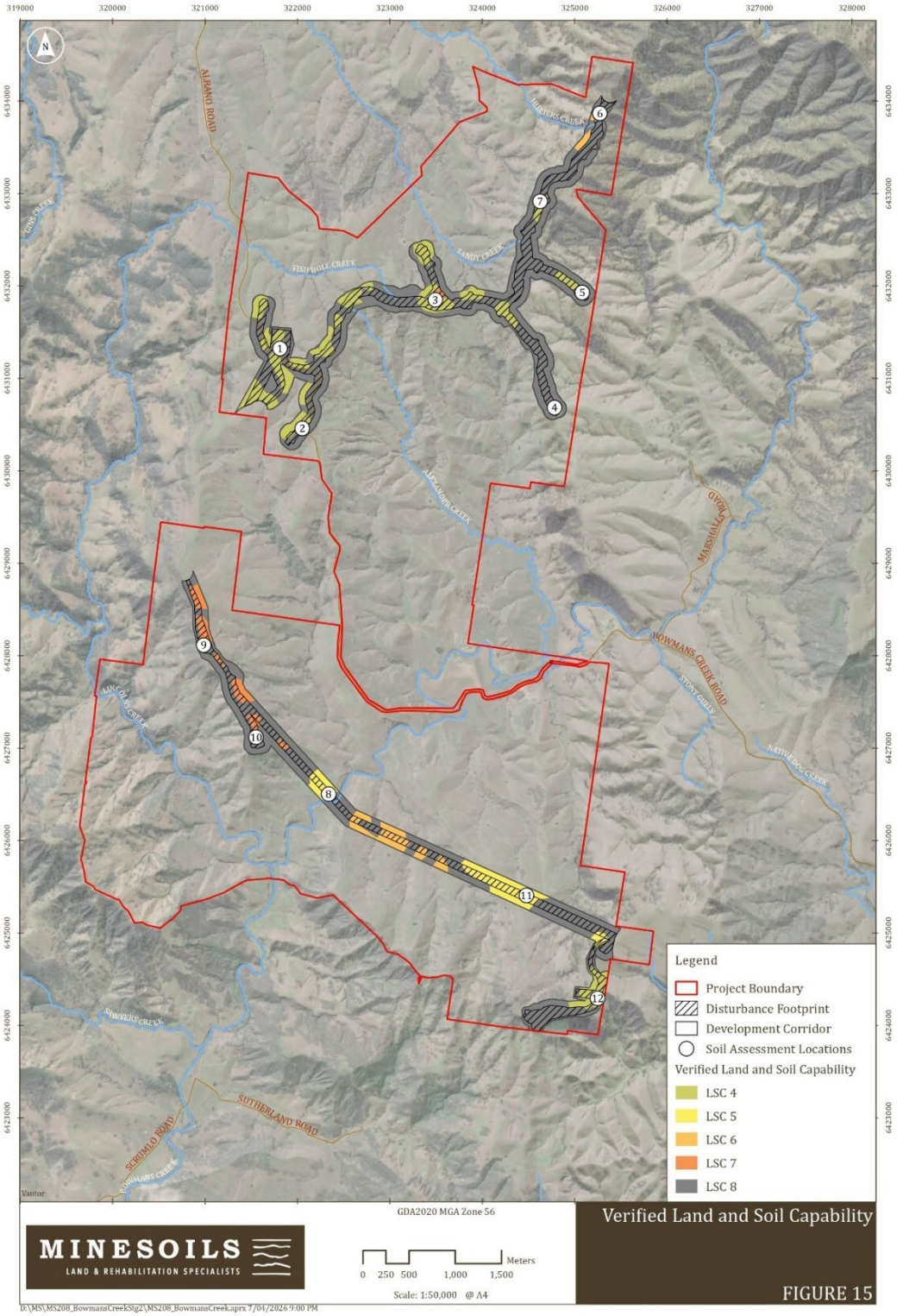


Figure 6.14 Verified Land and Soil Capability

Source: Minesoils (2026)

6.10.3 Land Use and Conflict Risk Assessment

The Land Use Conflict Risk Assessment (LUCRA) is a systematic process used to identify and manage potential friction between competing land uses. In accordance with the Land Use Conflict Risk Assessment Guide (NSW DPI, 2011), a LUCRA was undertaken to evaluate how the Project might impact the rights, values, or amenity of neighbouring landholders and the wider rural community.

In total, 24 potential conflicts were identified and assessed based on their probability and consequence. These risks span several categories, including construction impacts (noise, dust, and traffic), operational infrastructure (aviation and visual amenity), and agricultural management issues such as biosecurity and bushfire risk.

Of the 24 items, without implementing any management or mitigation measures, 10 were ranked as High risk, eight (8) as Moderate risk and four (4) at a low initial risk rating. Following the application of specific controls, the LUCRA identifies three (3) residual high-risk and seven (7) residual moderate-risk potential conflicts. These items, along with their associated risk controls, are summarised in **Table 6.30**.

High risk items, specifically aviation risk in the context of wind turbine structures and associated turbulence in the Project Area and visual amenity impacts, affect both immediate neighbours and the broader community. Moderate risk items focus on construction phase disturbances, biosecurity, and bushfire management. These risks are managed through the following framework:

- Integrated specialist assessments: impacts are addressed by detailed studies (e.g., AIA, LCVIA, and TTIA) that exceed the scope of the LUCRA. These reports provide the specific avoidance and mitigation strategies required to reduce conflict potential.
- Compliance and monitoring: Project activities will be audited against EIS commitments and consent conditions by qualified environmental practitioners. This oversight ensures that amenity impacts remain within acceptable limits throughout the Project life cycle.
- Ongoing consultation: continuous engagement with landholders and agencies will be maintained to address concerns proactively and implement practical solutions.

The assessment concludes that by applying these cross-disciplinary controls, the Project can maintain an acceptable level of land use compatibility with the community, while effectively managing specific conflicts with immediate neighbours as part of standard operations.

Table 6.30 LUCRA – Potential Conflict and Mitigated Conflict Risk Summary

Potential Conflict	Conflict Risk (mitigated)
Project Infrastructure and Aviation: Neighbouring landholders may be concerned that aerial spraying via aviation undertaken on properties within the locality may be limited by wind turbine structures and associated turbulence in the Project Area.	High
Project Infrastructure and Aviation: Landholders in the locality may be concerned the presence of wind turbine structures and associated turbulence will prevent fire fighters from controlling fires on their property.	High
Visual Amenity: Stakeholders in the locality who wish to maintain views of the existing landscape may be concerned about the change in visual amenity resulting from the wind farm.	High

Potential Conflict	Conflict Risk (mitigated)
Construction Ground Disturbance: Land users in the locality may be concerned about changes to water quality, quantity and surface water flows that may affect the site and locality, including local waterways, from surface disturbances during construction activities.	Moderate
Construction Traffic: The use of local roads during construction of the wind farm may cause conflict by interacting with agricultural and/or local transport activities, and/or resulting in additional travel time for road users or delays moving stock.	Moderate
Construction Traffic: Land users in the locality may be concerned about the possibility of increased vehicles during construction or operation may result in an accident with livestock, farm machinery or wildlife on roads.	Moderate
Project Infrastructure and Aviation: The placement of the wind farm in proximity to agricultural business operators may affect insurance premiums or insurance eligibility for surrounding private property owners.	Moderate
Property Insurance: The placement of the wind farm in proximity to agricultural business operators may affect insurance premiums or insurance eligibility for surrounding private property owners.	Moderate
Biosecurity: Land users in the locality may be concerned about biosecurity breaches including weed, plant pest, plant disease or pest animal introduction and/or spread, as a result of the Project.	Moderate
Bushfire: Land users in the locality may be concerned about the risk of fires occurring at the site and their potential to spread to surrounding land, infrastructure or livestock.	Moderate

6.10.4 Impact Assessment

Key assessment findings regarding the impacts on agricultural land and productivity include:

- The impacts on agriculture as a result of the Project range from short-term temporary impacts to longer-term impacts for the duration of the Project, with no permanent or irreversible impacts anticipated. Australian wind farming practices are generally considered low risk in terms of permanent impacts to agricultural resources.
- There is a high level of certainty regarding the status of agricultural resources and enterprises within the Project Area, locality and broader region, based on soil survey and site verification assessments, consultation and desktop studies.
- The Project will temporarily disturb approximately 180 ha of land currently subject to agricultural land use (i.e. the Disturbance Footprint), representing approximately 5% of the overall Project Area. For the purposes of this assessment, and applying a precautionary approach, it is assumed that agriculture will cease within this area for the duration of the Project.
- Agricultural land use is anticipated to be re-established over the Disturbance Footprint at the time of decommissioning, unless otherwise agreed with landholders or regulatory authorities. Accordingly, the reduction in agricultural land use is temporary.
- The temporary reduction in land used for agriculture is considered negligible in the context of land subject to agricultural use at the LGA scale, representing approximately 0.04% of agricultural land in Muswellbrook Shire and 0.01% in Singleton LGA.

- Current agricultural land use immediately adjacent to the Project Area, and within the broader Project locality, will not change as a result of the Project, and there will be no fragmentation or displacement of existing agricultural industries due to the temporary reduction in land used for agriculture.
- The temporary impact of the Project on agricultural productivity, based on the change in land use for the duration of the Project, is estimated to be up to $217,673 per year. This reduction is considered negligible in the context of the gross agricultural value of the Muswellbrook Shire and Singleton LGAs, representing approximately 0.4% and 0.1% respectively.
- Following decommissioning, land removed from agriculture is expected to be returned to agricultural use at an equivalent productivity, with no expected reductions in LSC.
- Agricultural productivity of land outside of the Project Area will not be affected, and the Project will not negatively impact the productivity potential of agricultural enterprises beyond the Project Area.
- The Project will have no impact on the viability of local and regional agricultural services and employment. Changes to agricultural support services in regional centres are driven by broader social and market trends and are not attributable to the minimal reduction in agricultural land use or productivity associated with the Project.
- Due to the localised and sporadic nature of landform modification required for the Project, impacts on soils and LSC are expected to be minimal and confined to the Disturbance Footprint. With appropriate soil stripping, reuse, capping and rehabilitation measures, no permanent impacts on soil resources or LSC are anticipated.
- With the implementation of mitigation measures, direct and indirect impacts to water resources, erosion and sedimentation risks, biosecurity risks, air quality, traffic, and noise are expected to be limited and manageable, with impacts to agricultural resources and enterprises unlikely to be experienced.
- At the scale of the agricultural enterprises operating within the Project Area, anticipated impacts are considered offset, as host landholders would be financially compensated.
- In the context of cumulative development within the Hunter-Central Coast Renewable Energy Zone, cumulative impacts to agriculture are expected to be minor, given the minimal changes to agricultural land use and productivity anticipated for individual renewable energy projects and the established nature of livestock grazing and broadacre cropping within the region.

Overall, it is anticipated that, through the implementation of mitigation measures during construction and operation, and with effective decommissioning and rehabilitation at the end of Project life, the Project will result in a minor impact on agricultural land and productivity within the Project Area, and a negligible impact on agricultural industries operating within the wider region.

6.10.5 Decommissioning and Rehabilitation

The Project infrastructure has an anticipated operational lifespan of approximately 30 years. Near the end of this period, the Proponent will evaluate the continued viability of the site, with options including the extension of the current facility, the installation of updated wind technology (subject to further approvals), or the full decommissioning of the site.

Should the decommissioning option be selected, all costs associated with decommissioning will be borne by the Proponent or their representative. In addition:

- Key stakeholders including relevant landholders would be consulted regarding the Decommissioning and Rehabilitation Management Plan (DRP).
- All above ground structures not required for the ongoing agricultural use of the land, including the WTGs and substations will be removed and the land rehabilitated so that it can return to agricultural use.
- Internal roads, if not required for ongoing farming purposes or fire access, would be removed. Access gates, if not required for farming purposes, would also be removed. Host landholders will be involved in any discussion regarding the removal or hand-over of infrastructure on their properties.
- Below ground infrastructure, including WTG foundations, hardstands and some cabling may be left in situ and covered in clean fill material to a suitable depth, with the land returned to approximate prior condition and use as far as practicable.
- The decommissioning phase would require similar equipment and activities to the construction phase including mobile and heavy equipment (e.g. cranes, earthworks machinery, compressor and rock crusher). Prior to the commencement of decommissioning activities, the Project would prepare a detailed decommissioning plan in consultation with DPHI and the relevant Councils to guide the implementation of the decommissioning works.

Although decommissioning of the Project is planned to occur at least 30 years into the future, a detailed DRP for the Project will be prepared following approval. The purpose of this DRP is to outline a current methodology that may be used to decommission all infrastructure associated with the Project and rehabilitate the land at the end of the Project's economic life which will be developed to address development consent conditions for the Project if approved.

6.10.6 Mitigation and Management Measures

BCWF have committed to a range of mitigation and management measures with respect to soil, land and agriculture. These measures are described in detail in the SLAIA (**Appendix 14**) and are summarised below:

- **SLA01**: During the life of the Project, agriculture land use will continue within the Project Area outside of the Disturbance Footprint.
- **SLA02**: At the time of decommissioning, agriculture land use will be re-established over 180 ha of agricultural land removed from agriculture (unless otherwise agreed with the landholder and/or regulatory authorities).
- **SLA03**: A DRP will be prepared to outline a current methodology that may be used to decommission all infrastructure associated with the Project and rehabilitate the land at the end of the Project's economic life, which will be developed to address development consent conditions for the Project if approved.
- **SLA04**: During the life of the Project, agriculture land use will continue within the Project Area outside of the Disturbance Footprint at historical stocking rates.

- **SLA05**: At the time of decommissioning, the Project Area will be returned to an agricultural productivity that is approximately equivalent of pre-Project status. This includes rehabilitating all disturbed land to an equivalent LSC class following the end of life for the Project, through site rehabilitation and good soil management practices as outlined in Section 7.3 of the SLAIA. This would be documented in the Project DRP.
- **SLA06**: All soil that is proposed to be disturbed during the Project will be handled in accordance with the strategy outlined in Section 7.3 of the SLAIA and a site Soil Stripping and Management Plan prepared for the Project that includes soil management measures relating to stripping, stockpiling, reuse, and sourcing, as required. This will inform the CEMP, OEMP and a DRP.
- **SLA07:** All soil resources are to be managed throughout construction, operation and decommissioning phases of the Project in accordance with an ESCP which should include recommendations outlined in Section 7.3 of the SLAIA.
- **SLA08:** All remaining infrastructure to be capped with 0.5 m of soil at the time of decommissioning with material of suitable texture and preparation to mitigate long term wind erosion.
- **SLA09**: At the time of decommissioning, 180 ha of disturbed land will be returned to an equivalent LSC class following the end of life for the Project, through site rehabilitation and good soil management practices unless otherwise agreed with the landholder and/or regulatory authorities.
- **SLA10**: Stock fences, farm dams, and access tracks to be retained and maintained to accommodate continued agricultural operations within the Project Area.
- **SLA11**: Provision of ground-based spray equipment as required.
- **SLA12**: Pest species will be managed in accordance with measures outlined in Section 7.4.2 of **Appendix 14** and a Pest and Weed Management Plan prepared for the Project.
- **SLA13**: Biosecurity will be managed in accordance with measures outlined in Section 7.4.1 of **Appendix 14** and an Agricultural Biosecurity Management Plan prepared for the Project.

6.11 Hazards and Risks

The SEARs require the EIS to address the hazards and risks associated with the Project. This includes bushfire, hazards, aviation safety, human health (EMF) and telecommunications (EMI). The following sections provide an overview of the outcomes of the relevant assessments undertaken address potential hazards and risks.

6.11.1 Aviation

An Aviation Impact Assessment (AIA) was prepared by Aviation Projects to review potential aviation impacts associated with the Project and provide aviation safety advice with respect to relevant air safety regulations, guidelines and procedures. The SEARs require an assessment of the potential impacts of the Project on aviation safety including:

- Prepare an aviation impact assessment in accordance with Appendix A of the Wind Energy Guideline and the National Airports Safeguarding Framework Guideline D: Managing Wind Turbine Risk to Aircraft.

- Assess the impact of the turbines on the safe and efficient aerial application of agricultural fertilisers and pesticides and emergency helicopter access (if required) in the vicinity of the turbines and transmission line.
- The AIA is presented in **Appendix 15**, with the key findings summarised below.

6.11.1.1 Assessment Results

The Project satisfies relevant aviation safety requirements of both the Upper Hunter Shire and Maitland regions. It will not create incompatible intrusions, adversely affect, or compromise the safety of existing airports and associated navigation and communication facilities. The AIA concluded that:

- There are two (2) certified airports located within 30 nautical miles (nm) (56 km) of the Project: Scone Airport (YSCO) and Maitland Airport (YMND) of Scone Airport or Maitland Airport.
- Project WTGs will not impact on the circling areas for either airport, as the Project is located beyond the required radii for all relevant aircraft categories.
- Project WTGs will not impact on the Scone 25 nm MSA surfaces.
- Project WTGs will impact on the Maitland 25 nm MSA western sector, which will need to be raised by 200 ft to 3600 ft AMSL or sectorised for the Project Area.
- Project WTGs will not impact PANS-OPS surfaces. However, due to the requirement of increasing the Maitland 25 nm MSA to 3600 ft, a commensurate increase in the commencement altitude and minimum holding altitude for the RNP approach procedures would be required.
- Project WTGs will not impact on the Grid Lowest Safe Altitude (LSALT) or any established air route LSALTs, including J70, W130, W702, W786, W797, H91, and Q155.
- The Project Area is located within Class G airspace and outside all controlled airspace, Prohibited, and Danger areas.
- The Project Area is located within Restricted Area R585D when active, necessitating ongoing consultation with the Department of Defence.
- Project WTGs will not impact on the aviation navigation or communication facilities of nearby certified airports.
- Project WTGs will not impact on the closest radar installations, including Cecil Park and Sydney PSR/SSR. Furthermore, impacts on military L-Band Radar at RAAF Base Williamtown and the Newcastle BoM weather radar are considered unlikely due to natural terrain shielding.

The AIA also included a safety risk assessment for the Project, having regard to potential collision risks and the requirement for obstacle lighting. This assessment concluded that the risks are primarily associated with smaller aircraft likely to be flying under the VFR. The Project must be reported to CASA and construction details provided to Airservices Australia. BCWF will continue to consult with relevant stakeholders, including NPWS regarding forest buffer areas, to minimise and/or mitigate the Project's impacts to local aerial operations where practicable.

6.11.1.2 Mitigation and Management Measures

BCWF will implement the following mitigation and management measures, consistent with the recommendations of the AIA:

Notification and Reporting

- **AV01**: details of WTGs and WMTs 100 m or more AGL must be reported to CASA as soon as practicable after forming the intention to construct or erect the proposed object or structure in accordance with CASR Part 139.165(1)(2). The notification should be provided to CASA via email to Airspace.Protection@casa.gov.au.
- **AV02**: final details of WTG coordinates and elevation should be provided to Airservices Australia at least two (2) weeks prior to construction commencing, by submitting the form at this webpage:
    - https://www.airservicesaustralia.com/wp-content/uploads/ATS-FORM-0085_Vertical_Obstruction_Data_Form.pdf to the following email address:
    - vod@airservicesaustralia.com.
- **AV03**: any obstacles 100 m or more AGL (including temporary construction equipment) should be reported to Airservices Australia NOTAM office until they are incorporated in published operational documents. With respect to crane operations during the construction of the Project, a notification to the NOTAM office may include, for example, the following details:
    - the planned operational timeframe and maximum height of the crane; and
    - either the general area within which the crane will operate and/or the planned route with timelines that crane operations will follow.
- **AV04**: details of the wind farm should be provided to local and regional aircraft operators prior to construction in order for them to consider the potential impact of the wind farm on their operations.
- **AV05:** to facilitate the flight planning of aerial application operators, details of the Project, including the final location and height information of WTGs and overhead transmission lines should be provided to landowners so that, when asked for hazard information on their property, the landowner may provide the aerial application pilot with all relevant information.
- **AV06:** the closest WTGs would be 8.8 km away from the boundary of the Mount Royal National Park. To confirm the buffer area of the forest boundary, consultation with NPWS is required.

Marking of WTGs

- **AV07**: the rotor blades, nacelle, and supporting mast of the WTGs will be painted in a non-reflective off- white colour, as is typical of most WTGs operational in Australia. No additional marking measures are required for WTGs.

Lighting of WTGs

- **AV08**: based on NSW Wind Energy Guideline:
    - if turbines and WMTs are 150 m or more above ground, lighting is required for the most critical turbines (e.g. turbines at highest elevations and/or around the Project perimeter)

- lighting of turbines and ancillary infrastructure should be designed to minimise potential amenity impacts by using the lowest intensity lighting suitable for the site
- To ensure the ongoing availability of obstacle lights, a monitoring, reporting and maintenance program should be established in accordance with the guidance in CASR Part 139 MOS.

Micrositing

- **AV09**: providing the Micrositing is within 100 m of the planned WTGs it is not likely to result in a change in the maximum overall blade tip height of the Project. No further assessment is likely to be required from micrositing, and the conclusions of this AIA would remain the same.

Overhead transmission line

- **AV10:** transmission lines and/or supporting poles that are located where they could adversely affect aerial application operations should be identified in consultation with local aerial application operators and marked in accordance with CASR Part139 MOS.

Aerial firefighting

- **AV11**: the developer or operator will ensure that:
  - liaison with the relevant fire and land management agencies is ongoing and effective
  - access is available to the wind farm site by emergency services response for on-ground firefighting operations
  - wind turbines are shut down immediately during emergency operations
  - where possible, blades should be stopped in the 'Y' or 'rabbit ear' position, as this positioning allows for the maximum airspace for aircraft to manoeuvre underneath the blades and removes one (1) of the blades as a potential obstacle. This may not always be possible due to the risk to equipment and personnel as a fire approaches or exists in or near to the WTGs
  - Aviation Projects considers that it may be impractical to stop and lock the turbine blades in a Y configuration due to the time needed to stop and lock the turbine and the risk to personnel having to climb into the WTG tower as a bush fire approaches. WTG blades can be feathered to effectively stop or reduce the rotation rate of the turbine to a very slow speed.

Triggers for review

- **AV12:** Triggers for review of this risk assessment are provided for consideration:
  - prior to construction to ensure the regulatory framework has not changed
  - following any significant changes to the context in which the assessment was prepared including the regulatory framework
  - following any near miss, incident or accident associated with operations considered in this risk assessment.

6.11.2 Telecommunications (EMI)

A Telecommunications Impact Assessment (TIA) has been undertaken for the Project by Middleton Group (MG). The TIA is presented in **Appendix 16** with the key findings summarised below.

The SEARs require an assessment of the potential impacts of the Project on telecommunications including:

- Identify possible effects on telecommunications systems, assess impacts and mitigation measures including undertaking a detailed assessment to examine the potential impacts as well as analysis and agreement on the implementation of suitable options to avoid potential disruptions to radio communication services, which may include the installation and maintenance of alternative sites.

The TIA assesses the potential impacts of the Project on the following telecommunication services:

- point-to-point microwave links
- meteorological radar
- mobile voice-based communications
- wireless and satellite internet services
- broadcast and digital radio
- broadcast, digital and satellite television
- trigonometry stations
- Global Positioning System (GPS).

MG conducted a review of the Australian Communications and Media Authority (ACMA) database for point-to-point links within a 150 km radius of the Project Area, in June 2024, and again in August 2024. No links or sites were identified within 2 km of the proposed WTGs

The TIA confirms that the Project's design, siting, and layout have been strategically planned to avoid or mitigate electromagnetic interference with existing radio, radar, and television transmission and reception systems.

Following a comprehensive technical analysis and direct consultation with relevant stakeholders, it has been determined that the Project will not result in any significant adverse impacts on identified telecommunication services. This conclusion is based on the successful integration of the mitigation and management strategies detailed in the subsequent section of this report.

6.11.2.1 Mitigation and Management Measures

The mitigation and management measures to be employed by BCWF relating to telecommunications include:

- **EMI01:** Stakeholder engagement has been initiated/conducted. When responses are received from the stakeholders, any recommendations will be recorded and provided to the Proponent for its action and consideration in Project design and delivery.
- **EMI02:** With regard to meteorological radar services and BoM consultation, a comprehensive technical assessment will be conducted for the Newcastle weather radar (if required) during the detailed design of the Project. The Proponent has commenced direct consultation with the BoM towards addressing any potential impacts, and ensuring there are suitable commitments (as reflected in this report) to consider this matter in the Project's detailed design and delivery.

- **EMI03:** With regard to survey mark (SS 39397) and works associated with the Project (e.g., WTG 73), detailed design will ensure the survey mark continues to be avoided, or, alternatively, assistance from a registered surveyor will be sought to move or remove the survey mark/s.

6.11.3 Health (EMF)

The SEARs require an assessment of the Project's electric and magnetic fields:

- Identify potential hazards and risks associated with electric and magnetic fields (EMF) and demonstrate the application of the principles of prudent avoidance, including an assessment against the International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guidelines for limiting exposure to Time-varying Electric, Magnetic and Electromagnetic Fields.

An Electromagnetic Field (EMF) study has been undertaken by Middleton Group to address the Requirements of the SEARs. The EMF study is provided in **Appendix 17** and key findings are summarised below.

6.11.3.1 Methodology

Industry-standard EMF modelling software CDEGS was used to predict electric and magnetic field strengths for the proposed electrical infrastructure. The modelling incorporated conservative assumptions, including maximum load conditions and minimum ground clearance. EMF limits for this study were based on guidelines from the International Commission on Non-Ionising Radiation Protection (ICNIRP), which specify:

- magnetic field limit: 2,000 milligauss (mG) (equivalent to 200 microteslas)
- electric field limit: 5 kilovolt per metre (kV/m) for public exposure.

6.11.3.2 Results

The results of the EMF assessment are provided in **Table 6.31** and **Table 6.32**. In summary:

- 33 kV Underground Cable: Maximum magnetic field strength directly above the cable is approximately 30 mG, well below the ICNIRP limit. No external electric field is generated by underground cables.
- 33 kV Overhead Power Line: Maximum magnetic field strength is approximately 650 mG, and electric field strength is approximately 1 kV/m, both within permissible limits.
- 330 kV Overhead Transmission Line: Maximum magnetic field strength is approximately 350 mG, well below the ICNIRP limit. The electric field strength directly under the line is predicted to be 7.6 kV/m under conservative assumptions, which exceeds the ICNIRP public limit but complies with Transgrid's standard of 9.1 kV/m. At the recommended conductor height (minimum sag of 11 m), the electric field strength reduces to 4.7 kV/m, meeting ICNIRP requirements.

Table 6.31 Magnetic Field Strength Results Summary

Electrical Infrastructure	Maximum Field Strength (mG)	Pass / Fail
Underground 33 kV Cable	30	PASS
Overhead 33 kV Power Line	650	PASS
Overhead 330 kV Single Circuit Transmission Line	350	PASS

Table 6.32 Electric Field Strength Results Summary

Electrical Infrastructure	Maximum Field Strength (kV/m)	Pass / Fail
Overhead 33 kV Power Line	1	PASS
Overhead 330 kV Single Circuit Transmission Line	7.6	PASS

The Project design has avoided, minimised and mitigated risks and impacts associated with EMF and the recommended 8 m clearance to the 330 kV transmission line, as specified in Table 3.5 of the AS/NSZ 7000:2016, and is accommodated within the Project design assessed in this EIS.

The assessment concludes that EMF levels associated with the Project are generally within accepted safety limits. For the 330 kV transmission line, compliance with ICNIRP guidelines will be achieved through adherence to recommended clearance distances during detailed design. Further verification is recommended as the design progresses to ensure ongoing compliance.

6.11.3.3 Mitigation and Management Measures

The design approach for the Project prioritises reducing potential EMF-related risks through avoidance and mitigation strategies. While the EMF analysis was based on modelled conductor layouts, actual configurations may vary slightly during detailed electrical design. Such deviations are expected to be minimal, and any resulting changes in magnetic field levels should be insignificant, ensuring continued compliance with EMF safety requirements for the transmission infrastructure.

- **EMF01**: the expected EMF levels from the Project at the recommended height comply with the relevant Australian and International standards and guidelines. However, a risk assessment will be conducted with respect to Transgrid and ICNIRP recommendations during detailed design if ground clearance cannot be maintained.
- **EMF02**: the proposed transmission lines are required to maintain a minimum ground clearance of 11 m, pending completion of the detailed design.

6.11.4 Bushfire

The SEARs require an assessment of the potential impacts of the Project on bushfire risks including:

- Assess potential hazards and risks associated with bushfires / use of bushfire prone land, including the risk of the Project causing bush/grass fires.
- Identify measures to prevent a fire occurring within the site from developing into a bushfire.

- Consider any potential impacts of the Project on the aerial fighting of bushfires.
- Demonstrate compliance with Planning for Bush Fire Protection 2019.

A Bushfire Assessment Report (BAR) has been undertaken by Blackash Bushfire Consulting (Blackash) to demonstrate compliance with Planning for Bush Fire Protection 2019 (PBP) (NSW Rural Fire Service, 2019). The BAR is provided in **Appendix 18** and the key outcomes are summarised below.

6.11.4.1 Existing Environment

The Project Area is identified as being within 'bushfire prone land' (BPL). BPL is land that has been identified by council, which can support a bushfire or is subject to bushfire attack.

The Development Corridor and surrounds contain small areas of Category 1 vegetation while the majority of the Development Corridor is mapped as containing Category 3 vegetation.

Blackash conducted a bushfire landscape assessment which determines the likelihood of a bushfire approaching the Project Area, its potential severity and intensity and the resultant impact on life and property in the context of the broader surrounding landscape. Landscape scale fires are those that can span many kilometres or tens of kilometres, and that burn for days or weeks at a time.

Key considerations in the assessment included:

- Extent and continuity of vegetation: the Project Area is predominantly used for agriculture and with some smaller areas of retained forest and woodland, generally in the gullies following drainage lines.
- Topography: the landscape is characterised by moderate to steep, mostly cleared hills with scattered paddock trees.
- Prevailing winds: prevailing winds generally occur on the ridge lines which, while vegetation is generally in gullies, along drainage lines.
- Potential fire run and area that is likely to be impacted by the fire: there is little potential for a landscape scale fire to directly affect the Project Area due to the limited and fragmented vegetation in the wider area.

Impact on evacuation routes to safer places considering road networks, distances, and landscape factors:

- Location and exposure of the development to bushfire: there is limited and fragmented vegetation within the Project Area and adjacent to the Development Corridor.
- Ability to seek bushfire shelter on site or at alternative locations.
- Extent of neighbourhood-scale damage the bushfire may produce.

When the individual factors are scored, after consideration of the landscape context and the Project design complying with PBP, the overall Landscape Scale Threat for the Project Area is assessed as Moderate Risk.

6.11.4.2 Method

The Bushfire Attack Level (BAL) is a means of measuring the severity of a building's or structures potential exposure to ember attack, radiant heat, and direct flame contact. The BAL is used as the basis for establishing the requirements for construction to improve protection of building elements and to articulate bushfire risk.

The following methodology is from PBP (p. 80) which has been used to determine the BAL at across the Project Area. The process to determine BAL is outlined below:

1. Step 1: Determine vegetation formation in all directions around the building to 140 m.
2. Step 2: Determine the effective slope of the land from the building for 100 m.
3. Step 3: Determine the relevant Forest Fire Danger Index (FFDI) for the council area where development is to be undertaken.
4. Step 4: Determine the separation distance by measuring from the edge of the unmanaged vegetation to the closest external wall of an asset.
5. Step 5: Match the relevant FFDI, appropriate vegetation, distance, and effective slope to determine the appropriate BAL using the relevant tables in PBP.

6.11.4.3 Assessment Criteria

A 10 m APZ applies to wind and solar assets specified under Section 8.3.6 of PBP. This is a general requirement and does not account for the vulnerability of critical infrastructure to bushfire impacts or the consequences of asset damage or disruption. Accordingly, bushfire attack exposure has been assessed for sensitive assets (the substation), against a maximum radiant heat flux of 29 kW/m^2. This criteria is consistent with PBP and *Australian Standard AS 3959:2018 Construction of buildings in bushfire-prone areas* (AS3959).

As WTGs and associated infrastructure are not considered sensitive infrastructure, the 10m APZ will be the minimum requirement as specified in Section 8.3.6 of PBP.

6.11.4.4 Impact Assessment

Bushfire Attack Assessment

The inclusion of a variable APZ surrounding the substation which ranges from 10 m to 36 m meets and or exceeds the APZ required for a BAL less than 29 kW/m^2 at the substation perimeter. Additionally, the APZ established by BCWF surrounding all other infrastructure meets or exceeds the 10m APZ established by the PBP.

Risk to Personnel during Construction

The risk of bushfire impact during construction is dependent on factors such as fuel loads, weather and the scale (size) of fires which may occur. There is a threat to construction personnel or firefighters from fast moving bushfire events which may impact the Project Area, however this can be mitigated through the development and implementation of a Bushfire Emergency Management & Operations Plan (BEMOP) and Bushfire Emergency Response Plan (BERP).

Risk to Personnel during Operation

The BEMOP noted above will prescribe the measures required for the management of risk associated with operations. There are substantial locations across the Disturbance Corridor for the provision of firefighting infrastructure, and these details can be finalised and conditioned in the BEMOP during later stages of the Project.

Aerial Firefighting

The Project does not present a significant risk to aerial firefighting operations and as presented is in line with the guidance presented by the Wind Farms and Bushfire Operations document.

Bushfire Ignition Risk

Wind Farms and Bushfire Operations, a report prepared by Australasian Fire and Emergency Service Authorities Council (AFAC) clarifies the risks of constructing and operating wind projects in Australia.

The report notes that:

- Wind farms are not expected to increase bushfire risk or alter fire behaviour when appropriately designed and managed.
- Ignition risks are low, with turbines designed to shut down and isolate faults automatically.
- Construction and maintenance activities present temporary, manageable fire risks under standard controls.
- Wind farms may affect aerial firefighting operations, but this can be mitigated through emergency shutdown procedures.
- Access tracks, water supplies and emergency plans can support firefighting and emergency response when properly designed.

6.11.4.5 Mitigation and Management Measures

BCWF have committed to a range of mitigation and management measures with respect to bushfire impacts. These measures are described in detail in the BAR (**Appendix 18**) and are summarised below:

- **BF01**: APZs are to be established around WTGs and key Project infrastructure. All WTG will have a 10m APZ as required by PBP as shown in Appendix 5. APZ required for the on-site substation shall be established as shown in Figure 14 of **Appendix 18** and in accordance with PBP Table A1.12.2 to meet the project standard of <29 kW/m^2 of radiant heat flux.
- **BF02**: The Project design features presented in Section 10.1 of the BAR will be considered and implemented where feasible during detailed design of the Project. This includes the provision of a dedicated firefighting water supply tank of up to 100,000 L to be installed within the Development Corridor and maintained throughout the life of the Project. This tank would be fitted with a 65 mm Storz fitting and be accessible to firefighting vehicles in accordance with PBP standards.

- **BF03**: Prior to construction and following Project approval, a BEMOP and a BERP (including a Pre Incident Plan) will be developed for the Project, in consultation with emergency services. The BEMOP and BERP must include:
    - Details of how the infrastructure can be safely isolated in any emergency;
    - Availability of fire suppression equipment, access and water;
    - Emergency procedures for fires within, and in the vicinity of, the Project;
    - Details of any triggers or circumstances for modifying or ceasing operation, such as approach of bushfire/grassfire to the Project;
    - a management plan review process;
    - details of reasonable procedures for training staff e.g., in initial attack firefighting with available equipment; and
    - procedures for assisting with firefighting agencies during an incident.

Copies of these plans are to be provided to local emergency services. These plans should be reviewed at least every five (5) years and after any significant fire event in the immediate area.

- **BF04**: WTGs are shut down immediately during bushfire emergency operations. Where possible, blades should be stopped in the 'Y' or 'rabbit ear' position.
- **BF05**: All tall structures (e.g., WTG) must be designed, managed and notified to the Civilian Aviation Safety Authority (CASA) as per requirements set out in the Aviation Impact Assessment (AIA) prepared in support of the EIS (refer to **Appendix 15**).
- **BF06**: In accordance with the Rural Fires Act 1997 – Section 9, total restriction of hot works on any day declared to be a Total Fire Ban (TOBAN) will be applied to the Project to address the potential impacts associated with onsite ignition. Essential works may be completed during a TOBAN if works are compliant with the Hot Work and Fire Risk Work procedure and any exemption provided by the NSW RFS.

