

Liverpool Range

Wind Farm

Response to Submissions – Executive Summary

February 2017

**SSD 6696
(MP10-0225)**

EPURON

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1 Executive Summary

1.1 Overview

The Liverpool Range Wind Farm is a 282 turbine wind farm project proposed to be located to the east of Coolah and northwest of Cassilis, approximately 325 km northwest of Sydney in Central Western NSW. The proposed site, bounded by the Coolah Cassilis Road to the South and Coolah Tops National Park to the north east, is located on Crown, freehold and leasehold land within and adjacent to agricultural areas which are predominantly sheep and cattle country.

The Planning Process

Epuron commenced developing the project in 2009 under Part 3A of the Environmental Planning & Assessment Act 1979 (EP&A Act). A planning application for the Liverpool Range Wind Farm was lodged with the Department of Planning and Environment (DPE) on 11 February 2011 and Director General's Requirements were issued on 31 March 2011 to outline the work required in assessing the project.

An Environmental Assessment (EA) for the Liverpool Range Wind Farm was submitted to DPE on 7th December 2012, addressing the requirements raised by the Director General. After a number of revisions, the EA was placed on public exhibition from 1 August 2014 to 1 October 2014. In response, DPE received 49 submissions from 32 members of the public and 12 government agencies (noting some individuals lodged multiple submissions). DPE assigned individual identification numbers to each submission and provided copies of those submissions to Epuron for response.



Purpose of this Report

Since providing the EA for exhibition, Epuron has continued to refine the project including input from the involved landowners, neighbouring property owners, government agencies and other stakeholders. This has included continuing consultation with these stakeholders with a focus on submissions received in response to the EA.

This Response to Submissions (RTS) provides the revised wind farm infrastructure layout and responds to each of the submissions to the exhibited Environmental Assessment.

The NSW Planning process was reformed in 2011 and Part 3A of the Act was repealed. As a result the project was reclassified as 'Part 3A transitional' and subsequently Part 4. DPE will now assess the project under Part 4 of the EP&A Act and make its recommendations to the Planning Assessment Commission for determination.

1.2 Proponent

The Proponent for the project is Epuron Pty Ltd, 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. Our projects include:

- ▶ Cullerin Range Wind Farm (15 turbines, 30 megawatts, operating)
- ▶ Gullen Range Wind Farm (73 turbines, 165 megawatts, operating)
- ▶ 7 megawatts of off-grid solar projects owned and operated by Epuron including:
 - TKLN Solar;
 - Uterne Solar at Alice Springs; and
 - Yulara Solar at Ayers Rock Resort
- ▶ White Rock Wind Farm (up to 119 turbines, 175MW under construction)
- ▶ Silverton Wind Farm (up to 170 turbines, 203MW under construction)
- ▶ Yass Valley Wind Farm (up to 79 turbines, approved)
- ▶ Rye Park Wind Farm (up to 84 wind turbines, recommended for approval)

Epuron is a leader in its field with 573 MW of wind turbines in operation or construction resulting from its development work, significantly more in NSW than any other developer. Epuron also owns and operates more off-grid utility-scale solar power stations than any other Australian company.



1.3 Site Selection

The Liverpool Range Wind Farm site was first identified in 2008 through analysis of wind speed mapping and various constraints across a number of areas of NSW. The site offers an excellent wind resource, as well as proximity to a high capacity existing transmission line, relatively sparse population, interested and engaged landowners who hold large contiguous properties, good access to transport, and the potential for generally low impacts to existing ecological values.

Epuron's ongoing site investigations since that time have confirmed that the site appears commercially viable, and environmental impacts resulting from the project area have been avoided and minimised to an acceptable level based on the findings of independent experts.

1.4 Project Outline

The Liverpool Range Wind Farm will include up to 282 wind turbines, each with a capacity of between 1.5 and 3.6 megawatts. Each wind turbine will have three blades mounted on a tubular steel tower, with a combined height of blade and tower limited to a maximum tip height of 165 metres.

The Wind Farm proposed in this Development Application includes the following:

