



Planning &
Environment

**STATE SIGNIFICANT
DEVELOPMENT ASSESSMENT
Liverpool Range Wind Farm
(SSD 6696)**



Assessment Report
Section 4.38 of the
Environmental Planning and Assessment Act 1979

March 2018

Cover Photograph: Sourced from Liverpool Range Wind Farm EA (Epuron, March 2014)

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EXECUTIVE SUMMARY

Epuron Pty Ltd (Epuron) proposes to develop a new wind farm (the project) of up to 960 megawatts east of Coolah and northwest of Cassilis, approximately 90 kilometres (km) northwest of Muswellbrook, within the Orana and Hunter regions of NSW. The site is located in the Warrumbungle Shire, Upper Hunter Shire and Mid-Western Regional local government areas, and is on the Great Dividing Range within a larger rural area used primarily for grazing and agriculture.

During the assessment process Epuron reduced the number of turbines proposed to be constructed from 288 to 267 and identified a new 330 kV overhead transmission line route to address several concerns in relation to biodiversity, mineral resources and aviation issues. As such, the project as proposed now involves the installation, operation, maintenance and decommissioning of up to 267 turbines with a tip height of up to 165 metres (m) and hub height of up to 100 m, and an 82 km 330 kV overhead transmission line to facilitate connection to the grid via the Wollar – Wellington 330 kV transmission line near Ulan.

The project also involves the development of associated ancillary infrastructure, including:

- temporary construction compounds, concrete batching plants and equipment storage; and
- permanent access tracks, operation and maintenance facilities, site offices, substations and other electrical infrastructure.

The project is classified as State Significant Development under the *Environmental Planning and Assessment Act 1979* (EP&A Act), and the consent authority for the project is the NSW Minister for Planning. However, under the Minister's delegation of 11 October 2017, the Deputy Secretary, Planning Services, may determine the development application. This is because less than 25 public submissions by way of objection were received, no reportable political donations were made, and the Councils did not object to the proposal.

Epuron also needs to obtain an approval from the Commonwealth Minister for the Environment and Energy under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), due to the potential impacts on threatened species and communities. The assessment process under the EP&A Act has been accredited under a bilateral agreement with the Commonwealth Government. Under this agreement, the assessment of both State and Commonwealth matters has been integrated into a single assessment process and incorporated in this report.

Consultation

The Department exhibited the Environmental Assessment (EA) for the project from 1 August 2014 to 1 October 2014 (61 days). During the EA exhibition period, the Department received 42 submissions, including 17 objections, of which approximately 50% were from residents and local interest groups located within 5 kilometres of the project site.

The Department also exhibited Epuron's response to submissions (RTS), which included an Amended Development Application (DA), from 16 June 2017 to 18 July 2017 (32 days). During the RTS exhibition period, the Department received a further 23 submissions (either as new submissions or as updates to previous submissions), including 6 objections. In total, the Department received 20 submissions by way of objection on the project from the general public.

The Department visited the site on several occasions, hosted a Community Information Session in Cassilis of which approximately 10 community members attended, and met with a number of community members that lodged submissions at their residence. The Department has also consulted further with Epuron and key government agencies, including the Councils, throughout the assessment process. This consultation has resulted in changes to the project that have led to better outcomes for the community and the environment.

None of the government agencies, including the Councils, objected to the project, but have provided advice and recommendations that have been addressed in the Department's assessment and incorporated into the recommended conditions of consent.

The key issues raised in submissions and considered in the Department's assessment include biodiversity, noise and visual impacts, and the impacts of construction traffic on the local and regional road network.

Assessment

Traffic and Transport

The potential traffic impacts would be largely restricted to the project's 36 month construction period and could be managed by undertaking suitable road upgrades prior to commencing construction, and implementing a detailed Traffic Management Plan under the supervision of the relevant roads authority.

Epuron has agreed on a schedule of road upgrades with both Roads and Maritime Services and the Councils, which includes undertaking surveys and upgrades for up to 143 km of regional and local roads, including a structural assessment of Bill Foley Bridge on Vinegaroy Road, upgrades to causeways and culverts as necessary, and intersection treatments to facilitate turning with over-dimensional vehicles.

Additionally, due to the lengthy 36 month construction period proposed, Epuron has agreed to carry out dilapidation surveys of the transport routes before construction, on an annual basis during construction and after decommissioning of the project, and repair, or pay the full cost associated with repairing any damage to the road network caused by any project-related traffic.

Further, Epuron has agreed to implement additional measures to mitigate the impacts of development-related construction traffic on agricultural activities at two properties on Turee Vale Road and Coolah Creek Road, including relocating stockyards and/or providing additional traffic management measures.

RMS and the Councils are satisfied with the recommended conditions. With these measures in place, the Department considers the project would not result in any unacceptable impacts on the capacity, efficiency or safety of the road network.

Visual

The sensitivity of the landscape and the proximity of residences, and hence the nature and extent of potential visual impacts of the project, vary considerably across the site.

The proposal is located on elevated ridges that form part of the Great Dividing Range, intersected by drainage lines, and spans approximately 36 km from north to south and 20 km east to west, at its widest points. The area surrounding the project site is an undulating pastoral and agricultural landscape, traversed by a number of creeks and drainage lines that generally flow in a southwest direction. Coolah Tops National Park adjoins the northeastern project site boundary.

The predominant views to the project from non-associated residences occur to the south and west of the site. In contrast, the views from non-associated residences to the north and east of the site are largely shielded by intervening hills and ridgelines.

The Department undertook an assessment of the visual impact of the project on the landscape character and key non-associated residences located within approximately 5 km of a proposed turbine.

The Department acknowledges that the project would change the visual landscape of the locality and that there would be some residual impacts to residences in areas where the topography, lack of intervening vegetation and relatively exposed views towards the ridgelines would increase the overall visibility of the project.

That being said, no residences have the potential to experience high visual impacts from the project. However, 1 non-associated residence has the potential to experience moderate/high visual impacts and 22 non-associated residences have the potential to experience moderate visual impacts, all of which are located to the south and west of the project site.

Due to the impacted non-associated residence's distance to the turbines and the intervening topography, the Department considers these impacts could be effectively minimised through the provision of visual impact mitigation measures (such as landscaping and visual screening).

Accordingly, the Department has recommended conditions requiring Epuron to reduce the visual impacts of the project by giving both the owners of all non-associated residences characterised as having a moderate impact, and the owners of all non-associated residences located within 4 km of a turbine, the ability to ask Epuron to implement visual mitigation measures at their residence.

As such, with the implementation of additional mitigation, the Department considers the residual visual impacts of the project would be acceptable.

Noise

The project site is located in a relatively quiet rural area with low background noise levels. Using conservative assumptions, the noise modelling suggests the project would be able to comply with the relevant operational noise criteria at all non-associated residences.

As such, the Department is satisfied that the operational noise generated by the project would be able to comfortably comply with the applicable operational noise criteria at all non-associated residences.

However, during construction, up to 27 residences may be subject to temporary noise above the relevant noise criteria from construction activities and/or construction related traffic. The level of disturbance to residents would be directly related to the proximity of the residence to the construction activity and/or access roads. Most of these residences would experience construction noise levels of up to 45 dB(A), well below the highly noise affected criterion of 75 dB(A).

Epuron has committed to implementing a number of measures to minimise construction noise from the project, which may include construction of temporary acoustic barriers and use of proprietary enclosures around machines. Additionally, Epuron has committed to apply a range of mitigation measures at those residences impacted by construction related traffic, such as providing double glazing, insulation, and/or air conditioning, for the duration of the period of construction. The Department has recommended conditions formalising these commitments.

With these measures in place, the Department is satisfied that the project would not result in any unacceptable construction noise impacts.

Biodiversity

Based on the findings of the ecological assessments and concerns raised by OEH, Epuron significantly revised the project layout to avoid disturbance of native vegetation where practicable, including relocating the 330 kV overhead transmission line route, removing 21 turbines from the project layout, revising the location of 12 turbines and reducing the number of proposed substations from 6 to 4.

However, the project would still involve clearing of up to 744.94 hectares (ha) of vegetation (representing 1.5% of the project site), of which 343.45 ha is exotic vegetation. The 401.49 ha of native vegetation to be cleared is largely fragmented and degraded, however it does contain up to 200 ha of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Box Gum Woodland) listed as an endangered ecological community under the *Threatened Species Conservation Act 1995* (TSC Act), inclusive of 10.37 ha of Box Gum Woodland Ecological Community listed under the EPBC Act.

Additionally, the project would disturb potential habitat for 11 threatened fauna species and 1 threatened flora species listed under the TSC Act.

Epuron proposes to further reduce the biodiversity impacts through additional micro-siting of turbines, and offset the residual impacts of the project in accordance with the *NSW Biodiversity Offsets Policy for Major Projects*.

In that regard, Epuron identified potential offset areas within and around the project area and undertook an assessment of the ability for these areas to meet the estimated credit requirements for the project.

OEH reviewed Epuron's proposed offset areas, and raised concerns regarding the proximity of a number of the offset areas to turbines, requesting that turbines be setback a minimum of 300 m from any proposed offset areas. To address OEH's concerns, Epuron setback all proposed offset areas 300 m from the turbines, and removed an additional 5 turbines from the project, which were located in proximity to proposed offset areas adjacent to Coolah Tops National Park.

The Department's assessment found that despite clearing of up to 401.49 ha of native vegetation, the project would not result in any significant impacts on threatened species or communities, and would not pose a significant or unacceptable level of risk to bird and bat species in the vicinity of the proposed turbines.

Overall, with these project amendments, both the Department and OEH consider that with the recommended conditions in place that require Epuron to avoid impacts on threatened species, limit clearing of native vegetation, and implement a Biodiversity Management Plan, Bird and Bat Adaptive Management Plan, and biodiversity offset strategy, the residual biodiversity impacts of the project would be suitably minimised, managed and/or offset.

Summary

The Department acknowledges there is some community opposition from local landowners and special interest groups to the project. However, the Department considers that the project would achieve a reasonable balance between maximising the use of the site's wind resources, and minimising the potential impacts on the local community and environment.

To address the residual impacts of the project, the Department has recommended a range of detailed conditions to ensure these impacts are effectively minimised and/or offset. These conditions use a risk-based approach that focuses on performance-based outcomes. This reflects current government policy, and the fact that wind farms require relatively limited ongoing environmental management once the turbines have been commissioned.

Importantly, taking into consideration the amendments made to the project through the assessment process, the project would still be the largest approved wind farm in NSW with an installed capacity of up to 960 megawatts, enough to power close to half a million homes. It would also contribute to both the Commonwealth Government's *Renewable Energy Target* and NSW's *Renewable Energy Action Plan*, with all the associated benefits to the wider community, including job creation, capital investment, reduction in greenhouse gases, and community funding contributions of up to approximately \$800,000 a year (plus CPI) through a voluntary planning agreement with Warrumbungle and Upper Hunter Shire Councils.

As such, following on from its detailed assessment of the project, the Department considers that the project is approvable, subject to the recommended conditions of consent.

1. PROJECT

Epuron Pty Ltd (Epuron) proposes to develop the Liverpool Range Wind Farm, located to the east of Coolah and northwest of Cassilis, approximately 90 km northwest of Muswellbrook primarily within the Orana and Hunter regions of NSW (see Figure 1).

The site is in the Warrumbungle Shire, Upper Hunter Shire and Mid-Western Regional local government areas (LGAs), and forms part of a larger rural area used primarily for grazing and agriculture.

The proposed project involves the installation, operation, maintenance and decommissioning of a wind farm of up to 267 turbines, with a maximum tip height of 165 metres (m) and hub height of 100 m.

The project also involves the development of associated ancillary infrastructure including:

- a new 330 kilovolt (kV) overhead transmission line approximately 82 kilometres (km) in length and substation connecting to the existing TransGrid 330 kV Wellington – Wollar transmission line at Ulan;
- permanent access tracks, operation and maintenance facilities, substations and other on-site electrical infrastructure; and
- temporary construction compounds, concrete batching plants, site offices and equipment storage areas.

During the assessment process, Epuron initially reduced the number of turbines proposed from 288 to 272 and identified a new overhead transmission line route to address several concerns in relation to biodiversity, mineral resources and aviation issues. Epuron made further refinements to the project layout, reducing the number of turbines proposed to 267. A comparison of the key project changes is summarised in Table 1.

Table 1: Amendments to the project during the assessment process

| <i>Detail</i> | <i>EA August 2014</i> | <i>Amended DA June 2017</i> | <i>Final Amended DA December 2017</i> |
|---|---------------------------|---------------------------------|---|
| <i>Number of wind turbines</i> | 288 | 272 | 267 |
| <i>Length of overhead power line</i> | 94.9 km (up to 330 kV) | 81.9 km (up to 330 kV) | 81.9 km (up to 330 kV) |
| <i>Number of collection substations</i> | 6 | 4 | 4 |
| <i>Maximum tip height</i> | 157 m | 165 m | 165 m |

Should all 267 proposed turbines be built, the project would have a generating capacity of approximately 960 megawatts (MW) depending on the turbine models chosen. The wind farm would be the largest wind farm in NSW, generating up to 2,760,000 megawatt hours (MWh) of electricity annually, which is equivalent to the energy consumption of about 460,000 homes.

The project is described in full in the Environmental Assessment (EA) (see Appendix A), the amendment to the development application (DA) documented in Epuron's Response to Submissions (RTS) (see Appendix B) and final project layout maps provided on December 2017 (see Appendix C). The major components of the project are summarised below in Table 2 and shown on Figures 2 and 3.

To provide flexibility in the requirements for micro-siting of turbines, Epuron has defined a development corridor where turbines and ancillary infrastructure can be located (see Figures 2 and 3). The purpose of the development corridor is to identify locations where turbines and ancillary infrastructure could be sited without materially changing the key environmental impacts of the project (i.e. visual, noise, biodiversity and heritage impacts).

Epuron also consulted with Warrumbungle Shire, Upper Hunter Shire and Mid-Western Regional Councils (the Councils) further during the assessment process, and the project includes the road upgrades required for the project and voluntary planning agreements (VPA) with both Warrumbungle Shire and Upper Hunter Shire Councils (as those two LGAs would host turbines) for community contributions.

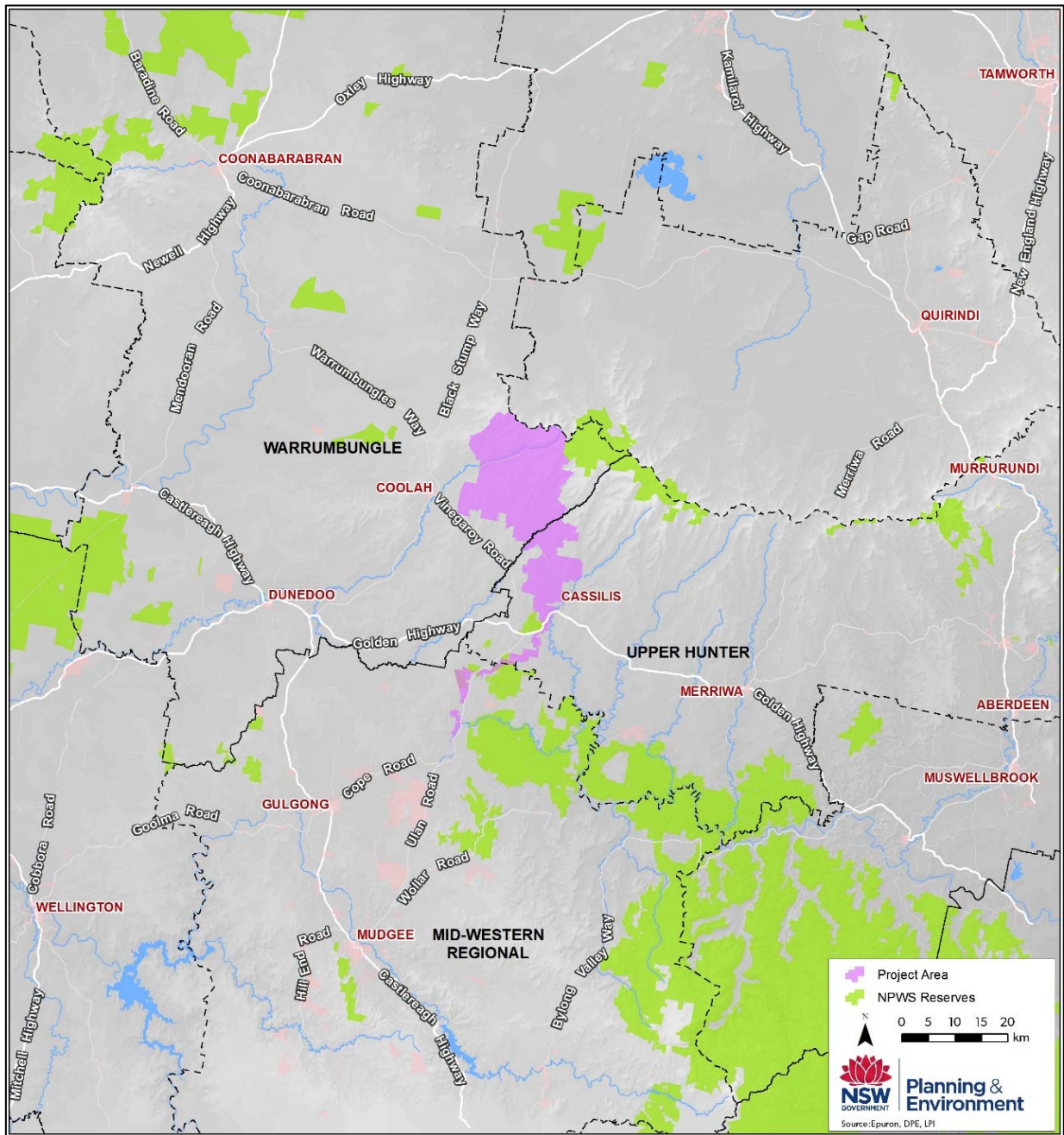


Figure 1: Project Location

Table 2: Major components of the project

| Aspect | Description |
|--|--|
| <i>Project summary</i> | <p>Development of a wind farm including:</p> <ul style="list-style-type: none"> • up to 267 turbines and associated infrastructure; • a new 330 kilovolt (kV) overhead transmission line approximately 82 km in length and substation, connecting to the existing TransGrid 330 kV Wellington – Wollar transmission line; • temporary and permanent ancillary infrastructure on site to facilitate the construction and operation of the turbines; and • upgrades to several local and regional roads to cater for construction traffic and enable turbines to be delivered to the site using over-dimensional vehicles. |
| <i>Project area</i> | Approximately 51,360 ha |
| <i>Disturbance footprint</i> | 744.94 ha or 1.5% of the site |
| <i>Wind turbines</i> | <ul style="list-style-type: none"> • 267 turbines and associated crane hard stand areas • Maximum tip height of 165 m • Maximum turbine hub height of 100 m • Maximum rotor diameter of 65 m • Approximate capacity of 3.6 MW¹ |
| <i>On-site ancillary infrastructure</i> | <ul style="list-style-type: none"> • Electrical infrastructure including: <ul style="list-style-type: none"> - a 330 kV substation near Ulan, connecting to the TransGrid 330 kV Wellington – Wollar transmission line; - 330 kV overhead transmission line approximately 82 km in length; - 22 kV or 33 kV overhead and underground transmission lines; - up to 4 22 kV or 33 kV / 300 kV collection substations; • Operation and maintenance facility including site parking, control room, maintenance and equipment storage facilities; • Up to 6 temporary construction compounds, including staging areas, storage and 4 concrete batch plants; • Up to 274.1 km of new internal access tracks; and • 6 (permanent) meteorological masts (already operating). |
| <i>Off-site road works</i> | <ul style="list-style-type: none"> • Road, bridge and culvert upgrades along: <ul style="list-style-type: none"> - Vinegaroy Road, Coolah Road, Rotherwood Road, Yarrawonga Road, Bounty Creek Road, Turee Vale Road, Coolah Creek Road, Pandora Road, Burragundy Road, Warung Road, Norfolk Road, Cooks Drive, Gundare Road, Oakdale Road and State Forest Road. • Intersection treatments at: <ul style="list-style-type: none"> - Golden Highway/Vinegaroy Road; - Vinegaroy Road/Coolah Road; - Vinegaroy Road/Rotherwood Road; - Vinegaroy Road/Turee Vale Road; - Vinegaroy Road/access point 9 - Vinegaroy Road/Coolah Creek Road; - Coolah Creek Road/Oakdale Road; - Coolah Creek Road/State Forest Road; - Rotherwood Road/Yarrawonga Road; - Ulan Road/Summerhill Road; - Ulan Road/Cliffdale Road; and - Ulan Road/Unnamed crown road to access point 30. |
| <i>Over-dimensional and heavy vehicle transport routes</i> | <ul style="list-style-type: none"> • New England Highway, Golden Highway; and • Coolah Road, Rotherwood Road, Yarrawonga Road, Bounty Creek Road, Turee Vale Road, Coolah Creek Road, Pandora Road, Cooks Drive, Gundare Road, Oakdale Road and State Forest Road. |
| <i>Employment</i> | <ul style="list-style-type: none"> • Construction – up to 800 people; and • Operations – up to 47 people locally. |
| <i>Capital investment value</i> | \$653 million |
| <i>Voluntary planning agreements</i> | <ul style="list-style-type: none"> • Contribute the greater of: <ul style="list-style-type: none"> - \$3,000 per annum per wind turbine built; or - \$100,000 per annum, (adjusted annually to increases in CPI from 2 years after the date development consent is granted) over the operational life of the development. |

¹ The project may use a mix of turbine models across the site to better utilise the wind resource profile.
 NSW Government
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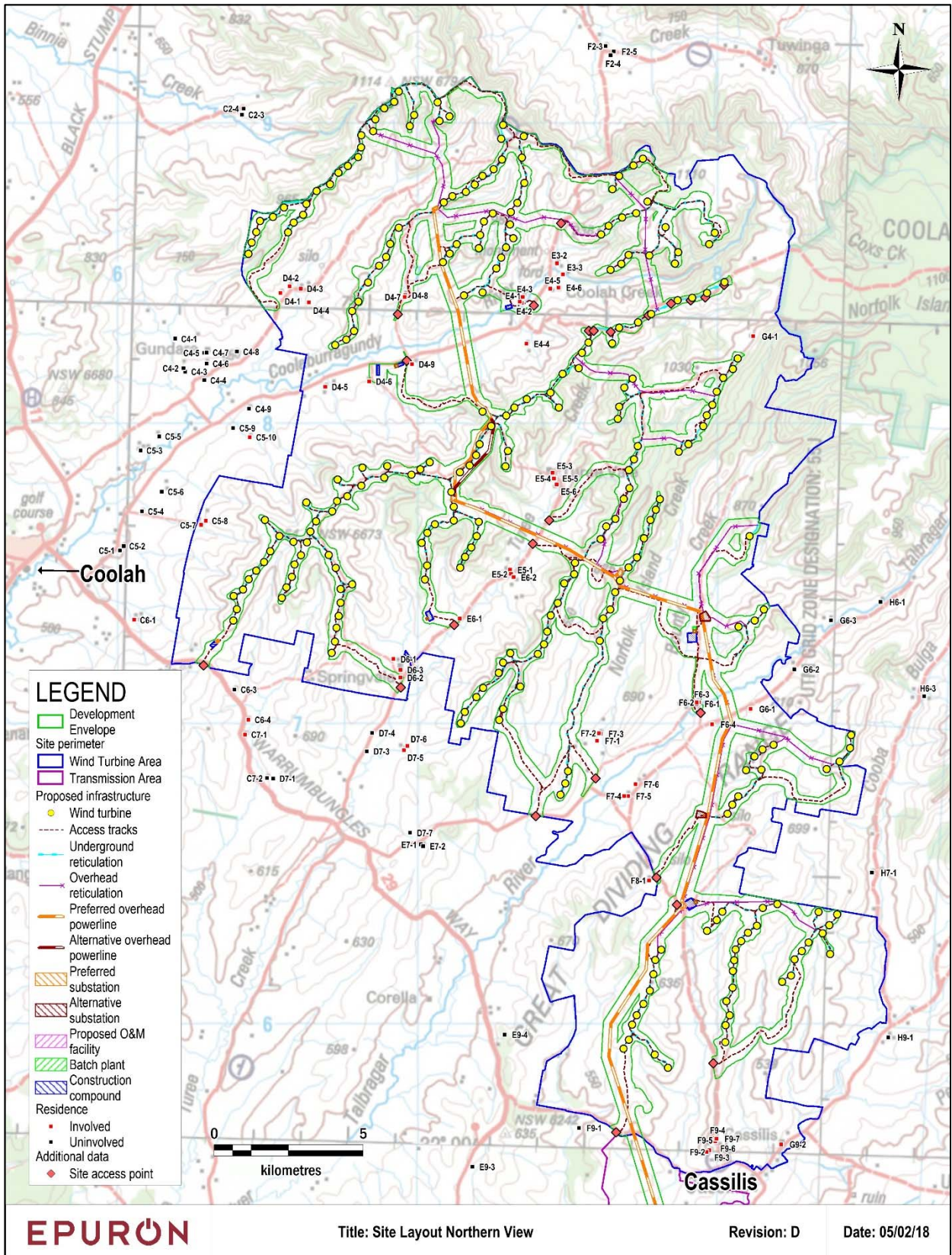


Figure 2: Site Layout (North)

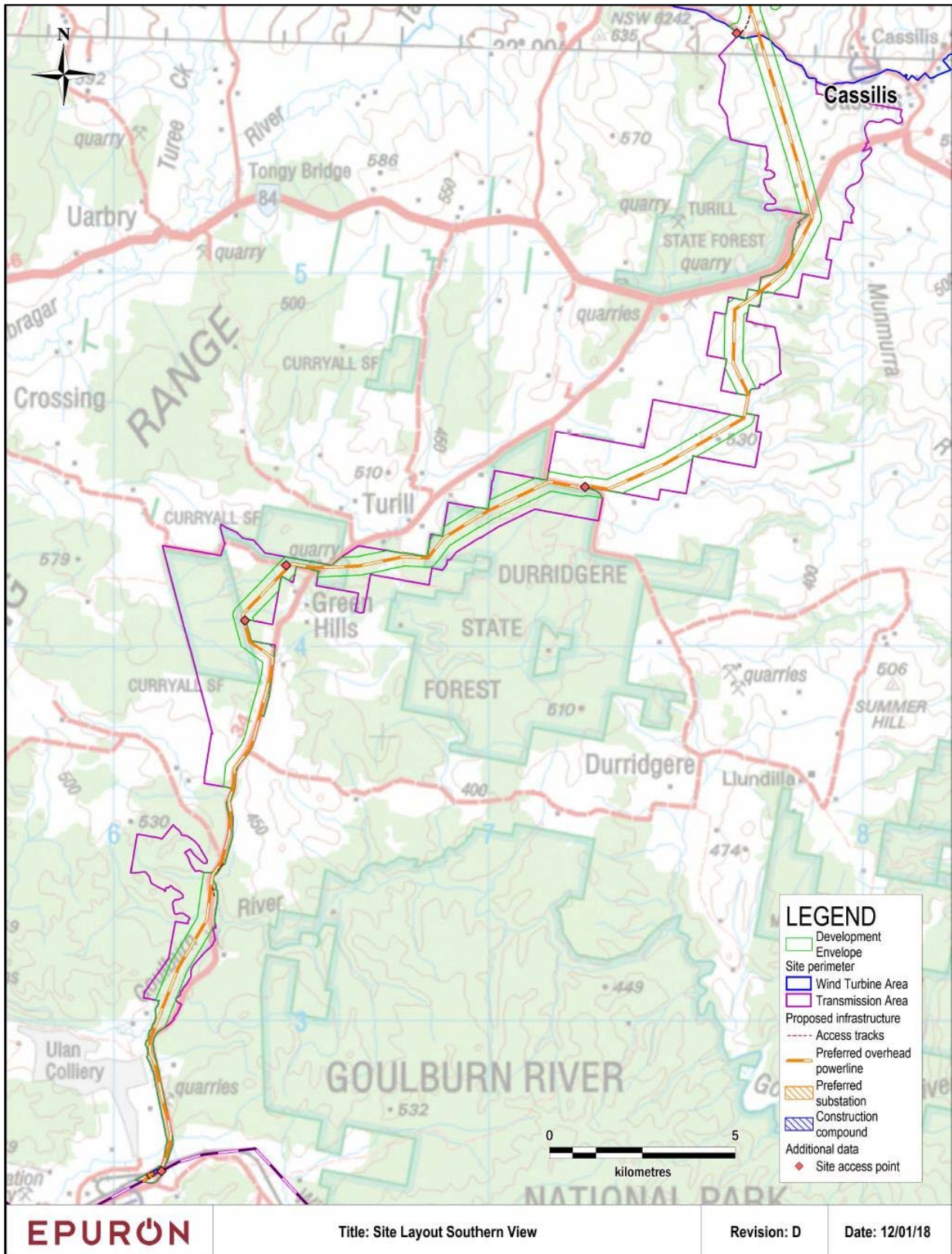


Figure 3: Site Layout (South)

2. STRATEGIC CONTEXT

2.1 Wind Energy

Renewable Energy Action Plan

In 2016, the vast majority of energy in NSW was derived from fossil fuels, including 80.4% from coal and gas, with only 19.6% derived from renewable energy sources. However, there are currently no plans for the development of new coal fired power stations in NSW, and the development of renewable energy sources, such as wind and solar, is experiencing rapid growth.

