



Planning &
Environment

**STATE SIGNIFICANT
DEVELOPMENT ASSESSMENT
Biala Wind Farm
(SSD 6039)**



Assessment Report
Section 89E of the
Environmental Planning and Assessment Act 1979

December 2016

Cover Photograph: Existing wind farm depicted on Newtricity website at: <http://www.newtricity.com.au>

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EXECUTIVE SUMMARY

Newtricity Biala Property Limited (Newtricity) proposes to develop the Biala Wind Farm, about 15 kilometres (km) southwest of Crookwell in the Southern Tablelands.

The site is located off Grabben Gullen Road in the Upper Lachlan local government area, and forms part of a larger rural area used primarily for grazing. There are nine operational, approved and proposed wind farms within 60 km of the site. This is a consequence of the area's superior wind resources, and easy access to major electricity transmission lines.

The project involves the development of:

- 31 wind turbines with a tip height of up to 185 metres (m) and hub height of up to 110 m;
- ancillary infrastructure, including three new intersections with the site off Grabben Gullen Road, internal access roads, an operations/maintenance facility, internal electricity transmission lines and a substation; and
- upgrades to the local road network, including both Kialla Road and Range Road, to facilitate the delivery of wind turbines to and from the site.

Although the project cannot operate without a connection to the electricity grid, it does not include the development of a transmission line to the grid. Newtricity proposes to seek a separate planning approval for this transmission line prior to constructing the project.

The project is classified as State significant development (SSD) under section 89C of the *Environmental Planning & Assessment Act 1979* (EP&A Act), and requires the Minister's consent. However, under the Minister's delegation of 14 September 2011, the Planning Assessment Commission must determine the development application for the project as it attracted more than 25 public objections.

Consultation

From 21 August 2015 until 20 October 2015, the Department exhibited the environmental impact statement (EIS) for the project. During the exhibition period, the Department received 50 submissions, including 11 from public authorities, 5 from special interest groups and 34 from the general public.

Most of the public submissions came from groups or residents living more than 5 km from the site, with 22 of these submissions coming from people living over 50 km from the site. This gives some idea of the regional interest in wind farm projects in the Southern Highlands. Four of the public submissions were from groups or residents living within 5 km of the site, and included substantial submissions from the Grabben Gullen Community Progress Association and Biala Landscape Protection Group.

All the agencies support the project, subject to the imposition of suitable conditions of consent. However, all but one of the 39 public submissions objected to the project. These submissions were concerned about the:

- adequacy of Newtricity's community consultation;
- exclusion of the transmission line from the project;
- cumulative visual and noise impacts of the project, which could have an adverse effect on surrounding property values; and
- justification of the project.

The Department has assessed the development application, EIS, submissions, Newtricity's response to submissions, and the additional information provided by Newtricity in accordance with the requirements of the EP&A Act. It has consulted widely with the local community, and inspected the site and surrounds several times to get a better appreciation of the key issues. Finally, it commissioned an independent expert to provide advice on the potential visual impacts of the project.

Assessment

Transmission Line

The community raised concerns about the exclusion of the transmission line from the project, and the potential impacts the development of the transmission line could have on surrounding properties.

The Department notes that under the EP&A Act, Newtricity is legally entitled to seek separate approvals for the wind farm and the transmission line.

Newtricity has identified several options for connecting the project to the grid, and carried out a strategic analysis of each of these options.

This analysis shows:

- there is sufficient network capacity in both the Yass to Bannaby 330 kV and Yass to Goulburn 132 kV transmission lines to accommodate the electricity generated by the project; and
- the development of a transmission line for the project is both reasonable and feasible, even though some options would have greater environmental and social impacts than others.

The Department agrees with this analysis, and notes that the detailed assessment of the potential impacts of the transmission line is primarily a matter for any future transmission line assessment process rather than the assessment of the wind farm.

Nevertheless, after considering Newtricity's strategic options analysis, the Department favours the shorter, more direct connections to the Yass to Bannaby transmission line (Options 3 & 4) over the longer connections to the Yass to Goulburn 132 kV transmission line (Options 1 & 2), and encourages Newtricity to examine these options closely before making a final decision on the preferred transmission line.

Further, the Department has recommended a condition requiring Newtricity to secure planning approval for the transmission line before it is allowed to carry out the project.

Visual

Concerns about visual impact dominated the public submissions on the project.

Many people thought the project would have significant visual impacts on several residences close to the site, including the Grabben Gullen village and exacerbate the cumulative visual impacts of wind farms in the region.

Following detailed assessment, the Department has concluded that the incremental and cumulative visual impacts of the project would be moderate to low, primarily due to the:

- limited number of turbines, and compact layout of the site;
- limited number of dwellings in close proximity to the site; and
- local topography and vegetation, which would limit or screen views of the wind turbines on the site.

Nevertheless, consistent with several other wind farm approvals, the Department has recommended conditions requiring Newtricity to further reduce the visual impacts of the project. These conditions include giving the owners of residences within 4 km of a turbine the ability to ask for additional screening or landscaping measures to be implemented on their property.

With these conditions in place, the Department considers the visual impacts of the project to be acceptable.

Traffic

With suitable road upgrades already agreed with Upper Lachlan Shire Council, regular road maintenance, and the implementation of standard traffic control measures and a driver's code of conduct, the Department is satisfied that the project would not result in any unacceptable impacts on the capacity, efficiency or safety of the road network.

Noise

The site sits in a quiet rural area with low background levels. Using conservative assumptions, noise modelling suggests the project would be able to comfortably comply with the relevant noise criteria at all non-associated residences under all wind speeds.

The Department has recommended conditions requiring Newtricity to comply with the relevant noise criteria, and undertake detailed noise compliance monitoring within six months of the commencement of operations.

Although several submissions were concerned about the potential health risks associated with the low frequency noise and infrasound emissions of the project, detailed assessment has shown that the project is unlikely to generate excessive low frequency noise.

The Department notes that the National Health and Medical Research Council (NHMRC) has concluded that “*there is no direct evidence that exposure to wind farm noise affects physical or mental health,*” and that any further health-based studies should be limited to areas within 1.5 km of wind turbines. In this case, there would be no non-associated residences within 2 km of a wind turbine.

Biodiversity

The site has limited conservation value, apart from some scattered patches of remnant vegetation.

The project would disturb around 43 hectares of the site, mostly comprising non-native pastures, and clear less than 1% of the native vegetation on site, although this would include up to 1.05 hectares of a woodland endangered ecological community (EEC).

Detailed assessment suggests the bird and bat strike impacts of the project are likely to be low, as most of the bird and bat species recorded on site would fly below or outside the swept path of the wind turbine blades.

The Department notes that Newtricity proposes to further reduce these impacts through additional micro-siting of wind turbines, and offset the residual biodiversity impacts of the project in accordance with the requirements of *NSW Biodiversity Offsets Policy for Major Projects*.

Overall, the flora and fauna impacts of the project are considered to be minor.

The Department has recommended conditions requiring Newtricity to implement a range of measures to minimise the biodiversity impacts of the project, and offset any residual impacts.

Socio-Economic

The project would result in a range of social and economic benefits for the wider community.

These benefits include:

- facilitating the development of the renewable energy industry in NSW, and helping implement the state’s *Renewable Energy Action Plan*;
- making efficient use of the region’s significant wind resources;
- generating up to 242 gigawatt (GW) hours of electricity a year, or enough power for 33,200 homes, and helping Australia to meet its renewable energy target by 2020;
- reducing the greenhouse gas emissions associated with electricity production in NSW;
- making a positive contribution to the local economy by creating jobs, and providing income to for the associated landowners;
- upgrading the local road network for all road users; and
- providing ongoing funding for community enhancement projects in the local area (around \$77,500 a year), consistent with other benefit-sharing schemes across NSW.

A number of submissions raised concerns about the potential adverse impacts of the project on property values in the area. However, the Department notes the project is a permissible land use under the relevant planning instruments, and is not predicted to generate any significant environmental impacts at nearby residences.

Further, the Department has recommended conditions requiring Newtricity to further reduce the impacts of the project. With these safeguards in place, the Department considers the project is unlikely to result in any discernible impact on property values.

Summary

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, is a permissible use on the land, and has relatively few environmental constraints.

Based on its assessment, the Department is satisfied that Newtricity has designed the project in a manner that achieves a reasonable balance between maximising the use of the site's wind resources and minimising the potential impacts of the project on the site and its surrounds.

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.

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 state's renewable energy resources.

Given these benefits can be achieved without causing any significant adverse impacts, the project is considered to be approvable, subject to strict conditions.

1 PROJECT

1.1 Background

Newtricity Biala Property Limited (Newtricity) proposes to develop the Biala Wind Farm, about 15 kilometres (km) southwest of Crookwell in the Southern Tablelands of NSW (see Figure 1).

