# EPURŮN

# BOWMANS CREEK WIND FARM

### environmental impact statement

**Vol. 1** Main EIS + Appendices A - G

Prepared by:

MAR. 2021

> HANSEN BAILEY 6/127-129 John Street SINGLETON NSW 2335

For:

EPURON PROJECTS PTY LTD Level 11 75 Miller Street NORTH SYDNEY NSW 2060



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## ENVIRONMENTAL IMPACT STATEMENT

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#### ENVIRONMENTAL IMPACT STATEMENT

This Environmental Impact Statement (EIS) has been prepared to fulfill the requirement of Section 4.12(8) of the *Environmental Planning and Assessment Act 1979.* 

EIS Prepared By	
Name	James Bailey
Qualifications	B. Natural Resources, MBA
Address	Hansen Bailey PO Box 473 SINGLETON NSW 2330
In respect of	Bowmans Creek Wind Farm
Proponent Name	Epuron Projects Pty Ltd
Proponent Address	Level 11 75 Miller Street NORTH SYDNEY NSW 2060
Land to be Developed	Albano Road, Bowmans Creek. See Appendix A of this EIS.
Proposed Development	Bowmans Creek Wind Farm Project and associated activities outlined in <b>Section 3</b> of this EIS.
Environmental Impact Statement	This document including any appendices and attachments referenced herein.
Certification	<ul> <li>I certify that I have read and am aware of the terms of the Expert Witness Code of the Land and Environment Court of NSW.</li> <li>I further certify that I have prepared the contents of this EIS and to the best of my knowledge:</li> <li>It has been prepared to fulfil the requirement of Section 4.12(8) of the <i>Environmental Planning and Assessment Act 1979</i>;</li> <li>Meets the form and content requirements of Clauses 6 and 7 of Schedule 2 of the <i>Environmental Planning and Assessment Regulation 2000</i>;</li> <li>It contains all available information that is relevant to this EIS for the activity to which the Statement relates; and</li> <li>The information contained in the statement is neither false nor misleading.</li> </ul>
Signature	land
Date	17 March 2021

#### EXECUTIVE SUMMARY

#### INTRODUCTION

#### Background

Epuron Projects Pty Ltd (Proponent) is seeking approval for the construction, operation, maintenance and decommissioning of the Bowmans Creek Wind Farm (Project).

The Project has an estimated capital investment value of \$569 million and involves up to 60 wind turbine generators with an indicative generation capacity of 336 megawatts. The Project also includes electrical infrastructure, temporary and permanent ancillary infrastructure, local road network upgrades and an additional transmission line to connect to the existing TransGrid network via the Liddell substation.

The Project will generate up to 156 full time equivalent jobs during its 18-month construction period and 15 full time equivalent jobs over its operational life.

The Project is generally located at Bowmans Creek, approximately 10 kilometres (km) east of Muswellbrook and 120 km north-west of the Port of Newcastle in NSW. The region is a significant power generating area accommodating active coal mines and two coal fired power stations. The renewable energy sector is emerging with one solar, one pumped hydro and one wind farm project either in the assessment process or approved. There are also two existing quarries external to but in the vicinity of the Project Boundary.

The Project Boundary extends predominantly across the Muswellbrook Shire Council and Singleton Shire Council Local Government Areas. A small number of wind turbine generators are additionally proposed in the Upper Hunter Shire Council Local Government Area. There are several rural communities proximate to the Project Boundary including: Bowmans Creek, Davis Creek, Goorangoola, Greenlands, Hebden, McCullys Gap, Muscle Creek and Rouchel Brook.

An early assessment of the wind resource identified an investigation area comprising several elevated ridgelines that had the potential for hosting wind turbine generators. Preliminary consultation with potential host landholders and wind monitoring commenced in 2017. This investigation area was used as the basis for early consultation activities and to seek feedback from stakeholders about the Project in 2018. This feedback was then considered in the design of the Scoping Report preliminary layout for consultation with the wider community to culminate in the Project presented in this Environmental Impact Statement.

#### Epuron Projects Pty Ltd

Epuron Projects Pty Ltd is the Proponent and is an Australian renewable energy company established in North Sydney in 2003. The Proponent is one of the most experienced wind energy development companies in NSW, as well as a significant developer of solar projects across Australia.

The Proponent is a leader in its field with 570 megawatts of wind turbines in operation in Australia resulting from its development work (including more than 216 turbines across four wind farms). The Proponent's approved wind energy projects in NSW total over 2,300 megawatts.

#### Document Purpose and Structure

This Environmental Impact Statement has been prepared by Hansen Bailey Environmental Consultants to support applications for both State and Federal Approval.

The Proponent is seeking State Significant Development (SSD) Consent (SSD 10315) under Division 4.7 of Part 4 of the *Environmental Planning & Assessment Act 1979*; and an Environment Protection and Biodiversity Conservation Approval (Referral 2020/8631) under Section 75 of the *Environment Protection and Biodiversity Conservation Act 1999*.

This Environmental Impact Statement has been prepared in consideration of the 'Preparing an Environmental Impact Statement Guideline' and the 'NSW Wind Energy Framework'.

This Environmental Impact Statement comprises a main volume and supporting technical appendices titled A to Q.

#### STRATEGIC CONTEXT

#### Natural Environment

The topography within the Project Boundary ranges between 135 metres Australian Height Datum in the valley floors up to 786 metres Australian Height Datum in the escarpments and steeper slopes.

A series of ridges run north–south with moderate to steep slopes through the Project Boundary. These ridges originate in the Barrington Tops and Mount Royal Range which lies 6 km to the northeast of the Project Boundary. Bowmans Creek is the major drainage line within the Project Boundary and delivers water to the Goorangoola Creek to the south.

The Project is located within the bioregions of the Sydney Basin and NSW North Coast. The Sydney Basin Bioregion exhibits a temperate climate whereas the North Coast Bioregion exhibits a sub-tropical and sub-humid climate. The regional climate is characterised by warm summers.

Prevailing winds are from the south-east in summer, north-west in winter and from both directions in spring and autumn. Wind speeds typically increase throughout the day with a peak in the evening period followed by a low in the early morning. This pattern of wind is common throughout the Hunter Valley.

#### Existing Land Use

Most of the land within the Project Boundary is privately owned across multiple agricultural properties and comprises a series of ridges, valleys and gullies. The historic land use of the locality has impacted on the presence of fauna corridors within the landscape as extensive land clearing has occurred for agricultural uses as well as the development of open cut mines.

Within the Project Boundary, the vegetation corridors are somewhat fragmented, ranging from dense native vegetation on the steeper slopes of the ranges (generally in the western and north-eastern sections) and lightly wooded areas on spurs and gentle slopes. The extent of wooded areas varies from property to property depending on the individual land management practices of existing and previous land managers/owners.

The predominant agricultural enterprise within the Project Boundary is beef cattle grazing on private, freehold land. Some areas within the farming properties have been historically subject to pasture improvement, resulting in some areas being dominated by exotic pasture species.

AGL Macquarie's Liddell and Bayswater Power Stations are located 10 km south-west of the Project Boundary. Bayswater and Liddell Power Stations produce approximately 15,000 gigawatt Hours (GWh) and 8,000 GWh of electricity per annum, respectively. Combined, they produce power for approximately 3 million average Australian homes. Liddell Power Station is scheduled to commence closure in April 2022 with final closure by April 2023, whilst Bayswater Power Station is scheduled for closure in 2035.

In light of the forecast power station closures, the Federal and State governments have committed to financially supporting an upgrade of the transmission lines between NSW and Queensland. As part of this process, the Australian Energy Regulator published a decision to support TransGrid's 'QNI Minor Upgrade Contingent Project' which will expand the transmission transfer capacity between the two states. This will increase the transmission capacity in the Upper Hunter area and support the NSW Government initiative of designating the Hunter Region as one of its Renewable Energy Zones.

Presently, there are no known existing wind farms in the Region other than the proposed Upper Hunter Energy Park (north-west of Scone). Although there is potential for the expansion of renewable energy development in the Upper Hunter Valley and government policy is in place to support this, there are currently few in operation or in the planning process.

#### Built Environment

All town centres are located at significant distances from the Project. The Muswellbrook town centre is located 12 km west of the Project Boundary. The Singleton town centre is located 25 km south-east of the Project Boundary. The Scone town centre is located 22 km north-west of the Project Boundary.

The Main Northern Rail Line is located approximately 8 km south of the Project Boundary. The section of line between Muswellbrook and Newcastle is an integral part of the Hunter Valley Coal Chain. It also services other freight trains as well as regional and intercity passenger trains.

The New England Highway is located approximately 8 km south and is the main road that connects Muswellbrook and Singleton in a generally north-south direction. No Roads and Maritime Services signposted Tourist Routes are within 20 km of the Project.

#### Land Ownership

The Project Boundary comprises 16,720 hectares (ha) of which the majority is freehold land with some minor areas of crown land. Less than 3% of this land area is directly impacted by the Project. Land associated with the powerline easement is largely freehold with some Crown land outside the road easement.

Land required for road widening from the Port of Newcastle to the site entry is largely freehold with some Crown land and totals less than 7 ha.

#### Landholder Agreements

"Associated Landholders" are owners and occupiers of land proposed to host wind turbine generators or related infrastructure and owners and occupiers of land required for access during construction and/or operation of the Project.

"Neighbour Landholders" are private landholders with a dwelling less than 3 km from a proposed wind turbine generator location. Consultation with Neighbours has been ongoing with Neighbour Agreements offered to address specific issues raised by individual landowners or to mitigate the impacts identified in the specialist assessments as described in this Environmental Impact Statement.

"Non-Associated Landholders" are private landholders where the residence is greater than 3 km from the closest wind turbine generator, the landholder is not associated with hosting Project infrastructure or a neighbour agreement is not in place with the landholder.

A Neighbour Benefit Program has been developed to share the benefits of the Project with landholders within 3 - 4.4 km of the closest proposed wind turbine generator's location where no other commercial agreements are reached. The Neighbour Benefit Program will consist of an electricity grant/rebate offer.

Agreements are being sought with all Associated Landowners and are being offered to all Neighbour Landholders as described above. The Neighbour Benefit Program will be open to all eligible landholders on a voluntary basis.

#### THE DEVELOPMENT

The Project will generally involve the construction, operation, maintenance, and decommissioning of the Bowmans Creek Wind Farm and includes:

- Up to 60 wind turbine generators consisting of:
  - A three-blade rotor and nacelle mounted onto a tubular tower;
  - Crane hardstand area; and
  - Laydown area;
- Electrical infrastructure:
  - Up to two collector substations and associated transmission line to transmit the generated electricity into the existing high voltage network; and
  - Connections between the wind turbine generators and the collector substation/s, which will include a combination of underground cables and overhead powerlines;
- Ancillary infrastructure;
  - Operations and Maintenance Facility;
  - Storage facilities and laydown areas;
  - Unsealed access tracks;
  - Ongoing use of two temporary wind monitoring masts and the installation of up to four permanent monitoring masts; and

- Temporary construction facilities (including concrete batching plant and rock crushing facilities);
- Minor upgrades to the road network to facilitate delivery of oversize or overmass loads (such as wind turbine generator components) to the site and to facilitate the construction of the transmission line; and
- Administrative activities (including boundary adjustments and land subdivisions).

Construction hours will generally be 7 am to 6 pm on weekdays, 8 am to 1 pm on Saturdays with no audible work (at non-Associated receivers) conducted on Sundays or public holidays. Operational hours will be up to 24 hours a day, seven days a week. Wind turbine generators have a design life of approximately 25 years.

The Survey Area of 1,052 ha incorporates buffers around Project components to enable detailed design and micro-siting changes during construction. Within this Survey Area, up to 515 ha of ground disturbance will occur.

A Voluntary Planning Agreement will be entered into with each of Muswellbrook Shire Council, Upper Hunter Shire Council and Singleton Shire Council generally in accordance with Division 7.1(a) of Part 7 of the *Environmental Planning & Assessment Act 1979*. An offer of \$3,000 per wind turbine generator, per annum, constructed within each Local Government Area boundary has been made to each Council. The financial benefit to each municipality is proposed to be distributed via an individual Council 'Community Fund' (or similar) distribution mechanism.

#### STATUTORY CONTEXT

#### Environmental Planning and Assessment Act 1979

This Project constitutes State Significant Development in accordance with Schedule 1 of the *State Environmental Planning Policy* (*State and Regional Development*) 2011 and as such will require approval under Division 4.7 of Part 4 of the *Environmental Planning and Assessment Act* 1979.

Section 4.38 of the *Environmental Planning and Assessment Act 1979* states that development consent cannot be granted to a development that is wholly prohibited by an Environmental Planning Instrument. Clause 34 of the *State Environmental Planning Policy (Infrastructure) 2007* states that development for the purpose of electricity generating works may be carried out on any land in a prescribed rural, industrial or special use zone. The Project is located entirely on land zoned as RU1 – Primary Production which is a 'prescribed rural zone' for the purpose of Clause 34 of the *State Environmental Planning Policy (Infrastructure) 2007*. Therefore, the Project is permissible (with development consent) on the land on which it is proposed.

Section 4.41 and 4.42 lists the authorisations under other Acts that are not required or must be granted consistent with the development consent for State Significant Development, respectively. A summary of post-approvals required prior to construction, if the development application is approved, are described in this Environmental Impact Statement.

#### STAKEHOLDER ENGAGEMENT

Wind farms in NSW are generally limited to sites on elevated land with above average wind speeds and close proximity to existing transmission infrastructure. The NSW Government has released the 'Wind Farm Map' (Carter & Gammidge, 2019) which illustrates sources of wind energy, generator capacity and key transmission lines in NSW. The wind farm map shows that the Project is located within a high wind speed area that is in proximity to existing transmission lines and substations.

Such sites are relatively rare, and often, these sites are in the vicinity of rural dwellings and in some cases in the vicinity of small to medium sized regional communities. This can cause conflict where local community members feel they will be impacted by the Project and yet will not see any direct benefits. The limited number of viable wind farm sites means that this conflict is often unavoidable and cannot be eliminated by simply moving the wind farm to a different location.

Accordingly, community engagement is focused not only on the careful positioning of wind turbines and other project elements to reduce direct impacts, but to also understand and mitigate the potential impacts of the Project whilst maximising the socio-economic benefits of the Project to the local community.

The 'Wind Energy Guideline' outlines the expectation for early and meaningful consultation with the local community and other stakeholders to enable feedback that can be incorporated into the design of the Project. This approach is described below.

#### Stakeholder Engagement Plan

The Proponent prepared and implemented a Stakeholder Engagement Plan for the Project. Key stakeholders relevant to the Project were identified through a variety of means including ground truthing. The list of interested stakeholders has been continually updated throughout the consultation process.

Various methods were employed to directly and thoroughly engage with the community which included (at least):

- Introductory letters to the community within 5 km of the Project in 2018 and 2019;
- Face to face meetings were held with landholders and members of the nearby community and community groups during the preparation of the Environmental Impact Statement;
- Newsletters Approximately 250 copies of each of the six newsletters released were distributed to the local community, regulators and other interested stakeholders. Newsletters were distributed during June 2018, May 2019, September 2019, November 2019, February 2020, July 2020 and December 2020. Supporting information accompanied the July 2020 newsletter in the form of frequently asked questions covering topics raised regularly during consultation activities;
- Community Information Sessions were held during October 2018, November 2019 and July 2020. There were four in-person sessions held in each series at McCullys Gap, Muscle Creek, Hebden and Mt Pleasant in 2018 and 2019. Additionally, three sessions were held in July 2020 via the software platform "Zoom". Over 200 people attended the community information sessions in total;

- Bowmans Creek Community Consultative Committee was formed in April 2020 with three formal meetings held to date and proposed quarterly meetings moving forward;
- Press release and advertisements; and
- Website and Project mailbox updates.

#### Issue Scoping and Response

During 2019, there were over 100 meetings consisting of email, telephone and face-to-face meetings. Of these, the majority of concerns raised were in relation to potential impacts from landscape and visual, noise, bushfire risk and property value.

A comprehensive list of issues was collated, documented and responded to in this Environmental Impact Statement from regulators, near neighbours and other interested parties. Issues raised during consultation were also included as part of the Social Impact Assessment which included consideration of the character, amenity and values of the area surrounding the Project Boundary.

**Figure ES2** provides a summary of issues raised by neighbours within and external to 4 km from the Project.





#### Aboriginal Community Consultation

The Aboriginal community consultation over the Project was conducted by Ozark Environment and Heritage Management Pty Ltd in accordance with the 'Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010'.

#### Ongoing Stakeholder Engagement

The Proponent is committed to effective engagement with identified stakeholders and will continue to implement a Stakeholder Engagement Plan through the approvals process and beyond.

The Stakeholder Engagement Plan will include all stakeholder related commitments from this EIS. Additionally, various other mechanisms will be implemented from time to time to ensure the effective ongoing engagement with Project stakeholders.

Ref: 210317 Bowmans Creek Wind Farm EIS

#### **RISK ASSESSMENT**

Potential environmental and socio-economic risks were identified from the Project to direct the level of assessment required in the Environmental Impact Statement.

There were no critical risks identified from the Project due to project refinement and careful design. There were nine issues rated as high risk, six issues rated as moderate risk and nine issues rated as low risk. Each risk has been assessed and mitigated in this Environmental Impact Statement.

#### IMPACTS, MANAGEMENT AND MITIGATION

#### Landscape and Visual

#### Impact Assessment

A Landscape and Visual Impact Assessment (LVIA) was undertaken for the Project by Green Bean Design Pty Ltd (GBD).

An analysis of the landscape within 4.4 km of the wind turbines did not identify any key public viewpoints (such as dedicated lookouts, public spaces or recreational areas); however, the LVIA extends to a broader study area in excess of 12 km which includes public viewpoints and lookouts beyond the project Boundary.

Community consultation has been comprehensively considered in the LVIA with turbine locations responding to an iterative process of reviews against the Bulletin performance objectives.

A Visual Baseline Study incorporated community input to establish residential and public viewpoints. This study informed the LVIA in relation to key landscape features and relative scenic quality. The LVIA identified and described the relative scenic quality of the area within and surrounding the Project. The LVIA identified landscapes surrounding the project site within the NSW Sydney Basin and North Coast Bioregions (and Hunter Valley sub region) with examples of high to low scenic quality. Most of the area within and surrounding the project site is a moderate scenic quality landscape. The Bowmans Creek Wind Farm is not considered to result in a significant impact upon landscape scenic values or quality.

A range of Visual Influence Zones have been identified including VIZ 1 at proximate viewpoints and/or those with a local heritage listing. Most viewpoints within the LVIA are VIZ 2 viewpoints and include rural residential dwellings beyond 2 km from the wind turbines.

The LVIA identified no existing operational or approved wind energy projects within a local context and/or within 8 km of the proposed Bowmans Creek Wind Farm. The closest approved wind farm was identified as the Upper Hunter Energy Park located approximately 35 km north-west of the Bowmans Creek project site.

The Zone of Visual Influence and Wind Turbine Visibility diagrams illustrate the influence of surrounding landform which disperses visibility from between 3 and 4 km, although opportunities to view turbines from elevated, but moderately distant and generally unoccupied landscape occurs from areas beyond 5 km. When viewed from distances of around or greater than 10 km, turbines will generally be less distinct from other distant elements within the same field of view.

Most dwellings within 4.4 km of wind turbines are considered compliant with the Bulletin performance objectives including visual magnitude and multiple wind turbine effects. Where impacts do not meet all the visual performance objectives (generally against multiple wind turbine effect or visual magnitude) the Proponent has committed to a range of mitigation measures including neighbour agreements, relocation and/or removal of wind turbines. Although the Bulletin performance objectives can be achieved for the majority of dwellings, vegetative screening will be offered at all dwellings within 4.4 km of wind turbines resulting from site specific assessments (e.g. where few wind turbines are visible, where no significant tree cover surrounds the dwellings or curtilages, existing vegetation indicates partial screening of the Project or there are views of blades only.

No key public view locations were identified within 4.4 km of the turbines. However, the assessment of scenic locations has been undertaken for 16 public view-points and scenic locations to at least 8 km. Locations considered views from: local roads, various locations in Muswellbrook, Lake Liddell Recreation Park, Mt Royal National Park, Lake Glenbawn, Lake St Clair, as well as near properties in Greenlands, Woodlands Ridge, McCullys Gap and Rouchel.

Key public view locations, scenic areas or lookouts are located at considerable distance from the wind turbines (and generally beyond the 8 km threshold). Whilst wind turbines will be visible from key public view locations, their scale will not dominate the landscape and occur within a single 60-degree sector where within 8 km of the wind turbines.

The Project is compliant with the Aviation hazard lighting performance objectives; however, GBD has noted that AS 4282:1997 and AS4282:2019 as referenced in the Bulletin is not applicable to flashing aviation hazard lighting or lighting for aviation safety.

Electrical works, including the installation of internal reticulation and powerlines are not considered to result in significant visual impacts. Landscape characteristics within and beyond the Project Boundary are considered to offer a reasonably high degree of visual absorption capability and will offer a reasonable degree of screening and filtering of views from sensitive view locations including dwellings and public lookouts. The transmission line corridor will be located below ridgeline areas to avoid skyline views where possible and/or located within existing utility/transport corridors to minimise visual intrusion.

#### Mitigation and Management

Where impacts do not entirely meet the visual performance objectives, residual impacts are possible. The Proponent has committed to offering additional mitigation in this instance, to landowners. In addition to vegetative screening, a neighbour agreement will be offered to affected landholders as described in **Table 18**.

Should Agreements not able to be finalised with three owners, some of the following turbines would not be constructed: 60, 61, 22, 23, 9 and 10.

During the detailed design process, further refinement of the wind turbine layout may occur to assist in the visual mitigation of some of the proposed wind turbine structures as well as a review of materials and colour finishes for other selected smaller scale components (including the use of appropriate finishes to minimise potential for glint and glare). During construction tree removal will be minimised and the protection of mature trees undertaken across the Project site. Temporary light spill will be avoided beyond the construction site and progressive rehabilitation of disturbed areas will occur.

During operations ongoing maintenance and repair of constructed elements, replacement of damaged or missing constructed elements and long-term maintenance (and replacement as necessary) of vegetation within the Project site will occur to maintain visual filtering and screening of external views, as and where appropriate.

#### Noise and Vibration

#### Impact Assessment

A Noise and Vibration Impact Assessment was undertaken for the Project by Sonus Pty Ltd.

Based on the predictions of the Noise and Vibration Impact Assessment, the maximum equivalent noise levels generated by the wind turbines under conditions most conducive to noise propagation (such as temperature inversions) will comply with the criteria established by the Secretary's Environmental Assessment Requirements at all non-Associated dwellings (excepting P22-1 by 1 dBA).

Should an Agreement with P22-1 not be gained, a curtailment strategy will be implemented (where relevant operating turbine(s) will operate in a "sound optimised" mode at the wind speeds where the predictions indicate that the criteria will be exceeded) to achieve compliance with criteria at P22-1.

The maximum equivalent noise levels generated by the substations under conditions most conducive to noise propagation (such as temperature inversions) will readily comply with the relevant criteria.

Based on the predicted noise levels in the Noise and Vibration Impact Assessment, it is expected that during standard construction hours (7 am to 6 pm on weekdays, 8 am to 1 pm on Saturday), noise generated from time to time will potentially be greater than 40 a-weighted decibels for some activities. However, it will be significantly less than 75 a-weighted decibels which represents the point where there may be strong community reaction to noise.

For a residence set back 20m from the roadside on the heavy vehicle transport route, the Noise and Vibration Impact Assessment predicts that the 55 a-weighted decibels criterion can be achieved for 20 passenger vehicle movements and six heavy vehicle movements in one hour.

#### Mitigation and Management

The Proponent will employ the following management and mitigation measures to the construction of the Project:

- The majority of construction works will be restricted to the hours between 7 am and 6 pm Monday to Friday, and between 8 am and 1 pm on Saturdays;
- Works carried out outside of these hours will only occur under strict controls;
- Best practice feasible and reasonable work practices will be employed when working outside of standard work hours or when in close proximity to sensitive receptors;

- Fixed noise sources will be located at the maximum practicable distance to the nearest dwellings, in consideration of topography to block line of sight;
- Acoustic screens or mounding to be constructed within the Survey Area where required;
- Equipment selection will meet strict criteria;
- Consultation and notification will occur prior to works within 2.4 km of a Non-Associated residence and when significant construction traffic has the potential to impact private dwellings; and
- Site access will only be via the site access roads stipulated in the Environmental Impact Statement.

Given that the noise assessment has been made based on a representative wind turbine generator and the selection may change during the detailed design of the Project, the need for curtailment and the final operating strategy will be determined during a pre-construction noise assessment. The pre-construction noise assessment will consider the final turbine selection and layout, guaranteed sound power levels for the WTG, and final agreements with landowners.

#### Aviation Safety

#### Impact Assessment

An Aviation Impact Assessment was undertaken by Aviation Projects to identify and assess aviation constraints relevant to the Project.

The Project is located within 55 km of three registered airports; Cessnock Airport, Maitland Airport and Scone Airport. Each of these were assessed and the Project will not penetrate any Obstacle Limitation Surfaces or Procedures for Air Navigation Services – Aircraft Operations, or circling areas.

Four Aircraft Landing Areas (ALA) will be impacted by the Project (ALA 1, ALA 2, ALA 4 and ALA 13) of which three are located on land associated with the Project (ALA 2, ALA 4 and ALA 13). Take-off and landing from each would not be impacted but the associated circuit may be and as such may require alteration in some circumstances.

Safe aerial application operations will remain possible on properties within and neighbouring the Project Boundary.

Aerial firefighting and emergency aviation services organisations have formal risk management programs to assess the risks associated with their operations and implement applicable treatments will ensure an acceptable level of safety can be maintained.

The highest wind turbine is turbine 46 with a maximum overall height of 2,988 feet is below the lowest safe altitude minimum obstacle clearance of 5,600 feet by approximately 2,612 feet above mean sea level. Therefore, the Project will not affect the grids lowest safe altitude.

The Project's wind turbines will not penetrate any protection areas associated with aviation facilities. The closest aviation facility is a non-directional (radio) beacon at Scone Airport, 29 km to the north-east from the Project and will not be impacted.

The Project is located outside controlled airspace (wholly within Class G airspace) but within the Restricted Area R583B and the Danger Area D600 associated with RAAF Base Williamtown military restricted airspace. All wind turbines within the Restricted Area R583B and the Danger Area D600 will be within the applicable vertical restriction limits.

There may be some high-speed low-level military jet aircraft and helicopter operations conducted in the airspace above the Project Boundary from time to time.

The Project will not require obstacle lighting to maintain an acceptable level of safety to aircraft.

#### Mitigation and Management

"As constructed" details of wind turbines and wind monitoring tower coordinates and elevations will be provided to Air Services Australia.

The rotor blades, nacelle and the tower of the wind turbines will be off-white/grey (unless otherwise agreed by the Secretary) consistent with most wind turbines operational in Australia to increase their visibility from above.

Wind monitoring towers will be marked according to the requirements set out in Manual of Standards Chapter 8 Division 10 (as modified by the guidance in National Airports Safeguarding Framework Guideline D).

Overhead transmission lines that are located where they could adversely affect aerial agricultural activities will be identified in consultation with local aerial agriculture operators. In the event that pre-existing aerial agricultural activities are affected by the construction and/or operation of the wind turbine generators, reasonable measures will be implemented in consultation with the landowner to mitigate the impacts.

Local aerial agricultural operators and aerial firefighting operators will be engaged to develop procedures for aircraft operations in the vicinity of the Project.

#### Traffic and Transport

#### Impact Assessment

A Traffic and Transport Impact Assessment was undertaken for the Project by Cardno Pty Ltd.

A Road Condition and Safety Assessment was conducted based on the swept path review and documentation, an on-site review of the road condition and safety features of the oversize or overmass route from Newcastle, Hebden Road, Scrumlo Road, Bowmans Creek Road and Albano Road.

The oversize or overmass route from New England Highway onto Hebden Road South to Scrumlo Road is generally considered to be satisfactory. There will be a requirement for road works and vegetation removal / trimming, however this is considered to be minor and will be refined as part of the detailed design for the works.

The overmass route on Bowmans Creek Road and Albano Road is generally undulating and consisting of crushed road base surface. The topography in select locations is generally exceeding the maximum 20-25% gradient considered suitable for an overmass vehicle. Where the gradient is too high, the road will be modified in consultation with the relevant Council.

Minor works are also required on Selwyn Street upon exit from the Port of Newcastle. Access to the Pacific Highway and Hunter Expressway will require traffic management measures and likely short-term road closures.