6.11.5 Blade Throw

The SEARS require an assessment of blade throw risks, including consideration of associated dwellings, non-associated dwellings and neighbouring infrastructure. An assessment of potential blade throw risk for the Project has been undertaken by Middleton Group as part of a Blade Throw Assessment (BTA) in accordance with the SEARs. The BTA is provided in **Appendix 19** and the key outcomes are summarised below.

The purpose of the assessment was to estimate the risk to human life associated with a blade failure event, based on the likelihood of a human occupying space within the potential impact zone and the likelihood of a failure occurring. Blade throw is defined as a catastrophic incident where a WTG loses all or part of its blade and it is thrown into the surrounding area.

For the purposes of the Project assessment, blade throw is defined as a catastrophic blade failure, which is divided into two (2) types of events: blade drop and fragmentation. Blade drop is defined as detachment of the whole blade or much of the blade from the WTG hub. Fragmentation is defined as an event where a smaller blade fragment such as a blade tip or part of the shell detaches from the blade proper.

Modern WTGs and components supplied by major manufacturers are generally designed and certified in accordance with recognised international standards to ensure structural integrity and safe operation over the lifetime of the WTG, including International Electrotechnical Commission (IEC) Standard 61400. In addition to meeting design standards, modern WTGs incorporate sophisticated control systems designed to shut the WTG down during high wind speeds or in response to abnormalities such as abnormal vibration, rotor imbalance, or reduced power output. These control systems include redundant protection intended to prevent situations where the rotor could accelerate to speeds higher than its rated speed. Furthermore, lightning protection systems prevent damage caused by strikes, and operational maintenance programs increase the likelihood that minor faults are detected and rectified early.

The blade throw assessment provides an estimate of the risk to human life based on the likelihood of a person occupying space within the potential impact zone. In Australia, there have only been six (6) recorded blade throw events. The study utilised a conservative 2 km initial screening criterion, with models identifying a maximum impact radius of 831 m for blade fragmentation.

The assessment determined that no dwellings fall within the calculated maximum impact radius of any WTG. The nearest dwelling (S15-1) is located 1,192 m from the closest turbine, which is well beyond the potential impact area. Consequently, the Location Specific Individual Fatality Risk (LSIFR) for all residences is calculated as zero.

To provide a risk comparison, Hazardous Industry Planning Advisory Paper No. 4 – Risk Criteria for Land Use Safety Planning (HIPAP 4) (DPIE, 2011) provides suitable thresholds of acceptability for various land uses. The HIPAP 4 acceptable risk threshold for residential land use is a 1-million-year return period. Even when applying conservative sensitivity modelling to the nearest dwelling, the results remain comfortably within the bounds of what is considered to be broadly acceptable. This estimate is based on the characterisation of the following:

- the likelihood of a blade failure, based on existing Australian wind turbines and reported blade failure events in Australia
- the likelihood, taking into account range and wind direction, that the predicted landing zone corresponds to the location of a house
- the impact area of such a blade failure.

The low likelihood of adverse outcome is due to the low incidence of failure and the fact that all dwellings are located outside the maximum exclusion zone.

Assessment of Potential Development Rights

The SEARs require an assessment of the potential impact of the development on existing land uses on the site and adjoining land to address the requirements set out in Section 6.0 of the Wind Energy Guideline (DPHI, 2024). This was undertaken in detail in **Section 6.17** and includes consideration of potential blade throw-related impacts on neighbouring properties.

As per the methodology described in Section 6.0 of the Wind Energy Guideline (DPHI, 2024), this process involved the identification of an initial search radius around Project WTGs to conservatively capture key planning and environmental constraints. This involved preparing a conservative 1,000 m buffer around all Stage 2 WTGs to reflect the maximum blade fragment drop radius as calculated in the BTA report (**Appendix 19**).

The assessment of development rights determined that there are no lots that fall within the blade throw setback and have a potential dwelling entitlement. Refer to **Section 6.17** for further details.

6.11.5.2 Mitigation and Management Measures

The Project design has avoided, minimised and mitigated risks and impacts associated with blade throw. Accordingly, there are no Project-specific recommendations made in the Blade Throw Assessment. However, a range of standard recommendations are made in line with best industry practices, which will be implemented by BCWF during the life of the Project. These include:

- **BT01**: ensure all WTG are manufactured and certified to achieve relevant Australian and international safety standards (IEC 61400-23).
- **BT02**: ensure all WTG are equipped with suitable measurement instrumentation that can detect and then respond to any rotor blade imbalances and shut down WTG if required.
- **BT03**: ensure all WTGs will be suitably managed and maintained according to industry best-practice standards and are subject to a regular and comprehensive maintenance and servicing regime.
- **BT04**: to safeguard against potential new impacts resulting from design or other changes, the following measures are to be considered:
    - re-assess the BTA for any design modifications involving the material relocation of WTGs
    - ensure that any new dwellings within 2 km of the Project Area are located outside the impact zone of all WTG's.

6.11.6 Preliminary Hazard Risk Screening

The SEARs require the completion of a preliminary risk screening in accordance with State Environmental Planning Policy (Resilience and Hazards) 2021. A preliminary risk screening has been undertaken as discussed below.

Under the *State Environment Planning Policy (Resilience and Hazards) 2021* (Resilience and Hazards SEPP), a preliminary risk screening of a proposed development is required to determine whether a development may be potentially hazardous and require further assessment via a preliminary hazard analysis (PHA). The preliminary screening involves the identification and assessment of the storage of specific dangerous goods classes that have the potential for significant off-site effects. If, at the proposed location, and in the presence of controls, the risk level exceeds the acceptable criteria for impacts on the surrounding land use, the development is classified as 'hazardous' and may not be permissible within most land use zones in NSW.

A proposal cannot be considered hazardous until it is firstly identified as 'potentially hazardous' and subjected to the assessment requirements of the Resilience and Hazards SEPP. To determine whether a proposed development is 'potentially hazardous', a risk screening process is undertaken using the process outlined in the Applying SEPP 33 Guideline (DoP, 2011). The process considers the type and quantity of hazardous materials to be stored on site, distance of the storage area to the nearest site boundary, as well as the expected number of transport movements, as outlined in Table 2 of Applying SEPP 33. The SEPP risk screening assessment has been undertaken in **Table 6.33** which considers the hazardous material usage and storage context for the Project discussed in **Section 6.11.6.1** below.

6.11.6.1 Hazardous Material Usage and Storage–Context

Permanent storage of hazardous materials during the construction and operation phases of the Project will be limited in quantities, with maximum inventories below the SEPP screening thresholds. These materials include diesel, which would be used during construction and operations, and Liquefied Petroleum Gas (LPG) and gasoline, which would only be used during construction (i.e. will not be stored or used for the long-term operations phase of the Project).

Project construction may require the blasting of rock and therefore the use of explosives within the Project Area. Quantities of explosives will be confirmed during the detailed design phase however, if blasting is required, it is assumed that Ammonium Nitrate Emulsion (ANE), a division 5.1 oxidiser and explosive precursor, will be sensitised on site in a mobile manufacturing unit to become an explosive and used immediately.

Based on a conservative assumption it is estimated that Project construction will require up to two (2) blasts per week requiring on average approximately 10 tonnes of ANE per week (i.e. two (2) separate five (5) tonne quantities), over a period of approximately six (6) months during construction. In addition, the Project may require the following Class 1 initiating explosives:

- 500 x boosters (Division 1.1D) per week (i.e. two deliveries of up to 250 units).
- 500 x detonator cord downlines (non-electric signal tube) (Division 1.1B) per week (i.e. up to two (2) deliveries of 250 units).
- 500 x No.6 non-electric detonators (Division 1.1B) per week (i.e. up to two (2) deliveries of 250 units).

Other materials considered as part of the SEPP risk screening include transformer oil and herbicide/pesticide. They are not considered to be potentially hazardous under the SEPP as:

- Transformer oil: it is not classified as dangerous good and is excluded from risk screening. Additionally, it would not be stored with other flammable materials.
- Herbicide/pesticide: the dangerous good classification will be product specific as determined from the respective safety data sheet (SDS), and would not be stored on site in significant quantities.

6.11.6.2 Preliminary Risk Screening

A preliminary risk screening is undertaken to determine whether the Project may be classified as potentially hazardous, and require further assessment through the preparation of a PHA. The Resilience and Hazards SEPP contains assessment criteria for the storage quantities as well as transport quantities and frequencies of hazardous material that have the potential to create off-site impacts. Assessment against the relevant assessment criteria is presented in the subsections below.

Table 6.33 Resilience and Hazards SEPP – Risk Screening Assessment

Material	DG Class	Category	Storage Threshold	Transport Threshold (Movements)	Transport Threshold (Quantities)	Project Storage Quantities and Applicable SEPP Screening	Exceed Threshold?
LPG	2.1	Flammable gas	10 tonnes or 16 m^3	Cumulative annual – 500 Peak weekly– 30	Bulk – 2 Packages – 5	7 tonnes	No
Gasoline	3PG II	Flammable liquid	5 tonnes	Cumulative annual – 750 Peak weekly – 45	Bulk – 3 Packages – 10	4 tonnes	No
Diesel	C1	Combustible liquid	N/A	N/A	N/A	13 tonnes	N/A
Electrical transformer insulating oil	C1		Not classified as a dangerous good under the Australian Code for the Transport of Dangerous Goods (National Transport Commission (2020)	N/A	N/A	Approximately 45,000-50,000 L (approx. 44.5 t based on an assume specific gravity of 0.89)	N/A
Ammonium Nitrate	Class 5.1	Oxidising substance	5 tonnes	Cumulative annual – 500 Peak weekly–30	Bulk – 2 Packages – 5	No more than 5 tonnes at one time, noting this would be used immediately for blasting purposes	No

On average, it is estimated that two (2), five (5) tonne deliveries of ANE will be transported to the Project Area each week over a period of approximately six (6) months. While the bulk quantity of ANE transport to the Project Area is equal to the minimum bulk quantity threshold, the number of peak weekly (i.e. approximately two (2) per week) and cumulative annual (i.e. approximately 52 over approximately six (6) months) vehicle movements is well below the vehicle movement screening thresholds. Therefore, a route evaluation study is not considered to be required based on ANE transport.

SEPP 33 does not provide transport screening for Class 1 explosive materials. Rather, the estimated transport quantities and frequencies for Class 1 materials are required to be provided to the DPHI Hazard team to determine whether a transport route evaluation is required. The Class 1 transport quantities listed in the storage quantity screening above were provided to the DPIE Hazard team, which indicated that a route evaluation study would not be required.

The preliminary risk screening found that the Project is not considered as 'potentially hazardous' in accordance with the provision specified in the SEPP (Resilience and Hazards) and does not require further consideration by means of a PHA. The main findings of this preliminary risk screening are summarised below:

- The storage and transport of hazardous materials required for the construction and operation of the Project would not exceed the relevant risk screening threshold.
- No other risk factors have been identified that could result in significant off-site impacts.
- The Project is not considered as 'potentially hazardous' with respect to DG storage and transportation and does not require further consideration as part of a PHA.

Management Measures

ANE is an explosive precursor and requires careful storage to avoid decomposition and detonation. Additionally, Class 1.1 materials will decompose in a fire and may detonate if exposed to heat from a fire under confinement. ANE (an explosive pre-cursor and SSDS) and Class 1.1 materials require SafeWork NSW security clearances and licences to purchase, possess, use, store, transport and dispose of.

Management measures include:

- **HZ01:** BCWF will ensure that all suppliers and contractors handling ANE and Class 1.1 materials possess the required SafeWork NSW licences.
- **HZ02:** BCWF will also ensure that that all suppliers and contractors supplying, transporting and handling ANE and Class 1.1 materials have systems in place to ensure that safety and security risks are managed in accordance with the NSW Explosives Act and the NSW Explosives Regulation which includes the requirement to comply with Code of Practice, Mobile Processing Units (Australian Explosives Industry Safety Group Inc., 2018).

6.12 Social Impacts

The SEARs require an assessment of the potential social impacts of the Project including:

- An assessment of the social impacts in accordance with the Social Impact Assessment Guideline (DPE) and SIA Guideline–Technical Supplement (DPE) including consideration of any increase in demand for community infrastructure services, consideration of construction workforce accommodation.

- A Social Impact Assessment (SIA) has been undertaken for the Project by Umwelt. The SIA is presented in **Appendix 20** and key findings are summarised in the sections below.

In recognition of the feedback received from community and acknowledging the SEARs component to provide a consideration of construction workforce accommodation, Appendix G of the SIA (**Appendix 20**) presents the AES for the Project.

The Social Locality, for the purposes of the SIA, is defined in **Figure 6.15**. It comprises the towns of Hebden, Muscle Creek, Rouchel Brook, McCullys Gap, Goorangoola, Singleton and Muswellbrook, and the Local Government Areas of Muswellbrook Shire (host), Singleton (host) and Upper Hunter Shire.

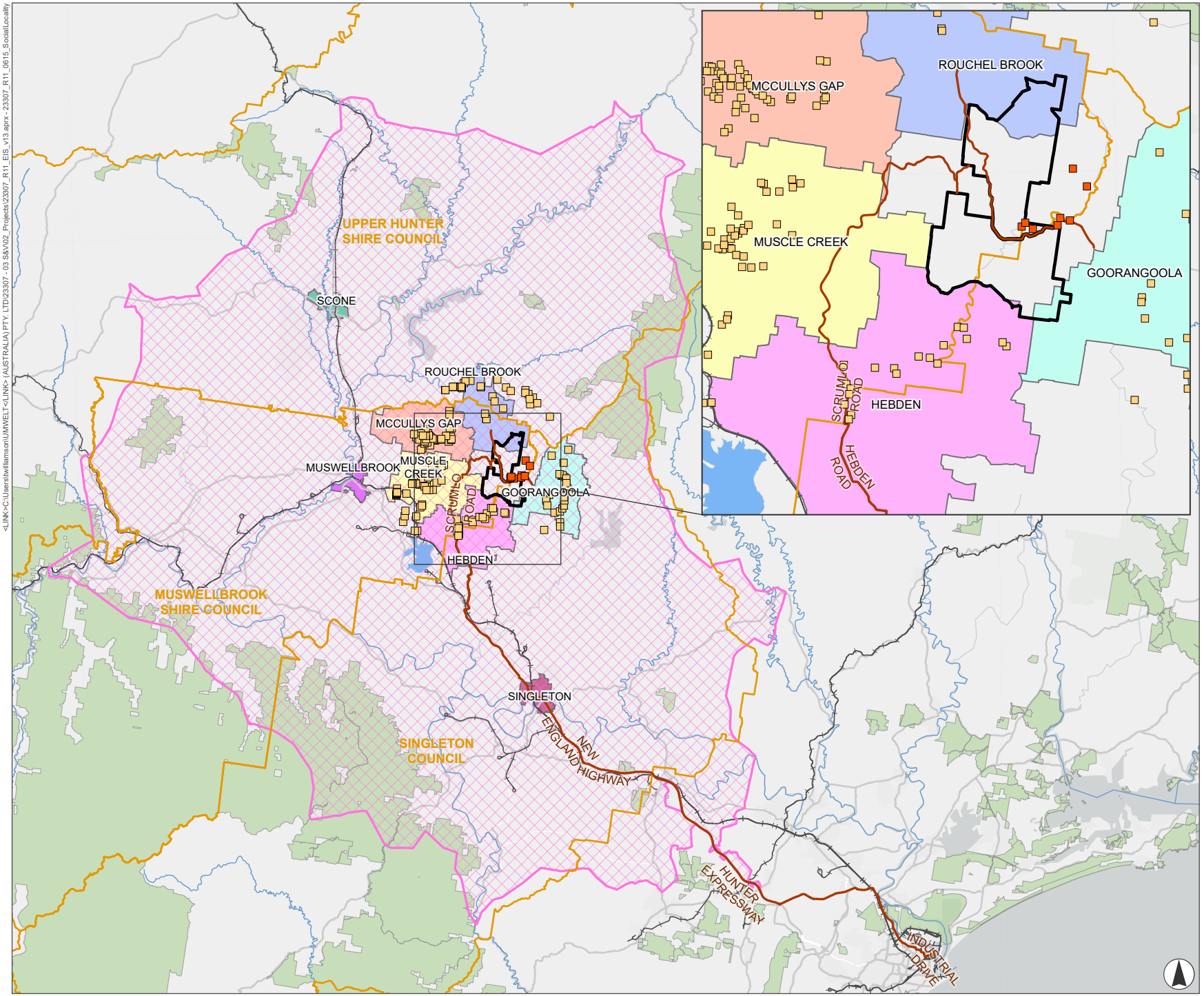


FIGURE 6.15

Social Locality

Legend

- Project Boundary - Stage 2
- Areas Within a 60 Minute Drive
- Local Government Area Boundary
- National Park
- Lake Liddell
- Site Access Roads
- Major Watercourse
- Major Roads
- Railway

Dwellings

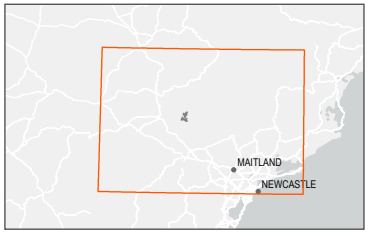
- Non-Associated
- Associated

Urban Centres and Localities Boundaries

- Muswellbrook
- Scone
- Singleton

Suburb and Localities Boundaries

- Goorangoola
- Hebden
- McCullys Gap
- Muscle Creek
- Rouchel Brook



0 10 20

Kilometres

Scale 1:750,000 at A4
GDA2020 MGA Zone 56

umwelt

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Image Source: ESRI Basemap (2026) | **Data Source:** NSW DFSI (2026), SLR (2026), Ozark (2026), Ark Energy (2026)

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6.12.1 Social Impact Evaluation

This section provides a summary of perceived social impacts identified in relation to the Project through extensive community engagement. It is important to note that stakeholders consulted raised both positive and negative impacts relating to the Project. The SIA includes a detailed analysis of community feedback regarding perceived impacts, which are summarised below.

The SIA found that the identified and assessed potential positive impacts of the Project include:

- Provision of additional sources of income for landholders, enhancing local livelihoods.
- Community investment initiatives and funds allocated to improve social outcomes for local communities.
- Increased economic spend in local communities and townships due to the influx of construction workers.
- Employment and procurement opportunities for local residents and businesses.

Key negative social impacts assessed as medium and high prior to mitigation include:

- Loss of environmental values of importance to the community.
- Temporary increase in population, increasing pressure on housing and accommodation.
- Reduced public safety due to potential change in bushfire risk.
- Reduced sense of place due to presence of wind turbine generators (WTGs) and altered landscape character.
- Reduced community cohesion due to differing attitudes and feelings towards the Project.
- Lack of trust in BCWF due to perceived inadequate information provision.
- Lack of trust in planning and assessment processes due to an inability to influence decision-making systems.
- Consultation fatigue and uncertainty resulting from an extended planning process, resulting in some cases in increased stress and anxiety.
- Livelihood impact due to decreased property values and increase in insurance premiums.
- Uncertainty, stress and anxiety related to the planning process.
- Social amenity and way of life impacts due to lighting, noise and dust associated with Project activities.
- Reduced public safety due to increased traffic on local roads and further road deterioration.
- Reduced access to telecommunications, with further deterioration of already poor television and mobile reception caused by interference from WTGs.
- Degradation of environmentally valued areas due to inadequate rehabilitation and production of waste during the decommissioning phase.
- Concern regarding physical health and wellbeing impacts due to potential chemical contamination of surface/ ground water and air.
- Inequitable distribution of Project impacts and benefits across the local area.

- Concern regarding health and wellbeing impacts due to noise and light/ shadow flicker.
- **Cumulative Impact Assessment**: as noted in the Social Impact Assessment (**Appendix 20**) this technical study recognised several impacts that are of a cumulative nature and therefore cannot be addressed by BCWF in isolation. There is a responsibility for proponents developing projects in the Hunter-Central Coast REZ, alongside the NSW Government, to consider these impacts collectively and develop strategies for appropriate management, mitigation, and enhancement through effective and proactive multi-stakeholder collaboration. Whilst a targeted section addressing potential cumulative impacts is not provided here, the assessment at large is providing a detailed cumulative impact assessment of potential social impacts, and the mitigation and management measures presented in **Section 6.12.2** below are tailored as such.

6.12.2 Mitigation and Management Measures

As outlined in **Section 2.6.3**, the Project has been developed and progressively refined in response to stakeholder feedback and in an effort to avoid and minimise negative social impacts associated with the Project to the greatest extent practicable.

Additionally, BCWF has committed to a range of measures to mitigate and management impacts to biodiversity and heritage values, amenity, agricultural productivity and to minimise hazards, consistent with the recommendations of the respective specialist assessment reports. These measures are documented throughout **Section 6.0** of this EIS and are summarised in **Appendix 5**.

A Preliminary Social Impact Management Framework was developed to manage residual negative impacts and to maximise positive impacts to affected communities. This framework is outlined in the sections below, and comprises:

- Neighbour Benefit Sharing.
- Community Benefit Sharing Program.
- Complaints management system (CMS).
- A Community and Stakeholder Engagement Strategy.
- Accommodation and Employment Strategy (AES), and associated Accommodation and Employment Implementation Plan (AEIP).

6.12.2.1 Neighbour Benefit Sharing Scheme

SO01: The proposed neighbour benefit sharing scheme for the Project is outlined in **Section 2.5.3.1**. The scheme aims to monitor compliance with agreed measures (including matters such as noise and traffic where relevant), monitor neighbour satisfaction with the program, and share monitoring outcomes with neighbours. Monitoring should commence prior to construction, occur quarterly during construction, and continue annually during operations (or at the frequencies established in the relevant management plans).

BCWF has implemented a Community Benefit Sharing Program for the Project. The program is designed to deliver local benefits across the project lifecycle and respond to identified community needs. The program will continue to be refined through ongoing community consultation, including consideration of support for local health and community services. During construction, BCWF will consider establishing a targeted community benefits fund to support residents and service providers most affected by project activities. Where appropriate, BCWF will collaborate with EnergyCo and

other renewable energy proponents within the HCC REZ to coordinate community funding initiatives and avoid duplication. Program performance will be monitored through measures such as community satisfaction, alignment of sponsorships with identified local needs, and evaluation of overall program effectiveness.

6.12.2.2 A Community and Stakeholder Engagement Strategy

SO02: BCWF has implemented a CSEP across the project lifecycle by updating it to address construction, operational and decommissioning phases, and reviewing it annually to assess performance and identify new stakeholders (refer to **Section 5.0**). BCWF will provide proactive communications through community newsletters (quarterly during construction and annually during operation, aligned to key activities), conduct regular engagement with neighbouring landholders to gather feedback on mitigation effectiveness (quarterly during construction and annually during operation), and host quarterly information sessions during construction in Mount Olive and Hebden.

6.12.2.3 Accommodation and Employment Strategy

SO03: An Accommodation and Employment Strategy (AES) has been developed for the Project and is presented in Appendix G of the SIA (**Appendix 20**). BCWF will maintain regular communication with the register (including supplier, contractor and employment opportunities), facilitate local workshops and/or information sessions on employment and procurement opportunities across the project and the HCC REZ, and coordinate with other proponents and industry developers on construction timing to support collaborative workforce planning and reduce cumulative workforce pressures. Monitor and report AES implementation outcomes regularly during construction (e.g. monthly, consistent with the AES monitoring approach). The AES has been informed by both secondary data review and primary social research through engagement with key stakeholders, such as local councils, accommodation providers, employment services and regional development agencies.

Employment Strategy

SO04: BCWF will deliver the employment outcomes as part of the AES implementation framework by incorporating actions into the Workforce Integration Plan and AEIP, including regular communication to the project register and local stakeholders on employment and procurement opportunities, and coordination with other proponents/industry on construction timing to support collaborative workforce planning. Employment and procurement performance (including local participation and representation of underrepresented groups) should be monitored and reported regularly during construction (e.g. monthly), with periodic review of the strategy to adapt measures if targets and outcomes are not being met.

SO05: To increase the local employment and procurement outcomes for the Project beyond the Goal scenario of 20%, a combination of the below measures would need to be resourced, funded and implemented to reach scenarios 2, 3 and 4 as set out within the AES (30%, 50% and 80% respectively):

- Workforce readiness: Work with local industry and employment stakeholders to understand workforce readiness in the local area. For underrepresented workforce groups, such as women and First Nations people, as well as those who have relevant workplace skills but may lack the technology skills associated with online job seeking and resume preparation. The application of specific outreach programs may enable increased and more equitable Project participation.

- Provide transport to the site: Provide a shuttle bus service from key population centres/townships and accommodation locations to the Project Area. It is expected that this would assist local residents to engage in employment opportunities, who may otherwise be unable to access the Project Area. This would also improve safety associated with any predicted traffic impacts.
- Develop partnerships with local training providers: Facilitate opportunities for reskilling or upskilling local workforces during the planning phase and beyond to meet Project needs by partnering with service providers, education providers and other relevant stakeholders. Identify relevant training programs and provide traineeship opportunities. Include training opportunities that are tailored for those currently unemployed, women and First Nations people. In addition, provide clear pathways for workers to become qualified and develop (on-the-job) skillsets for existing and future supervisory and/or leadership positions.
- Local Employment and Procurement Officer: Appoint a dedicated Project Officer to liaise with relevant stakeholders and provide information on Project related employment opportunities.

SO06: BCWF is committed to monitoring and evaluating the effectiveness of the AES. During the Project's pre-construction and construction phases, the strategy would be reviewed bi-annually between 2027 and 2029 by the EPC Contractor, to assess the effectiveness of steps taken to maximise local employment and procurement on the Project.

Accommodation Strategy

SO07: The AES includes a summary of proposed workforce accommodation measures and a corresponding monitoring plan. These measures are summarised in **Table 6.34.**

Table 6.34 Workforce Accommodation Measures

Existing Accommodation

Measure	Timing	Responsibility	Documented	KPI
EPC Contractor to prioritise the employment of locals who already reside in the area and who will not require accommodation	Pre-Construction	EPC Contractor	Contractor records	Number of local residents employed by the Project
Investigate and document accommodation options and explore potential accommodation partnerships in the local region – provide this information to the EPC Contractor	Pre-Construction	BCWF	This document	Number of rooms secured through partnership agreements Satisfaction with local accommodation providers with partnerships
Operate a Housing and Accommodation EOI Register to enable local landowners, businesses and individuals to register their interest in providing	On-going	BCWF	This strategy BCWF records	Promote Housing and Accommodation EOI Number of local landowners, businesses and individuals registered

Measure	Timing	Responsibility	Documented	KPI
accommodation services to the Project				
Work with Muswellbrook and Singleton Councils to advertise interest in supporting owners of currently vacant properties to make their properties available to the Project	On-going	BCWF	This strategy BCWF records	Promote Housing and Accommodation EOI
Development of an Accommodation and Employment Implementation Plan (AEIP) to coordinate accommodation	Pre-Construction	BCWF	AEIP	Development of AEIP prior to Construction

Newbrook Development (Brightway)

Measure	Timing	Responsibility	Documented	KPI
Provide onsite medical facilities and access to telehealth for workers to reduce pressure on existing medical systems	Construction	Brightway Development Group	Brightway Development Group records	Provision of telehealth and onsite health services
Ensure the Newbrook Development prioritises local procurement of key services such as catering, cleaning and security	Construction	Brightway Development Group	Development Group records	Promotion of local employment and procurement Proportion of local businesses contracted

Other

Measure	Timing	Responsibility	Documented	KPI
Investigate using a proportion of the Project's community benefit fund to support local social and affordable housing initiatives	Pre-Construction Construction	BCWF	Community Benefit Delivery	Funds distributed
Review workforce requirements regularly (e.g. monthly) during construction to ensure the objectives of the AES are being met	Construction	BCWF & EPC Contractor	BCWF records	Number of completed reviews per year Proportion of AES objectives met

Measure	Timing	Responsibility	Documented	KPI
Provide regular Project updates to the community via Project Newsletters, posts on the Project website	On-going	BCWF	BCWF records	Number of community updates provided Community satisfaction with information provided Proportion of enquiries responded to in a timely manner Proportion of grievances and /or complaints addressed within required timeframe

SO08: In addition to implementing the workforce accommodation measures above, BCWF will regularly maintain the accommodation/employment register (including accommodation availability and supplier/contractor opportunities), and coordinate with other proponents and industry developers regarding construction scheduling to support collaborative workforce planning and reduce cumulative impacts on accommodation availability and affordability.

6.12.2.4 Complaints Management System (CMS)

SO09: BCWF will establish and maintain a complaints management system that includes a dedicated hotline and email, defined KPIs (including response timeframes and escalation pathways), and ongoing promotion via newsletters, social media and community meetings throughout the project lifecycle. Ensure accessible complaint options for non-English speakers and people with disabilities and publish complaint outcomes quarterly on the project website (or equivalent public reporting mechanism).

6.13 Economic and Benefit-Sharing

The SEARs require an assessment of the Project's economic and benefit-sharing impacts, including any benefits of the economic impacts or benefits of the Project for the region and the State as a whole and provide details of proposed benefit-sharing arrangements, in accordance with the *Benefit-Sharing Guideline*.

An Economic Impact Assessment (EIA) has been undertaken for the Project by Ethos Urban (Ethos) to address the Requirements of the SEARs. The EIA for the Project is provided in **Appendix 21** and key findings are summarised below. The EIA Study Area was defined as the entirety of the Maitland City, Singleton Council, Muswellbrook Shire and Upper Hunter Shire LGAs.

6.13.1 Existing Economic Profile

6.13.1.1 Population Trends

As of June 2025, the population of the EIA Study Area is estimated at approximately 155,040 people. This includes around 98,220 residents within the Maitland City LGA, 25,520 within Singleton LGA, 16,840 within Muswellbrook LGA, and 14,460 within the Upper Hunter LGA.

Between 2025 and 2041, the EIA Study Area is forecast to experience average annual population growth of approximately 1.5 % per annum, equating to an increase of around 2,540 people per year over the 16-year period. This projected growth rate exceeds the NSW average of approximately 1.0 % per annum over the same timeframe. Population growth across the Study Area is expected to be driven largely by Maitland City LGA, which is forecast to grow at approximately 2.0 % per annum. In contrast, Singleton and Muswellbrook LGAs are projected to experience more moderate average annual growth of approximately 0.7 % and 0.4 % respectively between 2025 and 2041.

The Upper Hunter LGA is also projected to experience relatively modest population growth of approximately 0.4 % per annum over this period, which is notably lower than both the Study Area and NSW averages. This comparatively slower growth in the immediate Project locality underscores the importance of local investment initiatives that support employment generation and economic diversification, and that may assist in attracting and retaining residents within the region. In this context, large-scale renewable energy developments can also provide alternative and supplementary income streams for local landholders and workers.

The Project would generate new income for the host landowner and deliver economic benefits during both the construction and operational phases, including employment opportunities, procurement of local services, and increased expenditure within the regional economy. Collectively, these outcomes would contribute to supporting local economic activity and the continued development of the region's renewable energy sector.

6.13.1.2 Labour Force and Occupational Structure

The ESA reported an unemployment rate of 3.8% in December 2024, equating to approximately 2,990 individuals currently seeking work. While this indicates a relatively tight labour market, it also represents a pool of potential candidates who could benefit from both short-term and ongoing employment opportunities generated by the Project.

The region's existing skills base is well-suited to the Project's requirements. According to 2021 ABS Census data, the ESA has a strong occupational profile, with around 27,810 workers and 1,820 businesses engaged in construction-related industries. This concentration of skilled labour and established business infrastructure provides a solid foundation for meeting the Project's workforce needs.

At peak construction, the Project will require 160 direct FTE positions, with an estimated 80% expected to be sourced locally. This approach will create new opportunities for unemployed job seekers (where skills align) and strengthen participation within the regional labour force. However, given anticipated demand from other renewable energy projects in the HCC REZ and existing industries such as coal mining, careful workforce planning will be essential to ensure effective local sourcing.

The Project is well-positioned to support the transition of workers into the renewable energy sector, a shift underpinned by global, federal, and state emissions reduction targets. By leveraging the region's industrial base, the Project will contribute to establishing the ESA as a renewable energy hub while delivering sustained economic benefits to the local workforce.

6.13.1.3 Business Structure

According to ABS Business Count data (June 2024), the ESA hosts approximately 1,820 construction businesses, accounting for 16.0% of all businesses in the region. This reflects a strong presence of firms with the capability to deliver services required for the Project. While this proportion is slightly below the NSW average of 17.1%, the overall volume of construction businesses indicates a solid foundation for regional procurement opportunities.

Although construction-related businesses are expected to be the primary beneficiaries, other sectors that provide direct and indirect support to the Project are also likely to experience positive impacts. These include:

- retail trade
- accommodation and food services
- financial and insurance services
- rental, hiring and real estate services
- health care and social assistance.

Collectively, these sectors represent approximately 27.8% of all businesses in the ESA and will play an important role in meeting the needs of the construction workforce, particularly for workers relocating to the region during the Project's construction phase. The extent of regional business benefits will ultimately depend on the level of local procurement and supply chain integration achieved throughout both construction and operational stages of the Project.

6.13.1.4 Project Workforce

Direct Construction Employment

Construction-related jobs for the Project will involve a wide range of on and off-site activities, including:

- recruitment and workforce training
- civil works (earthworks, foundations, external roads, internal access tracks)
- installation and assembly of turbine components
- electrical works (cabling, connections)
- engineering and technical services
- operation of specialised equipment (e.g., cranes)
- transport and logistics
- vehicle and equipment hire
- installation of monitoring systems.

The ESA has the capacity to contribute significantly to the Project based on its established industrial base and the presence of approximately 27,810 construction-related workers and 1,820 businesses. While the regional labour market is currently tight, the Proponent has set an aspirational target to source 80% of the required construction workforce from within the ESA. This equates to an average of 55 FTE jobs per month, increasing to 130 FTE local jobs during the Project's peak. The Project will provide new participation opportunities for local businesses and workers, leveraging the strong match of skills available in townships like Singleton, Maitland, and Muswellbrook.

Indirect Construction Employment

In addition to direct employment, significant employment will be supported indirectly through the employment multiplier effect. By applying an industry-standard multiplier for the construction industry of 1.6, the Project is estimated to generate an additional 110 FTE jobs indirectly over the 22-month construction period.

These flow-on jobs include those supported locally and in the wider economy through financial services, accommodation, food and beverage, and trade supplies. It is assumed that approximately 20% of these indirect positions (roughly 20 FTE jobs) will be supported specifically within the ESA. This stimulus is driven by the industrial supply chain and the consumption spending of the workforce during the construction phase.

Operational Employment

Once operational, the Project (Stage 2) is estimated to require 10 direct FTE jobs on-site for ongoing operation and maintenance. When combined with Stage 1, a total of 40 direct FTE jobs will be supported across the broader Bowmans Creek Wind Project.

Further employment will be generated indirectly. By applying an industry-standard multiplier for the electricity industry of 2.9, an additional 30 FTE jobs will be supported in the wider State and national economies. Approximately 20% of these indirect roles (equating to 5 FTE jobs) are expected to be created within the ESA. While the total number of ongoing positions is smaller than the construction phase, they represent stable, long-term employment opportunities for the 30-year lifetime of the Project, supporting the regional transition toward a renewable energy economy.

6.13.2 Impact Assessment

6.13.2.1 Workforce Accommodation

The Project will require a small number of non-local workers during peak construction, estimated at about 30 FTE positions. Accommodation for these workers is expected to account for roughly 3% of the available capacity within the region, which includes approximately 920 rooms and cabins located within 60 minutes of the Project Area.

On this basis, existing accommodation supply within the ESA is considered sufficient to meet the anticipated peak demand. However, accommodation availability may vary due to concurrent regional infrastructure projects and seasonal pressures associated with tourism and agricultural activities.

In response, and following consultation with regional stakeholders including accommodation and service providers, Ark is assessing the use of a purpose-built temporary workforce accommodation (TWA) facility proposed by 'Brightway' in Muswellbrook. The proposed TWA has capacity to accommodate up to 30 FTE workers associated with the Project, thereby reducing potential pressure on existing housing stock and community services within the ESA.

In parallel, construction workforce expenditure is expected to generate positive economic outcomes for local businesses through increased demand for goods and services. These flow-on benefits are discussed further in **Section 6.13.2.3**. Workforce accommodation considerations are addressed in greater detail in **Section 6.12** and **Appendix 20**.

6.13.2.2 Impacts to Agricultural Production

The Project will result in the temporary disturbance of approximately 180 ha of agricultural land over the Project's operational life of up to 30 years. The Disturbance Footprint encompasses land required for Project infrastructure and associated activities. Permanent infrastructure areas will be leased from existing landholders for the duration of the Project.

Overall, the Project represents a minor reduction in the availability of low-intensity livestock grazing land within the broader Project Area. The SLAIA estimates that the impact on agricultural primary production would equate to an annual reduction of approximately $99,905 over the life of the Project (refer to **Appendix 14**).