This is highlighted in the recently released *Independent Review into the Future Security of the National Electricity Market* (the Finkel Review), which outlines a strategic approach to ensuring an orderly transition from traditional coal and gas fired power generation to renewable energy with lower emissions. It notes that Australia is heading towards zero emissions in the second half of the century.

The United Nations Framework Convention on Climate Change (UNFCCC) has adopted the Paris Agreement, which aims to limit global warming to well below 2°C, with an aspirational goal of 1.5°C. Australia's contribution towards this target is a commitment to reduce greenhouse gas emissions by between 26% to 28% below 2005 levels by 2030.

One of the key initiatives to deliver on this commitment is the Commonwealth Government's *Renewable Energy Target* (RET). Under this target, more than 23.5% of Australia's electricity would come from renewable energy by 2020. It is estimated that an additional 5,400 MW of new renewable energy capacity will need to be built by 2020 to achieve the RET.

The NSW Climate Change Policy Framework, released in November 2016, sets an aspirational objective for NSW to achieve net zero emissions by 2050. The NSW Government also has a *Renewable Energy Action Plan*, which promotes the sustainable development of renewable energy in NSW.

With a capacity to generate up to 2,760,000 MWh of electricity annually, which is equivalent to the energy consumption of about 460,000 homes, the project would contribute to the Commonwealth's RET and NSW's *Renewable Energy Action Plan*.

NSW Wind Energy Framework

In December 2016, the Department released the new *NSW Wind Energy Framework* (the Framework).

The Framework replaces the draft wind farm planning guidelines, which were exhibited in 2011, and seeks to provide greater clarity, consistency and transparency for industry and the community regarding both assessment and decision-making on wind energy projects.

The Framework provides a merit-based approach to the assessment of wind energy projects, which is focused on the issues unique to wind energy, particularly noise and visual impacts. The key documents comprising the Framework include:

- *Wind Energy Guideline*;
- *Visual Assessment Bulletin*;
- *Noise Assessment Bulletin*; and
- *Standard Secretary's Environmental Assessment Requirements (SEARs)*.

However, it is important to note that the Framework only applies to new large-scale wind energy projects where SEARs have been issued after the date the Framework was published (i.e. December 2016). As the assessment requirements for the Liverpool Range Wind Farm were issued in 2011 with supplementary requirements issued in 2014, the Framework does not apply.

Nonetheless, the Framework provides relevant guidance to decision-makers about the NSW Government's current policy position for assessing key impacts of wind energy developments, especially in regard to visual and noise impacts on local communities.

2.2 Regional and Local Population

Associated Landowners

The project has 41 host or 'associated landowners', who own land both on and adjoining the project site. They have provided landowner's consent for the DA and have entered into commercial agreements with Epuron to facilitate the development of the project, including accepting the impacts of the project.

Of the 41 associated landowners, 27 landowners would host turbines, and a further 14 landowners would host other aspects of the project including the transmission line, offset areas and ancillary infrastructure.

Non-associated Landowners

Based on the 267 turbine layout presented in the RTS, there would be 1 non-associated residence located within 2 km of a turbine and 7 non-associated residences located within 3 km of a wind turbine. Most of these residences are located to the project's south and west along Vinegaroy Road and the Golden Highway (see Figures 2 and 3). 17 non-associated residences are located within 1 km of the proposed transmission line, with the majority located along Ulan Road.

Regional Centres

Cassilis is the nearest town to the project site (see Figures 2 and 3), located approximately 4.2 km south of the closest turbine within the Upper Hunter Shire LGA. With a population of approximately 300 (2016 census), some turbines on the south-eastern edge of the wind farm would be visible from parts of town, although intervening topography provides visual screening from the majority of residents in Cassilis.

Another population centre near the project site is Coolah, which is located 5.9 km west of the nearest turbine. With a population of 1,290 (2016 census), Coolah is the second most populous town within the Warrumbungle Shire LGA and would have long distance views of turbines on the western edge of the site.

2.3 Key Infrastructure

The project is located in proximity to the major transport route of the Golden Highway, which extends roughly east to west across the project site, approximately 6 km south of the nearest turbine (see Figure 4). The project has a designated over-dimensional and heavy vehicle route where vehicles would travel to the site from the Port of Newcastle via the New England Highway and Golden Highway. The approved Crudine Ridge Wind Farm project located south of Mudgee also proposes to use this route, with construction proposed to commence in 2018.

From the Golden Highway, all turbine components would head north along Vinegaroy Road before making their way to site via the local road network including Coolah Road, Rotherwood Road, Turee Vale Road, Coolah Creek Road and a new access point along Vinegaroy Road (see Figure 4). This transport route bypasses both the towns of Cassilis and Coolah.

Conversely, from the Golden Highway, all 330 kV connection substation and some transmission line components would head south along Ulan Road before making their way to site via the local road network including Summerhill Road, Cliffdale Road and an unnamed crown road (see Figure 5).

2.4 Surrounding Land Use

The Orana and Hunter regions of NSW have diverse regional economies characterised by areas of agricultural land located within broad valleys, rolling hills, ridgelines and the steeper topography of the Great Dividing Range. Sheep, beef cattle and grain farming is the major industry in the region, closely followed by the region's mining sector.

There is a large-scale mining complex, which includes the Ulan and Moolarben coal mines, at the southern end of the proposed transmission line, and the route traverses a consolidated coal licence (i.e. CCL741) and the Bobadeen East Vegetation Offset Area, held by Ulan Coal Mines Ltd.

Adjoining the north-eastern boundary of the project site is Coolah Tops National Park, which is comprised of a densely forested plateau located on the Great Dividing Range. A section of the proposed transmission line route along Ulan Road traversing parts of the Durrigere State Conservation Area (SCA) (see Figure 5). Goulburn River National Park, which bounds the Goulburn River for approximately 90 km, is located to the project's southeast and covers an area of approximately 72,300 ha.

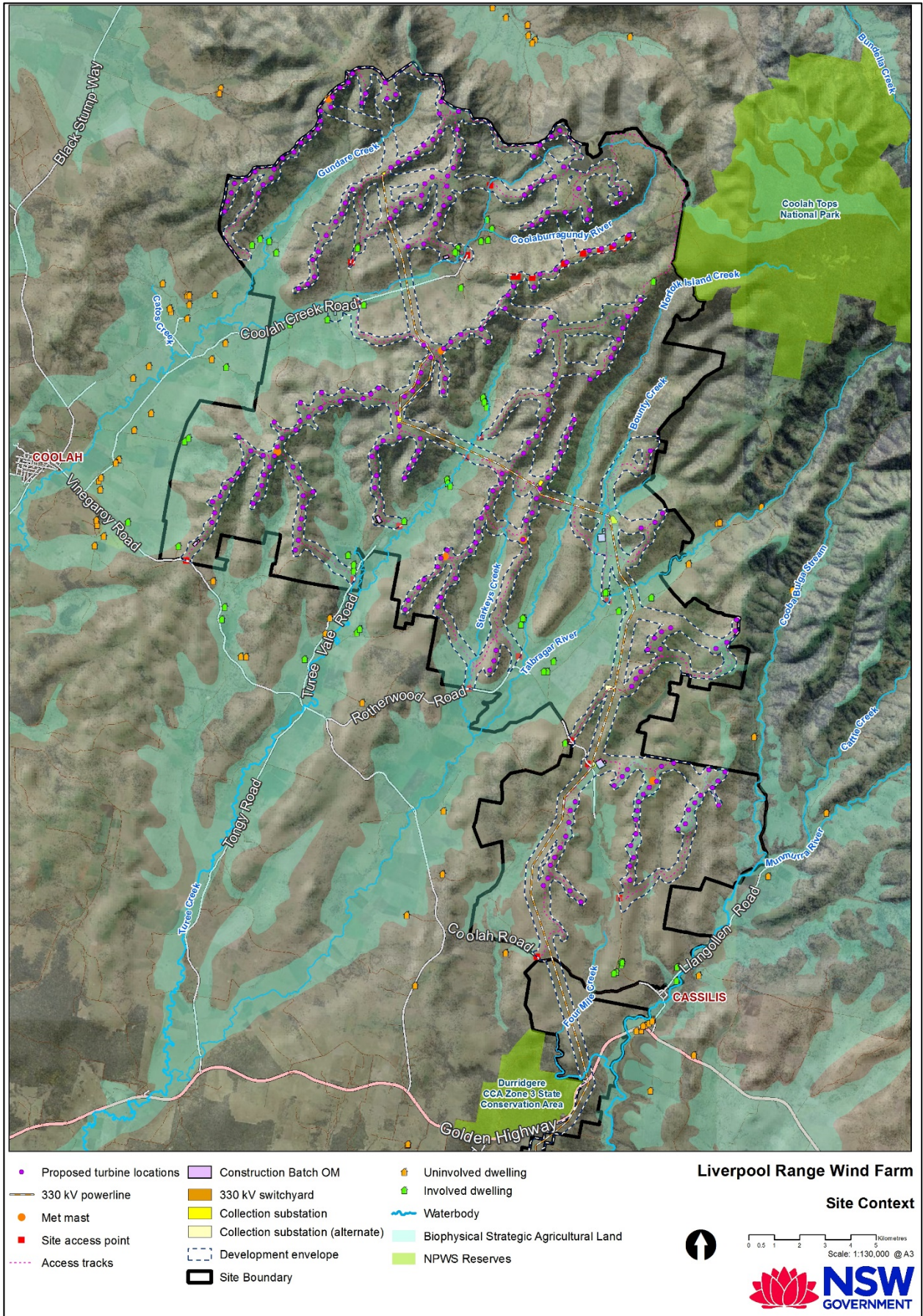


Figure 4: Site Context (North)

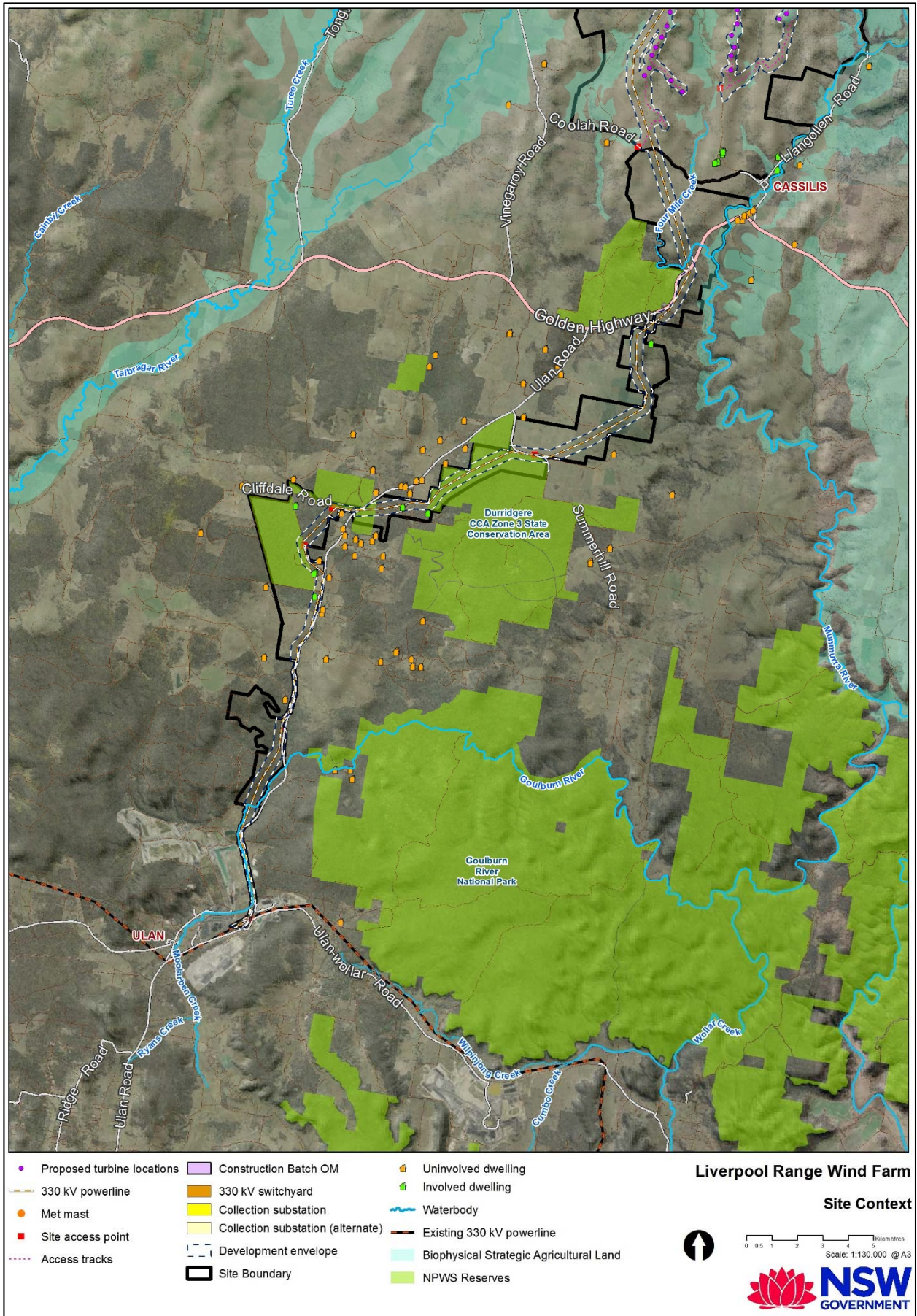


Figure 5: Site Context (South)

The project lies within the Coolaburragundy River, Talbragar River and Goulburn River catchments and contains a number of high order creeks, low order creeks and drainage lines. There are a number of access track crossings of waterways associated with the project. Of these, several are crossings of second order creeks or above, including Catos Creek, Gundare Creek, Coolaburragundy Creek, Coolah Creek, Turee Creek, Starkey Creek, Norfolk Island Creek, Bounty Creek, Talbragar River, Four Mile Creek, Two Mile Creek, Ironbark Creek, Curra Creek, Bobadeen Creek and the Goulburn River.

Additionally, the project lies within the Liverpool Ranges Basalt Murray-Darling Basin Groundwater source. 57 groundwater bores were identified inside the project site with an average water depth of 25 m.

3. STATUTORY CONTEXT

3.1 State Significant Development

The project was declared a 'critical infrastructure project' under Part 3A of the *Environmental Planning and Assessment Act* (EP&A Act) in November 2009.

Although Part 3A was repealed on 1 October 2011, the project remained a 'transitional Part 3A project' under what was formerly Schedule 6A of the EP&A Act. On 21 March 2014, the project was transitioned to the State Significant Development (SSD) process under Part 4 of the EP&A Act. The previous assessment actions undertaken under the Part 3A assessment process were accredited under the SSD process.

The project is classified as SSD under Section 4.36 of the EP&A Act as it triggers the criteria in Clause 20 of Schedule 1 to *State Environmental Planning Policy (SEPP) (State and Regional Development) 2011*, as it is development for the purpose of electricity generating works using wind power that has a capital investment value of more than \$30 million.

Consequently, the Minister for Planning is the consent authority for the development. However, under the Minister's delegation of 11 October 2017, the Deputy Secretary, Planning Services, may determine the development application. This is because less than 25 public submissions by way of objection were received, no reportable political donations were made, and the Councils did not object to the proposal.

3.2 Permissibility

The project is located across the Warrumbungle Shire, Upper Hunter Shire and Mid-Western Regional LGAs (see Figure 1). The Department considers the project can be wholly defined as "Electricity Generating Works" with the proposed 330 kV transmission line being an ancillary component of the project. This is because:

- the transmission line serves the sole purpose of enabling the wind farm to function on the land by providing a connection to TransGrid's transmission network;
- the transmission line does not serve its own purpose; and
- more than half (42.1 km) of the transmission line is located within the site for the wind farm.

Warrumbungle Shire and Upper Hunter Shire Councils

Most of the project site is on land zoned RU1 – Primary Production under the *Warrumbungle Local Environmental Plan 2013* and *Upper Hunter Local Environmental Plan 2013*. Electricity generating works are prohibited within land zoned RU1 under both local environmental plans.

However, under *SEPP (Infrastructure) 2007*, development for the purposes of electricity generating works may be carried out by any person with consent on any land in a prescribed rural, industrial or special use zone. Since zone RU1 is a prescribed rural zone, the proposal is therefore permissible in this zone.

As stated previously, the 330 kV transmission line traverses Durrigere SCA, which is zoned E1 – National Parks under the *Upper Hunter Local Environment Plan 2013*. Development within land zoned E1 is prohibited unless authorised under the *National Parks and Wildlife Act 1974*.

While landowners consent to lodge the DA has been granted by the Minister for the Environment, the Applicant must still obtain a Section 153 easement from the NSW Minister for Environment prior to the construction of the transmission line, should development consent be granted under the EP&A Act.

Mid-Western Regional Council

Approximately 25.1 km of the 330 kV transmission line corridor is located in Mid-Western Regional LGA, in land zoned as RU1 – Primary Production, RU3 – Forestry, E3 – Environmental Management and SP2 – Rail Infrastructure under the *Mid-Western Regional Local Environmental Plan 2012*.

Electricity generating works are permitted with development consent within land zoned RU1. In land zoned RU3, works are prohibited unless authorised under the *Forestry Act 1916*. The Department notes that the RU3 land traversed by the proposed transmission line corridor is located within the Durrigere SCA which is managed under the *National Parks and Wildlife Act 1974*.

Because zones RU3 and SP2 are prescribed rural, industrial or special use zones, the proposal is permissible with consent in these zones under *SEPP (Infrastructure) 2007*.

A 1.1 km section of the transmission line corridor traverses land zoned as E3, where energy generation works are prohibited. Avoiding E3 land would lengthen the transmission line easement by at least 5 km, increasing the disturbance footprint of intact woodland vegetation communities.

National Parks and Wildlife Service has not advised against placing the transmission line within this land and Epuron would be required to provide biodiversity offsets for vegetation clearing required for the project. Therefore, the Department considers that in this instance, the application of Section 4.38(3) of the EP&A Act which applies to SSD is appropriate, and that consent may be granted despite the development being partly prohibited by an environmental planning instrument.

The *Mid-Western Regional Local Environmental Plan 2012* also contains provisions relating to minimum lot sizes that would make the proposed subdivision prohibited. This partial prohibition could also be overcome through Section 4.38(3) and is discussed in detail in Section 5.5 of this report.

3.3 Environmental Planning Instruments

Several other environmental planning instruments apply to the project, including:

- *SEPP (Infrastructure) 2007*;
- *SEPP (State and Regional Development) 2011*;
- *SEPP (Rural Lands) 2008*; and
- *SEPP No. 55 – Remediation of Land*.

The Department has assessed this project against the relevant provisions of these instruments (see this report and Appendix C), as well as Epuron's consideration of these matters in the EA.

Based on its assessment of these instruments and its broader environmental assessment in Section 5, the Department considers that the proposed development could be undertaken in a manner that is generally consistent with the aims, objectives and provisions of these instruments.

3.4 Integrated and Other NSW Approvals

Under Section 4.41 of the EP&A Act, several other approvals are integrated into the SSD approval process, and consequently are not required to be separately obtained for the proposal. These include:

- various approvals relating to heritage required under the *National Parks and Wildlife Act 1974* and *Heritage Act 1997*;
- an authorisation under the *Native Vegetation Act 2003* for the clearing of native vegetation; and
- certain water approvals under the *Water Management Act 2000*.

Under Section 4.42 of the EP&A Act, a number of further approvals are required, but must be substantially consistent with any development consent for the proposal. These include:

- an Environmental Protection Licence (EPL) under the *Protection of the Environment Operations Act 1997*; and
- approvals for various road upgrades under the *Roads Act 1993*.

The Department has consulted with the relevant government authorities responsible for these integrated approvals (see Section 4.2), considered their advice in its assessment of the merits of the project (see Section 4.4), and included suitable conditions in the conditions of consent to address these matters (see Appendix G).

3.5 Commonwealth Approvals

Epuron also needs to obtain approval from the Commonwealth Minister for the Environment and Energy under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), because the project is a “controlled action” under that Act due to the potential for significant impacts on listed threatened species and communities (Sections 18 and 18A of EPBC Act).

The assessment process under the EP&A Act has been accredited under a bilateral agreement with the Commonwealth Government. This means that the NSW Government is undertaking the assessment on behalf of the Commonwealth and must assess matters of national environmental significance (MNES).

The Department consulted with the Department of Environment and Energy (DoEE) in accordance with the bilateral agreement and provided copies of this Assessment Report and the recommended conditions of consent to the DoEE for comment. DoEE advised the Department that the documentation provided contained sufficient information and analysis for determination under the EPBC Act.

The Department’s assessment of the potential impacts of the project on controlling provisions under the EPBC Act relating to biodiversity is provided in Section 5.4. Further information on the matters that the Commonwealth Minister must consider under the EPBC Act is provided in Appendix E.

3.6 Section 4.15 Considerations

Section 4.15(1) of the EP&A Act outlines the matters that a consent authority must take into consideration when determining development applications. These matters can be summarised as:

- the provisions of environmental planning instruments (including draft instruments), development control plans, planning agreements, and the EP&A Regulations;
- the environmental, social and economic impacts of the development;
- the suitability of the site;
- any submissions; and
- the public interest, including the objects in Section 1.3 of the EP&A Act and the encouragement of ecologically sustainable development (ESD).

The Department has considered all of these matters in its assessment of the project, to the extent they are of relevance, as summarised in Section 5 and Appendix C of this report.

4. CONSULTATION

4.1 Epuron’s Engagement

Epuron prepared a *Project Consultation Plan* (see Attachment 7 of the EA) and has confirmed that it has implemented the following aspects of this plan:

- establishing a project website, phone number and email address;
- distributing 13 newsletters to the local community between November 2009 and September 2016;
- establishing and operating a Community Consultative Committee (CCC) since February 2013 comprising an independent chairperson, 4 members of the local community, a representative from each of the 3 Councils and an Epuron representative. The CCC has met 10 times since it was established, with the most recent meeting being held on 27 April 2017;
- door-knocking and face-to-face meetings; and
- a public open day in Cassilis in November 2012 which was advertised in the project newsletters, local newspapers and was attended by approximately 75 people.

4.2 Department's Engagement

During the assessment process, the Department visited the site on several occasions, hosted a community information session in Cassilis, and consulted with local residents, the Councils, public authorities and Epuron. This engagement is summarised in Table 3 below.

Table 3: Department's engagement

| Date | Description | Attendees |
|---------------------------|---|---|
| 10 March 2011 | <ul style="list-style-type: none"> Planning Focus Meeting and site visit with agencies | <ul style="list-style-type: none"> Department planning officers Government agencies Epuron |
| 26 June 2017 | <ul style="list-style-type: none"> Meeting with the Councils Community Information Session in Cassilis | <ul style="list-style-type: none"> Department planning officers Warrumbungle Shire Council and Upper Hunter Shire Council Local community members |
| 22 August 2017 | <ul style="list-style-type: none"> Visit to site and surrounds to understand biodiversity impacts | <ul style="list-style-type: none"> Department planning officers NSW Office of Environment and Heritage (OEH) Epuron |
| 23 August 2017 | <ul style="list-style-type: none"> Visit to site, surrounds and non-associated residences to confirm impacts and discuss concerns | <ul style="list-style-type: none"> Department planning officers Local community members |
| 20 February 2018 | <ul style="list-style-type: none"> Visit to site, surrounds and non-associated residences to discuss residual concerns | <ul style="list-style-type: none"> Deputy Secretary, Planning Services Department planning officers Local community members |
| During assessment process | <ul style="list-style-type: none"> Consultation with agencies, particularly OEH, DRG, the Commonwealth and Councils to resolve residual concerns Consultation with Epuron | <ul style="list-style-type: none"> Department planning officers Government agencies Commonwealth Department of Environment and Energy Warrumbungle Shire Council, Upper Hunter Shire Council and Mid-Western Regional Council Epuron |

4.3 Exhibition

The Department:

- publicly exhibited the EA from 1 August 2014 until 1 October 2014 (61 days);
- notified relevant State government authorities and the Councils;
- notified relevant electricity supply and transmission authorities, in accordance with the SEPP (*Infrastructure*) 2007;
- notified affected landholders; and
- advertised the exhibition in the Mudgee Guardian, Coonabarabran Times, Scone Advocate, Sydney Morning Herald and Daily Telegraph newspapers.

In undertaking these processes, the Department has satisfied the notification requirements of Clause 9 of Schedule 1 of the EP&A Act and SEPP (*Infrastructure*) 2007.

4.4 Amended Development Application

Epuron submitted an Amended DA which was described in the RTS (see Appendix B). The Department exhibited the Amended DA from 16 June 2017 until 18 July 2017 (32 days) to give the community an opportunity to comment on the proposed amendments.

The Department advertised the exhibition in the Mudgee Guardian, Coonabarabran Times, Scone Advocate, the Australian, Merriwa Diary, Coolah Diary and The Land and notified both adjoining landholders and landholders who had lodged a submission during the original exhibition, as well as relevant State and local government authorities.

The Department also hosted a community information session during this exhibition period, of which approximately 10 community members attended, to provide the local community with an opportunity to learn more about the planning assessment process and to listen to any community concerns about the amended project.

4.5 Summary of Submissions

During the original exhibition period, the Department received a total of 42 submissions, including:

- 12 government agencies (all comment);
- 6 from special interest groups (3 object, 4 comment); and
- 24 from the general public (15 object, 5 support, 4 comment).

During the exhibition of the Amended DA, the Department received a further 23 submissions (either as new submissions or as updates to previous submissions), including:

- 9 from government agencies (all comment); and
- 14 from the general public (6 object, 6 support, 2 comment).

A summary of the submissions is provided in Table 4 and a full copy of the submissions is attached in Appendix D.

Table 4: Summary of submissions

| Submitters | Number | | Category |
|--|-----------|------------|----------|
| | EA | Amended DA | |
| Government Agency | 12 | 9 | |
| • Division of Resources and Energy | √ | √ | |
| • Office of Environment and Heritage | √ | √ | |
| • Environment Protection Authority | √ | √ | |
| • Airservices Australia | | √ | |
| • Department of Industry – Crown Lands & Water | √ | √ | |
| • Rural Fire Service | √ | √ | |
| • Civil Aviation Safety Authority | √ | √ | Comment |
| • Roads and Maritime Services | √ | √ | |
| • Commonwealth Department of Environment and Energy | √ | | |
| • NSW Health | √ | | |
| • Liverpool Plains Shire Council | √ | | |
| • Warrumbungle Shire Council | √ | √ | |
| • Upper Hunter Shire Council | √ | | |
| Special Interest Group | 6 | 0 | |
| • Australian Industrial Wind Turbine Awareness Network | √ | | Object |
| • Yancoal Australia Ltd | √ | | |
| • NTSCORP Ltd | √ | | |
| • Talbragar Holdings Pty Ltd | √ | | |
| • Ulan Coal Mines Ltd | √ | | Comment |
| • Coolah District Development Group Inc | √ | | |
| Community | 24 | 14 | |
| • < 5 km | 5 | 4 | Object |
| | 4 | 2 | Support |
| | 0 | 1 | Comment |
| • 5 – 10 km | 1 | 1 | Object |
| | 1 | 3 | Support |
| | 2 | 1 | Comment |
| • > 50 km | 9 | 1 | Object |
| | 0 | 1 | Support |
| | 2 | 0 | Comment |
| TOTAL | 42 | 23 | |

4.6 Key Issues – Government Agencies

None of the government agencies have objected to the project, and the key issues raised by agencies have been addressed through the provision of additional information, or through the recommended conditions of consent.

Roads and Maritime Services (RMS) requested Epuron design the proposed access point 9 on Vinegaroy Road to comply with the *Austrroads Guide to Road Design* to meet Safe Intersection Sight Distance (SISD) requirements and advised that the Golden Highway is currently undergoing an extensive program of upgrades for at least the next 24 months. Epuron has relocated access point 9 and proposed temporary speed restrictions to adhere to SISD requirements. This matter and a program of proposed road upgrades are discussed in Section 5.1.

Upper Hunter Shire Council and **Warrumbungle Shire Council** both raised concerns regarding impacts to the local and regional road network, particularly in regard to upgrade and maintenance requirements during construction of the project. The Department has consulted extensively with both Councils and Epuron, and included a schedule of road upgrades in the recommended conditions of consent to ensure that works are undertaken to the satisfaction of the relevant road authority as discussed in Section 5.1.

The **Environmental Protection Agency (EPA)** supported the project subject to the inclusion of recommended construction hours, blasting and noise criteria, which the Department has incorporated in the recommended conditions of consent as discussed in Section 5.3.

The **Office of Environment and Heritage (OEH)** raised concerns with the project layout presented in the original EA, particularly regarding sections of the transmission line route being located within Durrigere SCA. Although the amended transmission line alignment would still traverse the SCA, OEH has acknowledged the amended route would result in a reduced footprint and extent of impact. The Department's consideration of impacts on the SCA is further discussed in Section 5.4.

OEH also raised concerns about the potential impacts to bird and bat species, particularly during favourable eucalypt flowering events and recommended that additional bird utilisation data be collected and adaptive management measures be put in place. Epuron undertook additional avifauna surveys in response to OEH's concerns and the Department's consideration regarding this matter is discussed in Section 5.4.