The Project is expected to generate 282 trips daily in and out of the Project during the peak construction period of which about 47% will be delivery related heavy vehicles.

Oversize or overmass vehicle movements are scheduled to occur during months 11-16, during which time a peak of up to 131 one-way daily vehicle movements will occur. The delivery of wind turbines is likely to be grouped to minimise the impact on the road network along its journey and occur outside of peak times during periods.

It is estimated that in the AM peak, 66 vehicles will enter the site and 20 vehicles will leave the site with the reverse in the PM.

All vehicles will access the site from the New England Highway via Hebden Road north or south. Once light vehicles have entered Hebden Road from the New England Highway, they will access the operations and maintenance facility off Scrumlo Road before dispersing across the site on private tracks.

"SIDRA" analysis results and movement summaries indicates the New England Highway / Hebden Road intersection is not detrimentally impacted by the addition of project construction traffic and therefore would not require any upgrades.

Based on the low frequency of school bus movements, the exposure to light vehicle construction traffic will be low and therefore will be a minor conflict.

#### Mitigation and Management

Oversize or overmass vehicular movements will be scheduled to meet the restrictions on the relevant sections of the New England Highway and Hunter Expressway. Conflict points resulting from the swept path analysis as well as the serviceability of all box culverts / causeways and bridges along Hebden Road and Scrumlo Road will be carefully considered in the Traffic Management Plan.

Following construction, a dilapidation assessment will be conducted over those parts of the local government road network relied upon, to capture any changes in conditions during oversize or overmass and other heavy vehicle construction traffic movements. Any identified damage related to construction activities will be remedied in consultation with the relevant authority.

The interaction of heavy construction traffic and oversize or overmass vehicles will be coordinated with the operator of local school bus services and managed as part of the Traffic Management Plan.

#### **Biodiversity**

#### Impact Assessment

A Biodiversity Development Assessment Report was undertaken by Cumberland Ecology.

#### General Impacts

No important wetlands listed in the Directory of Important Wetlands in Australia are present in the Survey Area. The main fauna corridor occurs in the north-eastern parts of the Survey 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. On a wider regional level, with the exception to the vegetation corridor in the north-east, the Survey Area has patchy or 'stepping-stone' connectivity to the north, west and east due to widespread clearing across large expanses of agricultural lands.

No karsts, caves, crevices, cliffs or areas of geological significance have been identified within the Survey Area. A small cliff in an area known as Yellow Rock is not located within the Disturbance Area but is present in the Survey Area in close proximity to a section of proposed underground reticulation.

No areas of outstanding biodiversity value have been mapped within the Survey Area.

The native vegetation extent (including Derived Native Grassland) within the Disturbance Area occupies 330 ha, which represents approximately 61% of the Disturbance Area. This comprises predominantly remnant vegetation, with some scattered occurrences of planted vegetation within the public road corridor and Crown land. The remaining vegetation is comprised of exotic/cleared areas and dams.

#### Prescribed Impacts

Prescribed impacts as identified in Clause 6.1 of the *Biodiversity Conservation Regulation 2017* which are relevant to the Project include:

- Habitat connectivity will be reduced by the long-term removal of 133 ha of woody vegetation which forms part of fragmented or stepping-stone habitats. However, as the Project is linear in nature and involves relatively narrow clearance corridors, it does not result in large consolidated areas of clearing. As much of the Disturbance Area occurs in cleared grasslands or open woodlands with widespread tree cover, fragmentation in terms of habitat use by fauna is likely to be minimal. The reduction of this area of habitat is not considered to significantly impact the movement of mobile fauna species.
- Regular usage for the maintenance of wind turbines will increase the number of vehicles that will be accessing the Project. However, as the tracks are windy, steep and unsealed, vehicle speeds will remain such that fauna vehicle strikes have a low likelihood of occurrence.
- Collision risk modelling indicates that most avian species have an avoidance rate of 98-99%. Based on the outcome of the Risk Assessment, the risk of blade strike/collision for most birds was rated as negligible. The Wedge-tailed Eagle (which is not a listed threatened species on mainland Australia was assessed as a moderate to low risk.

#### Direct Impact

The primary and direct impact resulting from the Project is the loss of vegetation and associated habitat within the Disturbance Area of up to 515 ha. Impacts to native vegetation (PCT 1-18) total up to 330 ha (comprising 133 ha of woodland and 197 ha of derived native grassland). Two candidate species credit species were assessed as occurring in the Disturbance Area including the Large-eared Pied Bat and Brush-tailed Phascogale.

The distribution of disturbance across the different types of infrastructure has been estimated. This conservative assessment assumes 100% vegetation clearance beneath overhead reticulation and transmission lines of 186 ha (of which 44 ha is exotic vegetation or dams) and up to 50 m disturbance for access tracks across 295 ha (of which 121 ha is exotic or dams). WTG footings of up to 13 ha, as well as combined construction compounds, O&M Facility, batch plants and substation are conservatively estimated to total 12 ha. External road upgrades of 7 ha have been calculated. Of the remaining 2 ha of underground reticulation disturbance, 1.5 ha is exotic.

#### Mitigation and Management

#### Avoidance

A number of amendments have been able to be made to the location of the Project infrastructure within the Disturbance Area which have resulted in avoidance or minimisation of impacts on native vegetation and habitat including:

- Designing location of turbines to maximise avoidance of threatened ecological communities, in particular communities listed under both BC Act and EPBC Act;
- Designing access in consideration of current tracks, roads and creek crossings present within the Survey Area where possible, to avoid additional vegetation clearance for access;
- Placement of turbines in cleared or treeless areas, wherever possible, to minimise tree clearance and hollow loss;
- For turbines in woodland areas, situating turbines in naturally lower density areas or areas where disturbance (e.g. from grazing) has previously taken place, wherever possible;
- Hollow-bearing tree clearance has been avoided, where possible, to date and will be further avoided where practical during the detailed design and micro-siting phase;
- Placement of construction compounds, substations and rock crushing facilities outside areas of native vegetation, where possible;
- A commitment to the removal of canopy only and retention of understory where possible for the installation of the external overhead powerlines;
- Placement of underground reticulation within the access track footprint where possible to allow for temporary rather than permanent disturbance; and
- Where possible, utilisation of existing creek crossings to minimise impacts on hydrological processes.

#### Management

Management and mitigation measures are proposed to limit any impacts on habitat connectivity and vehicle strike.

During the detailed design stage, additional survey will be undertaken to confirm the presence of any potential threatened flora species so that access track (and other relevant infrastructure components) alignments can be adjusted to minimise any impacts to threatened flora.

#### Offsetting

The Biodiversity Assessment Method sets a standard that will result in no net loss of biodiversity values where the impacts on biodiversity values are avoided, minimised and mitigated. All residual impacts are offset by retirement of the required number of biodiversity credits.

Preliminary offset calculations have been undertaken for the 18 plant community types(total of 12,236 credits required) and two threatened species (2,526 credits required).

Revised offset calculations, utilising additional survey effort and the final project layout will include requisite credit calculations for any impacted threatened species. The calculations will be undertaken in accordance with conditions of development consent in consultation with relevant regulators.

With the implementation of the proposed avoidance, management and offsetting measures, the Project is considered likely to maintain or improve biodiversity values in the long term and will meet the no net loss standard required under the Biodiversity Assessment Method.

#### Aboriginal Cultural Heritage

An Aboriginal and Cultural Heritage Assessment Report was undertaken for the Project by Ozark Environment and Heritage Management Pty Ltd.

There were 16 sites considered, however only nine sites (six newly recorded and three previously recorded) are located within the Survey Boundary. For the 16 sites:

- Eight sites will be avoided by the Project (including ANT 22);
- Eight sites have potential to be impacted by the Project, however:
  - Six individual sites have potential to be avoided during the Transmission Line design;
  - Two sites have a low probability for avoidance along Albano Road.

Consultation with Registered Aboriginal Parties occurred in accordance with the 'Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010'.

No specific cultural values pertaining to the Survey Boundary were received during the fieldwork. The general feeling of the Registered Aboriginal Parties was that the steep sided hills of Survey Unit 1 would not have attracted occupation in the past. In Survey Area 2, the recorded sites were held to be significant by the Registered Aboriginal Party representatives and there was a unanimous desire to see the sites conserved and protected.

An Aboriginal Cultural Heritage Management Plan will be prepared for the Project in accordance with conditions of consent and will quantify the sites to be impacted, the methods by which they will be managed (Group 1: Archaeological Salvage and surface Artefact Collection or Group 2: Archaeological salvage: limited manual excavation) and the management of any artefacts that are recovered prior to the works.

As part of the Project detailed design phase there may be some flexibility to avoid harm to certain Aboriginal sites, particularly with regards to the design of the transmission line.

The Aboriginal Cultural Heritage Management Plan will include at least the above as well as a protocol for unanticipated finds and the discovery of human skeletal material and be prepared in consultation with the Registered Aboriginal Parties and relevant regulators.

#### Historic Heritage

An Historic Heritage Impact Assessment was undertaken for the Project by Ozark Environment and Heritage Management Pty Ltd.

There are no Commonwealth or National heritage listed places within the Survey Boundary and there are no State Heritage Register listed items within, or near to, the Survey Boundary.

There are three places listed on an LEP that are in close proximity but external to the Survey Boundary. The 'Former Roman Catholic Church' (I56) listed in the Singleton Local Environment Plan, and 'Fairview' (I47) and 'Hillcrest' (I48) both listed in the Muswellbrook Local Environment Plan. The Assessment concludes that there will be no impact on these listed items.

Although not listed on a Local Environment Plan, two historic heritage places were recorded during the survey. Although neither Rock Lily Gully (HS01) or Hilliers Creek (HC01) satisfy the criteria to be considered to have local heritage values, the loss of either item would be regretful, and as such both items will be retained in the landscape. Management will be conducted in consultation with the landowner.

#### Economics

A relevant Economic Impact Assessment was undertaken for the Project by Gillespie Economics.

The Project will provide economic activity to the regional economy of Singleton, Muswellbrook and Upper Hunter Shire Councils Local Government Areas, during both the construction and operations phase. General economic impact mitigation and management measures include:

- Employment of regional residents where practicable (i.e. where they are motivated to work, have the required skills and experience and are able to adhere to occupational health and safety policies, construction and operations protocols and demonstrate a cultural fit with the relevant organisations);
- Participating, as appropriate, in business group meetings, events or programs in the regional community;
- Purchase local non-labour inputs to production, preferentially where local producers can be cost and quality competitive, to support local industries;
- Design the Project infrastructure so that the continued agricultural productivity of the Associated landholdings is maintained to the maximum extent practicable;

- The establishment of a Neighbour Benefit Program to share the benefits of the Project;
- Enter into a Voluntary Planning Agreement with the three relevant Councils for the provision of social infrastructure, commensurate with the Project's impacts.

#### **Telecommunications**

#### Impact Assessment

A Radiocommunications Services Impact Assessment was undertaken for the Project by Lawrence Derrick and Associates.

The only link potentially impacted by the Project is the 400MHz NSW Rural Fire Service link which intersects with the swept path of the proposed location of Turbine 70. In order to avoid impacts to this link a clearance distance of 160m either side of the ray line will be required. Any micro-siting of other close turbines for example T69 will need to maintain the specified clearance of 160 m.

No other links from other sites in the area were identified as crossing the Project Boundary.

Six FM broadcast transmitter sites were identified in the Project Boundary and all are sufficiently distant such that the Project will not have impact on the coverage of these stations.

Two Broadcasting sites were identified. ACMA ID 151218 is a commercial TV relay station and no impact is predicted. ACMA ID 6361 is located 27 km from the nearest turbine and general coverage will not be impacted.

A pre-construction TV survey will be undertaken at a sample of dwellings out to 5 km from the closest wind turbine generator to establish a benchmark of TV reception. This will provide TV reception data to compare with any potential interference during operations.

In the unlikely event that TV reception of the two main stations is impacted by WTGs located in the direction of the main TV stations (confirmed through the benchmarking above), the Viewer Access Satellite Television service will be offered by the Proponent to any affected residence.

There are three aeronautical communications sites within 27km of the Project Boundary. No interference is expected to these sites due to the significant separation distances.

The main telecommunications mobile base station infrastructure includes Telstra and Optus Cellular towers, RFS Paging Service, NBN, Australian rail track sites and Liddell Coal's two way network. All sites are sufficiently distant to the nearest wind turbine such that the Project will have no impact on the coverage of these services.

Four NBN sites were identified at Parkville, Muswellbrook, Scone and Roughit. As the base stations are a substantial distance to the closest turbine (15 km minimum), there is low risk of interference to customer links.

#### Mitigation and Management

A pre-construction TV survey will be undertaken at a sample of dwellings out to 5 km from the closest turbine to establish a benchmark of TV reception. This will provide TV reception data to compare with any potential interference during operations. In the unlikely event that TV reception of the two main stations is impacted by turbines located in the direction of the main TV stations (confirmed through benchmarking), the VAST Satellite service will be offered by the Proponent to any affected residence.

During Project detailed design consideration will be given to micro-siting T70 and T69 to achieve the required clearance zone for the impacted link. If this cannot be achieved, consultation with RFS will occur to relocate its 400 MHz communications equipment. If this cannot be resolved to RFS's satisfaction, T70 will either not be constructed or the link may be rerouted via the installation of a repeater station.

#### Social

The Social Impact Assessment conducted for the Environmental Impact Statement considered the social impacts from the Project at both the regional and local levels. The significance of each social impact (mitigated) and opportunity for the region was identified using a risk-based approach.

Residents within the regional area and tourists are likely to experience visual amenity impacts during the operations phase associated with visibility of turbines from public viewpoints mainly associated with transport corridors. Tourist impacts will be limited in extent due to the relatively short exposure time when passing the Project during travel. With the implementation of the proposed management measures the residual social impact of the Project on residential amenity in the Regional Assessment Area is assessed as low.

Over the 18-month construction phase, direct and indirect economic benefits will accrue to the Local Government Areas of the regional area. These benefits will primarily be accrued through the creation of employment opportunities and supply arrangements with local businesses. It is anticipated that the majority of the construction workforce will likely already reside in the Local Government Areas of the region, so additional demand on services will be minor.

To support local employment preparation for the Project would include:

- Prioritisation of construction phase employment within the three Local Government Areas;
- Advertising long term employment opportunities within the three Local Government Areas; and
- Seeking to provide apprenticeship and/or traineeship opportunities across the construction and operations phase of the Project.

The construction phase of the Project has the potential to impact on traffic volumes, road safety and access. These impacts are expected to occur during construction only and mainly impact residents within the immediate area. A Traffic Management Plan will be prepared in consultation with relevant regulators to mitigate impacts.

The provision of accessible and transparent information to residents about the results of the Environmental Impact Statement, proposed management commitments and outcomes of future monitoring activities should also address community concerns regarding potential impacts to amenity and character. In this regard the Proponent will continue to:

- Support the continued operation of the Community Consultative Committee which provides a forum to share and discuss the environmental performance of the Project;
- Provision of regular community updates to residents on issues of interest such as Project construction and operations, visual management objectives and implementation timeline including through the Community Consultative Committee but also through other meetings and the proponent's website; and
- Create opportunities to engage further with residents such as through ongoing community information days to provide an opportunity for residents to meet face-to-face with the proponent, ask questions and clarify Project related technical information.

The impact of the construction and operations phase of the Project on acoustic amenity determined that operational noise generated by the Project was compliant with the relevant noise criteria at all surrounding residential dwellings excepting one (with whom an Agreement will be sought). As such, the operation of the Project is not expected to impact on the acoustic amenity of properties within the Primary Assessment Area.

During consultation, a number of residents indicated that they were experiencing elevated levels of stress and anxiety due to the anticipated visual impacts of the Project. The primary strategy to manage stress and anxiety in relation to the Project is for the Proponent to continue to engage in and maintain transparent, evidence-based and ongoing dialogue with concerned landholders and other community members, based on the results of the Environmental Impact Statement.

To mitigate potential social impacts, the Proponent will establish a VPA with each of the Muswellbrook, Singleton, and Upper Hunter Councils.

#### Bushfire

The purpose of the assessment was to identify the risk to assets located within and immediately surrounding the Project Boundary. The risk assessment is not limited to the unlikely event of a fire being caused by the Project, it also addresses risks associated with fires triggered by natural causes or third parties. The proposed wind turbine generator and electricity infrastructure (i.e. substations, transmission lines etc) have the potential to initiate or exacerbate the spread of fires. For wind turbine generators, the risk of fire may arise due to malfunctioning bearings, inadequate crankcase lubrication, electrical reticulation facilities, electrical shorting or arcing occurring in transmission and cable damage during rotation. With the standard mitigating measures to be installed at the Project the risk of wind turbine generator ignition is low.

Bushfires are more likely to occur within the Project Boundary due to causes unrelated to the Project. If a bushfire occurs within the Project Boundary, it is expected that significant injury or property damage can be prevented. This is due to the reduced fuel loads around dwellings, their location downslope of the proposed turbines and the good accessibility for emergency services via access tracks created for the Project.

If a fire occurs, it is likely to spread to areas of woodland vegetation (i.e. environmental assets). The likelihood of impacts to environmental assets is deemed to be 'Likely'.

With regards to people and private property, the dwellings within the Project Boundary are generally not located within areas of dense vegetation or on steep slopes (between 1-3%). For these reasons, it is not expected that the Project will exacerbate fires spreading to these assets. As such, the likelihood of impacts to people and property being exacerbated by the Project is deemed to be 'Unlikely'.

The proposed turbines are generally sited on ridgelines and hillslopes. Given that fire burns more quickly upslope, externally ignited fires are more likely to spread to Project infrastructure than to private infrastructure. The likelihood of impacts to Project infrastructure is deemed to be 'Likely'.

The bushfire assessment concluded overall that the risk to people and private property is 'Low', environmental assets is 'High'; and project infrastructure is 'High' and borne by the Proponent.

The Proponent will develop a Bushfire Management Plan in consultation with the relevant emergency services and regulatory authorities.

#### Minor Issues

Other assessments were undertaken in this Environmental Impact Statement for aspects ranked in the Project risk assessment as moderate or low, including: blade throw, shadow flicker, electric and magnetic fields, health, property values, greenhouse and life cycle, air quality, water sources, soils and agriculture, waste, hazardous materials, decommissioning and cumulative impacts.

Mitigation and management measures have been committed to for identified impacts and no material residual impacts remain for these issues.

#### Environmental Management System

A site Environment Management System will be developed and adopted for the Project including management plans as required by any Development Consent. Strategies, programs and plans will include adaptive management strategies, contingency measures to address residual impacts and a program to monitor and report on the environmental performance of the Project.

#### MERIT EVALUATION

The region is a significant power generating area accommodating thermal coal mines and two operating coal fired power stations. Further, in November 2020, the Hunter Region was identified as one of four Renewable Energy Zones in NSW to support the NSW Government's Electricity Infrastructure Roadmap. The renewable energy sector is emerging with one solar, one pumped hydro and one wind farm project either in the assessment process or approved for construction.

The Project is located primarily on private freehold land in the Hunter River catchment. Land within the Project Boundary is zoned RU1 – Primary Production (where electricity generation is permissible with consent).

The Proponent is one of the most experienced wind energy development companies in NSW with 570 megawatts of approved wind energy projects currently operating in NSW, as well as being a significant developer of solar projects across Australia.

#### Project Design

The Project design has been further refined since the SEARs were issued. The modifications have occurred in response to community and regulatory engagement, findings from field studies (to avoid sensitive features) and preliminary engineering design following ground-truthing of topographic features and geotechnical conditions.

The Project design has been developed through a comprehensive planning, stakeholder engagement and environmental assessment process to ensure that the principles of Ecologically Sustainable Development and the objectives of the *Environmental Planning & Assessment Act 1979* are achieved.

The Project's form has been determined by careful consideration of a number of alternatives. The impacts of the Project have been predicted with certainty in a detailed and methodical assessment process outlined in this Environmental Impact Statement. Management measures to address the impacts that will occur have been incorporated into the Project as required, thus addressing the Precautionary Principle.

Alternatives to the Project were considered which included the do-nothing option, consideration of wind turbine generators and associated infrastructure locations, transmission line access and site access via the public road network.

The "Do Nothing" approach would lead to a missed opportunity for the state of NSW, Federal Government of Australia and its people in relation to:

- Provision of additional generation capacity into the NSW grid to assist in meeting load demand as a result of retiring thermal generators;
- Reducing greenhouse gas emissions and contributing to cleaner electricity generation under the Federal Paris Agreement commitment;
- Supply of renewable energy to assist in meeting NSW targets under the 'Net Zero Plan Stage 1 2020-2030'; and
- Providing an opportunity for regional investment as the renewable energy sector grows in NSW and the Hunter Valley.

Additionally, the 'Do Nothing' approach will create missed opportunities for the environment and local community including:

- Reducing a significant amount of greenhouse gas emissions through the avoidance of carbon dioxide from coal fired power stations;
- Direct injection of funds into the local economy through the provision of jobs, use of local services, ongoing landowner payments and contributions under the Voluntary Planning Agreement;
- The production of 336 megawatts of clean, renewable energy, equivalent to the consumption of around 145,000 homes (greater than the total existing houses in the three Local Government Areas); and

• Improvements to the local road network.

Significant changes were made between the preliminary layout and the Conceptual Project for which approval is sought and as assessed in this Environmental Impact Statement and include reduction of turbines, relocation of batch plants to reduce noise impacts, discounting two northern transmission line options, and discounting site access routes which were unacceptable to the community.

#### Strategic Context

The Project falls within one of four Renewable Energy Zones where the Government has committed to supporting the development of renewable energy projects.

The Project will not impact conservation areas or tourism facilities. Where impacts to land of high scenic value were identified, adequate mitigation measures for residual impacts have been committed to by the Proponent.

The Project will not impact Strategic Agricultural Land, state forests, mineral resources, trigonometry stations, or existing or approved wind farms.

In consideration of the proposed closure of the Liddell Power Station prior to or within the early operational life of the Project, over 1,680 MW of generational capacity will be lost from the existing NSW system. The 336 MW from the Project's 60 turbines, when fully operational will have the potential to contribute to this shortfall.

There is adequate capacity in the adjacent transmission network for the Project. The further proposed upgrades by TransGrid to the NSW electricity transmission system will ensure that there will not only be capacity for the Project but for multiple other projects to be progressed.

#### **Regulatory Context**

#### Objects of the Act

Section 1.3 of the *Environmental Planning & Assessment Act 1979* lists the Objects of the Act, which are the outcomes that the legislation seeks to achieve.

The Project will facilitate the development of land for the generation of relatively low-cost renewable energy, thereby satisfying the energy needs of the community. The Project has been designed to minimise land disturbance, particularly disturbance of native vegetation. As such, it represents the proper development and conservation of natural resources. The Project will generate additional employment within the region which will assist in sustaining the socio-economic viability of three Local Government Areas.

The Project has been developed through a comprehensive planning, stakeholder engagement and environmental assessment process to ensure that the principles of Ecologically Sustainable Development are addressed. The Project's form has been determined by careful consideration of a number of alternatives. The impacts of the Project have been predicted with certainty in a detailed and methodical assessment process outlined in this Environmental Impact Statement. Management measures to address the impacts that will occur have been incorporated into the Project, thus addressing the Precautionary Principle.

The Project will generate employment and economic stimulus during its construction and operations. Further, it has been designed to minimise disturbance to land, promote dual land use and increase the economic returns from the land that is part of the development.

The Project will generally stimulate the economy with regional spending for production related costs and with wages for labour which will also contribute to the regional economy.

Further, the Associated and Near Neighbour agreements, Neighbour Benefit Program and proposed Voluntary Planning Agreement with Councils will provide an ongoing regional economic stimulus from the use of the land will increase its current productive capacity.

The Project has been designed to minimise disturbance to native vegetation. The Project will still result in the loss of some Critically Endangered Ecological Communities, Endangered Ecological Communities and habitat for threatened species. In accordance with Part 6 of the *Biodiversity Conservation Act 2016*, the Proponent has committed to establishing a biodiversity offset to compensate for clearing of native vegetation and impacts to threatened species.

The Project is a sustainable development and has been designed in consultation with the landowners and the keepers of the cultural heritage knowledge of the land. Aboriginal heritage values present at the site were assessed in consultation with Aboriginal stakeholders.

Extensive engagement with the landowners and other local community (both individuals and stakeholder groups) has been undertaken to identify key issues relating to the Project. These issues have been comprehensively addressed in this Environmental Impact Statement.

#### Consistency with Principles of Ecologically Sustainable Development

The objects of the *Environmental Planning & Assessment Act 1979* adopt the principles of Ecologically Sustainable Development in the application of the Act.

Adherence to the precautionary principle requires avoiding serious or irreversible environmental damage by properly assessing potential impacts and taking the necessary mitigation measures. This EIS identifies, with certainty, the environmental impacts from the development of the Project, which has been designed to avoid serious or irreversible environmental damage.

To ensure this, actions involving unquantifiable and unacceptable environmental consequences have been avoided. Further, environmental consequences have been assessed on a '*worst-case scenario*' basis, where if potential serious or irreversible damage was identified, an appropriate re-design of the Project was implemented to avoid those consequences. Additionally, this EIS adopted a risk-based approach to assessment to ensure certainty over the predicted impacts of the Project.

#### Intergenerational Equity

The Project design, determined through extensive consultation and the examination of the alternatives, will operate to ensure that there is no significant effect on the environment as a result of the Project which will diminish the health, diversity or productivity of the locality for future generations. This will be reinforced by the commitments to environmental management systems and the management and mitigation measures proposed.

The immediate cost of the environmental effects will be borne through the Project life and will not be left to be borne by future generations.

This has been achieved by limiting the scale of the Project and excluding development where visual and noise impacts exceeded relevant Government Guideline expectations. Residual ecological impacts will be offset by the retirement of biodiversity credits under the Biodiversity Assessment Method to ensure no net loss of biodiversity occurs as a result of the Project.

#### **Biodiversity Conservation**

The design of the Project excludes, where possible, areas of native vegetation and impacts to endangered species. The biodiversity offset committed to by the Proponent demonstrates adherence to this principle. These actions will ensure that the Project will not threaten the preservation of biodiversity and ecological integrity of the area and that the biodiversity and ecological value of the area is maintained and potentially improved in the longer term.

#### Improved Valuation

The generation of waste has been considered in this EIS and appropriate management strategies identified for construction, operation and decommissioning. Most of the waste associated with the Project will be classified as general solid waste (non-putrescible). With the exception of some metal and plastic items, most general solid waste (non-putrescible) is capable of being reused or recycled.

A lifecycle assessment was undertaken which concluded that the proposed wind turbine generators will offset their energy expenditure in less than one year, assuming an average capacity factor for Australian wind farms. The proposed wind turbine generators will have an operational life of approximately 25 years. As such, the energy produced by a wind turbine generator over its lifespan will substantially outweigh the energy required for its construction.

#### Government Plans, Policies and Guidelines

As a renewable energy development, the Project supports achievement of Commonwealth, NSW and local council policies and plans as summarised below. The 'NSW Climate Change Policy Framework' (OEH, 2016) outlines the NSW Government's role in reducing and managing the impacts of climate change. The Framework sets the aspirational long-term objective of achieving net-zero emissions by 2050.

The Project also falls within one of four Renewable Energy Zones where the Government has committed to supporting the development of renewable energy projects.

The 'Hunter Regional Plan 2036' outlines the NSW Government's land use planning priorities for the Hunter Region over the next 20 years and provides direction for regional planning decisions. The Hunter Regional Plan forecasts that the region's mining and energy industries will be affected by changing global and national policies. Future development of the region's coal and alternative energy resources will enable the Upper Hunter to respond to new and emerging opportunities.

The Hunter Region produces approximately 44% of the power generated in NSW. With the closure of Liddell and Bayswater power stations, it is necessary to transform the regional energy sector.

The Hunter Region has the solar, wind and geothermal resources required for the development of large-scale renewable energy projects. As such, the Hunter Region has the potential to become a major renewable energy hub.

Upper Hunter Shire Council's sustainable development policies encourage and support renewable energy and a diverse economy. The Hunter Regional Plan recognises the Local Government Area as part of the Upper Hunter Green Energy Precinct that has the potential to support renewable energy projects that will assist in the State-level direction to grow and diversify the energy sector. The Upper Hunter Shire Council has prepared a 'Climate Emergency Declaration' which commits it to being carbon neutral by 2030. It stated aim is to source an increasing proportion of its energy from renewable sources.

Muswellbrook Shire Council's environmental sustainability goals include support for state and federal climate change initiatives. Policies include the encouragement of renewable energy, shifting to alternate renewable energies such as wind, as well as diversification of future employment opportunities.