- ▶ **Turbine Infrastructure:** for each wind turbine, an adjacent pad mounted turbine transformer, crane hardstand area, construction lay down area, access track and underground cabling;
- ▶ **Connection Substation:** a 330 kV switchyard located near Ulan, allowing connection to the existing TransGrid 330 kV Wellington - Wollar transmission line;
- ▶ **Main Powerline:** a single or double circuit overhead powerline of up to 330 kV running from the Connection Substation at Ulan to the wind farm site, and then on to the wind farm Collection Substations;
- ▶ **Collection Substations:** up to 4 collection substations located on the wind farm site to increase the voltage from the wind turbine reticulation voltage (22 kV or 33 kV) to the main powerline voltage (330 kV);
- ▶ **Site Reticulation:** underground and overhead 22 kV or 33 kV electrical reticulation cabling and conductors linking the wind turbines to the Collection Substations;
- ▶ **Access Tracks:** access tracks to connect each of the wind turbines and the related facilities, and for the purpose of building other infrastructure;
- ▶ **O&M Facilities:** operation and maintenance facilities including site parking, a control room, maintenance and equipment storage facilities;
- ▶ **Construction Facilities:** temporary construction facilities including concrete batching plants, rock crushing equipment, laydown facilities, and construction compounds;
- ▶ **Road Upgrades:** minor upgrades to local roads, intersections and street furniture, as required for the delivery, installation and maintenance of the project;
- ▶ **Wind Monitoring:** temporary and permanent wind monitoring masts for wind speed verification, weather and general monitoring purposes; and
- ▶ **Subdivision of Land:** subdivision of land owned by Ulan Coal Mine Ltd (UCML) required for the Connection Substation, and removal of this land from UCML's mining area, as required.

The wind farm has been developed to allow its construction and commissioning to be done in stages. This allows the project to be increased to its full capacity over time to meet the demands of the energy market as renewable energy requirements increase.

1.5 Project Benefits

The Liverpool Range Wind Farm will make a substantial contribution to renewable energy generation in NSW and to the achievement of Federal and State policy objectives. Based on the proposed 282 wind turbines and a capacity of 3.6 MW per wind turbine, the wind farm will:

- ▶ produce 2,948 GWh of clean renewable electricity annually, sufficient for more than 400,000 homes and providing around 4.2 percent of NSW electricity needs (AEMO, 2016) on an annual basis;
- ▶ save 2.5 million tonnes of greenhouse gas emissions in its first full year of operation, and over 50 million tonnes of greenhouse gas emissions over its life (NSW OEH, 2017);
- ▶ offer significant economic benefits at the local, regional and State level, with the potential to inject funds of up to \$1,494 million into the Australian economy (SKM, 2012); and
- ▶ contribute to state, federal and international goals to diversify energy resources, increase renewable energy generation and reduce greenhouse gas emissions.

Local Benefits

The project will create local employment and increased demand and support for local goods and services during both the construction and operation phases. It is estimated to create around 800 jobs in the region during the construction phase. The ongoing operations and maintenance requirements are expected to provide up to 47 jobs locally and up to 78 across NSW once fully constructed (SKM 2012). As a result, new families may come into the area providing additional growth to the community.

The project will also inject funds into the local economy through payments to involved landowners and community funding payments. The wind farm construction also offers indirect benefits and opportunities for improvements in infrastructure (including improvements to the local road network), services, accommodation, tourism and ecology.

Federal and State Benefits

The project will contribute clean, competitively-priced energy to the NSW market. Importantly, while the price of fossil fuels changes rapidly due to Australia's fossil fuel resources being globally traded, the project provides a source of power with a very predictable cost years into the future.

The Liverpool Range Wind Farm will contribute to the NSW Government's target of achieving net zero greenhouse gas emissions by the year 2050 under the NSW Climate Change Policy Framework, and meets the objectives of the NSW Renewable Energy Action Plan.

The project will help the State and Federal Governments achieve their respective target of providing at least 20% of consumed electricity from renewable sources by 2020.

It will also help the Federal Government meet the commitments it made during negotiations of the UN International Panel for Climate Change where the international community signed the Paris Agreement to hold the increase in global average temperature to well below 2 °C above pre-industrial levels.

1.6 Community Consultation

Community consultation has been on-going throughout the process since 2009 with a number of information days held at Coolah and Cassilis, including information sessions for local businesses. The Community Consultative Committee has held 11 meetings, one of which was a workshop for representatives of the community and councils to explore the options for the operation of the community enhancement fund (Epuron, 2017).

Epuron has undertaken an extensive consultation process in relation to the wind farm. This process focussed on two way communication whereby:

- ▶ Epuron outlined its proposed project to the local community and other stakeholders and responded to questions and issues raised by the community;
- ▶ In parallel, Epuron learned from the local community and other stakeholders about the local environment and the issues which may result from the wind farm; and
- ▶ Epuron took on board that feedback to redesign its project to minimise the negative impacts and maximise the benefits of its project.

Initial Consultation

The initial consultation phase included phone calls and face to face meetings with involved landowners, neighbours, and other stakeholders; newsletters; community open days; and various press reports and newspaper articles. The initial consultation is summarised in the EA for the project.

Public Exhibition

The Liverpool Range Wind Farm Environmental Assessment was on public exhibition from 1 August 2014 to 1 October 2014 at the offices of NSW Department of Planning and Environment, and various public locations in the region of the project.