The **Division of Resources & Geosciences (DRG)** was concerned about the original transmission line which traversed coal titles held by Moolarben Coal. DRG has advised that Epuron's alteration to the route alignment, which now avoids traversing the Moolarben Coal title areas, adequately addresses its concerns.

Airservices Australia advised that the project would not adversely impact the performance of any of its Communications/Navigation/Surveillance (CNS) facilities. Furthermore, the project would not affect any sector or circling altitude, nor any instrument approach or departure procedure at any nearby airport. However, Airservices requested Epuron provide the relevant authorities (including itself) with the final details of the wind turbines and associated infrastructure as discussed in Section 5.5.

The **Civil Aviation Safety Authority (CASA)** conducted an assessment in accordance with the *National Airports Safeguarding Framework (Guideline D): Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation* and advised that the project as proposed would not require aviation hazard lighting. Consideration of impacts to aviation activities in the region are further discussed in Section 5.5.

The **Department of Defence, Department of Industry – Crown Lands & Water (CL&W), NSW Health, Liverpool Plains Shire Council** and **Rural Fire Service** did not have any residual concerns with the project.

4.7 Key Issues – Community

The 24 submissions received from the general public during exhibition of the original EA and 14 submissions received during exhibition of the Amended DA, came from 35 submitters, with 20 objecting, 5 commenting and 10 supporting the project.

As summarised in Table 4, the submissions from the general public were received from residents residing locally (within 5 km of the project site), regionally (within 10 km of the project site) and across the State, with two submissions received from Victoria. Of the 20 submitters objecting to the project, 10 were located within 10 km of the project site, and 9 of the 10 submissions supporting the project were also from submitters living within 10 km of the project site.

The key issues raised in submissions during the exhibition of the original EA related to the socio-economic, visual, noise, health and safety impacts of the project, whereas submissions received during exhibition of the Amended DA were focused on traffic and transport impacts and socio-economic impacts.

As detailed in Table 3, the Department met with concerned members of the community to get an appreciation of the potential impacts and further understand their concerns.

A breakdown and summary of the key issues raised by the general public during exhibition of the EA and RTS is provided in Figure 6 and described below.

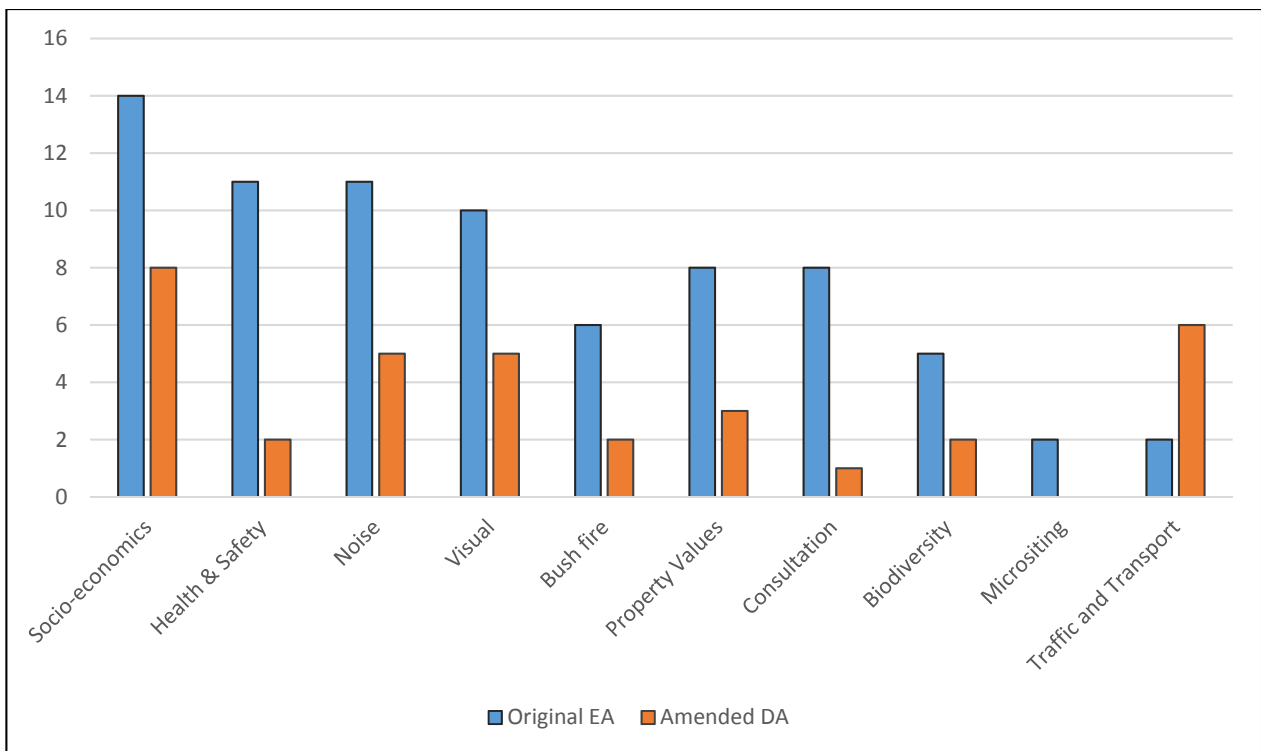


Figure 6: Key issues raised in public submissions

Socio-economics:

- benefits a few landowners but impacts surrounding farms and villages;
- number of jobs generated are exaggerated;
- adverse effects on power prices for NSW consumers; and
- disruption to agricultural activity.

Along with employing a large construction workforce, should all 267 proposed turbines be built, Epuron would be required to provide community contributions of over \$800,000 per annum (plus CPI) through a VPA with Warrumbungle Shire and Upper Hunter Shire Councils to benefit the local area (see Section 5.5). In the Department’s view, the likelihood of the project having an adverse impact on energy security or electricity prices in NSW is extremely low and could be mitigated through the operation of the National Electricity Market (NEM) (see Section 5.5).

The Department recognises the high level of agricultural productivity present in the locality and has considered the interactions between traffic and stock movements (see Section 5.3) and impacts on aerial agricultural activities (see Section 5.5).

Traffic & Transport:

- increased traffic over an extended period;
- suitability of the road network to accommodate heavy and over-dimensional vehicles;
- interactions with agricultural stock movements and school bus routes; and
- additional congestion on the Golden Highway.

The Department has undertaken extensive consultation with the local Councils and Epuron on the proposed transport routes, and have agreed on road upgrades for the local and regional road network. Consultation with landowners and provisions in the recommended conditions are also discussed in Section 5.1.

Health & Safety:

- perceived health impacts from the operation of wind turbines
- safety concerns regarding aviation activity; and
- safety for livestock and interactions with construction traffic.

The Department sought advice from NSW Health during the exhibition of the original EA which did not raise any concerns regarding the project. Epuron has removed several turbines due to their proximity to existing landing strips and has increased the setback distance of turbines from the site boundary. The Department's considerations of aviation and health related issues are addressed in Section 5.5.

Visual:

- transformation of the visual landscape;
- impacts to the visual amenity of local residents; and
- size and scale of the project.

The Department notes that Epuron has deleted 21 of the 288 turbines initially proposed as part of the EA and increased the setback distance of turbines from the project site boundary at the request of the Department. The Department's consideration of the project's residual visual impacts is discussed in Section 5.2.

Noise:

- construction traffic noise;
- noise from both the construction and operation of the wind farm; and
- low frequency noise and infrasound from wind turbines.

Both the EPA and the Department have undertaken a detailed assessment of the predicted noise impacts of the project, in accordance with applicable guidelines and policies, as discussed in Section 5.3.

Other issues:

- *decommissioning and rehabilitation* – responsibility for decommissioning the project at the end of the operational life;
- *biodiversity* – bird and bat strike;
- *soil and water* – erosion, sedimentation and dust generation and impacts on water resources;
- *property values* – depreciation of property values;
- *bushfire* – increased risk of bushfires, and interference with aerial fire-fighting operations;
- *communications* – disruption to radio and telecommunication signals; and
- *community consultation* – dissatisfaction with the level of consultation by Epuron.

Section 5.5 of the assessment report provides a summary of the Department's consideration of these matters and recommended conditions.

Support:

Reasons provided in submissions supporting the project included:

- diversification of the local and regional economy;
- new business opportunities and jobs in the region;
- environmental benefits associated with renewable energy; and
- the benefits of the Community Enhancement Fund.

4.8 Key Issues – Special Interest Groups

Of the 6 submissions received from special interest groups, 2 objected to and 4 commented on the project.

The **Australian Industrial Wind Turbine Awareness Network** objected to the project on the grounds that the carbon dioxide emission reductions from wind turbine technology are grossly overstated and the risks posed to the security of the transmission network. General concerns around noise and vibration impacts, health impacts, property values, decommissioning responsibilities and safety were also raised. These matters have been considered by the Department in Section 5.

NTSCORP Limited is the native title service provider for NSW and ACT. The organisation provided comments on the Aboriginal Cultural Heritage Assessment prepared for the EA and made recommendations regarding the cultural heritage management process. The Department's consideration of Aboriginal heritage impacts is provided in Section 5.5.

Moolarben Coal Operations Pty Ltd is a wholly owned subsidiary of Yancoal Australia Pty Ltd holds exploration licence EL6288 and mining lease ML1605. The company objected to the project during the exhibition of the original EA as the proposed transmission line corridor and associated substation would potentially impact ongoing mining operations and future development of the Moolarben Coal Project. Moolarben also flagged that the proposed transmission line alignment would interfere with its biodiversity offsets. Epuron has addressed Moolarben Coal's concerns in the RTS by altering the proposed transmission line alignment, which avoids traversing the Moolarben title areas. Interactions between the proposed transmission line alignment and grid connection infrastructure and mineral resources are further discussed in Section 5.5.

5. ASSESSMENT

In assessing the merits of the project, the Department has considered the:

- EA, submissions, the RTS and Final Amended DA;
- advice from Commonwealth, State and local government agencies;
- findings of its site visits and consultation with the local community;
- relevant environmental planning instruments, policies and guidelines; and
- relevant provisions of the EP&A Act, including the objects of the Act.

The following is a summary of the findings of the Department's assessment.

5.1 Traffic and Transport

The project proposes to import wind turbine components through the Port of Newcastle, transporting them to site via the New England Highway and Golden Highway. These highways are part of the State road network which are suitable for over-dimensional and heavy vehicle use. The approved Crudine Ridge Wind Farm project located south of Mudgee also proposes to use this route, with construction proposed to commence in 2018.

From the Golden Highway, over-dimensional and heavy vehicles would access the site via Vinegaroy Road, which provides a north-south arterial road link to the local road network between Cassilis to the south and Coolah to the north. To enter the site, project traffic would be spread across five main access routes on local roads including Coolah Road, Rotherwood Road, Turee Vale Road, Coolah Creek Road and a new access point on Vinegaroy Road (see Figure 7).

Project traffic would also use Ulan Road, which provides links to Cliffdale Road, Summerhill Road and several unnamed crown roads to construct and maintain the transmission line sections and 330 kV grid connection located south of the Golden Highway (see Figure 8).

The construction period would take approximately 36 months, with each local road connecting Vinegaroy Road to the project site forecast to be heavily used over a shorter 21 month period. Construction of the transmission line was estimated to occur over 12 months. The predicted volume of construction traffic generated is summarised in Table 5.

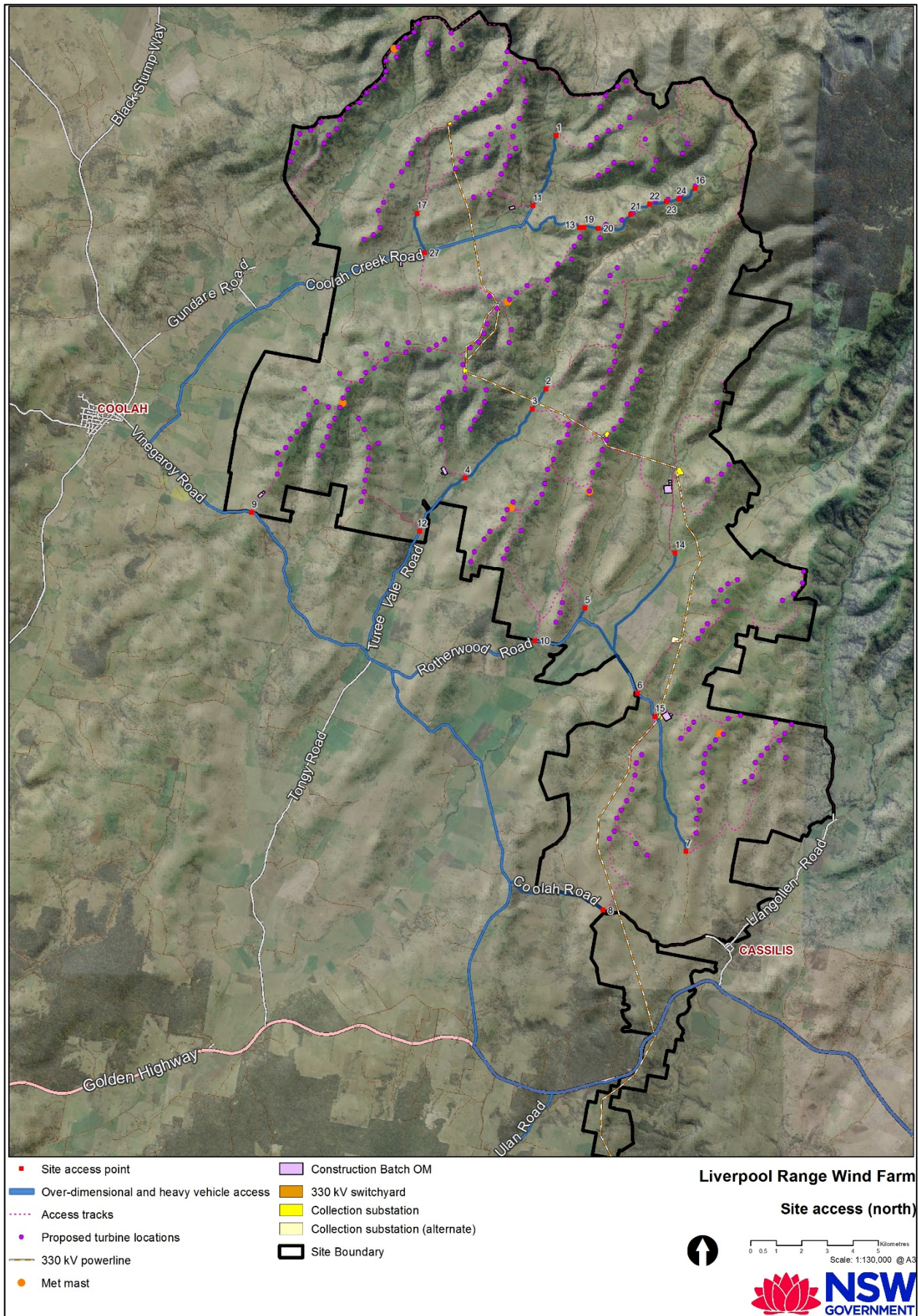


Figure 7: Local Road Network Transport Route and Site Access Points (North)

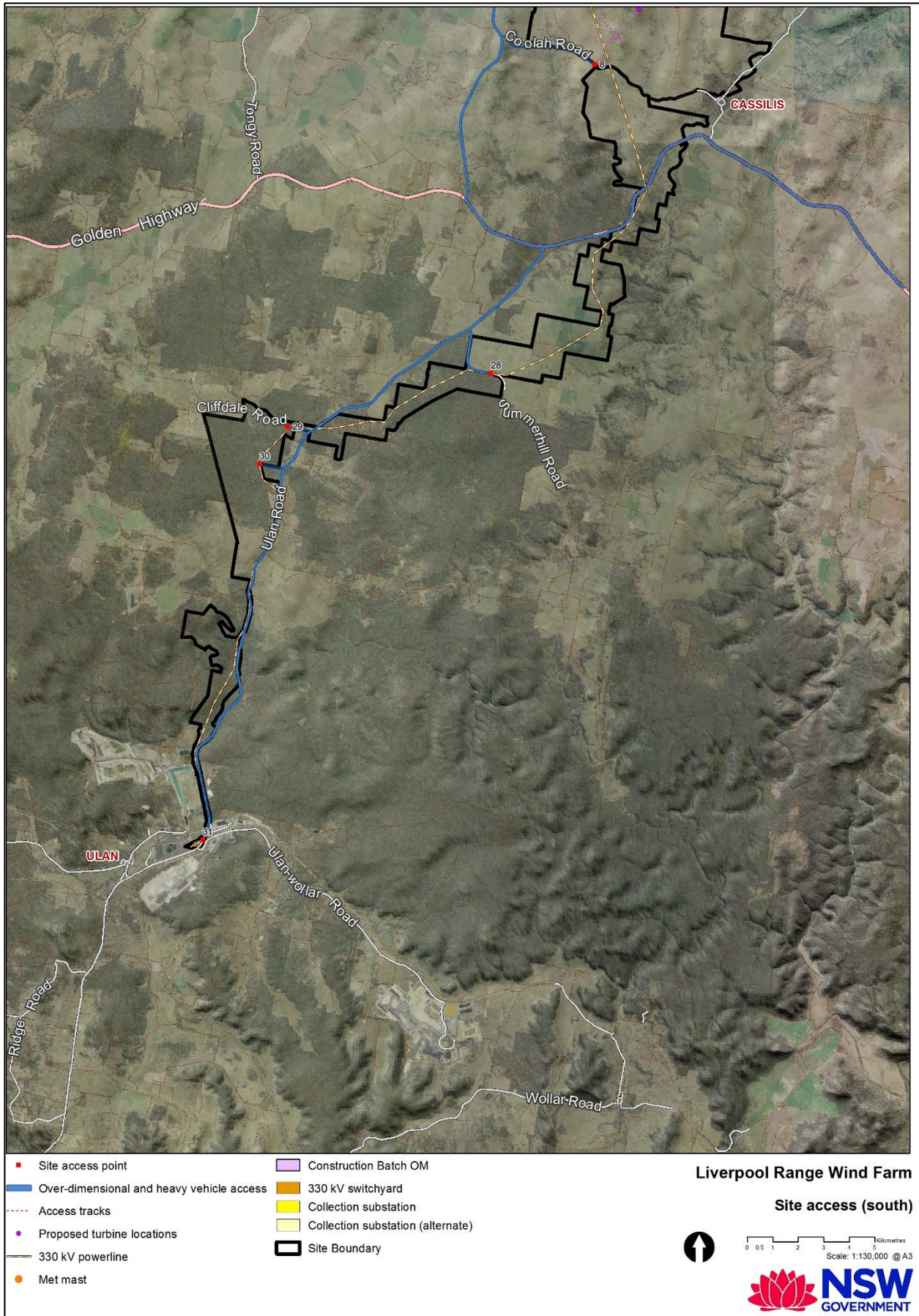


Figure 8: Local Road Network Transport Route and Site Access Points (South)

Table 5: Construction Traffic Generation Summary – Estimated Transport Movements

| Vehicle class | Peak movements (daily) | Total movements over construction period | Proportion of construction traffic |
|--|-------------------------------|---|---|
| Over-dimensional vehicles (restricted access vehicles) | 6 | 4,982 | 2% |
| Heavy vehicles | 100 | 39,791 | 17% |
| Light vehicles | 236 | 189,580 | 81% |
| TOTAL | 342 | 234,244 | |

Due to the large and linear nature of the proposed project, the Department has considered the possibility of the project being constructed in stages. While there could potentially be downtime between the completion of one stage and the commencement of construction of the next stage, the total and peak daily construction traffic movements would not change. While the downtime would provide a respite period for commuters travelling on the local and regional road network, the time between the commencement of construction and completion of the project could be extended.

Only a small full-time workforce would be required for site maintenance and monitoring purposes during operations. It is anticipated this workforce would contribute up to 30 vehicle movements per day.

Impacts on State Road Network

RMS is undertaking an extensive program of upgrades to the Golden Highway to better facilitate the movement of high productivity vehicles on the route. This program of works is scheduled to be completed by 2019.

Apart from the temporary widening of the Golden Highway and Vinegaroy Road intersection, the traffic impact assessment of the project shows the State road network can safely accommodate all project traffic without these upgrades.

Should construction traffic associated with the wind farm interact with the RMS works, these could be managed in consultation with RMS and administered under the Traffic Management Plan, which is required to be prepared and implemented by Epuron in consultation with the relevant roads authority under the recommended conditions of consent.

Impacts on Regional and Local Road Network

The key traffic and transport related impacts at Vinegaroy Road and the local road network would occur during the construction and decommissioning phases of the project. During the peak construction period, up to 342 additional vehicles would be using the local road network each day. Compared with traffic volume monitoring data collected by the Upper Hunter Shire Council recording 40 vehicles per day travelling on Coolah Road in 2007, this would be a noticeable increase for existing users.

Although more than 99% of the construction traffic would use Vinegaroy Road to access the wind farm site, traffic volumes across the local road network would be spread relatively evenly across Coolah Road, Rotherwood Road, Turee Vale Road, access point 9 and Coolah Creek Road. Due to the progressive nature of wind farm construction, most heavy vehicle traffic would be associated with the civil excavations and the delivery and erection of turbines over a shorter 12 to 15 month period.

Less than one percent of construction traffic would be using Ulan Road for the construction of the proposed transmission line and grid connection with the TransGrid network. While Ulan Road is used to service the Ulan and Moolarben coal mining operations, traffic associated with these operations mainly access the mines near the village of Ulan and Wollar Road.

RMS and the Councils have not raised concerns around the capacity of the existing road network to accommodate the construction traffic proposed, provided road surfaces are upgraded to the relevant Austroad standard and all project traffic is managed under a Traffic Management Plan.

Standard mitigation measures including the scheduling of deliveries outside of peak times could be implemented to minimise disruptions to school bus routes, agricultural activities and mining operations. The Department notes that Epuron has consulted with both mines regarding the alignment of the transmission line route and location of the grid connection.

Furthermore, Epuron has committed to consulting with the road authorities, mines and schools prior to the finalisation and implementation of the Traffic Management Plan.

The Department considers the interactions between mining traffic and the construction traffic for this project can be adequately managed under the proposed Traffic Management Plan, as required under the recommended conditions.

Road Upgrades & Maintenance

The condition of Vinegaroy Road and the local road network was raised as a key issue in submissions from the community.

Residents were concerned about the suitability of the local road network to accommodate the volume of traffic proposed, and the resulting damage that would be caused to roads, culverts and cattle grids.

The traffic impact assessment of the project recognised the regional and local road network would require significant upgrades before it can suitably accommodate the proposed over-dimensional and heavy vehicle traffic.

The Department has undertaken extensive consultation with the Councils and Epuron on the proposed transport route, road upgrade and road maintenance requirements. From these discussions, the Department has recommended conditioning a detailed schedule of road works (see Appendix F) agreed to by all parties requiring Epuron to upgrade:

- up to 143 km of regional roads (i.e. Vinegaroy and Ulan Roads) and local roads;
- bridges, causeways, culverts and cattle grids as necessary; and
- intersection treatments to facilitate turning with over-dimensional vehicles.

These upgrades would be carried out to the standards and satisfaction of the relevant road authority prior to any use of the road by over-dimensional and heavy vehicles.

Due to the 36 month construction period proposed, the Department has also recommended conditions requiring Epuron to:

- carry out dilapidation surveys of the transport routes before construction, on an annual basis during construction and after decommissioning of the project; and
- repair, or pay the full cost associated with repairing any damage to the road network caused by any project-related traffic.

Once the wind farm is operational, up to 30 percent of the Community Enhancement Fund would be allocated to the ongoing maintenance of the local road network, leaving the road network in an improved state for the community.

The relevant road authorities including RMS and the Councils have advised the Department that they are satisfied with this outcome.

With these measures in place, the Department is satisfied that the project would not result in any unacceptable impacts on the capacity, efficiency or safety of the road network.

Stock Movements

Two non-associated landowners (i.e. of residences C4-4 and D7-3) raised concerns around the impacts construction traffic would have on their agricultural activities on Gundare Road and Turee Vale Road. In particular, the interference to their use of travelling stock routes and impeded access to cattle yards due to the high volume of traffic proposed.

The Department visited both properties to gain an understanding on how these activities would be disrupted.

Cooks Drive and Gundare Road were originally proposed as heavy vehicle access routes by Epuron in the Amended DA. The landowners of C4-4 informed the Department that they frequently moved cattle across Gundare Road and Coolah Creek Road which bisects their property. The use of both roads for over-dimensional vehicle access would disrupt their ability to farm cattle. In response to the Department's concerns for this property, Epuron removed the use of Gundare Road as a heavy vehicle access route for the project to minimise disruptions.

Both landowners have also suggested that relocating stockyards at the Applicant's expense could minimise interactions with construction traffic and enhance safety for farm workers handling stock for sale and veterinary check-ups.

Given the 36 month construction period and high volume of construction traffic utilising the roads, the Department has recommended a condition requiring Epuron to offer mitigation options to minimise conflicts with the landowners stock movements. Such measures could include relocating stockyards or providing additional traffic management measures for the project.

These measures would be implemented in consultation with the affected landowner prior to any over-dimensional or heavy vehicle traffic use of the applicable road.

Site Access

RMS advised that access point 9 off Vinegaroy Road did not meet Safe Intersection Sight Distances (SISD) requirements for a 100 km/h speed zone as specified in the *Austroads Guide to Road Design*. This would increase the risk of a collision occurring at this location.

In response to RMS concerns, Epuron moved the location of access point 9. While the new location would not meet SISD requirements for a 100 km/h speed zone, it would satisfy SISD requirements for a 80 km/h speed zone. Epuron has proposed to temporarily reduce the signposted speed on Vinegaroy Road near access point 9 to 80 km/h during construction.

RMS confirmed with the Department that access point 9 could be used, subject to the implementation of a traffic control plan being implemented at the intersection for use of the access during construction. The traffic control plan would include a reduced speed zone.

The Department has recommended a condition requiring the removal of access point 9 once construction is completed and the speed zone would be reinstated to 100 km/h. Access point 9 could be reinstated during the decommissioning phase of the project and would be subject to a traffic control plan.

A requirement for all access point locations and intersection upgrades to be designed and constructed to the satisfaction of the relevant road authority, prior to the use of the access point or intersection, has been included in the recommended conditions.

Conclusion

The Department considers the proposed transport routes could be upgraded to facilitate the transport of wind turbine components to the site, noting that the final upgrade works would be subject to further detailed assessment and design prior to implementation. To ensure this occurs, the Department has recommended conditions requiring Epuron to:

- undertake all necessary road upgrades for the project to the standard and satisfaction of the relevant roads authority prior to commencing the use of the relevant road along the designated transport route by any over-dimensional and heavy vehicle traffic associated with the construction of the development;
- undertake dilapidation surveys of the relevant transport routes prior to construction and decommissioning, on an annual basis during construction, and repairing any damage resulting from project-related traffic;
- prepare a detailed Traffic Management Plan in consultation with the relevant road authorities, that includes provisions for:
 - temporary traffic controls;
 - notifying the local community about project-related traffic impacts;
 - minimising potential for conflict with school bus routes, stock movements and mining traffic;
 - implementing measures to minimise development-related traffic on the public road network outside of standard construction hours;
 - responding to any emergency repair requirements or maintenance during construction and/or decommissioning;
 - a traffic management system for managing over-dimensional vehicles; and
 - a driver's code of conduct that addresses travelling speeds, fatigue management and procedures to ensure that drivers implement safe driving practices; and
- provide additional mitigation options in consultation with the landowners of C4-4 and D7-3 to mitigate potential traffic interactions with agricultural activities.

Should Epuron propose to develop the project in stages, they would be required to ensure the conditions of the consent are complied with at the relevant time and to the extent that they are relevant to the specific stage.

With these conditions in place, the Department is satisfied that the project would not result in unacceptable impacts on the capacity, efficiency or safety of the road network.

5.2 Visual

Concerns about visual impacts were raised in some public submissions, particularly regarding the size and scale of the wind farm. Epuron commissioned a Landscape and Visual Impact Assessment, which was prepared by Green Bean Design in May 2016, and provided a supplementary visual assessment in May 2017, which accompanied the RTS.

Visual Context and Landscape Character

The proposal is located on elevated ridges that form part of the Great Dividing Range, intersected by drainage lines, with turbines spanning approximately 36 km from north to south and 20 km east to west, at its widest points. The sensitivity of the landscape and the proximity of residences, and hence the nature and extent of the impacts of the project, vary considerably across the site (see Figure 9).

The area surrounding the project site is an undulating pastoral and agricultural landscape, traversed by a number of creeks and drainage lines that generally flow in a southwest direction, including the Coolaburragundy River, Turee Creek and Bounty Creek.

Coolah Tops National Park adjoins the northeastern project site boundary and covers an area of approximately 12,000 ha. While there are a number of lookouts within the park, they are all located along the northern boundary of the park and are oriented north. As such, they do not overlook the project site.

To the north and east of the project site there are dispersed settlement patterns with scattered rural homesteads. The majority of residences in these areas are oriented to take advantage of views to the north/northeast, and those that are oriented south/southwest towards the project would have limited views due to intervening topography and vegetation.