Singleton Shire Council's policies indicate that in order to minimise impacts on employment rates from downturns in the mining industry steps need to be taken to grow other industries in the Local Government Area, so as to better balance the local industry base. Policies aim to promote increased use of renewable energy sources and to be at the forefront of alternate energy initiatives in partnership with industry resulting in the creation of an alternate energy hub at Singleton.

#### Project Impacts and Benefits

The primary need for the Project is to contribute efficient, low cost electricity to the National Electricity Market.

The Australian Energy Market Operator released its main system planning document, the Integrated System Plan in July 2020.

The July 2020 Integrated System Plan states the factors that underline the need for the Project. The most important are:

- Electricity demand in the National Electricity Market is expected to remain generally constant throughout the period to 2040. While there is projected to be underlying growth in consumption across the NEM, this will be offset via continued investment in distributed photovoltaic and extension of the NSW Energy Saving Scheme.
- While overall grid consumption is being held constant, new generation capacity is needed to replace retiring plants. To fill that gap, AEMO forecasts that Australia should invest in a further 26-50 GW of new large-scale variable renewable energy beyond existing, committed and anticipated projects; and
- An optimal split of new solar and wind variable renewable energy would minimise the need for dispatchable storage and generation and therefore keep costs down for consumers.

A change in Government policy settings, coupled with innovation and technological advancements is driving the growth and diversification of the Hunter Region's energy industries with a focus on both energy efficiency and the generation of renewable energy.

With the scheduled closure of Liddell and Bayswater power stations in 2022 and 2035 respectively, a successful transformation in the energy sector will contribute to the Upper Hunter's continued socio-economic wellbeing.

#### Public Interest

#### Economics

The Environmental Impact Assessment found that the Project will provide economic activity to the regional economy of Singleton, Muswellbrook and Upper Hunter Shire Local Government Areas, during both the construction and operations phase. It will only result in a minor and largely temporary contraction in regional economic activity from current cattle grazing activity within the disturbance area.

#### Construction

The Input Output analysis identified that the peak construction year of the Project (Year 1) is estimated to make up to the following total contribution to the regional economy:

- \$114 M in annual direct and indirect output;
- \$48 M in annual direct and indirect value-added;
- \$17 M in annual direct and indirect household income; and
- 209 direct and indirect jobs.

The peak construction year of the Project (Year 1) is estimated to make up to the following total contribution to the NSW economy:

- \$218 M in annual direct and indirect output;
- \$99 M in annual direct and indirect value added;
- \$58 M in annual direct and indirect household income; and
- 494 direct and indirect jobs.

#### Operations

The operation of the Project is estimated to make up to the following total annual contribution to the regional economy for a period of 25 years:

- \$65 M in annual direct and indirect regional output or business turnover;
- \$53 M in annual direct and indirect regional value-added;
- \$2 M in annual direct and indirect household income; and
- 30 direct and indirect jobs.

The Project is estimated to make up to the following total annual contribution to the NSW economy for 25 years:

- \$74 M in annual direct and indirect regional output or business turnover;
- \$57 M in annual direct and indirect regional value-added;
- \$6 M in annual direct and indirect household income; and
- 58 direct and indirect jobs.

While there will be impacts to agricultural activity over the life of the Project, this was estimated to be less than 0.01% of the total agricultural activity in the region. This economic impact will not impact the capability of the land in perpetuity. If the wind farm does ever become redundant, the land could be returned to its former rate of agricultural productivity.

The impacts to foregone agricultural productivity will be borne by the Associated landholders, for which they will be compensated. The regional economic activity impacts of foregone agricultural activity are far less than those of the construction and operation of the Project.

#### <u>Social</u>

The Office of Environment and Heritage's 2015 'Community Attitudes to Renewable Energy in NSW' study concluded that the environmental benefits were the dominant perceived advantage of renewable energy technologies. Specifically, the survey found that:

- Respondents generally supported the notion that Renewables were cleaner or created less 'pollution' or fewer greenhouse gases (52%);
- Respondents supported sustainability and reduced reliance on non-renewables such as coal (39%);
- Renewables would help "save the planet" for future generations (7%); and
- Others saw benefits in the preservation of the landscape and agricultural land (e.g. by not "digging up" the landscape (5%)).

In the Hunter / Central Coast Region, 210 people were asked for their views about renewable technologies which are summarised as follows:

- Ninety three percent supported using renewables to generate electricity in NSW;
- Eighty five percent believed NSW should increase the renewables over the next five years;
- Most common perceived advantages of renewables were environmental benefits and lower cost;
- Most common perceived disadvantages included:
  - Higher cost 36%;
  - Concerns about efficiency and reliability 14%; and
  - No disadvantages 40%.
- Sixty five percent were prepared to use renewables "*provided I don't have to pay more for my electricity*" and 30% were prepared to pay more to support them.

#### Emissions Reductions

The Project is estimated to result in annual greenhouse gas savings of 813,700 tonnes of carbon dioxide equivalent (from 1,030 gigawatt hours of generated electricity) (CER, 2020a). Assuming an average wind farm capacity factor, the Project has the potential to provide sufficient renewable energy to support the annual electricity needs of approximately 145,000 households.

#### Contribution to Security and Reliability of the National Electricity Market

For the vast majority of people in NSW, electricity is supplied from large scale power plants, transported along transmission wires and eventually distributed to houses and businesses for use.

The Australian Energy Market Operator concluded the following in the 2019 'Electricity Statement of Opportunities':

"The National Energy Market has seen a continued reduction in dispatchable reserves and a tightening in supply-demand balance as conventional generation has retired. At the same time, while large amounts of renewable generation have entered the system, the reliability of the aging thermal generation fleet has deteriorated and the warming climate has increased the risk of extreme temperatures and high peak demands."

Following the 2019 ESOO report, a significant addition of supply in the form of renewable generation was installed locally in NSW. The 2020 ESOO assessed that as a result, the outlook over the short term had improved, stating:

"New South Wales' reliability outlook after the Liddell Power Station retires has improved since the 2019 ESOO, as a result of the committed augmentation of the Queensland to New South Wales Interconnector (QNI) in 2022-23 and the development of local new renewable generation (900 MW)."

However, the 2020 ESOO also highlighted the continued need to provide suitable replacement for the aging fleet of thermal generators as follows:

"A summer of unprecedented weather events, followed by the COVID-19 pandemic, demonstrates the need for increased vigilance in supporting the reliable delivery of affordable energy while taking necessary steps to increase system resilience to minimise disruptions for consumers and businesses."

While overall grid consumption is being held constant, new generation capacity is needed to replace retiring plants (ISP, 2020). To fill that gap, AEMO forecasts that Australia should invest in a further 26-50 GW of new large-scale variable renewable energy beyond existing, committed and anticipated projects (ISP, 2020).

The 2020 Integrated Systems Plan determined an optimal split of new solar and wind variable renewable energy that would minimise the need for dispatchable storage and generation and therefore keep costs down for consumers. This optimal split is approximately 43% solar and 57% wind by 2040.

When considering the future generation mix of the NEM at the lowest overall consumer expense, the Integrated Systems Plan takes a wholistic and technology-neutral approach. This is supported by modelling done by CSIRO and AEMO of the projected electricity generation technology costs (CSIRO, 2019).

By 2020 the overall cost to produce one unit of electricity MWh, referred to as the Levelised Cost Of Electricity (LCOE), for wind and solar PV is expected to be significantly less than new coal or gas fired power plants.

#### **Conclusion**

The Project offers several strategic and long-term benefits to the state of NSW and its people, including to:

- The supply of cost-effective renewable energy that will assist electricity retailers to fulfil their obligations under state and federal renewable energy targets;
- Provide replacement energy generation capacity into the NSW grid that will assist in meeting load demand as a result of retiring thermal generators and assist in providing a clean, reliable generation mix;
- Provide an opportunity for regional investment in the renewable energy sector in the Upper Hunter Valley of NSW as is promoted strategically by the relevant NSW and local government planning Instruments.

The Project offers several specific benefits to the environment and local community via the direct injection of funds into the local economy through:

- The provision of jobs in construction and operation;
- Use of local services in both the construction and operation phases; and
- Ongoing landowner payments and financial contributions to the local community being reinjected into the local economy.

The Project's social and environmental impacts have been avoided or minimised as far as practicable by implementing all reasonable and feasible management and mitigation measures. As a consequence, the socio-economic benefits of the Project will outweigh its social and environmental impacts.

The Project addresses the principles of Ecologically Sustainable Development, has been assessed in accordance with the *Environmental Planning & Assessment Act 1979*, its "objects" and as required by the Secretary's Environmental Assessment Requirements.

This assessment has determined that it is open for the Minister to conclude that the Project is in the public interest and as such should be approved under the *Environmental Planning & Assessment Act 1979*.

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## 1 INTRODUCTION

This section introduces the Project Environmental Impact Statement. It provides an overview of the Project, its need and design, introduces the Proponent and outlines the Environmental Impact Statement's purpose and structure.

## 1.1 BACKGROUND

Epuron Projects Pty Ltd (Proponent) is seeking approval for the construction, operation, maintenance and decommissioning of the Bowmans Creek Wind Farm (Project).

The Project has an estimated capital investment value of \$569 million (M) and involves up to 60 wind turbine generators (WTGs) with an indicative generation capacity of 336 megawatts (MW). The Project also includes electrical infrastructure, temporary and permanent ancillary infrastructure, local road network upgrades and an additional transmission line to connect to the existing TransGrid network via the Liddell substation.

The Project will generate up to 156 Full Time Equivalent (FTE) jobs during its 18-month construction period and 15 FTE jobs over its operational life.

The Project is generally located at Bowmans Creek, approximately 10 kilometres (km) east of Muswellbrook and 120 km north-west of the Port of Newcastle in New South Wales (NSW) as shown on **Figure 1**.

The region is a significant power generating area accommodating active coal mines and two coal fired power stations. The renewable energy sector is emerging with one solar, one pumped hydro and one wind farm project either in the assessment process or approved. There are also two existing quarries located approximately 3 km south of the Project Boundary.

The Project Boundary covers approximately 16,720 ha and extends predominantly across two Local Government Areas (LGA) being the Muswellbrook Shire Council (MSC) and Singleton Shire Council (SSC) (see **Figure 2**). A small number of WTGs are also proposed in the Upper Hunter Shire Council (UHSC) LGA. There are several rural communities proximate to the Project Boundary including: Bowmans Creek, Davis Creek, Goorangoola, Greenlands, Hebden, McCullys Gap, Muscle Creek and Rouchel Brook.

The Project is located primarily on private freehold land in the Hunter River catchment. Land within the Project Boundary is zoned RU1 – Primary Production (where electricity generation is permissible with consent). The dominant agricultural pursuit within 5 km of the Project Boundary is beef cattle grazing (see **Plate 1**).

An early assessment of the wind resource identified an investigation area comprising several elevated ridgelines that had the potential for hosting WTGs. Preliminary consultation with potential host landholders and wind monitoring commenced in 2017. This investigation area was used as the basis for early consultation activities and to seek feedback from the community and other stakeholders about the Project in 2018. This feedback was then incorporated into the design of the Scoping Report preliminary layout for further consultation with the wider community to culminate in the Project presented in this Environmental Impact Statement (EIS).



Plate 1 Indicative Beef Grazing Country within the Project Boundary

Source: Airports courtesy of Oz runways (Airservices Aust), Oz Runways, WAC Chart, 9 October 2019; World Shaded Relief © Esri



mans Creek Wind Farm | Fig01 NSW Locality | 15 02 2021

Hansen Bailey EPURON

ENVIRONMENTAL CONSULTANTS

BOWMANS CREEK WIND FARM

NSW Locality

**FIGURE 1** 

Source: Mining Authorities © 2019 NSW Department of Planning, Industry and Environment; World Shaded Relief © Esri



BOWMANS CREEK WIND FARM

**Regional Locality** 

Hansen Bailey

EPURON

FIGURE 2

## 1.2 PROJECT NEED

The primary need for the Project is to contribute efficient, clean and relatively low-cost electricity to the National Electricity Market (NEM).

The NEM operator, the Australian Energy Market Operator (AEMO) released its main system planning document, the 'Integrated System Plan' (ISP) in July 2020. This document is updated each two years and is described as *"an actionable roadmap for eastern Australia's power system to optimise consumer benefits."* 

Through a detailed technical, regulatory and economic analysis of the current electricity system and drawing on extensive consultation with industry participants, the ISP develops a number of scenarios for how electricity demand may be met in the NEM in the period to 2040.

The ISP states the factors that underline the need for the Project. The most important are:

- Electricity demand in the NEM is expected to remain generally constant throughout the period to 2040. Although electricity is being used more efficiently than ever before and some intensive electricity users are closing large operations at the end-of-life (both of which will reduce demand), economic growth and fuel-switching (for example increase use of electric vehicles) will compensate for this;
- Most of the current fleet of coal fired power stations will reach the end of their serviceable lifetime and be permanently shut down in the period. More than 26 gigawatts (GW) of new variable renewable energy is needed to replace the 63% of Australia's coal-fired generation set to retire by 2040; and
- From its analysis, the amount of wind power in the system provides the lowest cost outcomes over all scenarios.

The Hunter Region is the leading regional economy in NSW and currently accounts for 44% of its power generation (DPE, 2016d). The main industries in the Upper Hunter Valley are currently coal mining and fossil fuel power generation followed by the agricultural pursuits of the equine, viticulture and livestock grazing industries.

A change in Government policy settings, coupled with innovation and technological advancements is driving the growth and diversification of the Hunter Region's energy industries with a focus on both energy efficiency and the generation of renewable energy. In particular, in the Upper Hunter Valley, with the scheduled closure of Liddell and Bayswater power stations in 2022 and 2035 respectively, a successful transformation in the energy sector will be critical to the Upper Hunter's continued socio-economic wellbeing.

The 'Hunter Regional Plan 2036' (HR Plan) (DPE, 2016d) Direction 12 encourages the "*diversity and growth*" of the energy sector. The Upper Hunter has the solar, wind and geothermal resources with the potential to deliver large-scale renewable energy projects. Newcastle is already home to some landmark projects including CSIRO's solar farm. With its energy industries and research base, the Hunter Region has the potential to be a major hub for next-generation power supply, to which the Project will be a major contributor.

The Project Boundary is proximate to a major centre for power generation and the largest concentration of open cut coal mining in NSW. The unique mix of industries present has driven investment in transport and energy reticulation infrastructure which in turn have the ability to support the Project.

The Project is needed to assist NSW transition to lower greenhouse emission power generation and thus achieve its stated goal of net zero emissions by 2050. The Upper Hunter critically needs to be part of this transition in the context of its dependence on the energy sector for its economic sustainability.

The Project also contributes to Australia's national goals related to increased use of renewables and to emissions reduction. The Doha Amendment builds upon the Kyoto Protocol and was adopted on 8 December 2012 with the goal of reducing world GHG emissions to 18% below 1990 level between 2013 and 2020. Australia ratified the Paris Agreement in 2016, reinforcing our commitment to action on climate change.

Australia's current NDC commits it to reducing GHG emissions to 26-28% below 2005 levels by 2030. To satisfy its NDC, Australia will need to reduce its annual GHG emissions to between 263 and 272 Mt of carbon dioxide equivalent ( $CO_2$ -e). Australia's total emissions for 2018 were 383 Mt of CO2-e. Material reductions in GHG emissions are required over the next decade to achieve this target under Australia's NDC.

The 'NSW Climate Change Policy Framework' (OEH, 2016) outlines the NSW Government's role in reducing and managing the impacts of climate change. The role of the government is to implement emissions savings policies, minimise emissions from its own operations, and to advocate for Commonwealth and international action consistent with the Paris Agreement.

## 1.3 PROJECT DESIGN

The Project design has been refined since the request for Secretary's Environmental Assessment Requirements (SEARs) were received on 23 July 2019. Modifications to Project design have occurred in response to community and regulatory engagement, findings from field studies to avoid sensitive features and preliminary engineering design following ground-truthing of topographic features and geotechnical conditions.

Modifications have generally included reductions in the number of WTGs, relocation of tracks and project infrastructure, confirmation of a preferred site access route (including limits on the types of vehicles used on roads) and confirmation of a preferred transmission alignment.

The design process was focused around four core principles (avoid, minimise, mitigate and offset) and included:

- Development of layout to avoid higher conservation value areas and to avoid serious or irreversible environmental damage;
- A commitment to minimise residual impacts during detailed design and micro-siting;
- Mitigation of impacts through strict protocols during construction and operation of the Project; and
- Offsetting the residual loss of native vegetation and habitat via use of biodiversity credits in accordance with the Biodiversity Assessment Method (BAM).

The Project design has been developed through a comprehensive planning, stakeholder engagement and environmental assessment process to ensure that the principles of Ecologically Sustainable Development (ESD) and the objectives of the EP&A Act are addressed.

The Project's form has been determined by careful consideration of a number of alternatives. The impacts of the Project have been predicted with certainty in a detailed assessment process outlined in this EIS.

**Plate 2** (GBD Pty Ltd, 2018a) and **Plate 3** (GBD Pty Ltd, 2018b) illustrates typical wind farm components showing a WTG, overhead reticulation and internal access tracks.

## 1.4 **PROJECT OVERVIEW**

The Project will generally comprise the following aspects:

- Up to 60 wind WTGs sites consisting of:
  - A three-blade rotor and nacelle mounted onto a tubular tower;
  - Crane hardstand area; and
  - o Laydown area.
- Electricity infrastructure:
  - Up to two collector substations and associated transmission lines to transmit the generated electricity into the existing high voltage network; and
  - Connections between the WTGs and the collector substation/s, which will include a combination of underground cables and overhead powerlines;
- Ancillary infrastructure;
  - Operation and Maintenance Facility (O&M Facility);
  - Storage facilities and laydown areas;
  - Unsealed access tracks;
  - Ongoing use of two temporary wind monitoring masts and the installation of up to four permanent monitoring masts; and
  - 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 (such as WTG components) to the site and to facilitate the construction of the transmission line; and
- Administrative activities (including boundary adjustments and subdivisions).

Figure 3 illustrates the conceptual Project layout.



Plate 2 Typical Wind Farm Infrastructure



Plate 3 Typical Wind Farm Internal Access Roads

Source: Aerial ©2019 Google



BOWMANS CREEK WIND FARM

**Conceptual Project Layout** 

Hansen Bailey



**FIGURE 3** 

#### 1.5 EPURON PROJECTS PTY LTD

Epuron is an Australian renewable energy company established in North Sydney in 2003. Epuron is one of the most experienced wind energy development companies in NSW, as well as a significant developer of solar projects across Australia and owns and operates more off-grid utility-scale solar power stations than any other Australian company.

Epuron has a proven history of best practice environmental management, which will continue to be implemented for the Project. Epuron is a founding signatory to the Clean Energy Council's 'Best Practice Charter for Renewable Energy Developments' (CEC, 2018) and commit to honouring the Charter for the Project. The Charter outlines a commitment by signatories to engage respectfully with the communities in which they plan and operate projects, to be sensitive to environmental and cultural values and to make a positive contribution to the regions in which it operates.

Epuron is a leader in its field with 570 MW of wind turbines in operation in Australia resulting from its development work (including more than 216 turbines across four wind farms).

Epuron-approved wind energy projects in NSW total over 2,300 megawatts (MW) and includes:

- Cullerin Range Wind Farm (15 WTGs, 30 MW, operating);
- Gullen Range Wind Farm (73 WTGs, 165 MW, operating);
- White Rock Wind Farm Stage 1 (70 WTGs, 175 MW, operating);
- White Rock Wind Farm Stage 2 (48 WTGs, 216 MW, pre-construction);
- Silverton Wind Farm (58 WTGs, 200 MW operating);
- Yass Valley (Coppabella) Wind Farm (up to 75 WTGs, 290 MW, approved);
- Rye Park Wind Farm (up to 92 WTGs, 322 MW, approved); and
- Liverpool Range Wind Farm (up to 267 WTGs, 960 MW, approved);

Epuron approved solar energy projects in Australia totals over 400 MW and includes 7 MW of off-grid solar projects owned and operated by Epuron including:

- Clermont Solar Farm (90 MW, operating, QLD);
- Nevertire Solar Farm (130 MW, operating, NSW);
- Katherine Solar Farm (34 MW, under construction, NT); and
- Walgett Solar Farm (32.5 MW, approved, NSW).

Epuron's key projects are shown on Figure 4.

Contact details for Epuron are as follows:

Level 11 75 Miller Street NORTH SYDNEY NSW 2060

Phone: +61 2 8456 7400 Email: <u>info@epuron.com.au</u> Website: <u>https://epuron.com.au</u>



BOWMANS CREEK WIND FARM

Key Epuron Renewable Projects

EPURUN

**FIGURE 4** 

#### 1.6 DOCUMENT PURPOSE

This EIS has been prepared by an independent consultancy, Hansen Bailey Environmental Consultants, to support applications for both State and Federal Approval.

Epuron is seeking State Significant Development (SSD) Development Consent under Division 4.7 of Part 4 of the *Environmental Planning & Assessment Act 1979* (EP&A Act) for the Project.

The Project was referred to the Commonwealth Department of Agriculture, Water and the Environment (DAWE) and was determined to be a "controlled action" under section 75 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 3 June 2020 (EPBC Referral 2020/8631). Approval is also sought under Section 75 of the EPBC Act (EPBC Approval).

Under section 4.12(8) of the EP&A Act, a development application for SSD must be accompanied by an EIS. This EIS has been prepared in accordance with the form and content requirements prescribed by clauses 6 and 7 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* (EPA Regulation).

A request for SEARs was made to the Department of Planning, Industry and the Environment (DPIE) in May 2019 in accordance with clause 3 of Schedule 2 of the EPA Regulation. The application was supported by the 'Bowmans Creek Wind Farm Scoping Report' (Epuron, 2019) (Scoping Report).

SEARs for Application SSD-10315 were issued on 23 July 2019. Revised SEARs were issued on 13 July 2020 to incorporate DAWE's requirements in relation to EPBC Approval 2020/8631. The land to which SSD-10315 applies is listed in **Appendix A**.

A table listing the revised SEARs is included in **Appendix B** and addressed in **Section 7.5**. **Appendix B** also addresses regulatory submissions to the SEARs and identifies where each is addressed in this EIS.

An extensive Stakeholder Engagement Plan (SEP) was developed and implemented for the Project as described in **Section 5**.

This EIS addresses the revised SEARs and the issues identified in the stakeholder engagement process by assessing the social, economic and environmental opportunities and impacts of the Project to enable the relevant authority to determine the development application.

This EIS has also been prepared in consideration of the 'Preparing an Environmental Impact Statement Guideline' (DPE, 2019) (EIS Guidelines). It has also been prepared in accordance with the 'NSW Wind Energy Framework' (Wind Framework) which comprises:

- 'Wind Energy Guideline' (Wind Guideline) (DPE, 2016a);
- 'Wind Energy: Visual Assessment Bulletin' (Visual Bulletin) (DPE, 2016b);
- 'Wind Energy: Noise Assessment Bulletin' (Noise Bulletin) (DPE, 2016c);
- 'Standard Secretary's Environmental Assessment Requirement' (DPE, 2016d); and
- 'Wind Energy Framework Q&As'.

#### 1.7 DOCUMENT STRUCTURE

This EIS consists of three volumes.

The main report (Volume 1) is structured as follows:

- **Section 1** introduces this EIS. It provides an overview of the Project, introduces the Proponent and outlines the EIS purpose and structure;
- Section 2 provides an overview of the existing environment, the environmental monitoring program in place, existing land use and land ownership. It also provides a discussion on the key issues in the strategic context that are relevant to the assessment and evaluation of the Project's merits;
- Section 3 provides a detailed description of the conceptual construction, operation, maintenance and decommissioning activities. It also outlines the alternatives considered during the development;
- Section 4 includes a description of the Project's relevant state, local and federal legislation and policies;
- Section 5 provides a summary of the stakeholder engagement undertaken. It also provides an overview of the engagement process, the findings that have been incorporated into this EIS and the Proponent's commitment to ongoing engagement;
- **Section 6** considers the potential environmental and social impacts and identifies higher priorities for further assessment in this EIS;
- Section 7 provides a summary of potential environmental and social impacts of the Project and the measures that will be implemented to mitigate and manage any residual impacts. The issues have been prioritised in accordance with the SEARs, the risk assessment and outcomes of the SEP;
- **Section 8** outlines management and mitigation strategies that the Proponent will undertake during the construction, operation, maintenance and decommissioning of the Project;
- Section 9 includes an evaluation of the merits of the Project;
- Section 10 defines the abbreviations used; and
- Section 11 provides a list of materials referenced.

Volume 1 includes the Main EIS and Appendices A to G.

Volume 2 includes Appendices H to K.

Volume 3 includes Appendices L to Q.

The Study Team responsible for the preparation of this EIS is listed in Appendix C.

## 2 STRATEGIC CONTEXT

This section provides an overview of the existing environment, the environmental monitoring program in place, existing land use and land ownership. It also provides a discussion on the key issues in the strategic context that are relevant to the assessment and evaluation of the merits of the Project.

## 2.1 NATURAL ENVIRONMENT

Topography within the Project Boundary fluctuates between 135 m Australian Height Datum (AHD) in the valley floors up to 786 AHD in the escarpments and steeper slopes. A series of ridges run north–south through the Project Boundary with moderate to steep slopes. These ridges originate in the Barrington Tops and Mount Royal Range which lies to the north-east of the Project Boundary.

The following topographic high points are located within the Project Boundary:

- Hilliers Knob located in the north;
- Blue Gum Top located in the west; and
- Yellow Rock located in the east.

Adjacent to the western edge of Project Boundary is Native Dog Hill and to the south is Well Mountain.

Bowmans Creek is the major drainage line within the Project Boundary and delivers water to the Goorangoola Creek to the south.

The Project is located in the Sydney Basin Bioregion. The geology in this bioregion is characterised by Permian and Devonian bedrocks associated with the New England Fold Belt. Faulting has resulted in small granite and granodiorite intrusions of the sedimentary rocks.

The Project Boundary consists predominantly of red podzolic soils which belong to the soil order known as Chromosols. This order is the most widely used soils for agriculture. The Project Boundary primarily encompasses land that conforms to the lower land capability classes 5 and 7. Detail in relation to water resources, agriculture, soils, are provided in **Section 7.15** and **Section 7.16**.

The Sydney Basin Bioregion exhibits a temperate climate characterised by warm summers (EES, 2016). Temperatures are highest in January (mean maximum 32.1°C) and lowest in July (mean minimum 4.2°C) (BOM, Site 061397). The average annual rainfall is 656 mm (BOM, Site 061397) with the highest monthly rainfall in February (mean 86 mm) and the lowest occurs in July (mean 24 mm).

Prevailing winds are from the south-east in summer, north-west in winter and from both directions in spring and autumn. Wind speeds typically increase throughout the day with a peak in the evening period followed by a low in the early morning. This pattern of wind is common throughout the Hunter Valley.

Topographic and key natural features in the vicinity of the Project are shown on Figure 5.

Source: World Shaded Relief © Esri



Regional Existing Environment | 14 10 2020 Creek Wind Farm

> Hansen Bailey ENVIRONMENTAL CONSULTANTS

EPURON

BOWMANS CREEK WIND FARM

**Regional Existing Environment** 

## **FIGURE 5**

## 2.2 EXISTING MONITORING PROGRAM

In 2017, the Proponent commenced wind monitoring with a portable Sonic Detection and Ranging (SoDAR) device to determine site selection and feasibility. Additionally, two temporary wind monitoring masts and a further three SoDAR devices were installed to measure wind speed, wind direction, air pressure and temperature at various levels (discussed further in **Section 3.5.5**). The four SoDAR devices are regularly relocated to improve coverage across the site and assist with the design of the turbine layout.

Noise monitoring was conducted between 28 October 2019 and 16 January 2020 to determine noise background levels to support the Noise and Vibration Impact Assessment (NIA) (discussed further in **Section 7.2.1**).

## 2.3 EXISTING LAND USE

The majority of land within the Project Boundary is privately owned. The Project Boundary is located across multiple agricultural properties and comprises a series of ridges, valleys and gullies. The historic land use of the locality has impacted on the presence of fauna corridors within the landscape as extensive land clearing has occurred for agricultural uses as well as development of open cut mines. Small areas of bushland remain in limited areas as described in **Section 7.5.3**.

Within the Project Boundary, the vegetation corridors are somewhat fragmented, ranging from dense native vegetation on the steeper slopes of the ranges (generally in the western and north-eastern sections) and lightly wooded areas on spurs and gentle slopes. The extent of wooded areas varies from property-to-property depending on the individual land management practices of existing and previous land managers/owners.