Open House event in Coolah Nov 2012

Local residents were notified of the exhibition period through advertisements placed in the local papers and a newsletter sent to residents within 5 km of the project as well as those who had previously registered their interest in the project. Interested parties were able to secure an electronic copy of the documents by contacting Epuron.

Ongoing Consultation

Since the exhibition period, consultation has been on-going with involved and neighbouring property owners, with a particular focus on changes to the powerline route. This has involved extensive consultation with landowners along the proposed and new section of powerline route, Ulan Coal Mines Ltd, the NSW Office of the Environment and Heritage and the Mudgee Local Aboriginal Lands Council. Ongoing consultation with local Councils has included extensive discussions around road upgrades and potential community funds via a Voluntary Planning Agreement.

1.7 Consideration of Submissions

Submissions and Assessment of Submissions

The Department of Planning and Environment received a total of 49 submissions in response to the exhibition of the EA. Some parties sent in multiple submissions, reducing the number of submitters to 44, 12 of which were from government agencies commenting on the project.

Table 1-1 Summary of submitters

Submitters (Approx. distance from LRWF)	Number	Support	Comment	Object
Less than 5km	13	2	4	7
5 – 10km	8	3	3	2
10 – 50km	1	-	-	1
Greater than 50km	10	-	1	9

In accordance with clause 85A of the *Environmental Planning and Assessment Regulation 2000*, this RTS provides considered responses to the issues raised in submissions received in relation to the EA for the Liverpool Range Wind Farm. Responses to public submissions have been prepared in relation to the issues raised rather than by preparing individual responses to each submission.

Impact on project

Consideration of the issues raised has led to a number of changes and improvements to the project which are described and assessed in the RTS in Section 6.2. In general, responding to the issues raised required relatively minor changes to the project. However, all changes have resulted in similar or lower impacts from the construction and operation of the wind farm. In addition, a number of clarifications from the EA have been addressed in preparing this response.

All issues raised through the exhibition and submissions process have been considered and addressed in this response.

1.8 Wind Farm Design

Number of turbines

When the Liverpool Range Wind Farm site was first identified it was noted that the area had the potential to host up to 550 wind turbines. Since that time, a number of refinements to the project area culminated in the project described in the EA which comprised 288 turbines. The reduction in size occurred as a result of a number of factors including a reduced land area; increasing turbine capacity; better understanding of wind resource; better understanding of local vegetation and input from host landholders.

Design process

The wind farm design process is highly iterative, with a change to any one aspect requiring a change to associated infrastructure. Further, there are many considerations taken into account in the location of each component, including technical, financial, social and environmental aspects.

In reviewing the submissions to the EA, and preparing its final wind farm layout, the Proponent has taken into account all these aspects and undertaken a thorough review of the project layout to ensure it meets all requirements.

This RTS presents the revised infrastructure layout following design development resulting in a final layout of 282 wind turbines. These revisions are a result of ongoing consultation with involved landowners and feedback received through the exhibition and submissions process.

Involved landowners

Based on the final layout, the project will involve 27 properties hosting wind turbines and related infrastructure. A further 15 properties will host other aspects of the project including access tracks, transmission lines, offset areas and related infrastructure.

Neighbouring landowners

Epuron carefully considered the proximity of wind farm infrastructure to local residences, with a particularly focus on neighbouring, non-involved properties.

Based on the final layout, there is one non-involved residence within 2km of a wind turbine location – at 1.8km, and only 7 non-involved residences within 3km of a wind turbine location. Amenity impacts such as visual and noise have been key drivers in the design of the wind farm.

Epuron is committed to mitigating any residual impacts to neighbouring residences in accordance with its Statement of Commitments and best industry practices.

1.9 Key siting issues

Wind speeds

The primary driver of the wind farm layout is the location of a strong, consistent wind resource. Wind speed can vary considerably over a small distance, particularly in areas of hilly terrain. Ridges tend to accelerate wind speed, and as a result the turbine layout is concentrated on the top of ridges where wind speeds are the highest.

Epuron has been collecting wind data around the site since 2008 and regularly updates its analysis of long term wind speed and direction across the site. The final wind farm layout is based on analysis of this long term wind data and consideration of all other project constraints. Its scale is important in ensuring the overall viability of the wind farm which includes a significant grid connection.

Transmission line corridor

The wind farm requires connection to the NSW electricity grid to allow the sale of the power generated. Over the development period, a several grid connection corridors were considered as outlined in Section 3.4 of the EA and Section 5 of the Response to Submissions.

The EA included a Preferred and Alternate powerline route. Key drivers of the powerline route include minimising the length (a straight line is shorter and always preferred but difficult to achieve), securing the land and minimising the impacts.