Agricultural activities, including grazing and cropping, will continue across the remainder of the landholding, and the Project has been designed to co-exist with ongoing agricultural operations. A suite of mitigation and management measures has been proposed to minimise potential land use conflicts, as outlined in **Section 6.10**. In addition, participating landholders will benefit from diversified income streams through lease arrangements, as well as improved property access associated with the construction of internal access roads.

6.13.2.3 Key Economic Benefits

During construction, the Project will involve an estimated capital investment of approximately $260 million (excluding GST), with around $26 million expected to be retained within the ESA through local procurement and service expenditure. Over the construction period, the Project is anticipated to support an average of 70 direct and 110 indirect FTE positions nationally, with up to 160 direct FTE jobs during peak construction.

Relocating construction workers are expected to contribute approximately $1.3 million in additional expenditure within the ESA over the construction phase, including spending on retail, recreation, and personal and professional services. This level of expenditure is estimated to support approximately four (4) FTE positions in the local service sector during the period.

During operation, the Project is expected to support approximately 10 direct and 30 indirect FTE positions nationally. Over the Project's operational life, ongoing economic benefits to the ESA is estimated at approximately $35 million (CPI-adjusted), derived from landholder lease payments, operational wages, and community contributions.

In total, the combined construction and operational phases of the Project are estimated to generate economic benefits of approximately $61 million within the ESA. Additional community benefits will also be delivered through the Proponent's benefit-sharing commitments, as outlined in **Section 2.5**.

These include a Voluntary Planning Agreement (VPA) with Muswellbrook Shire Council and Singleton Council, providing a contribution of $1,050 per MW over the life of the development.

Decommissioning is expected to deliver temporary economic benefits through employment, business contracts, and local spending. The estimated cost of decommissioning is approximately $24.0 million, with around $12 million likely to be retained within the ESA for local services. Activities will involve dismantling infrastructure and transporting components for recycling or disposal, requiring a smaller workforce than during construction. As decommissioning is not anticipated for at least 30 years, the exact scale of impacts cannot be confirmed, given potential changes in economic, technological, and regulatory conditions.

6.13.3 Mitigation and Management Measures

BCWF have committed to a range of mitigation and management measures with respect to economic and benefit sharing. These measures are described in detail in the EIA (**Appendix 21**) and are summarised below:

- **EIA01:** BCWF will prepare and implement an AES in consultation with relevant stakeholders prior to commencing construction of the Project, to minimise impacts on the community and maximise benefits of the Project.
- **EIA02:** BCWF will monitor and update (where and if necessary) the AES during the construction phase of the Project to reflect local market conditions at the time (including demands from concurrent infrastructure projects, visitor markets etc).

6.14 Waste

The SEARs require the EIS to:

- identify, quantify, and classify the likely waste streams to be generated during construction and operation, and describe the measures to be implemented to manage, reuse, recycle and safely dispose of this waste and an assessment of sewage (if required) and provide a waste management plan.

Appropriate and best-practice waste management will be implemented as part of the Project in accordance with the following legislation and guidelines:

- Protection of the Environment Operations Act 1997 (POEO Act).
- Protection of the Environment Operations (Waste) Regulation 2014.
- Waste Avoidance and Resource Recovery Act 2001 (WARR Act).
- Waste Classification Guidelines – Part 1: Classifying wastes (EPA, 2014).
- NSW Waste and Sustainable Materials Strategy 2041 (DPIE, 2021).

Best practice waste management involves implementation of resource management hierarchy principles as specified in the WARR Act, and the principles of ecologically sustainable development, which include:

- avoidance of unnecessary resource consumption
- resource recovery (including reuse, reprocessing, recycling and energy recovery)

- disposal, including management of all disposal options in the most environmentally responsible manner and seeking opportunities to divert waste into the circular economy in accordance with the NSW Waste and Sustainable Materials Strategy 2041 (DPIE, 2021).

The WARR Act is underpinned by a waste hierarchy, which establishes a set of priorities for the efficient use of resources. This hierarchy (EPA, 2022) is, in order of priority:

- **Avoidance** including action to reduce the amount of waste generated by households, industry and all levels of government.
- **Resource recovery** including re-use, recycling, reprocessing and energy recovery, consistent with the most efficient use of the recovered resources.
- **Disposal** including management of all disposal options in the most environmentally responsible manner.

BCWF is committed to ensuring waste generated by the Project is managed in accordance with this waste management hierarchy. While many wastes can be avoided, recycled or reused, some wastes will need to be disposed of to landfill, and in this case BCWF will liaise with the relevant local authorities to work with them to manage this, and cumulative impacts, that may result from the waste disposal needs of multiple developments in the region.

6.14.1 Waste Disposal Options

Waste facility options available to BCWF are outlined in **Table 6.35**, which classifies accepted waste streams as well as the distance each facility is to the Project. BCWF will select the waste recycling and disposal facilities to be utilised by the Project during the detailed design and contract development stage of the Project, in consultation with the facility operators. These facilities will be identified in the CEMP and OEMP.

BCWF will not rely on the municipal waste collection services, waste products than cannot be reused will be removed by local waste contractors and maintenance personnel.

Table 6.35 Waste Disposal Facilities in Proximity to the Project

Facility	LGA	Distance	Construction Waste Accepted at the Facility
Singleton Waste Management Facility	Singleton	28 km	Construction and demolition (C&D) waste General commercial and industrial solid waste Aluminium and steel Electronic waste Motor oils Plastics
Muswellbrook Waste & Recycling Facility	Muswellbrook	17 km	Mixed waste Steel reinforced concrete Scrap metal recycling Concrete or rubble (clean) Green waste Soil (clean) Timber and timber pallets
Denman Waste Transfer Station	Muswellbrook	42 km	N/A

Facility	LGA	Distance	Construction Waste Accepted at the Facility
Merriwa Waste Transfer Station	Upper Hunter Shire	72 km	Construction and demolition waste Metals and scrap Electrical equipment Chemical drums (empty/appropriate types) Oils and batteries (certain types) General commercial waste
Scone Waste Management Facility	Upper Hunter Shire	31 km	N/A
Murrurundi Waste Transfer Station	Upper Hunter Shire	60 km	N/A
Aberdeen Resource Recovery Centre	Upper Hunter Shire	20 km	N/A

6.14.2 Construction and Operations

The Waste Classification Guidelines: Part 1 Classifying Waste (EPA, 2014) provide direction on the appropriate classification of waste, specifying requirements for management, transportation, and disposal of each waste category. Should waste be found to be unsuitable for reuse or recycling, disposal methods would be selected based on the classification of the waste material in accordance with the Waste Classification Guidelines (EPA, 2014).

The potential waste streams expected to be generated by the Project during the construction and operational phases are quantified in **Table 6.36**.

The construction period of the Project will result in the largest contribution of waste, most of which will be required to be disposed of off-site. Onsite use of waste would be limited to reuse of excavated materials, including topsoil, excavated rock and sediment recovered from erosion and sediment control devices which will be reused onsite as general fill material, or it will be incorporated within landscaping materials, where possible. Waste generated during construction would mainly arise from works associated with site preparation, demolition (if required), construction of accessways, landscaping and the construction of operational infrastructure.

Construction and operational waste will be reused and disposed of in conjunction with Stage 1 project. Waste storage will be shared between Stage 1 and the Project, with coordinated collection and removal to improve operational efficiency.

During operations waste generation would be limited to minor quantities of waste from staff amenities, redundant equipment and maintenance activities. Under the waste definitions in the POEO Act, most of the waste generated during the construction phase would be classified as general solid waste, either putrescible or non-putrescible (refer to **Table 6.36**). The potential impacts associated with waste generation and management during the operational phase would be similar to those for construction, albeit at a much smaller scale.

Some materials such as fuels and lubricants, redundant equipment and metals may require very infrequent replacement over the operational life of the Project and there will be some disposal of these used materials (e.g. replacement oil) and equipment which has reached its operational life. The Project does not include an accommodation facility as this is a component of the Stage 1 Project. As such, effluent waste is expected to be minimal as a product of the Project. Any sewage collected, will be stored and removed by a licensed waste contractor.

Table 6.36 Waste Classification and Expected Waste Types

Waste Classification	Construction	Operations	Decommissioning
Liquid Waste	Waste oils, lubricants and liquids, paint, and sewage ablutions.	Waste oils, lubricants and liquids, paint, and sewage ablutions.	Waste oils, lubricants and liquids, paint, and sewage ablutions.
General Solid Waste (Non-Putrescible)	Green waste from site establishment and clearing of Disturbance Footprint, spoil from site earthworks, concrete, footings and laydown area waste, timber and packaging (including pallets), plastic packaging, other plastics (PET), cardboard packaging, paper, glass, empty chemical drums, oil spill clean-up material, metal offcuts and damaged metal (ferrous and non-ferrous), electronics and electrical infrastructure, recyclable domestic waste and personal protective equipment (PPE).	Timber and packaging (including pallets), plastic packaging, other plastics (PET), cardboard packaging, paper, glass, empty chemical drums, paint, oil spill clean-up material, metal offcuts and damaged metal (ferrous and non-ferrous), electronics and electrical infrastructure, recyclable domestic waste and PPE.	Spoil from excavations and removal of infrastructure concrete, footings and laydown area waste, timber and packaging (including pallets), plastic packaging, other plastics (PET), cardboard packaging, paper, glass, empty chemical drums, oil spill clean-up material, metal offcuts and damaged metal (ferrous and non-ferrous), electronics and electrical infrastructure, recyclable domestic waste and PPE.
General Solid Waste (Putrescible)	Domestic waste.	Domestic waste.	Domestic waste.

6.14.2.1 Minimisation and Management Measures – Construction and Operations

W01: As part of the detailed design and following Project approval, a Waste Management Plan (WMP) will be prepared which will include a detailed breakdown of waste types and quantities in accordance with relevant legislation and guidelines. It is noted that a WMP is required under the Project SEARs, although at this stage of the Project design, insufficient information is available to prepare a comprehensive WMP. Muswellbrook Shire Council have noted that a Waste Management Plan will be required as a condition of consent, and is to be prepared in consultation with the relevant authority and Council's Waste Operations unit. As such, BCWF commit to the preparation of the WMP post approval of the Project.

The Waste Management Plan will outline the measures and strategies to be implemented on site to manage, reuse, recycle and safely dispose of waste including:

- separation and storage of recyclable and non-recyclable materials
- reuse and collection/transportation of waste
- procedures for tracking waste storage and disposal.

On-site waste management will include the appropriate separation and storage of waste streams to enable recycling and reuse wherever possible to reduce associated environmental impacts and impact to the capacity of local waste management facilities.

Potential management actions that may be required to manage waste have been identified for each potential waste type identified in **Table 6.37**, including indicative quantities (construction and operations phase).

Table 6.37 Indicative Waste Generation

Waste Type	Classification	Indicative Quantity – Construction	Indicative Quantity – Operations	Management Strategy
Paper, plastics, packaging, cartridges	General solid waste (non-putrescible)	60 tonnes	10 tonnes	Recyclable and nonrecyclable waste will be segregated. Mixed recycling bins will be provided.
Green waste	General solid waste (putrescible)	To be determined during detailed design. Anticipated disposal of 60 m^3 (approximately 100 tonnes)–aim to reuse where possible	N/A	Reused on site where appropriate or recycled.
Spoil from earthworks	General solid waste (non-putrescible) or Virgin Excavated Natural Material (VENM)	N/A–reuse	N/A	Reused on site where appropriate or transferred off site if classified as VENM.
Concrete	General solid waste (non-putrescible)	15 tonnes	N/A	Separated on site and stored. Reused on site where possible or off site, alternatively transported off site for recycling by appropriately licensed contractor.

Waste Type	Classification	Indicative Quantity – Construction	Indicative Quantity – Operations	Management Strategy
Oils and lubricants	Liquid waste	300 L	300 L	Stored within bunded area in appropriately sized tanks/containers. Collected on a regular basis by a licensed waste contractor(s) and transported to an appropriately licensed facility for recycling.
Paint	Liquid waste	50 L	50 L	Stored appropriately then transported from site and disposed of by appropriately licenced contractor.
Sewage	Liquid waste	250 tonnes	200 tonnes	Treated on site in approved septic system or compositing system with removal of final waste products at appropriate intervals by licensed contractor.
Vehicle maintenance consumables	General solid waste (non-putrescible)	75 kg	75 kg	Wastes such as batteries and tyres will be separated for collection/recycling by appropriate licensed contractors. Other items that are not able to be recycled will be stored prior to periodic transportation off site to landfill facilities by appropriately licensed contractors.
WTG blades	General solid waste (non-putrescible)	N/A	~60 tonnes (allows for 2 full blade replacements across the life span)	Technology in this field is rapidly evolving and options for recycling will be considered during the decommissioning of the Project. Current Industry practice is for blades to be disposed of by being cut to a size to facilitate handling and transportation and disposed of to landfill (in consultation with Council).
Plastic packaging	General solid waste (non-putrescible)	6 tonnes	5 kg	Separated on site and stored in recycling bins for periodic transportation off site to applicable recycling facilities by appropriately licensed contractor.

Waste Type	Classification	Indicative Quantity – Construction	Indicative Quantity – Operations	Management Strategy
Cardboard and paper packaging	General solid waste (non-putrescible)	45 tonnes	8 tonnes	Separated on site and stored in recycling bins for periodic transportation off site to applicable recycling facilities by an appropriately licensed contractor.
Glass	General solid waste (non-putrescible)	55 kg	5 kg	Separated on site and stored in recycling bins for periodic transportation off site to applicable recycling facilities by an appropriately licensed contractor.
Timber	General solid waste (non-putrescible)	8 tonnes	5 kg	Pallets will be returned to suppliers or reused on site where possible. All other timber will be reused on site where possible or stored and transported off site for recycling by appropriately licensed contractor.
Recyclable Domestic Waste	General solid waste (non-putrescible)	5 tonnes	7 tonnes	Separated on site and stored in recycling bins for periodic transportation off site to applicable recycling facilities by an appropriately licensed contractor.
Domestic waste	General solid waste (putrescible)	10 m^3	20 m^3	Stored in covered bins for periodic transportation offsite to landfill facilities by appropriately licensed contractor. Where located in open areas, the bins would be fitted with animal-proof lids.
PPE	General solid waste (non-putrescible)	250 kg	50 kg	PPE will be stored on site for reuse or periodic transportation offsite to applicable recycling facilities by an appropriately licensed contractor.
Metals (ferrous and non-ferrous)	General solid waste (non-putrescible)	45 tonnes	4.5 tonnes	Scrap metal will be stored on site for transportation to appropriate recycling facilities by an appropriately licensed contractor.

Waste Type	Classification	Indicative Quantity – Construction	Indicative Quantity – Operations	Management Strategy
Empty chemical/hydrocarbon drums	General solid waste (non-putrescible)	60 drums	N/A	Reused on site or stored for recycling (if possible) then transported to appropriate recycling facilities by an appropriately licensed contractor.
Electronics and electrical infrastructure	General solid waste (non-putrescible)	N/A–reuse	10 kg	Where possible components will be reused, sold as scrap, recycled or re-purposed.

6.14.3 Decommissioning

BCWF acknowledges that waste generation associated with Project decommissioning was identified as a key issue of concern for the community during engagement.

Decommissioning is discussed in Section 5.7 of the Wind Energy Guideline, and states that certain issues which are specifically relevant for wind energy developments are to be considered in the environmental assessment (i.e. EIS), as follows: "Applicants must identify the decommissioning and rehabilitation activities that will take place and address all relevant issues for decommissioning and rehabilitation in the project's environmental impact statement". Section 5.7 of the Wind Energy Guideline also stipulates that the financial responsibility of the decommissioning phase is with the applicant.

In line with the NSW Waste and Sustainable Materials Strategy 2041, the Wind Energy Guideline asserts that applicants consider the principles of the circular economy and mechanisms to minimise impacts to local waste facilities. The Wind Energy Guideline requires the prioritisation of recyclable WTGs as far as practicable and encourages applicants to give preference to the most efficient and cost-effective recycling and recovery methods which become available across the life of the Project.

As noted previously throughout this EIS, a DRP will be prepared to achieve the above-mentioned objectives and provide a plan to outline the current methodology that may be used to decommission all infrastructure associated with the Project and rehabilitate the land at the end of the Project's economic life, and to address relevant Development Consent conditions for the Project (if approved). The DRP will be developed for the Project prior to closure which will include a detailed review of the associated waste streams and recycling/disposal options available at the time.

All above-ground components, including WTGs, electrical infrastructure, buildings, and equipment will be removed from site as part of the decommissioning process. Additionally, foundations will be excavated to at least 500 mm below ground level and backfilled with topsoil for rehabilitation. WTGs will be sequentially removed and transport off site for re-use, sale, or recycling, with all costs incurred by BCWF. The same process will be followed for the removal of an individual turbine during operations in the event of malfunction.

After dismantling of the WTGs, components will be sold and transported to another site for reuse or sold to the scrap metal market. The methods for re-using or recycling WTG components, particularly turbine blades, is based on current technology. There is an emerging WTG refurbishment industry internationally, however as most Australian wind farms are still within their operational life the industry is still developing in Australia. As wind farms are decommissioned across Australia over the coming years there will be a growth in providers tendering to procure, transport and sell wind farm components and scrap material for future uses, and this growth will be reflected in future development and reviews of the DRP.

After the assets are removed, most of the materials will be reclaimed or recycled, given the significant value of the steel, copper, aluminium and other materials. It is important to note that the recycling of WTGs is an evolving space with research and experimentation occurring across the world to find ways to recycle WTG components at the end of its life. BCWF has committed to the adoption of best practice to reuse, recycle and dispose of turbine components at the time of decommissioning.

Depending on the type of battery storage technology selected for the Project and based on the rapid rate of change in recycling technology for these items, locally available initiatives will be assessed at the time of replacement/decommissioning.

Although to a lesser degree compared to the construction phase, solid wastes will be generated by decommissioning activities including non-putrescibles and putrescibles (refer to **Table 6.36** and **Table 6.37**). Solid wastes include packaging, excess building materials, general refuse, and other non-putrescible wastes will be disposed of using waste management facilities.

Decommissioning and rehabilitation of the Project at the end of its operational life is the obligation and cost of the Project owner. Based on Australian and international experience, recycling and scrap recovery from WTGs typically offsets a significant portion of total decommissioning and rehabilitation costs, with the majority of value derived from recovered steel and copper. A project-specific decommissioning and rehabilitation cost estimate, including conservative assumptions regarding salvage value, will be provided in the DRP.

6.14.3.1 Minimisation and Management Measures–Decommissioning

W02: As discussed above, BCWF has committed to develop and implement a detailed DRP for the Project in consultation with key stakeholders, to guide the decommissioning of the Project and the rehabilitation of the site and to mitigate any negative legacy impacts to the community.

Decommissioning and rehabilitation of the Project at the end of its operational life is the obligation and cost of the Project owner. Although there are currently no examples of wind farm decommissioning in Australia, data available from overseas operations suggests that the salvage value of turbine components has the potential to cover the cost of decommissioning of wind farm infrastructure and site rehabilitation, although a full cost estimate of decommissioning and rehabilitation for the Project will be undertaken and provided in the DRP.

However, to cover any potential future shortfall in the decommissioning costs BCWF will commit to the following conditions to be included in any development approval issued:

- **W03:** Undertake an annual assessment of the remaining life of the Project, starting in Year 15.
- **W04:** When it is determined that the remaining economic life of the Project is less than six (6) years, update the DRS to identify the expected decommissioning methodology and anticipated cost.

- **W05:** If a shortfall (cost) is identified, establish a dedicated decommissioning reserve fund to cover the decommissioning and rehabilitation cost of the Project. This reserve will be established out of operating cashflows, with an appropriate percentage of cash generated by the wind farm directed into this reserve over an annual basis, until the reserve is fully cash funded, based on the most recent estimate of decommissioning and rehabilitation costs.

6.15 Contamination

The SEARs require an assessment of contamination, including *a preliminary investigation into potential contamination across the site, in accordance with the State Environmental Planning Policy (Resilience and Hazards) 2021 (Hazards SEPP) (as required).*

A Preliminary Site Investigation (PSI) report has been undertaken for the Project by Cavvanba Consulting (Cavvanba) to address the Requirements of the SEARs. The PSI for the Project is provided in **Appendix 22** and key findings are summarised below.

6.15.1 Existing Environment

The Project Area is characterised by undulating to rolling hills with narrow valleys transitioning to wide valleys adjoining creeks and waterways to the south of the site. The disturbance footprint comprises an area of approximately 180 ha and is grazing / pastural land, situated on the foothills and slopes associated with the Mount Royal range.

A site inspection was also undertaken to incorporate anecdotal evidence and consolidate the findings of the information review through physical inspection of potential contaminant sources, pathways and receptors. The site inspection was undertaken by Cavvanba representatives on 9 December 2025.

A review of the existing environment identified that the site has remained grazing / pastural land since development. No potential contamination sources were identified, and there is no indication that the site has been contaminated by historical farming-related activities. This is evidenced by observations made during the site visit, information provided by the site owner and the elevation of the site where the footprint of the project is proposed.

6.15.2 Impact Assessment

The PSI involved undertaking a desktop information review, site inspection and information request from the site owner. Based on the findings of the PSI, no potential sources of contamination were identified and there is no indication that the site has been contaminated by current / historical land use activities that require further investigation.

There were no current or historical land use practices identified on, or within the immediate vicinity of the site that are considered to represent a potential source of contamination for the Project. In the absence of potential sources of contamination, no migration or exposure pathways were identified and no receptors were identified.

6.15.3 Mitigation and Management Measures

The PSI concluded that the Project design has avoided, minimised and mitigated risks and impacts associated with contamination. Accordingly, there are no project-specific design recommendations required or provided by Cavvanba as relevant to the Project.

However, despite the lack of identifiable contamination sources, it is recommended that an unexpected finds procedure (UFP) be prepared to assist with the earthworks that will occur during the construction phase. Earthworks during any development have the potential to unexpectedly uncover concealed materials which could be contamination sources, and an UFP will assist in the management of those finds during the construction phase of the Project. This must include early intervention of the find and appropriate segregation.

This is particularly relevant for the following common unexpected finds for rural and agricultural areas such as the Project Area:

- Asbestos containing pipework – Stormwater drainage pipework that may have been used beneath access roads or tracks.
- Waste burials, including livestock, household wastes, and building materials including asbestos – Rural properties are well-known for concealed waste burials from historical land use practices that are otherwise undetected until ground disturbance is undertaken.
- Timber treatment – Rural fencing timber posts are often treated with sump oil to preserve timbers. If present, this will be visually identifiable and likely to be limited to immediately below fence posts.

PSI01: A UFP will be integrated into the overall CEMP or relevant sub-plan that will be prepared for the Project. To safeguard against potential future impacts, a revised PSI will be considered for any relevant design modifications to avoid, minimise, and/or mitigate contamination risks and impacts.

6.16 Cumulative Impacts

The Cumulative Impact Assessment Guidelines for State Significant Projects (CIA Guidelines) (DPE, 2022) require an assessment of a Project's impacts both alone and in combination with impacts generated by other existing and planned development.

In undertaking an assessment of cumulative impacts, the CIA Guidelines require consideration of:

- Existing development within the locality and region, as well as planned changes to existing projects (such as expansion, modification, closure).
- Approved projects (where development consent has been granted but construction has not commenced).
- Projects under assessment (application for the project has been exhibited and is currently under assessment).
- Related development (development that is required for the project but subject to separate assessment).

In accordance with the CIA guidelines, a scoping summary was prepared to identify the potential for cumulative impacts to occur as a result of the Project (refer to **Appendix 23**).

6.16.1 Strategic Context

The strategic context of the Project is discussed in **Section 2.1** with respect to the renewable energy market and relevant policy. Regional strategic plans and policies are then discussed in **Section 2.2**. With respect to the Project and other relevant future and existing projects (mostly SSD wind farms, with some SSD solar) that are prevalent within the Hunter-Central Coast REZ, most align with the relevant Commonwealth and State objectives outlined in this EIS. Additionally, those situated close to the Project Area are assumed to achieve the objectives of shared regional strategic plans and policies. In particular, most achieve the objectives of the United Nations SDG (United Nations, 2023), UNFCC COP28 (UNFCCC, 2023) and COP21 (UNFCCC, 2021).

Consistent with the Project, these other relevant future and existing renewable energy developments are anticipated to provide affordable, reliable and sustainable energy and would assist achieving Commonwealth and NSW emission reduction targets. They will also assist NSW in the development of affordable, reliable and sustainable renewable energy generation, transmission and storage.

These other relevant future and existing projects developments:

- Have or are in the process of progressing their respective development applications (predominantly state and regionally significant renewable energy, wind and solar projects) and associated environmental and social impacts assessments. Consistent with the objectives achieved for the Project these other assessments (which predominately require an EIS to be prepared) will assist to avoid, minimise, mitigate and/or manage potential impacts across key cumulative impact matters such as biodiversity, visual, social and economic, and traffic.
- Will provide social and economic benefit to the region and encourage economic development by supporting both employment and economic growth. While all developments are assumed to seek a percentage of local workforce and employment, labour from outside the region would still be required, however this will likely still provide a significant injection into the local economy as workers spend time and wages in town throughout the years of construction.

6.16.2 Identified Developments

This EIS identifies proximal developments in **Section 2.4.2**, i.e. other relevant future and existing projects within the REZ in accordance with Section 3.4 of the CIA Guidelines.

6.16.3 Cumulative Impact Summary

As outlined in **Appendix 23**, the key potential cumulative impacts associated with the Project relate to:

- Biodiversity
- Aboriginal Cultural Heritage
- Traffic
- Visual
- Noise
- Social/Economic.

Based on the information presented in **Appendix 23**, and that summarised above, a cumulative impact assessment summary is provided in **Table 6.38** below. All environmental and social matters were considered with respect to potential cumulative impacts, but for brevity **Appendix 23** presents a scoping summary of only the key matters summarised above.

In regard to biodiversity, a detailed assessment is included in **Section 6.4.7.4**, and that presented below summarises the outcomes and anticipated potential for cumulative impacts.

Table 6.38 Cumulative Impact Assessment Summary

Project	Biodiversity	Aboriginal Cultural Heritage	Traffic	Visual	Noise	Social/Economic
Bowmans Creek Wind Farm Stage 1 Adjacent to the Project	Cumulative impacts would occur as a result of the Projects construction and have been assessed within the technical study. The Stage 1 project is anticipated to impact approximately 280 ha of native vegetation, comprising eight (8) PCTs, three (3) of which correspond to listed TECs. The Stage 1 project is expected to impact two (2) fauna and 20 flora species. To manage cumulative biodiversity impacts with respect to this approved project, the design of the Project has considered the placement of infrastructure to avoid and minimise impacts to biodiversity. The Project will continue to explore further opportunities for avoidance and minimisation during the detailed design phase and based on further survey, where required. Biodiversity offsets will be provided to address biodiversity impacts where removal of habitat and vegetation is unavoidable. The risk of cumulative operational biodiversity impacts is considered acceptable; however, collision risks still need to be actively addressed in the relevant BBAMP for each project. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable.	The ACHA did not identify any Aboriginal sites within the Disturbance Footprint. As such, cumulative Aboriginal cultural heritage impacts are not anticipated. There is potential for unexpected finds to disturb Aboriginal artefacts, in which case there is potential for the Project to contribute to cumulative impacts across the broader region although this is considered unlikely. This finding was provided with respect to recorded AHIMs sites, published reports for each development, consideration of intergenerational equity, and the broader Aboriginal cultural heritage resource of the geographic region. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable.	A review of existing traffic count data for the surrounding road network, including the Stage 1 project, was undertaken as part of the TTIA (**Appendix 11**). The majority of the proposed transport arrangements for the Project are consistent with those for Stage 1, including use of the approved OSOM transport route for delivery of large components. Background traffic volumes for 2027 (the anticipated construction year) were have been derived from the Stage 1 Traffic and Transport Impact Assessment (Cardno, 2021) and were adopted for this assessment. Intersection analysis indicates that Hebden Road (south) / New England Highway will continue to operate within acceptable capacity. However, the Hebden Road (north) / New England Highway intersection is predicted to exceed capacity on the Hebden Road (north) approach during the PM peak in 2027, prior to the addition of Project traffic. Accordingly, cumulative traffic impacts associated with the combined Stage 1 and Stage 2 construction phases are anticipated. Cumulative traffic impacts are expected to be restricted to the construction phase, with limited impacts anticipated during the operational and decommissioning phases.	Cumulative visual impacts are anticipated as the Stage 1 Project surrounds the Project to the west, the north-east and the south-east. Dwellings N22-1 and O22-1 have visibility of both Stage 1 and the Project and have a low overall visual impact. Public Viewpoints including VPA02, VPA04 and VPA05 have visibility of both projects, and each have a moderate visual impact rating. For each of the three (3) public viewpoints the Project is considered to adhere to the Visual Performance Objectives set out in the Technical Supplement without the need for further mitigation. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable.	Cumulative construction (and decommissioning) noise impacts are anticipated. This is limited to only a small number of associated and/or non-associated residences and would only occur when works occur concurrently. As BCWF is the proponent of both projects, coordination will be undertaken where practical. There are no shared receivers at which the introduction of noise from the Project results in an exceedance of the base noise limit of 35 dB LAeq, 10 min. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable.	Cumulative impacts are likely to occur due to overlapping construction timeframes. Cumulative impacts will include increased traffic, strain on local services, housing and accommodation.
Bowmans Creek Wind Farm Stage 1 – MOD 1 BESS Adjacent to the Project	Cumulative biodiversity impacts are anticipated, as the same type of native vegetation, associated PCT and TEC, and habitat may be disturbed as a result of both projects. However, no additional TECs or species identified outside of those included in the Stage 1 project above.	The ACHA did not identify any Aboriginal sites within the Disturbance Footprint. As such, cumulative Aboriginal cultural heritage impacts are not anticipated. There is potential for unexpected finds to disturb Aboriginal artefacts, in which case there is potential for the Project to contribute to cumulative impacts	It is expected that construction traffic for the BESS project will overlap with the proposed Project construction traffic. With respect to traffic: • The BESS project will utilise the same quarry and water supply sources and routes nominated for the Stage 2 Project. • Approximately eight (8) heavy vehicles per day, from Port of Newcastle for the delivery of the following project items: Inverter BESS, BESS Battery Storage, Main Transformer, Substation switch rooms.	The Stage 1 modification will not host infrastructure that is taller than 15 m and the nearest infrastructure to the Project is more than 5 km away. As such, cumulative impacts are considered acceptable.	The proposed Stage 1 BESS modification is approximately 6 km to the south-west of the Project substation. Given this significant separating distance and the low predicted noise levels associated with the Project ancillary infrastructure, the risk of cumulative noise impact from the concurrent operation of the Project and the Stage 1 BESS modification is expected to be negligible and no targeted mitigation measures are provided.	Cumulative impacts are likely to occur due to overlapping construction timeframes. Cumulative impacts will include an increased traffic, strain on local services, housing and accommodation.

Project	Biodiversity	Aboriginal Cultural Heritage	Traffic	Visual	Noise	Social/Economic
		across the broader region although this is considered unlikely. This finding was provided with respect to recorded AHIMs sites, published reports for each development, consideration of intergenerational equity, and the broader Aboriginal cultural heritage resource of the geographic region. Residual cumulative impacts, with mitigation and management measures applied are considered acceptable.	• An anticipated peak construction workforce of 50 FTE workers and no additional operational workforce. Based on the above factors and the TTIA, only minor cumulative traffic impacts are anticipated associated with the Project.			
New England REZ Transmission Project 3 km from the Project	Cumulative biodiversity impacts are anticipated, as the same type of native vegetation, associated PCT and TEC, and habitat may be disturbed as a result of both projects.	Cumulative Aboriginal cultural heritage impacts are not anticipated, given no Aboriginal objects were recorded in the Disturbance Area, the Project will not add to the cumulative impact to Aboriginal sites in the broader local government areas.	The New England REZ Transmission project is proposed to be constructed approximately 3 km from the Project. The transportation of materials and equipment for the New England REZ Transmission project is proposed to be from the ports of Newcastle and Sydney. Primary access to the Project is proposed via the existing road network, namely the New England Highway and the Oxley Highway. Limited information is available on the proposed traffic volumes associated with this project. Although this project is expected to use the New England Highway as a component of its proposed transport route, it would not utilise the primary site access route for the Project (i.e. Hebden Road (north and/or south) and Scrumlo Road) and is not expected to result in an increase in cumulative traffic volumes on these roads.	The New England REZ Transmission Project is proposed to be 3 km from the Project boundary. The proposed transmission towers will be 70 m in height. Cumulative visual impacts are anticipated.	Limited public information is available on potential operational noise from the NE REZ Transmission Project. A revised Scoping Report submitted in December 2025 identifies a study corridor approximately 3 km west of the Project but does not include detailed noise assessment, limiting the ability to assess cumulative impacts. The Scoping Report indicates operation from 2032–2034, well after the Project's expected commencement in early 2029. Given this timing, the assumed absence of nearby operational noise sources and low predicted noise levels from Project ancillary infrastructure, cumulative operational noise impacts are expected to be negligible and no further assessment or mitigation is proposed.	Cumulative impacts are likely to occur due to overlapping construction timeframes. Cumulative impacts will include an increased traffic, strain on local services, housing and accommodation.

Project	Biodiversity	Aboriginal Cultural Heritage	Traffic	Visual	Noise	Social/Economic
Queensland-Hunter Gas Pipeline 3.5 km from the Project	Cumulative biodiversity impacts are anticipated, as the same type of native vegetation, associated PCT and TEC, and habitat may be disturbed as a result of both projects.	Cumulative Aboriginal cultural heritage impacts are not anticipated, given no Aboriginal objects were recorded in the Disturbance Area, the Project will not add to the cumulative impact to Aboriginal sites in the broader local government areas.	The Queensland-Hunter Gas Pipeline is proposed to be construction approximately 3.5 km from the Project. The traffic assessment for this project was prepared in 2008 as part of this project's original Environmental Assessment and is considered to be outdated in terms of traffic information, though does identify that the gas pipeline would cross the New England Highway. Construction timeframes for this project are currently not identified, with the overall status of the project appearing uncertain. Therefore at this stage, cumulative traffic impacts are considered unlikely.	Low risk of cumulative visual-related impacts as the construction periods are not expected to overlap and the pipeline is proposed to be located underground.	Low risk of cumulative noise-related impacts as the construction periods are not expected to overlap.	Unlikely cumulative impact as construction timeframes are not expected to not overlap.
Liddell Battery and Bayswater Ancillary Works 13 km from the Project	Cumulative impacts would occur as a result of the project's construction and have been assessed within the technical study. Impacts are anticipated to 42.3 ha of native vegetation across 4 PCTs. TECs expected to be impacted include Central Hunter Grey Box – Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions Threatened species impacted include the Southern Myotis, Striped Legless Lizard. To manage cumulative biodiversity impacts, the design of both wind farm developments have considered the placement of infrastructure to avoid and minimise impacts to biodiversity. Both projects will continue to explore further opportunities for avoidance and minimisation during the detailed design phase and based on further survey, where required. Biodiversity offsets will be provided for both projects to address biodiversity impacts where removal of habitat and vegetation is unavoidable. Residual cumulative impacts, with mitigation and management measures applied, are considered acceptable.	No cumulative Aboriginal cultural heritage impacts are anticipated.	This project proposes the construction of a BESS and ancillary works at the Bayswater Power Station. The site is accessible off the New England Highway next to Lake Liddell. During construction, this project is expected to generate up to: • 250 light vehicles arriving and departing during peak traffic periods • 70 heavy vehicles arriving and departing per day • 43 OSOM vehicle deliveries in total arriving and departing outside of peak periods • The project EIS identifies that access to the site would be provided via an existing dedicated access road, and that traffic volumes would not affect the operation of the New England Highway • Additionally, this project would not utilise the primary site access route for the Project (i.e. Hebden Road (north and/or south) and Scrumlo Road) and is not expected to result in an increase in cumulative traffic volumes on these roads.	No cumulative construction, operational and/or decommissioning visual impacts are anticipated.	No cumulative construction, operational and/or decommissioning noise impacts are anticipated.	Cumulative impacts may occur if construction timelines overlap. Cumulative impacts will include a strain on local services, housing and accommodation.