Other existing land uses in the vicinity of the Project Boundary include: extractive industries, defence, power generation, renewable energy projects, town centres, rural villages, tourism and recreation and transportation corridors (shown on **Figure 1** and **Figure 2**).

## 2.3.1 Agriculture

The predominant agricultural enterprise within the Project Boundary is beef cattle grazing. Some areas within the farming properties have been historically subject to pasture improvement, resulting in some being dominated by exotic pasture species. This typically reflects the enterprises found in the Hunter Valley escarpments.

Agriculture (beef cattle farming) is not in the top five industry sectors of employment for the MSC or SSC LGA. Beef cattle farming is the second highest industry of employment in the UHSC LGA after Health Care and Social Assistance.

## 2.3.2 Extractive Industries

Within 10 km of the Project Boundary and on the eastern side of the New England Highway (NEH), there are three operating coal mines, three quarrying operations and one approved (but not yet contracted) gas pipeline.

There are a number of approved coal mines within 10 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 within the Project Boundary. There are also no mining tenements issued under the *Mining Act 1992* within the Project Boundary.

Ref: 210317 Bowmans Creek Wind Farm EIS

#### Muswellbrook Coal Mine

Idemitsu Australia Resources (Idemitsu) owns and operate Muswellbrook Coal Mine located 7 km west of the Project Boundary. It is an open cut coal mine with approval to produce 2 million tonnes coal per annum (Mtpa) until 2022 with rehabilitation activities continuing past this date. Muswellbrook Coal Mine has 158 FTE employees (MCC, 2019).

#### Liddell Coal Mine

Liddell Coal Operations (LCO) is an established open-cut mine located at Ravensworth, located approximately 7 km south of the Project Boundary. LCO is approved to extract up to 8 Mtpa of run of mine (ROM) coal until 31 December 2028 and currently has up to 460 employees (SLR, 2013).

#### Mount Owen Continued Operations

Mount Owen Continued Operations (MOCO) comprises two open cut mining areas (Mount Owen and Ravensworth East) and is located approximately 8 km south of the Project Boundary. MOCO is approved to extract up to 14 Mtpa of ROM coal until 31 December 2031 and currently employs up to 1,200 FTEs (Umwelt, 2015).

#### Quarries

The two most proximate quarry operations to the Project Boundary are described below:

- SCE (Hebden) Quarry is an operating hard rock quarry located 3 km south from the Project Boundary. SCE Quarry is a supplier of aggregates, road base, crusher dust, rocks and ballasts. It is approved to operate for 20 years and utilises Pictons Lane; and
- East Quarry is an operating quarry located approximately 2 km south from the Project Boundary. There was no public information available to determine the life of the quarry or employment numbers.

## Gas Pipeline

The Queensland-Hunter Gas Pipeline (Q-H Pipeline) is an approved but not yet constructed and extends from Wallumbilla in Queensland to Newcastle in NSW. A section of Q-H Pipeline alignment is within the southern section of the Project Boundary near the site access.

#### 2.3.3 Defence

The Singleton Military Area (SMA) comprises the Lone Pine Barracks and Singleton Training Area. The SMA is located approximately 35 km from the closest WTG and houses the School of Infantry, Joint Logistics Unit East, a firing range and the Australian Army Infantry Museum. RAAF Base Williamtown is located approximately 84 km south-east of the Project Boundary.

#### 2.3.4 Power Generation

The Liddell and Bayswater Power Stations, both owned by AGL Macquarie (AGL Energy), are located around 10 km south-west of the Project Boundary. The AGL Energy website (June 2020) reports that Bayswater Power Station generally produces approximately 15,000 GWh (2,640 MW) of electricity a year, enough power for two million average Australian homes. Liddell Power Station produces around 8,000 GWh (1,680 MW) of electricity per year or enough power for approximately 1 million average Australian homes.

Liddell Power Station is scheduled to commence closure in April 2022 with final closure by April 2023 (AGL, 2019) whilst Bayswater Power Station is scheduled for closure in 2035 (Jacobs, 2020). In light of the forecast power station closures, the Federal and State governments have committed to financially supporting an upgrade of the transmission lines between NSW and Queensland (NSW Government, 2019).

There are two existing TransGrid 330 kV Liddell to Tamworth transmission lines located west of the Project Boundary (TransGrid, ND). Of these, the closest is located within 3 km.

In November 2018, TransGrid published a report proposing options to expand the NSW and Queensland transmission transfer capacity (TransGrid, 2018). As part of this process, on 28 April 2020, the Australian Energy Regulator published a decision to support TransGrid's 'QNI Minor Upgrade Contingent Project' which will go some way towards expanding the transmission transfer capacity between the two states.

TransGrid's QNI minor upgrade project was identified as a priority investment in the Australian Energy Market Operator's 2018 ISP and the 2020 ISP published on 12 December 2019. TransGrid's upgrade is consistent with the preferred investment option identified through the 'Expanding NSW-QLD Transmission Transfer Capacity Regulatory Investment Test for Transmission (RIT-T)' process. This investment will benefit consumers and producers of electricity by deferring the need to build new generation and storage capacity in NSW, as well as allowing for more efficient sharing of generation across the NEM, and supporting the ongoing energy market transition. The two existing TransGrid 330 kV Liddell to Tamworth transmission lines are located west of the Project Boundary approximately 3 km from the Project as shown on **Figure 2**.

## 2.3.5 Renewable Energy Projects

There are no known other existing, approved or approved wind farms in the Region other than the Upper Hunter Energy Park. Although there is enormous potential for the expansion of renewable energy projects in the Upper Hunter Valley and government policy is in place to support this, there are currently few in operation or in the planning process. However, a number of developments are currently being advanced as described below and shown on **Figure 2**.

## Pumped Hydro

AGL Energy and Idemitsu have announced plans to undertake an engineering feasibility study for AGL Energy's proposed 250 MW pumped hydro project (PHP) at Bells Mountain, near Muswellbrook (AGL, 2019b), 5 km west of the Project Boundary. The agreement between AGL Energy and Idemitsu follows on from an initial concept study which explored the viability of utilising the mining void on the Muswellbrook Coal Company (MCC) site, which has been deemed suitable for the proposed PHP. The feasibility study will assess whether the PHP is technically feasible, provide cost estimates for both construction and operation and assess the required planning and approval processes.

## Maxwell Solar Farm

The Maxwell Solar Farm is a 25 MW solar farm project to be located on rehabilitated land within the Maxwell Infrastructure site approximately 11 km south-west of the Project Boundary (Malabar Coal, 2018). Approval was granted for the Maxwell Solar Farm in August 2020.

Ref: 210317 Bowmans Creek Wind Farm EIS

## Upper Hunter Energy Park

The Upper Hunter Energy Park is located west of Scone and 35 km north-west of the Project Boundary. It was granted Project Approval in 2010 and includes the construction and operation of the following (Pamada, 2020):

- Up to 34 WTGs (31 at Mountain Station and three at Middlebrook Station);
- 3-10 MW solar photovoltaic arrays;
- One MW closed loop hydro plant;
- Electricity substation, switch yard and control room;
- 33 kV internal transmission cabling and overhead connection and access tracks;
- Manager's residence, visitors and education centre and maintenance shed; and
- Temporary construction compound(s).

As reported on the Upper Hunter Energy Park website (accessed June 2020), "the Upper Hunter Energy Park is nearing the transition from the development phase into construction phase. Noise, aviation, flora, fauna and grid connection option studies have been undertaken."

## 2.3.6 Town Centres

#### Muswellbrook

The Muswellbrook town centre is located 15 km west from the Project Boundary within the MSC LGA. The Shire is centrally located in the Upper Hunter Valley, approximately 130km north-west of Newcastle and covers approximately 3,402km<sup>2</sup>, of which 43% is National Park. Lake Liddell delineates the MSC boundary to the east, Wollemi National Park to the west, Aberdeen to the north and Coricudgy State Forest to the south (MSC, 2016).

## Singleton

The Singleton town centre is located 25 km south-east from the Project Boundary within the SSC LGA. Singleton is strategically located in the centre of the Hunter Valley, within easy reach of other major centres including Maitland, Newcastle and Sydney. Its town centre is the main commercial and retail centre for the local population, as well as for visitors to the area (SSC, 2013). Key demographics for the SSC LGA are included in **Section 7.23**.

#### Scone

The Scone town centre is located approximately 22 km north-west from the Project Boundary within the UHSC LGA. UHSC LGA is located in the Hunter Region of NSW, approximately 250 km north of Sydney. UHSC LGA is a predominantly a rural area and encompasses a total land area of about 8,000 km<sup>2</sup>, of which a large proportion is National Park and nature reserves. Most of the rural area is used for grazing, dairy farming, horse studs and cropping (UHSC, 2020c).

#### 2.3.7 Local Communities

There are a number of local communities within 5 km of the Project Boundary including Bowmans Creek, Davis Creek, Goorangoola, Greenlands, Hebden, McCullys Gap, Muscle Creek and Rouchel Brook. Bowmans Creek, Davis Creek, Goorangoola, Greenlands, Hebden and Rouchel Brook are generally defined by larger sized landholdings. McCullys Gap and Muscle Creek are rural communities with larger sized landholdings and some smaller blocks.

There are not any publicly available, new or approved residential developments or subdivisions in the project vicinity as at October 2020.

## 2.3.8 Tourism and Recreation

The township of Muswellbrook is visited for its colonial buildings, Heritage walk and Regional Arts centre and is surrounded by mines, vineyards, olive groves and National Parks. A short drive south-west is Pukara Estate (Visit NSW, 2020a). In relation to tourism the Upper Hunter is known for thoroughbred horse-breeding, wineries, olive groves, gourmet foods, National Parks, scenic drives, heritage towns and festivals (Visit NSW, 2020b).

The township of Singleton is visited for its vineyards, colonial heritage and outdoor adventures (including Lake St Clair) (Visit NSW, 2020c). The Singleton LGA also houses a large infantry military base and is renowned for its military museum (**Section 2.3.3**).

## Parks

There are no National Parks or State Forests within or immediately adjoining the Project Boundary. Mount Royal National Park is located 8.6 km north-east of the closest WTG (T10). The World Heritage Listed Gondwana Rainforest is located within the Mount Royal National Park and over 13 km north-east from the nearest WTG (T12).

Ravensworth State Forest is the closest State Forest located approximately 6 km south from the closest WTG (T22).

## Lake St Clair

Lake St Clair is over 10 km to the south-east of T7 and Lake Liddell over 8 km to the south-west of T67.

In the foothills of Mt Royal National Park, Lake St Clair extends about 16km up the Glennies Creek and has a storage capacity of 283 ML. Apart from being an integral component of the Hunter Valley's water supply system, Lake St Clair is a local recreational facility enabling boating, fishing, sailing and water-skiing.

## Glenbawn Dam

Lake Glenbawn is located 13 km north-west of T12. Glenbawn Dam is a popular inland sport and recreation destination near Scone, offering year-round attractions for water sports and fishing enthusiasts, nature lovers, bushwalkers, campers and picnickers (Water NSW, 2020). The dam has one of the largest rock-fill embankment walls in Australia, 100 m high and 1.1 km long. The main purpose of the dam is to supply water for irrigation, power generation, stock, industry and household needs in the Hunter Valley, and provide flood mitigation and environmental flows.

## Lake Liddell

Lake Liddell is located 4 km to the south-west of the Project Boundary and is partially spanned by the electrical transmission line to Liddell Substation (proposed as part of the Project).

Lake Liddell was constructed in the late 1960s as part of the Liddell Power Station development. The lake is a cooling pond for Liddell power station and water storage facility for both Liddell and Bayswater power stations. Previously used for recreational facilities, AGL Energy closed public access in 2016 due to water quality safety concerns (AGL, 2016).

Ref: 210317 Bowmans Creek Wind Farm EIS

The Lake Liddell Recreational Area (discussed further in **Section 7.18.2**) is located adjacent to Lake Liddell. It comprises an extensive camping ground and offers recreational activities such as go-karting, laser tag, water park play and rock climbing. It also has a function room for hire.

## 2.3.9 Transport Corridors

The Main Northern Rail Line is located approximately 8 km south of the Project Boundary. The section of line between Muswellbrook and Newcastle is an integral part of the Hunter Valley Coal Chain. It also services other freight trains as well as regional and intercity passenger trains.

The New England Highway (NEH) is located approximately 8 km south of the Project Boundary. It is the main road that connects Muswellbrook and Singleton in a north-south direction.

The closest RMS signposted Tourist Route is located along the Golden Highway between Singleton and Denman approximately 20 km south of the Project Boundary.

## 2.4 LAND OWNERSHIP

#### 2.4.1 Overview

The Project Boundary includes a majority of freehold land as shown in Figure 6.

Land associated with the powerline easement is largely freehold with some Crown land outside the road easement (Crown land is discussed further in **Section 4.4.8**).

Land associated with the road widening from Hebden Road / NEH turnoff to the site entry is largely freehold. A tension pole located within the road reserve on the OSOM access route may require modification. In this location, the road corridor falls within a Travelling Stock Reserve (TSR).

Land associated with the road widening from Hebden Road / NEH turnoff to the Port of Newcastle is owned by Port Authority, Newcastle Council or TfNSW.

Some minor areas of Crown Land occur in the north-east, east and west of the Project Boundary as discussed in **Section 4.4.8**. Paper roads also occur within the Project Boundary as discussed in **Section 4.4.8**.

## 2.4.2 Associated, Near Neighbour and Non-Associated Private Landholders

The following types of private landholders are described in this EIS:

- Associated Host Landholders: owners and occupiers of land proposed to host WTGs or related infrastructure, and owners and occupiers of land required for access during construction and/or operation;
- Neighbour Landholders (Neighbours): are private landholders with a dwelling less than 3 km from a proposed WTG location. Consultation with Neighbours has been ongoing with Neighbour Agreements offered to address specific issues raised by individual landowners or to mitigate the impacts identified in the specialist assessments as described in Section 7 of this EIS; and
- **Non-Associated Landholders**: are private landholders where the residence is greater than 3 km from the closest WTG, the landholder not associated with hosting Project infrastructure or a neighbour agreement as described above is not in place with the landholder.

A **Neighbour Benefit Program** has been developed to share the benefits of the Project with landholders within 3 - 4.4 km of the closest proposed WTG location, where no other agreement exists. The Neighbour Benefit Program will consist of an electricity grant/rebate offer.

Agreements are being sought with all Associated Landowners and are being offered to all Neighbour Landholders as described above.

The Neighbour Benefit Program will be open to all eligible dwellings on a voluntary basis.

**Appendix E** includes a list of dwellings as shown on **Figure 6** and as described in this EIS. As listed in Appendix E, there are 20 "Associated Landholders" with dwellings. There are 18 "Non-Associated" dwellings within 3 km and 71 additional "Non-Associated" dwellings within 3 km to 5.5 km. Appendix E also lists the distance to the closest WTG for each turbine for each dwelling.

#### 2.5 LANDHOLDER AGREEMENTS

**Table 1** provides a summary of the types of Associated landholder Agreements which are proposed to be implemented for the Project.

Category	Туре	Reason
Associated (host)	Agreement – Individual	N/A
Near Neighbour	Agreement – Individual to address specific impacts	Individual agreements following recommendations from specialist assessments where the proposed layout does not meet all performance objectives.
	Neighbour Agreement	Offered to all residents with a dwelling less than 3 km from a proposed turbine location.
Non – Associated Benefit Program	Neighbour Benefit Program	Open to eligible residents within 3 – 4.4km of a proposed turbine to share the benefits of the project with the local communities.

Table 1Landholder Agreements Categories

Source: Cadastre courtesy of the Spatial Collaboration Portal (accessed July 2020); Terrain ©2019 Google

mans Creek Wind Farm | Fig06 Land Ownership | 23 03 2021

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BOWMANS CREEK WIND FARM

Land Ownership

**FIGURE 6** 

#### 2.6 GOVERNMENT PLANS, POLICIES AND GUIDELINES

This section discusses the relevant international and domestic policies relevant to the Project.

#### 2.6.1 International Agreements

#### United Nations Framework Convention on Climate Change

Following international concerns over a measured increase in greenhouse gas (GHG) emissions and the subsequent potential for this increase in concentration in the atmosphere to cause climate change, an international environmental treaty, 'The United Nations Framework Convention on Climate Change' (UNFCCC), was adopted on 9 May 1992 and then opened for signature at the Earth Summit in Rio de Janeiro from 3 to 14 June in 1992. It then entered into force on 21 March 1994, after a sufficient number of countries had ratified it. The objective of the UNFCCC is to stabilise GHG emissions "at a level that would prevent dangerous anthropogenic (human induced) interference with the climate system."

The UNFCCC itself does not impose any enforceable limits on GHG emissions. However, it facilitates the formation of protocols and agreements that are legally binding. The Kyoto Protocol and the Paris Agreement are the key treaties which have come into force under the UNFCCC to date.

The Kyoto Protocol requires its parties to set and adhere to national emissions targets. Developed countries agreed to a collective target of 5% below the 1990 level (the base year). Australia's target under the Kyoto Protocol was to limit its emissions to 108% of the base year level.

The Kyoto Protocol was adopted on 11 December 1997 and entered into force on 16 February 2005. It required its parties to achieve their national commitments by 2008 to 2012. The Doha Amendment was adopted on 8 December 2012 with the goal of reducing GHG emissions to 18% below 1990 level between 2013 and 2020.

#### Paris Agreement

The Paris Agreement establishes the framework for climate action from 2020 onwards, building on existing efforts under the Kyoto Protocol. The Paris Agreement was formed on 12 December 2015 and came into force on 4 November 2016. To date, 189 of the 197 parties to the UNFCCC have ratified the Paris Agreement (UNFCCC, 2020). Australia ratified the Paris Agreement on 10 December 2016, reinforcing our commitment to action on climate change.

Key outcomes of the Paris Agreement include:

- A global goal to keep average temperature increase to well below 2°C above pre-industrial levels;
- Pursue efforts to further limit global temperature rise to less than 1.5°C above pre-industrial levels; and
- Strengthen the ability of countries to deal with the effects of climate change.

To achieve these objectives, parties to the Paris Agreement are required to develop a NDC. Each country's NDC will outline its emissions reduction target and its commitments from 2020 onwards. NDCs are required to be reviewed and updated every 5 years.

Australia's current NDC commits it to reducing GHG emissions to 26-28% below 2005 levels by 2030. In 2019, renewable energy sources accounted for 24% of Australia's total electricity generation, which represents an increase of 2.7 percentage points on the previous year. This satisfied Australia's NDC of achieving 23% of energy production from renewable sources by 2020.

Australia's total GHG emissions in 2005 were reported at 366 Mt of  $CO_2$ -e. To satisfy its NDC, Australia will need to reduce its annual GHG emissions to between 263 and 272 Mt of  $CO_2$ -e. Australia's total emissions for 2018 were reported at 383 Mt of  $CO_2$ -e, which exceeds the base year emissions. Therefore, material reductions in GHG emissions are required over the next decade to achieve the target under Australia's NDC.

## 2.6.2 Commonwealth Policies

The Department of Industry, Science, Energy and Resources (DISER) manages numerous programs and policies as described in the NDC, including the measures referenced in Australia's NDC. The programs and policies relevant to renewable energy development are discussed below.

## **Emissions Reduction Fund**

The Emissions Reduction Fund (ERF) creates financial incentives for businesses to implement initiatives that reduce their GHG emissions. Businesses that implement eligible initiatives are awarded Australian carbon credit units, which can be sold to the Australian government. Given that the Project generates electricity without producing GHG emissions, it is not an activity that the ERF is targeted at.

## Clean Energy Innovation Fund

The Clean Energy Innovation Fund is a \$10 billion fund used to invest in projects that advance the development of energy efficiency, renewable energy and low emissions technologies. The fund is administered by the Clean Energy Finance Corporation (CEFC). The CEFC has invested in several wind projects such as Ararat Wind Farm, Kennedy Energy Park and Crudine Ridge Wind Farms.

## Renewable Energy Target

The Renewable Energy Target (RET) is made up of two legislated schemes that continue to operate until 2030 under the *Renewable Energy (Electricity) Act 2000*. The target stays the same from 2020 to 2030 and, under current regulation, new renewable energy power stations can continue to be accredited after 2020.

The RET is a scheme aimed at increasing electricity generation from sustainable or renewable energy sources. Under this scheme, energy producers (such as wind farm operators) are issued large-scale generation certificates for each megawatt hour (MWh) of electricity generated from renewable sources. Electricity retailers need to purchase these certificates in order to supply electricity to end users. The scheme effectively requires electricity retailers to purchase a proportion of their electricity from renewable energy producers.

The RET to be achieved by the end of 2020 was to generate 33,000 GWh of energy from largescale renewable energy sources (Clean Energy Regulator, 2020). This target was achieved in September 2019, more than a year ahead of its deadline (Clean Energy Council, 2020).

Ref: 210317 Bowmans Creek Wind Farm EIS

Thirty-four large scale projects were completed in 2019, adding more than 2.2 GW of large-scale renewable generation capacity to the grid. Large scale solar developments accounted for the majority of this new capacity. Eight new wind farms added 837 MW of capacity in 2019, which represents the largest increase in wind power in a single year.

## National Climate Resilience and Adaptation Strategy

The 'National Climate Resilience and Adaptation Strategy' (Australian Government, 2015) establishes a framework for management of risks associated with climate change, such as extreme weather events. The Strategy prescribes a 'dual approach' consisting of mitigation works (to avoid the risks) and adaptation works (to manage the risks). Increased uptake of renewable energy is one the mitigation works identified by the Strategy.

## 2.6.3 NSW Policies

## NSW Climate Change Policy Framework

The 'NSW Climate Change Policy Framework' (Office of Environment and Heritage, 2016) outlines the NSW Government's role in reducing and managing the impacts of climate change. The Framework sets the aspirational long-term objective of achieving net-zero emissions by 2050. The role of the government is to implement emissions savings policies, minimise emissions from its own operation, and to advocate for Commonwealth and international action consistent with the Paris Agreement.

The Framework prescribes seven policy directions, of which the following are relevant to renewable energy developments:

- Create a certain investment environment by working with the Commonwealth to manage transition;
- Boost energy productivity, thus putting downward pressure on household and business energy bills; and
- Take advantage of opportunities to grow new industries.

## Net Zero Plan Stage 1: 2020-2030

The 'Net Zero Plan Stage 1: 2020-2030' (DPIE, 2020) outlines four priorities over the next decade to facilitate the long-term objective of achieving net-zero emissions by 2050. The four 'net zero priorities' are:

- Drive uptake of proven emissions reduction technologies that grow the economy, create new jobs or reduce the cost of living;
- Empower consumers and businesses to make sustainable choices;
- Invest in the next wave of emissions reduction innovation to ensure economic prosperity from decarbonisation beyond 2030; and
- Ensure the NSW Government leads by example.

## NSW Electricity Strategy

The 'NSW Electricity Strategy' aims to "improve the efficiency and competitiveness of the NSW electricity market by reducing risk, cost, Government caused delays and by encouraging investment in new price-reducing generation and energy saving technology" (DPIE, 2019c). This

Strategy recognises that wind and solar energy, firmed by gas, pumped hydroelectricity and battery storage will become the most economic form of electricity in the future. The Strategy identifies 10 actions for the NSW Government to achieve its objectives. The following actions are relevant to renewable energy developments:

- Providing financial support to proponents of new electricity generating technologies;
- Establishment of Renewable Energy Zones (REZ) in the Central West, Hunter-Central Coast, South-west, Illawarra and New England regions; and
- Supporting further deployment of utility scale generation.

The NSW Government is in the early stages of feasibility for the Hunter-Central Coast REZ, as set out under the *Electricity Infrastructure Investment Act 2020*.

Like the New England and South-West REZs, developing the Hunter-Central Coast and Illawarra REZs will be complex, taking a number of years to design and build. The NSW Government will engage closely with the local community and stakeholders on the design and delivery of these REZs.

## Hunter Regional Plan 2036

The HR Plan outlines the NSW Government's land use planning priorities for the Hunter Region over the next 20 years. The Regional Plan provides a direction for regional planning decisions.

Goal 1 of the Regional Plan is to become "the leading regional economy in Australia". The Regional Plan outlines 13 directions to achieve Goal 1, of which Directions 5 and 12 are relevant to renewable energy developments.

## Direction 5 – Transform the Productivity of the Upper Hunter

The Upper Hunter is recognised as a major supplier of coal and energy to national and global markets. These industries have driven investment in the region and will continue to support the growth and diversification of the regional economy and employment base. The Regional Plan forecasts that the region's mining and energy industries will be affected by changing global and national policies. Future development of the region's coal and alternative energy resources will enable the Upper Hunter to respond to new and emerging opportunities. The Regional Plan recommends the following actions to facilitate Direction 5:

- Prepare for the diversification and innovation of the economy in response to long term industry restructuring in coal and power generation and the growth in new high-technology primary industry and associated specialist knowledge-based industries;
- Leverage the regional advantages of the Upper Hunter to create a diverse, thriving and prosperous economy built upon industry growth and investment; and
- Identify the land and infrastructure requirements to develop the Hunter's coal and alternative energy resources.

## Direction 12 – Diversify and Grow the Energy Sector

The Hunter Region produces approximately 44% of the power generated in NSW. The Liddell and Bayswater power stations are expected to be decommissioned in 2022 and 2035 respectively. The impending closure of these stations necessitates the transformation of the regional energy sector.

The Hunter Region has the solar, wind and geothermal resources required for the development of large-scale renewable energy projects. As such, the Hunter Region has the potential to become a major renewable energy hub. The proposed actions to attain Direction 12 include:

- Enable renewable energy industries by reviewing local planning controls; and
- Promote new opportunities arising from the closure of coal-fired power stations that enable long term sustainable economic and employment growth in the region.

## 2.6.4 Local Government Policies

#### Upper Hunter Council Policies

The UHSC holds the following policies relevant to renewable energy and the Project:

- 'Upper Hunter Community Strategic Plan 2027' (UHCS Plan);
- 'Upper Hunter Land Use Strategy 2017' (UHLU Strategy);
- 'Draft Delivery Program & Operations Plan 2020/2021' (DPOP); and
- 'Sustainability Action Plan 2018-2021' (SAP).

Excerpts relevant to the Project are discussed below.

#### UH Community Strategic Plan

The UHSC Plan is "structured around the pillars of sustainability: environmental, social (referred to as Community Life) and economic (referred to as Economy and infrastructure). Leadership and Community Engagement is a fourth element. These have all been integrated in our long-term planning and decision making." Goal 4 includes "to encourage and support sustainable development" and Goal 5 states "to encourage a diverse economy whist promoting and preserving agriculture and equine industries".

#### Upper Hunter Land Use Strategy

The UHLU Strategy outlines key land use policies and principles for the UHSC and provides the planning context for the preparation of LEP provisions. Section 1.3 states that "The local economy is growing and diversifying. ... the LGA is well placed to attract a range of new opportunities in industries such as ... renewable energy production. Providing a range of housing choices to attract a skilled workforce will support this economic growth."

Section 4.4 further states "The global response to climate change is also driving greater advancements in renewable energy technology. This is leading to development of rural areas to accommodate renewable energy generation and distribution infrastructure. The Hunter Regional Plan recognises the LGA as part of the Upper Hunter Green Energy Precinct. It has the potential to support renewable energy projects that will assist in the State-level direction to grow and diversify the energy sector. ... Renewable energy developments may be compatible with other rural land uses, and can assist in supporting local employment opportunities."

Direction 4.4 concludes "The development of renewable energy facilities will be supported in appropriate locations".

#### Draft Delivery Program & Operations Plan

UHSC's draft DPOP contains the following relevant to the Project:

- A 'Climate Emergency' declaration;
- Commits the UHSC to be 'carbon neutral' by 2030;
- Requires the preparation of a Corporate GHG inventory; and
- Requires the settings of informed Corporate GHG targets.

In its response to Ordinary Council Meeting 25 February 2019 a Climate Emergency motion was resolved. UHSC has strengthened its approach to climate change, with an endorsed carbon neutral target of 2030. UHSC has a responsibility for a broad range of functions that will now need to consider the adoption of this target such as: the construction and operation of public infrastructure, local emergency responses, building regulation and planning, public health and environmental management.

UHSC has incorporated a range of operational actions in the draft DPOP which reflect the elevation of this issue as a priority for UHSC. The operational actions for 2020 – 2025 include:

- Facilitate and support the Sustainability Advisory Committee;
- Implementation of the SAP (see below);
- Develop a corporate greenhouse gas inventory to enable an achievable and science based climate change target to be set (Council endorsed carbon neutral target 2030);
- Develop a climate change response and strategy;
- Implement the climate change response strategy and action plan;
- Review Council's Position Statement on coal mining and coal seam gas activities; and
- Quality check of all planning strategies and policies as they relate to climate emergency response.