Following receipt of the submissions to the EA Epuron has undertaken further consultation with landowners and land authorities including:

- ▶ NSW Office of Environment and Heritage which manages the State Conservation Areas through which the powerline will pass;
- ▶ NSW Department of Industry & Lands which manages paper and Crown road corridors and other land;
- ▶ Ulan Coal Mine Limited which is a significant landholder within the corridor; and
- ▶ the Mudgee Local Aboriginal Land Council which holds an undetermined land claim in relation to the powerline corridor.
- ▶ Private landholders for a short new section of powerline
- ▶ Private landholders for a short new section of powerline to enable the State Conservation Area (SCA) impacts to be minimised.

A contiguous powerline route which appears to be commercially, technically and environmentally acceptable has now been identified and is included in the revised layout.

Epuron takes this opportunity to thank all parties for their continuing dialog in relation to the powerline easements required for the Liverpool Range Wind Farm.

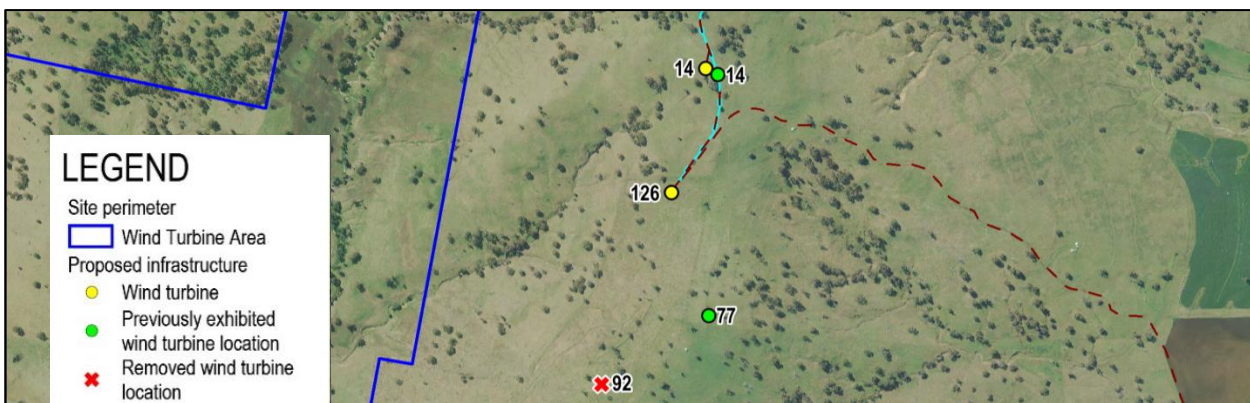
1.10 Changes since Exhibition

There have been a number of changes to the project since the exhibition of the Environmental Assessment. While many of these changes were in response to submissions, some were also introduced by Epuron identifying further improvements through its own review processes.

The key changes are as follows:

- ▶ **Wind Turbines:** the number of turbines have been reduced from 288 to 282, and a number of wind turbines has been micro-sited to minimise impacts. The turbine rating has been slightly increased from 3.5 to 3.6MW (turbine dimensions remain the same);
- ▶ **Connection Substation:** a firm location for the connection substation has been identified near Ulan and a proposed subdivision included to allow the required land tenure arrangements and construction of this substation;
- ▶ **Main Powerline:** the main powerline route has been adjusted and a number of options removed, reducing the anticipated length of the main powerline from 94.9km to 81.9km;
- ▶ **Collection Substations:** collection substations have been relocated taking into account the revised main powerline route; reducing the number required from six to four;
- ▶ **Site Access:** considerable thought has gone into improving site access to reduce the number of public roads required to be used, and to reduce traffic movements near dwellings - this has led to changes in site access points; and
- ▶ **Road Upgrades:** a specific proposal for upgrades / improvements to public roads has been included in the project.

Details of these changes, and their justification, are included in Section 6.2 of the Response to Submissions. See excerpt below showing an example of changes made.



Changes to wind turbine locations and the powerline route have resulted in a number of refinements to ancillary infrastructure such as access tracks; access points, site reticulation; and locations of O&M and Construction Facilities.

Site boundary

The involved landowners are shown in the map in Attachment 1 of the Response to Submissions along with the included lots.