Project	Biodiversity	Aboriginal Cultural Heritage	Traffic	Visual	Noise	Social/Economic
Muswellbrook Solar Farm 15.0 km from the Project	Cumulative impacts would occur as a result of the project's construction and have been assessed within the technical study. Impacts are anticipated to 316 ha of native vegetation across four (4) PCTs. TECs expected to be impacted include White Box–Yellow Box–Blakely's Red Gum Grassy Woodland and Derived Native Grassland. Threatened species impacted include the *Diuris tricolor*; *Cymbidium canaliculatum*–endangered population; Large-eared pied bat; Southern Myotis; Brush-tailed Phascogale; Squirrel glider; Hunter Valley Delma. To manage cumulative biodiversity impacts, the design of both wind farm developments have considered the placement of infrastructure to avoid and minimise impacts to biodiversity. Both projects will continue to explore further opportunities for avoidance and minimisation during the detailed design phase and based on further survey, where required. Biodiversity offsets will be provided for both projects to address biodiversity impacts where removal of habitat and vegetation is unavoidable. Residual cumulative impacts, with mitigation and management measures applied, are considered acceptable.	No cumulative Aboriginal cultural heritage impacts are anticipated.	This project is proposed to be located adjacent to the Muswellbrook Coal Mine. The EIS for this project states that Vehicles would access the site via New England Highway and either Muscle Creek Road or Sandy Creek Road. Construction materials and infrastructure are anticipated to be transported to the site via road from several locations, which may include the Port of Newcastle, Port Botany and Melbourne. During peak construction, the project is expected to generate up to 200 light vehicle trips and 90 heavy vehicle trips per day, with an average of 24 heavy vehicle trips per day. Construction timeframes are expected to overlap with that of the Project. Although this project is expected to use the New England Highway as a component of its proposed transport route, it would not utilise the primary site access route for the Project (i.e. Hebden Road (north and/or south) and Scrumlo Road) and is not expected to result in an increase in cumulative traffic volumes on these roads.	No cumulative construction, operational and/or decommissioning visual impacts are anticipated.	No cumulative construction, operational and/or decommissioning noise impacts are anticipated.	Cumulative impacts may occur if construction timelines overlap. Cumulative impacts will include a strain on local services, housing and accommodation.
Muswellbrook Pumped Hydro Energy Storage 15.4 km from the Project	No detailed documentation to date. However scoping report indicates potential impacts across five PCTs. TECs potentially impacted include: Hunter Valley Vine Thicket in the NSW North Coast and Sydney Basin Bioregions, Central Hunter Grey Box—Ironbark Woodland and EPBC Act-listed Central Hunter Valley Eucalypt Forest and Woodland. No threatened species recorded to date though potential habitat does occur.	No cumulative Aboriginal cultural heritage impacts are anticipated.	This project is proposed to be located to the northeast of Muswellbrook. Project materials are proposed to be transported to the site from the Port of Newcastle via the New England Highway. This project nominates New England Highway and local rural roads as part of its proposed transport route. Although this project is expected to use the New England Highway as a component of its proposed transport route, it would not utilise the primary site access route for the Project (i.e. Hebden Road (north and/or south) and Scrumlo Road) and is not expected to result in an increase in cumulative traffic volumes on these roads.	No cumulative construction, operational and/or decommissioning visual impacts are anticipated.	No cumulative construction, operational and/or decommissioning noise impacts are anticipated.	Cumulative impacts are likely to occur due to overlapping construction timeframes. Cumulative impacts will include an increased traffic, strain on local services, housing and accommodation.

Project	Biodiversity	Aboriginal Cultural Heritage	Traffic	Visual	Noise	Social/Economic
McCullys Gap Battery Energy Storage System SSD – 81555720 16 km from the Project	No detailed documentation to date. However, the scoping report indicates a project site of up to 13.38 ha. Preliminary assessments have identified two (2) potential PCTs, both of which potentially align to TECs under the BC Act and EPBC Act. One (1) threatened flora species and two (2) threatened fauna species are known to occur within the project site with several further threatened species predicted to occur.	No cumulative Aboriginal cultural heritage impacts are anticipated.	This project is proposed to be located approximately to the northeast of Muswellbrook. Access to the site is expected to be via Sandy Creek Road, a local road which turns east off the New England Highway. The scoping report for this project notes that the Sandy Creek Road – New England Highway intersection is constrained under existing conditions. While this project is likely to contribute to cumulative traffic impacts with other nearby projects in the local vicinity that also propose to use Sandy Creek Road for access, cumulative traffic impacts with the Project are not anticipated despite a potential overall in construction timeframes.	No cumulative construction, operational and/or decommissioning visual impacts are anticipated.	No cumulative construction, operational and/or decommissioning noise impacts are anticipated.	Cumulative impacts are likely to occur due to overlapping construction timeframes. Cumulative impacts will include an increased traffic, strain on local services, housing and accommodation.
Muswellbrook Battery Energy Storage System 17 km from the Project	Minor cumulative impacts would occur as a result of the project's construction and have been assessed within the technical study. Impacts are anticipated to 0.3 ha of native vegetation across two (2) PCTs. TECs expected to be impacted include White Box–Yellow Box–Blakely's Red Gum Grassy Woodland and Derived Native Grassland *Diuris tricolor*; *Cymbidium canaliculatum*–endangered population; Large-eared pied bat; Southern Myotis; Brush-tailed Phascogale; Squirrel glider; Hunter Valley Delma. To manage cumulative biodiversity impacts, the design of the Project has considered the placement of infrastructure to avoid and minimise impacts to biodiversity. Both projects will continue to explore further opportunities for avoidance and minimisation during the detailed design phase and based on further survey, where required. Biodiversity offsets will be provided for both projects to address biodiversity impacts where removal of habitat and vegetation is unavoidable. Residual cumulative impacts, with mitigation and management measures applied, are considered acceptable.	No cumulative Aboriginal cultural heritage impacts are anticipated.	This project is proposed to be located off the New England Highway to the north of Muswellbrook. A Traffic Management Plan (TMP) has been prepared to support a modification (Mod 1) to the main application. The TMP identifies that all heavy vehicles and heavy vehicles requiring escort associated with the project will travel to and from the site via New England Highway and Sandy Creek Road. The project is anticipated to generate up to a maximum up 30 heavy vehicle movements per day. Although this project is expected to use the New England Highway as a component of its proposed transport route, it would not utilise the primary site access route for the Project (i.e. Hebden Road (north and/or south) and Scrumlo Road) and is not expected to result in an increase in cumulative traffic volumes on these roads.	No cumulative construction, operational and/or decommissioning visual impacts are anticipated.	No cumulative construction, operational and/or decommissioning noise impacts are anticipated.	Cumulative impacts may occur due to potential overlapping construction timeframes. Cumulative impacts will include a strain on local services, housing and accommodation.
Maxwell Solar Farm 18 km from the Project	BDAR waiver granted as site is predominantly cleared of native vegetation and lacks habitat for threatened species. Cumulative impacts are not anticipated.	No cumulative Aboriginal cultural heritage impacts are anticipated.	Construction of this project commenced in August 2025 and is anticipated to take between 12-18 months to completion. Construction timeframes will not overlap with that of the Project, and therefore, cumulative traffic impacts are not anticipated.	No cumulative construction, operational and/or decommissioning visual impacts are anticipated.	No cumulative construction, operational and/or decommissioning noise impacts are anticipated.	Cumulative impacts may occur due to potential overlapping construction timeframes. Cumulative impacts will include a strain on local services, housing and accommodation.

Project	Biodiversity	Aboriginal Cultural Heritage	Traffic	Visual	Noise	Social/Economic
Hunter Transmission Project 18 km from the Project	Cumulative biodiversity impacts are not anticipated given distance offset to this project.	No cumulative Aboriginal cultural heritage impacts are anticipated.	This project is proposed to be constructed between 2027 and 2029 and has nominated a construction support site on Hebden Road (north) as a component its proposed construction traffic route. As construction timeframes are expected to overlap with that of the Project, and both projects are proposing to use Hebden Road (north), cumulative construction traffic impacts are anticipated. In order to manage construction traffic related impacts from the Project, BCWF have committed to reducing the number of right turn movements at the Hebden Road (north) approach during the PM peak hour, by instructing workers to turn left onto the New England Highway and make a U-turn at the Bayswater Power Station using the highway interchange, approximately 5 km south of the intersection. It is expected that this additional measure would also support in minimising potential cumulative construction traffic impacts with this project. No further measures have been identified.	No cumulative construction, operational and/or decommissioning visual impacts are anticipated.	No cumulative construction, operational and/or decommissioning noise impacts are anticipated.	Cumulative impacts are likely to occur due to overlapping construction timeframes. Cumulative impacts will include increased traffic, strain on local services, housing and accommodation.
Upper Hunter Battery Energy Storage System 20 km from the Project	No PCTs/native vegetation mapped within the project boundary to date. Cumulative impacts are not anticipated.	No cumulative Aboriginal cultural heritage impacts are anticipated.	This Upper Hunter Battery Energy Storage System project is proposed to be located off the New England Highway in Aberdeen. Materials are expected to be transported to the site from either the Port of Newcastle or Port Botany along the New England Highway. In the case that construction timeframes overlap with that of the Project, there may be minor cumulative traffic impacts anticipated along the New England Highway. Although this project is expected to use the New England Highway as a component of its proposed transport route, it would not utilise the primary site access route for the Project (i.e. Hebden Road (north and/or south) and Scrumlo Road) and is not expected to result in an increase in cumulative traffic volumes on these roads.	No cumulative construction, operational and/or decommissioning visual impacts are anticipated.	No cumulative construction, operational and/or decommissioning noise impacts are anticipated.	Cumulative impacts may occur due to potential overlapping construction timeframes. Cumulative impacts will include a strain on local services, housing and accommodation.

Project	Biodiversity	Aboriginal Cultural Heritage	Traffic	Visual	Noise	Social/Economic
Kayuga Solar Farm Denman Battery Energy Storage System Maison Dieu Solar Farm Denman Solar Park Edderton Solar Project Upper Hunter South Solar Farm 105 Merriwa Road Denman – Battery Energy Storage System Kyoto Energy Park (Kyoto Wind Farm) Sandy Hollow Solar Farm Allandale Solar Farm	Given the location, type and scale of these projects; cumulative construction, operational and/or decommissioning biodiversity impacts are unlikely to occur, with suitable avoidance, minimisation, mitigation and offset strategies being implemented.	No cumulative Aboriginal cultural heritage impacts are anticipated.	No cumulative traffic impacts are anticipated.	No cumulative construction, operational and/or decommissioning visual impacts are anticipated.	No cumulative construction, operational and/or decommissioning noise impacts are anticipated.	See **Section 6.16.4**.

6.16.4 Social and Economic Impacts within the Hunter-Central Coast REZ

This EIS is supported by a comprehensive SIA and EIA, refer **Appendix 20** and **Appendix 21** respectively.

These technical studies recognised several impacts that are of a cumulative nature and therefore cannot be addressed by BCWF in isolation. There is a responsibility for proponents developing projects in the Hunter-Central Coast REZ, alongside the NSW Government, to consider these impacts collectively and develop strategies for appropriate management, mitigation, and enhancement through effective and proactive multi-stakeholder collaboration. The SIA (**Appendix 20**) identified proximal projects with the capacity to contribute to cumulative impacts. These projects include the Bowmans Creek Wind Farm Stage 1, New England REZ Transmission Project, and the Hunter Transmission Project. Cumulative impacts are likely to occur with the Project due to their close proximity and overlapping construction timeframes. Cumulative impacts will include increased traffic, strain on local services, housing and accommodation.

An AES is included as Appendix G to the SIA (**Appendix 20**). The AES determined that in a worst-case scenario where 80% (128 FTE) of workers for the Project require short-term accommodation, there are sufficient rooms locally within the Study Area to house the construction workforce, based on the total rooms available by LGA and accommodation type. The AES also estimated that in a worst-case scenario, up to sixteen projects may have overlapping construction schedules including the Project, resulting in an estimated 2,233 workers which may result in cumulative effects on accommodation and employment. While there was determined to be insufficient accommodation to house all construction workers, the Hunter Transmission Project proposes three (3) temporary workers accommodation to house 730 workers which would further alleviate pressures on short-term accommodation in the region.

The EIA (**Appendix 21**) identified that the Project would likely experience cumulative impacts arising from competition for labour, accommodation, and other resources associated with major infrastructure projects being constructed concurrently within the region. Most cumulative impacts in the region are related to workforce procurement and accommodation demand. While the Project's standalone requirement for approximately 30 FTE local workers is not expected to constrain labour supply, there is potential for labour market pressures when considered alongside ongoing local demand and the cumulative effects of multiple concurrent renewable energy, mining, and infrastructure projects. As a result, it was recommended that an 80% local labour share should be considered a target for the construction phase of the Project.

6.16.5 Other Cumulative Impacts Considered

Cumulative impacts were addressed for other key matters across the range of proximal projects identified in this EIS. To avoid an overly exhaustive list of environmental matters and repeated statements relating to cumulative impacts, further discussion is provided below for each other matter considered. These other key matters and general outcomes of their respective cumulative impact assessments are summarised as follows.

6.16.5.1 Water Resources

Cumulative water resource impacts were considered within the specialist study (**Appendix 12**), which concluded that the primary cumulative risk to water resources is the competition for potable and non-potable water supplies during overlapping construction periods. As there are a number of projects within the Muswellbrook and Singleton LGAs with proposed overlapping construction timelines, there is a risk of strain to the local municipal water supply.

Cumulative surface water impacts are not anticipated as the only project within close enough proximity to influence surface water is the Stage 1 project. The Stage 1 project and the Project are subject to strict planning requirements and will implement site-specific erosion and sediment controls in accordance with the Blue Book (Landcom, 2004).

6.16.5.2 Agriculture

Cumulative impacts to agriculture were considered within the specialist study (**Appendix 14**), however it concluded that cumulative impacts were unlikely to occur. In the context of agriculture, increased cumulative impacts including changes to land used for agriculture, localised productivity, secondary productivity and some agricultural support services are likely to be experienced. This will be a result of agriculture land use being inhibited by landform modification and infrastructure, such as the development corridors for wind and solar farms. However, given the nature and scale of the established agricultural industries within the region that interfaces with renewable energy projects (that is, predominantly livestock grazing, with some broadacre cropping), as well as the generally low quality agricultural resources and low stocking rates for the region, significant impacts to regional agricultural businesses, industry critical mass thresholds and regional agricultural infrastructure are unlikely to occur in the foreseeable future.

6.16.5.3 Telecommunications

Wind farm impacts are typically related to the direct impact and/or infringement on telecommunication links. The Project is able to avoid and/or manage these impacts to telecommunication links (refer to **Appendix 16**). Based on the proximity of the above-mentioned developments to the Project, and the limited potential for interactions to occur with respect to electromagnetic interference to telecommunication services, cumulative impacts are considered highly unlikely to occur.

6.16.5.4 Air Quality, Hazards and Risk, and Waste Management

As identified in each of the specialist studies (**Appendix 13** and **Appendix 17** respectively), and discussed in **Section 6.14** (for waste), cumulative impacts are highly unlikely to occur with the successful implementation of mitigation and management measures. It is noted that the AQIA identified select projects with potentially overlapping construction timeframes, and includes specific recommendations for consultation with the proponents of these projects to minimise potential cumulative air quality/dust-related impacts where possible. This includes:

- The Proponent for Maison Dieu Solar Farm, regarding any simultaneous use of strategic road network routes that could cause cumulative impacts.
- The Proponents for Liddell Battery and Bayswater Ancillary Works and Muswellbrook Solar Farm, regarding timing of any substantial maintenance works that could cause cumulative impacts.

This measure has been reflected in **Appendix 5** of this Project EIS (**AQ02**).

6.16.6 Mitigation and Management Measures

Potential cumulative impacts associated with the Project will be manageable via BCWF's commitment to implement the mitigation and management measures presented in this EIS. The consolidated set of all Project related mitigation and management measures is provided in **Appendix 5** of this EIS.

These Project related mitigation and management measures, combined with those provided for other nearby future and existing projects are anticipated to avoid and/or minimise cumulative impacts, or provide for suitable management measures, that will reduce residual impacts to acceptable levels.

6.17 Development Rights

The SEARs require an assessment of the potential impact of the development on existing land uses on the site and adjoining land to address the requirements set out in Section 6.0 of the Wind Energy Guideline (DPHI, 2024). Specifically, this section of the Wind Energy Guideline requires consideration of whether the proposed development would impact the right for neighbouring landholders to develop their land for the purpose of any of the following permitted land uses:

- residential accommodation
- tourist and visitor accommodation
- eco-tourist facility.

The assessment of potential development rights was undertaken using the methodology set out in **Section 6.17.1** below.

6.17.1 Methodology

The assessment of development rights was undertaken using the following key steps, consistent with the requirements set out in Section 6 of the Wind Energy Guideline (DPHI, 2024):

- Identification of an initial search radius around Project WTGs to conservatively capture key planning and environmental constraints. This involved preparing:
    - a 1,579 m buffer around all Stage 2 WTGs which reflects the visual setback area as outlined in the LCVIA (**Appendix 6**)
    - a conservative 1,000 m buffer around all Stage 2 WTGs to reflect the maximum blade fragment drop radius as calculated in the Blade Throw Assessment (BTA) report (**Appendix 19**)
    - a buffer around all Stage 2 WTGs using the 35 dBA operational noise contour spatial data derived from the NVA (**Appendix 7**).
- Removal of lots that either contain existing dwellings or reside on a host landowner property of both Stage 1 and Stage 2 projects from further consideration.

- Removal of lots that form part of a property owned by a landholder that is associated with either of the Stage 1 or Stage 2 projects from further consideration. This identified the lots on non-associated landholder properties for further investigation. F*or the purposes of this development rights assessment, it is considered that host and/or receivers associated with the Stage 1 project are already accepting of amenity (i.e. noise and visual) based impacts from turbines and any associated impacts to potential development rights, and have not been considered further from potential impacts to development rights from the Stage 2 Project. This is the only instance where receivers associated with Stage 1 have been considered as associated for the purposes of the Project.*
- Removal of any crown land, roads or water courses from further investigation.
- Confirm development rights within each of the lots requiring further investigation, based on a desktop review of the relevant zoning and minimum lot sizes for the construction of a dwelling under the Singleton LEP 2013 and Muswellbrook LEP 2009.
- Where lots are confirmed to have development rights under Step 5 above, assess whether residential/tourist development could be designed, sited and oriented to avoid or reduce significant impacts from the Project, having regard to the relevant sections of the Singlton Development Control Plan (DCP) 2013 and Muswellbrook DCP 2009.

The development rights assessment area is shown on **Figure 6.16** below.

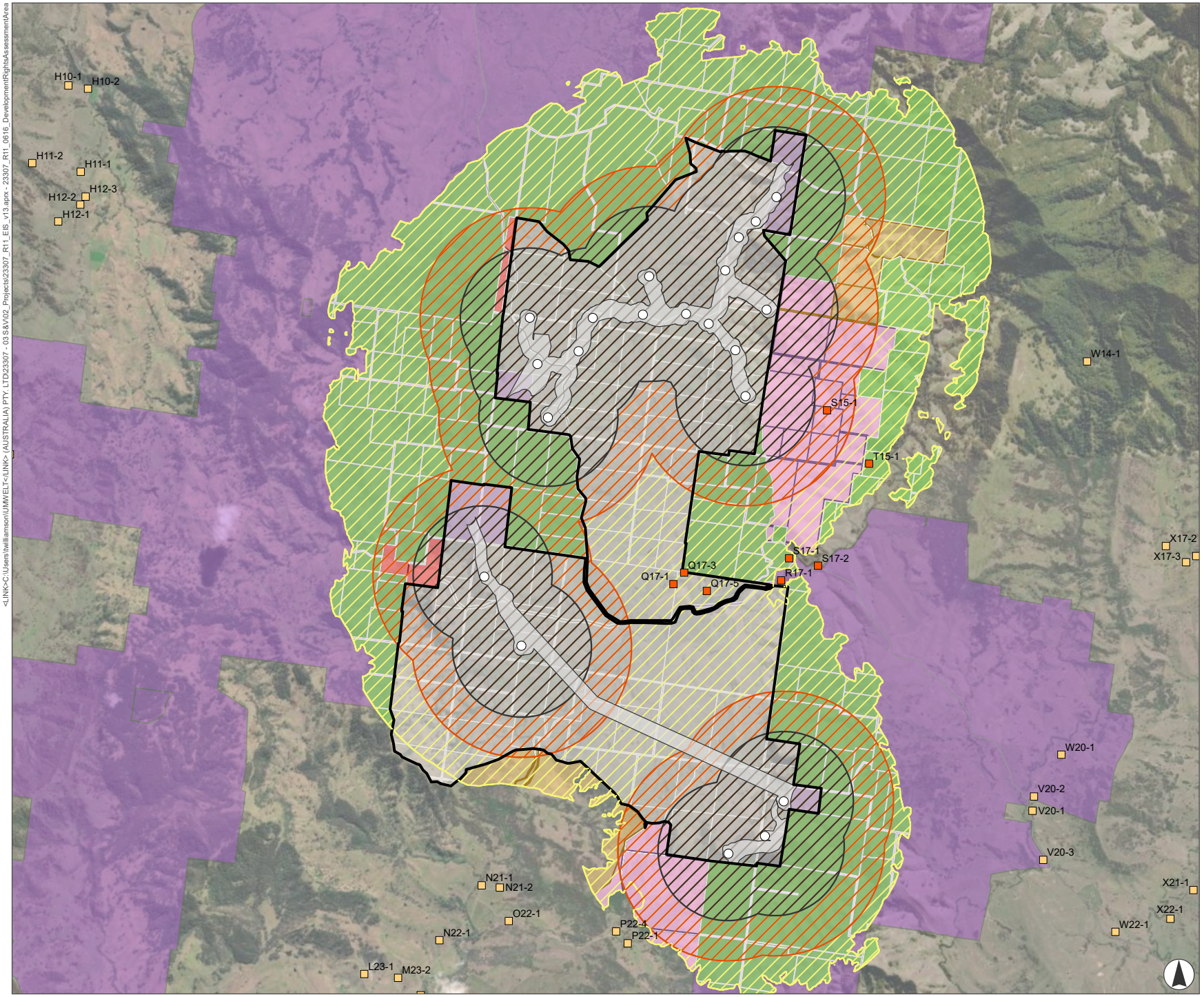


FIGURE 6.16

Development Rights Assessment Area

Legend

Project

- Project Boundary
- Development Corridor
- Wind Turbine Generators
- Road
- Noise Contours - 35dBA
- Visual Setback
- Blade Throw Setback
- 35 dBA Noise Setback
- Stage 1 Project Area

Dwellings

- Non-Associated
- Associated

Lot / Landowner Status

- Associated Neighbour
- Excluded from Assessment
- Lots Requiring Further Assessment
- Within Stage 1 Project Area
- Within Stage 2 Project Area



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Kilometres

Scale 1:75,000 at A4
GDA2020 MGA Zone 56

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Consistent with the requirements set out in Section 6 of the Wind Energy Guideline, regular reviews of the publicly accessible Singleton, Muswellbrook and Upper Hunter Shire Council Development Application (DA) registers were undertaken at the provision of the SEARs, and during preparation of the EIS to confirm whether any DAs were lodged within an eight (8) km radius of the Project WTGs. At the time of preparation of this EIS, there were three (3) DA's within eight (8) km of a Project WTG, as summarised below:

- Singleton Council (8.2025.202.1) located approximately 7.9 km from a Project WTG.
- Singleton Council (8.2025.154.1) located approximately 6.5 km from a Project WTG.
- Singleton Council (8.2025.78.1) located approximately 6.7 km from a Project WTG.

The assessment of the lots requiring further investigation is presented below.

6.17.2 Assessment

The assessment of potential development rights focused on lots that fall within an identified environmental constraint buffer (i.e. visual and/or blade throw setbacks, and the 35 dBA noise contour), on lands that were not contained within or associated with either of the Stage 1 or Stage 2 project areas, noting that these landowners have already signed onto agreements with BCWF for potential amenity-based impacts. As per the methodology presented in **Section 6.17.1**, each of these remaining lots were compared against the minimum lot size as set out in the respective LEP, to determine whether a dwelling entitlement exists.

The resultant lots requiring further consideration are summarised in **Table 6.39** and shown on **Figure 6.17** below. The results indicate the majority of remaining lots that fall within an environmental constraint buffer do not have dwelling entitlements under the respective LEPs, noting that these lots are either part of a broader contiguous property holding with an existing confirmed dwelling, or are below the minimum lot size required for a dwelling entitlement to exist.

However, there are seven (7) lots that fall within an identified environmental constraint buffer and may have a dwelling entitlement, which have been considered further in the subsequent sections below.

Table 6.39 Remaining Lots with Potential Development Rights

Lot	DP	Associated environmental constraints buffer	Existing dwelling?	Receiver ID	Property Holding ID	LEP	Land Use Zoning	Minimum Lot Size (ha)	Existing Lot Size (ha)	Above minimum lot size?	Potential dwelling entitlement?
179	DP752465	35 dBA noise contour	Yes	N21-1, N22-1	N/A	Muswellbrook LEP	RU1	80	880.56	**Yes**	**N/A – existing dwelling**
179	DP752465	35 dBA noise contour	Yes	N21-1, N22-1	N/A	Singleton LEP 2013	RU1	40	880.56	**Yes**	**N/A – existing dwelling**
314	DP752460	35 dBA noise contour, visual setback	Yes	N21-2, O22-1	N/A	Muswellbrook LEP 2009	RU1	80	703.92	**Yes**	**N/A – existing dwelling**
314	DP752460	35 dBA noise contour, visual setback	Yes	N21-2, O22-1	N/A	Singleton LEP 2013	RU1	40	703.92	**Yes**	**N/A – existing dwelling**
1	DP974684	35 dBA noise contour	Yes	V25-2	N/A	Singleton LEP 2013	RU1	40	790.20	**Yes**	**N/A – existing dwelling**
256	DP752460	35 dBA noise contour, visual setback, blade throw setback	No	N/A	A	Muswellbrook LEP 2009	RU1	80	35.61	No	No
225	DP752460	35 dBA noise contour, visual setback	No	N/A	A	Muswellbrook LEP 2009	RU1	80	31.27	No	No
224	DP752460	35 dBA noise contour, visual setback	No	N/A	A	Muswellbrook LEP 2009	RU1	80	15.26	No	No

Lot	DP	Associated environmental constraints buffer	Existing dwelling?	Receiver ID	Property Holding ID	LEP	Land Use Zoning	Minimum Lot Size (ha)	Existing Lot Size (ha)	Above minimum lot size?	Potential dwelling entitlement?
235	DP752460	35 dBA noise contour	No	N/A	A	Muswellbrook LEP 2009	RU1	80	23.12	No	No
229	DP752460	35 dBA noise contour	No	N/A	A	Muswellbrook LEP 2009	RU1	80	49.1	No	No
226	DP752460	35 dBA noise contour	No	N/A	A	Muswellbrook LEP 2009	RU1	80	25.1	No	No
248	DP752460	35 dBA noise contour	No	N/A	A	Singleton LEP 2013	RU1	40	21.23	No	No
352	DP752460	35 dBA noise contour	No	N/A	A	Singleton LEP 2013	RU1	40	28.66	No	No
247	DP752460	35 dBA noise contour	No	N/A	A	Singleton LEP 2013	RU1	40	20.84	No	No
271	DP752460	35 dBA noise contour	No	N/A	A	Singleton LEP 2013	RU1	40	35.1	No	No
273	DP752460	35 dBA noise contour, visual setback	No	N/A	A	Singleton LEP 2013	RU1	40	52.73	**Yes**	**Yes**
246	DP752460	35 dBA noise contour	No	N/A	A	Singleton LEP 2013	RU1	40	63.3	**Yes**	**Yes**
272	DP752460	35 dBA noise contour	No	N/A	A	Singleton LEP 2013	RU1	40	67.64	**Yes**	**Yes**
298	DP752460	35 dBA noise contour	No	N/A	A	Singleton LEP 2013	RU1	40	62.85	**Yes**	**Yes**
299	DP752460	35 dBA noise contour	No	N/A	A	Singleton LEP 2013	RU1	40	105.2	**Yes**	**Yes**

Lot	DP	Associated environmental constraints buffer	Existing dwelling?	Receiver ID	Property Holding ID	LEP	Land Use Zoning	Minimum Lot Size (ha)	Existing Lot Size (ha)	Above minimum lot size?	Potential dwelling entitlement?
301	DP752460	35 dBA noise contour	No	N/A	A	Singleton LEP 2013	RU1	40	68.54	**Yes**	**Yes**
353	DP752460	35 dBA noise contour	No	N/A	A	Singleton LEP 2013	RU1	40	77.59	**Yes**	**Yes**
302	DP752460	35 dBA noise contour	No	N/A	B	Singleton LEP 2013	RU1	80	25.72	No	No
320	DP752495	35 dBA noise contour	No	N/A	B	Upper Hunter LEP 2013	RU1	400	66.11	No	No
319	DP752495	35 dBA noise contour	No	N/A	B	Upper Hunter LEP 2013	RU1	400	61.48	No	No
64	DP752495	35 dBA noise contour	No	N/A	B	Upper Hunter LEP 2013	RU1	400	126.29	No	No

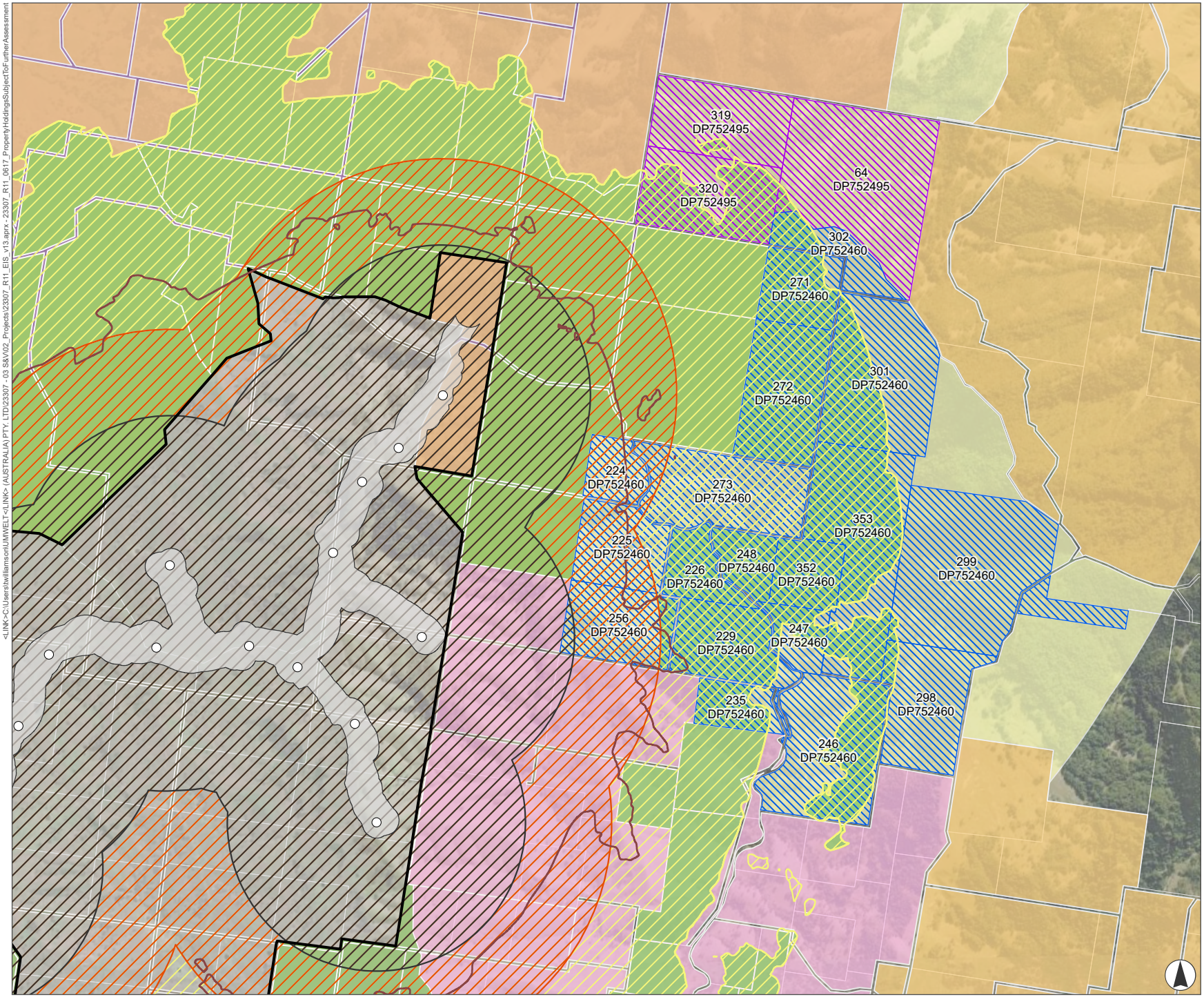


FIGURE 6.17

Property Holdings Subject to Further Assessment

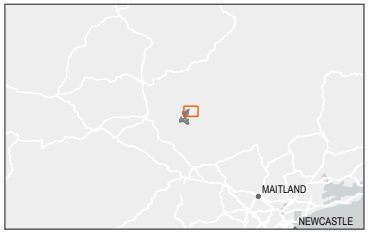
Legend

Project

- Project Boundary
- Development Corridor
- Wind Turbine Generators
- Road
- Noise Contours - 35dBA
- Noise Contours - 40dBA
- Lot
- Visual Setback
- Blade Throw Setback
- 35 dBA Noise Setback
- Lots Under Property Holding A
- Lots Under Property Holding B
- Stage 1 Project Area

Lot / Landowner Status

- NA
- Non-Associated
- Associated Neighbour
- Within Stage 2 Project Area
- Within Stage 1 Project Area



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Kilometres

Scale 1:35,000 at A4
GDA2020 MGA Zone 56

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6.17.2.1 Noise Impact Summary

As outlined in **Table 6.39** above, the seven (7) lots which may have a dwelling entitlement are as follows:

- Lot 273 of DP752460
- Lot 246 of DP752460
- Lot 272 of DP752460
- Lot 298 of DP752460
- Lot 299 of DP752460
- Lot 301 of DP752460
- Lot 353 of DP752460.

Seven (7) lots identified above fall form part of one (1) property holding, referred to throughout this assessment as 'Property Holding A'. The total area of all lots within 'Property Holding A' is approximately 705.5 ha.

The total estimated impact from the Project across 'Property Holding A', being the area of the property holding which falls inside the predicted 35 dBA operational noise contour, is approximately 441.2 ha, or ~62.5%. As a result, approximately 37.5% of 'Property Holding A' could be considered for future development, including lots within this holding that exceed the minimum lot size under the Singleton LEP 2009. This suggests that a future development within 'Property Holding A' could be designed, sited and oriented to avoid or reduce significant impact from the Project, noting that lots east of the impacted lots within this property holding fall outside the predicted 35 dBA operational noise contour.

It is also noted that the NVA (**Appendix 7**) prepared to support this EIS has assessed a conservative design scenario to predict worst case operational noise levels for the Project, and that actual operational noise levels from the Project may not reach the predicted values presented in the NVA.

BCWF has committed to undertaking detailed operational noise modelling following project approval and prior to commencement of construction, when the final Project design and layout has been selected (i.e. mitigation measure NV01 in **Appendix 5**). Additionally, BCWF will prepare an operational noise management plan (ONMP) which will provide appropriate, Project-specific measures to support in the reduction of operational noise levels from the Project (i.e. NV03 in **Appendix 5**). With the implementation of these measures, it is likely that operational noise levels would be reduced below those predicted within this EIS, and would result in a smaller proportion of 'Property Holding A' experiencing noise levels at or above 35 dBA during operation of the Project.

6.17.2.2 Visual Impact Summary

As per **Table 6.39** above, there is one (1) lot with potential dwelling entitlements, being Lot 273 of DP752460 that falls within the visual setback buffer. This lot falls within Property Holding A. Of all lots identified in **Table 6.39**, four (4) are mapped within the visual setback constraints buffer. The total estimated visual impact from the Project across these lots is approximately 76.6 ha, which represents approximately 10.9% of the total area within the Property Holding A. This suggests that a future development could be designed, sited and oriented to avoid or reduce significant visual-related impacts from the Project, noting that lots east of the impacted lots within this property holding fall outside the visual setback buffer.

6.17.2.3 Blade Throw Impact Summary

There are no lots that fall within the blade throw setback and have a potential dwelling entitlement.

Of all lots identified in **Table 6.39**, one (1) is mapped within the blade throw setback constraints buffer. The total estimated visual impact from the Project across on this lot is approximately 2.2 ha, which represents approximately 0.31% of the total area within the Property Holding A. This suggests that a future development could be designed, sited and oriented to avoid or reduce significant blade throw-related impacts from the Project, noting that lots east of the impacted lots within this property holding fall outside the blade throw setback buffer.