The site is located off Grabben Gullen Road in the Upper Lachlan local government area, and forms part of a larger rural area used primarily for grazing. Most of the site has been cleared for agriculture although there are a few stands of remnant vegetation on site, particularly in the northeastern corner near one of the access points for the site (see Figure 2).



Figure 1 Project Location

1.2 Wind Turbines

The project involves the installation, operation, maintenance and decommissioning of 31 wind turbines with a tip height of up to 185 metres (m) and hub height of up to 110 m.

The choice of turbine has not been finalised yet, but each turbine is expected to produce about 3.5 megawatt (MW) of power. This means the wind farm is expected to be able to generate around 78 MW or 242 (GW) hours of electricity annually, which is enough to power about 33,200 homes.

Extensive planning has gone into the layout of the proposed turbines.

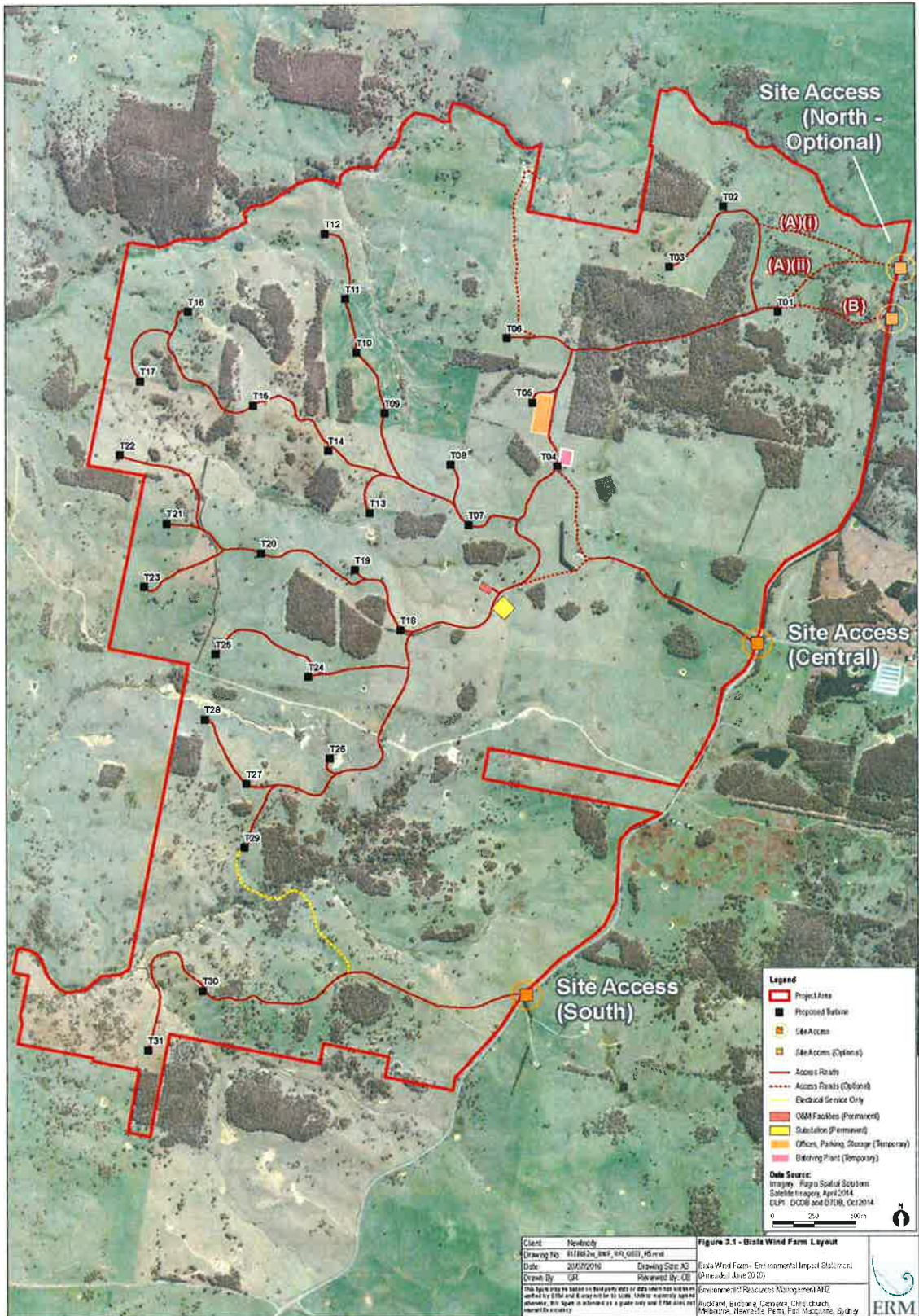


Figure 2: Project Layout

In general, the turbines have been laid out to minimise impact and comply with the following criteria:

- 50 m from mapped Aboriginal areas;
- 100 m from identified ecologically sensitive areas;
- 50 m from existing water bodies; and
- 2 km from privately-owned dwellings, where the owner is not associated with the project.

The only exceptions are turbines 14, 15, 25 and 30, which are closer than 100 m from identified ecologically areas (see Figure 2).

Notwithstanding, Newtricity wants the flexibility to be able to micro-site the turbines during the final design of the project, both to improve the efficiency of the wind farm but also to further minimise any environmental impacts.

While it has not specified any particular limits for this micro-siting, it considers there are few environmental constraints on site that should prevent this micro-siting.

1.3 Ancillary infrastructure

The project requires a range of ancillary infrastructure.

This includes temporary and permanent works on site to support the construction and operation of the wind farm, including:

- Temporary: concrete batching plant, site offices and equipment storage; and
- Permanent: 3 new intersections off Grabben Gullen Road, internal access roads, an operations and maintenance facility, internal electricity transmission infrastructure and a substation.

It also includes upgrades to both Kialla and Range Road to facilitate the delivery of the wind turbines to the site using over-dimensional vehicles.

1.3 Transmission Line

While the project cannot operate without a connection to the electricity grid, it does not include the construction or operation of a transmission line to connect the substation on site to the grid.

Newtricity has identified several options to connect the project to the nearby Yass to Goulburn 132 kV transmission line or Yass to Bannaby 330 kV transmission line, and says it will obtain separate planning approval for the construction and operation of this transmission line prior to constructing the project.

While this creates some uncertainty about the final layout of the project as a whole, Newtricity has carried out a strategic assessment of the potential impacts associated with constructing and operating the various transmission line options in the Environmental Impact Statement for the project (EIS, see Appendix A), and claims there are no insurmountable constraints to developing at least one of these options.

The major components of the project are depicted in Figure 2, summarised in Table 1 below, and described in detail in the EIS for the project (see Appendix A).

Table 1: Major Components of the Project

Aspect	Description
Project summary	<p>Development of a wind farm, including:</p> <ul style="list-style-type: none"> • 31 wind turbines; • temporary and permanent ancillary infrastructure on site to facilitate the construction and operation of the wind turbines; and • upgrades to Range Road and Kialla Road to enable wind turbines to be delivered to site using over-dimensional vehicles.
<i>Project area</i>	1,936 ha
<i>Disturbance area</i>	42 ha or 2 % of the site
<i>Wind turbines</i>	<ul style="list-style-type: none"> • 31 wind turbines and associated crane hardstand areas • Maximum height (to blade tip) - 185 m • Tower heights - up to 110 m • Blade lengths - up to 75 m • Maximum capacity - 3.5 MW¹
<i>On-site ancillary infrastructure</i>	<ul style="list-style-type: none"> • Temporary construction facilities, including a site compound, concrete batching plant, site office and equipment storage area; • Electrical infrastructure, including: <ul style="list-style-type: none"> ○ 31 wind generator transformers; ○ predominantly underground 33kV electrical interconnection lines with a 900 m overhead line connecting two turbines within the southern portion of the site; ○ a substation with 132 kV step up transformers, switch gear and ancillary equipment; • Road works, including: <ul style="list-style-type: none"> ○ 3 new access intersections off Grabben Gullen Road; and ○ up to 27 km of 8 m wide internal access roads, building on existing access roads wherever possible • Operations and maintenance facilities; and • 3 permanent wind monitoring masts
<i>Off-site road works</i>	<ul style="list-style-type: none"> • Pavement rehabilitation along: <ul style="list-style-type: none"> ○ 2.1 km of Kialla Road; ○ 7.3 km of Range Road, including the replacement of 9 causeways; and • Intersection treatments at: <ul style="list-style-type: none"> ○ Goulburn Road/Range Road; ○ Grange Road/Cullen Street; ○ Cullen Street/Kialla Road; ○ Kialla Road/Range Road; and ○ Range Road/Grabben Gullen Road)
<i>Heavy vehicle transport routes</i>	<ul style="list-style-type: none"> • <i>Over-dimensional vehicles:</i> Hume Highway, Crookwell-Goulburn Road, Kialla Road, Range Road, and Grabben Gullen Road • <i>All other heavy vehicles:</i> Hume Highway, Gunning Road and Grabben Gullen Road.
<i>Employment</i>	<ul style="list-style-type: none"> • Construction - up to 74 people • Operations - up to 7 people
<i>Capital investment value</i>	<ul style="list-style-type: none"> • \$192 million
<i>Voluntary Planning Agreement</i>	<ul style="list-style-type: none"> • Contribute \$2,500/turbine (plus CPI) each year to Upper Lachlan Shire Council to fund community projects in the surrounding area

¹ The Applicant may use a mix of turbine models across the site to maximise the efficiency of the project.