#### Sustainability Action Plan

"In pursuing a sustainable future we have some great opportunities to leverage our natural and built assets and our proximity to major centres – creating industries around local food production, sustainable tourism and renewables that will further enhance the Upper Hunter's clean rural image."

The SAP is also consistent with UHSC's obligations under the HR Plan and under the 'Upper Hunter Economic Diversification Regional Leadership Executive (RLE) Action Plan'. These two documents prioritise sustainable land use planning, the protection and management of natural resources and the development of strong, diverse local economies and new industries around renewables, agribusiness and tourism. The SAP further states:

"Across the Shire we have an important role to play, firstly in supporting and learning from other organisations who are further along in their journey toward sustainability and secondly in showing leadership in key strategic areas that will support the sustainability of our region - for example, renewable energy ...

To ensure that it consumes energy more sustainably, Council also aims to source an increasing proportion of its energy from renewable sources."

Objective 18 of the SAP is to support the development of renewable energy projects with the following actions listed:

- Facilitate Upper Hunter and Liverpool Wind Farms and any other potential new renewable energy ventures by developing a public position supporting renewable energy development;
- Support the renewable energy sector by providing information to project proponents (including land use mapping links on website) and making appropriate submissions through planning and approval processes at State level;
- Support the investigation of renewable energy opportunities throughout the region; and
- Support the renewable energy sector through the purchase of renewable energy for Council facilities.

## Muswellbrook Shire Council Policies

The economy of the MSC is driven by the coal mining and power generation industries. The local industry profile is likely to change as a result of international, federal and state policies. MSC has developed policies to address the likely changes in the LGA in the future. The following policies are potentially relevant to renewable energy developments:

- 'Draft MSC Local Strategic Planning Statement 2020-40' (MSC, 2020) (Draft Muswellbrook LSPS);
- 'Muswellbrook Shire Council Delivery Program 2017-2021' (Delivery Program);
- 'Operational Plan 2020-2021';
- 'Muswellbrook Local Environmental Plan (LEP) 2009 Review: Draft Discussion Paper' (Muswellbrook LEP Review); and
- 'Mine Affected Roads Network Plan Review 2020' (MSC Roads Plan).

## Draft Muswellbrook LSPS

The Draft Muswellbrook LSPS implements the actions in the Hunter Regional Plan and Council's own priorities as set out in the Muswellbrook Community Strategic Plan and other adopted strategies and actions. The Draft Muswellbrook LSPS identifies the key outcomes that MSC aims to achieve when developing policies and making land use decisions, and in advocating to other levels of government regarding decisions that involve the MSC Shire. The Planning Priorities within the Draft Muswellbrook LSPS states the following:

- Renewable energy generation is encouraged;
- The production and distribution of sustainable energy will continue in the Shire, with a shift to alternative renewable energies such as wind, biomass, gas, solar, geothermal and pumped hydro sources; and
- Current employment opportunities in the Shire are strongly biased toward mining; more diversification is necessary to limit future shocks expected in that sector.

A short-term action for the MSC as outlined in the Draft Muswellbrook LSPS is "the investment in renewable energy projects and infrastructure".

#### **Delivery Program**

The Delivery Program outlines MSC's plan for the delivery of community infrastructure and services during the period 2017-2021. The Delivery Program identifies MSC's six priority areas: economic prosperity, social equity and inclusion, environmental sustainability, cultural vitality, community infrastructure and community leadership. The Delivery Plan has been developed to be consistent with the Regional Plan.

In relation to economic prosperity, MSC's aim to diversify the local economy to reduce volatility caused by a high reliance on the resources sector. MSC is seeking to diversify the economy through development of intensive agriculture and other growth industries. The Delivery Program identifies climate change as a local sustainability issue. One of MSC's environmental sustainability goals is to support state and federal climate change initiatives.

#### Operational Plan 2020-2021

MSC develops Operational Plans on an annual basis to outline how it will implement its Delivery Program over the next financial year. The 'Operational Plan 2020-2021' (MSC, 2020) further refines MSC's objective of diversifying the local economy and employment base. It identifies renewable energy, bioresources and intensive smart agriculture as the new industries that the LGA will transition towards. Increased use of renewable energy is one of MSC's environmental sustainability objectives. The goals for the 2020-21 financial year include:

- Investigate opportunities for joint ventures with renewable energy innovators and power suppliers; and
- Deliver the funded components of the 'Muswellbrook Shire Renewable Energy Action Plan' (document not available to review as at 9 October 2020).

## Muswellbrook LEP Review

In 2016, MSC engaged planning consultants to review the Muswellbrook LEP and recommend actions to create a local planning framework that supports new development in the LGA. The Muswellbrook LEP Review forecasts that in 10 years, the contributions of the mining and power generation industries to the local economy will begin to decline. It further recognised that the closures of the Liddell and Bayswater Power Stations will create opportunities for the development of new power generation facilities. Pumped hydro, solar, wind, bioenergy (biomass) and gas are identified as potential replacement energy sources. The review recommends an action for MSC to "Engage with all relevant stakeholders to explore the opportunities for alternative energy production and adaptive reuse of the existing generation and distribution infrastructure".

#### Mine Affected Roads Network Plan Review

Mining activities within the MSC have resulted in the closure or realignment of some public roads. The MSC Roads Plan considered the impacts of these changes on the efficiency and safety of the road network.

None of the roads will be utilised by OSOM or heavy vehicles associated with the Project (as explained in **Section 3.6**. These roads may be used by personnel to travel to and from work. Personnel movements will be limited to light vehicles, and will not significantly affect traffic volumes in the network (see **Section 7.4** for a discussion on road use and traffic volumes).

Ref: 210317 Bowmans Creek Wind Farm EIS
### Singleton Council Policies

The SSC holds the following policies and strategies relevant to renewable energy and the Project:

- 'Singleton Local Strategic Planning Statement 2041' (SSC, 2020) (SSC LSPS);
- 'Singleton Community Strategic Plan 2017-2027' (SCS Plan);
- 'Singleton Land Use Strategy 2008' (SLU Strategy); and
- 'Singleton Operational Plan 2019-2020' (SOP).

### SSC LSPS

The SSC LSPS 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 SSC LGA. The SSC LSPS has been informed by the HR Plan, the SCS Plan, stakeholder consultation feedback and other relevant plans. The SSC LSPS 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." Further, it has identified opportunities in the higher altitude areas of the LGA to generate electricity from wind power.

#### Singleton Community Strategic Plan

The SCS Plan defines success as "Singleton is a well-planned, sustainable, accessible and safe community with vibrant places and spaces" where "we value, protect and enhance a sustainable environment" and "...have an innovative, sustainable and diverse economy".

### Singleton Land Use Strategy

The proposed vision for the SLU Strategy is "to create a progressive community of excellence and sustainability." One of its aims and objectives is "... to retain options for alternative land use strategies so that flexibility to allow economic, social and environmental change can be accommodated ...". Strategic actions of the SLU Strategy include "Consider introducing sustainability targets for new buildings (e.g. energy efficiency, onsite renewable electricity generation, building recyclability and durability, carbon neutrality etc."

### Singleton Operational Plan

The associated Community Environmental Sustainability Strategy and Action Plan (Singleton Council, 2016) aims to "Promote increased use of renewable energy sources" and wants the community to be "... at the forefront of alternate energy" and "partner with industry to create Singleton as an alternate energy hub".

### 2.6.5 Summary

In order for Australia to meet its obligations under the Paris Agreement, national GHG emissions will need to reduce substantially over the next decade. Each of federal, state and local government policies have recognised the need to increase the production of energy from renewable sources. This objective is particularly relevant to the Hunter Region because it currently produces approximately 44% of NSW's electricity, most of which is generated from coal combustion (DPIE, 2016d) as such the implementation of climate change policies has the potential to result in significant changes to the Hunter Region.

Ref: 210317 Bowmans Creek Wind Farm EIS

The economy of the Upper Hunter is heavily reliant on the fossil fuels sector. The Liddell and Bayswater power stations account for 26.6% of the state's electricity production and employ 650 persons. The anticipated closure of these power stations will leave a 'gap' in both the state's energy supply and local employment base. To combat the effects of these closures, the local governments of the Upper Hunter have committed to diversification of the local economy to include new industries, including wind energy.

The Project will facilitate the production of energy from renewable sources and employ up to 156 personnel during the construction phase and 15 during the operational phase. This will contribute to satisfying the Upper Hunter Region's need for replacement energy and employment after the expected closure of the Liddell coal-fired power station. As a renewable energy development, the Project will generate electricity with only very minor GHG emissions. Therefore, the Project is consistent with the federal, state and local governments' objectives of reducing GHG emissions, securing electricity supply and diversification of the economy. Additionally, the Project falls within one of four Renewable Energy Zones where the Government has committed to supporting the development of renewable energy projects.

## 2.7 AUSTRALIAN RENEWABLES INDUSTRY

## 2.7.1 Overview

The Proponent has been developing wind energy projects in NSW for the past 17 years and over that period has developed considerable experience in site identification and selection. There are several key areas of consideration when selecting a site for development, including:

- Wind resource To confirm the viability of wind projects, the Proponent has established a vast network of wind monitoring masts across NSW, including a number of masts and other monitoring devices in the vicinity of the Project. These masts, including wind monitoring towers on site, have confirmed that wind speeds at the site are sufficient for a viable wind farm (consistent with the 'Wind Map') reproduced as Figure 7);
- Environmental impact on the land the properties selected for involvement in the Project are generally used for cattle grazing and other low intensity agricultural purposes. Ridgelines where WTGs are proposed are mostly cleared of vegetation;
- Access to the local electricity network The proposed site is less than 10 km from multiple connection points to the electricity network which have sufficient capacity to export the design output from the Project;
- Local communities The properties selected for involvement are large land holdings and naturally provide a considerable buffer to non-associated (or neighbouring) dwellings. The low population density of the surrounding area will assist in reducing any residual noise or visual impacts from the Project;
- Proximity to resources During the construction phase it will be necessary to source water and materials for the construction of roads and WTG foundations. there are a number of local active quarries and water sources that will be able to accommodate the requirements for construction of the Project; and
- Economic impact The local population centers of Muswellbrook and Singleton are well established to cater for an increase in workforce having serviced the mining and energy industry for many years. The region is preparing to enter a transitional period beginning with the retirement of Liddell Power Station in 2023 making this an ideal place to develop a replacement renewable energy industry.

### 2.7.2 New Generation Requirement

For the vast majority of people in NSW, electricity is supplied from large scale power plants, transported along transmission wires and distributed to houses and businesses for use. NSW participates in the National Electricity Market (NEM), sometimes referred to as "the Grid". Supply and use of electricity in the NEM is managed by Australian Energy Market Operator (AEMO).

Each year AEMO releases a key planning document called the 'Electricity Statement of Opportunities' (AEMO, 2020) (ESOO). The ESOO provides technical and market data that informs the decision-making processes of market participants, new investors, and jurisdictional bodies as they assess opportunities in the NEM over a 10-year outlook period. In 2020, due to the comprehensive and transformational changes occurring throughout the energy sector, AEMO also released its ISP, a road map for the next 20 years to facilitate the smooth transition of Australia's evolving power system to a more sustainable footing. According to the 2020 ESOO, operational consumption on the NEM over the next 20 years is expected to remain flat. While there is projected to be underlying growth in consumption across the NEM, this will be offset via continued investment in distributed PV, and extension of the NSW Energy Saving Scheme.

In NSW, electricity is mainly supplied by coal-fired power stations with contributions from gas and hydro plants at certain times of the day plus a growing proportion of renewable energy (wind and solar). Coal-fired power plants typically have a life span of around 50 years before requiring major refurbishment or replacement. AEMO concluded the following in the 2019 ESOO:

"The NEM has seen a continued reduction in dispatchable reserves and a tightening in supply-demand balance as conventional generation has retired. At the same time, while large amounts of renewable generation have entered the system, the reliability of the aging thermal generation fleet has deteriorated and the warming climate has increased the risk of extreme temperatures and high peak demands."

Following the 2019 ESOO report, a significant addition of supply in the form of renewable generation was installed locally in NSW. The 2020 ESOO assessed that as a result, the outlook over the short term had improved, stating:

"New South Wales' reliability outlook after the Liddell Power Station retires has improved since the 2019 ESOO, as a result of the committed augmentation of the Queensland to New South Wales Interconnector (QNI) in 2022-23 and the development of local new renewable generation (900 MW)."

However, the 2020 ESOO also highlighted the continued need to provide suitable replacement for the aging fleet of thermal generators as follows:

"A summer of unprecedented weather events, followed by the COVID-19 pandemic, demonstrates the need for increased vigilance in supporting the reliable delivery of affordable energy while taking necessary steps to increase system resilience to minimise disruptions for consumers and businesses."

In addition to the retirement of Liddell, the remaining coal-fired power stations are forecast to retire over the next 15 years as shown by the declining installed capacity in **Figure 8** (ISP, 2020).



EPURON

Hansen Bailey

BOWMANS CREEK WIND FARM

Renewable Resources NSW - Wind





While overall grid consumption is being held constant, new generation capacity is needed to replace retiring plants (ISP, 2020). To fill that gap, AEMO forecasts that Australia should invest in a further 26-50 GW of new large-scale variable renewable energy beyond existing, committed and anticipated projects (ISP, 2020).

The 2020 ISP determined an optimal split of new solar and wind variable renewable energy that would minimise the need for dispatchable storage and generation and therefore keep costs down for consumers. This optimal split is shown in **Figure 9** as approximately 43% solar and 57% wind by 2040.

Ref: 210317 Bowmans Creek Wind Farm EIS



Figure 9 New National Electricity Market Build, Solar and Wind

### 2.7.3 Lowest Cost of New Generation

The 2020 ISP takes a wholistic and technology-neutral approach when considering the future generation mix of the NEM at the lowest overall consumer expense. This is supported by modelling done by CSIRO and AEMO of the projected electricity generation technology costs (CSIRO, 2019).

By 2020 the overall cost to produce one unit of electricity MWh, referred to as the Levelised Cost Of Electricity (LCOE), for wind and solar PV is expected to be significantly less than new coal or gas fired power plants.

Figure 10 shows the projected costs for installation of new generation for each technology (CSIRO, 2019).





#### 3 THE DEVELOPMENT

This section provides a detailed description of the conceptual construction, operation, maintenance and decommissioning activities associated with the Project. It also outlines the alternatives that were considered during the development of the Project.

#### 3.1 DESCRIPTION

#### 3.1.1 Overview

The Project will generally involve the construction, operation, maintenance and decommissioning of the Bowmans Creek Wind Farm as generally illustrated on **Figure 3** including:

- Up to 60 WTGs consisting of:
  - A three-blade rotor and nacelle mounted onto a tubular tower;
  - Crane hardstand area; and
  - Laydown area;
- Electrical infrastructure:
  - Up to two collector substations and associated transmission line to transmit the generated electricity into the existing high voltage network; and
  - Connections between the WTGs and the collector substation/s, which will include a combination of underground cables and overhead powerlines;
- Ancillary infrastructure;
  - O&M Facility;
  - Storage facilities and laydown areas;
  - Unsealed access tracks;
  - Ongoing use of two temporary wind monitoring masts and the installation of up to four permanent monitoring masts; and
  - Temporary construction facilities (including concrete batching plant and rock crushing facilities);
- Minor upgrades to the road network to facilitate delivery of OSOM loads (such as WTG components) to the site and to facilitate the construction of the transmission line; and
- Administrative activities (including boundary adjustments and subdivisions).

Extensive engagement has occurred with stakeholders in relation to the Project description. A detailed discussion over the outcome of this process is included in **Section 5**.

A Voluntary Planning Agreement (VPA) will be entered into with each of MSC, UHSC and SSC generally in accordance with Division 7.1(a) of Part 7 of the EP&A Act. An offer of \$3,000 per WTG per annum, constructed within each LGA boundary has been made to each of UHSC, SSC and MSC and is proposed to be distributed via a 'Community Fund' mechanism.

There are no relevant related developments to the Project to be incorporated into the Project.

There are no components of the Project that are subject to a separate approval process under the EP&A Act to facilitate the operation of the Project.

## 3.1.2 Project Boundary

The Project Boundary includes the majority of the key components of the Project as shown on **Figure 3**.

Additional Project components which are external to the Project Boundary include road upgrades (see **Section 3.6**) and the transmission line (see **Figure 3**).

#### 3.1.3 **Project Disturbance**

The Survey Area is shown on **Figure 11** and is approximately 1,052 ha. It incorporates buffers around Project components to facilitate future detailed design and "micro-siting" (outlined in **Section 3.3.2**). Therefore, the Survey Area encompasses the vast majority of the area that may be disturbed by the Project. It excludes minor road works from the NEH / Hebden Road turnoff to Newcastle Port as described in **Section 7.4**.

For the purposes of determining the maximum disturbance area and direct impacts in **Section 7**, the indicative disturbance areas as shown in **Table 2** have been applied to Project components. Actual disturbance may vary on a case-by-case basis, however, the total Project disturbance will remain within 515 ha.

Components	Indicative Disturbance					
Project Boundary						
WTG footing and pad	30 m x 70 m					
Access tracks	Variable (7 m – 50 m)					
Underground reticulation	2 m (1 m from centre)					
Overhead reticulation	29 m (14.5 m from centre)					
O&M Facility / Substation /	Polygon + 2 m					
Batching plant / Construction compound						
External to Project Boundary						
Road upgrades	Polygon + 2 m					
Transmission line (overhead)	60 m (30 m from centre)					
Transmission line (underground)	12 m (6 m from centre)					

Table 2Indicative Disturbance Parameters



BOWMANS CREEK WIND FARM

Survey Area



# 3.1.4 Project Summary

The key aspects of the Project are summarised in Table 3 and shown conceptually on Figure 3.

Aspect	Description						
Project Boundary	Shown on Figure 3 and encompasses an area of 16,720 ha						
	Some minor components are external to the Project Boundary as described in this section						
Project Term	In perpetuity. The life cycle of an individual WTG is approximately 25 years						
Survey Area	Shown on <b>Figure 11</b> and encompasses an area of 1,052 ha and indicates the Survey Area utilised for field assessments						
Disturbance Area	Maximum disturbance of up to 515 ha						
WTGs	Up to 60 WTGs generators						
	Hardstand areas						
	Transformers enclosed within the nacelle or separate enclosure, depending on final turbine model adopted						
	Communications equipment connecting to the O&M Facility						
Output	Approximately 336 MW						
Electrical reticulation	Transmission Line to Liddell Substation (up to 330 kV voltage)						
infrastructure	• Up to two substations (1a and 1b options, 2)						
	Underground and overhead 22kV or 33kV electrical reticulation cabling from WTG sites to substations						
Ancillary infrastructure	O&M Facility and associated communications equipment						
	Unsealed access tracks						
	Laydown areas						
	Two wind monitoring masts (temporary)						
	Up to four permanent monitoring masts						
Temporary construction	Construction compounds / offices						
facilities	Rock crushing plant/s						
	Concrete batching plant						
Public infrastructure	Upgrades to Hebden, Albano and Scrumlo Road						
works	Temporary road and infrastructure works from Newcastle Port to site     entry						
	Connection to the electrical transmission network at Liddell substation						
	Associated communications or other public infrastructure relocations						
Construction timeframe and hours	<ul> <li>Up to 18 months</li> <li>Generally, 7 am to 6 pm (weekdays) and 8 am to 1 pm (Saturday) for standard construction work (additional activities may be subject to an 'Out of Hours Protocol')</li> </ul>						
	• Blasting only between 9 am and 5 pm (weekdays) and 9 am to 1 pm (Saturdays). No blasting will occur on Sundays or public holidays.						

Table 3Indicative Key Project Parameters

Aspect	Description					
Operational hours	24 hours per day, 7 days a week					
Workforce (full time equivalent personnel)	<ul><li>Up to 156 construction personnel</li><li>Up to 15 operational personnel</li></ul>					
Capital Investment	\$569 million					

## 3.2 OPERATING HOURS, PERSONNEL AND SCHEDULE

Approval is being sought in perpetuity for the Project. The life cycle of a WTG is approximately 25 years and changing out of componentry will occur infrequently.

The 'Interim Construction Noise Guideline' (DECC, 2009) (ICNG) recommends standard hours for construction work which will be utilised for the Project as outlined in **Table 4** except where an exemption is granted by the relevant authority.

Work Type	Recommended Standard Hours
Normal	7 am to 6 pm on weekdays
construction	8 am to 1pm on Saturdays
	No work on Sundays or public holidays
	Additional activities may be subject to an 'Out of Hours Protocol'
Blasting	9 am to 5 pm on weekdays
	9 am to 1pm on Saturdays
	No blasting on Sundays or public holidays
Operation	24 hours a day, seven days a week

Table 4Standard Construction and Operational Hours

Construction hours will generally be 7 am to 6 pm on weekdays, 8 am to 1 pm on Saturdays with no audible work conducted on Sundays or public holidays. Additional activities may be subject to an "Out of Hours Protocol" approved by the relevant regulator. Operational hours will be up to 24 hours a day, up to seven days a week.

The Project will utilise up to 156 FTE construction employees and approximately 15 FTE operational personnel. Additional contractors may be required.

The construction phase for the Project is expected to have a duration of approximately 18 months. Indicative durations of the key tasks are provided in **Table 5**. Multiple construction tasks may be undertaken simultaneously.

# Table 5Indicative Construction Schedule

Task	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13	M14	M15	M16	M17	M18
Establish temporary construction infrastructure																		
Establish site access (i.e. upgrades to public roads)																		
Initial civil works (access tracks and laydown areas)																		
Earthworks for WTG foundations																		
Install electrical reticulation infrastructure (powerlines and cables)																		
Install communications cables for WTG sites																		
WTG component delivery and erection																		
Construct electrical substations																		
Construct transmission line																		
Commission operational infrastructure																		
Decommission temporary structures																		

#### 3.3 WIND TURBINE GENERATORS

#### 3.3.1 Wind Turbine Generator Design

The components of a typical WTG are indicatively shown in **Figure 12**. The WTG will have a maximum height of 220 m from above ground level to blade tip. **Figure 13** provides an indication of the maximum height of the WTG against other relevant local features.

An individual turbine capacity of 5.6 MW has been assumed for the Project, which results in an indicative capacity of 336 MW for the Project as a whole.

**Figure 14** conceptually illustrates the relationship between the WTG tower and nacelle (including internal components) for a typical WTG (EERN, ND). For assessment purposes an appropriate combination for hub height (140 - 150 m) and blade length (80 m blade length with a maximum tip height of 220 m) has been selected to consider the greatest impact. The hub height dimensions selected are specified within each relevant individual report.

The WTG will feature three blades in an 'up-wind' configuration. This configuration has the blades in front of the tower and nacelle and face into the wind.

Each tower is a tubular steel structure that supports the nacelle, the hub and the three blades. The exact dimensions for each tower will depend on the WTG model that is selected. The diameter of the tower typically tapers from approximately 5 m at the base to 3 m at the top. The interior of the tower contains the power and control cables and an access ladder or lift (with safety controls).

The nacelle is the structure at the top of the tower. It encloses the generator, gearbox (if used) and control gear including motors, pumps, brakes and electrical components. This control gear ensures that the WTG always faces into the wind and adjusts blade angles to maximise power output and minimise blade noise. The nacelle also houses winches to assist in lifting maintenance equipment or smaller replacement parts to the nacelle. The nacelle includes noise suppression devices to minimise the noise generated by the mechanical components.

WTGs are fitted with lightning conductors, which direct lightning strikes into the ground. Lightning conductors reduce the risk of damage to the WTG and fire by providing a safe path to earth for lightning strikes. Operation of the WTG can be managed remotely (see **Section 3.5.4**) including the ability to shut down the WTG as a safety precaution.

Each WTG is mounted on a reinforced concrete footing. Concrete footing design is dependent on the WTG model and geological conditions at each site (e.g. a footing design could be a gravity foundation or a rock-bolted foundation). A hardstand area will be established at each WTG site to facilitate assembly of the WTG. The hardstand provides a base for the installation crane and a storage area for WTG components. The shape and exact size of the hardstand area is subject to final WTG selection and crane lifting requirements.

No obstacle lighting is required as part of the Project (see **Section 7.3.3**). Therefore, there will not be a requirement for hazard lighting at the top of individual towers. WTGs are proposed to be painted off white/grey and finished with a surface treatment that minimises the potential for glare and reflection. WTGs will not display any advertising signs or logos.

Approximately 67 km of internal access tracks will be established during the initial construction phase generally to connect WTGs and other internal infrastructure.



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**Conceptual Wind Turbine Components** 



Turbine Height Comparison to Bayswater Stacks

**FIGURE 13** 

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Figure 14 Typical Wind Turbine Generator Components – Nacelle Internals

## 3.3.2 WTG Locations

Indicative locations of the proposed WTGs are shown in **Figure 3**. The indicative layout reflects the spacing required for the WTG models that are being considered. WTG towers will be located at least 100 m from the Project Boundary. The design of the Project followed the principles of:

- Avoiding and minimising adverse environmental impacts;
- Maximising production of renewable energy; and
- Practical limitations affecting the construction and operation of the wind farm.

The coordinates of the locations and maximum heights of the WTGs are presented in Appendix D.

The indicative WTG locations have accounted for known constraints as described in **Section 7**. However, WTGs may need to be relocated during the detailed design or construction phase due to geotechnical, environmental and other technical requirements, up to 100 m from the specified GPS co-ordinates in **Appendix D** (except where noted in **Section 7.9.4**). This practice is referred to in the Wind Assessment Guideline as "micro-siting".

In accordance with the Wind Assessment Guideline:

- Micro-siting will not materially increase the environmental impacts of the Project; and
- Potential variability has been addressed in this EIS.

Figure 15 to Figure 18 provides an amplified aerial view of the northern, eastern, western, and southern aspects of the Project. The location of the insets are shown in **Section 7.5**.

Source: Aerial ©2019 Google



BOWMANS CREEK WIND FARM

**Conceptual Project Layout - Northern** 

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**Conceptual Project Layout - Eastern** 

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**Conceptual Project Layout - Western** 

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**Conceptual Project Layout - Southern** 

### 3.3.3 Hardstand Areas

The establishment of hardstand areas at each WTG site will generally involve clearing of vegetation, earthworks and compaction of soil.

The tower will be mounted on a reinforced concrete foundation that will require removal of rock and subsoil at the base of each WTG. The material excavated during the construction of the WTG footings may be crushed, and reused as road base for the access tracks, used in hardstand areas; or other in earthworks for other Project components.

In some circumstances, blasting may be required to loosen the bedrock at the WTG site. If required, blasting will be undertaken and monitored in accordance with the Development Consent and Environment Protection Licence (EPL) for the Project. Blasting would be undertaken between 9 am and 5 pm Monday to Saturday only (excluding public holidays).

Once the footings have been established, a mobile crane and other ancillary equipment will be introduced to assemble the WTG components. Hardstands and towers will generally be retained in situ after construction to allow for any required maintenance and repairs over the life of the Project.

### 3.3.4 Operation and Maintenance

Although the operation of WTG is largely automated, operational staff will conduct routine inspections and maintenance. WTGs typically require up to 6 days of maintenance per year. In addition to scheduled maintenance, WTG components will be repaired or replaced as required.

### 3.3.5 Refurbishment

Individual WTG have an operating lifespan of approximately 25 years. Depending on the WTG, some or all of the major components will be replaced to ensure its ongoing operation. Wherever possible, the concrete foundations and towers will be reused for the refurbished WTGs.

The access tracks established during the initial construction phase will continue to be utilised for refurbishment works. The refurbishment process will be similar to the original construction of the WTGs.

WTGs that are not refurbished will be decommissioned as generally described in Section 3.8.

### 3.4 ELECTRICAL INFRASTRUCTURE

### 3.4.1 On-site Electrical Reticulation

Each WTG will be accompanied by a transformer, which will be either housed within the nacelle or separate enclosure. WTGs typically produce electricity at a voltage of around 690 V. The transformer within the WTG will step up the voltage to 33 kV for more efficient reticulation within the site. The transformer will be either a dry-type transformer, or will be suitably bunded / contained.

Electricity will be reticulated from the WTG to the on-site substation/s using either overhead powerlines or underground cables. Underground cables are generally preferred for connecting WTGs along ridgelines, whereas overhead powerlines are preferred for transporting power between adjacent ridges and for connecting groups of WTGs to the substation.

Ref: 210317 Bowmans Creek Wind Farm EIS

Adjustment of electrical connections may be required to enable micro-siting of WTGs or other constraints identified during detailed design to facilitate construction. Any amendments to powerline routes external to the Survey Area will implement the 'Land Disturbance Procedure' as described in **Section 7.25**.