6.17.3 Mitigation and Management Measures

As indicated in **Section 6.17.1**, a review of the Singleton, Muswellbrook and Upper Hunter Shire Council DA registers indicates that no active DAs are listed within 6.5 km of a Project WTG, suggesting that there would be no impacts to existing DAs on these lots.

As a result of the assessment undertaken above, it is considered unlikely that the Project would substantially impact on the right for neighbouring landholders to develop their land for the purpose of residential accommodation, tourist and visitor accommodation, or an eco-tourist facility.

As such, no additional mitigation and management measures have been provided. Existing commitments (including NV01 and NV03) are consisted sufficient in managing any potential impacts to development rights to acceptable levels.

7.0 Project Justification

This section provides a conclusion to this EIS. It includes discussion of the justification for the Project, taking into consideration the associated environmental, social and economic impacts and the suitability of the site, to assist the consent authority to determine whether or not the Project is in the public interest.

7.1 Environmental, Social and Economic Impacts

As discussed in **Section 2.6** and **Section 5.0**, the Project has been designed and progressively refined in response to key environmental constraints and in response to community feedback regarding potential negative social impacts, and with the goal of maximising social and economic benefits to local communities.

As summarised in **Section 6.0**, a comprehensive assessment of the environmental, social and economic impacts of the Project has been undertaken based on:

- assessment of the site characteristics (i.e. the existing environment)
- expert technical assessment
- focused consultation with relevant government agencies
- extensive engagement with local community and other key stakeholders
- application of the principles of ecologically sustainable development, including the precautionary principle, intergenerational equity and conservation of biological diversity and ecological integrity.

The key issues identified were subject to detailed specialist assessment to identify the potential impacts of the Project on the existing environment. These assessments are detailed in **Section 6.0** and the appendices to this EIS.

BCWF has considered a range of alternatives in planning the Project and in determining the concept layout included in this EIS (refer **Section 2.6.1** and **Section 2.6.2**). The preliminary WTG layout and infrastructure design was subject to a number of iterations in order to minimise environmental and social impacts, as outlined in **Section 2.6.3**.

The assessment findings outlined in **Section 6.0** indicate that while there will be environmental and social impacts associated with the Project, the extent of impact has been minimised through the design process and where impacts are predicted, BCWF has committed to management, mitigation and offset measures to address these residual impacts, as outlined in **Appendix 5.**

The detailed impact assessment undertaken concludes that with the implementation of feasible and reasonable mitigation measures, the Project can proceed within acceptable environmental standards.

7.1.1 Summary of Key Environmental and Social Matters

As noted above and detailed in **Section 2.6**, the Project was refined to avoid and minimise impacts. This process included consideration of all environmental and social matters assessed in this EIS but provided a focus on key issues where the greatest need, and potential, for spatial adjustments to the Project layout existed. These matters (listed in the order documented in this EIS) and any additional considerations, regarding the scale and nature of impacts, costs and benefits are outlined below.

Visual (Amenity)

- A Landscape Character Study Area (LCSA) was established and includes all land within a 25 km radius from the Project WTGs. Five (5) Landscape Character Zones (LSZs) were identified within this radius and the landscape character assessment determined the Project would have a very low or low impact on these landscapes.
- The Visual Study Area for the Project is 7,160 m and the Visual Setback distance for the Project is 1,579 m. No non-associated dwellings are located within the setback distance, and 59 non-associated dwellings are located with the Visual Study Area. Ten (10) public viewpoints have been selected to represent a range of views and landscape character typologies from within the Visual Study Area. All of these non-associated dwellings and public viewpoints were within the cumulative impact zone for the Project and the Stage 1 project.
- Per the Visual Technical Supplement, simple assessments were undertaken for all non-associated dwellings, of which 27 dwellings required intermediate assessments to occur. A detailed assessment was then undertaken for two (2) of the non-associated dwellings within the Visual Study Area. It was determined that one (1) dwelling would not have visibility of the Project and the other will have a low visual impact. Three (3) public viewpoints were determined to have a moderate visual impact, of which all three (3) viewpoints have a significant sight line to surrounding ridge lines, and as such, inclusion of any additional visual mitigation measures were deemed unnecessary.
- An assessment of night lighting was undertaken to determine the impact of Aviation Hazard Lighting (AHL) on potential receivers. Given the turbines' high elevation and the use of light shields, any AHL would likely appear as low-level ambient glow rather than a direct light source when viewed from nearby locations.
- BCWF is committed to implementing the mitigation and management measures identified in this EIS (refer **Section 6.2.5**) and will ensure that visual amenity continues to be considered during the detailed design process.

Noise (Amenity)

- A total of 71 non-associated receivers were identified within 8 km of the Project wind turbines.
- An assessment of operational noise indicate that the Project is capable of being designed and operated to comply with the operational wind turbine noise requirements of the Technical Supplement for Noise and Wind Energy Guideline. Predicted wind turbine noise levels at all non-associated receivers are below the Technical Supplement for Noise base noise limit of 35 dB LAeq, 10 min by a minimum margin of 1.8 dB.

- No exceedances of the highly noise affected management level were expected for any of the assessed tasks, and construction noise and vibration can be appropriately managed using standard good practice measures. The assessment identified that no vibration generating works were expected to occur within the established minimum working distances.
- An assessment of traffic noise associated with construction activities identified several receivers located within these setback distances. These receivers should be consulted prior to and during construction activities to manage impacts and considered in more detail as part of a future construction noise and vibration management plan (CNVMP).
- BCWF is committed to implementing the mitigation and management measures identified in this EIS (refer **Section 6.3.5**) and during the detailed design process will consider the suggested EIS safeguards relating to consideration of WTG procurement contracts and noise specifications, and then potential noise reduction management strategies (if actually required), where commercially viable and reasonable and feasible to implement.

Biodiversity

The Project would directly impact up to 163.58 ha of native vegetation across eight (8) PCTs within the Project Area. Other key aspects of biodiversity include:

- TECs impacted: Lower Hunter Valley Dry Rainforest; Central Hunter Ironbark – Spotted Gum–Grey Box Forest in the NSW North Coast and Sydney Basin Bioregions (Central Hunter Valley Eucalypt Forest and Woodland under EPBC Act); White Box–Yellow Box–Blakely's Red Gum Grassy Woodland and Derived Native Grassland.
- Threatened species impacted: Large-eared Pied Bat, Southern Myotis, Brush-tailed Phascogale, Powerful Owl.
- One (1) SAII entity was identified within the Project Area, being the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland and the Large-eared Pied Bat. Approximately 34.48 ha of White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland are anticipated to be impacted, comprising 3.02 ha in woodland form and 31.46 ha in DNG form.
- A second potential SAII entity – breeding habitat for the Large-eared Pied Bat – has also been recorded along the proposed overhead transmission line alignment in the southern portion of the Subject Land. To avoid potential impacts on this habitat, an avoidance area has been established. BCWF commit to ensuring that no ground-disturbance, vegetation removal, or vegetation trimming will occur within this avoidance area.
- In accordance with BAM credit calculations, the proposed offset obligation based on the Disturbance Footprint is1,006 ecosystem credits and 1,647 species credits. An additional three (3) ecosystem credits are required as additional offsets for the offsite transport route upgrades.
- BCWF is committed to implementing the mitigation and management measures identified in this EIS (refer **Section 6.4.10**) and will ensure that biodiversity values are continued to be considered (and impacts offset where required) during the detailed design process.

Aboriginal Cultural Heritage

- No Aboriginal sites were identified within the Disturbance Footprint. The Disturbance Footprint was confirmed to comprise almost entirely of steep slopes and crests subject to natural erosive processes exacerbated by ongoing agricultural operations and vegetation clearing or loss. Additionally, no cultural values specific to the Disturbance Footprint, Development Corridor, or lands within the Project Boundary more broadly were raised by Aboriginal community members that attended the survey or during consultation.
- BCWF is committed to implementing the mitigation and management measures identified in this EIS (refer **Section 6.5.8**) and will ensure that Aboriginal Cultural heritage values are continued to be considered during the detailed design process.

Historic Heritage

- The Project will have no physical or visual impact on the nearby Former Roman Catholic Church (LEP I156) and is expected to have negligible impact on other SHR and LEP-listed heritage items. No historic heritage items were identified within the Project Boundary or Disturbance Footprint, making the likelihood of impacting significant historic heritage very low. Additionally, it is considered unlikely that the proposed works at the offsite road works locations would impact any items of historic heritage significance.
- BCWF will implement the targeted mitigation and management measures identified in this EIS (refer **Section 6.6.3**) and ensure these matters are considered during the detailed design process.

Transport

- For the OSOM vehicle to access the Project Area, the temporary removal of street furniture, modification of embankments, cutting back vegetation, traffic management measures and likely short term road closures will be required. Where road modifications are required to facilitate movement of OSOM vehicles, a strategic concept design has been developed and included in **Appendix 3**. The strategic concept designs identify 15 work areas where road modifications are required to facilitate the movement of turbine blades and tower bases.
- A worst-case assessment of potential traffic movements required for the construction phase of the Project is likely to generate 186 one-way daily trips of which approximately 25 one-way trips are heavy vehicles. Without considering Project traffic, the Hebden Road (south) approach is expected to operate over acceptable capacity. The addition of a 20m short right turn lane on the Hebden Road (south) approach mitigates the expected impact of the Project's construction traffic. The level of traffic generated during the operation of the Project is unlikely to result in adverse road conditions. Decommissioning of the project will see traffic generation levels lower than the construction phase due to a number of services not being required.
- The Project proposes to utilise the same OSOM Transport Route as approved under the Stage 1 project from the Port of Newcastle. This transport route would be utilised to deliver Project components, including WTG towers and blades, to the Project Area. However, the WTG dimensions proposed under the Stage 2 Project are larger than those assessed and approved under the Stage 1 project and as such, a new Route Study Report has been undertaken by RJA (**Appendix 26**). Strategic Concept Designs have been prepared by Stantec (2026) for the proposed offsite road work areas (**Appendix 3**).

- A TMP will be prepared to mitigate the impacts of site traffic generated along the proposed transport route. BCWF is committed to implementing the mitigation and management measures identified in this EIS (refer **Section 6.8.3**) and will ensure that traffic related matters continue to be considered during the detailed design process.

Water Resources

- Construction water demand is estimated at approximately 42.5–55 ML over the 22-month construction period, reducing to around 1 ML per year during operation, with water sourced from commercial suppliers, on-site dams, tanks, and supplementary harvesting and recycling where practicable. Groundwater impacts, including to groundwater-dependent ecosystems, are considered very unlikely as excavation is not expected to intercept the water table, and temporary watercourse crossings required for some access tracks will be designed in accordance with relevant guidelines and in consultation with DPI Fisheries, resulting in no measurable impacts on water quality, stream health, or fish passage.
- BCWF will implement the targeted mitigation and management measures identified in this EIS (refer **Section 6.8.3**) and ensure these matters are considered during the detailed design process.

Air Quality

- Air quality impacts would be primarily limited to the construction phase, and to a lesser extent, the decommissioning phase of the Project. During construction, effective dust control measures will be implemented at the point of emission and the residual impacts will therefore normally be considered 'not significant' (IAQM, 2005). Given the substantial distance between the footprint and the nearest sensitive receptors, the overall risk of dust impacts on amenity and human health is low. Dust emissions during operations would largely arise from vehicles using internal access road and emissions can be managed effectively through routine road upkeep (e.g., grading and surface conditioning) and sensible speed controls.
- BCWF will implement the targeted mitigation and management measures identified in this EIS (refer **Section 6.9.3**) and ensure these matters are considered during the detailed design process.

Soil, Land and Agriculture

- The Project will temporarily disturb approximately 180 ha of land currently subject to agricultural land use (i.e. the Disturbance Footprint), representing approximately 5% of the overall Project Area. In total, 25 potential land use conflicts were identified although the SLAIA concludes that by applying cross-disciplinary controls, the Project can maintain an acceptable level of land use compatibility with the community, while effectively managing specific conflicts with immediate neighbours. Due to the localised and sporadic nature of landform modification required for the Project, impacts on soils and LSC are expected to be minimal and confined to the Disturbance Footprint.
- The Land Use Conflict Risk Assessment (LUCRA) determined that the Project can maintain an acceptable level of land use compatibility with the community, while effectively managing specific conflicts with immediate neighbours as part of standard operations.

- BCWF will implement the targeted mitigation and management measures identified in this EIS (refer **Section 6.10.6**) and ensure these matters are considered during the detailed design process.

Aviation Safety

- The Project meets applicable aviation safety requirements for the Upper Hunter Shire and Maitland regions, with Scone and Maitland Airports located within 30 nautical miles of the site. While the Aviation Impact Statement identified the need to raise or sectorise the Maitland 25 nm MSA western sector and undertake ongoing consultation with Defence due to proximity to Restricted Area R585D, these matters are manageable through standard regulatory processes, and obstacle lighting requirements will be confirmed through detailed design and continued consultation with CASA.
- BCWF will implement the targeted mitigation and management measures identified in this EIS (refer **Section 6.11.1.2**) and ensure these matters are considered during the detailed design process.

Bushfire

- The outcomes of the Bushfire Assessment indicate the Project is at 'moderate risk', with a possibility of bushfire occurring at the Project Area over year asset life of up to 30 years. However, the risk to life and Project infrastructure can be mitigated through the implementation of management measures presented in Section 10 of this report, including through effective Project design, adopting a minimum 10 m wide Asset Protection Zones (APZ) around select Project infrastructure, ensuring permanent firefighting water supplies are available, and through ongoing emergency management planning for the Project Area.
- Mitigation measures have been recommended to provide passive protection, including commitments to preparing and implementing a Bushfire Emergency Management and Operations Plan following approval of the Project to ensure measures are established to limit the potential for uncontrolled fire starting on or spreading from the Project Area. Accordingly, the Project complies with Planning for Bush Fire Protection 2019, provided that appropriate bushfire mitigation measures are employed.

EMI, EMF and Blade Throw

Assessments undertaken with respect to blade throw risk, EMI and EMF have concluded that the Project meets relevant assessment criteria. BCWF will implement the targeted mitigation and management measures identified in this EIS (refer **Section 6.11.2.1**, **Section 6.11.3.3** and **Section 6.11.5.2**) and ensure these matters are considered during the detailed design process.

Social and Economic

- The three (3) most frequently identified negative social impacts relating to the Project, as raised during consultation, included reduced sense of place and altered landscape character due to the presence of WTGs, followed by reduced public safety due to deterioration of local roads and increased volume of traffic, and lack of trust in BCWF due to perceived inadequate information provision.

- Positive impacts identified by stakeholders include the Projects' positive role in the energy transition, community investment initiatives and funds allocated to improve social outcomes for local communities, provision of additional sources of income for landholders, enhancing local livelihoods, increased training, education and capacity building for local people, and local employment procurement opportunities.
- With the implementation of proposed mitigation and management measures including updates and amendments to the AES, CSEP, a Community Benefit Sharing Program, and phase-specific environmental and social management plans, residual social impacts are generally expected to reduce to low or medium significance.
- The combined construction and operational phases of the Project are estimated to generate economic benefits of approximately $61 million within the Economic Study Area (ESA). Additional community benefits will also be delivered through the Proponent's benefit-sharing commitments.
- BCWF will implement the targeted mitigation and management measures identified in this EIS (refer **Section 6.13.3**) and ensure these matters are considered during the detailed design process.

Waste

- The EIS identifies and quantifies the waste streams expected during construction, operation, and decommissioning, and outlines measures to avoid, reuse, recycle, and safely dispose of waste in accordance with the waste hierarchy. While most waste will be managed through avoidance and resource recovery, some landfill disposal will be required, with BCWF to coordinate with local authorities to manage disposal and cumulative regional impacts, supported by a detailed waste strategy developed during detailed design.
- BCWF is committed to implementing the mitigation and management measures identified in this EIS (refer **Section 6.14.2.1** and **Section 6.14.3.1**) and will ensure that these matters continue to be considered during the detailed design process.

Cumulative

- There is an inherent difficulty in fully assessing cumulative impacts in developed areas, such as that surrounding the Project (and in the context of the Hunter-Central Coast REZ), primarily due to the uncertain status and timeframes of other potential developments in the region. Detailed cumulative impact assessments of key issues such as biodiversity, noise, visual, traffic, social and economic aspects have however occurred and identified that while risks are present, acceptable environmental and social standards can be achieved. Cumulative impacts to other environmental aspects e.g. historical heritage, agriculture are negligible. These impacts will generally be limited to the short-term construction period and impacts during operation will be negligible.
- BCWF is committed to implementing the set mitigation and management measures identified throughout **Section 6.0** and **Appendix 5** of this EIS and these will ensure that an acceptable level of cumulative impact is achieved. Whilst negative impacts have been considered in this EIS to ensure cumulative impacts are suitably considered, it is reiterated that project of this scale and type within the Hunter-Central Coast REZ present a significant positive impact and benefit to the region.

7.2 Site Suitability

As discussed in **Section 2.1**, the Project is a direct response to the NSW Electricity Strategy (NSW Government, 2019) to transition to renewable electricity generation.

As discussed in **Section 2.6.2**, the Project Area was selected based on a range of factors, including its proximity to the Stage 1 project which is approved to provide electricity to the NEM via a 21 km overhead and underground transmission lines to the 330 kV Liddell Substation, its strategic position within the Hunter-Central Coast REZ, the reliability of the wind resource, the low density of potentially affected residences within the surrounding area, and mostly supportive or neutral attitudes towards the Project from potentially affected landholders.

The Project design has been developed and refined in response to key environmental constraints, adopting the following principles:

- **Minimising impacts to potential SAII entities**: BCWF undertook Project design refinements to avoid interacting with areas of potential SAII as far as reasonably practical, including:
    - the complete avoidance of the potential LEPB breeding habitat buffer in the northern portion of the Project Area,
    - design of the overhead transmission line to avoid siting transmission line towers within LEPB breeding habitat and enable adequate height clearance of the transmission line cables from the potential LEPB habitat, and
    - avoiding impact to the majority of the woody vegetation component of the Box Gum Woodland. As outlined in the BDAR, 34.48 ha of Box Gum Woodland grassland form are identified for impact, with only 3.02 ha of woodland form being impacted.
- **Avoiding and minimising impacts to native vegetation, particularly TECs**: from Project inception, regional vegetation mapping was integrated into BCWF's model for WTG placement to focus on avoiding high and medium value vegetation and areas of threatened ecological communities. As biodiversity fieldwork progressed and a more detailed understanding of the biodiversity values of the Project Area became available, the Development Corridor was progressively refined, and the indicative Disturbance Footprint was designed such that impacts to native vegetation and particularly impacts to threatened ecological communities were reduced as far as reasonably practicable.
- **Minimising interactions with Biodiverse Riparian Land:** BCWF has sought to avoid placement of WTGs and other key infrastructure within GDE along the proposed overhead transmission line alignment in the southern portion of the Project Area. The placement of transmission poles has been designed to avoid direct impacts to riparian woodland and Derived Native Grassland (DNG). Several stream crossings are still required; however, these have been minimised as far as reasonably practicable.
- **Continued protection of heritage values:** BCWF has designed the Project to minimise interactions with areas of higher potential archaeological significance by reducing the number of watercourse crossings, where possible.
- **Minimise amenity impacts to residences:** BCWF has sought to minimise amenity impacts, including visual and noise impacts, as far as reasonably practicable, and in line with the NSW Wind Energy Guideline (DPHI, 2024). As far as practicable, Project-related infrastructure has been located away from nearby residences and adjoining properties.

- **Protect agricultural values:** the iterative design process has considered and addressed, as far as practicable, landowner feedback on agricultural values and land use. BCWF's design objective was to maintain the existing agricultural values, by enabling wind farm operations to co-existing with grazing activities and to avoid impacts to irrigated cropping areas within the Host landholdings.

Based on the assessment findings outlined in **Section 6.0**, and subject to the implementation of the management, mitigation and offset measures to address these residual impacts (refer to **Appendix 5**), the site is considered suitable for the carrying out of the proposed Project.

7.3 Ecologically Sustainable Development

An objective of the EP&A Act is to encourage ecologically sustainable development (ESD) within NSW. This section provides an assessment of the Project in relation to the principles of ESD.

To justify the Project with regard to the principles of ESD, the benefits of the Project in an environmental and socio-economic context should outweigh any negative impacts. The principles of ESD encompass the following:

- The precautionary principle.
- Intergenerational equity.
- Conservation of biological diversity.
- Valuation and pricing of resources.

Essentially, ESD requires that current and future generations should live in an environment that is of the same or improved quality than the one that is inherited.

7.3.1 The Precautionary Principle

The EP&A Regulation defines the precautionary principle as:

> 'The precautionary principle is that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
>
> *In the application of the precautionary p*rinciple, public and priv*ate decisions should be guided by careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and an assessment of the risk-weighted consequences of various options.'*

In order to achieve a level of scientific certainty in relation to the potential impacts associated with the Project, this EIS has undertaken an extensive evaluation of all the key components of the Project. Detailed assessment of all key issues and necessary management procedures have been conducted and are comprehensively documented in this EIS.

The preparation of this EIS has involved a detailed analysis of the existing environment (refer to **Section 2.3** and **Section 6.0**), and the use of desktop analysis, site-specific survey and monitoring and scientific modelling (where relevant) to assess and determine potential impacts as a result of the Project.

The decision-making process for the design/refinement, impact assessment and development of management and mitigation measures has been transparent in the following respects:

- Key community, Aboriginal representatives and Government stakeholders have been consulted during EIS preparation. Stakeholder feedback has informed impact avoidance, the Project refinement process and the development of proposed impact mitigation and management strategies. Further details regarding key stakeholder feedback and how this feedback has been addressed are provided in **Section 5.0**.
- The EIS has been undertaken on the basis of the best available scientific information about the Project Area and has been informed by site-specific survey, monitoring, modelling and impact assessment.

Due to the nature of the Project, specific details will be subject to the detailed design phase and will be influenced by the technology applicable at the time. Any uncertainty in the data used for the assessment has been appropriately identified, and appropriate assumptions have been applied to represent a conservative worst-case analysis to assess a range of potential impact scenarios. Extensive management and mitigation measures will be implemented, including monitoring programs to measure predicted against actual impacts of the Project (refer to **Appendix 5**).

BCWF will prepare and implement a CEMP and OEMP, which will implement best practice management and will incorporate all identified mitigation and management measures identified in this EIS. Additionally, the Project will be subject to an independent auditing and verification process consistent with relevant requirements for SSD projects.

BCWF will report on monitoring outcomes and compliance with the development consent, should the Project be approved. It is expected any development consent would include non-compliance notification procedures. BCWF will make the following information publicly available on its website as relevant to the stage of the Project:

- a comprehensive summary of the monitoring results, which will be reported in accordance with the various plans and programs approved under a development consent
- the annual Statement of Compliance with an environmental protection licence (EPL) issued under the POEO Act
- any independent environmental audit.

7.3.2 Intergenerational Equity

The EP&A Regulation defines the principal of intergenerational equity as:

> *'that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.'*

Intergenerational equity refers to equality between generations. It requires that the needs and requirements of today's generations do not compromise the needs and requirements of future generations in terms of health, biodiversity and productivity.

As discussed in **Section 2.3**, as a renewable energy project located within the Hunter-Central Coast REZ, the Project is located within a defined area planned for renewable energy development by the NSW Government. The Project is consistent with the objectives of the NSW Electricity Strategy and NSW Electricity Infrastructure Roadmap (NSW Government, 2020), in aiming to provide large-scale renewable electricity generation that is affordable and reliable. With a proposed capacity of up to 120 MW, the Project will support the State's transition away from fossil fuel reliance.

The assessment findings outlined in **Section 6.0** indicate that while there will be environmental and social impacts associated with the Project, the extent of impact has been minimised through the design process and where impacts are predicted, BCWF has committed to management, mitigation and offset measures to address these residual impacts (refer to **Appendix 5**).

7.3.3 Conservation and Biological Diversity

The EP&A Regulation identifies that the principle of conservation of biological diversity and ecological integrity should be a fundamental consideration in the decision-making process. The conservation of biological diversity refers to the maintenance of species richness, ecosystem diversity and health and the links and processes between them. All environmental components, ecosystems and habitat values potentially affected by the Project are described in this EIS (refer **Section 6.4** and **Appendix 8**) and measures to ameliorate any negative impacts are outlined in **Appendix 5**.

The conceptual layout has been developed to avoid and minimise impact to identified biodiversity. Following the application of avoidance and mitigation measures, the BDAR (**Appendix 8**) has identified the biodiversity credit requirement to offset the impacts of the residual impacts of the Project and the required management and mitigation measures to be implemented, including the Bird and Bat Adaptive Management Plan (BBAMP) which will provide for the ongoing adaptive management of impacts on key species.

The principle of Conservation of Biological Diversity is considered to be satisfied.

7.3.4 Valuation and Pricing of Resources

The goal of improved valuation of natural capital has been included in Agenda 21 of Australia's Intergovernmental Agreement on the Environment.

The principle has been defined in the EP&A Regulation as:

'that environmental factors should be included in the valuation of assets and services, such as:

(i) polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,

(ii) the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,

(iii) environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems'

The Project has been designed to avoid and minimise adverse environmental, social and economic impacts as much as practicable. For example, the proposed Disturbance Footprint has been designed to avoid areas of potential SAII, where practicable.

Project considerations have included the costs of management measures to minimise potential environmental and social impacts. There will also be additional costs associated with establishing and managing ecological offsets to reduce the magnitude of ecological impacts.

The Project will provide cleaner reliable electricity generation, assisting with meeting current load demand while reducing greenhouse gas emissions and the impacts of climate change.

7.4 Conclusion

As discussed in **Section 2.1**, as a renewable energy project located within the Hunter-Central Coast REZ, the Project is located within a defined area planned for renewable energy development by the NSW Government.

The NSW government has indicated that REZs will play a vital role in delivering affordable energy generation to help prepare the State for the expected retirement of thermal power stations over the coming decades. The Project will contribute to meeting these Federal and NSW Government objectives and is appropriately located.

The Project (and the Stage 1 project BESS that is being progressed as a separate modification) has been identified for inclusion in the National Renewable Energy Priority List, reflecting its strategic importance in supporting the energy transition and advancing national climate and energy objectives. As a designated priority project, it is expected to contribute to increasing renewable energy generation capacity and enhancing energy security.

The Project is consistent with the objectives of the NSW Electricity Strategy and Infrastructure Road Map (NSW Government, 2020), in aiming to provide large-scale renewable electricity generation that is affordable and reliable. Although not contributing directly to the generation capacity indicated for this REZ, the Project will assist in providing a reliable energy source and associated GHG emission reductions, consistent with the broader NSW Electricity Strategy and Infrastructure Road Map.

The Project has been designed and progressively refined in collaboration with key stakeholders to avoid and minimise impacts to key environmental, cultural and social values where practicable, and to maximise potential benefits to impacted communities.

The assessment findings outlined in **Section 6.0** indicates that while there will be environmental, social and economic impacts associated with the Project, the extent of impact has been minimised through the design process and where impacts are predicted, BCWF has committed to management, mitigation and offset measures to address these residual impacts.

The Project will provide long-term, strategic benefits to NSW, and at the regional and local levels, including:

- Renewable energy supply to assist with fulfilling the current obligations under State and Commonwealth renewable energy targets.
- Providing for cleaner reliable electricity generation, assisting with meeting current load demand while reducing GHG emissions and the impacts of climate change.
- Providing regional investment in the NSW renewable energy sector.

- The Project would require approximately $260 million in investment (excluding GST) during the construction phase (of which approximately $26 million will be retained in the ESA).
- Ongoing economic stimulus associated with the operation of the Project is estimated at approximately $50.9 million over 30 years (CPI adjusted) relating to land holder leasing payments, operational wage stimulus, and community payments, minus the agricultural productivity loss impact.
- Supporting 70 direct and 110 indirect FTE positions in the national economy (on average) over the construction period, with 160 FTE jobs during peak construction. Of which, a minimum of 55 FTEs are expected to be sourced from the local LGAs of Singleton, Muswellbrook, Upper Hunter and Maitland, increasing to approximately 130 FTE jobs at the Project's peak.
- Supporting an estimated 10 direct FTE jobs nationally during operations, equating to 40 FTE across the Stage 1 and Stage 2 projects collectively.
- An estimated $1.3 million in economic stimulus is expected to be directed to local businesses and service providers due to the temporary migration of non-local workers during the construction period.
- The Project will also provide additional direct financial benefits to the region and local community, including:
    - Payments to host and neighbouring landowners via private agreements and a community benefit sharing scheme.
    - Annual payments to the community under Planning Agreements with both Singleton and Muswellbrook Councils.

On this basis, and subject to the implementation of the mitigation, management and offsetting commitments outlined in this EIS, it is considered that the Project is consistent with the objects and requirements of the EP&A Act and is in the public interest.

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Appendix 1

SEARs Compliance



A1.1 SEARs Compliance

Appendix Table A1.1 SEARs Compliance Table

Issues	SEARs	Section
General Requirement	The Environmental Impact Statement (EIS) must meet the minimum form and content requirements as prescribed by Part 8 of the Environmental Planning and Assessment Regulation 2021 (the Regulation) and must have regard to the Department's:	**This EIS**
General Requirement	State Significant Development Guidelines; and	**This EIS**
General Requirement	Renewable Energy Planning Framework, including the Wind Energy Guideline and its supporting Technical Supplement for Landscape Character and Visual Impact Assessment and Technical Supplement for Noise Assessment and the Benefit-Sharing Guideline (most recent version as updated from time to time).	**This EIS**
General Requirement	In particular, the EIS must include:	**This EIS**
General Requirement	a stand-alone executive summary;	**Executive Summary**
General Requirement	a full description of the development, including: details of construction, operation and decommissioning, including any proposed staging of the development or refurbishing of turbines over time;	**Section 3.0**
General Requirement	all infrastructure and facilities, such as substations, transmission lines, battery energy storage system, construction compounds, concrete batching plants, internal access roads, and road upgrades (including any infrastructure that would be required for the development, but the subject of a separate approvals process);	**Section 3.0**
General Requirement	the Project Area (as per Table 1 of the SSD guidelines–preparing an environmental impact statement) and Development Footprint (disturbance area including but not limited to areas for infrastructure, road works, access tracks, defendable space, fencing and temporary laydown);	**Section 3.0**
General Requirement	plans for any buildings;	**Appendix 3**
General Requirement	high quality site plans and maps at an adequate scale with dimensions showing: the location and dimensions of all project components including coordinates in latitude / longitude and maximum AHD heights of the turbines;	**Figures, Appendix 3**
General Requirement	existing infrastructure, land use, and environmental features in the vicinity of the development, including nearby residences and approved residential developments or subdivisions within 5 km of a proposed turbine, and any other existing, approved or proposed wind farms in the region; and	**Figures, Appendix 3**

Issues	SEARs	Section
General Requirement	the development corridor that has been assessed, including any allowance for micro-siting of turbines and identification of the key environmental constraints that have been considered in the design of the development;	**Figures, Appendix 3**
General Requirement	consolidated list and GIS data of coordinates of wind turbines, project infrastructure and relevant receivers and distances to potentially impacted receivers; and	To be provided to DPHI separately
General Requirement	interactions with the consent for Bowmans Creek Wind Farm (SSD 10315) including consideration of shared infrastructure;	**Section 3.1**
General Requirement	details of the progressive rehabilitation of the site;	**Section 3.2.12** **Section 6.10** **Appendix 14**
General Requirement	consistency in information presented in the EIS and all technical reports, including distances, development footprint, project design and infrastructure proposed, construction timeframes and receiver numbers;	**This EIS**
General Requirement	demonstrate the suitability of the site and viability of the wind resources for the project and include high quality maps showing the wind resource;	**Section 2.1.5**
General Requirement	a list of any approvals that must be obtained before the development may commence;	**Appendix 4**
General Requirement	a model for community benefit-sharing, prepared in accordance with the Benefit-Sharing Guideline, including the terms of any proposed voluntary planning agreement with the relevant local council;	**Section 2.5**
General Requirement	a risk assessment of the potential environmental impacts of the development, identifying the key issues for further assessment;	**Section 6.1**
General Requirement	an assessment of the likely impacts of the development on the environment and any other significant issues identified in this risk assessment, focusing on the specific issues identified below, including: a description of the existing environment likely to be affected by the development using sufficient baseline data;	**Section 2.3**
General Requirement	an assessment of the likely impacts of all stages of the development (which is commensurate with the level of impact), including the cumulative impacts of the site and existing or proposed developments in the region in accordance with the Cumulative Impact Assessment Guideline (DPIE, 2022), taking into consideration any relevant State and Commonwealth legislation, environmental planning instruments, guidelines, policies, plans and industry codes of practice and including the Wind Energy Guideline;	**Section 6.0** **Section 6.16** **Appendix 23**

Issues	SEARs	Section
General Requirement	a description of the measures that would be implemented to avoid, mitigate and/or offset residual impacts of the development and the likely effectiveness of these measures, including details of consultation with any affected non-associated landowners in relation to the development of mitigation measures, and any negotiated agreements with these landowners; and	**Section 6.0** **Appendix 5**
General Requirement	a description of the measures that would be implemented to monitor and report on the environmental performance of the development, including adaptive management strategies and contingency measures to address residual impacts;	**Appendix 5**
General Requirement	a consolidated summary of all the proposed environmental mitigation, management and monitoring measures, identifying all the commitments in the EIS;	**Appendix 5**
General Requirement	a detailed evaluation of the merits of the project as a whole having regard to: the requirements in Section 4.15 of the Environmental Planning and Assessment Act 1979 (EP&A Act), and how the principles of ecologically sustainable development have been incorporated in the design, construction and ongoing operations of the development;	**Section 7.3**
General Requirement	the environmental, economic and social costs and benefits of the development, having regard to the predicted electricity demand in NSW and the National Electricity Market, NSW's Climate Change Policy Framework, NSW's Net Zero Plan Stage 1: 2020 – 2030 and the greenhouse gas savings of the development;	**Executive Summary** **Section 2.1.4** **Section 7.3**
General Requirement	feasible alternatives to the development (and its key components) including project design alternatives to avoid impacts to areas of biodiversity value, indirect impacts to any nearby national parks or nature reserves and archaeological sensitivity, opportunities for shared infrastructure with proposed developments in the region and the consequences of not carrying out the development;	**Section 2.6**
General Requirement	the suitability of the site with respect to potential land use conflicts with existing and future surrounding land uses, including rural villages, rural dwellings, subdivisions, land of high scenic value, conservation areas, strategic agricultural land, state forests, mineral and coal resources, triangulation stations, tourism facilities, existing or proposed wind farms, and the capacity of the existing electricity transmission network to accommodate the development; and	**Section 7.2**
General Requirement	a detailed consideration of the capability of the project to the security and reliability of the electricity system in the National Electricity Market, having regard to local system conditions and the Department's guidance on the matter.	**Section 2.1.3.1**

Issues	SEARs	Section
Estimated Development Cost and Employment	Provide the estimated development cost (EDC) of the development prepared in accordance with the relevant planning circular using the Standard Form of EDC Report; and	**Appendix 24**
Estimated Development Cost and Employment	Provide an estimate of the retained and new jobs that would be created during the construction and operational phases of the development, including details of the methodology to determine the figures provided.	**Appendix 21, Appendix 24**
Estimated Development Cost and Employment	The development application must be accompanied by: the consent of the owner/s of the land (as required in Section 23(1) of the Regulation); and	**Provided to DPHI separate to this EIS**
Estimated Development Cost and Employment	a declaration from a Registered Environmental Assessment Practitioner that the EIS includes the information specified in the Department's Registered Environmental Assessment Practitioner Guidelines.	**Declaration**
Key Issue	The EIS must address the following specific issues for the wind farm and associated infrastructure:	**Section 6.0**
Key Issue	**Landscape and Visual** – including:	**Section 6.2** **Appendix 6**
Key Issue	a detailed assessment of the visual impacts of all components of the project (including turbines, transmission lines, substations, battery storage and any other ancillary infrastructure) in accordance with the Wind Energy Guideline and supporting Technical Supplement for Landscape Character and Visual Impact Assessment.	**Section 6.2** **Appendix 6**
Key Issue	**Noise and Vibration** – including: an assessment of wind turbine noise in accordance with the Wind Energy Guideline, including the supporting Technical Supplement for Noise Assessment; an assessment of noise generated by ancillary infrastructure in accordance with the NSW Noise Policy for Industry (EPA, 2017); an assessment of construction noise under the Interim Construction Noise Guideline (DECC, 2009); an assessment of traffic noise under the NSW Road Noise Policy (DECCW, 2011); an assessment of vibration under the Assessing Vibration: A Technical Guideline (DECC, 2006); and	**Section 6.3** **Appendix 7**
Key Issue	an assessment of the cumulative noise impacts (considering other developments in the area).	**Section 6.3** **Appendix 7** **Section 6.16** **Appendix 23**
Key Issue	**Biodiversity** – including: an assessment of the biodiversity values and the likely biodiversity impacts of the project in accordance with Section 7.9 of the Biodiversity Conservation Act 2016 (NSW), in accordance with the Biodiversity Assessment Method (BAM) and documented in a Biodiversity Development Assessment	**Section 6.4** **Appendix 8**