2 STRATEGIC CONTEXT

2.1 Wind Energy

Renewable Energy Action Plan

In September 2013, the NSW Government released the *Renewable Energy Action Plan*.

The plan seeks to:

- encourage the development of renewable energy in NSW, and help meet the national Renewable Energy Target (RET) of 20% renewable energy by 2020; and
- reduce the state's greenhouse gas emissions.

It identifies wind as one of the key sources of renewable energy in NSW, as the state has valuable wind resources by international standards with many of these resources located near existing electricity transmission infrastructure.

The best wind resources in NSW are generally located along the Great Dividing Range and the Western Slopes, including the Southern and Central Tablelands.

The site for the Biala project falls within this area, and has strategic potential for wind farm development given its access to moderate to high average wind speeds and its proximity to the Yass-Goulburn and Yass to Bannaby electricity transmission lines.

If it proceeds, the Department is satisfied the project would be consistent with the strategic intent of the *Renewable Energy Action Plan*, and help Australia to meet its renewable energy target.

Other Wind Farms

There are several operational, approved and proposed wind farms in the regional area surrounding the Biala site (see Table 2 and Figure 3).

This is a consequence of the area's superior wind resources, and has given rise over the last decade to growing community concerns about the cumulative impacts of wind farm development in the region, and in particular the visual impacts of these projects on the regional landscape.

Most of these wind farms are located over 15 km from the Biala site, and are not expected to cause any cumulative impacts with the project apart from at the broad landscape level, and even then these impacts would be mitigated to a large extent by the rolling hills of the Southern Tablelands.

The closest wind farms to the Biala site are: the Gullen Range Wind Farm, which is located 5.5 km to the east of the Biala site; and the Gunning Wind Farm, which is located 7.2 km to the south of the site. In its assessment, the Department has considered the potential cumulative impacts of these projects with the Biala project, and in particular the visual and noise impacts.

Table 2: Wind farms in the region

Wind Farm	Distance from Biala Wind Farm	Status	Number of turbines	Tip height
<i>Gullen Range</i>	5.5 km east	Operational	73	135 m
<i>Gunning</i>	7.2 km southeast	Operational	31	121 m
<i>Crookwell 1</i>	16.1 km northeast	Operational	8	67 m
<i>Crookwell 2</i>	15 km east	Approved	46	128 m
<i>Crookwell 3</i>	15 km east	Proposed	29	151 m
<i>Cullerin Range</i>	20.9 km south	Operational	15	126 m
<i>Collector</i>	25 km south	Approved	55	150 m
<i>Taralga</i>	45.9 km northeast	Operational	51	130 m
<i>Woodlawn</i>	55 km southeast	Operational	23	124 m
<i>Capital I</i>	60 km southeast	Operational	67	124 m
<i>Capital II</i>	55 km south	Approved	41	157 m
<i>Rye Park</i>	29.5 km west	Proposed	126	157 m
<i>Bango</i>	41.4 km west	Proposed	122	200 m

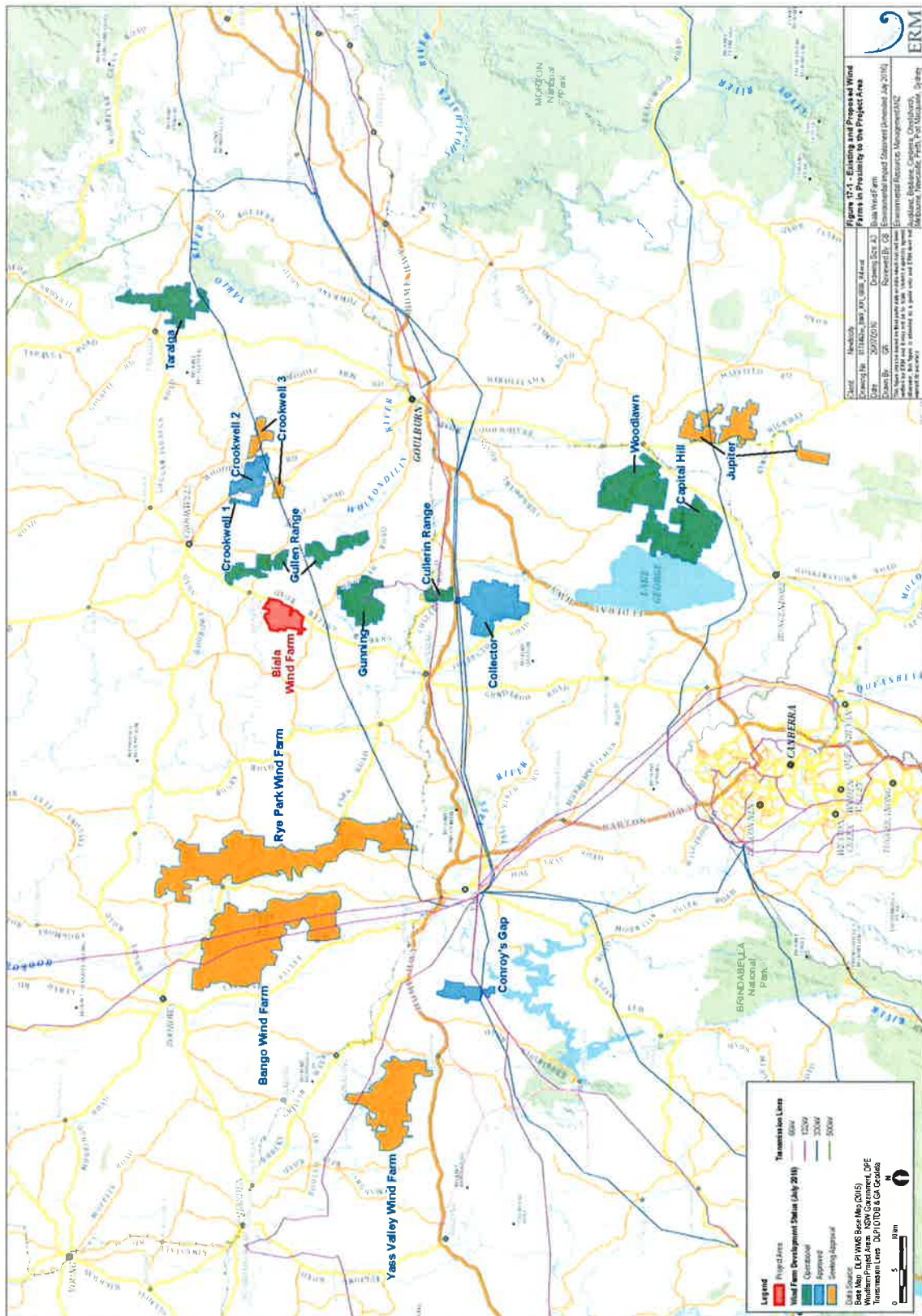


Figure 3: Wind Farms in the Regional Area

In relative terms, the Biala project is comparatively modest in size and has a compact layout (31 turbines and about 7 km north to south) compared to the Gullen Wind Farm (73 turbines and about 25 km north to south).

NSW Wind Energy Policy Framework

In August 2016, the Department exhibited a new *Wind Energy Planning Framework* (the draft Framework) for public comment.

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

The draft Framework provides a merit-based approach and includes specific guidance on the assessment of noise and visual impacts in the:

- *Visual Impact Assessment Bulletin*; and
- *Noise Assessment Bulletin*.

The Department is currently considering the issues raised in submissions, and expects to finalise the new Framework shortly.

However, it is important to note that the draft Framework will only apply to new projects once it is made, and therefore does not apply to the Biala project.

2.2 Regional Population

The area surrounding the project has scattered rural residences located primarily along Grabben Gullen Road to the east, Wheeo Road to the north, Biala-Gurrundah Road to the south and Sapphire Road to the west (see Figure 4).

The closest village to the project area is Grabben Gullen, which is located 3 km to the northeast. Together with the broader locality, it hosts a population of 475 (2011 census). The Grabben Gullen village contains lots zoned rural smallholdings (RU4), village (RU5) and low density residential (R2). Based only on distance from turbines, the village could be affected by the visual (Section 5.2) and traffic impacts of the project.

Other rural localities (RU1 / RU2) in the vicinity of the project include Biala (8 km west), Wheeo (10 km northwest) and Gurrundah (6 km southeast), which comprise a relatively small number of rural residences and homesteads. Some individual residences in these localities could be affected by the visual (Section 5.2) impacts of the project.