Approximately 50 km of underground cables will be required and the installation of which will require the excavation of trenches approximately 2 m wide and 1 m deep. Where possible, trenches will be located within or adjacent to access tracks to reduce ground disturbance.

Approximately 30 km of overhead powerlines will be required and will include a combination of single-circuit and double-circuit powerlines. The overhead powerlines will use single pole type structures. Compared to underground cables, overhead powerlines have the advantage of requiring less disturbance and being able to span across creeks. At creek crossings, powerlines will be designed such that the poles avoid the stream bed. Powerlines will generally follow the on-site access tracks, and where retained these will be maintained for the life of the Project.

### 3.4.2 Substations

The reticulation cables and powerlines will transport the generated electricity to one or two substations (at locations 1a or 1b; and 2 shown on **Figure 3**). Each substation facility will occupy an area of 150 m x 150 m A typical substation is shown in **Plate 4** (TransGrid, 2014).

Each substation will include a transformer to step up the reticulation voltage (33 kV) to (up to 330kV). Should the transformer be oil-cooled units, appropriate bunding to the relevant Australian Standards will be implemented to manage potential spills or leakages. The substation 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.

The substations will be contained within fenced enclosures to prevent unauthorised access. To reduce the risk of fires, an appropriate Asset Protection Zone (APZ) will be established around each substation in accordance with 'Planning for Bushfire Protection' (RFS, 2006) as described in **Section 7.10**.

Night lighting will be installed at the substations and O&M Facility to enable critical maintenance work to be undertaken safely at night. These lights will be of low intensity and directed downwards in accordance with relevant Australian Standards.



Plate 4
Typical Wind Farm Substation Layout

### 3.4.3 Transmission Line

A new single or double circuit transmission line(s) will be constructed to export electricity generated by the Project to the existing TransGrid network via the Liddell substation as shown on **Figure 3**. The voltage of the proposed transmission line will be up to 330 kV.

The overhead portion of the transmission line is approximately 16.5 km in length and will be supported by single pole steel or concrete structures. The towers will be approximately 45 m tall and spaced at intervals of 200 - 300 m depending on topography. The transmission lines will be constructed within a 60 m wide easement. Although the easement does not need to be entirely cleared, vegetation will be removed where required to maintain a safe setback from the transmission wires.

The underground portion of the transmission line is approximately 4.5 km in length and will either be trenched at a depth of approximately 1.2 m below the ground surface with a work's area of approximately 5 - 6 m wide either side of the trench to accommodate the excavator and stockpiling of soil, or underbored. 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. The underground transmission line will cross some waterways as discussed in **Section 7.15**.

An unsealed access track of up to 3 m will be constructed where necessary within the overhead transmission line easement to provide access for maintenance activities. The transmission line will be equipped with an earth wire to protect the current carrying wires from lightning strikes. The towers will be fitted with insulators to prevent current from being transferred to the supporting structure. The final design of the transmission line will be developed in consultation with TransGrid.

## 3.5 ANCILLIARY INFRASTRUCTURE AND EQUIPMENT

The Project will involve the following ancillary infrastructure which will generally be retained throughout the operational life of the Project:

- O&M Facility;
- Communications;
- Access tracks; and
- Wind monitoring masts and monitoring equipment.

Temporary infrastructure and equipment that will only be required for the construction phase are described in **Section 3.5.1** and **Section 3.5.2**, respectively. All infrastructure components will be designed to ensure the visual appearance (including paint colours) blends in as far as possible with the surrounding landscape.

### 3.5.1 Temporary Construction Infrastructure

Construction compounds will be established at various locations within the Survey Area to facilitate the construction of the WTGs and other operational infrastructure described in **Section 3.3** and **Section 3.4**. These compounds will include power supply, 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.

Bedrock excavated during the construction of the WTG sites will be crushed to produce gravel for other construction activities (such as road base for access tracks). Mobile rock crushers will be established at various locations within the site for this purpose.

Up to three temporary concrete batching plants will be commissioned during the construction phase to produce the concrete required for construction activities. The batching plants 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 throughout the site using concrete mixer trucks.

The concrete batching plant and rock crushers will be decommissioned at the completion of the construction phase.

Only with the permission of the landholders, water in existing farm dams may be used to assist in dust suppression (under the conditions described in **Section 4.4.7**).

### 3.5.2 Construction Equipment

The equipment fleet required for the construction of the Project will include at least:

- OSOM and semi-trailers to deliver components to site;
- Excavators, loaders, dozers and other earthmoving machinery;
- Graders and rollers for road construction;
- Trenching machine;
- Underboring machine for directional drilling for transmission line installation;
- Trucks (including road registered trucks for transportation of materials, concrete mixer trucks and water trucks);

- Mobile cranes and elevated work platforms; and
- Hand operated tools.

#### 3.5.3 Operation and Maintenance Facility

The O&M Facility acts as the main administration building during the operational phase of the Project. The O&M Facility will include (at least): the main control room, offices, amenities, storage areas (for equipment and materials), water tank(s), laydown/storage areas, septic system(s) and car park.

The O&M Facility will accommodate approximately 15 personnel. The indicative location of the O&M Facility is shown on **Figure 3**.

An indicative fleet of operational and maintenance vehicles includes: 4WD vehicles, watercart, trucks and light trucks. During refurbishment of WTGs, OSOM vehicles will also be required.

#### 3.5.4 Communications

The operation of the WTG will be controlled remotely from the O&M Facility. To enable this to occur, control and communication cables will be installed from each WTG to the O&M Facility. These connections are generally in the form of optical fibre cables.

In order to minimise ground disturbance, the optical fibre cables will accompany the electrical reticulation infrastructure associated with that WTG (wherever practicable). That is, the optical fibre cables will either be attached to the powerline or laid in the same trench as the underground cable.

A communications network for personnel will also be established. This network will utilise radio (UHF or VHF) or microwave transmissions. The installation of equipment on masts to improve phone performance and fix any impact to radio or other links as described in **Section 7.9** will also be undertaken in the vicinity of the Project Boundary.

### 3.5.5 Wind Monitoring Masts and Monitoring Equipment

There are two existing wind monitoring masts at the site used for wind speed verification, weather and general monitoring purposes. The masts are steel lattice structures (approximately 110 m high) that are mounted on a concrete footing and supported by guy-wires. These may be relocated over the life of the Project. The masts are fitted with instruments for measuring wind speed and direction, pressure and temperature at various levels. The mast is also equipped with a solar panel, lightning rod, data loggers and anti-climb barrier. Security fences have been established around the masts and each of the guy-wire anchor points.

The two existing, temporary masts were constructed pursuant to the *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP). The Project involves the continuing use of these monitoring masts, which may be relocated from time to time within the Project Boundary.

Up to four additional, permanent monitoring masts and associated equipment (including performance monitoring masts and associated communications) may also be constructed and utilised for the Project.

#### 3.6 ACCESS AND ROAD NETWORK UPGRADES

#### 3.6.1 Public Road Access

The WTG components, other materials and construction equipment required for the Project will be transported to the site via the public road network.

WTG components will be to be delivered to the Project from the Port of Newcastle via the Hunter Expressway. Once at the intersection of Hebden Road (south) / NEH, OSOM vehicles will access the site via the identified Site Access location (see **Figure 3**) utilising Hebden Road (south), Scrumlo Road and Bowmans Creek Road/Albano Road as follows:

- Hebden Road (south) between NEH and the intersection with Pictons Lane;
- Hebden Road (south) and Scrumlo Road from the intersection with Pictons Lane to the Site Access location; and
- Bowmans Creek Road/Albano Road connecting the north-western to the south-eastern areas of the Project Boundary.

Muscle Creek Road, Sandy Creek Road, Goorangoola Road and Rouchel Road will not be used by Project related traffic.

It is anticipated that the construction workforce will predominantly be located in the nearby townships of Muswellbrook and Singleton (including south of Singleton). Operational personnel originating in Singleton and Muswellbrook will generally access the site from the NEH via Hebden Road and Scrumlo Road.

Glencore proposes to realign a 5 km section of Hebden Road south which is conceptually shown in 'Glendell Continued Operations Project EIS' (Umwelt, 2019). It is likely that this work will be completed prior to the commencement of the construction of the Project.

Access protocols will be described in the Traffic Management Plan (TMP) (**Section 7.4.4**) and will minimise disruption to the local community and consider (at least): local school bus routes, time of delivery, designing and implementing modifications to intersections, providing a 24 hour contact during construction as well as public notifications of upcoming traffic patterns and/or road changes.

### 3.6.2 Public Infrastructure Upgrades

#### NEH / Hebden Road Intersection to Local Roads

Due to the size of the WTG components, some of the deliveries to the Project will be OSOM loads. Upgrades to the local road network will be required to facilitate the safe transportation of these loads.

A detailed description of road upgrades and modifications to associated infrastructure are included in **Appendix K**. Temporary and permanent works will be required to Hebden Road, Scrumlo Road, Albano Road / Bowmans Creek Road and along the transport route from the Port of Newcastle at Selwyn Street, George Street, Industrial Drive, Pacific Highway and the Hunter Expressway.

The required upgrades to the existing local road network to facilitate the OSOM haulage of wind turbine components for the Project are discussed in **Section 7.4**. The impacts and mitigation measures proposed during these upgrades are also discussed in **Section 7.4**.

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Road works will also be required to facilitate installation of the underground transmission line (discussed in **Section 3.4.3**). These works will be undertaken in consultation with the relevant council and in accordance with the *Roads Act 1993* (see **Section 4.4.6**).

During detailed design, where it is identified that the physical road does not follow the road easement, consultation will occur with the relevant council to undertake realignment of the cadastral boundary prior to any works commencing.

## Port of Newcastle to NEH / Hebden Road Intersection

A detailed description of road upgrades and modifications to associated infrastructure are included in **Appendix K** however temporary and permanent minor works will be required to Selwyn Street upon exit from the Port of Newcastle. The Pacific Highway and Hunter Expressway will require traffic management measures.

The required upgrades to the existing road network south of the NEH / Hebden Road Intersection to facilitate the OSOM haulage of windfarm componentry to the Project are indicatively shown in **Appendix K**.

### Associated Infrastructure

Associated communications or other public infrastructure relocations associated with the upgrades described above will be undertaken as required by the relevant road's authority.

### 3.6.3 Externally Supplied Resources

Gravel for construction purposes will be produced in situ wherever practicable. However, supplementary supplies of gravel will be obtained from local quarries or material suppliers if required. Fine aggregate (sand) for concrete production will also be sourced from local quarries, or other material's suppliers.

During the construction phase, water will be required for dust suppression, concrete production and human consumption. Potable water will be sourced from the municipal water supply (i.e. Hunter Water network) and transported to the site using road registered water trucks. The total water demand for the Project is discussed in **Section 7.15**.

Water that does not need to be of potable quality may be sourced from host landholders' farm dams (as described in **Section 4.4.7**) in consultation with the landholder or from water storages in the region where pumping stations are available (e.g. Glenbawn Dam, Glennies Creek Dam, Liddell Dam, etc.) and transported to the site using road registered water trucks.

Raw water from landholders may be used in accordance with the *Water Management Act 2000* (WM Act) as discussed in **Section 4.4.7**.

The Proponent does not own the land within the Project Boundary and as such, is not entitled to any harvestable rights. However, there are farm dams located within the Project Boundary that may be consistent with the relevant harvestable rights order. The Proponent will enter into agreements with these landowners if it is necessary to use water captured in these farm dams.

The water demands for the Project will significantly reduce at the completion of construction. The operational phase of the Project will only require a small volume of water (approximately 1 ML/year). **Section 7.15** provides further detail on water use.

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## 3.7 LAND SUBDIVISION

Subdivisions will be required for the two parcels of land that the substations will be located on, including:

- Substation 1, either of:
  - Substation 1a (Part of each of Lot 169 DP 752465 and Lot 12 DP 752465); or
  - o Substation 1b (Lot 86 DP 752465); and
- Substation 2 (Part of each of Lot 131 DP 752460 and Lot 198 DP 752460.

The new lots created by the subdivisions will be occupied by the proposed substations and transferred to TransGrid (or other operator) at their request. The subdivisions are administrative activities that do not involve any physical works. Long term leases or land sales will also be required over the subject land (see **Section 4.4.8**).

**Figure 19** to **Figure 21** provide indicative substation subdivision layouts on Associated landholders properties. Detailed plans will be prepared to accompany applications for subdivision works' certificates (refer to **Section 4.2.2**).

Subdivisions may also be required following detailed design where it is identified that the physical road does not follow the road easement as discussed in **Section 3.6.2**.

Source: Cadastre courtesy of the Spatial Collaboration Portal (accessed July 2020); Aerial ©2019 Google



BOWMANS CREEK WIND FARM

Indicative Substation Subdivision 1a

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Source: Cadastre courtesy of the Spatial Collaboration Portal (accessed July 2020); Aerial ©2019 Google



BOWMANS CREEK WIND FARM

Indicative Substation Subdivision 1b

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Indicative Substation Subdivision 2

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#### 3.8 OTHER ANCILLIARY ACTIVITIES

Other ancillary activities generally required during the construction, maintenance, operation and decommissioning of a wind farm including: sub surface geotechnical investigations, firebreaks, portable structures, signage, minor water diversion structures, pipelines, fencing, sediment and erosion control structures.

Some of these activities may occur within the Project Boundary but external to the Survey Area and will only occur following implementation of the 'Land Disturbance Protocol' (see **Section 7.16.3**) and within other limits within this Project Description.

#### 3.9 DECOMMISSIONING

The proposed WTGs are expected to have an operational life of approximately 25 years. At the end of this term, the operator may decide to refurbish the facility, thereby extending its operational life by an additional 25 years. If the operator decides not to refurbish the facility, WTGs will be decommissioned within 18 months of ceasing operation. The decommissioning process will generally involve the removal of above ground infrastructure, including WTGs, electrical infrastructure and maintenance buildings.

Substations, transmission lines and powerlines may be of use by TransGrid or other industrial stakeholders. If a future use is identified for any above ground infrastructure associated with the Project, that infrastructure may be retained in agreement with the interested stakeholders. Otherwise, all above ground electrical infrastructure will be removed during the decommissioning phase.

Buried infrastructure such as underground cables and footings will generally remain in situ to avoid further disturbance. Some infrastructure, such as access tracks and laydown areas, may be of benefit to the landowner. Such infrastructure may be retained in situ with the agreement of the landowner. The indicative decommissioning process is summarised in **Table 6**.

Component	Tasks
WTG	Disconnect from the electricity network
	Drain and dispose of liquids (e.g. oils, lubricants, coolants, etc.)
	Disassemble into its components using a crane
	Transportation of components off-site
	Concrete foundations will be retained in situ
Wind Farm	Deactivate the transformer and allow components to cool
Substation	Drain and dispose of liquids (e.g. oils, lubricants, coolants, etc.)
	Disassemble and dispose of parts off-site
	Concrete foundations will be retained in situ
Powerlines /	Overhead powerlines / transmission line will be dismantled and removed
transmission line	from the site (unless it is to be retained for future use by third parties)
and cables	Underground cables will generally be retained in situ

Table 6Indicative Decommissioning Activities

Component	Tasks							
Access tracks	<ul> <li>Access tracks will generally be retained for the landowner's use</li> <li>If required to be decommissioned, the gravel and sub-layers will be removed and either reused as fill or transported off-site</li> <li>If the road is to be decommissioned, associated culverts, crossings and drainage structures will also be removed</li> </ul>							
O&M Facility and other buildings	<ul> <li>Buildings may be retained for the land owner's use</li> <li>If not required for other uses, buildings will be demolished in accordance with relevant standards</li> </ul>							

During decommissioning, existing access tracks will generally be used for equipment access and removal of materials from site. The dismantled infrastructure components will generally be sold as parts or scrap materials. All waste will be recycled where practical, or where necessary disposed of in a relevantly licensed facility as described in **Section 7.17**.

Disturbed areas will be rehabilitated to meet the intended final land use and be comparable with pre-construction conditions in consultation with landholders.

## 3.10 ALTERNATIVES CONSIDERED

This section describes the alternatives considered during the development of the Project. This included the do-nothing option, consideration of WTGs and associated infrastructure locations, transmission line access, and site access via the public road network.

Various amendments were made in response to the stakeholder engagement (**Section 5**), environmental impact assessment findings (**Section 7**) and field ground-truthing during ongoing project planning.

### 3.10.1 "Do Nothing"

The "Do Nothing" approach would lead to a missed opportunity for the state of NSW, Federal Government of Australia and its people in relation to:

- Provision of additional generation capacity into the NSW grid to assist in meeting load demand as a result of retiring thermal generators;
- Reducing greenhouse gas emissions and contributing to cleaner electricity generation under the Paris Agreement;
- Supply of renewable energy to assist in meeting State targets under the 'Net Zero Plan Stage 1 2020-2030'; and
- Providing an opportunity for regional investment as the renewable energy sector grows in NSW and the Hunter Valley.

Additionally, the "Do Nothing" approach will create missed opportunities for the environment and local community including:

- Reducing a significant amount of GHG emissions through the avoidance of carbon dioxide from coal fired power stations;
- Direct injection of funds into the local economy through the provision of jobs, use of local services, ongoing landowner payments and contributions under the VPA;

- The production of 336 MW of clean, renewable energy, equivalent to the consumption of around 145,000 homes (greater than the total existing houses in the three LGAs); and
- Improvements to the local road network.

## 3.10.2 Alternative Powerline Route

As discussed in **Section 3.4.3** a new transmission line will be constructed to export electricity generated by the Project to the existing TransGrid network via the Liddell substation. The Proponent considered and investigated three potential options for the transmission line alignment: two running east-west towards the TransGrid Muswellbrook substation, and one running north-south towards Liddell substation. Options are shown on **Figure 22**. The two Muswellbrook options were discounted as a suitable transmission line corridor could not be secured.

An alternative alignment for the Liddell option was investigated as shown in **Figure 22.** This option was discounted due to current land access constraints and does not form part of the proposed route.

A detailed discussion on environmental impacts and benefits for the proposed alignment are described in **Section 7**. This option provides significant environmental, technical and social benefits (by way of less impacts on private landholders) to the alternate options considered.

#### 3.10.3 Alternative Site Access

Site Access is described in **Section 7.4**.

An alternative Site Access route for light and heavy vehicles was investigated along Muscle Creek Road and Stoney Creek Road. Following consultation with nearby landowners and transportation assessment, it was determined that these access routes were not preferred due to community concerns relating to interactions between heavy vehicles, school buses and local area traffic as well as challenging road conditions and the requirement to upgrade a number water crossing structures.

OSOM and heavy vehicles travelling along Pictons Lane was also considered but not pursued as part of the Project due to current land access constraints.

Site access options investigated as part of the proposal are shown on Figure 22.

### 3.10.4 Alternative WTG and Associated Infrastructure

Figure 22 illustrates the "preliminary layout" considered immediately following the Scoping Report.

Figure 23 shows the Conceptual Project Layout for which development consent is sought.

**Table 7** provides a detailed summary of the changes made between the "preliminary layout" and the "Conceptual Project" for which approval is sought and as assessed in this EIS. It also summarises environmental benefits resulting from the changes.

In summary, the following changes were made between the preliminary layout and the development for which approval is sought and as assessed in this EIS:

- 72 WTGs reduced to 60;
- Two proposed batch plants were relocated to reduce noise impacts at receivers;

- Two northern transmission line options were discounted in response to stakeholder engagement;
- The preferred southern transmission line includes several design changes due to stakeholder engagement; and
- Site access transport options were reduced to access via the NEH only (i.e. no OSOM vehicles on Pictons Lane, Muscle Creek Road) due to stakeholder engagement.

The following requirements and constraints were considered when determining the Project including (but not limited to):

- Topography and local wind conditions;
- Locations of non-associated dwellings in the vicinity;
- Results of noise monitoring and modelling;
- Identified ecological features (e.g. vegetation);
- Identified heritage items;
- Potential visual impacts on dwellings;
- Locations of communications links in the vicinity;
- Aviation assessments and landing grounds in the vicinity; and
- Accessibility for delivery of WTG components.

# Table 7 Project Alternatives Considered, Benefits and Outcomes

Infrastructure		Environmental Benefits Achieved from Outcome	Outcome					
Project Boundary								
WTG (T) 1	•	Noise – exceeds noise level (LAeq,10 minute) of 35dBA at W14-1	•	WTG removed				
	•	Shadow flicker – exceeds Visual Bulletin criteria of 30 hours per year at W14-	•	Access track connecting T1 to T71 removed				
		1						
	•	Visual – high impact on W14-1						
	•	Water – located 250 m south-west of Jolly Springs						
	•	Ecology – reduced impacts to Plant Community Types (PCTs) 1583, 1608,						
		618 (defined in <b>Section 7.5</b> )						
T2	•	Visual – high impact on W14-1	•	WTG removed				
	•	Ecology – reduced impacts to PCTs 1583, 1608, 618 (defined in Section 7.5)						
Т3	•	Isolated WTG due to constraints on T1, T2, T4 and T5	•	WTG removed				
	•	Ecology – reduced impacts to PCTs 1583, 618 (defined in Section 7.5)						
T4	•	Visual – high impact on W14-1	•	WTG removed				
	•	Located near dry rainforest identified by community member						
	•	Ecology – reduced impacts to PCTs 1583, 1606, 1608, 618 (defined in						
		Section 7.5)						
T5	•	Visual – impact on W14-1 unacceptable	•	WTG removed				
	•	Ecology – reduced impacts to PCTs 1583, 1608, 618 (defined in Section 7.5)						
T11	•	Unacceptable gradient for construction	•	WTG removed				
	•	Ecology – reduced impacts to PCTs 1543, 1583, 1607, 618 (defined in						
		Section 7.5)						
T53	•	Visual – high impact on H12-3, H11-1, and H12-2	•	WTG and associated infrastructure removed				
	•	Ecology – reduced impacts to PCTs 1683, 1608, 618 (defined in Section 7.5)						
Infrastructure		Environmental Benefits Achieved from Outcome		Outcome				
-------------------	---	----------------------------------------------------------------------------	---	-------------------------------------------------				
T54	•	Visual – high impact on H12-3, H11-1, and H12-2	•	WTG and associated infrastructure removed				
	•	Ecology – reduced impacts to PCTs 1606 (defined in Section 7.5)						
T55	•	Visual – high impact on H12-3, H11-1, and H12-2	•	WTG and associated infrastructure removed				
	•	Ecology – reduced impacts to PCTs 1606, 1608, 618 (defined in Section 7.5)						
T56	•	Visual – high impact on H12-3, H11-1 and H12-2	•	WTG and associated infrastructure removed				
	•	Ecology – reduced impacts to PCTs 1608, 618 (defined in Section 7.5)						
T62	•	Visual – moderate impact to dwellings	•	WTG and associated infrastructure removed				
	•	Ecology – reduced impacts to PCTs 1606, 1608, 618 (defined in Section 7.5)						
T64	•	Visual – moderate impact to dwellings	•	Turbine moved				
T65	•	Visual – high impacts to dwellings	•	WTG and associated infrastructure removed				
	•	Ecology – reduced impacts to PCTs 1584, 1604, 1607, 618 (defined in						
		Section 7.5)						
Batch Plant (BP)	•	BP 1 – preliminary modelling exceeded noise level (LAeq,10 minute) of	•	Batch Plant 1 – moved to Substation 1a location				
		35dBA at private dwelling	•	Batch Plant 2 – moved to Substation 2 location				
	•	BP 2 – preliminary modelling exceeded noise level (LAeq,10 minute) of						
		35dBA at S17-2 and Q17-2						
Transmission Line	9							
Muswellbrook 1	•	Landholder agreement not granted for access	•	Southern option to Liddell substation adopted				
Muswellbrook 2	•	Landholder agreement not granted for access	•	Southern option to Liddell substation adopted				
Liddell	•	Discounted due to current land access constraints	•	Southern option to Liddell substation adopted				

Infrastructure	Environmental Benefits Achieved from Outcome			Outcome	
Transport Route					
Muscle Creek Road, Stoney Creek Road, Pictons Lane	•	Following consultation with near landowners, it was determined that these potential access routes would not be used by the Project due to current land access constraints and concerns relating to interactions between Project OSOM traffic, school buses and proximate landowner traffic as well as unsuitable road conditions.	•	Hebden Road (north) used for heavy and light vehicle; Hebden Road (south) used for all vehicles	
Hebden Road (south)	•	Disturbance area included two trees adjacent to the road which landowner requested to retain	•	Move disturbance area to avoid the trees and widening opposite side of the road	

Source: Terrain ©2019 Google



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BOWMANS CREEK WIND FARM

Preliminary Project Layout

**FIGURE 22** 

Source: Aerial ©2019 Google



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**Conceptual Project Layout** 

**FIGURE 23** 

# 4 STATUTORY CONTEXT

This section includes a description of the relevant state, local and federal legislation and policies relevant to the development of the Project.

# 4.1 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

The EP&A Act integrates the planning and assessment regime that applies to proposed developments in NSW. The EP&A Act outlines the requirements for approval from the Minister for Planning and Public Spaces and other planning authorities. This Project constitutes SSD (see **Section 4.1.2**) and as such, will require approval under Division 4.7 of Part 4 of the EP&A Act.

The NSW approvals process for SSD as at 2020 is shown in **Figure 24**.

## 4.1.1 Objects of the Act

Section 1.3 of the EP&A Act lists the Objects of the Act, which are the outcomes that the legislation seeks to achieve. **Table 8** lists the Objects that are relevant to the Project and describes how each is satisfied.

Object	Application to the Project
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	The Project will facilitate the development of land for the generation of renewable energy, thereby satisfying the energy needs of the community. The Project has been designed to minimise land disturbance, particularly disturbance of native vegetation. As such, it represents the proper development and conservation of natural resources
To facilitate Ecologically Sustainable Development (ESD) by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment	The Project is a sustainable development. This EIS provides the decision maker (consent authority) with a comprehensive assessment of the potential environmental, economic and social effects of the Project
To promote the orderly and economic use and development of land	The Project will generate employment and economic stimulus during its construction and operations (see <b>Section 7.8</b> ). Further, it has been designed to minimise disturbance to land, promote dual land use and increase the economic returns from the land that is part of the development
To protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats	The Project has been designed to minimise disturbance to native vegetation. Residual impacts to biodiversity will be managed in accordance with the <i>Biodiversity</i> <i>Conservation Act 2016</i> (see <b>Section 4.4.4</b> )

# Table 8 Objects of the EP&A Act

Object	Application to the Project
To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage)	The Project is a sustainable development and has been designed in consultation with the landowners and the keepers of the cultural heritage knowledge of the land. Aboriginal heritage values present at the site were assessed in consultation with Aboriginal stakeholders. Impacts to Aboriginal items will be managed as outlined in <b>Section 7.6.4</b>
To provide increased opportunity for community participation in environmental planning and assessment	Extensive engagement with the landowners and other local community individuals and stakeholder groups (as described in <b>Section 5</b> ) has been undertaken to identify key issues regarding the Project. These issues have been addressed in this EIS

# 4.1.2 State Significant Development

Section 4.36 of the EP&A Act states that state environmental planning policies (SEPPs) may declare certain classes of development to be SSD. Classes of SSD are listed under Schedule 1 of *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP).

Clause 20 under Schedule 1 states that development for the purpose of electricity generating works is SSD if it has a capital investment value of more than \$30 million. The Project has an indicative Capital Investment Value (CIV) of \$569 million and is therefore deemed to be SSD.

# 4.1.3 Permissibility and Zoning

Section 4.38 of the EP&A Act states that development consent cannot be granted to a development that is wholly prohibited by an Environmental Planning Instrument (EPI). However, consent may be granted to a development that is partly prohibited. The permissibility of the Project is dictated by the relevant environmental planning instruments. As explained in **Section 4.3.6**, the Project is permissible on the land on which it is proposed.

# 4.1.4 Consent Authority

Clause 8A of the SRD SEPP declares that the Independent Planning Commission (IPCN) is the consent authority for SSD in the following circumstances:

- The local council(s) have made a submission by way of an objection;
- More than 50 persons have made a submission by way of an objection (petitions and/or submissions containing the same or substantially the same text is counted as one submission); or
- The applicant for the development has made a reportable political donation.

The Proponent has not made any reportable political donations. Accordingly, the Minister will be the consent authority unless more than 50 persons or the local council objects to the Project.

# 4.1.5 **Public Participation**

Schedule 1 of the EP&A Act outlines the community participation requirements for development applications. Development applications for SSD (including the accompanying EIS) must be placed on public exhibition for a minimum of 28 days.