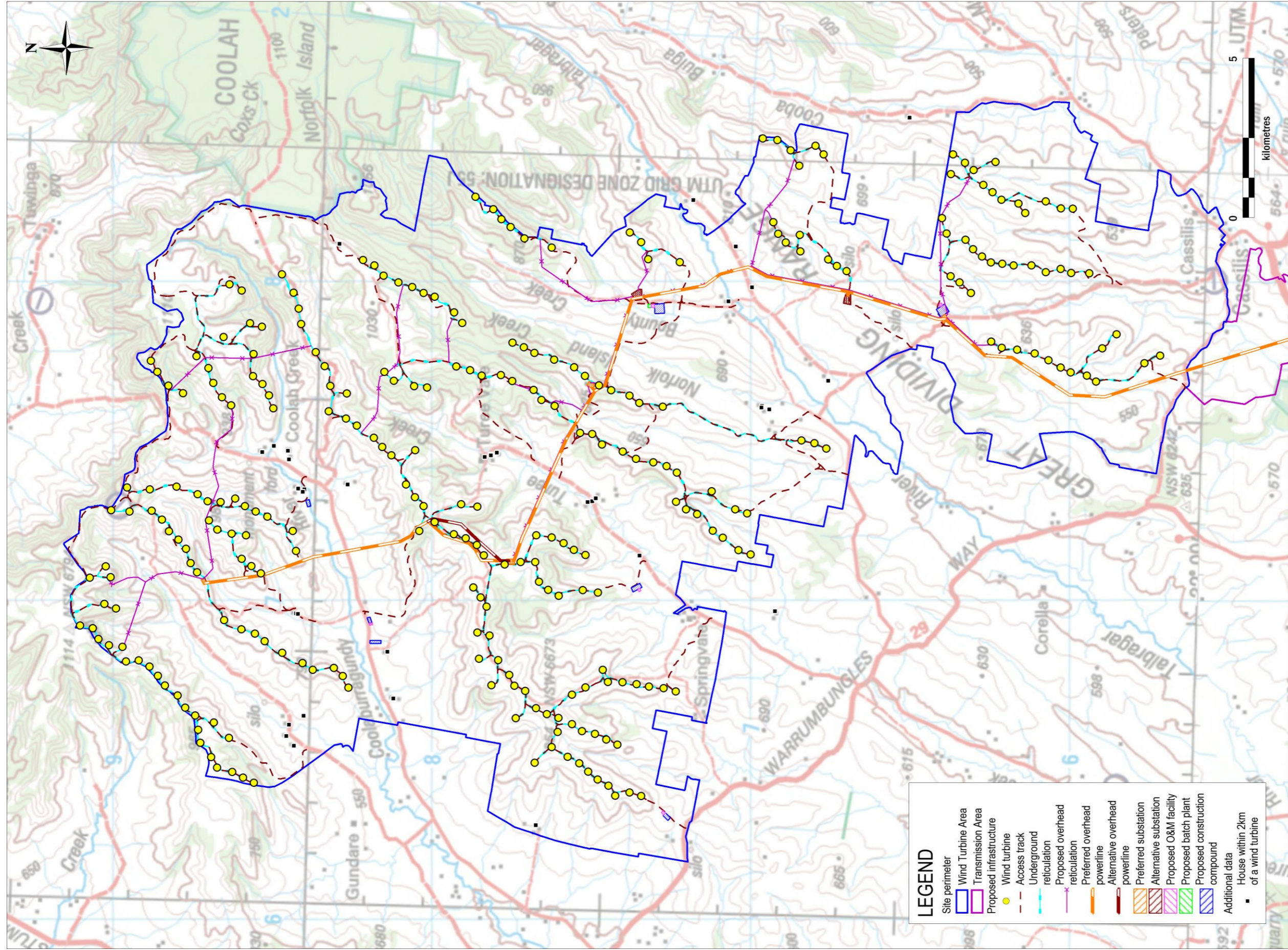


Figure 1-1 Proposed turbine and infrastructure layout

1.11 Impact Assessment

Planning Process

Throughout the planning process and the consultation phases Epuron has identified key issues to be addressed in the development of the Liverpool Range Wind Farm. These issues have been assessed and addressed through the Environmental Assessment process and subsequently in this Response to Submissions. These key issues include:

- ▶ Visual Amenity
- ▶ Noise
- ▶ Biodiversity
- ▶ Land Management
- ▶ Local Impacts
- ▶ Consultation

Through refinement of the wind farm design, Epuron has been able to avoid, mitigate and manage the impact of these issues to an acceptable level, whilst maximising the local and wider benefits. The site for the proposed Liverpool Range Wind Farm offers exceptional potential for wind energy with significant opportunity for avoiding, and minimising impacts resulting in a significant wind farm site which would have an overall low impact on the receiving and surrounding environment.