To the south and west of the project site settlement is denser, particularly in proximity to the towns of Coolah and Cassilis, and along Vinegaroy Road and the Golden Highway. Coolah is located approximately 5.9 km to the west of the closest turbine and Cassilis is located approximately 4.2 km to the south of the closest turbine. The predominant views to the project would occur from residences along Vinegaroy Road and in the larger Coolah and Cassilis areas, due to both their proximity to the project and the topography in these areas (see Figures 10 and 11).

As a result of the varying landscape characteristics and proximity to residences, the Department considers that the landscape to the south and west of the site has a higher sensitivity, as discussed further below.

Avoidance and Mitigation Measures

Epuron has reduced the maximum number of proposed turbines (i.e. from 288 to 267). While this was not necessarily done for the purpose of reducing visual impact in all cases, the Department acknowledges that it does result in a reduced visual impact on the landscape values at some non-associated residences.

Epuron is also proposing to implement a range of mitigation measures to further minimise visual impacts, including:

- painting turbines off-white/grey and finishing the blades with a treatment that minimises potential for any glare or reflection;
- locating transmission lines, substations and control buildings in areas which minimise the visual impact, where practical; and
- using building materials and treatments for associated infrastructure which visually complement the surrounding environment.

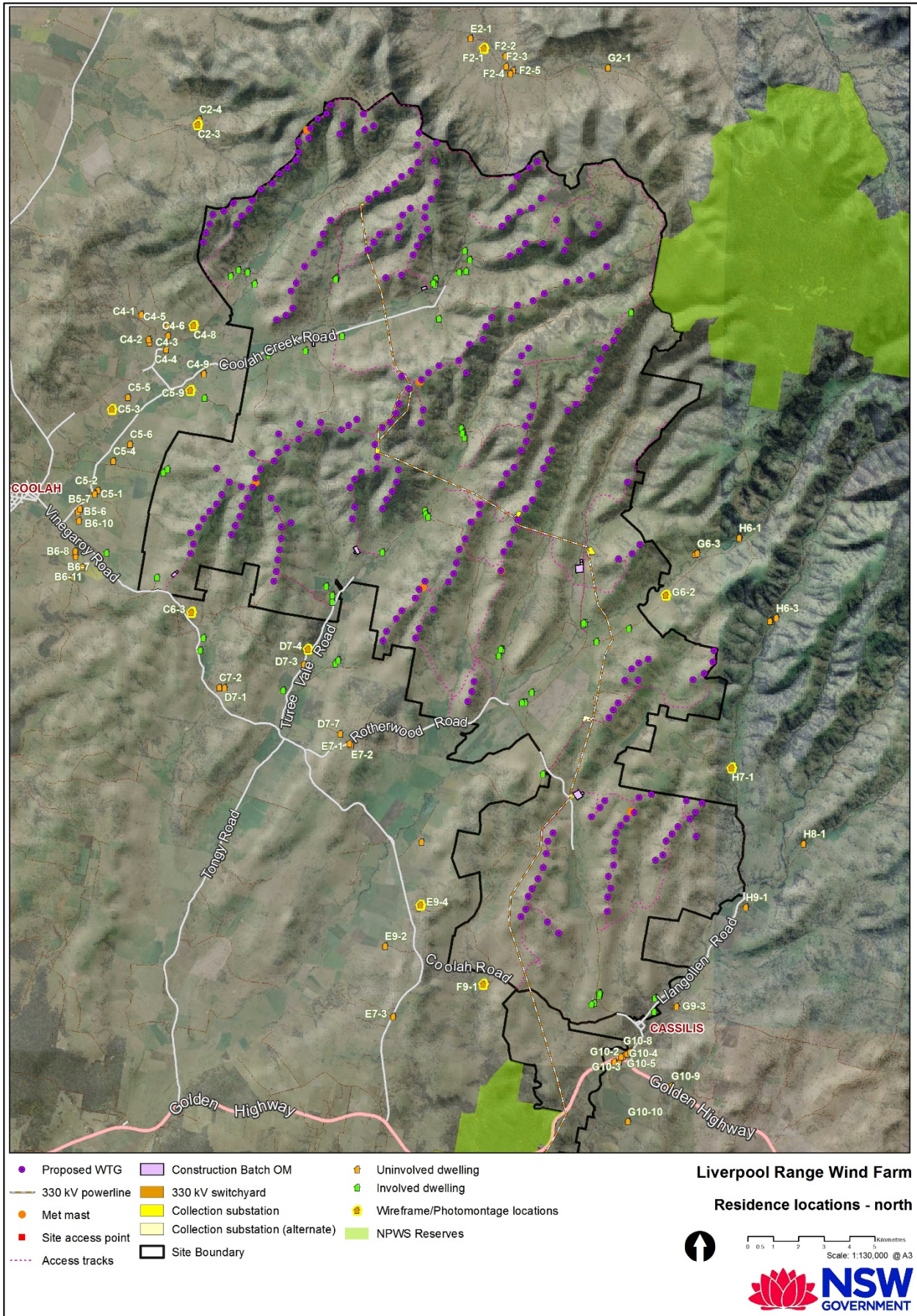


Figure 9: Residence Locations (North)

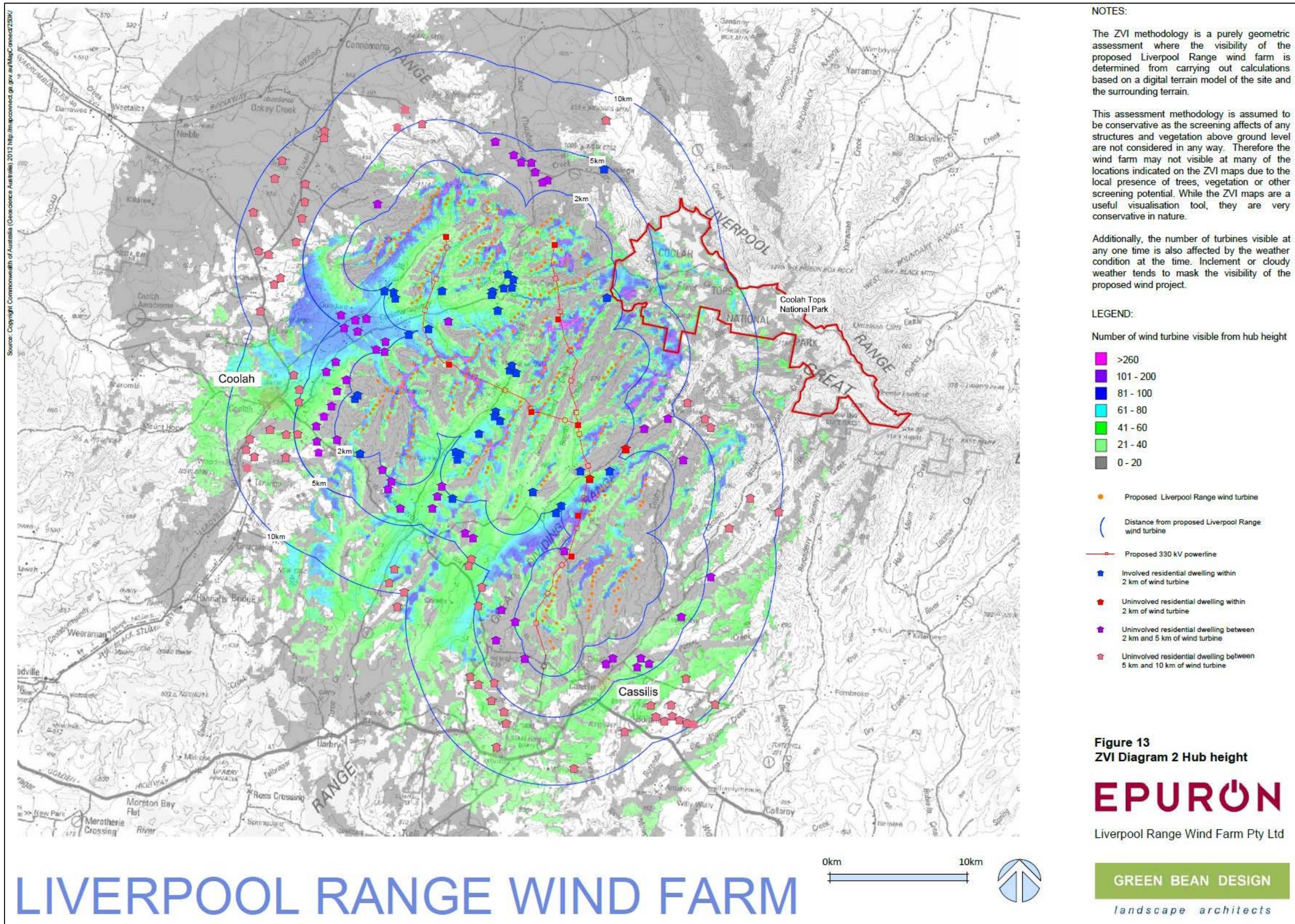


Figure 10: Zone of Visual Influence

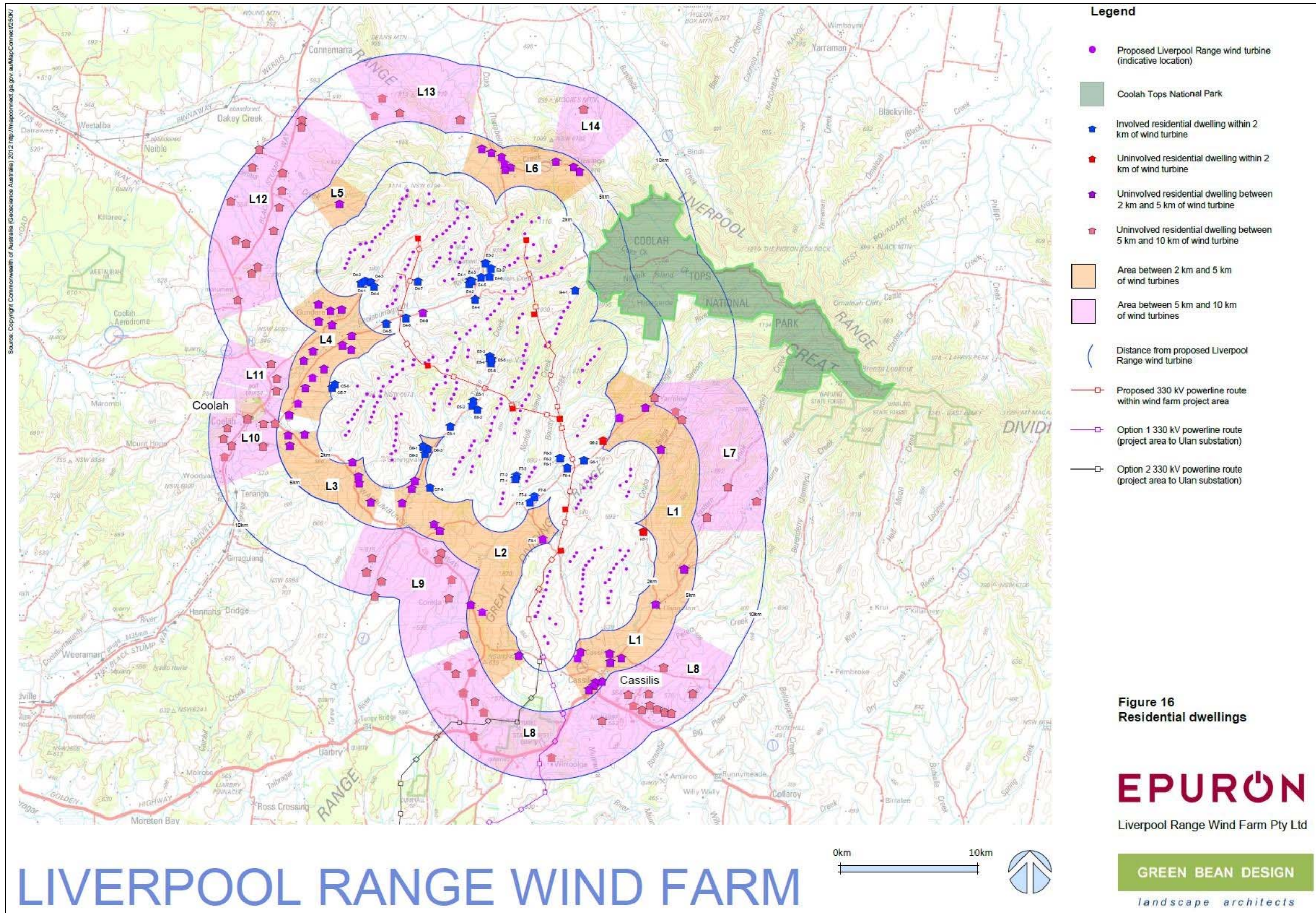


Figure 11: Visual Impact Zone Locations

Epuron has also committed to implementing appropriate visual mitigation (e.g. landscaping and screening) at any non-associated residences within 4 km of a turbine commensurate with the level of visual impact on the residence, where the applicable landowner requests such mitigation.

The Department supports the proposed avoidance and mitigation measures, however, notes that a number of residences located between 4 km and 5 km of a turbine are predicted to experience moderate visual impacts from the project.

As such, the Department considers that in addition to any non-associated residence within 4 km of a turbine being offered visual impact mitigation measures, measures should also be offered to the 14 non-associated residences located between 4 km and 5 km of a turbine that are predicted to experience moderate visual impacts from the project. The Department has recommended conditions formalising these measures.

Assessment

Epuron adopted a zone of visual influence of 10 km to assess the visual impacts of the project (see Figure 10). The assessment concluded that residences greater than 10 km from the project would be unlikely to experience any visual impacts due to a combination of distance and screening from topography and vegetation.

In addition to undertaking a quantitative analysis of visibility, Epuron undertook a qualitative assessment of visual impact from 50 viewpoints, including:

- 18 viewpoints within 2 km;
- 24 viewpoints between 2 km and 5 km; and
- 8 viewpoints between 5 km and 10 km.

Epuron's assessment divided the viewpoints between 2 km and 10 km into zones, based on location, distance and landscape character (see Figure 11). Of the 50 viewpoints, photomontages were prepared in the EA for 11 locations, including 3 residences and 8 public viewpoints, to demonstrate the scale and impact of the project.

The RTS included further detailed assessment and additional wireframe analysis for 18 locations, including 15 non-associated residences and 2 public viewpoints. Additionally, in response to the landowner's submission on the RTS, Epuron provided a wireframe analysis for residence C5-3.

Epuron's assessment found no non-associated residences have the potential to experience high visual impacts from the project. However, 1 non-associated residence (i.e. C4-8) has the potential to experience moderate/high visual impacts and 22 non-associated residences have the potential to experience moderate visual impacts, all of which are located in either Zone L2, L3 or L4 to the south and west of the project site.

The landowners of 5 of the 22 non-associated residences that Epuron's assessment found would have moderate impacts objected to the project due to visual impacts (including residences C4-4, C4-5, C4-9, D5-3, D7-4).

The Department largely agreed with Epuron's assessment, as it considers the same 1 non-associated residence would have moderate/high visual impacts and 22 non-associated residence would have moderate visual impacts.

However, the Department also considers that an additional 2 non-associated residences in Zone L2 and 1 non-associated residence in Zone L5 have the potential to experience moderate visual impacts from the project.

Epuron's assessment of all non-associated residences located within 5 km of a turbine, including the non-associated residences that would have either moderate/high or high visual impacts, and the Department's consideration and recommendations, is summarised below.

Zone L1

Table 6 summarises Epuron's assessment, the Department's consideration and recommendations for non-associated residences located within Zone L1, with impacts primarily attributed to turbines in the southeastern portion of the site. Figures 12 and 13 provide examples of wireframe analysis from representative viewpoints within this zone (i.e. residences G6-2 and H7-1).

Table 6: Visual Impact Assessment – Zone L1

| Residence | Distance to closest turbine (km) | Closest Turbine No. | Epuron's assessed impact | Department's consideration | Recommended mitigation strategy |
|------------------|---|----------------------------|---------------------------------|-----------------------------------|--|
| G6-2 | 2.098 | 168 | Low/Moderate | Low/Moderate | Visual mitigation measures |
| G6-3 | 2.249 | 214 | Low/Moderate | Low/Moderate | Visual mitigation measures |
| G9-3 | 4.605 | 241 | Low/Moderate | Low/Moderate | No mitigation required |
| H6-1 | 3.897 | 214 | Low/Moderate | Low/Moderate | Visual mitigation measures |
| H6-3 | 2.719 | 249 | Low/Moderate | Low/Moderate | Visual mitigation measures |
| H7-1 | 1.795 | 240 | Low | Low/Moderate | Visual mitigation measures |
| H8-1 | 4.226 | 250 | Low/Moderate | Low/Moderate | No mitigation required |
| H9-1 | 3.388 | 250 | Low/Moderate | Low/Moderate | Visual mitigation measures |

The Department considers that all non-associated residences located within Zone L1 would have low/moderate visual impacts as the views toward turbines would be partially screened through a combination of landform and existing vegetation. Notably, while residence H7-1 is the nearest non-associated residence located in proximity to a turbine, Epuron has further set back Turbine No. 240 from the project site boundary so that it is no longer visible from residence H7-1.

As such, the Department considers that only those residences in Zone L1 located within 4km from the nearest turbine should be offered additional visual impact mitigation measures, such as landscaping and screening, to mitigate any residual visual impacts.

Zone L2

Table 7 summarises Epuron's assessment, the Department's consideration and recommendations for non-associated residences located within Zone L2, with impacts primarily attributed to turbines in the southwestern portion of the site. Figures 14, 15 and 16 provide examples of wireframe analysis from representative viewpoints within this zone (i.e. residences F9-1, E9-4, and D7-4).

Table 7: Visual Impact Assessment – Zone L2

| Residence | Distance to closest turbine (km) | Closest Turbine No. | Epuron's assessed impact | Department's consideration | Recommended mitigation strategy |
|------------------|---|----------------------------|---------------------------------|-----------------------------------|--|
| N/A | 4.720 | 285 | Not assessed | Moderate | Visual mitigation measures |
| D7-3 | 3.265 | 201 | Not assessed | Moderate | Visual mitigation measures |
| D7-4 | 2.926 | 201 | Moderate | Moderate | Visual mitigation measures |
| D7-7 | 4.017 | 201 | Moderate | Moderate | Visual mitigation measures |
| E7-1 | 4.248 | 201 | Moderate | Moderate | Visual mitigation measures |
| E7-2 | 4.281 | 201 | Moderate | Moderate | Visual mitigation measures |
| E9-4 | 4.000 | 237 | Low/Moderate | Low/Moderate | Visual mitigation measures |
| F9-1 | 3.026 | 237 | Low/Moderate | Low/Moderate | Visual mitigation measures |

Notes:

- Residence 'N/A' was not identified in Epuron's assessment. This residence's address is 121 Coinda Road, Cassilis.
- Residence F8-1 is now considered associated as it was purchased by an associated landowner.

The Department considers that the majority of non-associated residences located within Zone L2 would have moderate visual impacts. While the majority of residences are located 4 km or more from the nearest turbines, they would have wide-ranging horizontal views along and across valleys toward turbines located on hilltop and ridgeline areas in 3 or more 60° sectors, despite partial screening due to existing vegetation.

As such, to mitigate this impact the Department considers that all residences located within Zone L2, including those residences located greater than 4km from the nearest turbine, should be offered additional visual impact mitigation measures, such as landscaping and screening.

Zone L3

Table 8 summarises Epuron's assessment, the Department's consideration and recommendations for non-associated residences located within Zone L3, with impacts primarily attributed to turbines in the western portion of the project. Figures 17 and 18 provides an example of a photomontage from a public viewpoint location on Vinegaroy Road, in the vicinity of non-associated residence C6-3.

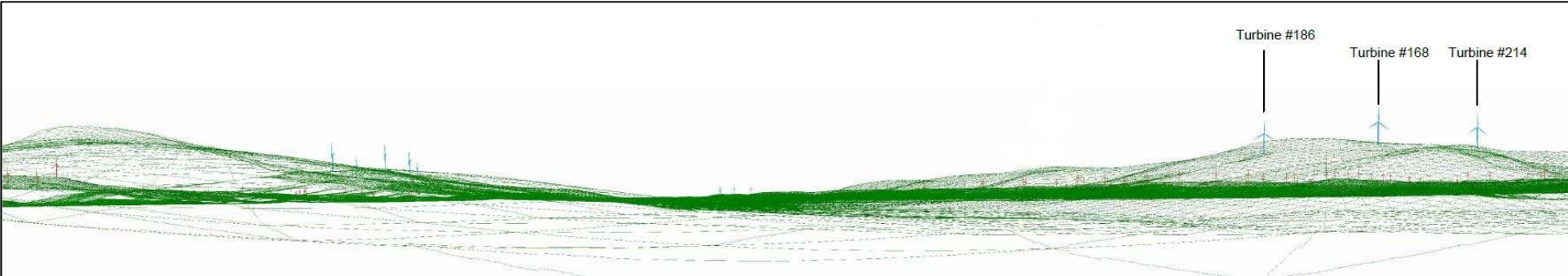


Figure 12: Residence G6-2 Wireframe Analysis (Zone L1)

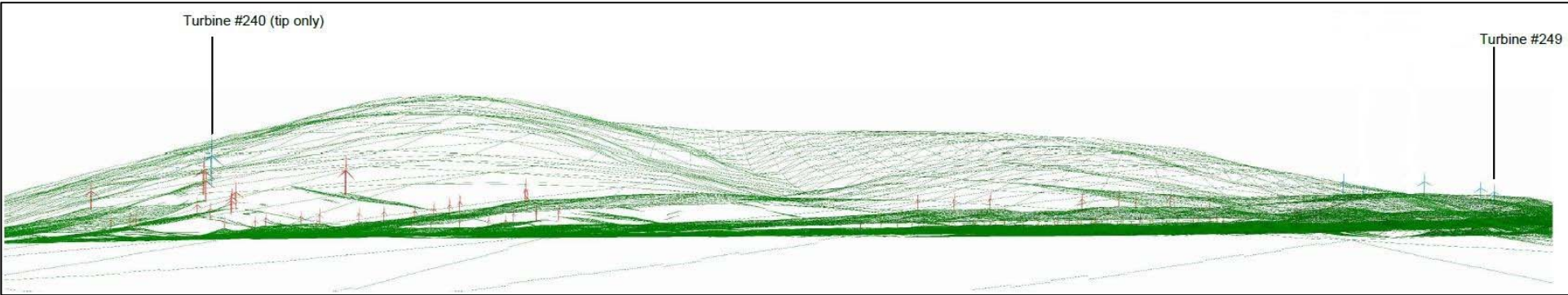


Figure 13: Residence H7-1 Wireframe Analysis (Zone L1)

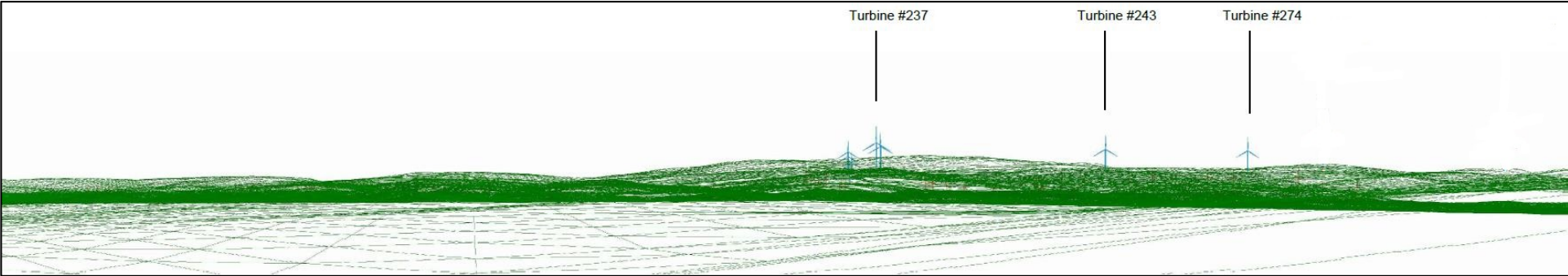


Figure 14: Residence F9-1 Wireframe Analysis (Zone L2)

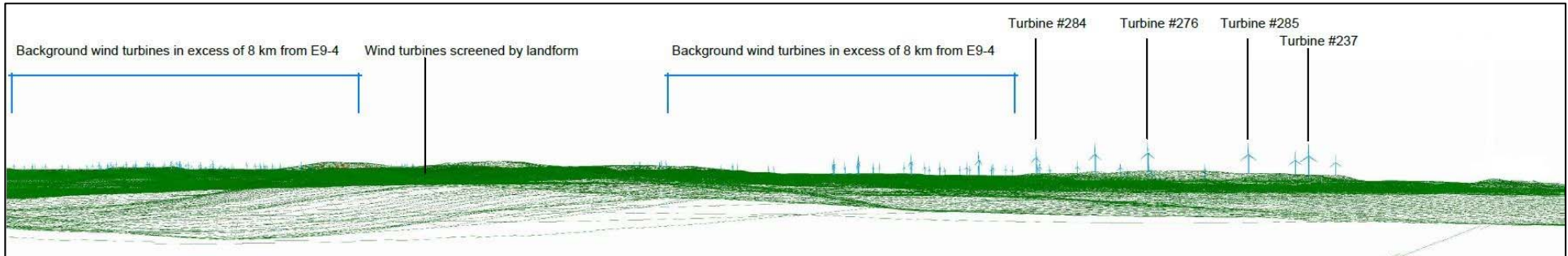


Figure 15: Residence E9-4 Wireframe Analysis (Zone L2)

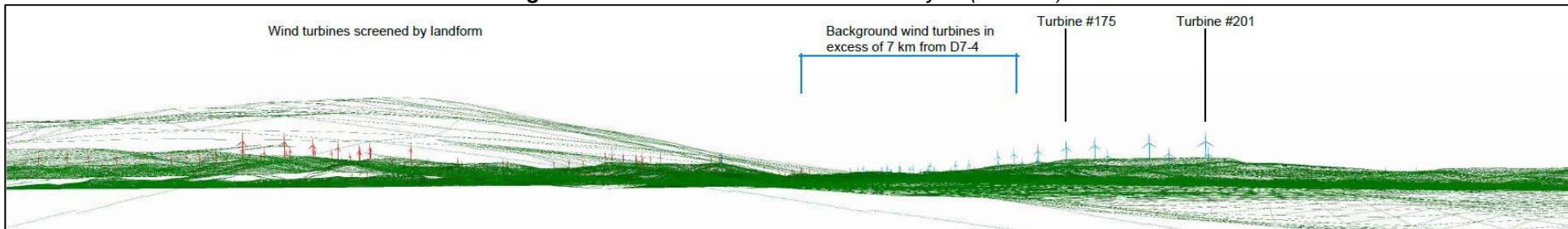


Figure 16: Residence D7-4 Wireframe Analysis (Zone L2)

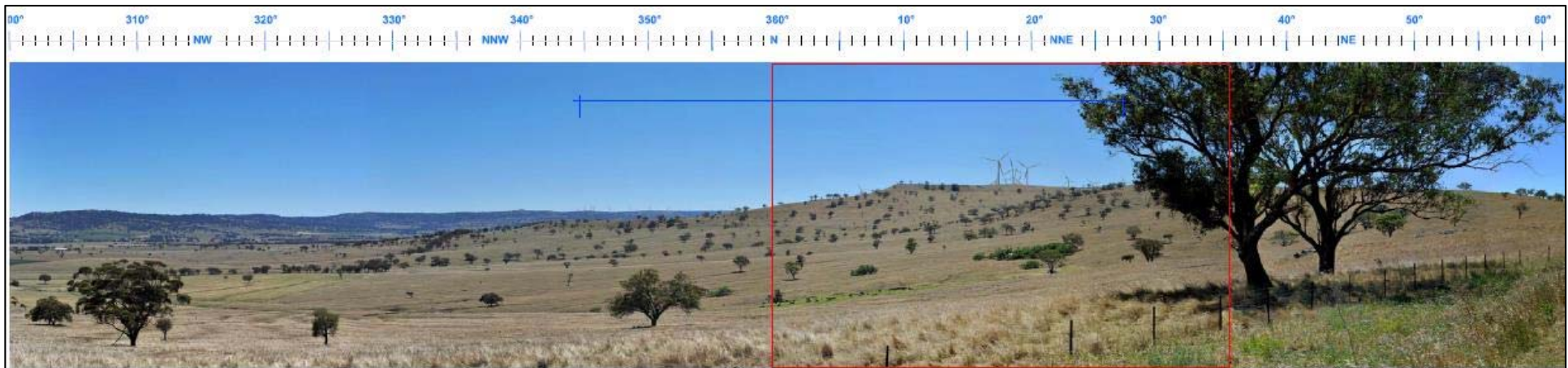


Figure 17: Photomontage looking towards turbines in the western area of the project from a public viewpoint on Vinegaroy Road in the vicinity of residence C6-3 (Zone L3)



Figure 18: Single frame photo looking towards turbines in the western area of the project from a public viewpoint on Vinegaroy Road in the vicinity of residence C6-3 (Zone L3)

Table 8: Visual Impact Assessment – Zone L3

| Residence | Distance to closest turbine (km) | Closest Turbine No. | Epuron's assessed impact | Department's consideration | Recommended mitigation strategy |
|------------------|---|----------------------------|---------------------------------|-----------------------------------|--|
| C6-3 | 2.284 | 23 | Moderate | Moderate | Visual mitigation measures |
| C7-2 | 4.691 | 126 | Moderate | Moderate | Visual mitigation measures |
| D7-1 | 4.615 | 126 | Moderate | Moderate | Visual mitigation measures |

Similar to Zone L2, the Department considers that all non-associated residences located within Zone L3 would have moderate visual impacts as they would have wide-ranging horizontal views along and across valleys toward turbines located on hilltop and ridgeline areas in 3 or more 60° sectors, despite partial screening due to existing vegetation.