Issues	SEARs	Section
	Report (BDAR). The BDAR must: • be prepared using the approved BDAR template; • document the application of the avoid, minimise and offset framework including assessing all direct, indirect and prescribed impacts in accordance with the BAM; • assess impacts associated with transport route road upgrades; • any indirect impacts to nearby conservation areas and nature reserves; and • be finalised by an accredited assessor as BAM-compliant within 14 days of submission. an assessment of the impact of the project on birds and bats from blade strikes, low air pressure zones at the blade tips (barotrauma), and alteration to movement patterns resulting from the turbines and considering cumulative effects of other wind farms in the vicinity; an assessment of the likely direct and indirect impacts on listed aquatic threatened species, populations or ecological communities, scheduled under the Fisheries Management Act 1994, and a description of the measures to minimise and rehabilitate impacts;	
Key Issue	a cumulative impact assessment of biodiversity values in the region from nearby developments; and	**Section 6.4** **Appendix 8** **Section 6.16** **Appendix 23**
Key Issue	if an offset is required, details of the measures proposed to address the offset obligation.	**Section 6.4** **Appendix 8**
Key Issue	**Heritage** – including: an assessment of the impact to Aboriginal cultural heritage items (archaeological and cultural) in accordance with the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH, 2011) and the Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW (DECCW, 2010), identifying, describing, and assessing any impacts to any Aboriginal cultural heritage sites or values associated with the site (including impacts from any proposed earth works, construction works and road upgrades), including results of archaeological test excavations (where required), undertaken in accordance with the relevant standards and requirements; evidence of adequate consultation with Aboriginal communities in determining and assessing impacts, identifying and selecting options for avoidance of Aboriginal cultural heritage and identifying appropriate mitigation measures (including the final proposed measures), having regard to the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010); including the consultation process outline within; and	**Section 6.5** **Appendix 9**

Issues	SEARs	Section
Key Issue	an assessment of the impacts to historic heritage having regard to the Guidelines for preparing a statement of heritage impact.	**Section 6.6** **Appendix 10**
Key Issue	**Traffic and Transport** – including: an assessment of the construction, operational and decommissioning traffic impacts of the development on the local and State road network; details of the peak and average traffic volumes (including light, heavy and over-mass / over-dimensional vehicles / heavy vehicles requiring escort and construction worker transportation) and transport and haulage routes during construction, operation and decommissioning, including traffic associated with sourcing raw materials (water, sand and gravel); an assessment of the potential traffic impacts of the project on road network function including intersection performance, site access arrangements, site access and haulage routes, and road safety, including school bus routes and school zones; an assessment of the capacity of the existing road network to accommodate the type and volume of traffic generated by the project (including over-mass / over-dimensional traffic haulage routes from port) during construction, operation and decommissioning; an assessment of the likely transport impacts to the site access and haulage routes, site access point, any rail safety issues, any Crown Land, particularly in relation to the capacity and conditions of the roads and use of rail level crossings (and rail safety assessment if required), and impacts to rail underbridges and overbridges;	**Section 6.7** **Appendix 11**
Key Issue	a cumulative impact assessment of traffic from nearby developments; and	**Section 6.7** **Appendix 11** **Section 6.16** **Appendix 23**
Key Issue	details of measures to mitigate and / or manage potential impacts (developed in consultation with the relevant road authorities) including: • a schedule of all required road upgrades (including resulting from heavy vehicle and over mass / over dimensional traffic haulage routes), • clear figures of proposed road upgrades (including the site access point); and • road maintenance contributions, and any other traffic control measures, developed in consultation with the relevant road and / or rail authority.	**Section 6.7** **Appendix 11**
Key Issue	**Water and Soils** – including: a site water balance for the development, quantify water demand, identify water sources (surface and groundwater), including any licensing requirements, and determine whether an adequate and secure water supply is available for the development (including consultation with suppliers);	**Section 6.8** **Appendix 12**

Issues	SEARs	Section
	an assessment of the likely impacts of the development (including flooding and flood modelling) on surface water and groundwater resources traversing the site and surrounding watercourses (including their Strahler Stream Order), drainage channels, wetlands, riparian land, farm dams, groundwater dependent ecosystems and acid sulfate soils, related infrastructure, adjacent licensed water users and basic landholder rights, and measures proposed to monitor, reduce and mitigate these impacts; where the project involves works within 40 metres of the high bank of any river, lake or wetlands (collectively waterfront land), identify likely impacts to the waterfront land, and how the activities are to be designed and implemented in accordance with the DPI Guidelines for Controlled Activities on Waterfront Land (2018) and (if necessary) Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (DPI, 2003); and Policy & Guidelines for Fish Habitat Conservation & Management (DPI, 2013); and	
Key Issue	a description of the measures to minimise surface and groundwater impacts, including how works on erodible soil types would be managed and any contingency requirements to address residual impacts in accordance with the Managing Urban Stormwater: Soils and Construction series of guidelines.	**Section 6.8** **Appendix 12** **Appendix 14**
Key Issue	**Air quality** – including: an assessment of risks of dust generation and propose mitigation measures designed in accordance with the Approved Methods and Guidelines for the Modelling and Assessment of Air Pollutants in New South Wales (DECC, 2005); and demonstration of how the development minimises greenhouse gas emissions (reflecting the Government's goal of net zero emissions by 2050).	**Section 6.9** **Appendix 13**
Key Issue	**Land** – including: a detailed justification of the suitability of the site and that the site can accommodate the proposed development having regard to its potential environmental impacts, permissibility, strategic context and existing site constraints; an assessment of the potential impacts of the development on existing land uses on the site and adjacent land, including: flood prone land, agricultural land, irrigated lands, Crown lands, travelling stock routes, mining, quarries, mineral or petroleum rights;	**Section 2.0**
Key Issue	a soil survey to determine the soil characteristics and consider the potential for erosion to occur; and	**Section 6.10** **Appendix 14**
Key Issue	a cumulative impact assessment of nearby developments;	**Section 6.10** **Appendix 14** **Section 6.16** **Appendix 23**

Issues	SEARs	Section
Key Issue	a preliminary investigation into potential contamination across the site, in accordance with the State Environmental Planning Policy (Resilience and Hazards) 2021 (Hazards SEPP) (as required); and	**Section 6.11.6**
Key Issue	the development potential of that land, in accordance with the Wind Energy Guideline; and	**Section 6.17**
Key Issue	an assessment of the compatibility of the development with existing land uses, during construction, operation and after decommissioning, including:	**Section 2.0**
Key Issue	consideration of the zoning provisions applying to the land, including subdivision (if required);	**Section 2.3.2** **Appendix 4**
Key Issue	completion of a Land Use Conflict Risk Assessment in accordance with the Department of Industry's Land Use Conflict Risk Assessment Guide; and	**Section 6.10.3** **Appendix 14**
Key Issue	assessment of impact on agricultural resources and agricultural production on the site and region.	**Section 6.10.4** **Appendix 14**
Key Issue	**Hazards and Risks** – including an assessment of the following:	**Section 6.11**
Key Issue	**Aviation Safety** – prepare an aviation impact assessment in accordance with Appendix A of the Wind Energy Guideline and the National Airports Safeguarding Framework Guideline D: Managing Wind Turbine Risk to Aircraft; and assess the impact of the turbines on the safe and efficient aerial application of agricultural fertilisers and pesticides and emergency helicopter access (if required) in the vicinity of the turbines and transmission line;	**Section 6.11.1** **Appendix 21**
Key Issue	*Telecommunications* – identify possible effects on telecommunications systems, assess impacts and mitigation measures including undertaking a detailed assessment to examine the potential impacts as well as analysis and agreement on the implementation of suitable options to avoid potential disruptions to radio communication services, which may include the installation and maintenance of alternative sites;	**Section 6.11.2** **Appendix 16**
Key Issue	*Health* – identify potential hazards and risks associated with electric and magnetic fields (EMF) and demonstrate the application of the principles of prudent avoidance, including an assessment against the International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guidelines for limiting exposure to Time-varying Electric, Magnetic and Electromagnetic Fields;	**Section 6.11.3** **Appendix 17**
Key Issue	Bushfire – assess potential hazards and risks associated with bushfires / use of bushfire prone land, including the risk of the project causing bush/grass fires; identify measures to prevent a fire occurring within the site from developing into a bushfire; consider any potential impacts of the project on the aerial	**Section 6.11.4** **Appendix 18**

Issues	SEARs	Section
	fighting of bushfires; and demonstrate compliance with Planning for Bush Fire Protection 2019;	
Key Issue	*Blade Throw* – assess blade throw risks, including consideration of associated dwellings, non-associated dwellings and neighbouring infrastructure; and	**Section 6.11.5** **Appendix 19**
Key Issue	*Dangerous Goods* – a preliminary risk screening completed in accordance with the State Environmental Planning Policy (Resilience and Hazards) 2021.	**Section 6.11.6**
Key Issue	**Social Impact** – including an assessment of the social impacts in accordance with the Social Impact Assessment Guideline (DPE) and SIA Guideline–Technical Supplement (DPE) including consideration of any increase in demand for community infrastructure services, consideration of construction workforce accommodation.	**Section 6.12** **Appendix 20**
Key Issue	**Economic and Benefit-Sharing** – including any benefits of the economic impacts or benefits of the project for the region and the State as a whole and provide details of proposed benefit-sharing arrangements, in accordance with the Benefit-Sharing Guideline.	**Section 6.13** **Appendix 21**
Key Issue	**Waste** – identify, quantify, and classify the likely waste streams to be generated during construction and operation, and describe the measures to be implemented to manage, reuse, recycle and safely dispose of this waste and an assessment of sewage (if required) and provide a waste management plan.	**Section 6.14**
Plans and Documents	The EIS must include all relevant plans, diagrams and relevant documentation required under Part 3 of the EP&A Regulation. Provide these as part of the EIS rather than as separate documents. In addition, the EIS must include high quality files of maps and figures of the subject site, proposal, and proposed road upgrades.	**This EIS**
Legislation, Polices and Guidelines	The assessment of the key issues listed above must take into account relevant guidelines, policies, and plans as identified.	**This EIS**
Legislation, Polices and Guidelines	While not exhaustive, a list of some of the legislation, policies and guidelines that may be relevant to the assessment of the project can be found at: https://www.planning.nsw.gov.au/policy-and-legislation/renewable-energy/renewable-energy-planning-framework https://www.planning.nsw.gov.au/Policy-and-Legislation/Planningreforms/Rapid-Assessment-Framework/Improving-assessment-guidance https://www.planningportal.nsw.gov.au/majorprojects/assessment/policies-and-guidelines; and https://www.dcceew.gov.au/environment/epbc/publications#assessments.	**Section 4.0**

Issues	SEARs	Section
Engagement	During the preparation of the EIS, you must consult with the relevant local, State or Commonwealth Government authorities, infrastructure and service providers, community groups and affected landowners, and any exploration licence and/or mineral title holders.	**Section 5.0** **Appendix 20**
Engagement	The EIS must: detail how engagement undertaken was consistent with the Undertaking engagement Guide: Guidance for State Significant Projects (DPHI); and describe the consultation process and the issues raised, and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, a short explanation should be provided. In particular you must consult with: the relevant local, State or Commonwealth Government authorities, service providers, community groups, affected landowners, exploration licence holders, quarry operators, mineral title holders and irrigation channel owners; and	**Section 5.0** **Appendix 20** **Appendix** **Table A1.2**
Engagement	carry out detailed consultation with the following: • Muswellbrook Shire Council • Singleton Shire Council • NSW Aboriginal Land Council • Wanaruah Local Aboriginal Land Council • Wonnarua Nation Aboriginal Corporation • NSW Local Land Services • NSW DCCEEW – Heritage NSW Group • NSW DCCEEW – Biodiversity Conservation and Science Group • NSW DCCEEW – Water Group • NSW DCCEEW – Natural Resource Access Regulator • Environment Protection Authority • Crown Lands • Department of Primary Industries and Regional Development – NSW Resources • Department of Primary Industries and Regional Development – Agriculture division • Department of Primary Industries and Regional Development – Fisheries division • Transport for NSW • Energy Corporation of NSW (EnergyCo) • Transgrid • NSW Telco Authority • Fire & Rescue NSW • NSW Rural Fire Service • Commonwealth Department of Defence • Civil Aviation Safety Authority	**Section 5.0** **Appendix 20**

Issues	SEARs	Section
	• Airservices Australia.	
Expiry Date	If you do not lodge a Development Application and EIS for the development within 2 years of the issue date of these SEARs, your SEARs will expire. If an extension to these SEARs will be required, please consult with the Planning Secretary 3 months prior to the expiry date.	**N/A**

Appendix Table A1.2 Issued SEARs – Agency Advice

Agency	Advice (Major Projects Website Link)	Section
SEARs Advice – Airservices	Major Projects Website Link	**Section 6.11.1, Appendix 15**
SEARS Advice – BCS	Major Projects Website Link	**Section 6.4, Appendix 8**
SEARs Advice – CASA	Major Projects Website Link	**Section 6.11.1, Appendix 15**
SEARs Advice – Crown Lands	Major Projects Website Link	**Section 2.3.1**
SEARs Advice – Defence	Major Projects Website Link	Noted, no further assessment required
SEARs Advice – DPE Water	Major Projects Website Link	**Section 6.8, Appendix 12**
SEARs Advice – DPI Agriculture	Major Projects Website Link	**Section 6.10, Appendix 14**
SEARs Advice – DPI Fisheries	Major Projects Website Link	Biodiversity: **Section 6.4, Appendix 8** Water: **Section 6.8, Appendix 12**
SEARs Advice – Environment Protection Authority	Major Projects Website Link	**Section 6.9, Appendix 13**
SEARs Advice – Fire and Rescue NSW	Major Projects Website Link	**Section 6.11.4, Appendix 18**
SEARs Advice – Heritage NSW	Major Projects Website Link	**Section 6.5, Appendix 10**
SEARs Advice – Mining Exploration and Geoscience (MEG)	Major Projects Website Link	**Section 2.3**

Agency	Advice (Major Projects Website Link)	Section
SEARs Advice – Muswellbrook Shire Council	Major Projects Website Link	Planning agreement: Subject to separate agreements, and **Section 2.5.4** Traffic: **Appendix 11** Electorate information: **Executive Summary** Workforce accommodation / Social: **Appendix 20** Visual: **Appendix 6** Biodiversity: **Appendix 8** Water: **Appendix 12** Waste, Rehab ad Decommissioning: **Section 6.14** Agriculture: **Appendix 14** Fire: **Appendix 18**
SEARs Advice – Singleton Council	Major Projects Website Link	Planning agreement: Subject to separate agreements, and **Section 2.5.4**
SEARs Advice – Telco Authority	Major Projects Website Link	**Section 6.11.2, Appendix 16**
SEARs Advice – Transport for NSW	Major Projects Website Link	Traffic and Transport: **Section 6.7, Appendix 11** Cumulative Impacts: **Section 6.16, Appendix 23**
SEARs Advice – WaterNSW	Major Projects Website Link	**Section 6.8, Appendix 12**

Appendix Table A1.3 Supplementary SEARs–DPHI

Issues	SEARs	Section
Development Rights	The EIS must include an assessment of the potential impact of the development on existing land uses on the site and adjoining land, including the development potential of that land in accordance with the guidance below.	**Section 6.17**
Development Rights	The applicant may need to consider whether the proposed development would impact the right for neighbouring landholders to develop their land for the purpose of any of the following permitted land uses: • residential accommodation • tourist and visitor accommodation • eco-tourist facility.	**Section 6.17**

Issues	SEARs	Section
Development Rights	In considering the impacts, applicants and consent authorities should only assess impacts on vacant land. That is, land in which there is a development right that has not been acted upon and is vacant of buildings and structures. Additionally, an assessment should only be undertaken if the land is vacant prior to 12 November 2024, and would: • be partly or wholly within the visual impact setback in the Wind Energy Guideline – Technical Supplement for Landscape and Visual Impact Assessment, • experience exceedances of the relevant noise criteria, or • be subject to significant risk from blade throw, ice throw or other risks.	**Section 6.17**
Development Rights	The assessment should consider whether the proposed development would unduly impact the development potential of the vacant land. In determining the impact, it may be relevant to consider: • whether the vacant land is part of a broader contiguous property holding with an existing dwelling, building or structures, • if a future development could be designed, sited and oriented to avoid or reduce significant impact from the project, and • any mitigating effects including topography and vegetation. • An example assessment is provided in Appendix B of the Wind Energy Guideline.	**Section 6.17**
Development Rights	If, as of 12 November 2024, the vacant land is subject to: • a development application that has been lodged but is yet to be determined, and/or • a development application or complying development certificate has been determined/granted but the development is yet to physically commenced, the applicant should consider measures to mitigate the impacts on these rights.	**Section 6.17**
Development Rights	Measures may include: • helping affected landholders modify the existing consent • seeking a new development consent that would minimise impacts • screening or landscaping treatments.	**Section 6.17**
Development Rights	For the avoidance of doubt, these approvals should not be treated as existing dwellings, or other receivers for the purpose of conducting a visual impact assessment or noise impact assessment. Any consents or approvals that have physically commenced as of 12 November 2024 should be treated as existing dwellings, or other receivers for the purpose of conducting a visual impact assessment or noise impact assessment.	**Section 6.17**

Table A1.4 Supplementary SEARs – Commonwealth DCCEEW

Issues	SEARs	Section
General Requirement	Relevant Regulations • The Environmental Impact Statement (EIS) must address all matters outlined in Schedule 4 of the EPBC Regulations and all matters outlined below in relation to the controlling provisions.	**Appendix C of Appendix 8**
General Requirement	**Project Description** • The title of the action, background to the action and current status. • The precise location and description of all works to be undertaken (including associated offsite works and infrastructure), structures to be built or elements of the action that may have impacts on Matters of National Environmental Significance (MNES). • How the action relates to any other actions that have been, or are being taken in the region affected by the action. • How the works are to be undertaken and design parameters for those aspects of the structures or elements of the action that may have relevant impacts on MNES.	**Appendix C of Appendix 8**
General Requirement	Impacts • The EIS must include an assessment of the relevant impacts of the action on the matters protected by the controlling provisions, including: ○ a description and detailed assessment of the nature and extent of the likely direct, indirect and ○ consequential impacts, including short term and long term relevant impacts; ○ a statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible; ○ analysis of the significance of the relevant impacts; and ○ any technical data and other information used or needed to make a detailed assessment of the relevant impacts.	**Appendix C of Appendix 8**
General Requirement	Avoidance, mitigation and offsetting • For each of the relevant matters protected that are likely to be significantly impacted by the action, the EIS must provide information on proposed avoidance and mitigation measures to manage the relevant impacts of the action including: ○ a description, and an assessment of the expected or predicted effectiveness of the mitigation measures; ○ any statutory policy basis for the mitigation measures; ○ the cost of the mitigation measures; ○ an outline of an environmental management plan that sets out the framework for continuing management, mitigation and monitoring programs for the relevant impacts of the action, including any provisions for independent environmental auditing; ○ the name of the agency responsible for endorsing or approving each mitigation measure or monitoring program.	**Appendix C of Appendix 8**

Issues	SEARs	Section
General Requirement	• Where a significant residual adverse impact to a relevant protected matter is considered likely, the EIS must provide information on the proposed offset strategy, including discussion of the conservation benefit associated with the proposed offset strategy.	**Appendix C of Appendix 8**
General Requirement	• For each of the relevant matters likely to be impacted by the action the EIS must provide reference to, and consideration of, relevant Commonwealth guidelines and policy statements including any: ○ conservation advice or recovery plan for the species or community; ○ relevant threat abatement plan for the species or community; ○ wildlife conservation plan for the species; and ○ any strategic assessment. Note: the relevant guidelines and policy statements for each species and community are available from the Department of the Environment Species Profiles and Threats Database. https://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl	**Appendix C of Appendix 8**
General Requirement	• In addition to the general requirements described above, specific information is required with respect to each of the determined controlling provisions. These requirements are outlined in paragraphs 15-18.	**Appendix C of Appendix 8**
Key Issue: Biodiversity (threatened species and communities)	Assessment Requirements • The EIS must identify each EPBC Act listed threatened species and community likely to be impacted by the action. For any species and communities that are likely to be impacted, the proponent must provide a description of the nature, quantum and consequences of the impacts. For species and communities potentially located in the project area or in the vicinity that are not likely to be impacted, provide evidence why they are not likely to be impacted.	**Appendix C of Appendix 8**
Key Issue: Biodiversity (threatened species and communities)	• For each of the EPBC Act listed threatened species and communities likely to be impacted by the action the EIS must provide a separate: ○ description of the habitat (including identification and mapping of suitable breeding habitat, suitable foraging habitat, important populations and habitat critical for survival), with consideration of, and reference to, any relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plans; ○ details of the scope, timing and methodology for studies or surveys used and how they are consistent with (or justification for divergence from) published Australian Government guidelines and policy statements; ○ description of the relevant impacts of the action having regard to the full national extent of the species or community's range;	**Appendix C of Appendix 8**

Issues	SEARs	Section
	○ description of the specific proposed avoidance and mitigation measures to deal with relevant impacts of the action; ○ identification of significant residual adverse impacts likely to occur after the proposed activities to avoid and mitigate all impacts are taken into account; ○ a description of any offsets proposed to address residual adverse significant impacts and how these offsets will be established. ○ details of how the current published NSW Biodiversity Assessment Method (BAM) has been applied in accordance with the objects of the EPBC Act to offset significant residual adverse impacts; and ○ details of the offset package to compensate for significant residual impacts including details of the credit profiles required to offset the action in accordance with the BAM and/or mapping and descriptions of the extent and condition of the relevant habitat and/or threatened communities occurring on proposed offset sites.	
Key Issue: Biodiversity (threatened species and communities)	Note: For the purposes of approval under the EPBC Act, it is a requirement that offsets directly contribute to the ongoing viability of the specific protected matter impacted by a proposed action and deliver an overall conservation outcome that improves or maintains the viability of the MNES i.e. 'like for like'. Like-for-like includes protection of native vegetation that is the same ecological community or habitat being impacted (preferably in the same region where the impact occurs), or funding to provide a direct benefit to the matter being impacted e.g. threat abatement, breeding and propagation programs or other relevant conservation measures. • Any significant residual impacts not addressed by the BAM may need to be addressed in accordance with the EPBC Act 1999 Environmental Offset Policy. https://www.dcceew.gov.au/environment/epbc/publications/epbc-act-environmental-offsets-policy	**Appendix C of Appendix 8**
Other Approvals and Conditions	• Information in relation to any other approvals or conditions required must include the information prescribed in Schedule 4 Clause 5 (a) (b) (c) and (d) of the EPBC Regulations.	**Appendix C of Appendix 8**
Environmental Record of person proposing to take the action	• Information in relation to the environmental record of a person proposing to take the action must include details as prescribed in Schedule 4 Clause 6 of the EPBC Regulations.	**Appendix C of Appendix 8**
Information Sources	• For information given in an EIS, the EIS must state the source of the information, how recent the information is, how the reliability of the information was tested; and what uncertainties (if any) are in the information.	**Appendix C of Appendix 8**

A1.2 Engagement

Engagement for the Project has been undertaken in accordance with the Engagement Guidelines (DPHI, 2026c). Engagement was undertaken throughout the assessment process using a proportionate and fit-for-purpose approach that reflected the scale, complexity and potential social impacts of the Project.

The engagement program, as outlined in **Section 5.0** included stakeholder and rights holder identification, targeted landholder and stakeholder interviews, community surveys, information sessions and ongoing opportunities for stakeholders to obtain information and provide feedback.

Engagement outcomes informed the development of the social baseline, identification and evaluation of social impacts, and the preparation of mitigation and enhancement measures.

Implementation of Engagement Guidelines

Consistent with the objectives of the Engagement Guidelines, all Project-related engagement followed a transparent, evidence-based and participatory process and establishes a framework for ongoing engagement, monitoring and adaptive management throughout the life of the Project, as documented in the SIA (**Appendix 20**) and associated CSEP (Appendix B of **Appendix 20**).

As outlined in Appendix A of the Engagement Guidelines, during the 'Preparing the EIS Phase' the following expectations for engagement are to be met by the proponent:

1. implement any engagement activities required by the SEARs (including engagement with relevant government agencies, council and the community)
2. inform the community about the opportunities to engage
3. explain how community feedback will be considered and documented
4. provide relevant information in plain English so that potential impacts and implications can be readily understood
5. be clear about the level of influence engagement will have by identifying what elements can be changed as a result of feedback
6. give the community the opportunity to voice their concerns or share local knowledge so that this information can be considered early on in the planning, design and assessment
7. consider the issues raised by the community, council and relevant government agencies when making project refinements and accurately reflect how these issues have been addressed in EIS documentation
8. keep the community, council and relevant government agencies informed with up-to-date information on the project.

With the implementation of the expectations above, the community is then able to:

1. seek clarification about the project and its impacts
2. provide timely feedback to the proponent about aspects of the project which they support, do not support or wish to be adjusted
3. provide clear reasons for any concerns to enable the proponent to consider possible alternative approaches to address the issues.

Appendix Table A1.5 outlines the engagement implemented throughout the EIS assessment phase of the Project, and how it aligns with the expectations of the Engagement Guidelines. It provides specific information in relation to what mechanism was applied, its timing, relevant details of the engagement, what Engagement Guideline expectations were addressed, target Stakeholder Groups and the quantity of stakeholders engaged in each instance.

Appendix Table A1.5 Consolidated Engagement Table

Mechanism	Timing	Detail	Expectation of Guideline Addressed	Target Stakeholder Groups	Stakeholders Engaged
• Project Information Sheet #2 • Project Overview	• August 2025	• Distribution of an information sheet that provides an update on the Project including relevant information regarding the receival of SEARs.	• 2, 4	• Host and proximal landholders. • Community and Special Interest Groups. • Local business and service providers. • Traditional Owners / First Nations Communities. • Local Government. • Residents in neighbouring communities. • Broader community.	• Newsletter distributed to 190 recipients in August 2025.
• Project Information Sheet #3	• December 2025	• Distribution of an information sheet that outlines the outcomes of the scoping phase engagement program to confirm the correct interpretation and understanding of the community's perceived impacts and to provide an update on the Project planning process. The information sheet will include a QR code to the SIA survey. This content can be included in regular	• 2, 3, 4, 5, 8	• Host and proximal landholders. • Community and Special Interest Groups. • Local business and service providers. • Traditional Owners / First Nations Communities. • Local Government. • Residents in neighbouring communities. • Broader community.	• Newsletter distributed to 1,166 recipients in December 2025.

Mechanism	Timing	Detail	Expectation of Guideline Addressed	Target Stakeholder Groups	Stakeholders Engaged
		newsletters if already developed or can form a stand-alone project newsletter.			
• Project Information Sheet #4	• To be distributed during exhibition of the Project EIS	• Distribution of a Project Newsletter which provides an update on the Project and inclusion of outcomes of the technical assessments summarised. This will be sent out during the exhibition phase.	• 2, 3, 4, 8	• Host and proximal landholders. • Community and Special Interest Groups. • Local business and service providers. • Traditional Owners / First Nations Communities. • Local Government. • Residents in neighbouring communities. • Broader community.	• TBC – to be completed during the exhibition phase.
• Targeted SIA Interviews with Key Stakeholders and Community Members	• 19 November 2025 – 27 November 2025	• This round of interviews focuses on validating social impacts identified in the scoping phase and identifying and developing mitigation and enhancement measures. • Interview guides and survey instruments – to guide discussions with key stakeholders and community members, including discussion points such as top of mind	• 1 (further consultation with State departments outlined in Section 5.4.4 of the EIS), 5, 6, 7, 9, 10, 11	• Host and neighbouring landholders. • Key stakeholder groups: • NSW Farmers – Hunter Branch. • Stop the Spin. • Hunter Region Landcare Network. • Singleton Beef and Land Management Association. • Rural Fire Service (Muscle Creek, St Claire, McCully's Gap). • Fire and Rescue NSW	• 19 contacted • 2 completed

Mechanism	Timing	Detail	Expectation of Guideline Addressed	Target Stakeholder Groups	Stakeholders Engaged
		associations with wind farms, level of knowledge and awareness of the Project, perceived impacts of the proposed Project, mitigation and enhancement measures to address these impacts, community values, needs and aspirations, and preferences for engagement and information provision.		• Upper Hunter Community Services. • Wonnarua Nation Aboriginal Corporation. • Wanaruah Local Aboriginal Land Council. • Hunter Valley Aboriginal Council. • Muswellbrook Shire Council. • Singleton Council. • Upper Hunter Shire Council.	
• Targeted AES Interviews	• 20 - 27 November 2025	• These interviews will be targeted towards the Accommodation and Employment Strategy in understanding the capacity of local business and service providers in the local area to support the Project and how the Project might impact access to these services.	• 3, 4, 5, 6	• Local businesses and service providers. e.g. • Muswellbrook Chamber of Commerce & Industry (Inc). • Home In Place – Muswellbrook. • WorkPac Muswellbrook. • Rural Fire Service (Singleton). • Short term accommodation providers in Muswellbrook, Singleton and Upper Hunter LGAs	• 7 contacted • 0 completed
• Community Project Information Sessions (x2)	• 12 August 2025 • 13 August 2025 • 13 May 2026	• To provide an update on the Project and the assessment and approvals process, and an overview of results and outputs of the EIS and technical studies. These	• 3, 4, 5, 6, 9, 10, 11	• Host and neighbouring landholders. • Community and Special Interest Groups. • Traditional Owners / First Nations Communities.	• 5 attendees (13/08/2025) • 15 attendees (12/08/2025)

Mechanism	Timing	Detail	Expectation of Guideline Addressed	Target Stakeholder Groups	Stakeholders Engaged
		occurred at the following locations: ○ Hebden Community Hall. ○ Mt Olive Community Centre.		• Local Government. • Residents in neighbouring communities. • Broader community. • Other industry.	
• Attendance at a Community Consultation Forum for Energy Projects	• 13 May 2026	• Ark Energy attended and presented at a community consultation evening alongside other energy developers, EnergyCo and the Energy & Water Ombudsman NSW which was focused on local energy projects, providing an opportunity for the community to hear directly from renewable energy proponents and ask questions about projects proposed or operating in the region. This forum was held at the McCully's Gap Community Hall.	• 6, 7, 8 and 10	• Host and neighbouring landholders. • Community and Special Interest Groups. • Local Government • Residents in neighbouring communities. • Broader community. • Other industry.	• ~80 attendees

Key issues raised during community engagement and where these issues have been addressed in the EIS

Appendix Table A1.6 identifies the key issues raised during community engagement undertaken for the Project and indicates where these matters have been addressed in the EIS. The table has been prepared to satisfy the requirements of Section 3.6 of the *State Significant Development Guidelines – Preparing an Environmental Impact Statement – Appendix B* (DPIE, 2026b). The frequencies presented in the table below are based on responses from 35 participants in the community survey undertaken for the Project, noting that respondents were able to select multiple responses.