The closest township to the project area is Crookwell, which is located approximately 15 km to the northeast, and has a population of around 2,507 residents; and the nearest major centre is Goulburn, which is located 37 km to the southeast, and has a population of over 21,000 residents. Due to their distance from the site and intervening topography, these townships are unlikely to experience any visual or noise impacts as a result of the project.

Associated Landowners

The project has four host or "associated" landowners, who own land both on and adjoining the project site (see Figure 4). They have entered into commercial arrangements with Newtricity to facilitate the development of the project, and agreed to accept the impacts of the project.

Non-associated Landowners

The remaining land is generally in private ownership, and the owners of this land are not associated with project in any way.

Between 2-3 km from the site (see Figures 4 & 7), there are 13 non-associated residences with the closest residences being located just over 2 km from the eastern boundary of the site, and one approved but not yet constructed residence to the southeast of the site (i.e. DA18).

Between, 3-4 km from the site, there is the Grabben Gullen village, which has multiple private landowners, and one other private landowner to the north (H03b) (see Figures 4 & 7).

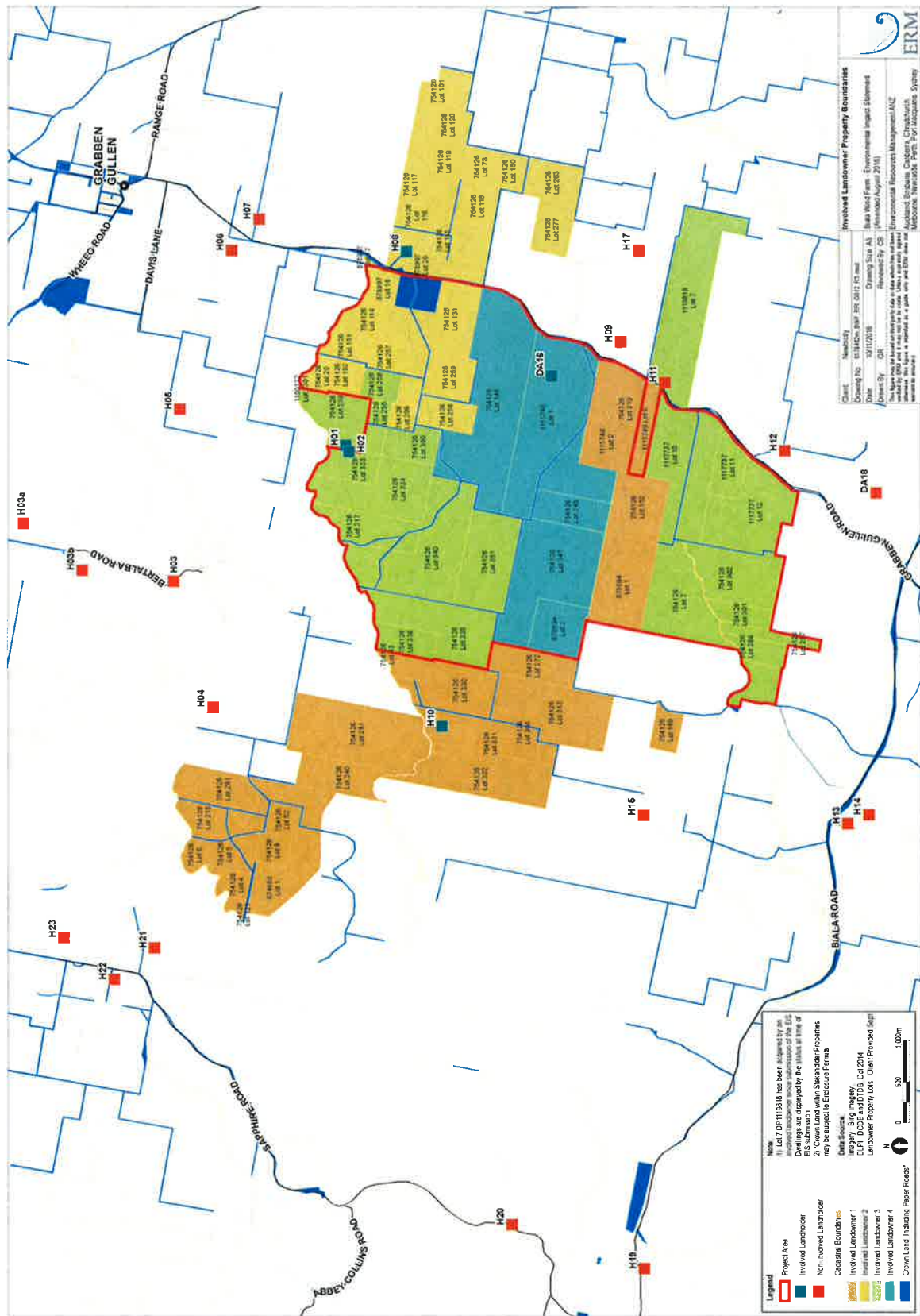


Figure 4: Landholdings in the Vicinity of the Site

2.3 Key Infrastructure

Road Network

The project is relatively isolated from major transport routes.

The Hume Highway, which is the major arterial road linking Sydney to Melbourne, runs in an east west direction approximately 25 km to the south of the site (see Figure 1), and would be used to access the site.

Over-dimensional vehicles with wind turbines would leave the Hume Highway at Goulburn, heading north along the Goulburn-Crookwell Road before making their way to the site via Kialla Road, Range Road and then Grabben Gullen Road (see Figure 15).

All other heavy vehicles would leave the Hume Highway at Gunning and travel along Gullen Grabben Road to the site (see Figure 15).

Electricity Transmission Lines

There are two existing transmission lines in close proximity to the site that could be used to link the Biala project to the electricity grid (see Figure 6):

- the 330 kilovolt (kV) Yass to Bannaby transmission line, which is owned by TransGrid and runs in a northeast to southwest direction near the Gullen Range Wind Farm about 10 km away from the site; and
- the 132 kV line Yass to Goulburn transmission line, which is owned by Essential Energy and runs in an east west direction approximately 22 km to the south of the site.

2.4 Natural Environment

The Southern Tablelands region is characterised by areas of extensively cleared agricultural grazing land comprised of rolling hills and gentle ridgelines with scattered remnants of vegetation.

There are limited areas of ecological sensitivity near the site. The regional setting is not characterised by areas identified as having high scenic value or areas that have been zoned for recreation, tourism, environmental management or conservation.

The project lies within the reaches of the Lachlan River catchment. There are no permanent watercourses on site, however a number of non-perennial watercourses flow from the site, predominantly discharging to the Lachlan River to the east.

3 STATUTORY CONTEXT

3.1 State Significant Development (SSD)

The project is classified as SSD under section 89C of the *Environmental Planning & Assessment Act 1979* (EP&A Act): it triggers the criteria in clause 20 of schedule 1 to *State Environmental Planning Policy (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 dated 14 September 2011, the independent Planning Assessment Commission must determine the development application for the project as there were more than 25 public objections.

3.2 Permissibility

The project is located in the Upper Lachlan Local Government Area.

Under the *Upper Lachlan Local Environmental Plan 2010*, most of land on site is zoned RU2 (Rural Landscape), with small parcels along the northern boundary being zoned RU1 (Primary Production). Wind farms are permissible with development consent in both of these zones.

The project is also permissible with development consent under *State Environmental Planning Policy (SEPP) (Infrastructure) 2007* (Infrastructure SEPP), as development for the purposes of electricity generating works may be carried out by any person with consent on any land in a prescribed rural zone, and the RU1 and RU2 zones are prescribed rural zones.

3.3 Environmental Planning Instruments

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

- *SEPP (State and Regional Development) 2011*;
- *SEPP (Rural Lands) 2008*;
- *SEPP No.44 – Koala Habitat Protection*; and
- *SEPP No. 55 – Remediation of Land*.

The Department has assessed the project against the relevant provisions of these instruments (see this report and Appendix B), and concluded that none of these instruments has a major bearing on whether or not the project should be approved, and that the project can be undertaken in a manner that is consistent with the aims, objectives and provisions of these instruments.

The Department has also considered the project against the relevant provisions of the *Upper Lachlan Development Control Plan (2010)*, and notes that the project is consistent with the key provisions in this plan:

- turbines are located at least 2 km from non-associated residences;
- turbines are located at least two times the height of the turbine (including the tip of the blade) from a non-associated property boundary;
- no non-associated property would be surrounded by turbines; and
- Newtricity would pay Upper Lachlan Shire Council (Council) \$2,500 (plus CPI) a year for each turbine for community enhancement projects in the surrounding area.

3.4 Integrated and Other NSW Approvals

Under section 89J of the EP&A Act, a number of other approvals are incorporated into the SSD approval process, and consequently are not required 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 89K 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 environment 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), considered their advice in its assessment of the merits of the project (see Section 5), and included suitable conditions in the recommended conditions of consent to address with these matters.