As such, to mitigate this impact the Department considers that all residences located within Zone L3, including those residences located greater than 4km from the nearest turbine, should be offered additional visual impact mitigation measures, such as landscaping and screening.

Zone L4

Table 9 summarises Epuron's assessment, the Department's consideration and recommendations for non-associated residences located within Zone L4, with impacts primarily attributed to turbines in the northwestern portion of the site. Figures 19, 20 and 21 provide examples of wireframe analysis from representative viewpoints within this zone (i.e. residences C4-8, C5-9 and C5-3).

Table 9: Visual Impact Assessment – Zone L4

| Residence | Distance to closest turbine (km) | Closest Turbine No. | Epuron's assessed impact | Department's consideration | Recommended mitigation strategy |
|------------------|---|----------------------------|---------------------------------|-----------------------------------|--|
| C4-1 | 3.631 | 116 | Moderate | Moderate | Visual mitigation measures |
| C4-2 | 4.278 | 116 | Moderate | Moderate | Visual mitigation measures |
| C4-3 | 4.360 | 116 | Moderate | Moderate | Visual mitigation measures |
| C4-4 | 4.370 | 116 | Moderate | Moderate | Visual mitigation measures |
| C4-5 | 3.500 | 116 | Moderate | Moderate | Visual mitigation measures |
| C4-6 | 3.820 | 116 | Moderate | Moderate | Visual mitigation measures |
| C4-7 | 3.478 | 116 | Moderate | Moderate | Visual mitigation measures |
| C4-8 | 3.200 | 116 | Moderate/High | Moderate/High | Visual mitigation measures |
| C4-9 | 3.582 | 42 | Moderate | Moderate | Visual mitigation measures |
| C5-1 | 4.081 | 61 | Moderate | Moderate | Visual mitigation measures |
| C5-2 | 4.028 | 61 | Moderate | Moderate | Visual mitigation measures |
| C5-3 | 4.746 | 102 | Moderate | Moderate | Visual mitigation measures |
| C5-4 | 4.104 | 102 | Moderate | Moderate | Visual mitigation measures |
| C5-5 | 4.487 | 102 | Moderate | Moderate | Visual mitigation measures |
| C5-6 | 3.561 | 102 | Moderate | Moderate | Visual mitigation measures |
| C5-9 | 3.229 | 102 | Moderate | Moderate | Visual mitigation measures |

Note: Residence D4-9 is now considered associated.

Similar to Zones L2 and L3, the Department considers that all non-associated residences located within Zone L4, except for residence C4-8, would have moderate visual impacts as they would have wide-ranging horizontal views along and across valleys toward turbines located on hilltop and ridgeline areas in 2 or more 60° sectors, despite partial screening due to existing vegetation. The Department considers these impacts could be mitigated through appropriate landscaping and screening.

Residence C4-8 is the only residence considered to have moderate/high visual impacts from the project. This residence is located on a sloping hillside above the valley floor with views towards turbines extending over 180° from the turbine nearest to it (i.e. Turbine No. 116 at 3.2 km) located to its northeast to more distant groupings of turbines between 5.5 km and 7.5 km away to the southeast (see Figure 16).

Despite the moderate/high visual impacts on residence C4-8, the Department considers these impacts could be mitigated through appropriate landscape screening, as landscape mitigation within proximity to the dwelling and its curtilage could screen its medium to long distance views of turbines to the northeast and southeast.

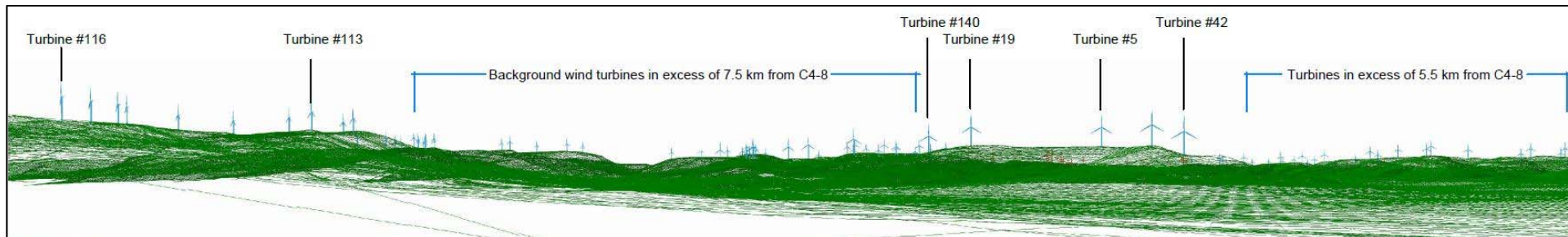


Figure 19: Residence C4-8 Wireframe Analysis (Zone L4)

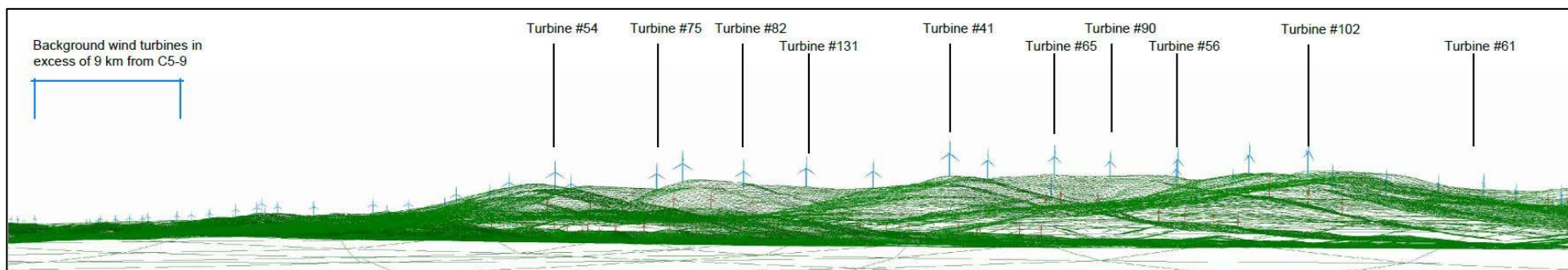


Figure 20: Residence C5-9 Wireframe Analysis (Zone L4)

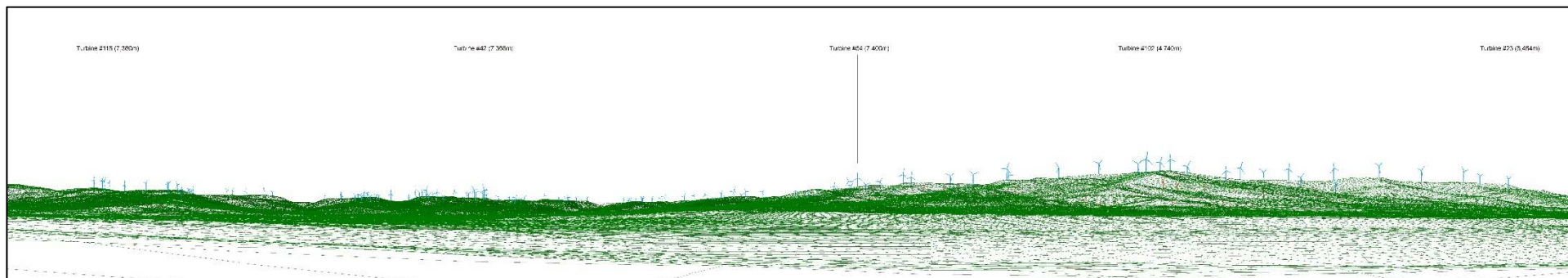


Figure 21: Residence C5-3 Wireframe Analysis (Zone L4)

As such, the Department considers that all residences located within Zone L4, including those residences located greater than 4km from the nearest turbine, should be offered additional visual impact mitigation measures, such as landscaping and screening.

Zones L5 and L6

Table 10 summarises Epuron's assessment, the Department's consideration and recommendations for non-associated residences located within Zones L5 and L6, with impacts primarily attributed to turbines in the northern portion of the site. Figure 22 provides a wireframe analysis from a representative viewpoint within this zone, (i.e. residence C2-3) and Figures 23 and 24 provides an example of a photomontage from a public viewpoint location on Pandora's Road, in the vicinity of non-associated residence F2-1.

Table 10: Visual Impact Assessment – Zones L5 and L6

| Residence | Distance to closest turbine (km) | Closest Turbine No. | Epuron's assessed impact | Department's consideration | Recommended mitigation strategy |
|------------------|---|----------------------------|---------------------------------|-----------------------------------|--|
| C2-3 | 3.265 | 91 | Low/Moderate | Moderate | Visual mitigation measures |
| C2-4 | 3.483 | 91 | Low/Moderate | Low/Moderate | Visual mitigation measures |
| E2-1 | 4.143 | 107 | Low/Moderate | Low/Moderate | No mitigation required |
| F2-1 | 4.118 | 107 | Low/Moderate | Low/Moderate | No mitigation required |
| F2-2 | 4.347 | 142 | Low/Moderate | Low/Moderate | No mitigation required |
| F2-3 | 3.950 | 142 | Low/Moderate | Low/Moderate | Visual impact mitigation |
| F2-4 | 3.615 | 142 | Low/Moderate | Low/Moderate | Visual impact mitigation |
| F2-5 | 3.704 | 142 | Low/Moderate | Low/Moderate | Visual impact mitigation |
| G2-1 | 4.605 | 142 | Low/Moderate | Low/Moderate | No mitigation required |

The Department considers that all non-associated residences located within Zones L5 and L6, except for residence C2-3, would have low/moderate visual impacts as their views of the project would be largely restricted to turbines elevated along the northern edge of the project site.

As such, the Department considers that only those residences in Zones L5 and L6 located within 4 km from the nearest turbine should be offered additional visual impact mitigation measures, such as landscaping and screening, to mitigate any residual visual impacts.

In summary, the Department considers that the landowners of the following residences should be entitled to request visual impact mitigation measures to minimise visual impacts at their residences, and has recommended conditions accordingly:

- all non-associated residences that would have moderate or moderate/high visual impacts, regardless of their distance to the nearest turbine (including residences C4-2, C4-3, C4-4, C5-1, C5-2, C5-3, C5-4, C5-5, C7-2, D7-1, D7-7, E7-1, E7-2 and 121 Coinda Road located within Zones L2, L3 and L4 between 4 km and 5 km of a turbine); and
- all non-associated residences located within 4 km of any turbine.

Public Viewpoints

As all public lookouts in the area are located along the northern boundary of Coolah Tops National Park and are oriented north, public viewpoints would be limited to road users. The Department notes the Golden Highway, Vinegaroy Road (Warrumbungles Way) and Black Stump Way are the only major roads near the project site with significant volumes of traffic.

Vinegaroy Road is the main route connecting Coolah to Cassilis via the Golden Highway. For the majority of its 33 km length it would be located between 2 km to 5 km from the nearest turbine. While intervening topography and vegetation would limit views in some areas, motorists travelling along Vinegaroy Road would have views of turbines for the majority of the trip.

Additionally, motorists on local roads, including Gundare Road, Coolah Creek Road, Pandora Pass Road, State Forest Road, Turee Vale Road, Yarrowonga Road, Rotherwood Road, Llangolen Road and Cooba Bulga Road would have views of turbines. However, given the largely transient nature of views from moving vehicles and the very low traffic volumes on these roads, potential impacts would not be significant.

Similarly, views of the project from the Golden Highway and Black Stump Way would be limited, as they would be distant (i.e. 5 to 7 km) and temporary.

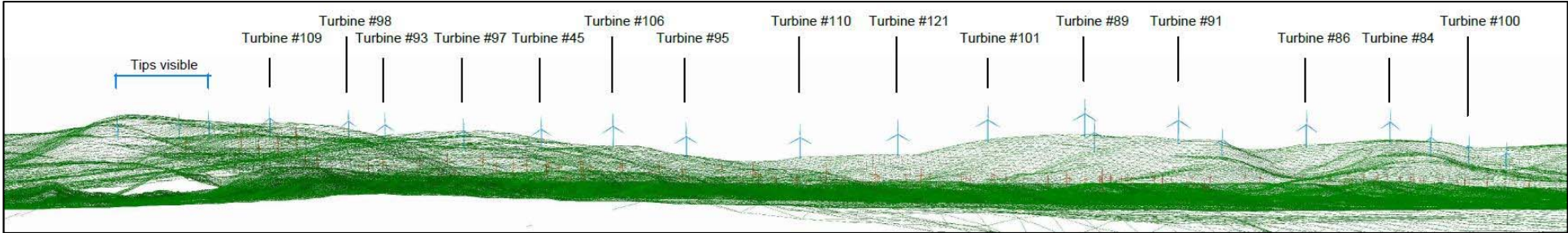


Figure 22: Residence C2-3 Wireframe Analysis (Zone L5)

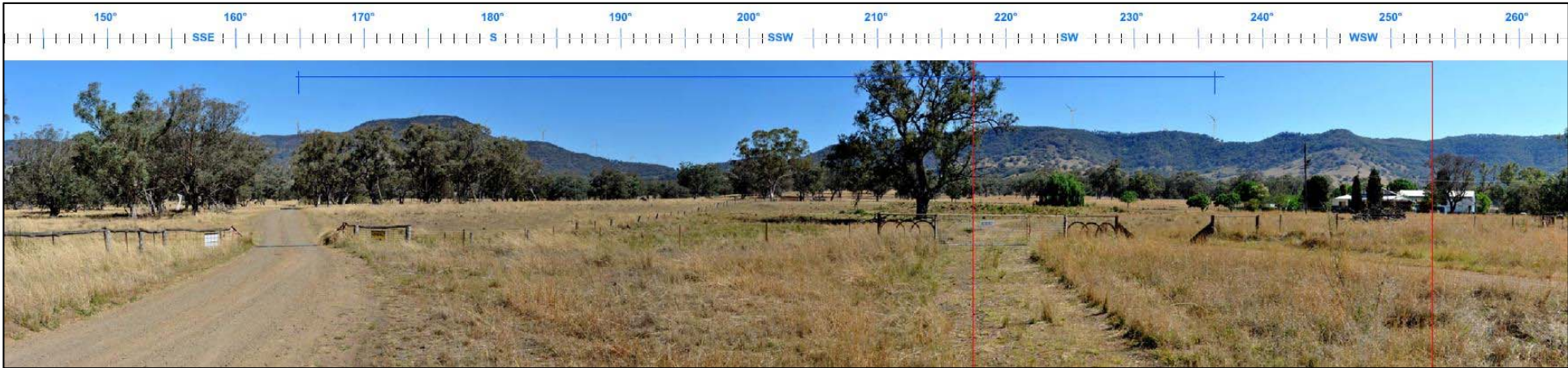


Figure 23: Photomontage looking towards turbines in the northwestern area of the project from a public viewpoint on Pandora's Road in the vicinity of residence F2-1 (Zone L6)



Figure 24: Photomontage looking towards turbines in the northwestern area of the project from a public viewpoint on Pandora’s Road in the vicinity of residence F2-1 (Zone L6)

Ancillary Infrastructure

In regard to the project's ancillary infrastructure, (e.g. collection substations, connection substation, 330 kV transmission line and cabling), Epuron has sited this infrastructure to minimise its visual impacts by locating it in areas screened by local topography and vegetation, where possible.

As such, potential views of the ancillary infrastructure would be limited to road users and a number of rural residences, mostly on either side of the proposed 330 kV transmission line.

The proposed 330 kV transmission line runs generally in a north to south direction through the centre of the project site and traverses Coolah Creek Road, Turee Vale Road, Yarrawonga Road, Rotherwood Road and Coolah Road before crossing the Golden Highway south of Cassilis. Once across the Golden Highway, the transmission line alignment generally follows Ulan Road before terminating at the proposed connection substation site near the Sandy Hollow Gulgong Railway.

Figure 25 provides an example of the predicted view of the 330 kV transmission line from a public viewpoint on Coolah Road, located approximately 200 m to the transmission line's northeast, and Figure 26 provides an example of the predicted view of the 330 kV transmission line from a public viewpoint on Ulan Road, located in the vicinity of Ulan Mine.

Epuron's LVIA determined that the 330 kV transmission line would not have a significant visual impact on any non-associated residences due to the undulating nature of the local landform and distribution of vegetation cover along the transmission line's route.

The Department also considered the visual impact associated with the project's ancillary infrastructure, noting that Epuron has amended the alignment of the 330 kV transmission line infrastructure in the Amended DA to minimise its visual impacts, where possible. The amended alignment reduces the overall footprint required, which results in a net reduction in visual impacts in addition to a reduction in the amount of vegetation clearing required.

Notwithstanding, a number of residences are still located in close proximity to the transmission line alignment (see Figure 27), including:

- residence C12-2, located to the west of Ulan Road 195 m from the transmission line;
- residence C14-1, located to the west of Ulan Road 162 m from the transmission line;
- residence C13-4 and C13-5, located to the east of Ulan Road approximately 290 m from the transmission line; and
- residence C13-7, located to the east of Ulan Road approximately 264 m from the transmission line.

Significant vegetation cover exists at all of these non-associated residences either at the dwelling or between the dwelling and the proposed transmission line alignment. While construction of the transmission line would require a 60 m wide easement corridor of vegetation to be cleared, sufficient vegetation cover would remain between the residences and the transmission line to largely screen views.

As the remaining residences would have distant views of the transmission line either partially or wholly screened by existing vegetation, and the transmission infrastructure largely blends in with its background (see Figure 25) the Department considers the transmission line is unlikely to have a significant visual impact on both landscape character and individual residences. The Department also notes that the proposed transmission line is not inconsistent with other land uses in the area which include existing transmission lines, and agricultural and mining infrastructure.

Further, due to distance and intervening topography, no non-associated residences would have views of either the connection or collection substations.

Other Visual Effects – Shadow Flicker and Blade Glint

Shadow flicker occurs when rotating blades momentarily block the sun's path. Epuron conducted a shadow flicker assessment having regard to the *Policy and Planning Guidelines for the Development of Wind Energy Facilities in Victoria* (Department of Planning and Community Development, 2012), which recommends a maximum shadow flicker duration of 30 hours per year.



Figure 25: Photomontage looking southwest towards 330 kV transmission line from a public viewpoint on Coolah Road



Figure 26: Photomontage looking southwest towards 330 kV transmission line from a public viewpoint on Ulan Road

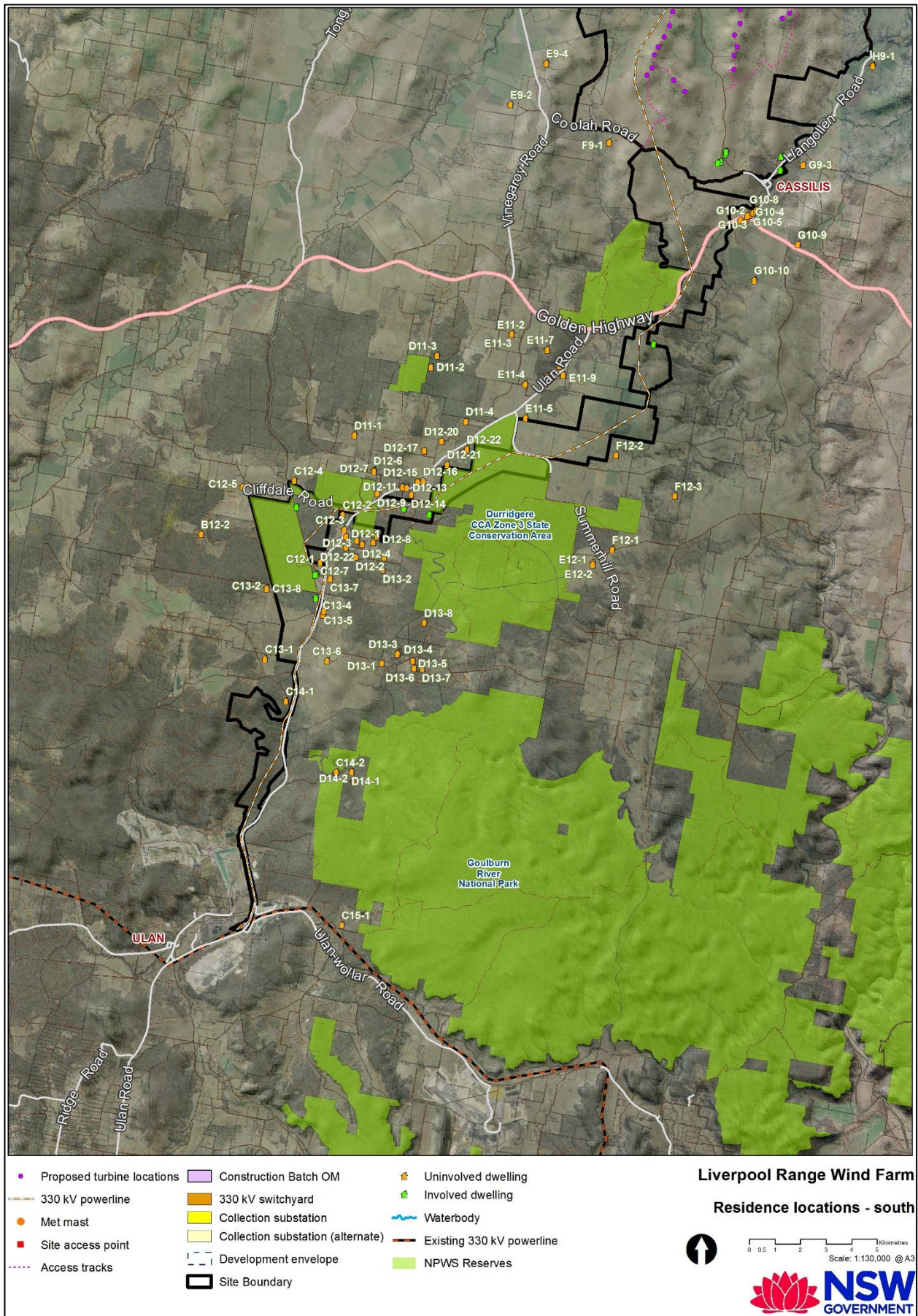


Figure 27: Residence Locations (South)

Epuron's assessment concluded that with the removal of a number of turbines as proposed in the Amended DA, all non-associated residences would experience less than 30 hours of shadow flicker per year. The Department has incorporated this limit in the recommended conditions.

Blade glint (reflection of sunlight off the turbine blade) could also have temporary effects at a given location, depending on the orientation of the blades and nacelle in relation to the sun. While there are no guidelines for blade glint, the 2012 Victorian guidelines recommend that blades are finished with a surface treatment of low reflectivity to ensure that glint is minimised.

The Department is satisfied that blade glint could be effectively managed through appropriate turbine treatments, such as the use of low sheen and matte finishes, to ensure negligible impacts, and has recommended conditions accordingly.

Obstacle Lighting

Under the *National Airports Safeguarding Framework, Guideline D – Managing the Risk to Aviation Safety of Wind Turbine Installations (Wind Farms) / Wind Monitoring Towers, National Airports Safeguarding Advisory Group, 2012* (NASAG Guidelines) CASA is required to be notified if a proposed wind turbine or wind monitoring tower is greater than 150 m in height or infringes on the Obstacle Limitation Surfaces of an aerodrome. CASA may determine, and subsequently advise a proponent and relevant planning authorities, whether obstacle lighting is required.

Epuron's Aviation Impact Assessment assessed the need to install obstacle lighting for the project and concluded that while the turbines do marginally infringe on navigable airspace, the project is not considered a hazard to aircraft safety based on its remoteness from aerodromes likely to be used for night operations navigated by visual flight rules. CASA agreed with Epuron's assessment that the project is not considered a hazard to aircraft safety due to its remote location, and as such does not require obstacle lighting.

Notwithstanding, the Department has recommended conditions requiring Epuron to consult with CASA about this matter, and ensure that if obstacle lighting is required to be installed for any reason at a later date, it is installed in accordance with CASA requirements and in a manner that minimises any adverse visual impacts.

The consideration of obstacle lighting is particularly relevant as the project is located approximately 85 km southeast of Siding Spring Observatory and therefore falls within the Dark Sky Region covered by the NSW Government's *Dark Sky Planning Guideline*. A consent authority must consider this guideline for SSD that within 200 km of the Observatory and could potentially impact the night sky.

However, as obstacle lighting is not required, the Department considers that the project would not impact on observing conditions at the Observatory.

Conclusion

The Department acknowledges that the project would change the visual landscape of the locality and that there would be some residual impacts to residences in areas where the topography, lack of intervening vegetation and relatively exposed views towards the ridgelines would increase the overall visibility of the project.

To minimise and manage the residual visual and lighting impacts as far as practicable, the Department has recommended conditions requiring Epuron to:

- offer visual impact mitigation measures, such as landscaping and/or vegetation screening, to all non-associated residences within 4 km of any approved turbine and all non-associated residences within 4 km to 5 km characterised as having moderate visual impacts;
- implement all reasonable and feasible measures to minimise the impacts of the visual appearance of the development;
- implement all reasonable and feasible measures to minimise the off-site lighting impacts of the development; and
- ensure that shadow flicker associated with turbines does not exceed 30 hours per annum at any non-associated residence.

5.3 Noise

The project site is located within a quiet rural environment. Background noise levels of less than 30 dB(A) during calm weather conditions are typical for such rural settings in the absence of other industrial, rail and road inputs.

Epuron commissioned 2 noise impact assessments throughout the assessment period, including:

- Liverpool Range Wind Farm Noise Impact Study, SLR Consulting Australia Pty Ltd, March 2014; and
- Liverpool Range Wind Farm Noise Impact Assessment - Amendment, SLR Consulting Australia Pty Ltd, February 2017.

These assessments were prepared in accordance with the applicable guidelines, including South Australia's *Environmental Noise Guidelines: Wind Farms (2003)* (SA Guidelines), which provides the accepted methodology for assessing wind farm noise in NSW.

Construction Noise

The construction period is estimated to be between 24 to 36 months, including a shorter 12 to 15 month period where civil works would be undertaken. Should construction of the project be developed in stages, the length of time between the commencement of construction and completion of the project could extend beyond 36 months.

The noise assessment indicates that construction noise would be well below the highly noise affected criterion of 75 dB(A) specified in the EPA's *Interim Construction Noise Guideline (2009)* (ICNG) for all non-associated residences for construction during standard hours (i.e. 7 am to 6 pm Monday to Friday, and 8 am to 1pm Saturday).

At the time of lodging the DA, the noise assessment predicted up to 34 non-associated residences would temporarily be subject to noise above the 'noise affected criterion' of 40 dB(A) from construction. Since then, Epuron has reached landowner agreements with additional residences, reducing the number of affected residences to 23 (see Figure 28).

The higher noise levels are attributed to the establishment of turbine tower foundations. Due to the large area of the project site and progressive nature of wind farm construction, the intensive civil works located close to this residence would occur within a shorter period of time (i.e. approximately 2 to 3 weeks).

The highest increase is predicted at residence (C5-6) with noise levels of up to 50 dB(A), although most of the 23 residences would experience temporary noise in the 40 – 45 dB(A) range. This is below the recommended internal noise levels of 45 dB(A) for noise at other sensitive land uses (such as school classrooms, hospital wards and places of worship).

While amenity levels in the *Noise Policy for Industry (EPA 2017)* are not used directly as regulatory limits and apply to noise from industry rather than construction, the project amenity noise level which represents the objective for noise from a single industrial development is 45 dB(A) for a rural residential receiver during the day.

Epuron has committed to implementing a number of standard measures to minimise construction noise from the project (including fixed noise sources such as the rock crushing and concrete batching plants), which may include construction of temporary acoustic barriers, use of proprietary enclosures around machines and notifying potentially impacted residents of the nature of works prior to construction.

The Department has recommended conditions requiring Epuron to implement all reasonable and feasible measures to minimise construction noise in accordance with best practice requirements outlined in the ICNG, or its latest version.

Examples of reasonable and feasible measures could include the construction of temporary acoustic barriers, the use of silencers, the substitution of alternative construction processes and the fitting of broadband reversing signals.

Although the potential staging of the project would extend the end to end date of construction, the Department considers this would be acceptable as there are no highly noise affected receivers and the time between stages would provide respite.

As such, the Department considers that the proposed construction activities are unlikely to result in significant adverse impacts during daytime hours and consequently has developed conditions restricting construction works to standard hours, with no work on Sundays or NSW public holidays.

However, the Department acknowledges that there may be some instances where construction activities may be required to be undertaken outside of these hours (such as emergency works or other works that are inaudible at any non-associated residence) and has recommended conditions allowing for these activities to be undertaken in accordance with these pre-conditions.

Construction Traffic Noise

Traffic noise impacts from increased project-related traffic are separately assessed against noise criteria in the NSW *Road Noise Policy* (2011) (RNP).