Appendix Table A1.6 Key issues identified during community engagement for the Project and where these issues have been addressed in the EIS

Key Issue	Issue Categorisation	Frequency	Section Addressed
Reduced sense of place due to presence of WTGs and altered landscape character (three (3) public viewpoints as per LCVIA).	Negative	16	**Section 6.2** **Appendix 6** **Section 6.12** **Appendix 20**
Reduced public safety due to increased traffic and road deterioration.	Negative	12	**Section 6.7** **Appendix 11** **Section 6.12** **Appendix 20**
Social amenity and way of life impacts due to noise.	Negative	11	**Section 6.3** **Appendix 7** **Section 6.12** **Appendix 20**
Lack of trust in planning and assessment processes due to perceived inability to influence decision making systems.	Negative	11	**Section 6.12** **Appendix 20**
Inequitable distribution of Project impacts and benefits in the local area.	Negative	10	**Section 6.12** **Appendix 20**
Loss of environmental values of importance to community e.g. flora and fauna.	Negative	10	**Section 6.4** **Appendix 8**
Reduced public safety due to potential change in bushfire risk.	Negative	10	**Section 6.11.4** **Appendix 18**
Reduced community cohesion due to differing attitudes and feelings towards Project.	Negative	9	**Section 6.12** **Appendix 20**
Disruption to agricultural operations and changes in operating costs.	Negative	8	**Section 6.10** **Appendix 14** **Section 6.13** **Appendix 21**

Key Issue	Issue Categorisation	Frequency	Section Addressed
Lack of trust in BCWF due to perceived inadequate information provision.	Negative	7	**Section 5.0** **Appendix A1.2** **Section 6.12** **Appendix 20**
Consultation fatigue resulting from an extended planning process resulting in some cases in increased stress and anxiety.	Negative	7	**Section 6.12** **Appendix 20**
Altered access for aerial firefighting due to height, quantity and presence of WTGs.	Negative	6	**Section 6.11.1** **Appendix 15**
Livelihood impact due to decreased property values and increase in insurance premiums.	Negative	6	**Section 6.12** **Appendix 20**
Reduced public safety and security due to increased workers in the area.	Negative	5	**Section 6.12** **Appendix 20**
Degradation of environmentally valued areas due to inadequate rehabilitation and production of waste during the decommissioning phase.	Negative	4	**Section 3.2.12** **Section 6.14** **Appendix 14**
Reduced access to water due to construction activities and associated use resulting in impacts on livelihood and way of life.	Negative	3	**Section 6.8** **Appendix 12** **Section 6.12** **Appendix 20**
Uncertainty, stress and anxiety related to the planning process.	Negative	3	**Section 6.12** **Appendix 20**
Temporary increase in population, increasing pressure on housing and accommodation (affordability and availability).	Negative	3	**Section 6.12** **Appendix 20** **Section 6.16**
Limited sustainable employment for local people offered by the Project.	Negative	3	**Section 6.12** **Appendix 20** **Section 6.13** **Appendix 21**
Social amenity and way of life impacts due to dust.	Negative	2	**Section 6.9** **Appendix 13**
Increased pressure on local health and emergency services resulting in access impacts and increased wait times.	Negative	2	**Section 6.12** **Appendix 20**
Concern regarding health and wellbeing impacts due to noise and light/ shadow flicker.	Negative	2	**Section 6.3** **Appendix 7** **Section 6.12** **Appendix 20**

Key Issue	Issue Categorisation	Frequency	Section Addressed
Concern regarding physical health and wellbeing impacts due to potential chemical contamination of surface/ ground water and air.	Negative	2	**Section 6.15** **Appendix 22**
Social amenity and way of life impacts due to lighting.	Negative	1	**Section 6.12** **Appendix 20**
Reduced access to telecommunications, with further deterioration of already poor television and mobile reception caused by interference from WTGs.	Negative	1	**Section 6.11.2** **Appendix 16**
Concern regarding decline in physical health due to potential exposure to electromagnetic fields (EMF).	Negative	1	**Section 6.11.3** **Appendix 17**
Facilitation of the energy transition and progress towards net zero targets.	Positive	8	**Section 2.1** **Section 2.7** **Section 7.0**
Community investment initiatives and funds allocated to improve social outcomes for local communities.	Positive	4	**Section 2.5.3**
Increased training, education and capacity building for local people.	Positive	4	**Section 6.12** **Appendix 20**
Provision of additional sources of income for landholders, enhancing local livelihoods.	Positive	3	**Section 6.12** **Appendix 20**
Local employment and procurement opportunities.	Positive	3	**Section 6.12** **Appendix 20** **Section 6.13** **Appendix 21**

Appendix 2

Schedule of Lands

A2.1 Schedule of Lands

Table A2.1 Schedule of Lands – Project Area

Lot	DP
1	1120432
1	1120433
1	1120434
10	1120434
10	127321
10	752460
111	752460
112	752460
120	752465
124	752465
126	752465
127	752465
128	752465
129	752465
131	752465
132	752465
133	752460
133	752465
134	752465
142	752465
143	752465
144	752465
145	752465
146	752465
147	752465
153	752460
154	752460
155	752460
156	752460
157	752460
158	752460
159	752460
168	752460
177	752460
187	752460

Lot	DP
188	752460
189	752460
190	752460
193	752460
194	752460
195	752460
2	1120432
2	1120433
2	1120434
2	558324
20	752465
206	752460
207	752460
208	752460
209	752460
210	752460
211	752460
212	752460
213	752460
214	752460
215	752460
262	752460
265	752460
266	752460
28	752465
281	752460
291	752460
293	752460
295	752460
3	1120432
3	1120433
3	1120434
32	752460
38	752460
4	1120432
4	1120433
4	1120434
473	1240509

Lot	DP
5	1120433
5	1120434
5	434309
51	752465
52	752465
53	752465
54	752465
55	752465
6	1120433
6	1120434
7	1120433
7	1120434
8	1120433
8	1120434
83	752460
84	752460
9	1120433
9	1120434
9	127321
A	376015
B	376015

Table A2.2 Schedule of Lands – Offsite Road Work Areas

Lot	Plan
1	1167323
3	1120432
4	1120432
5	1077004
23	752460
32	545601
34	6842
39	6842
41	1191982
42	1191982
147	752465
215	752460
228	752470
332	1176879

Table A2.3 Schedule of Lands – Road Reserves

Road Reserves (including State, Local and Crown Roads)
Crown Road Reserves
Albano Road (Bowmans Creek)
Bowmans Creek Road (Bowmans Creek)
Scrumlo Road (Hebden)
Hebden Road (North) (Hebden)
Hebden Road (South) (Ravensworth)
New England Highway (Ravensworth)
Selwyn Street (Mayfield)
Industrial Drive (Mayfield)
George St (Mayfield)
Maitland Road (Mayfield)
John Renshaw Drive (Buchanan)
Hunter Expressway (Buchanan)

Appendix 3

Detailed Maps and Plans

Appendix 4

Statutory Compliance Table



Appendix Table A4.1 Statutory Compliance Table

Relevant Legislation	Pre-condition	Relevance	Relevant EIS Section
NSW Legislation	-	-	-
State Environmental Planning Policy (Biodiversity and Conservation) 2021 (Biodiversity and Conservation SEPP)	Councils are restricted from granting development consent for proposals on land identified as core koala habitat without the preparation of a plan of management.	SEPP (Biodiversity and Conservation) 2021 commenced in March 2022 and includes a number of previous planning policies including Koala Habitat Protection 2020 and Koala Habitat Protection 2021, Chapter 3 and 4, respectively. Schedule 2 identifies that the provisions of chapters 3 and 4 apply in the Muswellbrook and Singleton LGAs. For all RU1 (Primary Production) zoned land outside of the Sydney Metropolitan Area and Central Coast, SEPP Koala Habitat Protection 2020 continues to apply, though it does not establish any specific obligations or considerations for SSD.	**Appendix 8**
State Environmental Planning Policy (Resilience and Hazards) 2021	Chapter 4 of State Environmental Planning Policy (Resilience and Hazards) 2021 provides that remediation of contaminated land is subject to specified approval pathways, with certain remediation works requiring development consent under the Environmental Planning and Assessment Act 1979. In particular, it aims to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment.	The construction and operational phases of the Project will be appropriately managed to prevent contamination, and any spills (e.g. hydrocarbons from mobile equipment during construction) will be cleaned up and the sites remediated. Decommissioning and rehabilitation following the closure of the Project will be undertaken in accordance with relevant consent conditions and legislation/licence requirements and will include consideration of any contamination risks and remediation requirement associated with Project infrastructure (e.g. WTGs and substations).	**Section 6.4**, **Section 6.10.5**, **Section 6.11**, and **Section 6.14.3** of the EIS

Relevant Legislation	Pre-condition	Relevance	Relevant EIS Section
State Environmental Planning Policy (Resilience and Hazards) 2021 (Resilience and Hazard SEPP)	The Resilience and Hazards SEPP requires a consent authority to consider whether an industrial development is a potentially hazardous industry or a potentially offensive industry. A preliminary hazard assessment (PHA) is to be completed for potentially hazardous developments to assist the consent authority to determine acceptability.	A preliminary hazard risk screening has been undertaken in accordance with the Resilience and Hazards SEPP. As no BESS is proposed for the Project, preparation of a standalone PHA is not required.	**Section 6.11.6** of the EIS
State Environmental Planning Policy (Transport and Infrastructure) 2021 (T&I SEPP)	Clause 2.36(1)(b) of the T&I 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 T&I SEPP, the provisions prevail where there are inconsistencies with any other environmental planning instruments, including LEPs.	The Project Area is zoned RU1 Primary Production under the Muswellbrook LEP and Singleton LEP. RU1 is a 'prescribed zone' under the relevant provisions of the T&I SEPP. As such, the Project is permissible with development consent by operation of the Infrastructure SEPP.	**Section 4.0** of the EIS
***Biodiversity Conservation Act 2016* (BC Act)**	Under the BC Act, biodiversity assessment in accordance with the Biodiversity Assessment Method (BAM) is required for any State significant development (SSD) project.	A comprehensive biodiversity assessment has been undertaken in accordance with the NSW BAM.	**Section 6.4** and **Appendix 8** of the EIS
***Protection of the Environment Operations Act 1997* (POEO Act)**	The POEO Act regulates pollution to the environment and requires licences for environmental protection including waste, air, water and noise pollution control. Wind farms are a scheduled activity under the POEO Act and require an Environment Protection Licence (EPL).	Being a wind farm development, the Project will require an EPL. Should the Project be approved, an EPL would be sought in relation to the construction and operation of the Project.	Not applicable

Relevant Legislation	Pre-condition	Relevance	Relevant EIS Section
***Water Management Act 2000* (WM Act)**	Any water extractions (take) from water sources (surface and groundwater) regulated by a Water Sharing Plan (WSP) for construction purposes requires licensing under the WM Act.	The Project will require water for construction and ongoing operations. The majority of the Project's raw water needs would be captured on site, with any additional requirements transported to site through a registered provider.	**Section 6.8** and **Appendix 12** of the EIS
Roads Act 1993 (Roads Act)	A consent is required under Section 138 to work on or above a road or to connect a road to a classified road.	The Project proposes a range of minor road upgrades as described in **Section 3.2.9** of the EIS. A Section 138 approval will be sought from TfNSW and the applicable Councils, as required.	**Section 6.7** and **Appendix 11** of the EIS
Crown Land Management Act 2016 (Crown Land Act)	The Crown Land Act provides for the administration and management of Crown Land in NSW. Crown land may not be occupied, used, sold, leased, licensed, dedicated, reserved or otherwise dealt with unless authorised by the Crown Land Act.	There are areas of Crown land reserves and roads present within the Project Area. BCWF will continue to engage with NSW Crown Lands to ensure the requirements of the Crown Land Act are met in respect of the Project.	**Section 2.3.1** of the EIS
***Contaminated Land Management Act 1997* (CLM Act)**	The CLM Act establishes the process for investigating and if required, remediating land that the NSW Environment Protection Authority (EPA) considers to be contaminated significantly enough to require regulation under Division 2 of Part 3.	The Project Area does not contain land listed on the Contaminated Lands Register and is not known to contain any contaminated land.	Not applicable
Commonwealth Legislation	-	-	-
***Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)**	Under the EPBC Act, the approval of the Commonwealth Minister for the Environment is required for any action that may have a significant impact on a matter of national environmental significance (MNES).	The Project was referred to the Commonwealth Minister for the Environment (EPBC 2024/10013). On 24 March 2025, the Project was declared a Controlled Action under section 75 of the	**Section 6.4** and **Appendix 8** of the EIS

Relevant Legislation	Pre-condition	Relevance	Relevant EIS Section
	Approval under Part 9 of the EPBC Act is required for actions that may result in a significant impact on MNES.	EPBC Act on the basis of likely significant impacts to listed threatened species and communities (section 18 and 18A) under the EPBC Act. It was further determined that the Project will be assessed under the Bilateral Agreement between NSW and the Commonwealth (Amending Agreement No. 1). The Controlled Action Decision (EPBC 2024/10013) is provided in **Appendix 1** of the EIS. Supplementary SEARs were subsequently issued by the former NSW Department of Planning and Environment. The Supplementary SEARs are included in **Appendix 1** of the EIS, along with a list of protected matters identified by the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) as relevant to the Project. These requirements are addressed in detail in Appendix C of **Appendix 8** of the EIS.	
Native Title Act 1993 **(NT Act)**	The NT Act recognises the interests and rights Aboriginal people have to land and aims to provide recognition and protection of common law native title rights.	No Native Title Claims and no Indigenous Land-Use Agreements (ILUAs) have been registered or notified by the National Native Title Tribunal as being in place over the Study Area.	**Section 6.5** and **Appendix 9** of the EIS

Relevant Legislation	Pre-condition	Relevance	Relevant EIS Section
Civil Aviation Regulations 1988	The Civil Aviation Regulations 1998 require any potential aviation obstacles and hazards be assessed under the National Airports Safeguarding Framework Guideline D: Managing Wind Turbine Risk to Aircraft.	The Project may be considered an aviation obstacle. An Aviation Impact Assessment (AIA) has been undertaken to support the Project. An Obstacle Lighting Plan (OLP) has been prepared as Annexure 6 of the AIA.	**Section 6.11.1** and **Appendix 15** of the EIS
Heavy Vehicle (Adoption of National Law) Act 2013	Relevant approvals under the Heavy Vehicle (Adoption of National Law) Act 2013 will be required for the transport of wind turbines and associated infrastructure by OSOM vehicles.	The Project will require the use of OSOM vehicles to transport wind turbines and associated infrastructure to the Project Area.	**Section 6.7** and **Appendix 11** of the EIS
Radio Communications Act 1992	Under Part 4.1 of the Radio Communications Act 1992, a legislative framework has been established to regulate equipment that uses or is affected by radio emissions.	Radio communications can be impacted by proposed wind farms through electromagnetic interference (EMI) produced by the turbines.	**Section 6.11.2** and **Appendix 16** of the EIS

Appendix Table A4.2 Mandatory Considerations Table

Relevant Legislation	Mandatory Consideration	Relevance	Reference
Considerations under the EP&A Act and EP&A Regulation	-	-	-
Objects of the Act (Section 1.3) Relevant objects of the Act include:	• 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 • to protect the environment, including the conservation of threatened species of native animals and plants and ecological communities and their habitats • to promote the sustainable management of built and cultural heritage, including Aboriginal cultural heritage • to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment • to promote the orderly and economic use and development of land.	The Project aims to provide a reliable and affordable source of energy for the people of NSW. The Project will also contribute to reducing greenhouse gas (GHG) emissions associated with energy generation and provide significant economic benefits to the region. The Project is therefore strategically located in an area identified by the NSW Government as suitable for renewable energy projects and will assist the NSW Government in delivering on the objectives for the Electricity Strategy and the Hunter-Central Coast REZ. The Project has been designed through a comprehensive process that incorporates community and stakeholder feedback and the findings of environmental and social studies to maximise positive social and economic outcomes while minimising adverse impacts to the environment, built and cultural heritage. As such, it is considered to represent an orderly and economic use of land.	**Section 7.0** of the EIS
Evaluation (Section 4.15) In determining a development application, a consent authority is to take into consideration such of the following matters as are of	(i) Any environmental planning instrument that apply to the land to which the development application relates.	Relevant environmental planning instruments are listed in the next sub-section of this table (see below).	Refer below

Relevant Legislation	Mandatory Consideration	Relevance	Reference
relevance to the development the subject of the development application— (4)(a) the provisions of:			
Evaluation (Section 4.15) In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application— (4)(a) the provisions of:	(ii) Any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved) that apply to the land to which the development application relates.	At the time of preparing this EIS, there were no known proposed environmental planning instruments that are relevant to the application.	Not applicable
Evaluation (Section 4.15) In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application— (4)(a) the provisions of:	(iii) Any development control plan that apply to the land to which the development application relates.	As per Clause 2.10 of the Planning Systems SEPP, development control plans do not apply to SSD projects.	Not applicable
Evaluation (Section 4.15) In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development	(iii) (a) Any planning agreement that has been entered into under section 7.4, or any draft planning agreement that a developer has offered to enter into under section 7.4 that apply to the land to which the development application relates.	BCWF is committed to entering into a Planning Agreement with Muswellbrook Shire Council and Singleton Council in respect of the Project.	**Section 2.5.4**

Relevant Legislation	Mandatory Consideration	Relevance	Reference
the subject of the development application— (4)(a) the provisions of:			
Evaluation (Section 4.15) In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application— (4)(a) the provisions of:	(iv) The regulations (to the extent that they prescribe matters for the purposes of this paragraph) that apply to the land to which the development application relates.	This EIS has been prepared in accordance with the requirements of the EP&A Regulation.	Throughout the EIS
(b) The likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality	-	A detailed assessment has been undertaken with respect to the Project's environmental social and economic impacts, as documented within this EIS.	**Section 6.0** and the various specialist assessment reports provided in the Appendices.
(c) The suitability of the site for the development	-	The site is considered suitable for the Project for the reasons outlined in **Section 7.2** of the EIS.	**Section 7.2**
(d) Any submissions made in accordance with this Act or the regulations	-	Not Applicable.	Not applicable
(e) The public interest	-	The approval of the Project is considered to be in the public interest for the reasons outlined in **Section 7.0**.	**Section 7.0**
Section 4.24	Relevant concept approval.	There are no concept approvals relevant to the Project.	Not applicable

Relevant Legislation	Mandatory Consideration	Relevance	Reference
Section 4.63	Voluntary surrender of development consent i.e. if a development consent is to be surrendered as a condition of a new development consent.	The Stage 1 project development consent (SSD-10315) would not be surrendered as a condition of the Bowmans Creek Wind Farm Stage 2 (i.e. the Project) SSDA and subsequent development consent.	Not applicable
Division 4.11(section 4.65 and section 4.66)	Existing uses, and continuance of and limitations on existing uses.	Approval for the Stage 1 project (SSD-10315) was provided by way of an EPI. As such, no existing rights prior to the commencement of the Act would be impacted with the inclusion of the Project as a related development to the Stage 1 project. Additionally, the inclusion of the Project as related development to the Stage 1 project would not prevent the continuance of the Stage 1 project i.e. there is no limitation on existing uses with the inclusion of the Project.	Not applicable
Considerations under other legislation	-	-	-
BC Act (NSW)	Under the BC Act, biodiversity assessment in accordance with the Biodiversity Assessment Method (BAM) is required for any SSD project. The likely impact of the proposed development on biodiversity values as assessed in the biodiversity development assessment report. The Minister for Planning may (but is not required to) further consider under that Act the likely impact of the proposed development on biodiversity values.	A BDAR has been completed for the Project in accordance with the NSW BAM.	**Appendix 8**

Relevant Legislation	Mandatory Consideration	Relevance	Reference
Civil Aviation Regulations 1988 (Cth)	Reporting of tall structures to the Royal Australian Air Force (RAAF) is required under the Civil Aviation Regulations 1988.	Development of the Project will require installation of tall structures. A detailed Aviation Impact Assessment in accordance with the regulations and consultation with the relevant agencies has been undertaken as part of the preparation of the EIS.	**Appendix 15**
Consideration under EPI's	-	-	-
State Environmental Planning Policy (Resilience and Hazards) 2021 (Resilience and Hazards SEPP) Chapter 3 Hazardous and offensive development Chapter 4 Remediation of Land		• In accordance with Section 3.7 of the Hazards SEPP, this EIS has considered current circulars and guidelines published by the Department that relate to hazardous or offensive development, including: • Hazardous Industry Advisory Paper No. 4 – Risk Criteria for Land Use Safety Planning (HIPAP 4) (Department of Planning, 2011). • Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis (HIPAP 6) (Department of Planning, 2011). • Multi-Level Risk Assessment (Department of Planning, 2011). • Planning for Bush Fire Protection 2019 (NSW RFS, 2019). • A Preliminary hazard risk screening has been developed for the Project (**Section 6.11.6**). • Under Clause 4.6, a consent authority is required to consider whether a proposed development site is affected by soil or other contaminants before granting consent. • An Agricultural Impact Assessment provides further discussion on the potential impacts	**Section 6.11.6** and **Appendix 14** of this EIS

Relevant Legislation	Mandatory Consideration	Relevance	Reference
		on soil and agriculture resources associated with the Project (**Appendix 14**).	
State Environmental Planning Policy (Biodiversity and Conservation) 2021 (Biodiversity and Conservation SEPP)	Nil	The SEPP does not establish any specific mandatory considerations for SSD.	**Appendix 8**
State Environmental Planning Policy (Resources and Energy) 2021 (Resources and Energy SEPP)	Clause 2.19 of the Resources and Energy SEPP provides that a consent authority must consider the compatibility of proposed development with mining, petroleum production or extractive industry where development is proposed on land that is, immediately before the application is determined— (a) in the vicinity of an existing mine, petroleum production facility or extractive industry, or (b) identified on a map (being a map that is approved and signed by the Minister and copies of which are deposited in the head office of the Department and publicly available on the Department's website) as being the location of State or regionally significant resources of minerals, petroleum or extractive materials, or Note— At the commencement of this Chapter, no land was identified as referred to in paragraph (b). (c) identified by an environmental planning instrument as being the location of significant resources of minerals, petroleum or extractive materials.	There were no current mining leases or explorations licences identified within the Project Area, or with 10 km of the Project Boundary at the time of preparing this EIS (Regional NSW, 2025). The closest coal operation to the Project Boundary is Liddell Coal Operations (LCO), an established open-cut mine at Ravensworth, approximately 10 km south of the Project Boundary. There are no resources of minerals, petroleum or extractive materials of State or regional significance identified in the Project Area. As such, Clause 2.19 is not relevant to the development.	**Section 2.3** of the EIS

Relevant Legislation	Mandatory Consideration	Relevance	Reference
	Note— Sydney Regional Environmental Plan No 9—Extractive Industry (No 2—1995) is an example of an environmental planning instrument that identifies land as containing significant deposits of extractive materials.		
State Environmental Planning Policy (Primary Production) 2021 (Primary Production SEPP)	The primary Production SEPP contains planning provisions to manage primary production and rural development, including supporting sustainable agriculture for the protection of prime agricultural land of state and regional significance, as well as regionally significant mining and extractive resources.	A detailed Land, Soils and Agriculture Assessment has been undertaken for the Project, informed by a soil survey.	**Appendix 14**

Appendix Table A4.3 Local Environmental Plan Provisions–Muswellbrook Local Environmental Plan 2009

Provisions	Relevance	Relevant EIS Section
The EIS addresses relevant components of the Muswellbrook LEP. The aims of the plan relevant to the Project include: (a) to encourage the proper management of the natural and human-made resources of Muswellbrook by protecting, enhancing or conserving— (i) productive agricultural land, and (ii) timber, minerals, soils, water and other natural resources, and (iii) areas of significance for nature conservation, and (iv) areas of high scenic or recreational value, and (c) to promote ecologically sustainable urban and rural development, (d) to manage development in flood-prone areas by ensuring any obstruction, re-direction or pollution of flood waters will not have adverse consequences for the environment or increase the risk of endangering life or property, (e) to enhance the urban amenity and habitat for flora and fauna, (f) to protect and conserve— (i) soil stability by controlling development in accordance with land capability, and (ii) remnant native vegetation, and (iii) water resources, water quality and wetland areas, natural flow patterns and their catchments and buffer areas,	Impacts to productive agricultural land have been assessed as minimal, temporary and limited to the Project's Development Corridor. The Project will result in the temporary removal of 180 ha of land within the Project Area from agricultural land use for the duration of the Project. BCWF has committed to a range of mitigation strategies to minimise land use conflicts with surrounding agricultural uses during the life of the Project and to ensure that the Project Area is returned to its pre-disturbance agricultural capability and land use following the conclusion of the Project. Natural resources such as soil stability will also be protected through a range of mitigation measures including ground and sediment controls with particular focus on areas within 40 m of a water way and stream. The Project design has undergone iterative development and refinement and has aimed avoided areas of significant biodiversity value and remnant native vegetation. There is no land within the Project Area that is zoned C1 National Parks and Nature Reserves or C3 Environmental Management. A Landscape Character Assessment (LCA) which determined that the landscape visual impact rating of the Project is anticipated to be low or very low in all landscape character zones. The Project is considered to represent ecologically sustainable development (ESD) on the basis that: • It will provide for cleaner reliable electricity generation and assist with meeting current load demand while reducing greenhouse gas emissions and the impacts of climate change. • The Project has been designed to avoid and minimise environmental, biodiversity, cultural heritage and social impacts where practical through careful design and best practice environmental protection and impact mitigation. Where impacts cannot be avoided or minimised, they will be offset in accordance with applicable State and Commonwealth Government policies.	**Appendix 6** **Appendix 8** **Appendix 12** **Appendix 14** **Section 6.2** **Section, 6.4** **Section, 6.8** **Section 6.10** **Section 7.1** **Section 7.3**

Provisions	Relevance	Relevant EIS Section
(g) to provide a secure future for agriculture by expanding Muswellbrook's economic base and minimising the loss or fragmentation of productive agricultural land	• With the implementation of measures outlined in the Construction Soil and Water Management Plan (CSWMP), potential water quality impacts during construction and decommissioning are expected to be minor, localised, and temporary. No controlled discharges to surface watercourses are required, and overall catchment yield reductions from containment of runoff are expected to be negligible.	
Zone Objectives: RU1 Primary Production • To encourage sustainable primary industry production by maintaining and enhancing the natural resource base. • To encourage diversity in primary industry enterprises and systems appropriate for the area. • To minimise the fragmentation and alienation of resource lands. • To minimise conflict between land uses within this zone and land uses within adjoining zones. • To protect the agricultural potential of rural land not identified for alternative land use, and to minimise the cost to the community of providing, extending and maintaining public amenities and services. • To maintain the rural landscape character of the land in the long term. • To protect or conserve (or both)— (a) soil stability by controlling development in accordance with land capability, and (b) trees and other vegetation, and (c) water resources, water quality and wetland areas, and their catchments and buffer areas, and	The Project is compatible with the zone objectives on the basis that: • The Project will facilitate co-existence between agriculture and renewable energy while enabling the host landholder to diversify their income streams • A range of mitigation measures are proposed to be ensure that the potential land use conflicts with nearby land uses are appropriately managed over the life of the Project, and to ensure the Project area is suitably rehabilitated and returned to its pre-Project land capability at the conclusion of the Project. • A Landscape Character Assessment (LCA) which determined that the landscape visual impact rating of the Project is anticipated to be low or very low in all landscape character zones. • The Project protects and conserves natural resources by limiting development to land within the Development Corridor which has been designed to avoid areas of high biodiversity value and sensitive water resources. Soil stability will be maintained through erosion and sediment controls and the land rehabilitated post decommissioning. Impacts on trees, vegetation and biodiversity are minimised through careful design that avoids sensitive areas, while water resources, catchments and buffers are protected through implementation of the Construction Soil and Water Management Plan, with only minor, temporary water quality impacts expected. The Project will not compromise mineral or extractive resources, as the Project is not mapped as there are no resources of minerals, petroleum or extractive materials of State or regional significance identified in the vicinity of the Project Area.	**Appendix 6** **Appendix 8** **Appendix 12** **Appendix 14** **Section 6.2** **Section, 6.4** **Section, 6.8** **Section 6.10**

Provisions	Relevance	Relevant EIS Section
(d) valuable deposits of minerals and extractive materials by restricting development that would compromise the efficient extraction of those deposits.		
Clause 4.1 Minimum Lot Size	The Project involves subdivision to create lots smaller than specified on the Lot Size Map under the Muswellbrook LEP 2009. Notwithstanding this, may be granted for the subdivision under 4.38 of the EP&A Act. Further details are provided in **Section 4.1** of the EIS.	**Section 4.1**

Appendix Table A4.4 Local Environmental Plan Provisions – Singleton Local Environmental Plan 2013

Provisions	Relevance	Relevant EIS Section
The EIS addresses relevant components of the Singleton LEP. The aims of the plan relevant to the Project include: (c) to encourage the sustainable management, development and conservation of natural resources, (d) to protect and conserve the environmental and cultural heritage of Singleton, (f) to promote and coordinate the orderly and economic use and development of land in Singleton, (g) to provide adequate protection for, and minimise risk to, the community, as far as is practicable, from environmental hazards, including flooding and bush fire, (h) to protect and enhance watercourses, riparian habitats and water quality in Singleton.	The Project aims to sustainably manage natural resources through development which represents ecologically sustainable development (ESD) on the basis that: • It will provide for cleaner reliable electricity generation and assist with meeting current load demand while reducing greenhouse gas emissions and the impacts of climate change. • The Project has been designed to avoid and minimise environmental, biodiversity, cultural heritage and social impacts where practical through careful design and best practice environmental protection and impact mitigation. Where impacts cannot be avoided or minimised, they will be offset in accordance with applicable State and Commonwealth Government policies. • With the implementation of measures outlined in the Construction Soil and Water Management Plan (CSWMP), potential water quality impacts during construction and decommissioning are expected to be minor, localised, and temporary. No controlled discharges to surface watercourses are required, and overall catchment yield reductions from containment of runoff are expected to be negligible. • Natural resources such as soil stability will also be protected through a range of mitigation measures including ground and sediment controls with particular focus on areas within 40 m of a water way and stream.	**Appendix 6** **Appendix 8** **Appendix 12** **Appendix 14** **Section 6.2** **Section 6.4** **Section 6.8** **Section 6.10** **Section 7.1** **Section 7.3**

Provisions	Relevance	Relevant EIS Section
	• The Project design has undergone iterative development and refinement and has aimed avoided areas of significant biodiversity value and remnant native vegetation. There is no land within the Project Area that is zoned C1 National Parks and Nature Reserves oroC3 Environmental Management. • A LCA which determined that the landscape visual impact rating of the Project is anticipated to be low or very low in all landscape character zones. • The Project will not impact items of European Heritage. The Project design has also been refined to conserve and protect items of Aboriginal cultural heritage. This has included refinements to the disturbance footprint to avoid areas of high archaeological sensitivity along with subsequent refinements to avoid. • During construction, the Project will involve an estimated capital investment of approximately $260 million (excluding GST), with around $26 million expected to be retained within the ESA (as described in **Section 6.13** of this EIS). BCWF has committed to a range of mitigation measures to manage flood and bushfire risk to the local community, including the provision of asset protection zones and the integration of flood modelling into Project design.	
Zone Objectives: RU1 Primary Production: • To encourage sustainable primary industry production by maintaining and enhancing the natural resource base. • To encourage diversity in primary industry enterprises and systems appropriate for the area. • To minimise the fragmentation and alienation of resource lands. • To minimise conflict between land uses within this zone and land uses within adjoining zones.	The Project is compatible with the zone objectives on the basis that: • The Project will facilitate co-existence between agriculture and renewable energy while enabling the host landholder to diversify their income streams • A range of mitigation measures are proposed to be ensure that the potential land use conflicts with nearby land uses are appropriately managed over the life of the Project, and to ensure the Project area is suitably rehabilitated and returned to its pre-Project land capability at the conclusion of the Project. BCWF has committed to a range of mitigation strategies to minimise land use conflicts with surrounding agricultural uses during the life of the Project and to ensure that the Project Area is returned to its pre-disturbance agricultural capability and land use following the conclusion of the Project.	**Appendix 8** **Appendix 12** **Appendix 14** **Section, 6.4** **Section, 6.8** **Section 6.10**
Clause 4.1 Minimum Lot Size	Subdivision of land will not take place within Singleton LGA	**Section 4.1**

Appendix Table A4.5 Other State Approvals

Other State Approval	Description
Relevant Section – of EP&A Act: Section 4.41–Approvals that are not required Section 4.41 of the EP&A Act specifies authorisations which are not required for approved SSD	The following approvals will not be required by operation of Section 4.41: • *Fisheries Management Act 1994* – a permit under section 201, 205 or 219. • *National Parks and Wildlife Act 1974* – an Aboriginal heritage impact permit under section 90. • *Rural Fires Act 1997* – a bushfire safety authority under section 100B. • *Water Management Act 2000* – 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.
Relevant Section – of EP&A Act: Section 4.42–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	The following approvals will be required to carry out the development: • *Protection of the Environment Operations Act 1997* – an Environment Protection Licence under Chapter 3. • *Roads Act 1993* – consent(s) under section 138 for work within a public road.
Conveyancing Act 1919 (NSW) (Conveyancing Act)	The Project involves subdivision to create a new freehold lot (containing the on-site substation) and to facilitate the registration of long-term leases as described in **Section 3.2.2** of the EIS, in accordance with the requirements of the Conveyancing Act. The registration of long-term leases may occur by: • registration of plans of subdivision for lease purposes, or • such other manner as may be required under the Conveyancing Act.

Appendix 5

Mitigation Measures

Appendix Table A5.1 Consolidated Mitigation Measures Table

Aspect	ID#	Mitigation and/or Management Measure	Timing	Relevant EIS Section/Appendix
Landscape and Visual	LV01	With respect to ancillary infrastructure, the following principles will be applied: • Avoidance of unnecessary lighting, signage, logos on associated infrastructure. • Use of subtle colours and a low reflectivity surface treatment on power poles to ensure that glint is minimised. • Consideration will be given to controlling the type and colour of building materials used.	At all times during the carrying out of the development	**Section 6.2** and **Appendix 6**
Landscape and Visual	LV02	With respect to access tracks, the following principles will be applied: • Any new roads / access tracks will be constructed to minimise cut and fill and avoid the loss of vegetation. • Allow for the provision for downsizing roads or restoring access tracks to existing condition following construction where possible. • Utilise local materials where possible and practical.	During construction	**Section 6.2** and **Appendix 6**
Landscape and Visual	LV03	With respect to AHL, the following principles will be applied: • Where possible, careful consideration of WTGs upon which AHL is installed to avoid unnecessary impact upon residences. • Treatment of the rear of blades with a non-reflective coating to reduce reflection off the rotating blade at night. • Use of the lowest candela intensity allowed by CASA. • Permanent light shielding is also an option to reduce impact on residences within two (2) km of the installation.	At all times during the carrying out of the development	**Section 6.2** and **Appendix 6**
Landscape and Visual	LV04	With respect to AHL, the following principles will be applied: • AHL proposed is to be spaced around the outer edges of the Project. Lights are not required on every tower. Careful consideration has been given to the selection of turbines requiring lighting to avoid unnecessary impact upon residences; • Treat the rear of blades with a non-reflective coating to reduce reflection off the rotating blade at night; • Use of the lowest candela intensity allowed by CASA; • Shielding is to be provided to restrict the downward spill of light to the ground plane by ensuring that no more than 5% of the nominal light intensity should be emitted at or below 5° below horizontal; and • No light should be emitted at or below 10° below horizontal.	At all times during the carrying out of the development	**Section 6.2** and **Appendix 6**
Landscape and Visual	LV05	With respect to construction, BCWF will minimise visual clutter during the construction phase by limiting the number of construction vehicles, cranes, and equipment visible on-site at any given time. Equipment will be stored away from visible areas.	During construction	**Section 6.2** and **Appendix 6**
Noise & Vibration	NV01	The predicted operational wind turbine noise levels will be updated prior to construction with sound power levels of the wind turbine selected for the Project.	Operational Phase	**Section 6.3** and **Appendix 7**
Noise & Vibration	NV02	The predicted operational ancillary infrastructure noise levels will be updated prior to construction with the developed design and sound power levels of the final project design and equipment selections.	Operational Phase	**Section 6.3** and **Appendix 7**
Noise & Vibration	NV03	An operational noise management plan (ONMP) will be prepared prior to commencement of operations to outline measures to manage operational noise, including verification of compliance with applicable noise criteria.	Operational Phase	**Section 6.3** and **Appendix 7**
Noise & Vibration	NV04	Post construction noise compliance monitoring will be undertaken in accordance with the ONMP to verify operational performance and identify any requirement for contingency measures.	Operational Phase	**Section 6.3** and **Appendix 7**
Noise & Vibration	NV05	A CNVMP will be prepared prior to construction to detail measures for managing construction noise and vibration impacts, including those associated with construction traffic. This includes any specific noise management practices at select OSOM Transport Route off-site road work areas for sensitive, non-associated receivers that are identified as experiencing construction noise levels above the noise affected management level in the ICNG. Any targeted noise consultation requirements will be outlined.	During construction	**Section 6.3** and **Appendix 7**
Noise & Vibration	NV06	The CNVMP will include site specific and traffic specific noise management practices, including consultation, notification, and complaint handling procedures for receivers potentially affected by construction traffic.	During construction	**Section 6.3** and **Appendix 7**
Noise & Vibration	NV07	Feasible and reasonable work practices will be implemented during construction to minimise noise impacts from construction activities and associated vehicle movements.	During construction	**Section 6.3** and **Appendix 7**

Aspect	ID#	Mitigation and/or Management Measure	Timing	Relevant EIS Section/Appendix
Noise & Vibration	NV08	Where construction activities or traffic movements are required outside standard construction hours, additional mitigation and community consultation measures will be implemented in accordance with the CNVMP.	During construction	**Section 6.3** and **Appendix 7**
Noise & Vibration	NV09	Residents located near Scrumlo Road will be included in consultation prior to and during construction.	During construction	**Section 6.3** and **Appendix 7**
Noise & Vibration	NV10	Traffic speeds will be limited along the identified sections of Scrumlo Road, where feasible.	During construction	**Section 6.3** and **Appendix 7**
Noise & Vibration	NV11	The maximum number of OSOM movements will be limited to once or twice each night.	During construction	**Section 6.3** and **Appendix 7**
Noise & Vibration	NV12	OSOM movements will be schedules for times when adverse impact is less likely, e.g. the very start of the night period and the very end of the night period, to reduce the potential for sleep disturbance.	During construction	**Section 6.3** and **Appendix 7**
Biodiversity	BIO01	**Limit clearing of native vegetation** Minimise overall areas of native vegetation, associated TECs and threatened species habitat to be directly impacted by proposed development.	Design/DA	**Section 6.4** and **Appendix 8**
Biodiversity	BIO02	**Construction Environment Management Plan** Reduce potential for impacts from traffic, sedimentation, erosion and stormwater. Increase workforce awareness/education	Implementation to begin at commencement of construction	**Section 6.4** and **Appendix 8**
Biodiversity	BIO03	**Biodiversity Management Plan** Enable protection and enhancement of retained vegetation and reduce the introduction and spread of weeds and noxious species within the Development Corridor and adjacent areas. Minimise impacts of vegetation clearing activities and allow for hollow and foraging resource replacement strategy.	Implementation to begin at commencement of construction	**Section 6.4** and **Appendix 8**
Biodiversity	BIO04	**Micro siting of development components** Identification of site-specific constraints and minor amendment of design within previously assessed Development Corridor.	Implementation to begin during final design and commencement of construction	**Section 6.4** and **Appendix 8**
Biodiversity	BIO05	**Maintenance of buffers between WTG and vegetation, etc** Maintain free movement for birds and bats and avoid areas where interactions most likely to occur.	Design/DA	**Section 6.4** and **Appendix 8**
Biodiversity	BIO06	**Stormwater management** Minimise indirect impacts on ephemeral habitats.	Implementation to begin at commencement of construction	**Section 6.4** and **Appendix 8**
Biodiversity	BIO07	**Prepare and Implement BBAMP** Assess for impacts resulting from turbine strikes through monitoring and the implementation of adaptive management measures.	Operational phase	**Section 6.4** and **Appendix 8**
Biodiversity	BIO08	**LEPB Avoidance Area** Implementation of the LEPB avoidance area and maintenance of adequate vertical clearance between the LEPB habitat and associate vegetation and the overhead transmission line.	Construction and operation	**Section 6.4** and **Appendix 8**
Biodiversity	BIO09	**Fauna displacement** Timing works to avoid critical life cycle events, such as breeding or nursing.	Site clearing and construction	**Section 6.4** and **Appendix 8**
Biodiversity	BIO10	**Fauna displacement** Instigating clearing protocols, including pre-clearing surveys, daily surveys and staged clearing, and using a trained ecologist or licensed wildlife handler during clearing events.	Site clearing	**Section 6.4** and **Appendix 8**
Biodiversity	BIO11	**Fauna displacement** Relocating habitat features (e.g. fallen timber, hollow logs) from the development or clearing site, to adjacent retained vegetation.	Site clearing	**Section 6.4** and **Appendix 8**
Biodiversity	BIO12	**Indirect impacts on native vegetation and habitats** Adoption of clearing protocols that identify vegetation to be retained, prevent inadvertent damage and reduce soil disturbance; for example, a chainsaw is preferable to heavy machinery to remove native vegetation for partial clearing.	Site clearing and construction	**Section 6.4** and **Appendix 8**
Biodiversity	BIO13	**Indirect impacts on native vegetation and habitats** Using light shields, or daily/seasonal timing of construction and operational activities to reduce impacts of light spill.	Construction and operational	**Section 6.4** and **Appendix 8**
Biodiversity	BIO14	**Indirect impacts on native vegetation and habitats** Using adaptive dust management and monitoring programs to control air quality.	Construction	**Section 6.4** and **Appendix 8**