3.5 Commonwealth Approvals

On 6 May 2015, the Commonwealth concluded that the project would not have a significant impact on any Matters of National Environmental Significance, and declared that it was not a controlled action under section 75 of the *Environment Protection and Biodiversity Act 1999* (EPBC Act).

Consequently, the project does not require Commonwealth approval.

3.6 Section 5A-D Considerations

Section 5A-D of the EP&A Act outlines several matters that a consent authority must take into consideration, including whether the development is likely to have a significant effect on:

- threatened species, populations or ecological communities, or their habitats, having regard to the '7 part test of significance' and the *Threatened Species Assessment Guidelines – The Assessment of Significance*, dated August 2007; or
- critical habitat, having regard to the relevant register.

The Department has considered these matters, and concluded that the project it is unlikely to have a significant impact on any of these matters (see Section 5.5 and Appendix B).

3.7 Section 79C Considerations

Section 79C(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 the EP&A Act and the encouragement of ecologically sustainable development (see Appendix B).

4 CONSULTATION

4.1 Newtricity's Engagement

In the early stages of developing the project, Newtricity prepared a *Stakeholder and Community Engagement Strategy* (see Annex D of the EIS).

To date, it has implemented the following aspects of this strategy:

- established a project website and email address;
- distributed three newsletters to the local community between June 2013 and February 2015;
- held two community information sessions, which were each attended by between 35 and 40 people;
- door knocking and face-to-face meetings with several members of the local community; and
- established a community consultative committee (CCC) for the project - comprising an independent chairperson, four members of the local community, and one Council representative – and held three committee meetings.

4.2 Department's Engagement

During the assessment process, the Department has visited the site on several occasions, and consulted with local residents, Council, state agencies, and Newtricity. This engagement is summarised in Table 3 below.

Table 3: Department's engagement

Date	Description	Attendees
5 August 2015	• Visit to site and surrounds to understand project area and context	• DPE officers
21 August 2015 – 20 October 2015	• Public exhibition of the development application and EIS	• General public

Date	Description	Attendees
9 November 2015	<ul style="list-style-type: none"> Visit to site and surrounds Meeting with selected adjacent residents, Grabben Gullen Progress Association, group regarding transmission line 	<ul style="list-style-type: none"> DPE officers Local residents
25 March 2015	<ul style="list-style-type: none"> Visit to site to understand biodiversity impacts 	<ul style="list-style-type: none"> DPE officers OEH officers Newtricity
22 March 2016	<ul style="list-style-type: none"> Visit to site and door knock to selected adjacent non-associated residences 	<ul style="list-style-type: none"> DPE officers Independent visual expert Local residents
26 May 2016	<ul style="list-style-type: none"> Visit to surrounds and selected adjacent residences to confirm impact and discuss issues Meeting with group of community members to hear and understand concerns 	<ul style="list-style-type: none"> DPE officers
<i>During assessment process</i>	<ul style="list-style-type: none"> Consultation with agencies and in particular OEH and Council to resolve residual concerns; and Consultation with Newtricity and its consultants 	<ul style="list-style-type: none"> DPE officers OEH Council Newtricity

4.3 Exhibition

The Department:

- publicly exhibited the EIS from 21 August 2015 until 20 October 2015 (60 days);
- notified relevant State government authorities and the Council;
- notified relevant electricity supply and transmission authorities, in accordance with the Infrastructure SEPP;
- notified members of the public who had expressed interest in the project; and
- advertised the exhibition in the Canberra Times, Crookwell Gazette and Goulburn Post newspapers as well as the Gunning Lions Club Newsletter.

This satisfies the notification requirements in Section 89F of the EP&A Act and the Infrastructure SEPP.

During the exhibition period, the Department received a total of 50 submissions on the project (see Table 4 below).

Table 4: Summary of Submissions

Submitters	Number	Objection / Support
Agency:	11	
<ul style="list-style-type: none"> Office of Environment and Heritage Environment Protection Authority Department of Primary Industries (Agriculture, Fisheries, Water, Lands) Division of Resources and Energy within Department of Industry Roads and Maritime Services NSW Health – Murrumbidgee Local Health District Airservices Australia CASA Crown Land Department of Defence Upper Lachlan Shire Council 		No objections
Special Interest groups:	5	
<ul style="list-style-type: none"> Doctors for the Environment Australia 	1	Support
<ul style="list-style-type: none"> Biala Landscape Protection Group Grabben Gullen Community Progress Association Parkesbourne/Mummel Landscape Guardians Inc. Rye Park Action Group 	4	Object
Community	34	All object

Submitters	Number	Objection / Support
Approx. distance from Biala Wind Farm:		
< 5 km	2	
5 - 50 km	9*	
> 50 km	21	
unknown	2	
TOTAL	50	

* Note: 3 of the 9 properties located 5 – 50 km from Biala Wind Farm have the proposed transmission line corridor located on their property

Most of the public submissions came from groups or residents living more than 5 km from the site, with 22 of these submissions coming from people living over 50 km from the site. This gives some idea of the regional interest in wind farm projects in the Southern Highlands. Four of the public submissions were from groups or residents living within 5 km of the site, and included substantial submissions from the Grabben Gullen Community Progress Association and Biala Landscape Protection Group.

A full copy of the submissions is included in Appendix C.

Following exhibition, Newtricity provided a detailed response to the matters raised in public submission (see Appendix D). It also provided a range of additional information to address matters raised by the Department and other agencies during the assessment process (see Appendix E).

4.4 Key Issues - Agencies

Most of the issues raised by agencies have been addressed through the provision of additional information, or through the recommended conditions of consent.

The **Environment Protection Authority (EPA)** has advised that the Department that it is prepared to issue an environment protection licence for the project, and recommended conditions to control the potential noise, blasting, dust and water pollution impacts of the project.

The **Department of Primary Industries (DPI)** had no concerns about the water, agricultural or fisheries impacts of the project, and recommended conditions to ensure all waterway crossing of the ephemeral creeks on site are constructed to the relevant standard, and that the site is properly rehabilitated following the decommissioning of the project.

The **Division of Resources and Energy** supports the project as it will make the most of the region's wind resources.

Both the **Roads and Maritime Services (RMS)** and **Upper Lachlan Shire Council** are satisfied that the traffic impacts of the project can be suitably managed with upgrades to the over-dimensional vehicle route prior to the delivery of any wind turbines, regular maintenance of both transport routes, and the implementation of standard traffic control and management measures during the construction and decommissioning of the project.

The **Department of Defence** and relevant Commonwealth aviation agencies – the **Civil Aviation Safety Authority** and **Airservices Australia** – have no concerns about the aviation safety impacts of the project subject to the imposition of standard conditions requiring the notification of aviation authorities of the final location of the turbines and the installation of aviation lighting (if necessary).

Finally, while the project is unlikely to result in any significant biodiversity or heritage impacts, the **Office and Environment and Heritage (OEH)** has residual concerns about:

- the proximity of two turbines (T29 and T30) to a wedge-tailed eagle nest, and asked for these turbines to be moved as far as possible from the nest during any micro-siting of the turbines on site; and
- the potential impacts on Aboriginal heritage item (BWF PAD1)..

These matters are discussed in more detail in Section 5 below.

4.5 Key Issues - Community

The Department has summarised the issues raised by the general public, including the five special interest groups, in Figure 5 and Table 5 below.

These issues can be grouped into four categories:

- *Community consultation:* Newtricity's community engagement strategy was inadequate, and it should have done more to address the concerns raised by the community;
- *Transmission line:* the transmission line is an essential component of the project, and should have been included in the project; the failure to do so has created uncertainty for several landowners surrounding the site; and with a detailed assessment of the potential impacts of the transmission line, the full impacts of the project remain unknown;
- *Wind Farm:* in particular, the incremental and cumulative visual and noise impacts of the project which are likely to adversely affect the values of properties in close proximity to the site; and
- *Justification:* the NSW Government support for renewable energy projects such as this should be reviewed, as the region is already "saturated" with wind farms and the cost of the project would outweigh its benefits, and the draft guidelines for wind energy projects should be finalised as soon as possible to provide certainty to all parties involved in the assessment of these projects.