Several local submissions were particularly concerned about noise impacts associated with the general increase in daily traffic along the proposed access routes. Disturbance levels would be directly related to the proximity of a residence to an access route. D7-3 is the closest residence to the road, with a setback distance of around 24 m and predicted to experience noise levels of up to 58 dB(A)_{L_{Aeq}} (1 hour).

The Department met with 4 of the 5 non-associated residences (i.e. C4-4, D7-3, D7-4, E7-1 and E9-3) predicted to experience construction traffic noise levels above the RNP criterion to discuss potential mitigation options. These residences are all located within 60 m of the road easement, with C4-4, D7-3, D7-4 and E9-3 located on quiet local roads.

With Epuron's removal of site access point 18, the over-dimensional and heavy vehicle transport route would no longer include Gundare Road, and as such, exceedance of the road noise criteria would not occur at non-associated residence C4-4.

E7-3 is located on Vinegaroy Road and would experience increased traffic noise for the full duration of construction, while D7-3, D7-4 on Turee Vale Road and E7-1 on Rotherwood Road would be affected over a shorter period of between 12 to 15 months where the bulk of over-dimensional vehicles would use these roads. The frequency of vehicle movements would vary on a daily basis, depending on the construction activities occurring at the time.

In accordance with the RNP's general principles of providing noise abatement for road traffic noise, Epuron proposes to apply a range of mitigation measures to reduce impacts at these residences, such as providing double glazing, insulation, and/or air conditioning prior to the use of the relevant site access route by heavy and over-dimensional vehicles. As a guide, the difference between the internal noise level and the external noise level is typically 10 dB with windows open for adequate ventilation.

The Department is satisfied that the proposed mitigation measures would be sufficient to minimise noise impacts from the project and has recommended conditions requiring Epuron to:

- offer noise mitigation measures, such as providing double glazing, insulation, and/or air conditioning, to non-associated residences D7-3, D7-4, E7-1 and E9-3; and
- manage traffic movements and implement a driver's code of conduct that addresses travelling speeds as part of a Traffic Management Plan for the project.

Operation

Noise monitoring was undertaken from 19 September 2012 to 4 November 2012 and 13 August 2013 to 16 September 2013 at 4 locations to determine background noise levels. In response to comments received from the EPA on the Environmental Assessment, additional baseline noise monitoring was undertaken from June to July 2015 at 2 locations.

Background noise levels were found to be relatively quiet, as expected for receivers in a rural environment isolated from other extraneous noise sources (e.g. traffic noise).

For noise predictions, a 288 Vestas V112 turbine layout was used to represent the likely sound outputs of the project. The predictions conservatively assumed that all turbines would be operating at full capacity, with no noise management mode (operating turbines at lower speeds to curtail noise impacts). The noise assessments also considered potential noise generation from the proposed substations and the overhead 330 kV transmission lines.

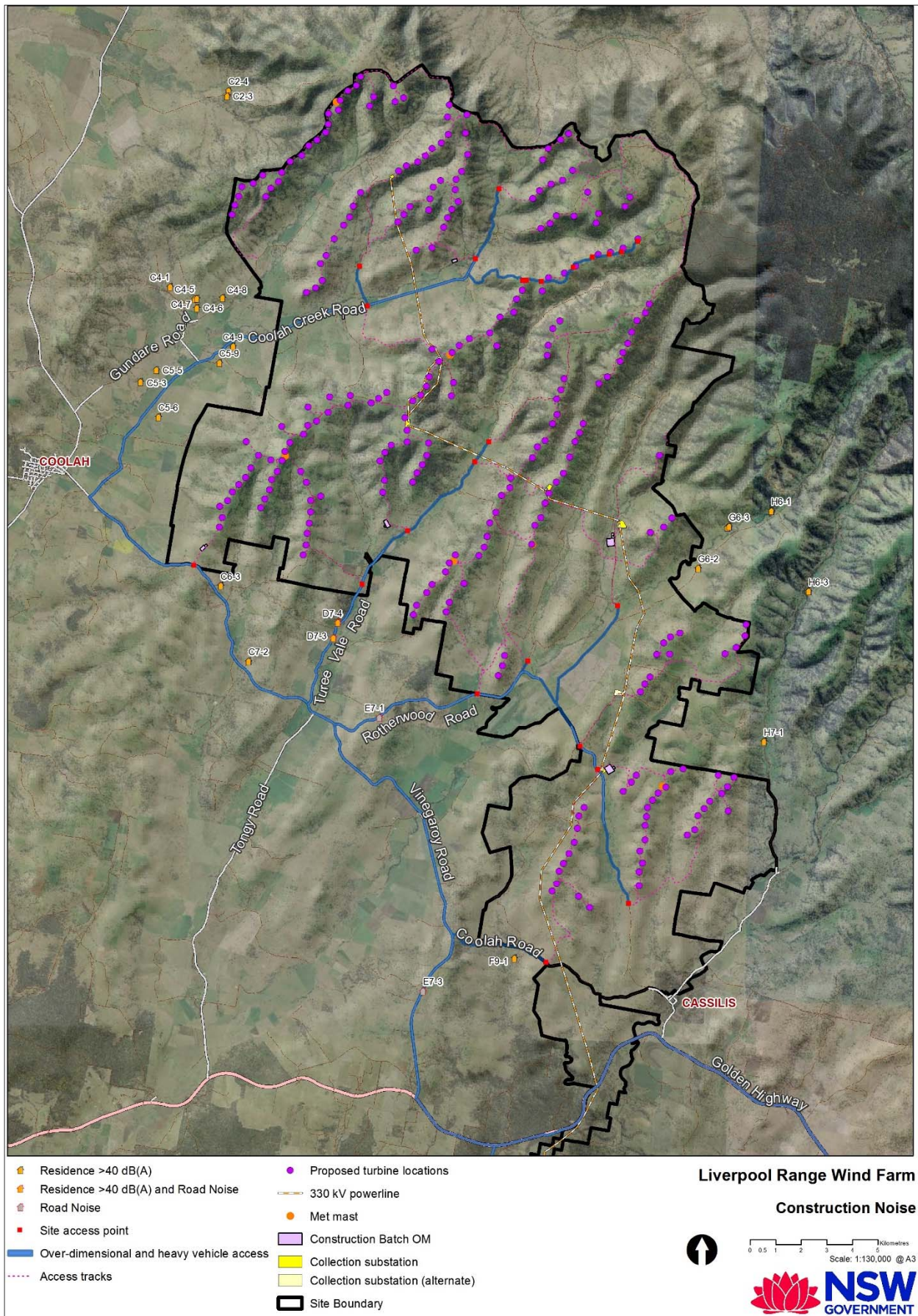


Figure 28: Construction Noise Impacts

The predicted noise levels were found to be able to comply with the lower base noise criteria established under the SA Guidelines, of 35 dB(A) or the background plus 5 dB, whichever is greater, at all non-associated residences.

Both the EPA and the Department are satisfied that the noise criteria and the predicted noise levels have been correctly calculated for the project, and the EPA has indicated that it would be able to issue an EPL for the project subject to the noise limits in Table 11.

Table 11: Recommended noise criteria dB(A)

| Residence | Criteria (dB(A)) with Reference to Hub Height Wind Speed (m/s) | | | | | | | | | |
|--|---|----|----|----|----|----|----|----|----|----|
| | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| G6-2, G6-3, H6-3 | 35 | 35 | 35 | 35 | 35 | 35 | 36 | 37 | 38 | 39 |
| C4-8, C4-9, C5-2, C5-6, C5-9 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 37 | 40 |
| C6-1, C6-3, C6-4 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 36 |
| C2-3, D7-4, E2-1, E7-2, E8-5, E9-2, F2-1, F2-4, F8-1, F9-1, G9-1, G9-4, H7-1, H8-1 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 |
| All other non-associated residences | The higher of 35 dB(A) or the existing background noise level (L_{A90} (10-minute)) plus 5 dB(A) | | | | | | | | | |

The Department notes that the noise generated by operation of the project, would be subject to the final turbine selection and layout. Should Epuron select more efficient wind turbines than those modelled, this would further reduce the typical noise levels generated by the wind turbines.

In order to protect the amenity of surrounding residents from operational noise, the Department has recommended conditions requiring Epuron to:

- comply with noise limits at non-associated residences surrounding the project for noise generated by the operation of both the wind turbines and ancillary infrastructure;
- comply with a range of standard noise conditions, including implementing all reasonable and feasible measures to minimise the noise impacts of the project; and
- undertake noise monitoring following commencement of operation of the wind turbines to determine compliance with the noise limits.

Low Frequency Noise

Several community submissions raised concerns about the potential health impacts from low frequency noise and infrasound (a subset of low frequency noise in the frequency range below 20 Hz, below human detection).

The noise assessments indicate that the aerodynamic noise from a wind turbine is not dominant in the low frequency range and is generally in the mid-frequency (200 Hz to 1,000 Hz) and predicted that low frequency noise from the project would be no greater than 60 dB(C) at all non-associated residences.

By way of comparison, this level is well below the low frequency noise limits considered acceptable in the Department's *Wind Energy Framework: Noise Assessment Bulletin*, which recommends a more detailed low-frequency noise assessment if measured noise levels are repeatedly greater than 65 dB(C) during the daytime or 60 dB(C) during the night time.

Notwithstanding, to ensure surrounding residents are protected from any potential impact from low frequency noise, the Department has recommended conditions such that if the presence of excessive low frequency noise from the wind farm is repeatedly greater than the applicable criteria during the night time for more than 10% of the 24-hour assessment period at any relevant receiver, a 5 dB(A) penalty would be added to the measured noise level for the project. The EPA has advised the Department that it is satisfied with this approach.

In regard to infrasound, the Department acknowledges the community's concern regarding potential health effects from wind farms. However, the Department is guided by the literature reviews undertaken by the National Health and Medical Research Council (NHMRC) that uses a robust evidence-based approach, supported by NSW Health, regarding human health effects from wind farms.

In 2015, the NHMRC concluded that “there is no direct evidence that exposure to wind farm noise affects physical or mental health”. More specifically, they stated that, “while exposure to environmental noise is associated with health effects, these effects occur at much higher levels of noise than are likely to be perceived by people living in close proximity to wind farms in Australia” (i.e. less than 1.5 km).

The Department will continue to monitor contemporary scientific research outcomes to ensure its position reflects robust evidence on any health effects, including any advice releases from the National Wind Farm Commissioner and the Independent Scientific Committee.

Further, the Department notes that Epuron does not propose to construct any turbines closer than 1.8 km from non-associated residences, and the noise assessment found the project would not generate excessive levels of low frequency noise or infrasound, and consequently considers the health risks of the project to be negligible.

5.4 Biodiversity

The project site and surrounds are ecologically diverse and are characterised by agricultural land located within broad valleys below areas of low rolling hills and ridgelines, patches of remnant vegetation, and intact woodland located along the steeper topography of the Great Dividing Range.

Additionally, the transmission line route passes through the Durrigere SCA and abuts the Bobadeen East Vegetation Offset Area, held by Ulan Coal Mines Ltd.

Due to the diverse nature of the project area, portions of the site include habitat for threatened species and endangered ecological communities (EEC), which would potentially be impacted by the project through direct habitat loss from clearing of vegetation, and bird and bat strike during operation of the wind turbines.

Epuron has undertaken a number of ecological assessments to assess the project’s biodiversity impacts, including:

- Biodiversity Assessment, Wind Farm Study Area, NGH Environmental, December 2013;
- Biodiversity Assessment, Transmission Line Study Area, December 2013;
- Biodiversity Addendum Report, Wind Farm and Transmission Line Project, NGH Environmental, May 2017;
- Biodiversity Offset Strategy, NGH Environmental, May 2017; and
- Raptor and Bird Utilisation Surveys, Brett Lane & Associates, September 2017.

Epuron also commissioned Brett Lane & Associates to undertake further raptor and bird use surveys in February 2018, and the results of these surveys will be used to prepare detailed collision risk modelling for the Bird and Bat Adaptive Management Plan.

As outlined in Section 3, the project was determined to be a controlled action under the EPBC Act due to the potentially significant impacts on MNES for listed threatened species and communities, specifically the Swift Parrot (*Lathamus discolor*), Regent Honeyeater (*Anthochaera phrygia*) and White Box – Yellow Box – Blakely’s Red Gum Grassy Woodland and Derived Native Grassland Critically Endangered Ecological Community (CEEC).

The biodiversity assessment was assessed under the *NSW Biodiversity Offsets Policy for Major Projects 2014* (NSW Offsets Policy) using the *Framework for Biodiversity Assessment* (FBA), which are accredited under the Assessment Bilateral Agreement between NSW and the Commonwealth.

It is important to note that the NSW Government’s policies in relation to biodiversity impact assessment and offsetting have changed during the assessment of this project, including changes to the classification of native vegetation condition and the introduction of new procedures. However, As Epuron’s assessment was undertaken prior to the commencement of the *Biodiversity Conservation Act 2016*, under the transitional arrangements, the project can still be assessed and determined under the NSW Offsets Policy.

Avoidance and Mitigation

The ecological assessments are based on a number of measures to avoid and/or mitigate impacts, including:

- designing the project to avoid disturbance of EECs, threatened species and woodland areas, as far as practicable;
- committing to undertaking micro-siting of wind turbines during the detailed design stage of the project to further avoid impacts on ecological resources and ecologically sensitive areas, as far as practicable; and
- locating ancillary infrastructure outside of ecologically sensitive areas, where practicable.

Based on the findings of the ecological assessments and concerns raised by OEH, Epuron revised the project layout during the assessment process to minimise the biodiversity impacts of the project, including:

- removing 21 turbines from the project layout;
- revising the location of 12 turbines;
- reducing the number of proposed collection substations from 6 to 4;
- streamlining the alignment of the transmission line route to minimise impacts to woodland areas and the Durridgere SCA; and
- avoiding impacts to the Bobadeen East Vegetation Offset Area.

In regard to the Durridgere SCA, a section of the proposed transmission line was proposed within the central part of the SCA. OEH expressed concerns about the potential fragmentation of the SCA. In consultation with OEH and the National Parks and Wildlife Service (NPWS), Epuron identified a corridor which more closely follows the SCA's boundaries in order to minimise the impacts of the transmission line on the higher value areas within the SCA. OEH has acknowledged that the amended transmission line route would reduce impacts on the SCA, and has noted that Epuron will still need to obtain approval for a Section 153 easement under the *National Parks and Wildlife Act 1974* for the proposed transmission line, should development consent be granted.

In regard to the Bobadeen East Vegetation Offset Area, which is a proposed offset area for the Ulan Coal Mine, a section of the proposed transmission line was proposed to pass through the offset area. In consultation with Epuron and OEH, Ulan Coal Mines Ltd. has identified an alternate offset and amended the boundary of the existing offset area so that any impacts from the transmission line have now been avoided.

Vegetation Community Impacts

With the changes made to the project in the Amended DA (but inclusive of 282 turbines), the disturbance area of the project would be reduced from 1,232.09 ha to 744.94 ha, of which 343.45 ha is exotic vegetation.

The 401.49 ha of native vegetation to be cleared is largely fragmented and degraded, however it does contain up to 200.85 ha of EEC listed under the TSC Act, the majority of which is comprised of derived native grassland with sparsely distributed trees, that has been subject to past clearing and grazing.

Notwithstanding, 10.37 ha of the 200.85 ha of EEC listed under the TSC Act is Box Gum Woodland Ecological Community listed under the EPBC Act.

Table 12 provides a summary of the estimated impacts of the project on each native vegetation type, based on the disturbance area of 401.49 ha of native vegetation, and Figures 29 and 30 provide maps of the vegetation type and condition across the project site.

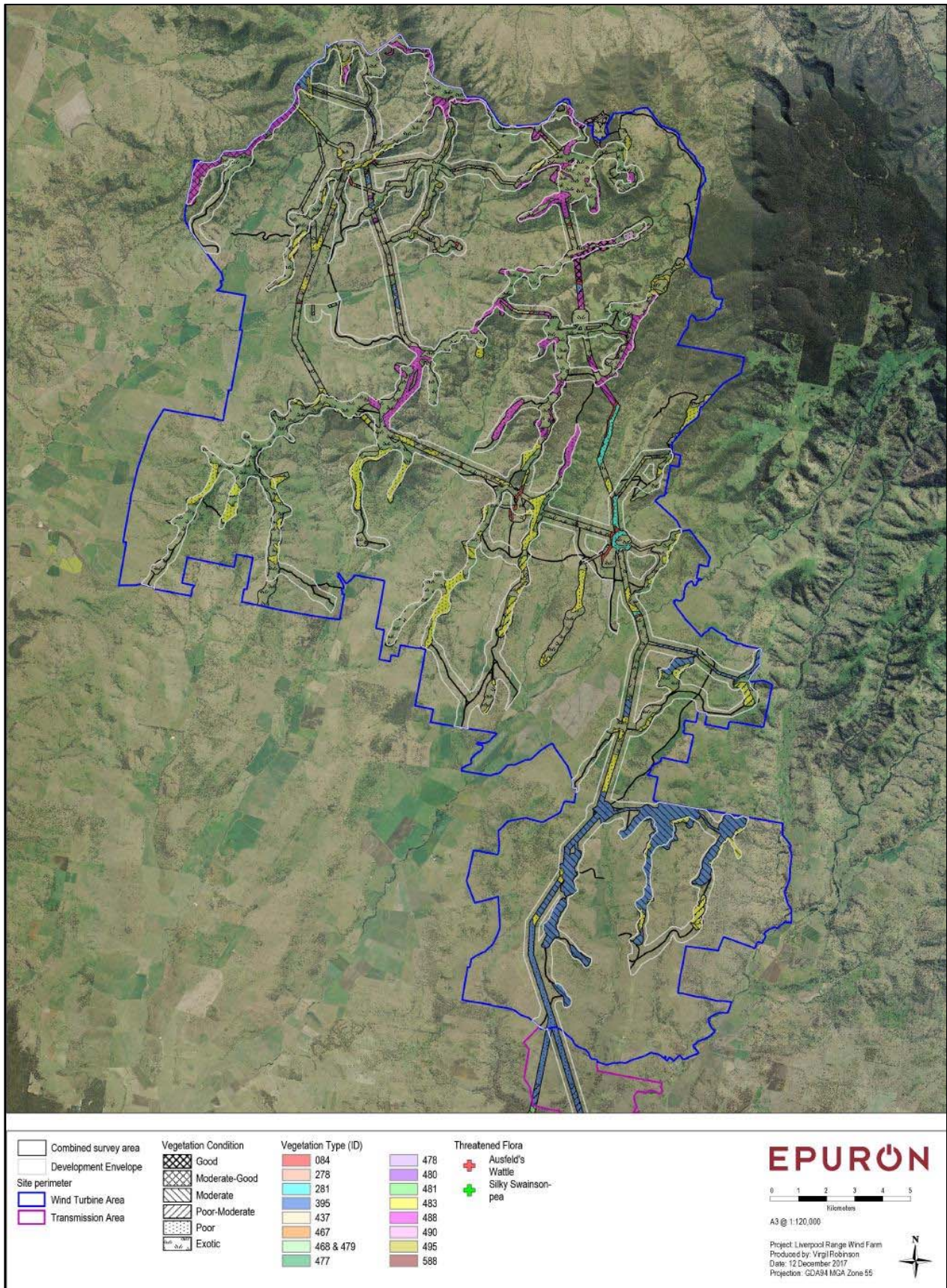


Figure 29: Vegetation Type and Condition Across Project Site (North)

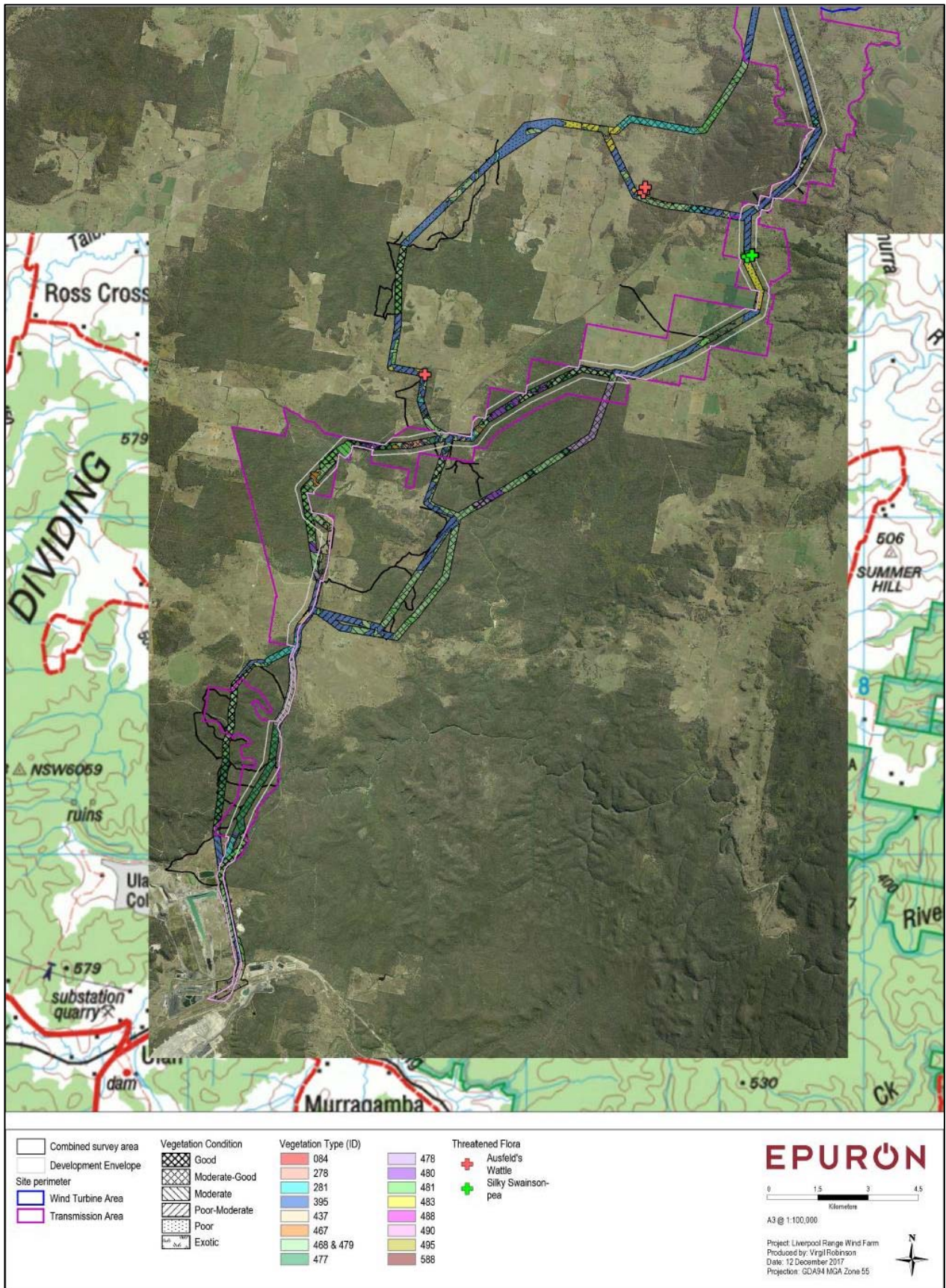


Figure 30: Vegetation Type and Condition Across Project Site (South)

Table 12: Vegetation community impacts

| Vegetation Type (PCT ² Code) | Conservation Significance ³ | | Impact (ha) |
|--|--|-----------------------|---------------------|
| | TSC Act ⁴ | EPBC Act ⁵ | |
| River Oak Woodland (ID 084) | - | - | 6.47 |
| Blakely's Red Gum – Grey Box-White Box – Riparian Woodland (ID 278) | EEC | - | 3.55 |
| Rough-barked Apple – Red Gum – Yellow Box Woodland (ID281) | EEC | - | 18.94 |
| Native Pasture (ID 395) | EEC | - | 77.26 |
| Sandstone Forest – Blue-leaved Ironbark dominant (ID 467) | - | - | 3.30 |
| Sandstone Forest – Inland Scribbly Gum dominant (ID 477) | - | - | 31.51 |
| Sandstone Forest – Red Ironbark dominant (ID 478) | - | - | 1.20 |
| Sandstone Forest – Black Cypress dominant (ID 480) | - | - | 10.32 |
| Riparian Forest – Rough-barked Apple and Blakely's Red Gum (ID 481) | - | - | 30.04 |
| Grey Box – White Box Grassy Woodland (ID 483) | EEC | CEEC | 101.10 ⁶ |
| Silvertop Stringybark – Yellow Box - Norton's Box Grassy Woodland (ID 488) | - | - | 70.16 |
| Mountain Gum – Silvertop – Stringybark Forest (ID 490) | - | - | 3.12 |
| Brittle Gum – Stringybark Woodland (ID 495) | - | - | 1.51 |
| White Box – White Cypress Pine Shrubby Open Forest (ID 588) | - | - | 0.36 |
| Sandstone Forest – Narrow-leaved Ironbark dominant (ID468 and 479) | - | - | 42.65 |
| Total | | | 401.49 |

As outlined in Table 12, based on the biometric condition classes, the project would disturb up to 200.85 ha of EEC listed under the TSC Act, including 101.1 ha of the Grey Box – White Box Grassy Woodland EEC, of which 10.37 ha located within the transmission line development corridor is listed as White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC under the EPBC Act.

The Department notes that the Commonwealth referral decision in determining that the action is a controlled action was based on there being a potential significant impact on White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland Ecological Community.

Epuron's ecological assessments assessed the significance of impacts on White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC using the methodology outlined in *Matters of National Environmental Significance Significant Impact Guidelines 1.1 (2013)*, in addition to assessing all relevant TSC Act listed EECs against the criteria in Section 5A of the EP&A Act and the *NSW Threatened Species Assessment Guidelines: The Assessment of Significance*.

Epuron's ecological assessments concluded that the project is unlikely to result in any significant impacts on the abundance, range and distribution of any EECs, including the White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC that was considered likely to be significantly impacted by the Commonwealth.

The Department has undertaken a detailed consideration of Epuron's ecological assessments, relevant approved conservation advice, recovery plans and threat abatement plans (TAPs) for White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC, as summarised in Appendix E.

Following the consideration of impacts and assessments of significance on all EECs listed in Table 12, including the White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC in Epuron's ecological assessments, the Department and OEH accept that impacts to any threatened communities would not be significant.

Notwithstanding, the impacts would need to be offset in accordance with the FBA, as discussed below.

² Plant community type

³ EEC – Endangered Ecological Community; CEEC – Critically Endangered Ecological Community

⁴ TSC Act – NSW Threatened Species Conservation Act 1995

⁵ EPBC Act – Commonwealth Environment Protection Biodiversity Conservation Act 1999

⁶ Only 10.37 ha of the 101.1 ha of Grey Box – White Box Grassy Woodland (ID 483) that would be impacted is classified as White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC under the EPBC Act

Flora Impacts

Eighteen (18) threatened flora species listed under the TSC Act and/or the EPBC Act have the potential to be present at the project site based on potential or known habitat and the results of online database searches. These threatened species and their conservation significance are listed in Table 13.

Table 13: Threatened flora species

| Species | Conservation Significance | | Recorded in Surveys | Impacts |
|--|---------------------------|-----------------------|---------------------|----------|
| | TSC Act | EPBC Act | | |
| Silky Swainson-pea (<i>Swainsonia sericea</i>) | Vulnerable | - | √ | √ |
| Ausfeld's Wattle (<i>Acacia ausfeldii</i>) | Vulnerable | - | √ | - |
| Austral Toadflax (<i>Thesium australe</i>) | Vulnerable | Vulnerable | - | - |
| Bluegrass (<i>Dicanthium setosum</i>) | Vulnerable | - | - | - |
| Finger Panic Grass (<i>Digitaria porrecta</i>) | Endangered | Endangered | - | - |
| Lobed Blue-grass (<i>Bothriochloa biloba</i>) | - | Vulnerable | - | - |
| <i>Homoranthus darwinoides</i> | Vulnerable | Vulnerable | - | - |
| Capertree Stringybark (<i>Eucalyptus cannonii</i>) | Vulnerable | Vulnerable | - | - |
| <i>Kennedia retrorsa</i> | Vulnerable | Vulnerable | - | - |
| <i>Ozothamnus tessellatus</i> | Vulnerable | Vulnerable | - | - |
| Clandulla Geebung (<i>Persoonia marginate</i>) | Vulnerable | Vulnerable | - | - |
| <i>Lasiopetalum longistamineum</i> | Vulnerable | Vulnerable | - | - |
| Leek Orchid (<i>Prasophyllum sp. Wybong</i>) | - | Critically Endangered | - | - |
| <i>Philothea ericifolia</i> | - | Vulnerable | - | - |
| Wollemi Mint Bush (<i>Prostanthera cryptandroides</i>) | Vulnerable | Vulnerable | - | - |
| Mount Vincent Mint Bush (<i>Prostanthera stricta</i>) | Vulnerable | Vulnerable | - | - |
| <i>Pultenaea sp. Olinda</i> | Endangered | - | - | - |
| <i>Rulingia procumbens</i> | Vulnerable | Vulnerable | - | - |
| Total | | | 2 | 1 |

Targeted surveys were undertaken as part of the ecological assessments to confirm the presence of the 17 threatened flora species on the project site listed in Table 13.