Ref: 210317 Bowmans Creek Wind Farm EIS



**NSW Approvals Process** 

**FIGURE 24** 

# 4.1.6 Assessment and Determination

Section 4.16 of the EP&A Act states that the consent authority may determine a development application by either granting consent (with or without conditions) or refusing consent. The consent authority is required to consider the matters listed in Section 4.15 of the EP&A Act.

## 4.1.7 Development Contributions

Section 7.23 of the EP&A Act states that the consent authority may impose a condition on the Proponent to make a development contribution. The purpose of development contributions is to fund the provision of public infrastructure and services that are required as a result of the development. Section 7.4 of the EP&A Act states that a proponent may enter into a planning agreement with the relevant planning authorities (e.g. local councils). A VPA may be entered into in lieu of a development contribution. The proposed VPA is described in **Section 3.1.1**.

## 4.1.8 Disclosure of Political Donations and Gifts

Section 10.4 of the EP&A Act provides that an applicant must disclose any political donations or gifts when making an application for SSD. The Proponent has not made any donations or gifts.

## 4.1.9 Relationship with Other NSW Legislation

Section 4.41 of the EP&A Act lists the authorisations under other Acts that are not required for any SSD that has been granted development consent.

Section 4.42 of the EP&A Act list the authorisations under other Acts that must be granted consistent with the development consent for SSD.

Other NSW legislation that is relevant to the Project is discussed in Section 4.4.

# 4.2 ENVIRONMENTAL PLANNING AND ASSESSMENT REGULATION 2000

#### 4.2.1 Environmental Impact Statements

Section 4.12(8) of the EP&A Act states that a development application for SSD must be accompanied by an EIS.

Part 2 under Schedule 2 of the EP&A Regulation outlines the process for the preparation of an EIS whilst Part 3 outlines the form and content requirements for an EIS.

The SEARs prescribe the matters that need to be addressed in this EIS.

A request for SEARs was made to DPIE in May 2019 in accordance with clause 3 of Schedule 2 of the EPA Regulation. The application was supported by the Scoping Report. SEARs were issued on 23 July 2019. Revised SEARs were issued on 13 July 2020 to incorporate DAWE's requirements in relation to EPBC Approval 2020/8631.

Each requirement of both the SEARs and relevant public authorities' submissions to the SEARs is listed in **Appendix B** which also indicates where each is addressed in this EIS.

#### 4.2.2 Subdivision of Land

Development consent is required for subdivision of land, as explained in **Section 4.3.6**. In addition, the Proponent will require subdivision works certificates under Division 2A of Part 8 of the EP&A Regulation. The Proponent will apply for subdivision works certificates in accordance with Clause 248A of the EP&A Regulation to facilitate subdivision of the lots to be occupied by the substations.

# 4.3 NSW ENVIRONMENTAL PLANNING INSTRUMENTS

# 4.3.1 State Environmental Planning Policy (Infrastructure) 2007

Clause 34 of the Infrastructure SEPP states that development for the purpose of electricity generating works may be carried out on any land in a prescribed rural, industrial or special use zone. The land within the Project Boundary is zoned RU1 – Primary Production which is a 'prescribed rural zone' for the purpose of Clause 34 of the Infrastructure SEPP. Therefore, the Project is permissible (with development consent) on the land on which it is proposed.

# 4.3.2 State Environmental Planning Policy (State and Regional Development) 2011

The SRD SEPP prescribes the classes of development that constitute SSD. The relevant provisions of the SRD SEPP are discussed in **Section 4.1.2** and **Section 4.1.4**. Clause 11 of SRD SEPP states that development control plans do not apply to SSD.

# 4.3.3 SEPP 33 – Hazardous and Offensive Development

State Environmental Planning Policy 33 – Hazardous and Offensive Development (SEPP 33) outlines assessment requirements for developments that meet the definitions of 'potentially hazardous industry' or 'potentially offensive industry'. Definitions of these terms are provided in Clause 3 of SEPP 33. Clause 8 of SEPP 33 states that current DPIE guidelines should be considered when determining if a development is a 'potentially hazardous industry' or 'potentially offensive industry'. The relevant guideline is 'Applying SEPP 33: Hazardous and Offensive Development Application Guidelines' (DoP, 2011) (SEPP 33 Guideline).

The risk screening method prescribed by the SEPP 33 Guidelines was undertaken for the Project. The hazardous materials that may be stored on site were identified and classified in accordance with the 'Australian Code for the Transport of Dangerous Goods by Road & Rail' (National Transport Commission, 2018). As described in **Section 7.20**, no hazardous materials will be stored in quantities that exceed the screening thresholds recommended by the SEPP 33 Guideline.

# 4.3.4 State Environmental Planning Policy (Koala Habitat Protection) 2020

State Environmental Planning Policy (Koala Habitat Protection) 2020 (Koala SEPP 2020) commenced on 30 November 2020, replacing the repealed SEPP (Koala Habitat Protection) 2019 that was in place from 1 March 2020 – 29 November 2020. Koala SEPP 2020 essentially replicates the objectives and provisions of the prior Koala Habitat Protection 2019 SEPP in relation to the processes for preparing koala plans of management, determining whether land contains potential or core koala habitat, and determining development applications on core koala habitat.

The Project is located across the MSC, SSC and UHSC LGAs which are listed in Schedule 1 of the SEPP. Although the Koala SEPP 2020 focuses on local developments and is not strictly applicable to SSD, the potential impacts on Koala has been appropriately considered in **Section 7.5** in accordance with Federal and State (BAM) guidelines.

# 4.3.5 State Environmental Planning Policy 55 – Remediation of Land

Clause 7 of *State Environmental Planning Policy* 55 – *Remediation of Land* (SEPP 55) provides that a consent authority must consider whether the land is contaminated. A search of the EPA contaminated land records on 22 July 2020 indicates that there are no known contaminated sites within the Project Boundary.

# 4.3.6 Local Environment Plans

The Project is located at the interface of three LGAs as shown in **Figure 2**. WTGs will primarily be located within the MSC and SSC, with only a small number located within the UHSC. The zoning of the land within the Project Boundary is illustrated in **Figure 25**.

# Muswellbrook Local Environment Plan 2009

The *Muswellbrook Local Environmental Plan 2009* (Muswellbrook LEP) applies to the part of the Project located within the MSC as shown on **Figure 2**. The land in this portion of the Project Boundary is zoned as RU1 – Primary Production. The land use table in the Muswellbrook LEP lists the class of development that are permissible within each land zoning. The Muswellbrook LEP does not list 'electricity generating works' as a permissible class of development in zone RU1. However, the land use table notes that it only addresses development to the extent that is it not regulated by a SEPP.

Clause 34 of the Infrastructure SEPP provides that "electricity generating works" are permissible in any rural land zone (see **Section 4.3.1**). Clause 1.9 of the Muswellbrook LEP states that in the event of an inconsistency between a LEP and a SEPP, the provisions of the SEPP will prevail. Therefore, the Project is permissible with consent on land zoned as RU1. The Muswellbrook LEP was reviewed in 2017 (**Section 2.6.4**) which recommended MSC to explore opportunities for alternative energy production. Clause 2.6(1) of the Muswellbrook LEP states that development consent is required for subdivision of land. The consent granted for this SSD will satisfy the requirement for development consent.

The proposed subdivision of the lot/dps for substations as described in **Section 3.7** will create a new lot that is smaller than the minimum lot size prescribed by the Muswellbrook LEP, which is 80 ha in the case of these lots. Clause 2.6(2) of the Muswellbrook LEP states that consent cannot be granted if the subdivision would result in a secondary dwelling being located on a lot smaller than the minimum lot size. The new lot created by the subdivision will be occupied exclusively by the proposed substation. Therefore, the restriction under Clause 2.6(2) does not apply to the Project because there will be no dwellings on the new lot.

# Singleton Local Environment Plan 2013

The *Singleton Local Environmental Plan 2013* (Singleton LEP) applies to the part of the Project located within the SSC as shown on **Figure 2**. The land within the Project Boundary in the SSC is zoned as RU1 – Primary Production. The Singleton LEP does not list 'electricity generating works' as permissible development in zone RU1. Pursuant to Clause 1.9 of the SSC, the Infrastructure SEPP will prevail over the LEP where there is an inconsistency. Therefore, the Project is permissible with consent in zone RU1. Clause 2.6(1) of the Singleton LEP states that development consent is required for subdivision of land. The consent granted for this SSD will satisfy the requirement for development consent.

The proposed subdivisions will create new lots that are smaller than the minimum lot size prescribed by the Singleton LEP, which is 40 ha in the case of this land. Clause 2.6(2) of the Singleton LEP states that consent cannot be granted if the subdivision would result in a secondary dwelling being located on a lot smaller than the minimum lot size. The new lot created by the subdivision will be occupied exclusively by the proposed substation. The restriction under Clause 2.6(2) does not apply to the Project because there will be no dwellings on the new lot.

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Source: Land Zoning © MSC LEP 2009, UHSC LEP ZOX

wmans Creek Wind Farm | Fig25\_Land Zoning | 11 03 2021

Hansen Bailey

ENVIRONMENTAL CONSULTANTS

BOWMANS CREEK WIND FARM

Land Zoning

**FIGURE 25** 

# Upper Hunter Local Environment Plan 2013

The *Upper Hunter Local Environmental Plan 2013* (UH LEP) applies to the part of the Project located within the UHSC as shown on **Figure 2**. The land within this portion of the Project Boundary is zoned RU1 – Primary Production. The UH LEP does not list 'electricity generating works' as permissible development in zone RU1. Pursuant to Clause 1.9 of the UH LEP, the Infrastructure SEPP will prevail over the LEP where there is an inconsistency. The Project is permissible with consent in zone RU1.

There is no subdivision of land required to facilitate the Project in the UHSC.

# 4.4 OTHER NSW LEGISLATION

# 4.4.1 Protection of the Environment Operation Act 1997

Section 48 of the *Protection of the Environment Operations Act 1997* (POEO Act) provides that an EPL is required for scheduled activities under the Act. Clause 17 under Schedule 1 of the POEO Act declares "electricity works (wind farms)" to be a scheduled activity if the wind farm is the subject of development consent for SSD. Given that the Project is the subject of an application for SSD, an EPL will be required to operate the Project. Section 4.42 of the EP&A Act states that an EPL must be granted for an approved SSD.

# 4.4.2 National Parks and Wildlife Act 1974

Under Section 86 of the *National Parks and Wildlife Act 1974 (NPW Act)*, it is an offence to harm or desecrate an Aboriginal object unless the harm or desecration was authorised by an Aboriginal Heritage Impact Permit (AHIP) issued under Section 90. The predicted impacts to Aboriginal items are discussed in **Section 7.6.3**. Pursuant to Section 4.41 of EP&A Act, AHIPs are not required for an approved SSD.

# 4.4.3 Heritage Act 1977

Section 139 of the *Heritage Act 1977* (Heritage Act) provides that an excavation permit is required for any land disturbance or excavation that may result in impacts to a "relic". A "relic" is defined as any item that relates to non-Indigenous settlement of NSW and has state or local significance.

As described in **Section 7.7.3**, there are no heritage items located within the Project Boundary that are listed as being of state or local heritage significance. Therefore, the Project will not impact on any relics. In any event, an excavation permit is not required for the Project due to the exemption provided by Section 4.41 of the EP&A Act.

# 4.4.4 Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2016* (BC Act) was enacted on 23 November 2016. Part 7 of the BC Act imposes a framework for the assessment of impacts to listed threatened species and ecological communities. If a proposed development is likely to impact upon threatened species, the development application must be accompanied by a Biodiversity Development Assessment Report (BDAR). The BDAR prepared for the Project is described in **Section 7.5**.

Part 6 of the BC Act establishes a biodiversity offsets scheme for developments that involve clearing of native vegetation and habitat. The relevant offsetting obligations for the Project are discussed in **Section 7.5.4**.

Ref: 210317 Bowmans Creek Wind Farm EIS

# 4.4.5 Fisheries Management Act 1994

Threatened species legislation in NSW currently consists of the *Fisheries Management Act 1994* (FM Act), and the BC Act. The FM Act protects threatened fish species and marine vegetation and identifies associated threatening processes. The FM Act has the objective to conserve, develop and share the fishery resources of NSW for the benefit of present and future generations. Assessments under the FM Act are required to assess potential impacts to areas mapped as Key Fish Habitat and/or indicative distributions of threatened freshwater species. These matters are addressed in **Section 7.5**.

# 4.4.6 Roads Act 1993

Section 138 of the *Roads Act 1993* (Roads Act) provides that the consent of the relevant roads' authority is required for the carrying out of works in, on or over a public road. The proposed upgrades to the local road network (as described in **Section 3.6**) will require the consent of the relevant roads' authorities. The Muswellbrook, Singleton and Newcastle Councils are the relevant roads authorities for the roads that are proposed to be upgraded. Section 4.42 of the EP&A Act provides that the consent of the road's authority must be given consistent with the approved SSD.

# 4.4.7 Water Management Act 2000

# Water Access Licences

The WM Act establishes a licensing regime for taking water from water sources that are the subject of a Water Sharing Plan (WSP). There are two WSPs that apply to the area within the Project Boundary described in **Section 7.15** and include:

- 'Water Sharing Plan for the Hunter Unregulated and Alluvial Water Sources 2009' (Hunter Unregulated WSP); and
- 'Water Sharing Plan for the North Coast Fractured and Porous Rock Groundwater Sources 2016' (North Coast WSP).

The Hunter Unregulated WSP applies to water on the ground surface and in the alluvial aquifers. The North Coast WSP applies to all aquifers other than unconsolidated sediments of Quaternary or Tertiary age (e.g. alluvial sediments). Section 60A of the WM Act states that water cannot be taken from a water source unless authorised by a Water Access Licence (WAL). The Project will not involve the capture of surface water runoff or extraction of groundwater as discussed in **Section 7.15**. Accordingly, the Project will not require any WALs under the WM Act. All water required during the construction of the Project will be transported to the site using water tankers or as described in "harvestable rights" below. The water suppliers will be responsible for holding the appropriate licences required for their activities.

# Approvals

Section 91(2) of the WM Act states that a controlled activity approval is required for the carrying out of a controlled activity in, on or under waterfront land. The definition of "controlled activity" includes the erection of a building or carrying out of a work. The definition of "waterfront land" includes the bed of a river and the land within 40 m of the bank. The Project will involve underboring beneath stream beds other construction works in stream beds within 40 m of stream banks. However, a controlled activity approval is not required for the Project due to the exemption provided by Section 4.41 of the EP&A Act.

Ref: 210317 Bowmans Creek Wind Farm EIS

# Harvestable Rights

Section 53 of the WM Act entitles the owner or occupier of land to capture and use a portion of the rainfall runoff on their property (known as the "harvestable right"). The water may be captured using a dam that complies with the relevant harvestable rights order.

The Proponent does not own the land within the Project Boundary and as such, is not entitled to any harvestable rights. However, there are farm dams located within the Project Boundary that may be consistent with the relevant harvestable rights order. The Proponent will enter into agreements with these landowners if it is necessary to use water captured in farm dams.

# 4.4.8 Crown Land Management Act 2016

The Project will involve the development of some ancillary infrastructure on Crown land. The Department of Industry – Crown Land has been consulted in this regard (**Section 5**). **Figure 26** shows both identifiable crown lots and crown roads within the Project Boundary. Three crown lots have a potential to be impacted by the Project as follows:

- Block A Reserve R474 gazetted 19 November 1187 with a purpose of trigonometrical purposes. This reserve is defaulted to the Minister. There are no current tenures over the reserve issued by DPIE Crown Lands Division. The Project proposes to include a road and underground powerline through the reserve however, the trigonometric station will not be impacted;
- Block B Reserve R44773, gazetted 19 January 1910 with a purpose of camping and travelling stock (Category 2 Travelling Stock Reserve (TSR)). The Reserve is vested in Local Land Services (LLS) and consultation has occurred as described in Section 5. There are no current tenures over the reserve issued by DPIE Crown Lands Division. The reserve will not be impacted by access tracks or site access associated with the Project; and
- Block C Reserve R209, gazetted 22 May 1886 with a purpose of access and water supply. The Reserve is vested in LLS and consultation has occurred as described in Section 5. There are no current tenures over the reserve issued by DPIE – Crown Lands Division. This block is a Category 2 TSR. This reserve will be impacted by underground powerlines and an access track associated with the Project.

Although not utilised for the Project, various crown roads will be required to be crossed at various locations. Crown land will be avoided where practical however final impacts cannot be determined until detailed design is completed, prior to construction.

To facilitate these works, the Proponent will obtain a special purpose lease or special purpose licence in accordance with Section 5.30 of the *Crown Land Management Act 2016* (CLM Act). Section 5:30(2) of the CLM Act states that a lease or licence can be granted to authorise the holder to "construct and operate facilities for the harnessing of energy from any source (including the sun or wind)".

Source: Cadastre courtesy of the Spatial Collaboration Portal (accessed July 2020); Terrain ©2019 Google



EPURON

BOWMANS CREEK WIND FARM

Crown Land

**FIGURE 26** 

# 4.4.9 Biosecurity Act 2015

Section 22 of the *Biosecurity Act 2015* (Biosecurity Act) imposes a general duty on any person dealing with a "biosecurity matter" to ensure that "biosecurity risk" is prevented, eliminated or minimised. The definition of "biosecurity matter" under Section 10 includes animals and plants. Given that the Project will interact with flora and fauna, a general duty of care will apply to the Proponent. "Biosecurity risk" is defined as the risk of a "biosecurity impact", which in turn is defined under Section 13 of the Biosecurity Act. There are two biosecurity impacts that may be relevant:

- Introduction, presence, spread or increase of a pest; and
- Risk to public safety caused by non-Indigenous animals.

In order to fulfil the general duty under Section 22, the Proponent will implement measures to control populations of noxious weeds and feral animals (see **Section 7.16.2**).

## 4.4.10 Rural Fires Act 1997

The management of bushfire risk is primarily regulated through the *Rural Fires Act 1997* (RF Act). Section 63 of the RF Act imposes a duty on owners and occupiers of land to take practicable steps to prevent the occurrence and spread of bushfires. Measures to reduce the risk of bushfires are outlined in **Section 7.10**. 'Planning for bush fire protection' (RFS, 2019a) (PBP) recommends the establishment of Bushfire Protection Measures (BPMs) to reduce the risk of impacts to assets. BPMs conform to the definition of "managed bushfire hazard management works" under Section 100C of the RF Act. There are two categories of hazard management works that are permitted:

- Emergency bushfire hazard management works; and
- Managed bushfire hazard management works (i.e. not emergency works).

Section 100C of the RF Act provides that emergency bushfire hazard management works can be undertaken on any land without consent or approval under the EP&A Act. Managed bushfire hazard management works can be conducted without approval, provided that:

- "(a) the work is carried out in accordance with a bush fire risk management plan that applies to the land, and
- (b) there is a bush fire hazard reduction certificate in force in respect of the work and the work is carried out in accordance with any conditions specified in the certificate, and
- (c) the work is carried out in accordance with the provisions of any bush fire code applying to the land specified in the certificate."

Bushfire hazard management works are also exempt from requirements for approvals, licences or consents under the BC Act or NPW Act, provided that the aforementioned conditions are met. The BPMs recommended by PBP are managed bushfire hazard management works. Given that approvals under the EP&A Act, BC Act or NPW Act are not required, the establishment of BPMs is not included as a component of the Project. Bush fire risk management plans (BFRMPs) are prepared by Bush Fire Management Committees (BFMCs) established under the RF Act.

There are three BFRMPs that apply to the land within the Project Boundary:

- Liverpool Range Bush Fire Risk Management Plan (Liverpool Range BFMC, 2009);
- Muswellbrook Bush Fire Risk Management Plan (Muswellbrook BFMC, 2011); and
- Singleton Bush Fire Risk Management Plan (Singleton BFMC, 2011).

Given that approvals under the EP&A Act, BC Act or NPW Act are not required, the establishment of BPMs is not included as a component of the Project.

# 4.4.11 Waste Avoidance and Resource Recovery Act 2001

The *Waste Avoidance and Resource Recovery Act 2001* (WARR Act) seeks to encourage the efficient use of resources through the following hierarchy of management options:

- Avoidance of unnecessary resource consumption;
- Resource recovery (including reuse, reprocessing, recycling and energy recovery); and
- Disposal.

As discussed in **Section 7.17**, the waste management strategies proposed for the Project are consistent with the hierarchy under the WARR Act.

# 4.5 COMMONWEALTH LEGISLATION

# 4.5.1 Renewable Energy (Electricity) Act 2000

The *Renewable Energy (Electricity) Act 2000* (RE Act) is an Act for the establishment and administration of a scheme to encourage additional electricity generation from renewable energy sources, and for related purposes. The objects of the RE Act are to:

- "(a) Encourage the additional generation of electricity from renewable sources; and
- (b) Reduce emissions of greenhouse gases in the electricity sector; and
- (c) Ensure that renewable energy sources are ecologically sustainable."

The objects of the RE Act are achieved through the issuing of certificates for the generation of electricity using eligible renewable energy sources and requiring certain purchasers (called liable entities) to surrender a specified number of certificates for the electricity that they acquire during a year. Wind energy is listed as an eligible renewable energy source under Section 17 of the RE Act. The energy generated by the Project will be accounted for through the creation of large-scale generation certificates, which can be sold to energy consumers.

**Section 9.6** discusses how the Project is consistent with the aims of the RE Act and will help meet the targets of the RET by producing renewable energy for Australia's electricity grid.

# 4.5.2 Environmental Protection and Biodiversity Conservation 1999

The EPBC Act prescribes the role of the Commonwealth in environmental impact assessment, biodiversity conservation and management of protected areas of national significance. The EPBC Act provides for the protection of nine Matters of National Environmental Significance (MNES).

In February 2015, a bilateral agreement was made under Section 45 of the EPBC Act between the Commonwealth of Australia and the State of NSW relating to environmental assessment. This bilateral agreement was amended (Amending Agreement No.1) effective 24 March 2020 to reflect changes to the EP&A Act, in particular the repeal of the TSC Act and replacement with the BC Act.

Under Amending Agreement No.1, the BAM and Biodiversity Offsets Scheme (BOS), as introduced under the BC Act are Accredited processes. A proponent must make a Referral under Section 68 of the EPBC Act if the proposed action has the potential to result in significant impacts to MNES.

The MNES that are relevant to the Project are listed threatened and/or migratory species, which are protected under Sections 18 and 20 of the EPBC Act. If the Minister decides that the proposed action may have a significant effect on any of these MNES, the action will be declared a "controlled action". Approval under Part 9 of the EPBC Act is required to conduct a controlled action.

The Project was referred to the Minister for the Environment on 5 May 2020. The Project was deemed to be a controlled action under Section 75 of the EPBC Act on 3 June 2020 (EPBC Referral 2020/8631) for the following relevant controlling provisions: Listed threatened species and communities (sections 18 & 18A); and Listed migratory species (sections 20 & 20A). Approval is also sought under Section 75 of the EPBC Act (EPBC Approval). The Minister decided that the assessment approach for the Project will be to have it assessed under the assessment bilateral agreement with the NSW government. DPIE provided revised SEARs (see **Section 4.2.1**).

# 4.5.3 Native Title Act 1993

The Native Title Act 1993 (NT Act) facilitates the recognition and protection of Native Title. Section 13 of the NT Act provides that a person can apply to the Federal Court for a determination of native title. There are no native title claims that apply to the land within the Project Boundary (as at February 2021). Section 23B of the NT Act provides that native title is extinguished by 'previous exclusive possession acts' that occurred prior to 23 December 1996. Examples of previous exclusive possession acts include the granting of a freehold estate or certain leases listed under Section 23B(2). The majority of the land within the Project Boundary is freehold land; however, there are some parcels of Crown land where native title may not have been extinguished as described in **Section 4.4.8**.

# 4.5.4 Civil Aviation Safety Regulations 1998

The *Civil Aviation Safety Regulations 1998* (CAS Regulations) imposes requirements on proponents to ensure that tall structures do not affect aviation safety. Regulation 139.365 states that notice must be provided to the Civil Aviation Safety Authority (CASA) if a proposed structure has a height of greater than 110 m above ground level. CASA has been consulted with over the Project and will be given formal notice of the localities of the proposed WTGs and monitoring towers prior to construction (see **Section 7.3.4**).

# 4.5.5 National Greenhouse and Energy Reporting Act 2007

The National Greenhouse and Energy Reporting Act 2007 (NGER Act) established the national greenhouse and energy reporting scheme, which requires registered corporates to report on their GHG emissions, energy production and energy consumption each financial year. A corporation must be registered for the scheme if its GHG emissions, energy production or energy consumption exceeds the thresholds under Section 13 of the NGER Act. The Proponent (or its parent company) will register and comply with the requirements of the NGER Act if it exceeds these thresholds.

# 4.6 CONSOLIDATED LIST OF APPROVALS AND POST-APPROVALS

**Appendix F** provides a summary of the list of ancillary and post-approvals that must be obtained for the Project. Any conditions of any development consent issued will supersede commitments in this table.

# 5 STAKEHOLDER ENGAGEMENT

This section provides a summary of the stakeholder engagement undertaken for the Project. It also provides an overview of the engagement process, the findings that have been incorporated into this EIS and the Proponent's commitment to ongoing engagement.

# 5.1 OBJECTIVES

Wind farms in NSW are generally limited to sites on elevated land with above average wind speeds and close proximity to existing transmission infrastructure. The NSW Government has released the 'Wind Farm Map' (Carter & Gammidge, 2019) which illustrates sources of wind energy, generator capacity and key transmission lines in NSW. The inset in **Figure 7** illustrates that the Project is located within a high wind speed area that is in proximity to existing transmission lines and substations.

Such sites are relatively rare, and often, these sites are located in the vicinity of rural dwellings and in some cases in the vicinity of small to medium sized regional communities. This can cause conflict where local community members feel they will be impacted by the Project and yet will not see any direct benefits from the Project.

The limited number of viable wind farm sites means that this conflict is often unavoidable and cannot be eliminated by simply moving the wind farm to a different location. Accordingly, community engagement is focused not only on the careful positioning of WTGs and other project elements to reduce direct impacts, but to also understand and mitigate the potential impacts of the Project whilst maximising the benefits of the Project to the local community. The Wind Energy Guideline outlines the expectation for early and meaningful consultation with the local community and other stakeholders to enable feedback that can be incorporated into the design of the Project.

# 5.2 STAKEHOLDER ENGAGEMENT PLAN

The Proponent prepared and implemented a SEP during the Scoping Report and revised the SEP for this EIS stage of the Project. The SEP's for both stages were developed consistent with NSW Government Policy and integrated into the various stages of the NSW planning approval's process as illustrated on **Figure 24**. Stakeholders were afforded multiple opportunities to comment and provide feedback on the Project during the consultation process.

During the Scoping Report stage, the Proponent conducted a review of the Wind Energy Guideline along with the relevant SEP from its previous wind farm projects to update and refine its approach to consultation and to develop a site-specific SEP. An independent stakeholder engagement specialist company, Plancom was engaged to review the consultation approach, the draft SEP and assist the Proponent with its implementation. The Scoping Report SEP was utilised until the submission of the Scoping Report in May 2019 with its focus on ensuring that those with the potential for the greatest impact were given every opportunity to provide early and meaningful feedback on the Project.

In preparation for the EIS SEP, a full day stakeholder risk assessment was conducted on 15 August 2019 with members of the Proponent, Peterkin Consulting, Plancom and Hansen Bailey attending. The day focused on refining the consultation objectives and approach based on responses to the Scoping Report SEP, key messages, consultation methods and tools and action plans for the EIS stage.

Ref: 210317 Bowmans Creek Wind Farm EIS

A revised EIS SEP was developed following the workshop. The key objectives of the Scoping Report SEP and EIS SEP are outlined in **Table 9**. In parallel with the EIS SEP, a Social Impact Assessment (SIA) was undertaken as a component of this EIS. Findings of the SIA are discussed in **Section 7.23**.

An Aboriginal Cultural Heritage Assessment Report (ACHAR) was also undertaken as a component of this EIS. The consultation program for the ACHAR is summarised in this section and is discussed further in **Section 7.6.2**.