282 Wind Turbines

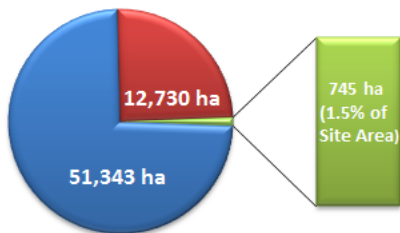


Generating up to 2,948GWh of renewable electricity annually



1 non-involved residence within 2km
7 non-involved residences within 3km

No noise exceedances at any residences
No residences with a high visual impact



Total Site Area = 51,343 ha
Development Envelope = 12,730 ha
Development Footprint = 745 ha (1.5% of Site Area)

Mitigation

Mitigation of impacts has been simpler at this wind farm than in other developments for a number of reasons but significant amongst them is the strength of community around the Coolah and Cassilis area. Involved landowners have been keen to ensure that the wind turbines they host will not have a negative impact upon their neighbours, involved and non-involved and discussions have included potentially impacted neighbours. Host landowners have specifically requested that treed areas and locations of ecological value be avoided. Neighbours who in other projects might have become opponents to the entire project have been keen to point out that they do not object to the project, that they understand and welcome the benefits it will bring to the community but they want specific and particular issues of concern addressed. It has been a pleasure to work with this community to avoid, minimise and mitigate impacts.

1.12 Visual Amenity

A detailed Landscape and Visual Impact Assessment (LVIA) was prepared for the Environmental Assessment (EA) and concluded that the wind farm is likely to be an acceptable development within the viewshed.

While there are 282 wind turbines proposed, due to the size of the site – 36km long by 20km wide – and the undulating topography there is only a small number of public and residential locations from which large numbers of wind turbines may be visible.

The LVIA involved a comprehensive evaluation of the visual character of the landscape and an assessment of the potential significance of visual impacts that may result from the construction and operation of the wind farm. The landscape, broken up into character units, was considered to have a medium sensitivity to accommodate change.



Figure 1-3 View of the proposed wind turbines from Vinegaroy Rd near Coolah



Figure 1-4 View of the proposed wind turbines from Rotherwood Rd

Visual amenity was raised in community consultation and in public submissions received following exhibition of the EA. An addendum to the LVIA was prepared for this Response to Submissions (attached as Appendix A) and assessed the visual impact specifically at 14 non-involved residences. The addendum report determined that 1 neighbouring residence would experience a medium-to-high visual impact and 7 neighbouring residences would experience a medium level of visual impact. Appropriate screening at these residences would have the potential to reduce the impact for the medium to high residence to medium, and for the remaining seven medium impact residences to medium to low visual impact.

Taking into account the mitigation measures outlined in the LVIA the assessment concludes that the Liverpool Range wind farm project would have an overall low to medium visual significance on the majority of uninvolved residential view locations within a 10 km viewshed as well as public view locations.

Consultation on visual impact is on-going with a particular focus on one neighbour who has raised visual impact on their residence as a concern.

Shadow Flicker

Shadow flicker occurs when rotating blades of a wind turbine pass between an observer and the sun, which can only occur under certain conditions at certain times of day. A detailed analysis of the potential for shadow flicker and blade glint to affect dwellings was carried out for the EA. The results showed an exceedance at one dwelling situated to the west of four turbines. The revised layout presented in this Response to Submissions has removed those four turbines. No residences are now expected to have any impact from shadow flicker caused by turbines.

1.13 Noise

Operational Noise

A detailed technical investigation into the operational noise from the wind farm was undertaken for the Environmental Assessment. Noise levels from the wind farm can be predicted by considering; sound power levels from specific turbine models, the wind farm layout, topography of the site, atmospheric conditions and wind speeds. The process followed to ensure the wind farm will comply with the required limits can be summarised as:

1. Measure actual background noise levels at representative residences around the wind farm.
2. Determine compliance criteria based on background noise levels.
3. Review predicted noise levels from wind farm layout to limits determined in step 2

Predictions are inherently conservative, for example, ground cover is assumed to be hard and sound reflective, no screening effects from vegetation or buildings are included and the model assumes the sensitive receptor or residence is downwind from every turbine even though this is impossible.

The operational noise impact assessment predicted noise levels for homes within 6 km of a proposed turbine and compared the predicted level to the limits set out in the South Australian Environmental Protection Authority (SA EPA) Environment Noise Guidelines for Wind Farms (February 2003) and World Health Organization (WHO) limits.

The Proponent has prepared the Noise Impact Assessment Amendment in Appendix B to demonstrate that the proposed turbine layout is compliant with the relevant standards. It shows that there is no exceedance of either standard at any non-involved residence within the area surrounding the wind farm.



Figure 1-5 Background noise monitoring station

The Proponent has committed to a comprehensive Noise Monitoring Program which would run through the duration of construction and continue for 2 years post commissioning.

Construction Noise

The construction period is anticipated to be 24-36 months, with civil works expected to span approximately 12 to 24 months, however, due to the large area of the wind farm site, intensive works will be located within close proximity to individual residential receivers for only very short and intermittent periods of time.