The targeted surveys identified only 2 threatened flora species in the study area, the Silky Swainson-pea and Ausfeld's Wattle. With the amendments made to the project in the Amended DA, impacts to the Ausfeld's Wattle would be avoided and only some individuals (i.e. 1 ha) of Silky Swainson-pea within the transmission line development corridor would potentially be impacted.

Epuron's ecological assessments include tests of significance for the Silky Swainson-pea and Ausfeld's Wattle, as well as the Austral Toadflax, Bluegrass, Finger Panic Grass and Lobed Blue-grass, which were considered to have a moderate or high risk of impact despite not being recorded in the surveys. The tests of significance concluded that the project is unlikely to result in any significant impacts on the abundance, range and distribution of any threatened flora species.

Following the consideration of impacts and assessments of significance on these species in Epuron's ecological assessments, the Department and OEH accept that impacts to the threatened flora species would not be significant.

Notwithstanding, the impacts on the Silky Swainson-pea would need to be offset in accordance with the FBA, as discussed below.

Fauna Impacts

The project has the potential to affect fauna in a number of ways, particularly through direct habitat loss through the clearing of vegetation (including hollow bearing trees), and bird and bat strike during operation of the turbines.

Hollow bearing trees are used for shelter and as breeding sites for a wide range of fauna species, including gliders, owls, birds and bats. As such, OEH recommends a buffer of at least 50 m from the canopy of hollow bearing trees to the tip of the turbine blade (i.e. a buffer of approximately 80 m from the base of the turbine to the base of hollow bearing trees depending on the height of the canopy), in order to reduce the risk of strike.

In accordance with OEH's recommendation, Epuron has located the majority of turbines so that the blade tip of the turbines is at least 50 m away from the canopy of hollow bearing trees. However, there are still 8 turbines within 50 m from the canopy of hollow bearing trees (i.e. Turbine Nos. 87, 123, 164, 181, 183, 189, 202 and 206).

Epuron has committed to micro-siting these turbines as far as practicable from hollow bearing trees during the detailed design of the project, and the Department has recommended conditions formalising this commitment.

Additionally, Epuron is also proposing a number of mitigation measures to avoid or minimise bird and bat strike, including preparing and implementing a Bird and Bat Monitoring Program that includes adaptive management techniques such as minimising the availability of raptor perches, swift carcass removal, pest control and sector management of turbines, to allow a species-specific approach to mitigation should unacceptable impacts be identified during operations.

Thirty-five (35) threatened or migratory fauna species listed under the TSC Act and/or EPBC Act have the potential to be present at the project site based on available habitat, known ecological requirements, local distribution records and the results of online database searches. These threatened species and their conservation significance are listed in Table 14.

Table 14: Threatened fauna species

| Species | Conservation TSC Act | Significance EPBC Act | Recorded in surveys | Impacts to habitat | Risk of blade strike |
|---|-------------------------|--------------------------|------------------------|-----------------------|-------------------------|
| Birds | | | | | |
| Speckled Warbler (<i>Chthonicola sagittate</i>) | Vulnerable | - | √ | - | - |
| Brown Treecreeper (eastern subspecies) (<i>Climacteris picumnus victoriae</i>) | Vulnerable | - | √ | - | - |
| Varied Sittella (<i>Daphoenositta chrysoptera</i>) | Vulnerable | - | √ | - | - |
| Regent Honeyeater (<i>Anthochaera phrygia</i>) | Critically Endangered | Critically Endangered | - | - | High |
| Swift Parrot (<i>Lathamus discolor</i>) | Endangered | Critically Endangered | - | - | Moderate |
| Scarlet Robin (<i>Petroica boodang</i>) | Vulnerable | - | √ | - | - |
| Grey-crowned Babbler (eastern subspecies) (<i>Pomatostomus temporalis temporalis</i>) | Vulnerable | - | √ | √ | - |
| Little Lorikeet (<i>Glossopsitta pusilla</i>) | Vulnerable | - | √ | - | - |
| Glossy Black Cockatoo (<i>Calyptorhynchus lathami</i>) | Vulnerable | - | √ | √ | - |
| Turquoise Parrot (<i>Neophema pulchella</i>) | Vulnerable | - | - | - | - |
| Square-tailed Kite (<i>Lophoictinia isura</i>) | Vulnerable | - | - | - | High |
| Little Eagle (<i>Hieraaetus morphnoises</i>) | Vulnerable | - | - | - | - |
| Grey Falcon (<i>Falco hypoleucos</i>) | Endangered | - | - | - | - |
| Spotted Harrier (<i>Circus assimilis</i>) | Vulnerable | - | - | - | Low |
| Barking Owl (<i>Ninox connivens</i>) | Vulnerable | - | - | - | Moderate |
| Powerful Owl (<i>Ninox strenua</i>) | Vulnerable | - | √ | √ | Moderate |
| Masked Owl (<i>Tyto novaehollandiae</i>) | Vulnerable | - | √ | √ | Low |
| White-throated Needletail (<i>Hirundapus caudacutus</i>) | - | Migratory | - | - | - |
| White-bellied Sea-eagle (<i>Haliaeetus leucogaster</i>) | Vulnerable | - | - | - | - |
| Black-chinned Honeyeater (eastern subspecies) (<i>Melithreptus gularis gularis</i>) | Vulnerable | - | √ | √ | - |
| Diamond Firetail (<i>Stagonopleura guttate</i>) | Vulnerable | - | √ | √ | - |
| Dusky Woodswallow (<i>Artamus cyanopterus cyanopterus</i>) | Vulnerable | - | - | - | High |

| Species | Conservation TSC Act | Significance EPBC Act | Recorded in surveys | Impacts to habitat | Risk of blade strike |
|---|---------------------------------|----------------------------------|--------------------------------|-------------------------------|---------------------------------|
| Microbats | | | | | |
| Large-eared Pied Bat (<i>Chalinolobus dwyeri</i>) | Vulnerable | Vulnerable | √ | √ | Moderate |
| Little Pied Bat (<i>Chalinolobus picatus</i>) | Vulnerable | - | - | - | - |
| Little Bentwing Bat (<i>Miniopterus australis</i>) | Vulnerable | - | - | - | - |
| Eastern Bentwing Bat (<i>Miniopterus schreibersii oceanensis</i>) | Vulnerable | - | √ | √ | Low |
| Corben's Long-eared Bat (<i>Nyctophilus corbeni</i>) | Vulnerable | Vulnerable | √ | √ | Low |
| Yellow-bellied Sheathtail Bat (<i>Saccolaimus flaviventris</i>) | Vulnerable | - | √ | - | Moderate |
| Eastern Cave Bat (<i>Vespadelus troughtoni</i>) | Vulnerable | - | √ | √ | Moderate |
| Eastern False Pipistrelle (<i>Falsistrellus tasmaniensis</i>) | Vulnerable | - | - | - | - |
| Greater Broad-nosed Bat (<i>Scoteanax reuppellii</i>) | Vulnerable | - | - | - | - |
| Greater Long-eared Bat (<i>Nyctophilus timoriensis</i>) | Vulnerable | Vulnerable | - | - | - |
| Large-footed Myotis (<i>Myotis macropus</i>) | Vulnerable | - | √ | - | - |
| Mammals (non-flying) | | | | | |
| Squirrel Glider (<i>Petaurus norfolcensis</i>) | Vulnerable | - | √ | √ | - |
| Koala (<i>Phascolarctos cinereus</i>) | Vulnerable | Vulnerable | - | - | - |
| Eastern Pygmy-possum (<i>Cercarterus nanus</i>) | Vulnerable | - | - | - | - |
| Reptiles | | | | | |
| Pink-tailed Legless Worm Lizard (<i>Aprasia parapulchella</i>) | Vulnerable | Vulnerable | - | - | - |
| Total | | | 18 | 11 | 13 |

Targeted surveys were undertaken as part of the ecological assessments to confirm the presence of the 35 threatened flora species on the project site listed in Table 14.

As indicated in Table 14, the ecological assessment surveys recorded 18 threatened fauna species in the project area, including 11 species of threatened birds, 6 species of threatened bats and 3 species of threatened non-flying mammals.

However, the surveys identified that only potential habitat for 11 of these 18 threatened fauna species would be affected by the project. All 11 of these threatened fauna species share the same habitat, which is characterised as woodland habitat in moderate or better condition, of which the project would impact 19 ha. These impacts are discussed further below and are summarised in Table 16.

Of the 11 threatened fauna species whose habitat would be impacted, Corben's Long-eared Bat and the Large-eared Pied Bat are listed as vulnerable under the EPBC Act.

However, the potential habitat of both the Regent Honeyeater and Swift Parrot, the 2 species which the Commonwealth considered would potentially be significantly impacted, would not be directly affected by the project.

Epuron's ecological assessments include tests of significance for all 18 of the threatened fauna species identified during the surveys, as well as the Regent Honeyeater, Square-tailed Kite, Little Eagle, Grey Falcon, Barking Owl, Koala and Eastern Pygmy Possum, which were considered to have a moderate or high risk of impact despite not being recorded in the surveys. The tests of significance concluded that the project is unlikely to result in any significant impacts on the abundance, range and distribution of any threatened fauna species, including the Regent Honeyeater and Swift Parrot.

The ecological assessments include a collision risk assessment to identify which species would be most at risk of strike. The risk assessment considered conservation status, flight character, distribution and whether the species is migratory. The thirteen (13) species that were identified at being at risk of strike are listed in Table 14, along with their risk ratings based on likelihood and consequence.

The collision risk for the Regent Honeyeater has been rated as high only as a result of the consequence, due to its critically endangered status. However, the likelihood of a collision occurring is considered low, given its preferred habitat for foraging is in forest in lower elevations along riparian corridors, and the project's turbines are proposed on ridges in largely fragmented and degraded habitat. Additionally, the species was not recorded on the project site during the surveys.

The collision risk for the Swift Parrot has been rated as moderate. Similar to the Regent Honeyeater, the risk rating is driven by the consequence of a collision. While the Swift Parrot is also listed as critically endangered, the consequence of collision is considered moderate as the project site is not near a breeding area for the species. The likelihood of a collision occurring is considered low, as its preferred habitat and movement paths are similar to that of the Regent Honeyeater.

Notwithstanding the potential risks, the EA predicted that in total mortality rates would likely be approximately 1.4 birds per turbine per year and 0.55 bats per turbine per year (or approximately 380 bird strikes and 150 bat strikes per year for the 267 wind turbines proposed in the Amended DA).

These predictions are based on monitoring data from 8 operational wind farms in south eastern Australia⁷, which indicate that mortality rates range from 0.1 to 2.0 bird/bat strikes per turbine per year, averaging approximately 1.0 bird/bat strikes per turbine per year. This monitoring data also indicates that the vast majority of affected species are commonly occurring (i.e. 50% of mortalities were Australian Magpie (*Cracticus tibicen*) Nankeen Kestrel (*Falco cenchroides*) and Brown Falcon (*Falco berigora*)), with only a small percentage of mortalities comprising threatened species (i.e. 1-2%).

The Department notes the data sets used to underpin these predictions is still small, and consequently the predictions should be treated with some caution.

Notwithstanding, whilst caution should be adopted in applying monitoring data from one site to another (as evidenced by the wide range in mortality rates identified in monitoring data), the Department accepts that Epuron's estimate of bird and bat strike is reasonably conservative.

Notwithstanding, the impacts on the habitat of the 11 threatened fauna species would need to be offset in accordance with the FBA, as discussed below.

Additionally, the Department has recommended conditions requiring Epuron to carry out detailed monitoring of the bird and bat strike impacts of the project, and carry out adaptive management if these impacts are higher than predicted or result in adverse impacts on any threatened bird or bat species in the locality. The results of the additional raptor and bird use surveys undertaken by Brett Lane & Associates will be used to prepare detailed collision risk modelling to inform the Bird and Bat Adaptive Management Plan.

With these measures in place, both the Department and OEH are satisfied that the project would not pose an overall significant or unacceptable level of risk to bird and bat species from rotor interaction, and that the bird and bat risks of the project can be suitably managed.

The Department is satisfied that Epuron has provided a suitably robust assessment of the potential risks of the project on bird and bat species from blade strike, and recognises that adaptive management techniques (e.g. minimising the availability of raptor perches, swift carcass removal, pest control and sector management of turbines) would help reduce any impact.

The Department has undertaken a detailed consideration of Epuron's ecological assessments, relevant approved conservation advice, recovery plans and threat abatement plans (TAPs) for the Regent Honeyeater and Swift Parrot, as summarised in Appendix E.

⁷ Smales, I. (2015) *Fauna Collisions with Wind Turbines: Effects and Impacts, Individuals and Populations, What Are We Trying to Assess?* Port Melbourne, Australia.

Following the consideration of impacts and assessments of significance on the threatened fauna species listed in Table 14, including the Regent Honeyeater and Swift Parrot, in Epuron's ecological assessments, the Department accepts that impacts to threatened fauna species would not be significant.

Biodiversity Offset

While Epuron has not proposed specific land-based offsets for the project, it has identified potential offset sites within and around the project area to demonstrate that it can meet the estimated credit requirements to compensate for the loss of native vegetation and habitat to be cleared for the project, in accordance with the NSW Offsets Policy. The potential offset sites identified by Epuron are shown on Figures 31 and 32 and comprise a total of 3,025 ha, with an estimated 28,133 ecosystem credits.

Tables 15 and 16 summarise the estimated offset requirements for the project's impacts to threatened ecosystems and species, respectively.

Table 15: Summary of ecosystem offset requirements

| Vegetation type (PCT code) | CMA ⁸ code | Impact (ha) | Credits required | Area of land required (ha) |
|--|-----------------------|---------------|------------------|----------------------------|
| River Oak Woodland (ID 084) | CW180 | 6.47 | 518 | 55.7 |
| Blakely's Red Gum – Grey Box-White Box – Riparian Woodland (ID 278) | HU681 | 3.55 | 266 | 28.6 |
| Rough-barked Apple – Red Gum – Yellow Box Woodland (ID 281) | CW111 | 7.79 | 562 | 60.4 |
| Rough-barked Apple – Red Gum – Yellow Box Woodland (ID 281) | HU714 | 11.15 | 836 | 89.9 |
| Native Pasture (ID 395)* | HU690 | 77.26 | 6273 | 674.5 |
| Sandstone Forest – Blue-leaved Ironbark dominant (ID 467) | HU682 | 3.30 | 242 | 26 |
| Sandstone Forest – Inland Scribbly Gum dominant (ID 477) | HU707 | 31.51 | 2511 | 270 |
| Sandstone Forest – Red Ironbark dominant (ID 478) | HU707 | 1.20 | 85 | 9.1 |
| Sandstone Forest – Black Cypress dominant (ID 480) | HU678 | 10.32 | 838 | 90.1 |
| Riparian Forest – Rough-barked Apple and Blakely's Red Gum (ID 481) | HU713 | 30.04 | 2439 | 315.7 |
| Grey Box – White Box Grassy Woodland (ID 483) | CW322 | 64.94 | 4078 | 438.5 |
| Grey Box – White Box Grassy Woodland (ID 483) | HU690 | 36.16 | 2936 | 315.7 |
| Silvertop Stringybark – Yellow Box - Norton's Box Grassy Woodland (ID 488) | CW303 | 1.05 | 32 | 3.4 |
| Silvertop Stringybark – Yellow Box - Norton's Box Grassy Woodland (ID 488) | CW304 | 69.11 | 5370 | 577.4 |
| Mountain Gum – Silvertop – Stringybark Forest (ID 490) | CW210 | 3.12 | 210 | 22.6 |
| Brittle Gum – Stringybark Woodland (ID 495) | CW225 | 1.51 | 118 | |
| White Box – White Cypress Pine Shrubby Open Forest (ID 588) | CW214 | 0.36 | 22 | 2.4 |
| Sandstone Forest – Narrow-leaved Ironbark dominant (ID468 and 479) | HU702 | 42.65 | 3196 | 343.7 |
| Total | | 401.49 | 30,532 | 3,336.4 |

*Native Pasture (ID 395) has been classified as Grey Box – White Box Grassy Open Woodland (ID 483) HU690 for the purposes of determining the offset requirements using the BioBanking Credit Calculator.

Table 16: Summary of threatened species offset requirements

| Species | Impact (ha) | Credits required | Area of land required (ha) |
|---|-------------|------------------|----------------------------|
| Glossy Black Cockatoo (<i>Calyptorhynchus lathami</i>) | 19.0 | 342 | 52 |
| Black-chinned Honeyeater (eastern subspecies) (<i>Melithreptus gularis gularis</i>) | 19.0 | 247 | 41 |
| Powerful Owl (<i>Ninox strenua</i>) | 19.0 | 570 | 90 |
| Corben's Long-eared Bat (<i>Nyctophilus corbeni</i>) | 19.0 | 399 | 70 |
| Grey-crowned Babbler (eastern subspecies) (<i>Pomatostomus temporalis temporalis</i>) | 19.0 | 247 | 41 |
| Diamond Firetail (<i>Stagonopleura guttate</i>) | 19.0 | 247 | 41 |
| Masked Owl (<i>Tyto novaehollandiae</i>) | 19.0 | 570 | 90 |
| Squirrel Glider (<i>Petaurus norfolcensis</i>) | 19.0 | 418 | 70 |
| Large-eared Pied Bat (<i>Chalinolobus dwyeri</i>) | 19.0 | 247 | 41 |
| Eastern Bentwing Bat (<i>Miniopterus schreibersii oceanensis</i>) | 19.0 | 247 | 41 |

⁸ Catchment Management Authority plant community type
NSW Government
Department of Planning and Environment

| Species | Impact (ha) | Credits required | Area of land required (ha) |
|---|--------------------|-------------------------|-----------------------------------|
| Eastern Cave Bat (<i>Vespadelus troughtoni</i>) | 19.0 | 247 | 41 |
| Silky Swainson-pea (<i>Swainsonia sericea</i>) | 1.0 | 18 | 2 |
| Total | | 3,799 | 620 |

In summary, approximately 3,336.4 ha would be required to satisfy the requirement for 30,532 ecosystem credits. Subject to this area being able to satisfy the required 3,799 species credits, up to an additional 620 ha may be required to satisfy the required species credits. However, it's important to note that all 11 of the threatened fauna species that require species credits to be offset share the same habitat, which is characterised as moderate or better woodland habitat.

The Department and OEH are satisfied that the offset credit requirements have been correctly calculated using the FBA, noting that these credits would need to be re-calculated once the final layout design of the project is known in order to confirm the final number and class of biodiversity offset credits to be retired.

The Department notes that with further avoidance measures during detailed design, the number and class of credits that would need to be retired is likely to be lower than the calculations presented in Tables 15 and 16.

Nonetheless, Epuron has undertaken an assessment of the ability for the potential offset sites to meet the estimated credit requirements for the entire project in accordance with the NSW Offsets Policy, and has identified a shortfall of 2,399 credits to satisfy the ecosystem offset credits. It's important to note that this shortfall of credits does not apply to the 101.1 ha of White Box – Grey Box Grassy Woodland that required to be offset, inclusive of the 10.37 ha of EPBC listed Box Gum Woodland ecological community.

To address the shortfall, Epuron has committed to undertaking further surveys and is confident that suitable offset sites are available either within the project site boundaries or on land immediately adjacent to the site owned by associated landowners.

OEH reviewed Epuron's proposed offset areas, and raised concerns regarding the proximity of a number of the offset areas to turbines, requesting that turbines be setback a minimum of 300 m from any proposed offset areas. To address OEH's concerns, Epuron setback all proposed offset areas a minimum of 300 m from the turbines.

As such, the Department considers that the majority of credits would be able to be successfully retired using land within or adjacent to the project area, as proposed by Epuron.

The Department also notes that the NSW Offsets Policy allows for the retirement of biodiversity offset credits to be achieved by a number of mechanisms (not just through land-based offsets), namely:

- acquiring or retiring 'biodiversity credits' within the meaning of the *Biodiversity Conservation Act 2016*⁹;
- making payments into an offset fund that has been developed by the NSW Government; or
- providing supplementary measures.

As such, the Department has recommended conditions requiring Epuron to:

- confirm the number and class of biodiversity offset credits required to be retired prior to the commencement of construction; and
- retire the required biodiversity offset credits in accordance with the NSW Offsets Policy within 2 years of the commencement of construction.

This approach also provides a significant incentive for Epuron to avoid and minimise impacts on biodiversity values of the locality during the detailed design and construction of the project. With the retirement of the required biodiversity offset credits, both the Department and OEH are satisfied that the project could be undertaken in a manner that improves or at least maintains the biodiversity values of the locality over the medium to long term.

⁹ Following repeal of the TSC Act on 25 August 2017, credits created under that Act are taken to be 'biodiversity credits' under the *Biodiversity Conservation Act 2016*, in accordance with clause 22 of the *Biodiversity Conservation (Savings and Transitional) Regulation 2017*.

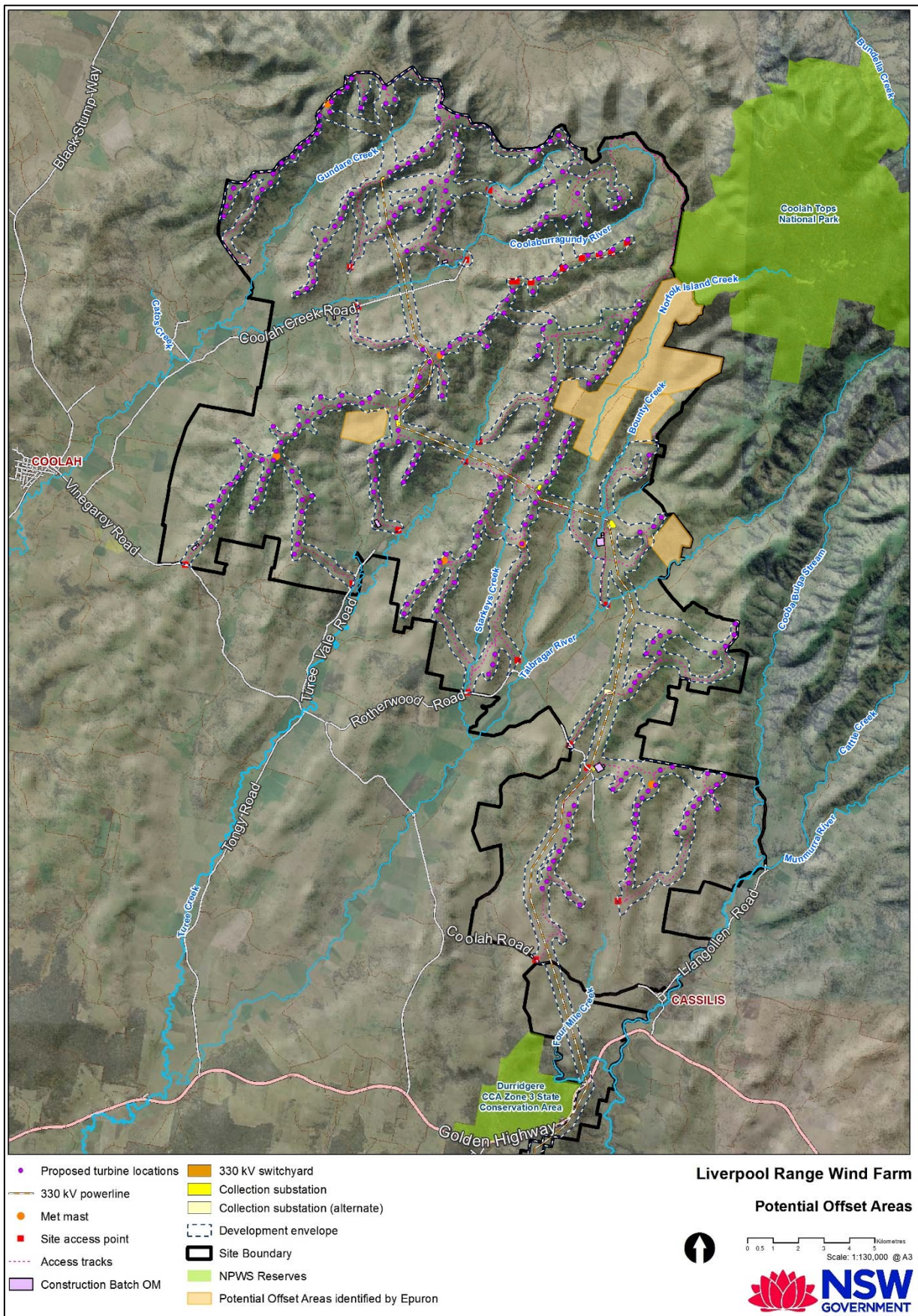


Figure 31: Potential Offset Sites (North)

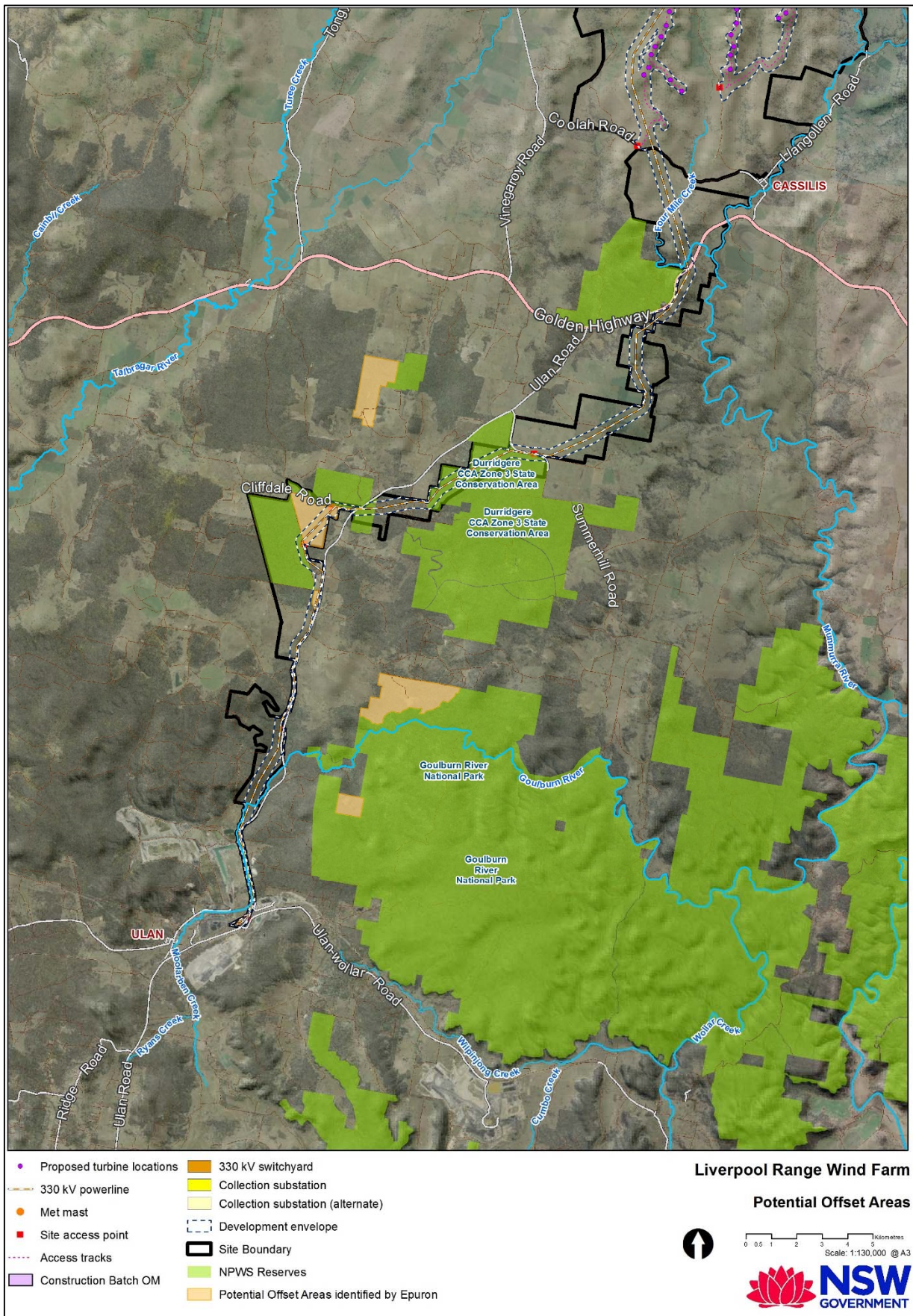


Figure 32: Potential Offset Sites (South)

Conclusion

The Department acknowledges that the project site for the most part is characterised by cleared agricultural land. However, the site does provide habitat for some threatened species and ecological communities, particularly along the slopes of the low rolling hills and ridgelines.

The Department is satisfied that Epuron has designed the project to avoid and minimise impacts on these biodiversity values, and impacts would be able to be further minimised through micro-siting during the detailed design stage of the project. However, as with most wind farm proposals, the project would result in some residual biodiversity impacts.

However, the Department is satisfied that these impacts would be relatively minor and are able to be adequately mitigated, or at least compensated for, through a range of mitigation and offsetting measures.

In this regard, the Department has recommended conditions requiring Epuron to:

- minimise disturbance of threatened species and communities as far as practicable;
- if micro-siting turbines, ensure the revised location of the blade of a turbine is at least 50 metres from the canopy of existing hollow-bearing trees; or where the proposed location of the blade of a turbine is already within 50 metres of the canopy of existing hollow-bearing trees, the revised location is not any closer to the existing hollow-bearing trees;
- prepare and implement a detailed Biodiversity Management Plan, which includes a Bird and Bat Adaptive Management Plan; and
- retire the applicable biodiversity offset credits in accordance with the NSW Offsets Policy.