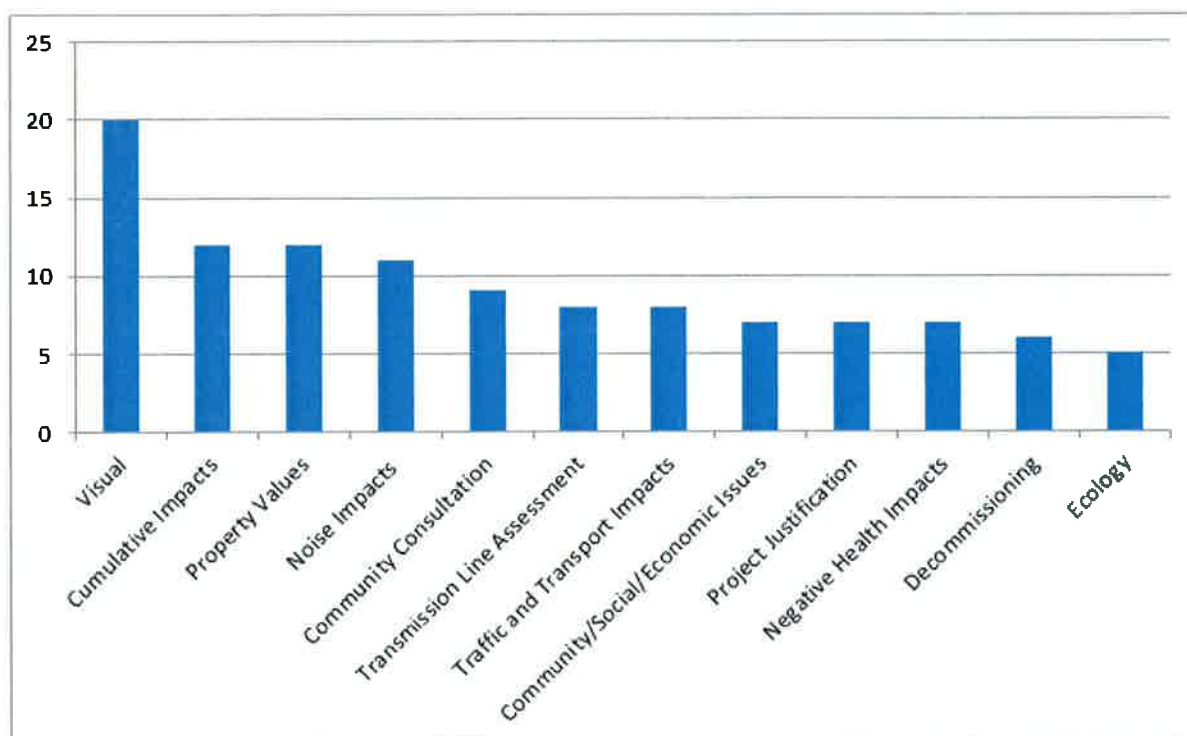


Figure 5: Key Issues Raised in Public Submissions

Table 5: Summary of community issues

Issue	Section in this report
TRANSMISSION LINE	
- construction of the transmission line should be assessed as part of the wind farm development as it is a necessary component of the project.	Section 5.1
- lack of a definitive route	
WIND FARM	
Visual	Section 5.2
- criticism of the visual impact assessment methodology and outcomes	
- visual impacts associated with the large size of the wind turbines	
- mitigation measures proposed are inadequate and unacceptable	

Issue	Section in this report
Cumulative Impacts <ul style="list-style-type: none"> - many existing wind farms in the region - cumulative impact assessment should include the impact on landowners already experiencing material impacts from existing wind farms 	Section 5.6
Property Values <ul style="list-style-type: none"> - property will be devalued as a result of the project - limitations to future development of properties located in close proximity to the wind farm and transmission line - compensation should be provided to landowners who experience a decrease in property values due to the project 	Section 5.6
Noise and Health <ul style="list-style-type: none"> - concerns about noise impacts from the wind turbines - background noise monitoring methodology does not comply with the applicable guidelines and policy - health and stress issues for humans and animals - infrasound and low frequency noise impacts are not well understood and a precautionary approach should be applied until results of further research is available, including a moratorium on wind farm development in the interim 	Section 5.4 and Section 5.6
Traffic and transport <ul style="list-style-type: none"> - criticism of the timing and accuracy of the traffic counts on local roads - condition of local roads will deteriorate due to heavy vehicle traffic associated with the project - increased safety risks for people travelling on local roads and through villages - concerns that commitments to maintain the condition of local roads will not be honoured - Range Road is not a viable option for heavy construction vehicle access - Biala Road, which has previously been upgraded for the Cullerin Wind Farm, should be the heavy vehicle access route 	Section 5.3
Ecology <ul style="list-style-type: none"> - inadequate length and timing of survey methodology - turbines will result in of avifauna mortality - concern about the destruction of the little pristine bush and grasslands (including rare bush orchids) that remain in the area 	Section 5.5
Community and socio-economic impacts <ul style="list-style-type: none"> - wind farm projects damage the cohesiveness of the community and cause divisions between associated and non-associated landowners - interference with farming operations 	Section 5.6
Decommissioning <ul style="list-style-type: none"> - concerns about the financial ability of Newtricity to decommission the development at the end of project life 	Section 5.6
Other issues <ul style="list-style-type: none"> - micro-siting should allow for only minor changes to the turbine layout assessed in the EIS and DPE could condition the approval such that no turbine can be moved closer than the approved closest turbine to any non-associated landowner - increased bushfire danger - land degradation and erosion issues associated with construction - water use requirements for construction and the negative effect on landowners further down the waterways who rely on these resources - electromagnetic interference to television reception 	Section 5.6
COMMUNITY CONSULTATION	
<ul style="list-style-type: none"> - insufficient and inadequate community consultation undertaken - not evident how issues raised by the community have been resolved - broad, generalised and misleading information being disseminated to the community 	Section 4
JUSTIFICATION	
<ul style="list-style-type: none"> - environmental benefits of reduced reliance on fossil fuels for energy generation and greenhouse gas emissions - adverse public impacts of the project would substantially outweigh any public benefits. - guidelines and policy for wind farms should be finalised as soon as possible - the project will not make a substantial difference to renewable energy generation in NSW - energy efficiency and green credentials of wind farms are questionable - the project offers no real benefit to the local community, with jobs being highly specialised and unlikely to go to locals 	Section 5.6 and Section 8

5 ASSESSMENT

During its assessment of the merits of the development application for the project, the Department has considered the:

- EIS, submissions, and the RTS;
- additional information provided by Newtricity;
- advice from Commonwealth, State and local government agencies;
- advice of the independent visual expert commissioned by the Department;
- 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 Transmission line

The community raised two key concerns about the transmission line for the project.

The first concern was Newtricity's decision to exclude the transmission line from the project, and to seek a separate planning approval for this line at some stage in the future, either under Part 4 of 5 of the EP&A Act.

The community felt this decision deferred consideration of an essential component of the project, as the project would not be able to function without a connection to the electricity grid, and created unnecessary uncertainty for landowners in the surrounding area whose land may be required for the development of the transmission line.

The Department acknowledges the community's concerns about this matter, but notes that Newtricity is legally entitled under the EP&A Act to seek separate approvals for the wind farm and the transmission line, rather than combining them into a single assessment process.

Nevertheless, it also notes that Newtricity is required to:

- demonstrate, at least at the strategic level, that the development of the transmission line is both reasonable and feasible; and
- carry out a detailed assessment of the environmental impacts of the transmission line and secure the necessary approvals before it builds the line; or, if the transmission line is to be built by a public authority, rely on the relevant public authority to do this.

In the EIS, Newtricity considered several transmission line options for the project (see Sections 3.8, 5.4, Annex B and additional information dated 15 June 2016), including potential variations to the options.

These options are summarised in Table 6 and depicted in Figure 6, and involve connecting the wind farm to either the:

- Yass to Bannaby 330 kV transmission line, either directly or via the Gullen Range Wind Farm; or
- Yass to Goulburn 132kV transmission line, either directly or via the Gunning Wind Farm.

Table 6: Transmission line connection options

Existing transmission line connection	Proposed transmission line	Connection point	Location (approx.)	Transmission Line Capacity
Yass to Goulburn 132 kV line east west direction Essential Energy	Option 1 132 kV above ground transmission line	Option 1A New connection to Essential Energy 132 kV line	29 km south	Yes with upgraded / new substation and design control measures
		Option 1B Through Gunning Wind Farm substation	15 km south	Yes with monitoring or upgrade of the portion of the line to Cullerin Wind Farm
	Option 2 33 kV underground transmission line	Through Gunning Wind Farm	15 km south	
Yass to Bannaby 330 kV northeast to southwest direction TransGrid	Option 3 330 kV above ground transmission line	New connection to TransGrid 330kV line	10 km southeast	Yes without constraint
	Option 4 33 kV underground transmission line	Through Gullen Range Wind Farm	10 km southeast	

This analysis shows there is sufficient network capacity in both transmission lines to accommodate the electricity generated by the Biala project.

It also shows that the development of a transmission line for the project is both reasonable and feasible, even though some options would have greater environmental and social impacts than others.

The decision on the final option has not been made yet, and would depend on the detailed consideration of a range of factors, including cost, engineering considerations, access and environmental constraints.

Given the ongoing uncertainty about the precise location of the transmission line, the Department has recommended a condition prohibiting Newtricity to secure approval for the transmission line before it is allowed to carry out the project. This will ensure the project as a whole is approved before any development may be carried out on site.

The second community concern was about the potential impacts of the various transmission line options, with several landowners to the south of the project saying any connection to the Yass to Goulburn 132 kV transmission line would have unacceptable impacts on their properties.