Ref	Objective
Scopir	ng Report SEP
1	Ensure the community is fully informed over the Project as it evolved, its likely impacts, and its likely benefits
2	Engage with stakeholders so views, concerns and aspirations are heard and understood
3	Ensure that the team developing the Project fully understood the local context, including any potential local impacts or opportunities
4	Provide multiple opportunities for dialogue in various forms to allow the community to receive information and provide feedback about the Project
5	Incorporate the feedback into the design of the wind farm where possible
6	Explain where and how feedback could be and was incorporated
7	Build positive, trust-based relationships with members of the local community
EIS SE	P
1	Maintain and further develop cooperative landowner and community relationships with both associated and non-associated landholders
2	Identify further key stakeholders, their potential issues and concerns and appropriate engagement opportunities so that their concerns and aspirations were heard and understood
3	Ensure the community continues to be fully informed about the Project, its likely impacts, its likely benefits, opportunities for input and the planning approval's process
4	Manage the current community awareness and expectations around the Project during the assessment process and incorporate feedback into the design of the Project where practical
5	Consult proactively with stakeholders using clear and consistent key messages
6	Facilitate the development and implementation of response and feedback strategies to address identified stakeholder concerns
7	Manage Project approval risks associated with stakeholder concerns
8	Ensure that the team developing the Project fully understands the local context, including any local impacts that it may have or opportunities that it could provide
9	Provide multiple opportunities for dialogue in various forms to allow the community to receive information and provide feedback about the Project
10	Where appropriate incorporate feedback into the Project design to address issues raised

# Table 9Stakeholder Engagement Plan Objectives

# 5.3 STAKEHOLDER IDENTIFICATION

#### 5.3.1 Methodology

Key stakeholders relevant to the Project were identified through a variety of means including:

- The compilation of land ownership information;
- Exploration into the local and wider community, industry and service providers;
- Networking with different individuals and community organisations;
- Media Advertisements;
- Newsletter distribution and community information sessions;
- Discussion with regulators; and
- Inclusion of all stakeholders referenced in the SEARs.

## 5.3.2 Stakeholder List

An extensive list of stakeholders was developed utilising the methods in **Section 5.3.1** which included community, regulatory and other stakeholders as shown in **Table 10**.

Category	Туре	Stakeholder
Community	Landholders	<ul> <li>Associated Landholders         <ul> <li>Hosting WTG/s, transmission easement or other infrastructure or direct impacts</li> </ul> </li> <li>Non-Associated         <ul> <li>Neighbours on public transportation routes</li> <li>Any Neighbour within 3 km of a proposed WTG</li> <li>Neighbours within 4.4km with Visual impacts as defined under the 'Wind Energy: Visual Assessment Bulletin' (DPE, 2016b) (Visual Bulletin)</li> <li>Other affected or interested landholders</li> </ul> </li> </ul>
Community	Nearby Communities	<ul> <li>Bowmans Creek</li> <li>Davis Creek</li> <li>Goorangoola</li> <li>Greenlands</li> <li>Hebden</li> <li>McCullys Gap</li> <li>Muscle Creek</li> <li>Rouchel Brook</li> <li>Muswellbrook township</li> <li>Scone and Singleton townships</li> <li>Community Consultative Committee (CCC)</li> </ul>
Community	Community Groups	<ul> <li>Local Progress Associations</li> <li>Local bush fire brigades</li> </ul>

# Table 10 Identified Stakeholders

Category	Туре	Stakeholder
Regulatory	Local Councils	<ul><li>MSC</li><li>SSC</li><li>UHSC</li></ul>
Regulatory	State Government Agencies	<ul> <li>Department of Planning, Industry &amp; Environment (DPIE)</li> <li>Environment, Energy and Science – Biodiversity and Conservation Division (BCD)</li> <li>Mining, Exploration and Geoscience</li> <li>Department of Industry</li> <li>Environment Protection Authority</li> <li>Transport for NSW</li> <li>TransGrid</li> <li>Dept Finance, Services and Innovation – Telco Authority</li> <li>Local Land Services</li> <li>Department of Defence</li> <li>Civil Aviation Safety Authority</li> </ul>
Regulatory	Federal Government Agencies	Department of Agriculture Water and Environment
Other	Registered Aboriginal Parties	See detailed discussion at Section 5.6
Other	Other Industry	<ul> <li>Australian Rail Track Corporation</li> <li>AGL Energy / power stations / other AGL Energy projects</li> <li>Airservices Australia</li> <li>Mining projects</li> <li>NBNCo</li> <li>NSW Rural Fire Service</li> <li>Other renewable projects</li> <li>Real estate agents</li> <li>Television / radio stations</li> <li>Aerial service providers         <ul> <li>Air Speed Aviation, Scone</li> <li>Pays Air Service, Scone</li> <li>Super Air</li> <li>Scone Aero Club</li> <li>Timberline</li> <li>Westpac Helicopter</li> </ul> </li> <li>Commercial Airports         <ul> <li>Scone</li> <li>Private airfields / landing strips</li> </ul> </li> </ul>
Other	Other Stakeholders	<ul> <li>Emergency Services – Police, Ambulance, Fire</li> <li>Local businesses and media</li> <li>Internal: employees, shareholders, consultants, contractors and suppliers</li> </ul>

# 5.4 ISSUE SCOPING

#### 5.4.1 Community

## Methods

Engagement with the community stakeholders was conducted to inform stakeholders of the Project and assist in identification of key Project issues. Various methods were employed to engage with the community which included (at least):

- Introductory letters;
- Face to face meetings;
- Newsletters;
- Community Information Sessions;
- Bowmans Creek Community Consultative Committee (CCC);
- Press release and advertisements;
- Website and Project mailbox; and
- Radio interviews local radio stations 2NM and ABC Radio.

## Introductory Letters

In 2018, introductory letters were sent to the community within 5 km where details could be obtained. In 2018 and 2019, during the preparation of this EIS, the Proponent continued to send letters and emails to landholders, nearby communities and community groups. Key messaging of these letters was to introduce the Proponent, provide copies of the Scoping Report and subsequent SEARs; offer methods for the community to contact the Proponent and to provide offers for face-to-face meetings.

#### Face to Face Meetings

Face to face meetings were offered to the neighbouring dwellings within 3 km of a WTG location in 2018 and 2019. The intention of the meetings was to introduce the Project and provide as much information as possible, to allow for questions and issues to be raised and for feedback to be given.

Numerous face-to-face meetings were held with landholders, members of the nearby community and community groups during preparation of this EIS and discussions with regarding individual issues and written responses (July 2019 – August 2020).

As part of the Lighting and Visual Impact Assessment (LVIA) process the offer for creation of a photomontage was made to all dwellings within 3 km of a proposed turbine location. Photomontages were also created for dwellings at further distances based on selection by the Landscape Architect or requests from residents, in some cases out as far as 7 - 8 km. Printed copies of the photomontages were either delivered to landowners during follow up meetings to discuss technical aspects of the process and collect feedback on the layout, or, where this was not possible, printed copies were posted to landowners with a follow up phone call or email.

#### Newsletters

Engagement with associated and non-associated landholders and the wider local community has been complemented by the distribution of several Project update newsletters during the preparation of this EIS.

Approximately 250 copies of each newsletter and fact sheet were distributed to the local community, regulators and other interested stakeholders on the Proponent's newsletter distribution database. Newsletters were distributed during June 2018, May 2019, September 2019, November 2019, February 2020 and July 2020. Supporting information was created to accompany the July 2020 newsletter in the form of Frequently Asked Questions (FAQ) covering topics raised regularly during consultation activities.

A further newsletter is proposed to be distributed immediately prior to this EIS being placed on public exhibition notifying stakeholders where they will be able to view a copy of this EIS should they wish to make a submission over the Project.

Copies of newsletters and FAQ sheets distributed to the community are available on the Proponent's website at <u>https://epuron.com.au/wind/bowmans-creek</u>.

# **Community Information Sessions**

In July 2018, the MSC held a Community Meeting at the McCullys Gap Community Hall and invited the Proponent to attend and provide an update on the feasibility activities it had been conducting. Members of the Proponent's team presented to the community of approximately 60 attendees and fielded questions on the potential development, approval process and estimated timings. A newsletter hand-out with this information summarised was provided and subsequently uploaded to the Project website. Attendees were invited to leave contact details for future communications regarding the Project.

Community information sessions were held during October 2018, November 2019 and July 2020. There were four in-person sessions held in each series at McCullys Gap, Muscle Creek, Hebden and Mt Pleasant in 2018 and 2019. There were three sessions held in the 2020 series via the software platform "Zoom". Over 200 people attended the community information sessions in total. The Community Information Sessions were initiated by the Proponent to provide the local community an opportunity to learn about the Project, to receive the most up to date information on the Project and to provide face to face feedback to Project staff.

The 2018 information sessions focused on introducing the Project and the describing the investigation area that the Proponent was exploring. Feedback forms were provided with an emphasis on understanding the key landscape features and values to the local community as well as learning about how the area is used. Maps of the investigation area and other visual aids were on display to guide discussion around typical land uses and features. Analysis from the feedback forms was incorporated into the Scoping Document and Preliminary Visual Impact Assessment.

The 2019 information sessions followed the issue of the Project's SEARs and the commencement of the specialist's studies. The focus for these sessions was to present the layout as submitted in the Scoping Document, verify findings from earlier consultation sessions and explain the assessment process for wind farms in NSW. Maps showing the proposed turbine layout, key landscape features identified by the community and other points of interest were on display along with the Wind Framework documents, the Scoping Report and updated feedback forms.

The 2020 information sessions were held online via the video conferencing software Zoom following recommendations from the NSW Department of Health regarding essential travel and social distancing due to COVID-19. The sessions were attended by 15 members of the nearby community.

The "Zoom" Information Sessions were advertised in the community Newsletter released in July 2020 and the subject of a radio interview with ABC Muswellbrook. Community members were also offered a one-on-one meeting for anyone who was unable to attend.

The focus of these sessions was to provide the revised layout resulting from community feedback and specialist recommendations during the environmental assessment phase of the Project. Epuron team members provided an overview of the industry and the Project with the aid of a presentation which was made available on the Project website.

Following the presentation, attendees were invited to ask questions and participate in a discussion on the key issues that they were seeking answers to. The Proponent representatives fielded questions from attendees covering a range of environmental and socio-economic issues. The matters raised were discussed at the time with additional follow up information provided as required.

## Bowmans Creek Community Consultative Committee

A CCC has been established for the Project generally in accordance with the 'Community Consultative Committee Guideline State Significant Projects' (DPIE, 2019) (CCC Guidelines) to provide a discussion forum for community on issues directly related to the Project.

Dr William Edward John (Wej) Paradice AM was appointed by DPIE as the independent chair of the CCC. In consideration of COVID19, the Chair elected to hold its first engagement in April 2020 via an email Q&A method. The first meeting was held on 15 July 2020 in Muswellbrook and a second meeting was held on 26 August 2020. The Chair has confirmed that meetings will be held quarterly (or as appropriate) relevant to the stage of the Project.

# Press release and Advertisements

Following the release of the July 2020 newsletter, an update was provided to local radio stations 2NM and ABC Local Radio in Muswellbrook and an interview was conducted and aired. These updates provided a Project overview, progress and information on opportunities to provide input into the assessment process including times and locations of community information sessions.

# Website, Community Information Line and Project Mailbox

The Proponent has maintained a Project specific since its inception in 2018. The Bowmans Creek Project Website contains key documents including project information, newsletters and the Proponent's contact information.

#### **Consultation Meetings**

Offers of briefings were made to regulatory agencies as stipulated in the SEARs and generally included presentation of the Project description, confirming the proposed methodologies for assessment and providing updates on the results of environmental studies.

The details of meetings held (as required by the SEARS) as at 16 February 2021 with relevant regulators are summarised in **Table 11**.

Issues raised by regulatory agencies and where each is addressed in this EIS are discussed further in **Appendix B**.

Table 11
<b>Regulatory Engagement Summary</b>

Stakeholder Category	Method		
Local Councils			
MSC	<ul> <li>Project briefing (Nov 2019)</li> <li>Project Briefing and discussion on road upgrades, all issues in submission to the SEARs, VPA (May 2020)</li> <li>Follow-up meeting on road upgrades, respond to May 2020 meeting (Jul 2020)</li> <li>Project update meeting to discuss transmission line (Jan 2021)</li> </ul>		
UHSC	<ul> <li>Project briefing (Nov 2019)</li> <li>Project Briefing and discussion, all issues in submission to the SEARs VPA and issues (Apr 2020)</li> </ul>		
SSC	<ul> <li>Project briefing (Nov 2019)</li> <li>Project Briefing and discussion on road upgrades, all issues in submission to the SEARs, VPA (May 2020)</li> <li>Follow-up meeting on road upgrades, respond to May 2020 meeting (Jul 2020)</li> <li>Project update meeting to discuss transmission line and road upgrades (Jan 2021)</li> </ul>		
State Government Agencies			
DPIE	<ul> <li>Project Briefing and introduction to the Project, Preliminary Environmental Assessment (PEA), and EIS (Nov 2018)</li> <li>Submit Scoping Report (May 2019)</li> <li>Project SEARS SSD 10315 issued (23 Jul 2019)</li> <li>Project Briefing (23 Jan 2020)</li> <li>Pre EIS lodgement discussion (25 Sep 2020)</li> <li>Project update meeting to discuss EIS submission (Feb 2021)</li> </ul>		
BCD	Project Briefing and presentation (May 2020)		
MEG	Project Briefing and presentation (Jun 2020)		
Dol	Crown Lands – Project Briefing and presentation (May 2020)		
EPA	Project Briefing including Project overview and to seek feedback (May 2020)		
TfNSW	<ul> <li>Project Briefing and discussions on interactions associated with road network including methodology for OSOM route assessment, State road network, specific options for access at Industrial Drive / Pacific Highway and John Renshaw Drive, other Projects (August 2020)</li> </ul>		
TransGrid	<ul> <li>Project Briefing and connection process discussion (July 2020)</li> <li>Request for Preliminary Technical Assessment (PTA) submitted 10 Aug 2020</li> <li>PTA received 21 Aug 2020</li> </ul>		
Finance, Services and Innovation – Telco Authority	<ul> <li>Emailed 12 Aug 2020 and follow up email sent 27 Aug 2010.</li> <li>No response received as at 9 October 2020.</li> </ul>		

Stakeholder Category		Method
LLS	•	Project Briefing including Project overview and presentation of potentially affected Crown Lands (Jun 2020)
DoD	• •	Draft Aviation Impact Assessment (AIA) review (Feb 2020) Offer of formal meeting (Jan – Mar 2020) Follow up emails sent (Jan – Sep 2020)
CASA	•	Draft Aviation Impact Assessment review (Mar 2020)
Federal Government Agencies		
DAWE	•	Project Briefing and notice of intent to submit referral (Jan 2020)

## 5.4.2 Other Stakeholders

**Table 12** lists other stakeholders with whom consultation was undertaken as at 16 February 2021.

Stakeholder Category	Method		
Aboriginal Community			
Registered Aboriginal Parties (RAPs)	Refer to consultation in accordance with Guidelines as shown in     Section 5.6		
Other Industry			
Australian Rail Track Corp	Project Briefing and discussions on interactions associated with Main Northern Railway line, seek issues and commitments (Oct 2020)		
AGL Energy / power stations	<ul> <li>Project Briefing for field survey on AGL Energy owned land (Nov 2019)</li> <li>Follow-up discussion regarding potential field survey on AGL Energy owned land (June 2020)</li> <li>Recipient of Project newsletter</li> </ul>		
Air Services Australia	Draft Aviation Impact Assessment (AIA) review (Feb2020)		
Mining Projects in the vicinity	<ul> <li>Project Briefing for field survey with Glencore owned mines (March 2020)</li> <li>Recipient of newsletter</li> </ul>		
NBNCo	Emailed 12 Aug 2020 and follow up sent email 27 Aug 2010.     No response received as at 9 October 2020.		
NSW Rural Fire Service	<ul> <li>Project Briefing with local brigade captains (June 2020). Seek issues and requested commitments</li> <li>Project Briefing and communications impacts discussion with Bulga RFS (June 2020)</li> </ul>		
Real Estate agents	Various meetings with Proponent throughout 2019 and 2020 to discuss Project, Scoping Report, newsletters and issues		
Television / radio stations	Radio campaign by Proponent in 2020 to discuss Project issues		
Aerial Providers	Project description, aerial distribution issues for agriculture and emergency services (April 2020)		

Table 12Other Stakeholders Engagement Summary

Stakeholder Category	Method
Commercial Airports	• Scone Airport / Private airfields and landing strips: Project description,
	aerial distribution issues for agriculture (April 2020)

## 5.5 ISSUE RESPONSE

#### 5.5.1 Community

Stakeholder issues, both actual and perceived, have been considered and assessed within this EIS. Strategies for the management and mitigation of these issues are also detailed in this EIS.

Follow up discussions have occurred where possible, where issues have been raised, to further discuss individual's concerns in relation to the Project and to ensure that these have been considered as appropriate in this EIS.

Additional to the Community Information Sessions described in **Section 5.4.1**, there were more than 100 meetings consisting of email, telephone, face-to-face meetings, texts and letters between 2018 and 2020. Of these, the majority of concerns raised were in relation to potential impacts from landscape and visual, noise and property value. The list of issues raised by landholders within 4 km of the Project Boundary are illustrated in orange in **Figure 27**.

The list of issues raised by landholders living greater than 4 km from the Project Boundary are illustrated in blue in **Figure 27**.



Figure 27 Community Issues and No of Times Raised

**Appendix G** provides detail in relation to issues raised by individuals, to the CCC, by regulations and by other stakeholders. It also states which section of this EIS each issue is addressed.

# 5.5.2 SIA Stakeholder Consultation

A SIA has been conducted over the Project. Key issues relating to environmental and socio-economic impacts of the Project raised during the SIA consultation process have been integrated into **Section 7.23**.

# 5.6 ABORIGINAL COMMUNITY CONSULTATION

The Aboriginal community consultation over the Project was conducted by Ozark Environment and Heritage in accordance with the 'Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010' (DECCW, 2010) (Aboriginal Consultation Guidelines). The Aboriginal community consultation program generally consisted of the following components:

- Stage 1 Notification and registration;
- Stage 2 Project information;
- Stage 3 Survey methodology and fieldwork; and
- Stage 4 Draft ACHAR review.

A summary of the Aboriginal community consultation for the Project is described below. Further details are described in **Section 7.6**.

# 5.6.1 Stage 1 – Notification and Registration

# **Consultation with Regulatory Agencies**

In accordance with section 4.1.2 of the Aboriginal Consultation Guidelines, regulatory agencies shown in **Table 13** were notified on 16 September 2019. These agencies were asked to assist in identifying and notifying Aboriginal persons who may possess the cultural knowledge needed for determining the cultural significance of Aboriginal objects or places in the area associated with the Project. 95 Aboriginal stakeholders were identified to be contacted regarding registration. Requests were then mailed to all inviting them to register their interest.

Ref	Regulator
1	Department of Planning, Industry and Environment
2	Wanaruah Local Aboriginal Land Council
3	NSW Department of Aboriginal Affairs – Office of the Registrar (ALRA)
4	National Native Title Tribunal
5	Native Title Services (NTS Corp)
6	Hunter Local Land Services
7	Upper Hunter Shire Council
8	Muswellbrook Shire Council
9	Singleton Shire Council

Table 13Consultation with Regulatory Agencies

#### **Public Notification**

Section 4.1.3 of the Aboriginal Consultation Guidelines requires that a Project must be advertised in the local newspaper. In accordance with this requirement, a public notice of the Project was advertised in the Hunter Valley News on 18 September 2019.

This notice invited Aboriginal stakeholders to register their interest to be consulted during the preparation of the ACHAR. In accordance with section 4.1.4 of the Aboriginal Consultation Guidelines, the registration period extended for 14 days to 2 October 2019.

## Invitations for Expressions of Interest

In accordance with section 4.1.3 of Aboriginal Consultation Guidelines, a letter inviting expressions of interest was sent to all Aboriginal stakeholders identified by the regulatory agencies on 18 September 2019. A total of 95 Aboriginal stakeholders were invited to register an interest in being consulted as part of the ACHAR. The closing date for expressions of interest was 2 October 2019. By the closing date for expressions of interest, 29 Aboriginal stakeholder groups had expressed an interest in the Project. All Aboriginal stakeholder groups that registered were accepted as Registered Aboriginal Parties (RAPs) to inform the ACHAR as listed in **Table 14**.

Ref	Group Name	Ref	Group Name	
1.	A1 Indigenous Services	16.	Nunawanna Aboriginal Corporation	
2.	Aboriginal Native Title Elders Consultants	17.	Murra Bidgee Mullangari Aboriginal Corporation	
3.	Aliera French Trading	18.	Plains Clans of the Wonnarua People	
4.	Amanda Hickey – AHCS	19.	Stakeholder 1	
5.	Cacatua Culture Consultants	20.	Stephen Talbot	
6.	David Horton	21.	Tocomwall Pty Ltd	
7.	Devine Diggers Aboriginal Cultural Consultants	22.	Wanaruah Local Aboriginal Land Council	
8.	Lower Hunter Aboriginal Incorporated	23.	Upper Hunter Wonnarua Council Inc	
9.	Glen Morris	24.	Wallagan Cultural Services	
10.	Hunter Valley Aboriginal Corporation	25.	Ungooroo Aboriginal Corporation	
11.	Hunters and Collectors	26.	Widescope Indigenous Group Pty Ltd	
12.	Kevin Duncan	27.	Wonn 1 Contracting	
13.	Gidawaa Walang & Barkuma Neighbourhood Centre	28.	Wonnarua Nation Aboriginal Corporation	
14.	Merrigarn Indigenous Corporation	29.	Yinarr Cultural Services	
15.	Muragadi Heritage Indigenous Corporation			

Table 14Registered Aboriginal Parties

# Notification of Registered Aboriginal Stakeholders

In accordance with section 4.1.6 of the Aboriginal Consultation Guidelines, the details of RAPs were provided to the Wanaruah Local Aboriginal Land Council and BCD in November 2019.

# 5.6.2 Stage 2 – Project Information

The aim of Stage 2 is to provide information about the Project to the RAPs and to seek information regarding Aboriginal Cultural Heritage values associated with the Project either through consultation and/or field work. This stage was run in parallel with Stage 3, and the detailed project information was provided in the survey methodology that is issued to all RAPs for their consideration.

# 5.6.3 Stage 3 – Survey Methodology and Field Work

# Methodology

In accordance with section 4.3.1 of the Aboriginal Consultation Guidelines, the survey methodology for the survey component of the ACHAR was sent out to the RAPs on 18 October 2019, with an invitation to comment on the survey methodology. Comments were sought by 18 November 2019.

The survey methodology provided a description of the Project, previous Aboriginal archaeology and cultural heritage impact assessments and context, results from a desktop assessment along with the proposed survey methodology for the Project. The survey methodology provided on 18 October 2019 did not include the proposed transmission line easement. As such, an addendum survey methodology was prepared to inform all RAPs that the transmission line easement had been added. This amended methodology was sent to all RAPs on 24 February 2020 with a further review period of 21 days.

All RAPs were encouraged to provide comments and raise any concerns in relation to the draft methodology or cultural heritage issues either in writing or during any stage of the consultation process. Four stakeholder groups provided a response to the survey methodology including:

- Agreement with the methodology; and
- Requests to be included in the fieldwork.

Five stakeholder groups provided a response to the addendum survey methodology including:

- Approval of the transmission line easement into the survey area; and
- Agreement with the excavation methodology of the transmission line easement and endorsement of the recommendations made.

All the RAPs agreed with the content in the survey methodology and addendum.

# Fieldwork

Fieldwork Session 1 was held between 25 - 29 November 2019 and included a survey generally within the Project Boundary. The purpose of the fieldwork was to:

- Provide an opportunity to view the Project Boundary and connect with Country; and
- Identify and share cultural heritage values or areas of significance.

Six RAPs were represented by six individuals during the fieldwork as described in **Appendix M**.

Fieldwork Session 2 was held over 23 - 27 March 2020 and included a survey of the areas outlined in the addendum survey methodology. A total of four RAPs were represented by four individuals during the fieldwork. Fieldwork Session 3 was held on 27 November 2020 to survey areas that were previously restricted due to the COVID-19 epidemic.

One RAP was represented by one individual. Fieldwork Session 4 was held on 23 February 2021 to survey a realigned section of the transmission line. One RAP was represented by one individual.

# 5.6.4 Stage 4 – Draft Aboriginal Cultural Heritage Assessment Report Review

The draft report was distributed to the RAPs on 4 June 2020 for review and comment. The RAPs were allocated a period of 28 days to provide any feedback and comments before 2 July 2020.

Comment was provided by five RAPs on the draft ACHAR and none indicated they had no changes to the report. Of the five RAPs who provided comments, one indicated they were satisfied with the recommendations and contents of the draft report. All feedback was considered and incorporated into the report, where possible. A summary of the responses is provided below. The reviews of the assessment can be seen in full in the ACHAR (discussed in **Section 7.6** and provided in **Appendix M**).

A revised draft was provided to the RAPs on 11 March 2021 for review following a design change to the transmission line. Any comments arising from the review of the revised ACHAR are due by 26 March 2021.

# 5.7 ONGOING STAKEHOLDER ENGAGEMENT

The Proponent is committed to effective engagement with identified stakeholders and will continue to implement a SEP through the approvals' process and beyond. The SEP will include all stakeholder related commitments to landholders and nearby communities outlined in **Section 7**.

Various other mechanisms will be implemented from time to time to ensure the effective ongoing engagement with Project stakeholders including:

- Associated and non-associated neighbour agreements;
- Ensure landholders are made aware of the EIS exhibition period and have timely access to project staff to discuss the findings;
- Undertake tailored consultation with landholders to ensure residents are informed of the nature and magnitude of predicted impacts; measures to manage and or mitigate predicted impacts; and opportunities for compensation;
- Distribution of benefits generated by the Project;
- Prior to construction, a Construction Environmental Management Plan (CEMP) will be prepared for the Project that will include a process for receiving and responding to community complaints, including the management response;
- Distribution of community newsletters
- Continuation of Community Information Sessions;
- Provision of regular updates and documentation on the Proponent's website; and
- Regular CCC meetings.

Additionally, the Proponent will consult with the following agencies prior to construction:

- The owner of the Queensland-Hunter Gas Pipeline to resolve interaction issues;
- The manager of the Lake Liddell Recreation Area to avoid placement of power poles within Lot 2 DP 238862; and
- Glencore in relation to the realignment of Hebden Road as part of the 'Glendell Continued Operations Project EIS' (Umwelt, 2019) if construction timing coincides.

# 6 RISK ASSESSMENT

This section considers the potential environmental and social impacts associated with the Project and identifies highest priorities for further assessment in this EIS.

The Proponent has used its experience in wind farm development, together with a preliminary assessment of the site to identify the key issues to be assessed in relation to the Project.

The risk assessment included a review of the Wind Energy Framework as well as the SEARs.

The environmental and social risk assessment is based on information collected from site, at nearby sites, generally within the region and based on similar projects in other regions.

Potential environmental and socio-economic risks were identified from the Project to direct the level of assessment required in this EIS. The assessment separates the issues into four priorities:

- Critical Priority requires revision to Project description to remove or reduce the risk involved;
- High Priority addressed through use of an independent specialist assessment;
- Moderate Priority addressed via desktop assessment, precedent and consultation; and
- Lower Priority addressed via desktop assessment.

Priorities have been allocated by taking into consideration:

- The level of information already available about that issue;
- The extent to which site-specific assessment is required to define that issue;
- The likelihood of that issue occurring, and potential impacts of that issue if it did occur in consideration of standard industry controls; and
- The extent to which standard industry practice, statutory requirements, and standard consent conditions adequately address the issue.

Where an issue has been established as a lower priority as assessed in **Section 7**, this has been on the basis that:

- It is an issue which is well understood;
- Site-specific assessment is not required to understand the issue;
- It has previously been demonstrated to not affect the assessment of wind farm projects or the consent conditions relevant to them;
- It has previously been found not to be relevant to the assessment of wind farm projects; and/or
- An industry standard approach is available which adequately addresses the issue.

Table 15 summarises potential environmental and socio-economic risks identified from the Project.

There are no critical risks identified from the Project due to project refinement and design as described in **Section 3.10**.

There were nine issues rated as high risk, six issues rated as moderate risk and nine issues rated as low risk. Each risk has been assessed and mitigated (see **Section 7**).

Detailed technical assessments are included in relevant appendices and summarised in **Section 7**.

Critical	High	Moderate	Low
None	Landscape and Visual	Social	Property Value
	Noise and Vibration	Bushfire	Greenhouse and Life Cycle
	Aviation Safety	Blade Throw	Air Quality
	Traffic and Transport	Shadow Flicker	Water Resources
	Biodiversity	Electric and Magnetic Fields	Soils and Agriculture
	Aboriginal Heritage	Health	Waste
	Historic Heritage		Hazardous Materials
	Telecommunications		Decommissioning
	Economics		Cumulative

# Table 15Environmental and Socio-economic Risk Rating