Aspect	ID#	Mitigation and/or Management Measure	Timing	Relevant EIS Section/Appendix
Biodiversity	BIO15	**Indirect impacts on native vegetation and habitats** Scheduling the timing of construction activities to avoid impacts (e.g. timing the construction for when migratory species are not at the site, or when particular species known to, or likely to use the habitat on the site, are not breeding or nesting).	Construction	**Section 6.4** and **Appendix 8**
Biodiversity	BIO16	**Indirect impacts on native vegetation and habitats** Erecting temporary fencing to protect significant environmental features, such as riparian zones.	Construction	**Section 6.4** and **Appendix 8**
Biodiversity	BIO17	**Indirect impacts on native vegetation and habitats** Using hygiene protocols to prevent the spread of weeds or pathogens between infected and uninfected areas.	Construction	**Section 6.4** and **Appendix 8**
Biodiversity	BIO18	**Indirect impacts on native vegetation and habitats** Training staff and conducting site briefings to communicate environmental features to be protected and measures to be implemented.	Construction	**Section 6.4** and **Appendix 8**
Biodiversity	BIO19	**Indirect impacts on native vegetation and habitats** Preparing a vegetation management plan to regulate activity in vegetation and habitats adjacent to residential developments. The plan may include controls on pet ownership, rubbish disposal, wood collection, fire management, and disturbance to nests and other niche habitats.	Operational	**Section 6.4** and **Appendix 8**
Biodiversity	BIO20	**Indirect impacts on native vegetation and habitats** Providing for the ecological restoration, rehabilitation and/or ongoing maintenance of retained native vegetation habitat on, or adjacent to, the development or clearing site.	Operational	**Section 6.4** and **Appendix 8**
Biodiversity	BIO21	**Prescribed Impacts** Erecting temporary fencing to protect significant environmental features.	Construction	**Section 6.4** and **Appendix 8**
Biodiversity	BIO22	**Prescribed Impacts** Using sediment barriers or sedimentation ponds to control the quality of water released from the site into the receiving environment.	Construction and operation	**Section 6.4** and **Appendix 8**
Biodiversity	BIO23	**Prescribed Impacts** Training staff and conducting site briefings to communicate environmental features to be protected and the measures implemented to protect them.	Construction	**Section 6.4** and **Appendix 8**
Biodiversity	BIO24	**Prescribed Impacts** Ecological restoration, rehabilitation actions and/or maintenance of retained native vegetation on, or adjacent to, the Development Corridor.	Post-construction	**Section 6.4** and **Appendix 8**
Aboriginal Cultural Heritage	ACH01	An Unanticipated Finds Protocol and Skeletal Remains Protocol must be in place during the construction and operation of the Project to guide the process.	Construction and operation	**Section 6.5** and **Appendix 9**
Aboriginal Cultural Heritage	ACH02	Should previously unrecorded Aboriginal objects be discovered, an approved Aboriginal Cultural Heritage Management Plan (ACHMP) will be required to appropriately manage the find. The ACHMP will be prepared in consultation with the Registered Aboriginal Parties for the Project.	Construction and operation	**Section 6.5** and **Appendix 9**
Aboriginal Cultural Heritage	ACH03	Inductions for work crews should include a cultural heritage awareness procedure to ensure they recognise Aboriginal artefacts.	Construction	**Section 6.5** and **Appendix 9**
Historic Heritage	HH01	Should potentially significant historic heritage items be unexpectedly discovered during construction, appropriate unexpected finds procedures must be followed, and further investigation, including the preparation of a Statement of Heritage Impact, may be required.	At all times during the carrying out of the development	**Section 6.6** and **Appendix 10**
Traffic and Transport	TTIA01	A Traffic Management Plan (TMP) will be prepared to manage traffic impacts across all phases of the Project, including construction, operation, maintenance and decommissioning. The TMP will outline measures to minimise disruption to the public road network, manage over-dimensional vehicle movements, maintain access for local road users and emergency services, and ensure compliance with consent conditions and relevant TfNSW and council requirements.	Prior to construction	**Section 6.7** and **Appendix 11**

Aspect	ID#	Mitigation and/or Management Measure	Timing	Relevant EIS Section/Appendix
Traffic and Transport	TTIA02	A Stakeholder Management Plan will be implemented to coordinate communication with affected councils, road authorities, local residents, mining operators and other road users. The plan will provide advance notification of heavy vehicle movements, OSOM deliveries and temporary traffic controls, and establish clear communication channels for addressing complaints or issues arising during construction. This would form part of the ongoing community and stakeholder engagement program discussed in Section 5.8 and the SIA (Appendix 20).	Prior to construction	**Section 6.7** and **Appendix 11**
Traffic and Transport	TTIA03	A Driver Code of Conduct will be enforced for all Project-related vehicle operators to promote safe and considerate driving behaviour. The Code will address speed management, adherence to approved haulage routes, load restraint, fatigue management, and interaction with other road users, and will form part of mandatory site induction requirements.	At all times during the carrying out of the development	**Section 6.7** and **Appendix 11**
Traffic and Transport	TTIA04	Construction traffic will generally be limited to standard working hours to minimise impacts on peak commuter traffic and local road users. Any works or vehicle movements required outside standard hours will be subject to separate approval processes and managed through appropriate mitigation and notification measures.	Construction	**Section 6.7** and **Appendix 11**
Traffic and Transport	TTIA05	All regular heavy vehicle and OSOM drivers accessing the Project site will be required to complete a driver induction prior to commencing works. The induction will cover approved transport routes, permitted travel times, traffic management procedures, speed limits, environmental responsibilities and emergency response requirements to ensure consistent and safe vehicle operations.	At all times during the carrying out of the development	**Section 6.7** and **Appendix 11**
Traffic and Transport	TTIA06	The Project contractor will be responsible for coordinating with transport and delivery contractors to ensure compliance with the TMP and approved traffic routes. This includes confirming that routes are suitable, traffic controls are in place where required, and relevant authorities are consulted prior to the commencement of significant transport activities.	At all times during the carrying out of the development	**Section 6.7** and **Appendix 11**
Traffic and Transport	TTIA07	Vehicle access to the Project site will be limited to approved access points and routes identified in the TTIA. OSOM vehicle movements will be managed under separate permit and escort arrangements, with deliveries scheduled to minimise impacts on the surrounding road network and avoid peak traffic periods where practicable.	At all times during the carrying out of the development	**Section 6.7** and **Appendix 11**
Traffic and Transport	TTIA08	All construction-related parking will be provided within the Project site to prevent spill-over parking on public roads. Parking demand will be monitored throughout construction, with measures such as car-pooling or shuttle services considered if required to reduce traffic volumes and on-road impacts.	Construction	**Section 6.7** and **Appendix 11**
Traffic and Transport	TTIA09	Temporary traffic and warning signage will be installed as required to support safe vehicle movements to and from the Project site. Signage may include reduced speed limits, construction warnings and OSOM movement notifications, and will be implemented in consultation with relevant authorities.	At all times during the carrying out of the development	**Section 6.7** and **Appendix 11**
Traffic and Transport	TTIA10	Traffic management measures will account for local climate conditions that may affect road safety, including heavy rainfall, flooding, dust, bushfire risk and reduced visibility. Construction traffic movements may be adjusted or temporarily suspended during adverse conditions, with drivers and stakeholders notified accordingly.	At all times during the carrying out of the development	**Section 6.7** and **Appendix 11**
Traffic and Transport	TTIA11	To reduce the number of right turn movements at the Hebden Road (north) approach during the PM peak hour, workers will be instructed to turn left onto the New England Highway and make a U-turn at the Bayswater Power Station using the highway interchange. This measure would be captured in the Driver's Code of Conduct (as per TTIA 03) and would apply to all light vehicle movements using this intersection.	At all times during the carrying out of the development	**Section 6.7** and **Appendix 11**
Traffic and Transport	TTIA 12	• Consistent with AQM02, where practicable, maintain communications with: • the Proponent for Maison Dieu Solar Farm, regarding any simultaneous use of strategic road network routes that could cause cumulative impacts. • the Proponents for Queensland Hunter Gas Pipeline, Liddell Battery and Bayswater Ancillary Works and Muswellbrook Solar Farm, regarding timing of any substantial maintenance works that could cause cumulative impacts. In the case of Queensland Hunter Gas Pipeline, reassess cumulative impacts if construction timelines are found to overlap.	At all times during the carrying out of the development	**Section 6.7** and **Appendix 11**
Water Resources	WR01	A CSWMP will be prepared to outline measures to manage soil and water impacts associated with the construction and decommissioning works.	Prior to construction	**Section 6.8** and **Appendix 12**
Water Resources	WR02	Creation of catch/diversion drains and sediment fences at the downstream boundary of construction activities, where practicable, to support the containment of sediment-laden runoff.	Construction	**Section 6.8** and **Appendix 12**
Water Resources	WR03	Erosion and sediment control measures will be implemented and maintained at all work sites in accordance with the principles and requirements in Managing Urban Stormwater – Soils and Construction, Volume 1 and Volume 2D of the Blue Book.	Construction	**Section 6.8** and **Appendix 12**

Aspect	ID#	Mitigation and/or Management Measure	Timing	Relevant EIS Section/Appendix
Water Resources	WR04	Measures to minimise/manage erosion and sediment transport both within areas of disturbance and off-site, including requirements for the preparation of ESCP for all progressive stages of construction.	Prior to construction	**Section 6.8** and **Appendix 12**
Water Resources	WR05	When works are scheduled during periods when the three-day forecast indicates that rain is likely, erosion control measures should aim to protect disturbed lands with 60% ground cover. Where non-forecast rainfall arrives, site management techniques should endeavour to minimise and mitigate site erosion within 24 hours.	Construction	**Section 6.8** and **Appendix 12**
Water Resources	WR06	The storage compound will be constructed of road base (or the like). The ESCP and CSWMP will implement controls that reduce the risk of erosive flows to minimise peak velocities.	At all times during the carrying out of the development	**Section 6.8** and **Appendix 12**
Water Resources	WR07	Excavation of subsoils should be minimised whenever possible. Any excavated subsoils should be stockpiled and contained to prevent potential dispersion and sediment transfer.	Construction	**Section 6.8** and **Appendix 12**
Water Resources	WR08	Inspection and monitoring requirements will be implemented, including monitoring of water quality located off-site. The monitoring methodology will be communicated through stakeholder engagement.	At all times during the carrying out of the development	**Section 6.8** and **Appendix 12**
Water Resources	WR09	Maintenance of suitable ground cover (nominally >60% coverage) and grasses to minimise the potential for erosion and export of sediment.	At all times during the carrying out of the development	**Section 6.8** and **Appendix 12**
Water Resources	WR10	All hazardous materials and chemicals will be stored in accordance with relevant Australian standards and other state and local guidelines including the NSW EPA's Storing and Handling Liquids: Environmental Protection–Participants Handbook.	At all times during the carrying out of the development	**Section 6.8** and **Appendix 12**
Water Resources	WR11	Infrastructure with the potential to cause pollution to be spread due to surface water inundation will be located with a minimum 300 mm freeboard above the 1% AEP flood level. Raising storage infrastructure can occur by situating potential pollutants on top of an earth fill pad or a structural platform.	At all times during the carrying out of the development	**Section 6.8** and **Appendix 12**
Water Resources	WR12	The SEARs require that no sensitive infrastructure (e.g., substations) is to be placed within 20 m of any Strahler 3 or above order streams. Sensitive infrastructure will be placed outside the 0.2% AEP flood extent with a minimum 500 mm freeboard to the 1% AEP flood level.	At all times during the carrying out of the development	**Section 6.8** and **Appendix 12**
Water Resources	WR13	A water sourcing and monitoring strategy would be prepared to manage potential availability impacts on downstream water users and ensure compliance with legislation relating to water extraction.	At all times during the carrying out of the development	**Section 6.8** and **Appendix 12**
Water Resources	WR14	Any liquids stored within the Project Area during operation will be contained within a bund and regularly inspected.	Operation	**Section 6.8** and **Appendix 12**
Water Resources	WR15	Further hydrogeology assessments will take place in the event will take place in the event that excavations are planned to occur within 3 m of recorded groundwater levels.	At all times during the carrying out of the development	**Section 6.8** and **Appendix 12**
Water Resources	WR16	In the event that groundwater flows into excavations unexpectedly, any water take would be appropriately licensed in accordance with the requirements of the WM Act, the Water Management (General) Regulation 2018 and relevant Water Sharing Plans (WSPs).	At all times during the carrying out of the development	**Section 6.8** and **Appendix 12**
Air Quality	AQ01	During detailed design (when precise timing of construction activities are known) confirm the anticipated cumulative impacts of the simultaneous construction and operation of both Bowman's Creek Wind Farm (Stage 1) SSD-10315 and proposed BESS MOD 1. Ensure plans regarding construction activities, operational vehicle movements and maintenance works are co-ordinated, dust and particle emissions are minimised across both projects, and interactions of off-site transport / deliveries using the same routes are considered.	Prior to construction	**Section 6.9** and **Appendix 13**
Air Quality	AQ02	Where practicable, maintain communications with: • The Proponent for Maison Dieu Solar Farm, regarding any simultaneous use of strategic road network routes that could cause cumulative impacts. • The Proponents for Liddell Battery and Bayswater Ancillary Works and Muswellbrook Solar Farm, regarding timing of any substantial maintenance works that could cause cumulative impacts.	At all times during the carrying out of the development	**Section 6.9** and **Appendix 13**
Air Quality	AQ03	Develop and implement an AQMP that details the air quality control measures and procedures to be undertaken during construction, including: • Air quality and dust management objectives that are consistent with relevant regulatory authority guidelines. • Identification of potential sources of dust. • Mitigation measures to minimise dust impacts on sensitive receptors and the environment (including but not necessarily limited to AQM04 to AQM13 below). • A dust monitoring program to assess compliance with the identified objectives.	Prior to construction	**Section 6.9** and **Appendix 13**

Aspect	ID#	Mitigation and/or Management Measure	Timing	Relevant EIS Section/Appendix
		• Contingency plans to be implemented in the event of non-compliances and/or complaints about dust.		
Air Quality	AQ04	Minimise areas of exposed surface where possible throughout the construction site planning and programming, to reduce the area of potential construction dust emission sources.	Construction	**Section 6.9** and **Appendix 13**
Air Quality	AQ05	Control measures, such as compaction stabilisation or covering will be implemented in order to minimise dust from stockpile sites.	Construction	**Section 6.9** and **Appendix 13**
Air Quality	AQ06	Consider the use of dust suppression measures, such as water carts or soil binders, on prolonged exposed surfaces and heavily trafficked access roads as required.	Construction	**Section 6.9** and **Appendix 13**
Air Quality	AQ07	All trucks must cover their loads when transporting materials that are potential sources of wind-blown dust, to and from the Project.	At all times during the carrying out of the development	**Section 6.9** and **Appendix 13**
Air Quality	AQ08	Bulk cement and other fine powder materials should be delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.	At all times during the carrying out of the development	**Section 6.9** and **Appendix 13**
Air Quality	AQ09	Activities that generate significant dust will be avoided or modified during high wind periods. This relates mainly to bulk earthworks activities such as excavation, dozing, material handling, and truck movement.	Construction	**Section 6.9** and **Appendix 13**
Air Quality	AQ10	Work activities will be reviewed if the dust suppression measures are not adequately restricting dust generation.	Construction	**Section 6.9** and **Appendix 13**
Air Quality	AQ11	Place rumble grids and wheel washes at all site exit points onto public roads.	At all times during the carrying out of the development	**Section 6.9** and **Appendix 13**
Air Quality	AQ12	Construction plant and equipment will be maintained in good working condition to limit impacts on air quality.	Construction	**Section 6.9** and **Appendix 13**
Air Quality	AQ13	Where practicable, vehicles will be fitted with pollution reduction devices and switched off when not in use.	At all times during the carrying out of the development	**Section 6.9** and **Appendix 13**
Land	SLA01	During the life of the Project, agriculture land use will continue within the Project Area outside of the Disturbance Footprint.	At all times during the carrying out of the development	**Section 6.10** and **Appendix 14**
Land	SLA02	At the time of decommissioning, agriculture land use will be re-established over the agricultural land removed from agriculture (unless otherwise agreed with the landholder and/or regulatory authorities).	Decommissioning	**Section 6.10** and **Appendix 14**
Land	SLA03	A DRP will be prepared to outline a current methodology that may be used to decommission all infrastructure associated with the Project and rehabilitate the land at the end of the Project's economic life, which will be developed to address development consent conditions for the Project if approved.	Prior to construction	**Section 6.10** and **Appendix 14**
Land	SLA04	During the life of the Project, agriculture land use will continue within the Project Area outside of the Disturbance Footprint at historical stocking rates.	At all times during the carrying out of the development	**Section 6.10** and **Appendix 14**
Land	SLA05	At the time of decommissioning, the Project Area will be returned to an agricultural productivity that is approximately equivalent of pre-Project status. This includes rehabilitating all disturbed land to an equivalent LSC class following the end of life for the Project, through site rehabilitation and good soil management practices as outlined in Section 7.3 of the SLAIA. This would be documented in the Project DRP.	Decommissioning	**Section 6.10** and **Appendix 14**
Land	SLA06	All soil that is proposed to be disturbed during the Project will be handled in accordance with the strategy outlined in Section 7.3 of the SLAIA and a site Soil Stripping and Management Plan prepared for the Project that includes soil management measures relating to stripping, stockpiling, reuse, and sourcing, as required. This will inform the CEMP, OEMP and a DRP.	At all times during the carrying out of the development	**Section 6.10** and **Appendix 14**
Land	SLA07	All soil resources are to be managed throughout construction, operation and decommissioning phases of the Project in accordance with an ESCP which should include recommendations outlined in Section 7.3 of the SLAIA.	At all times during the carrying out of the development	**Section 6.10** and **Appendix 14**
Land	SLA08	All remaining infrastructure to be capped with 0.5 m of soil at the time of decommissioning with material of suitable texture and preparation to mitigate long term wind erosion.	Decommissioning	**Section 6.10** and **Appendix 14**
Land	SLA09	All soil resources are to be managed throughout construction, operation and decommissioning phases of the Project in accordance with an ESCP which should include recommendations outlined in Section 7.3 of the SLAIA.	At all times during the carrying out of the development	**Section 6.10** and **Appendix 14**
Land	SLA10	Stock fences, farm dams, and access tracks to be retained and maintained to accommodate continued agricultural operations within the Project Area.	Decommissioning	**Section 6.10** and **Appendix 14**
Land	SLA11	Provision of ground-based spray equipment as required.	At all times during the carrying out of the development	**Section 6.10** and **Appendix 14**

Aspect	ID#	Mitigation and/or Management Measure	Timing	Relevant EIS Section/Appendix
Land	SLA12	Pest species will be managed in accordance with measures outlined in Section 7.4.2 of the SLAIA and a Weed Management Plan prepared for the Project.	At all times during the carrying out of the development	**Section 6.10** and **Appendix 14**
Land	SLA13	Biosecurity will be managed in accordance with measures outlined in Section 7.4.1 of the SLAIA and an Agricultural Biosecurity Management Plan prepared for the Project.	At all times during the carrying out of the development	**Section 6.10** and **Appendix 14**
Aviation	AV01	Details of WTGs and WMTs 100 m or more AGL must be reported to CASA as soon as practicable after forming the intention to construct or erect the proposed object or structure in accordance with CASR Part 139.165(1)(2). The notification should be provided to CASA via email to Airspace.Protection@casa.gov.au.	Prior to construction	**Section 6.11.1** and **Appendix 15**
Aviation	AV02	Final details of WTG coordinates and elevation should be provided to Airservices Australia at least two (2) weeks prior to construction commencing, by submitting the form at this webpage: • https://www.airservicesaustralia.com/wp-content/uploads/ATS-FORM- 0085_Vertical_Obstruction_Data_Form.pdf to the following email address: • vod@airservicesaustralia.com.	Prior to construction	**Section 6.11.1** and **Appendix 15**
Aviation	AV03	Any obstacles 100 m or more AGL (including temporary construction equipment) should be reported to Airservices Australia NOTAM office until they are incorporated in published operational documents. With respect to crane operations during the construction of the Project, a notification to the NOTAM office may include, for example, the following details: • The planned operational timeframe and maximum height of the crane; and • Either the general area within which the crane will operate and/or the planned route with timelines that crane operations will follow.	Prior to construction	**Section 6.11.1** and **Appendix 15**
Aviation	AV04	Details of the wind farm should be provided to local and regional aircraft operators prior to construction in order for them to consider the potential impact of the wind farm on their operations.	Prior to construction	**Section 6.11.1** and **Appendix 15**
Aviation	AV05	To facilitate the flight planning of aerial application operators, details of the Project, including the final location and height information of WTGs and overhead transmission lines should be provided to landowners so that, when asked for hazard information on their property, the landowner may provide the aerial application pilot with all relevant information.	Prior to construction	**Section 6.11.1** and **Appendix 15**
Aviation	AV06	The closest WTGs would be 8.8 km away from the boundary of the Mount Royal National Park. To confirm the buffer area of the forest boundary, consultation with NPWS is required.	Prior to construction	**Section 6.11.1** and **Appendix 15**
Aviation	AV07	The rotor blades, nacelle, and supporting mast of the WTGs will be painted in a non-reflective off- white colour, as is typical of most WTGs operational in Australia. No additional marking measures are required for WTGs.	At all times during the carrying out of the development	**Section 6.11.1** and **Appendix 15**
Aviation	AV08	Based on NSW Wind Energy Guideline: • If turbines and WMTs are 150 m or more above ground, lighting is required for the most critical turbines (e.g. turbines at highest elevations and/or around the Project perimeter). • Lighting of turbines and ancillary infrastructure should be designed to minimise potential amenity impacts by using the lowest intensity lighting suitable for the site. • To ensure the ongoing availability of obstacle lights, a monitoring, reporting and maintenance program should be established in accordance with the guidance in CASR Part 139 MOS.	Operation	**Section 6.11.1** and **Appendix 15**
Aviation	AV09	Providing the micrositing is within 100 m of the planned WTGs it is not likely to result in a change in the maximum overall blade tip height of the Project. No further assessment is likely to be required from micrositing, and the conclusions of this AIA would remain the same.	At all times during the carrying out of the development	**Section 6.11.1** and **Appendix 15**
Aviation	AV10	Transmission lines and/or supporting poles that are located where they could adversely affect aerial application operations should be identified in consultation with local aerial application operators and marked in accordance with CASR Part139 MOS.	Prior to construction	**Section 6.11.1** and **Appendix 15**

Aspect	ID#	Mitigation and/or Management Measure	Timing	Relevant EIS Section/Appendix
Aviation	AV11	The developer or operator will ensure that: • liaison with the relevant fire and land management agencies is ongoing and effective • access is available to the wind farm site by emergency services response for on-ground firefighting operations • wind turbines are shut down immediately during emergency operations • where possible, blades should be stopped in the 'Y' or 'rabbit ear' position, as this positioning allows for the maximum airspace for aircraft to manoeuvre underneath the blades and removes one (1) of the blades as a potential obstacle. This may not always be possible due to the risk to equipment and personnel as a fire approaches or exists in or near to the WTGs • Aviation Projects considers that it may be impractical to stop and lock the turbine blades in a Y configuration due to the time needed to stop and lock the turbine and the risk to personnel having to climb into the WTG tower as a bush fire approaches. WTG blades can be feathered to effectively stop or reduce the rotation rate of the turbine to a very slow speed.	Prior to construction	**Section 6.11.1** and **Appendix 15**
Aviation	AV12	Triggers for review of this risk assessment are provided for consideration: • prior to construction to ensure the regulatory framework has not changed • following any significant changes to the context in which the assessment was prepared including the regulatory framework • following any near miss, incident or accident associated with operations considered in this risk assessment.	Prior to construction	**Section 6.11.1** and **Appendix 15**
Telecommunications	EMI01	Stakeholder engagement has been initiated/conducted. When responses are received from the stakeholders, any recommendations will be recorded and provided to the Proponent for its action and consideration in Project design and delivery.	Prior to construction	**Section 6.11.2** and **Appendix 16**
Telecommunications	EMI02	With regard to meteorological radar services and BoM consultation, a comprehensive technical assessment will be conducted for the Newcastle weather radar (if required) during the detailed design of the Project. The Proponent has commenced direct consultation with the BoM towards addressing any potential impacts, and ensuring there are suitable commitments (as reflected in this report) to consider this matter in the Project's detailed design and delivery.	Prior to construction	**Section 6.11.2** and **Appendix 16**
Telecommunications	EMI03	With regard to survey mark (SS 39397) and works associated with the Project (e.g., WTG 73), detailed design will ensure the survey mark continues to be avoided, or, alternatively, assistance from a registered surveyor will be sought to move or remove the survey mark/s.	Prior to construction	**Section 6.11.2** and **Appendix 16**
Electric and Magnetic Fields	EMF01	The expected EMF levels from the Project at the recommended height comply with the relevant Australian and International standards and guidelines. However, a risk assessment will be conducted with respect to Transgrid and ICNIRP recommendations during detailed design if ground clearance cannot be maintained.	Prior to construction	**Section 6.11.3** and **Appendix 17**
Electric and Magnetic Fields	EMF02	The proposed transmission lines are required to maintain a minimum ground clearance of 11 m, pending completion of the detailed design.	At all times during the carrying out of the development	**Section 6.11.3** and **Appendix 17**
Bushfire	BF01	APZs are to be established around WTGs and key Project infrastructure. All WTG will have a 10 m APZ as required by PBP as shown in Appendix 5. APZ required for the on-site substation shall be established as shown in Figure 14 and in accordance with PBP Table A1.12.2 to meet the project standard of <29 kW/m^2 of radiant heat flux.	Construction	**Section 6.11.4** and **Appendix 18**
Bushfire	BF02	The Project design features presented in Section 10.1 of the BAR will be considered and implemented where feasible during detailed design of the Project. This includes the provision of a dedicated firefighting water supply tank of up to 100,000 L to be installed within the Development Corridor and maintained throughout the life of the Project. This tank would be fitted with a 65 mm Storz fitting and be accessible to firefighting vehicles in accordance with PBP standards.	At all times during the carrying out of the development	**Section 6.11.4** and **Appendix 18**
Bushfire	BF03	Prior to construction and following Project approval, a BEMOP and a BERP (including a Pre Incident Plan) will be developed for the Project, in consultation with emergency services. The BEMOP and BERP must include: • Details of how the infrastructure can be safely isolated in any emergency; • Availability of fire suppression equipment, access and water; • Emergency procedures for fires within, and in the vicinity of, the Project; • Details of any triggers or circumstances for modifying or ceasing operation, such as approach of bushfire/grassfire to the Project; • A management plan review process;	Prior to construction	**Section 6.11.4** and **Appendix 18**

Aspect	ID#	Mitigation and/or Management Measure	Timing	Relevant EIS Section/Appendix
		• Details of reasonable procedures for training staff e.g., in initial attack firefighting with available equipment; and • Procedures for assisting with firefighting agencies during an incident. Copies of these plans are to be provided to local emergency services. These plans should be reviewed at least every five (5) years and after any significant fire event in the immediate area.		
Bushfire	BF04	WTGs are shut down immediately during bushfire emergency operations. Where possible, blades should be stopped in the 'Y' or 'rabbit ear' position.	Operations	**Section 6.11.4** and **Appendix 18**
Bushfire	BF05	All tall structures (e.g., WTG) must be designed, managed and notified to the Civilian Aviation Safety Authority (CASA) as per requirements set out in the Aviation Impact Assessment (AIA) prepared in support of the EIS (refer to Appendix 15 of the Project EIS.	Prior to construction	**Section 6.11.4** and **Appendix 18**
Bushfire	BF06	In accordance with the Rural Fires Act 1997 – Section 9, total restriction of hot works on any day declared to be a Total Fire Ban (TOBAN) will be applied to the Project to address the potential impacts associated with onsite ignition. Essential works may be completed during a TOBAN if works are compliant with the Hot Work and Fire Risk Work procedure and any exemption provided by the NSW RFS.	At all times during the carrying out of the development	**Section 6.11.4** and **Appendix 18**
Blade Throw	BT01	Ensure all WTG are manufactured and certified to achieve relevant Australian and international safety standards (IEC 61400-23).	Construction	**Section 6.11.5** and **Appendix 19**
Blade Throw	BT02	Ensure all WTG are equipped with suitable measurement instrumentation that can detect and then respond to any rotor blade imbalances and shut down WTG if required.	Construction	**Section 6.11.5** and **Appendix 19**
Blade Throw	BT03	Ensure all WTGs will be suitably managed and maintained according to industry best-practice standards and are subject to a regular and comprehensive maintenance and servicing regime.	At all times during the carrying out of the development	**Section 6.11.5** and **Appendix 19**
Blade Throw	BT04	To safeguard against potential new impacts resulting from design or other changes, the following measures are to be considered: • re-assess the BTA for any design modifications involving the material relocation of WTGs • ensure that any new dwellings within 2 km of the Project Area are located outside the impact zone of all WTGs.	At all times during the carrying out of the development	**Section 6.11.5** and **Appendix 19**
Hazards (Dangerous Goods)	HZ01	BCWF will ensure that all suppliers and contractors handling ANE and Class 1.1 materials possess the required SafeWork NSW licences.	At all times during the carrying out of the development	**Section 6.11.6** and **Appendix 22**
Hazards (Dangerous Goods)	HZ02	BCWF will ensure that all suppliers and contractors supplying, transporting and handling ANE and Class 1.1 materials have systems in place to ensure that safety and security risks are managed in accordance with the NSW Explosives Act and the NSW Explosives Regulation which includes the requirement to comply with Code of Practice, Mobile Processing Units (Australian Explosives Industry Safety Group Inc., 2018).	At all times during the carrying out of the development	**Section 6.11.6** and **Appendix 22**
Social	SO01	The proposed neighbour benefit sharing scheme for the Project is outlined in **Section 2.5.3.1**.	At all times during the carrying out of the development	**Section 6.12** and **Appendix 20**
Social	SO02	SO02: BCWF has implemented a CSEP across the project lifecycle by updating it to address construction, operational and decommissioning phases, and reviewing it annually to assess performance and identify new stakeholders (refer to **Section 5.0**). BCWF will provide proactive communications through community newsletters (quarterly during construction and annually during operation, aligned to key activities), conduct regular engagement with neighbouring landholders to gather feedback on mitigation effectiveness (quarterly during construction and annually during operation), and host quarterly information sessions during construction in Mount Olive and Hebden.	At all times during the carrying out of the development	**Section 6.12** and **Appendix 20**
Social	SO03	An Accommodation and Employment Strategy (AES) has been developed for the Project and is presented in Appendix G of the SIA (Appendix 20). The AES outlines the approach and strategies proposed to manage workforce accommodation and employment impacts and opportunities relating to the Project. The AES has been informed by both secondary data review and primary social research through engagement with key stakeholders, such as local councils, accommodation providers, employment services and regional development agencies.	At all times during the carrying out of the development	**Section 6.12** and **Appendix 20**

Aspect	ID#	Mitigation and/or Management Measure	Timing	Relevant EIS Section/Appendix
Social	SO04	BCWF will deliver the employment outcomes as part of the AES implementation framework by incorporating actions into the Workforce Integration Plan and AEIP, including regular communication to the project register and local stakeholders on employment and procurement opportunities, and coordination with other proponents/industry on construction timing to support collaborative workforce planning. Employment and procurement performance (including local participation and representation of underrepresented groups) should be monitored and reported regularly during construction (e.g. monthly), with periodic review of the strategy to adapt measures if targets and outcomes are not being met.		
Social	SO05	• To increase the local employment and procurement outcomes for the Project beyond the Goal scenario of 20%, a combination of the measures would need to be resourced, funded and implemented to reach scenarios 2, 3 and 4 as set out within the AES (30%, 50% and 80% respectively). These are identified in the AES (Appendix G of **Appendix 20**).	At all times during the carrying out of the development	**Section 6.12** and **Appendix 20**
Social	SO06	BCWF is committed to monitoring and evaluating the effectiveness of the Employment Strategy. During the Project's pre-construction and construction phases, the strategy would be reviewed bi-annually between 2027 and 2029 by the EPC Contractor, to assess the effectiveness of steps taken to maximise local employment and procurement on the Project.	Prior to and during construction	**Section 6.12** and **Appendix 20**
Social	SO07	The AES includes a summary of proposed workforce accommodation measures and a corresponding monitoring plan. These measures are summarised in Table 6.34 of the SIA (**Appendix 20**).	Construction and decommissioning	**Section 6.12** and **Appendix 20**
Social	SO08	In addition to implementing the workforce accommodation measures, BCWF will regularly maintain the accommodation/employment register (including accommodation availability and supplier/contractor opportunities), and coordinate with other proponents and industry developers regarding construction scheduling to support collaborative workforce planning and reduce cumulative impacts on accommodation availability and affordability.	Construction and decommissioning	**Section 6.12** and **Appendix 20**
Social	SO09	BCWF will establish and maintain a complaints management system that includes a dedicated hotline and email, defined KPIs (including response timeframes and escalation pathways), and ongoing promotion via newsletters, social media and community meetings throughout the project lifecycle. Ensure accessible complaint options for non-English speakers and people with disabilities and publish complaint outcomes quarterly on the project website (or equivalent public reporting mechanism).	At all times during the carrying out of the development	**Section 6.12** and **Appendix 20**
Economic	EIA01	BCWF will prepare and implement an AES in consultation with relevant stakeholders prior to commencing construction of the Project, to minimise impacts on the community and maximise benefits of the Project.	Prior to construction	**Section 6.13 and Appendix 21**
Economic	EIA02	BCWF will monitor and update (where and if necessary) the AES during the construction phase of the Project to reflect local market conditions at the time (including demands from concurrent infrastructure projects, visitor markets etc).	Construction and decommissioning	**Section 6.13 and Appendix 21**
Waste	W01	As part of the detailed design and following Project approval, a Waste Management Plan (WMP) will be prepared which will include a detailed breakdown of waste types and quantities in accordance with relevant legislation and guidelines. It is noted that a WMP is required under the Project SEARs, although at this stage of the Project design, insufficient information is available to prepare a comprehensive WMP. Muswellbrook Shire Council have noted that a Waste Management Plan will be required as a condition of consent, and is to be prepared in consultation with the relevant authority and Council's Waste Operations unit. As such, BCWF commit to the preparation of the WMP post approval of the Project.	Prior to construction	**Section 6.14**
Waste	W02	As discussed above, BCWF has committed to develop and implement a detailed DRP for the Project in consultation with key stakeholders, to guide the decommissioning of the Project and the rehabilitation of the site and to mitigate any negative legacy impacts to the community.	Prior to construction	**Section 6.14**
Waste	W03	Undertake an annual assessment of the remaining life of the Project, starting in Year 15.	Fifteen years after the operation of the Project	**Section 6.14**
Waste	W04	When it is determined that the remaining economic life of the Project is less than six (6) years, update the DRS to identify the expected decommissioning methodology and anticipated cost.	Six (6) years before the end of life of the Project	**Section 6.14**
Waste	W05	If a shortfall (cost) is identified, establish a dedicated decommissioning reserve fund to cover the decommissioning and rehabilitation cost of the Project. This reserve will be established out of operating cashflows, with an appropriate percentage of cash generated by the wind farm directed into this reserve over an annual basis, until the reserve is fully cash funded, based on the most recent estimate of decommissioning and rehabilitation costs.	Six (6) years before the end of life of the Project	**Section 6.14**
Contamination	PSI01	A UFP will be integrated into the overall CEMP or relevant sub-plan that will be prepared for the Project. To safeguard against potential future impacts, a revised PSI will be considered for any relevant design modifications to avoid, minimise, and/or mitigate contamination risks and impacts.	At all times during the carrying out of the development	**Section 6.15 and Appendix 22**

Appendix 6

Landscape Character and Visual Impact Assessment



umwelt

Appendix 7

Noise and Vibration Assessment



umwelt

Appendix 8

Biodiversity Development Assessment Report



umwelt

Appendix 9

Aboriginal Cultural Heritage Assessment Report



umwelt

Appendix 10

Historic Heritage Assessment



Appendix 11

Traffic and Transport Impact Assessment



Appendix 12

Water Resources Impact Assessment



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Appendix 13

Air Quality Impact Assessment



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Appendix 14

Soil, Land and Agriculture Impact Assessment



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Appendix 15

Aviation Impact Assessment



Appendix 16

Telecommunications Impact Assessment



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Appendix 17

Human Health Assessment



Appendix 18

Bushfire Assessment Report



Appendix 19

Blade Throw Assessment



Appendix 20

Social Impact Assessment

Appendix 21

Economic Impact Assessment



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Appendix 22

Preliminary Site Investigation

Appendix 23

Cumulative Impact Assessment Scoping Summary



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Appendix 24

Estimated Development Cost Report (Executive Summary)



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Appendix 25

Consolidated Road Upgrades Table

Appendix 26

Port of Newcastle to Project Route Study



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