While the Department met with these landowners during the assessment process, and heard their specific concerns about Options 1A and 1B, it notes that these concerns are really matters for Newtricity to consider when it decides on the final alignment of the transmission line. It also notes that if Newtricity decides to pursue either Option 1A or 1B, then it would be required to carry out a detailed assessment of the economic, environmental and social impacts of the selected routes under the EP&A Act in consultation with the relevant owners.

In other words, this is primarily a matter for the future transmission line assessment process rather than this assessment process.

Nevertheless, after considering the impacts of the transmission line options at a strategic level, the Department favours the short, more direct connections to the Yass to Bannaby transmission line (Options 3 & 4) over the longer connections to the Yass to Goulburn 132 kV transmission line (Options 1 & 2), and encourages Newtricity to examine these options closely before making a final decision on the preferred transmission line.

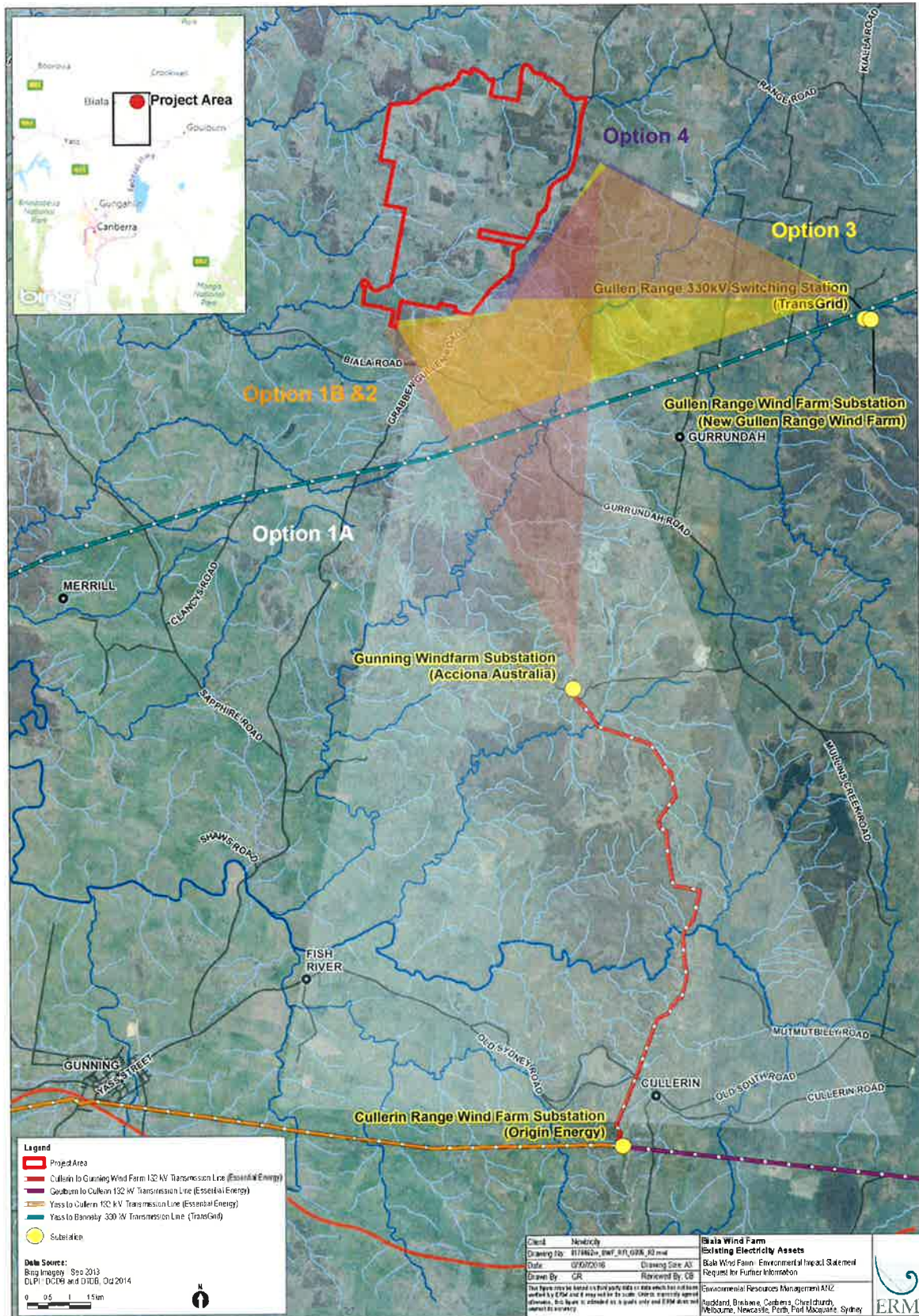


Figure 6: Transmission Line Options

5.2 Visual

Concerns about visual impact dominated the public submissions on the project.

These submissions:

- were critical of the visual impact assessment in the EIS, particularly the photomontages, and considered it underestimated the likely visual impacts of the project;
- thought the project would have significant visual impacts on several residences in close proximity to the site; and
- claimed the area was already “saturated” with wind farms, and were opposed to the landscape being transformed from a typical rural landscape in the Southern Highlands to a semi-industrial or wind farm landscape.

Visual Context

The broad landscape surrounding the site is characteristic of the Southern Tablelands, and has been heavily modified by agriculture. It is moderately elevated, mainly cleared rural land comprising broad, undulating rounded crests and ridges that grade into lower slopes and drainage lines and contains areas of remnant native vegetation, and low density rural-residential development.

The site features a broad ridgeline with an elevation of 900 m that extends along the eastern boundary.

In general, the landscape immediately surrounding the site has a number (approximately 3 or 4) residences that are isolated and within bushland or behind wind breaks; and a number in elevated positions with far reaching views (see Figure 7).

The landscape is such that the predominant views to the site occur from the rural residences located on the elevated ridgelines to the north of the site. Residents to the north and east also have the potential to experience cumulative impacts with the Gullen Range Wind Farm approximately 5.5 km to the east and Gunning Wind Farm 7.5 km to the south.

For visual impact assessment purposes, the Department has considered the impacts of the project on both the regional and local landscape; and for analytical purposes has divided the local landscape into four distinct areas:

- Grabben Gullen village and surrounds (see the circle on Figure 7);
- the residences in the northern cluster, which are elevated and look down onto the site;
- the residences in the western cluster; and
- the residences in the eastern cluster which are largely screened by vegetation.

It has also considered the likely views of the project from local roads.

Avoidance and Mitigation Measures

Newtricity has sought to reduce the visual impacts of the project, principally through site selection and the careful siting of turbines and other infrastructure.

It also proposes to implement a range of other measures, including:

- providing vegetation screening around substations and control buildings where they are visible from neighbouring residences;
- using building materials and treatments for associated infrastructure which visually complement the surrounding environment;
- painting the wind turbines grey or off white to minimise visual impacts;
- treating wind turbine blades to minimise the potential for any glare or reflection;
- using low intensity lighting; and
- offering landscaping and/or screening to certain non-associated residences in close proximity to the site.

The Department supports the implementation of these measures, and has recommended conditions to ensure they are implemented.