Construction activities associated with the project are planned to be undertaken during standard construction hours as set out in the Interim Construction Noise Guideline (ICNG). Construction traffic noise, blasting impact, vibration impact and transmission line noise have been predicted to fall within acceptable parameters under the Guideline.

1.14 Biodiversity

Ecological surveys have been conducted on site, along powerline corridors and in the vicinity over the past five years and conclude that the project is unlikely to cause any significant impacts on flora and fauna in general, nor on the particular species listed under the NSW Threatened Species Conservation Act 1995 (TSC Act). A referral was made under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) in 2014 and the project is a controlled action under section 18 and 18A, listed threatened species and communities, with further approval required. It is being assessed under the bilateral arrangement between the Commonwealth and State governments.

Biodiversity constraints and mitigation measures have been identified and incorporated into commitments during each stage of the development. A post construction monitoring and management plan will be developed as part of the project.



Figure 1-6 Typical ridgeline with proposed wind turbine locations

Context

The ranges and undulating terrain within the Project Area are characterised by cleared farmland, mostly derived from Box Gum Woodland on the lower slopes and flats, with Norton Box Woodland on the steeper sheltered slopes. Sandstone Forest is common within the flats of the southern half of the Project Area (i.e. Transmission Line Study Area). In particular, the composition and structure of vegetation types have been modified as a result of managed stock grazing as well as grazing by feral goats. Remnant stands of the original vegetation remain as paddock trees or larger scattered patches of forest/woodland throughout the wind farm site.

Survey Effort

Two Spring-time surveys were undertaken as part of the detailed assessment, the first over a 12-day period (the 8th to 19th October 2012) and the second over a nine day period (1st to 8th October 2013). A further survey program was undertaken in October 2016 to address specific changes to the project infrastructure and main powerline route in response to submissions received following public exhibition of the project.

Flora and Fauna

A total of 16 vegetation communities were recorded in total for the LRWF project area. The EA identified impacts to 1,763 ha across the entire development. Following modifications in response to submissions the total impact of the project has been reduced to 745 ha. The bulk of this reduction resulted from two changes: simplifying the overhead powerline from two branches through the site to a single line from north to south; and from reassessing the clearance area over open pasture for the powerline down from 60m to 4m corresponding to the actual footprint and width of the required access track. Of this significantly reduced area of impact 195 ha is Endangered Ecological Community with 88 ha of the 195 ha being classified as pasture (with native tree cover) in poor condition. Nine (9) hectares of CEEC will be impacted and offset accordingly.

Additional and revised assessments of significance for threatened fauna concluded that local population level impacts are unlikely for the species considered likely to occur on site, generally on account of clearing for the wind farm area being relatively minor in any one location; discrete patches would be cleared that are unlikely to include important habitat for a population.

The wind farm would comprise a series of sparsely distributed discrete footprints (turbines, substations and control buildings) connected by transmission lines and tracks. Considering the habitat within and surrounding these areas and the ecological characteristics of the Project Area, the impacts identified appear able to be managed. Significant impacts can be avoided and a maintain-or-improve outcome can be met for the proposal. Residual impacts that cannot be avoided would be offset and suitable offset locations have been identified. Refer to Section 6.5 of the Response to Submissions and Appendix C for further details.

1.15 Land Management

Land Use

The wind farm project infrastructure is located on freehold land that is primarily used for grazing and agricultural purposes. Once operational the wind farm will have a negligible impact on normal farming operations as it would occupy only 1 to 2 per cent of the land.

Hydrology and Drainage

The layout for the wind turbines and associated wind farm infrastructure has been developed to avoid any adverse effect on the hydrological regime of the site. The layout avoids crossing or interfering with streams and ephemeral watercourses wherever possible. Drainage management during construction and operation will ensure there are no negative impacts such as run off and erosion. Water crossings are limited, existing and will be upgraded to ensure there are no adverse impacts.

The water required for construction of this project will be predominantly locally sourced from natural water bodies, for example from Lake Burrendong, or a ground water license subject to availability.

Once the wind farm is completed it will require only a small amount of water to service the operations and maintenance facilities. This will be sourced from rainwater storage tanks at the permanent structures.

Soils and Landforms

The region is largely agricultural, characterised by intensively modified broad floodplains (cereal cropping and grazing) beneath broad basalt ridges (grazing). This existing use of the land has resulted over time in a significant loss of biodiversity within the catchment area. Within this receiving environment the project is not predicted to have any significant adverse environmental impacts on the geology or soils of the site or its surrounds, as the overall surface disturbance is relatively small in size and type.

A detailed geotechnical assessment would be conducted once the turbine locations have been finalised to determine the ground conditions and stability at each turbine site. This assessment would drive the foundation requirements for the wind turbine locations. All impacts have been assessed on the basis of the maximum potential impact from clearing and concrete foundations.