With the implementation of all of these measures, both the Department and OEH are satisfied that the project could be undertaken in a manner that improves, or at least maintains, the biodiversity values of the locality over the medium to long term.

5.5 Other Issues

The Department's consideration of other issues is summarised in Table 17.

Table 17: Other issues

| Issue | Consideration | Recommendation |
|-------------------------------------|--|--|
| <i>Energy Security</i> | <ul style="list-style-type: none"> Concerns were raised in some submissions that the project, or a combination of the project and a range of other renewable energy projects, could have an adverse impact on energy security in NSW and increase electricity prices. These concerns were expressed at a high level, and were not supported by any detailed evidence showing how intermittent energy in general could affect energy security and/or electricity prices, or how this project in particular would do that. This makes it difficult, if not impossible, for the Department to evaluate these concerns in any meaningful way, particularly in the context where it is required to look at the planning merits of this particular project. Any such evaluation, however, would need to have regard to the broader strategic context on these matters. First, there is strong policy support at both the Commonwealth and State level for the increased development of renewable energy projects, to both ensure a greater proportion of electricity is generated by renewable sources and to reduce greenhouse gas emissions associated with any electricity generation. Second, NSW forms part of the National Electricity Market (NEM). The NEM is complex and is governed by a robust statutory framework at both the Commonwealth and State level which covers the regulation of electricity generation, distribution and pricing. In the Department's view, the likelihood of the project having an adverse impact on energy security or electricity prices in NSW is extremely low, given that it would only add up to 960 MW of capacity to the NEM, which at this stage has a total generation capacity of over 47,000 MW. Further, any incremental or cumulative impacts associated with the potential intermittency of renewable energy projects could be mitigated through the operation of the NEM. | <ul style="list-style-type: none"> No specific conditions required. |
| <i>Subdivision</i> | <ul style="list-style-type: none"> Epuron has proposed to subdivide Lot 4 DP1214133, owned by Ulan Coal Mine Ltd (UCML), to create a new lot for the 330 kV substation which would connect to the Transgrid 330 kV Wellington – Wollar transmission line. The proposed subdivision would result in one lot that is approximately 192 ha and one lot that is approximately 13 ha. The smaller of the subdivided lots is prohibited under a strict reading of the <i>Mid-Western Regional Council LEP 2012</i> as it would not meet the minimum lot size for land zoned RU1 – Primary Production (100 ha). Notwithstanding, development consent for the project as a whole can be granted despite the subdivision of the application being prohibited by the LEP (under section 4.38(3) of the EP&A Act). In this case, the Department is satisfied that the subdivision be approved as part of the project as: <ul style="list-style-type: none"> it would ensure UCML's operations can continue on land that is not required by the project's operations; it would not result in the addition of any dwelling entitlements on the subdivided land; and it is consistent with the key objectives of the RU1 zone as it would encourage diversity in primary industry enterprises and minimise conflict between land uses. | <ul style="list-style-type: none"> Subdivide the proposed lot providing information is provided in accordance with requirements of section 157 of the <i>Environmental Planning and Assessment Regulation 2000</i>. |
| <i>Bushfire safety</i> | <ul style="list-style-type: none"> Some submissions raised concerns about the impacts of the project on aerial bushfire fighting. However, the NSW Rural Fire Service (RFS) did not raise any concerns about the project's impacts on aerial bushfire fighting. The Department also notes that in its <i>Wind Farm and Aerial Firefighting Information Sheet</i>, the NSW RFS states that the presence of a wind farm would not stop it from fighting a fire and it would deal with wind farms in the same way it deals with other potential hazards, such as transmission lines and radiocommunication towers. Epuron has committed to a number of mitigation measures, including the preparation of a Bushfire Management Plan in consultation with the NSW RFS and NSW Fire Brigade. Given the above, the Department is satisfied that the bushfire risks associated with the project can be effectively managed subject to implementation of the proposed mitigation measures. | <ul style="list-style-type: none"> The Department has recommended conditions requiring Epuron to: <ul style="list-style-type: none"> ensure that the project provides for asset protection in accordance with the NSW RFS's <i>Planning for Bushfire Protection 2006</i> (or equivalent) and is suitably equipped to respond to any fires on site; develop procedures to manage potential fires on site in consultation with the RFS; and assist the NSW RFS and emergency services if there is a fire in the vicinity of the project site. |
| <i>Electric and magnetic fields</i> | <ul style="list-style-type: none"> Like other electricity generating infrastructure, Electric and Magnetic Fields (EMF) would be generated by the electrical components of the project, including wind turbines, transmission lines and substations. It is noted that EMF also results from natural sources such as the Earth's magnetic field and lightning. The main sources from the project would be the electrical equipment within the turbine structures, the substation, interconnecting underground cables and overhead transmission lines. Epuron has implemented the principles of prudent avoidance by locating the transmission power lines as far as practical from residences. The EA includes an assessment of EMF, which indicates that the levels of EMF would be significantly lower than the current internationally acceptable level for human health. The Department is satisfied the project is not likely to have any significant EMF related impacts. | <ul style="list-style-type: none"> No specific conditions required. |

| Issue | Consideration | Recommendation |
|----------------------------|---|--|
| <i>Heritage</i> | <ul style="list-style-type: none"> The EA includes an Archaeological and Cultural Heritage Assessment in accordance with the applicable guidelines, including consultation with the local Aboriginal community. The assessment identified 17 Aboriginal heritage items within the development corridor that could be directly impacted by the project, including 4 previously recorded Aboriginal heritage items and 13 previously unidentified Aboriginal heritage items. These items include 2 rock shelters, 14 stone artefact scatters and 2 potential archaeological deposits (PADs). Of the 17 Aboriginal heritage items identified within the development corridor, 12 of the stone artefact scatters were assessed as having low significance, 1 stone artefact scatter and 1 PAD were assessed as having low/moderate significance, 1 PAD was assessed as having moderate significance and the 2 rock shelters have the potential to contain archaeological deposits. The assessment also identified a number of landform units adjacent to creek lines within the development corridor that were potentially used by Aboriginal people for hunting, gathering and camping, and as a result, are likely to have artefacts present. Additionally, the assessment identified 7 European heritage items located within the development corridor, including a telegraph tree and European midden, an electricity pole, 2 mouldboard ploughs and 3 old fence posts. The assessment included recommendations to: <ul style="list-style-type: none"> avoid impacts to the identified Aboriginal heritage rock shelters and PADs, and provide a buffer around them of at least 50 m; minimise impacts to the identified European heritage items; micro-site power poles in the transmission line to minimise impacts to both Aboriginal and European heritage items located in proximity to the transmission line route; undertake a program of salvage excavation at the identified selection of landform units adjacent to creek lines, if impacts to them cannot be avoided. Epuron has committed to preparing and implementing a Heritage Management Plan which would incorporate the recommendations of the assessment, and ensuring that all workers involved in the construction and management of the project receive training in how to implement the plan. | <ul style="list-style-type: none"> The Department has recommended conditions in accordance with the recommendations of the assessment. With these measures in place, the Department is satisfied that the project is unlikely to result in a significant impact on the Aboriginal or European heritage values of the locality. Notwithstanding, to ensure that heritage impacts are appropriately minimised and managed, the Department has recommended conditions requiring Epuron to prepare and implement a Heritage Management Plan in consultation with OEH and relevant Aboriginal stakeholders for the project. The plan would require a description of measures to be implemented for: <ul style="list-style-type: none"> protecting Aboriginal and European heritage items identified in Table 1 in Appendix 5 of the recommended conditions, and any items located outside the approved development corridor; minimising and managing impacts of the development on Aboriginal and European heritage within the development corridor, including: <ul style="list-style-type: none"> undertaking test excavations and salvage (if required) at the landform units identified in Table 3 in Appendix 5 of the recommended conditions, where impacts cannot be avoided; and a strategy for the long-term management of any Aboriginal heritage items or material collected during the test excavation or salvage works; a contingency plan and reporting procedure if: <ul style="list-style-type: none"> Aboriginal heritage items outside the approved disturbance area are damaged; previously unidentified Aboriginal heritage items are found; or Aboriginal skeletal material is discovered; ensuring workers on site receive suitable heritage inductions prior to carrying out any development on site, and that suitable records are kept of these inductions; and ongoing consultation with Aboriginal stakeholders during the implementation of the plan. |
| <i>Radiocommunications</i> | <ul style="list-style-type: none"> Electromagnetic signals transmitted for telecommunication systems (such as radio, televisions, mobile phones and mobile/fixed radio transmitters) function most efficiently where a clear line of sight exists between the transmitting and receiving locations. Wind farms and other infrastructure have the potential to cause interference with this line of sight. Epuron undertook a Telecommunications Impact Assessment in 2013 as part of its EA. The assessment included consultation with telecommunications licence holders and service providers. The assessment concluded that the project would have minimal effect on telecommunications services in the area. However, 3 turbines in the northern part of the project site (i.e. Turbine Nos. 87, 111 and 123) are located within 500 m of one omni-directional radio broadcast tower and one point-to-point radio communications tower operated by Three Rivers Radio Talbragar, which could cause near field scattering interference. Epuron has consulted with Three Rivers Radio Talbragar regarding the potential impact and has committed to implementing the necessary measures required to mitigate the impact on these radio links. As such, the Department is satisfied that the project is not likely to have significant impacts on radiocommunications. | <ul style="list-style-type: none"> To ensure that telecommunications services are maintained, the Department has recommended conditions requiring Epuron to 'make good' any disruption to radio or telecommunications services caused as a result of the project as soon as possible following the disruption, but no later than 1 month following the disruption of the service, unless the relevant service provider or user or Secretary agrees otherwise. The Department notes that this approach has been effective in addressing interference with telecommunications services associated with other wind farms in NSW. |
| <i>Agriculture</i> | <ul style="list-style-type: none"> The project site is dominated by agricultural land uses, in particular sheep and cattle grazing. Approximately 93 ha of land mapped as BSAL is located within the indicative development footprint, with 9358 ha of BSAL located within the project site boundary. Given the relatively small disturbance footprint of the project components, the Department is satisfied that agricultural and wind farm activities are compatible land uses and can co-exist in the locality. This has been demonstrated at several operating wind farms in NSW. Additionally, the Department notes that the project would provide an additional source of income for the landowners of the associated properties, whose land would be directly affected by the project. Two non-associated landowners raised concerns around the disruption to their agricultural activities that would be caused by over-dimensional and heavy vehicle construction traffic travelling on Coolah Creek Road and Turee Vale Road. The Department met with these landowners at their properties to further understand the potential impacts, and considers that construction traffic would impact their ability to undertake agricultural activities, including stock movements, on their properties. To mitigate these impacts, the Department considers the landowners of these properties should be offered mitigation options (such as construction of replacement stockyards or the provision of additional traffic management). | <ul style="list-style-type: none"> The Department has recommended conditions requiring Epuron to implement additional measures to mitigate the impacts of development-related construction traffic on agricultural activities, such as construction of replacement stockyards or providing additional traffic management measures (which could include the use of portable traffic lights and/or variable message signs) at the two potentially affected properties, prior to the commencing the use of the relevant road by any over-dimensional and/or heavy vehicle traffic associated with the construction of the development. Additionally, the Department has recommended conditions requiring the project site be rehabilitated to a standard that makes it available for agricultural production following decommissioning. |

| Issue | Consideration | Recommendation |
|---------------------------------|--|--|
| <p><i>Aviation safety</i></p> | <ul style="list-style-type: none"> The project is located 17 km east of Coolah Airport, 51 km west of Quirindi Airport and 70 km northeast of Mudgee Airport. Eighteen (18) private airstrips are located within 5 km of the project, which have historically been used for aerial agriculture. Fourteen (14) of the 18 private airstrips are associated with the project. The closest non-associated private airstrip is approximately 970 m from the nearest wind turbine. Additionally, the project is located within 'Danger Area D538B' airspace which is used by low flying military aircraft and would be situated in proximity to a deployable Department of Defence radar site located at Mt Coolah. The assessment concluded that aviation hazard lighting would not be required as the project would not impact any registered, certified or unregistered aerodromes Obstacle Limitation Surfaces (OLS), Procedures for Air Navigation Services – Aircraft Operations (PANS-OPS) protection surfaces at Coolah, Mudgee or Quirindi airports; any published Instrument Flight Rules (IFR) and Visual Flight Rules (VFR) air routes; minimum safe or lower safe altitude; and the performance of any radio navigation aid or airborne radio, aerial agricultural, recreation, air ambulance or military low jet operations outside of 780 m downwind of a turbine. Airservices Australia confirmed that there would be no adverse impact on its aviation communications, navigation and surveillance equipment from the project. CASA noted that while the turbines would marginally infringe upon navigable airspace, the likelihood of this being a hazard would be remote due to the location of the project. The Department of Defence acknowledged the Mt Coolah radar site would be unusable and did not raise any concerns about the project, however, requested that the colour used for the turbines would be conspicuous to aircraft during daylight hours, the transmission lines be marked with aviation markers in low terrain areas which may be overflown by low flying military aircraft and where they span valleys, and the details of turbines and monitoring masts be included in the RAAF's national database for tall structures. Epuron commissioned Rehbein Airport Consulting to undertake an Aviation Impact Statement in February 2017. Despite the conclusions of the assessment, some submissions expressed concern about the potential impacts of the project on aerial spraying on land in the immediate area surrounding the wind turbines. In response, Epuron: <ul style="list-style-type: none"> amended the location of the majority of turbines to ensure a minimum of 100 m setback from the project site boundary, consistent with the recommendations for turbine setbacks of the Aerial Agricultural Association of Australia's (AAAA) <i>National Windfarm Operating Protocols (May, 2014)</i>; and committed to implementing mitigation measures for any property immediately adjacent to the project site where pre-existing aerial agricultural activities are affected by the erection and/or operation of turbines. Further, the Department considers that any hazards from the turbines would be appropriately managed as long as the development is carried out in accordance with the <i>National Airports Safeguarding Framework Guideline D: Managing the Risk to Aviation Safety of Wind Turbine Installations (Wind Farms)/Wind Monitoring Towers</i>, or its latest version. With these conditions, the Department is satisfied that the project is unlikely to result in any significant aviation hazards or impacts to aerial agricultural activities. | <ul style="list-style-type: none"> The Department has restricted any turbines from being located within 100 m of the site boundary, unless otherwise agreed by the adjoining landowner. To ensure that hazards are appropriately managed, and in accordance with the standard requirements of the relevant aviation authorities, the Department has recommended conditions requiring Epuron to: <ul style="list-style-type: none"> provide the relevant authorities (including CASA, Airservices Australia and RAAF) with the final details of the wind turbines and associated infrastructure; carry out the development in accordance with the <i>National Airports Safeguarding Framework Guideline D: Managing the Risk to Aviation Safety of Wind Turbine Installations (Wind Farms)/Wind Monitoring Towers</i>, or its latest version. Additionally, the Department has recommended conditions requiring Epuron to implement mitigation measures, including funding the cost difference between the pre-development aerial agricultural activities and a reasonable alternative method and/or stopping wind turbines during aerial agricultural activities and aligning them as required by the aerial operator, if requested by the owner of any property immediately adjacent to the site where pre-existing agricultural activities are affected by the erection and/or operation of wind turbines. |
| <p><i>Mineral resources</i></p> | <ul style="list-style-type: none"> Moolarben Coal objected to the transmission line route and grid connection to TransGrid's existing 330 kV network originally proposed in the EA which would have been located within their exploration licence EL6288 and mining lease ML1605 area. The objections were based on concerns around placing the substation in the middle of an operational mining infrastructure area and that sections of the transmission line would be subject to subsidence effects from future underground mining. In response to these concerns, Epuron has realigned the transmission line route to the west of Ulan Road to avoid Moolarben Coal's exploration licence and mining lease areas. In doing so, the realigned transmission line route now runs through consolidated coal licence CCL741 and the Bobadeen East Vegetation Offset Area, held by Ulan Coal Mines Ltd, a subsidiary of Glencore. Following negotiations between Epuron, Ulan Coal, OEH and the Department, a suitable alternate offset area which provides environmental benefits has been agreed. Glencore confirmed via email correspondence with DRG that their negotiations with Epuron on the realigned transmission line route have been satisfactory. There are no other mineral titles or exploration licences within the remainder of the project site. The Department notes that transmission tower footings can and have been engineered to be located within areas subject to mine subsidence in other projects. The Department is satisfied the project would not impact existing mining operations. | <ul style="list-style-type: none"> In order to ensure that the whole of the project site is available for future mineral exploration following decommissioning, the Department has recommended conditions to ensure that redundant infrastructure is removed to a standard that makes the project site available for future mineral exploration within 18 months of the cessation of operations. |

| Issue | Consideration | Recommendation |
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| Community enhancement | <ul style="list-style-type: none"> • Epuron has undertaken extensive consultation with both Warrumbungle Shire Council and Upper Hunter Shire Council regarding the planning agreement and has committed to contributing towards a community benefit fund to support community groups, programmes and activities in the locality, as well as road maintenance projects. This funding would comprise the greater amount of either: <ul style="list-style-type: none"> • \$3,000 per annum per wind turbine built; or • \$100,000 per annum, (adjusted annually to increases in CPI from 2 years after the date development consent is granted) over the operational life of the development, to be paid in arrears on 1 July each year with the first payment occurring following the commencement of construction and ceasing when the development is decommissioned. Based on the final number of proposed turbines, this equates to about \$800,000 per annum. • The funding would be administered via a planning agreement established under Section 7.4 of the EP&A Act with the two Councils. As of the date of this report, a planning agreement has been drafted and agreed between Epuron and the two Councils, and the Department understands it is likely to be exhibited and executed, if the project is granted development consent. | <ul style="list-style-type: none"> • The Department has recommended that Epuron be required to enter into a VPA with Warrumbungle Shire Council and Upper Hunter Shire Council prior to commencing construction, unless otherwise agreed by the Secretary, in accordance with: <ul style="list-style-type: none"> • Division 7.1 of Part 7 of the EP&A Act; and • the terms of Epuron's offer. |
| Property values | <ul style="list-style-type: none"> • A number of submissions raised concerns about potential adverse impacts on property values in the area. • The Department notes that property values are influenced by a number of factors. • In 2009, the NSW Valuer-General released a report on the impacts of wind farms on land values in Australia. The report was based on primary investigations and analysis of previous studies, and concluded that the majority of wind farms in Australia appear to have no quantifiable effect on land values. • In 2016, OEH commissioned Urbis to undertake an investigation into the potential impact of wind farm developments in NSW. The study was based on sales data and traditional valuation sales analysis techniques, and similar to the NSW Valuer-General's report, concluded that wind farms are unlikely to have a measurable negative impact on surrounding land values in rural areas. • The Department acknowledges that these reports were based on limited data and should be considered in that context. • Nonetheless, the Department notes that the project is permissible with consent under applicable planning instruments, and the assessment demonstrates that with the changes made to the project through the assessment process, the project would not result in any significant impacts and would be able to comply with applicable amenity criteria established by the NSW Government for wind farm developments. • Accordingly, the Department considers the project would not result in any significant or widespread reduction in land values in the areas surrounding the wind farm. | <ul style="list-style-type: none"> • No specific conditions required. |
| Blasting and vibration | <ul style="list-style-type: none"> • The blast assessment concluded that if blasts were required during construction, the project would comply with the applicable amenity and structural damage criteria at all surrounding private residential receivers. • Furthermore, the assessment concluded that the project would not pose a perceptible source of vibration impacts during construction. | <ul style="list-style-type: none"> • To appropriately manage any blasting activities and vibration from the project, the Department has recommended conditions requiring Epuron to: <ul style="list-style-type: none"> • manage blasting operations to comply with relevant criteria at any residence on privately-owned land; and • limit blast hours to be consistent with the <i>Australian and New Zealand Environment Council Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration</i>. |
| Water use | <ul style="list-style-type: none"> • The project has the potential to impact on the availability of local water resources for agricultural and potable water supplies. • Some submissions raised concerns regarding the uncertainty of the water sources for the project, and the potential for the project to impact on the availability of local water resources that they use for agricultural purposes. • The amount of water required for the construction of the wind farm is estimated to be around 65 ML. This includes water for the construction of concrete foundations for the wind turbines, control buildings and substations, as well as for dust suppression and in the case of fire. • Epuron is proposing to source the water required for construction either by sourcing water from Burrendong Dam or Lake Windamere, or buying water from external suppliers. The Department of Industry – Crown Lands & Water (CL&W) requested that Epuron confirm the ability to extract water directly from Burrendong Dam and Lake Windamere prior to commencing construction. • The amount of water required during the operation of the wind farm is estimated to be approximately 1 ML per annum. • Epuron are proposing to source the water required for operation from on-site tanks collecting rainwater runoff from any permanent structures. • Whilst the project would involve some rock anchoring at depth (up to 20 m below ground surface level) and potentially some blasting, the activities are unlikely to result in any significant impacts to groundwater resources. • The Department and CL&W are satisfied that the project's water use is unlikely to have any significant impact on water supply and demand in the region. However, CL&W noted that any water sourced for the project is required to be appropriately licensed. | <ul style="list-style-type: none"> • The Department has recommended conditions requiring Epuron to ensure it has adequate water supplies for the project and that it obtains any necessary licences under the <i>Water Act 1912</i> or <i>Water Management Act 2000</i> required for the project. |
| Riparian areas and erosion risk | <ul style="list-style-type: none"> • The project involves a number of water crossings for internal access roads and cabling. • The landscape within the project site is characterised by intensively modified broad floodplains beneath broad basalt ridges. • Neither the EPA nor CL&W have raised any concerns about the site's erosion potential, and the Department considers that with the implementation of best practice control measures, any risks can be adequately managed. The Department also notes that it is a strict liability offence to pollute any waters off the site under the <i>Protection of the Environment Operations Act 1997</i>. | <ul style="list-style-type: none"> • The Department has recommended conditions requiring Epuron to: <ul style="list-style-type: none"> • comply with Section 120 of the <i>Protection of the Environment Operations Act 1997</i>; and • undertake activities in accordance with applicable guidelines including OEH's <i>Managing Urban Stormwater: Soils and Construction</i> and DPI's <i>Guidelines for Controlled Activities on Waterfront Land, Policy and Guidelines for Fish Friendly Waterway Crossings</i> and <i>Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings</i>. |

| Issue | Consideration | Recommendation |
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| <i>Decommissioning and rehabilitation</i> | <ul style="list-style-type: none"> • Some submissions raised concerns about decommissioning of wind turbines and associated infrastructure after the operational life of the project. • The Department has developed standard conditions for wind farms to cover this stage of the project life cycle, including clear decommissioning triggers and rehabilitation objectives (see opposite). • Additionally, the Department has provided guidance on how host landowner agreements should consider refurbishment, decommissioning and rehabilitation in the <i>NSW Wind Energy Framework's Negotiated Agreement Advice Sheet</i>. • With the implementation of these measures, the Department considers that turbines would be suitably decommissioned, either at the end of the project life or if they are not operating for more than a year, and the site appropriately rehabilitated to a standard that would allow the ongoing productive use of the land. | <ul style="list-style-type: none"> • To ensure that redundant infrastructure is removed and the areas rehabilitated appropriately, the Department has recommended conditions requiring Epuron to: <ul style="list-style-type: none"> • decommission wind turbines (and associated infrastructure) within 18 months of the cessation of operations; • progressively rehabilitate the site, and minimise the total disturbance area exposed at any time; and • comply with a number of rehabilitation objectives, including removing redundant above-ground infrastructure, restoring rural land capability and vegetation, ensuring public safety and ensuring the site is maintained in a safe, stable and non-polluting condition. |

6. RECOMMENDED CONDITIONS

The Department has prepared recommended conditions of consent for the project (see Appendix G). These conditions are required to:

- prevent, minimise, and/or offset adverse impacts of the project;
- ensure standards and performance measures for acceptable environmental performance;
- ensure regular monitoring and reporting; and
- provide for the ongoing environmental management of the project.

The recommended conditions use a risk-based approach that focuses on performance-based outcomes. This reflects current government policy and the fact that wind farms require relatively limited ongoing environmental management once the turbines have been commissioned.

In line with this approach, the Department has:

- set strict criteria for noise and shadow flicker;
- recommended operating conditions to minimise noise, biodiversity, air quality and water impacts; and
- consolidated the number of management plans to the following:
 - Traffic Management Plan
 - Heritage Management Plan
 - Biodiversity Management Plan; and
 - Bird and Bat Adaptive Management Plan.

Given concerns raised about micro-siting on other wind farm projects in NSW, the Department considers that to protect the interests of all stakeholders it is appropriate to provide further specificity in the conditions to guide the limits of micro-siting.

Accordingly, the Department has recommended conditions allowing Epuron to micro-site wind turbines and ancillary infrastructure without further approval provided:

- they remain within the development corridor;
- no wind turbine is moved more than 100 m from its approved location;
- the revised location of the blade of a wind turbine is at least 50 metres from the canopy of existing hollow-bearing trees; or where the proposed location of the blade of a wind turbine is already within 50 metres of existing hollow-bearing trees, the revised location is not any closer to the existing hollow-bearing trees; and
- the revised location of the wind turbine and/or ancillary infrastructure would not result in any non-compliance with the conditions of the consent.

The recommended conditions also require Epuron to provide detailed final layout plans to the Department prior to construction.

With these measures in place, the Department considers this to be an adequate mechanism for providing greater flexibility for the siting of turbines without resulting in any material changes to the impacts of the project.

Other key recommended conditions include:

- *visual mitigation* – additional visual impact mitigation measures for all non-associated residences that are either located within 4 km of any approved turbine or between 4 km and 5 km of any approved turbine where the Department has found the residence would have moderate visual impacts;
- *biodiversity offsets* – retiring biodiversity offset credits in accordance with the NSW Offsets Policy;
- *roads* – requiring the over-dimensional and heavy vehicle transport routes and other key local roads to be upgraded prior to construction;
- *community contributions* – formalising community contributions of up to approximately \$800,000 a year (adjusted annually to increases in CPI from 2 years after the date development consent is granted) with Warrumbungle Shire and Upper Hunter Shire Councils; and
- *decommissioning and rehabilitation* – requiring the wind turbines and above-ground ancillary infrastructure to be removed and the site rehabilitated to a good condition.

7. CONCLUSION

The Department has assessed the development application, EA, submissions, RTS and additional information provided by Epuron in accordance with the EP&A Act.

The Department notes that during the development of the project, Epuron reduced the maximum number of turbines proposed to be constructed from up to 288 to 272, and then to 267, primarily to avoid and/or minimise biodiversity and visual impacts.

Therefore, the Department has carefully considered the residual potential impacts of the project on the site and surrounds in its assessment, and is satisfied that the impacts of the project on the environment and the community could be adequately minimised, managed, or at least compensated for, to an acceptable standard, and the project can be carried out in a manner that is consistent with the principles of ESD.

The operation of the project would also not compromise the long-term use of the land for agricultural purposes and it encourages the proper development of natural resources. The project is able to be undertaken in a manner that would improve or at least maintain the biodiversity values of the locality over the medium to long term, and would not significantly impact threatened species and ecological communities of the locality. The Department is also satisfied that any residual biodiversity impacts can be managed and/or mitigated by imposing appropriate conditions and retiring the required biodiversity offset credits.

Overall, the Department considers the site to be suitable for the project, as it is in a region with significant wind resources, has good access to the State's electricity transmission infrastructure with the construction of the proposed 330 kV transmission line, and has relatively few environmental constraints.

Notwithstanding some community opposition from local landowners and special interest groups, the project offers several benefits for the wider community, and would facilitate the development of the State's renewable energy resources, and is consistent with the NSW Government's vision for a secure, reliable, affordable and clean energy future for the State.

Importantly, the project would provide an installed capacity of up to 960 MW, which would assist in meeting Australia's renewable energy targets as well as future electricity demands without the production of additional greenhouse gases.

In addition, the project would have flow-on benefits to the local community through job creation, capital investment and Epuron's proposed community funding contributions.

Given these benefits can be achieved without causing any significant adverse impacts, the Department believes the project is in the public interest and should be approved, subject to strict conditions.

8. RECOMMENDATION

In accordance with Section 4.38 of the EP&A Act, it is recommended that the Deputy Secretary, Planning Services, as delegate of the Minister for Planning:

- **consider** the findings and recommendations of this report;
- **approve** the SSD application for Liverpool Range Wind Farm (SSD 6696);
- **sign** the attached development consent and recommended conditions of consent (Appendix G).

Recommended by:

 26/3/18

Diana Mitchell
Senior Planning Officer
Resource and Energy Assessments

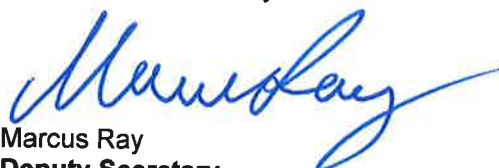
Recommended by:

 26/3/18.

Mike Young
Director
Resource and Energy Assessments

9. DECISION

Approved / Refused by:



Marcus Ray
Deputy Secretary
Planning Services

as delegate of the Minister for Planning

27/03/2018