An Environmental Management Strategy (EMS) would be developed in accordance with the Best Practice Guidelines for Wind Energy Projects and the project consent conditions to ensure that issues such as erosion, weed control, air quality (such as dust management) and drainage are appropriately addressed.

1.16 Local Impacts

Traffic and Transport

The construction phase of the project generates the greatest volume of traffic and accordingly presents the most issues. A Traffic and Transport Assessment considered the potential issues associated with the proposed wind farm and provided mitigation measures to minimise and avoid such issues.

Access to the site would be via the Golden Highway and Vinegaroy Road (Warrumbungles Way) and then on to designated local roads. Upgrades to local roads necessary to permit over-sized vehicles would be carried out prior to delivery of turbine components and maintenance of these roads would be ongoing through the construction phase. New unsealed tracks would be constructed to access the temporary construction compounds, operation and maintenance facility, substations and the turbine locations across the site. Additional traffic generated from the project would not constitute a significant or material increase in existing volumes on the Golden Highway.

The delivery route for over-sized and over-mass vehicles will avoid both local towns of Coolah and Cassilis.

A traffic and transport management plan will be developed in consultation with councils and RMS to minimise the disruption to the local community taking into consideration; local school bus routes, time of delivery, designing and implementing modifications to intersections, implementing dust control measures and providing a 24hr telephone contact during construction as well as public notification of upcoming traffic patterns, road changes and modifications to intersections.

The operational phase would have a very minimal impact upon traffic volumes as the turbines would be maintained by a selected crew of technicians likely to be based out of Coolah, Cassilis, Merriwa or Mudgee and travelling in light (4WD) vehicles.

The Traffic and Transport Impact Assessment is attached in Appendix E. It has been updated since the EA was on exhibition to include an assessment of the road structures (culverts, causeways and bridges) and intersections on the proposed access route as well as making commitments to upgrade sections of local roads used during construction of the wind farm.

Consultation is on-going with neighbours who have houses in close proximity to roads to be used for access.

Aviation

The proponent has consulted with the relevant aviation authorities and associations in relation to air safety and potential hazards caused by the construction and operation of turbines. The location of the proposed turbines would not encroach on an Obstacle Limitation Surface (OLS) of any registered or regulated aerodrome. The closest Civil Aviation Safety Authority (CASA) registered aerodrome to the proposed wind farm site is Coolah Aerodrome, which is 17.3 km from the closest proposed wind turbine.

The presence and location of 18 active agricultural airstrips identified within 5 km of the project have been assessed and considered in the design of the wind farm to ensure turbines do not encroach on any of the existing landing areas. Eight (8) airstrips occur within 500 m of a proposed wind turbine and each of these complies with the CASA take-off and approach clearance areas.

1.17 Conclusion

Liverpool Range Wind Farm is a utility-scale project in regional NSW which will contribute significantly to both the investment in renewable energy in New South Wales and also to the local community, area and region through jobs, investment and long term growth in the local and regional economy. The economic benefits will be felt most strongly in the Coolah – Cassilis – Merriwa region of NSW.

The project is located in a sparsely populated area, on ridgelines which support stock grazing and which lie over 7 km from the township of Coolah and around 5 km from the village of Cassilis.

Epuron has undertaken an iterative and thorough design process which has included extensive consultation with involved and neighbouring residents; local and regional community groups; the local business community; independent EA experts; and members of local, state and federal government authorities.

As a result of this consultation, a number of changes and improvements have been incorporated into the final preferred project outlined in this Response to Submissions. These changes are designed to reduce impacts and increase benefits which result from the project, particularly with respect to the local community and environment.

The project is supported by all agencies and by the local community which is proactively seeking to maximise and focus the benefits locally. Epuron notes the strong cohesion of the local community which has been apparent throughout the development of the wind farm.

In developing the project, Epuron has taken every opportunity to understand, avoid or reduce (where possible) negative impacts of the project. In addition to design improvements, Epuron has committed to a stringent set of requirements to mitigate impacts which cannot be avoided. As a result, the final environmental impact assessment finds that all impacts are acceptable, and the benefits materially outweigh any residual impacts.

In conclusion, the Liverpool Range Wind Farm would provide up to 1,000 MW of renewable energy and a scale of investment which would contribute significantly to the local area, the region and the State. Epuron is confident that the Liverpool Range Wind Farm is consistent with NSW State policy, has followed all prescribed processes, meets the reasonable requirements of all stakeholders, has the general support of the local and broader community, and has been developed responsibly and in accordance with NSW and Federal government objectives.

For further information about Epuron and the Liverpool Range Wind Farm please :

- ▶ Visit <http://www.epuron.com.au/>
- ▶ Call 02 8456 7400