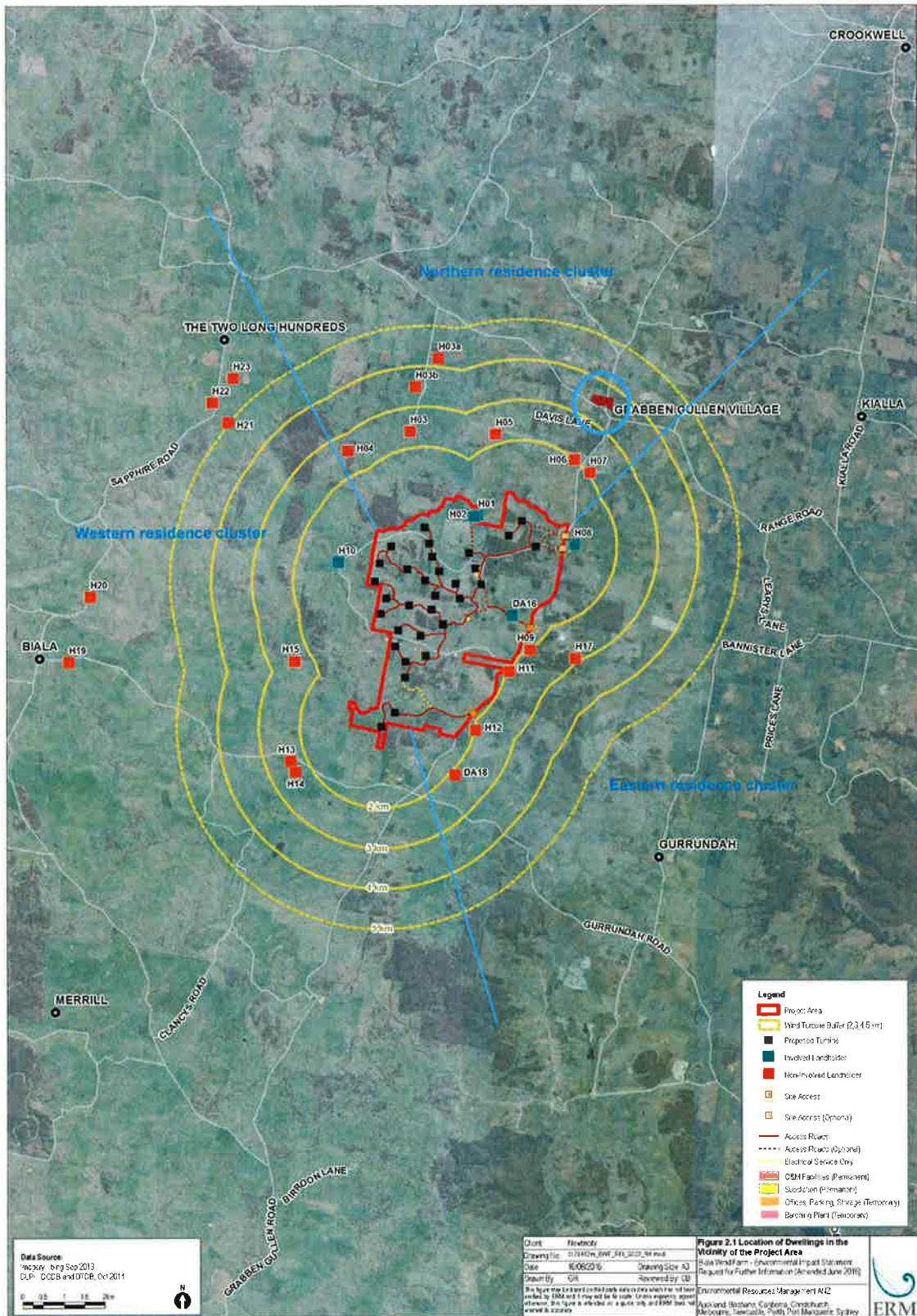


Figure 7: Visual Impact Assessment Clusters

Assessment

In assessing the potential visual impacts of the project, the Department has relied upon a broad range of information, including:

- the visual impact assessment prepared by Clouston Associates (see Annex I of the EIS and the additional visual analysis in Appendix E);
- independent expert advice from Green Bean Design (see Appendix F);
- the findings of various site inspections, which included visits to the Grabben Gullen village and all of the residences within 5 km of the site; and
- its knowledge of the visual impacts of existing wind farms in the region, including the Gullen Range and Gunning Wind Farms.

Although several public submissions were critical of Clouston's original assessment of the visual impacts of the project, the Department believes any flaws in this assessment have been addressed by the supplementary information gathered since the exhibition period, and that together this information provides a robust assessment of the potential visual impacts of the project.

Grabben Gullen Village and Surrounds

The Grabben Gullen village is located about 3 km from the project.

Given its proximity to the site, its zoning (village/rural residential - R2, RU4 and RU5), and the potential for cumulative visual impacts along with Gullen Range Wind Farm, the Department has carried out an extensive assessment of the potential impacts of the project on the village.

The eastern sections of the village are shielded from views of the wind farm by a ridgeline along Grabben Gullen Road and by the gently undulating landform between the village and the wind farm and by the wooded areas to the southwest of the village.

In addition, the majority of residences within the Grabben Gullen village have tree or shelter belt / privacy planting which would screen views of the wind turbines on site.

Nevertheless, along Hewitts Lane within the village there are 4 residences located on gently rising ground that would have restricted views of the upper sections of some wind turbines above scattered tree cover to the south. These views would cover a relatively narrow field of view, and the associated visual impacts are considered to be minor.

Consequently, the Department considers the visual magnitude impacts of the project on the village to be moderate to low.

The Gullen Range Wind Farm is located around 3 km to the east of some of the residences in the Grabben Gullen village. A small number of the residences in the Grabben Gullen village have views to the northern portion of the Gullen Range Wind Farm. However, these residences would not have views towards the project as they would be screened by local landforms and tree cover. Consequently, the Department considers the cumulative visual impacts of the project on the village to be low.

In addition, there are 10 residences to the east of the Grabben Gullen village (to the north and south of Range Road). Views to the project from these residences would be screened and/or partially screened by tree/hedgerow planting extending around the majority of dwellings. While these residences would continue to have views of the northern portion of the Gullen Range Wind Farm (approximately 1 to 2 km away), they would have limited or restricted views of the Biala turbines. Consequently, the project is not expected to result in any adverse impacts on those residences.

Notwithstanding, the Department has recommended conditions requiring Newtricity to implement additional visual impact mitigation measures (such as landscaping) at all residences within 4 km of the project, including the residences within the Grabben Gullen village, and believes these measures will be effective in further reducing the incremental and cumulative visual impacts of the project.

Northern Cluster

The landscape to the north of the project is undulating towards elevated ridgelines near Wheeo Road.

The Department has carried out a detailed assessment of the potential visual impacts of the project on the residences in this cluster, and summarised the findings of this assessment in Table 7. It has also included selected photomontages of the likely views of the project from some of these residences (see Figures 8 to 11).

In summary, the Department has concluded that none of these residences is likely to experience significant visual impacts as a result of the project, and that all those residences within 4 km of the project and residence H03a (which is approximately 4.2 km from the closest Biala turbine) should be entitled to ask Newtricity to implement additional screening at their residences to further reduce any visual impacts of the project.

The Department acknowledges the differences between the conclusions in Clouston's assessment and those in Green Bean Design's assessment, but notes that both sets of conclusions are at the lower end of the visual impact scale (i.e. moderate / low, low, nil).

Where the rating is moderate or moderate/high, the Department has considered the individual landscape characteristics at each residence to determine the recommended mitigation. Residences further north of Wheeo Road are screened by the ridgelines running along the road and the visual impact would be low to nil, and have not been considered for any further mitigation.

Table 7: Visual Impact Assessment - northern residence cluster

Residence	Distance to Closest Turbine (m)	Summary of conclusions	Visual impact rating	Recommended mitigation	Residual impact
H03	2409	<ul style="list-style-type: none"> - Turbines would be upslope of the residence which is located at a lower elevation with an intervening gentle valley. - Views to all the turbines at a minimum distance of 2.4 km. - The Department considers the magnitude of the turbines is not dominant as the views extends over an arc of about 70° of the field of view. - Distant views (approx. 10 km) of about 14 Gullen Range turbines and are obstructed largely by existing vegetation so that generally only the blade (i.e. above the hub) is visible and although there is a cumulative impact with the Biala Wind Farm, it does not increase the visual impact rating at the residence. - The Department does not consider the visual impact can be mitigated by removal of turbines, as there are views of all of the turbines, although not as a dominant element. - The Department considers that landscape planting (achieving 10m+ height) would be effective in reducing the residual visual impacts to acceptable levels. On this basis, the Department does not consider acquisition or negotiated agreement is warranted. 	Moderate / High	Additional visual impact mitigation (landscaping and vegetation screening)	Moderate / Low
H03a	4216	<ul style="list-style-type: none"> - Residence is on high ground north of project with direct views of all Biala turbines at a minimum distance of 4.2 km. The magnitude of the turbines is not considered dominant as the views extends over an arc of about 70° of the field of view. - Distant views to Gullen Range turbines to the east/southeast (to a small number of turbine blades at a distance of 8 km and obscured by vegetation) and Gunning turbines to the south (about 16 km). Although there is a cumulative impact with the Biala Wind Farm, it does not increase the visual impact rating at the residence. - The Department does not consider the visual impact can be mitigated by removal of turbines, as there are views of all of the turbines, although not as a dominant element. - The Department considers that landscape planting (achieving 5-8 m height) would be effective in reducing the residual visual impacts to acceptable levels. On this basis, the Department does not consider acquisition or negotiated agreement is warranted. 	Moderate / High	Additional visual impact mitigation (landscaping and vegetation screening)	Moderate / Low
H03b	3496	<ul style="list-style-type: none"> - Residence oriented away from Biala Wind Farm. - Existing dense vegetation screening and intervening topography obstructs views of Biala Wind Farm. - Distant views (approx. 10 km) of Gullen Range turbines and are obstructed largely by existing vegetation so that generally only the blade (i.e. above the hub) is visible and therefore with the obstructed views of Biala Wind Farm would not have unacceptable cumulative impacts. 	Low	Additional visual impact mitigation (landscaping and vegetation screening)	Low / nil
H04	2598	<ul style="list-style-type: none"> - Views are screened by topography and existing vegetation including large block of woodland restricts views of Biala Wind Farm. - Distant views (approx. 10 km) of Gullen Range turbines and are obstructed largely by existing vegetation so that generally only the blade (i.e. above the hub) is visible and therefore with the obstructed views of Biala wind farm would not have unacceptable cumulative impacts. 	Moderate / Low	Additional visual impact mitigation (landscaping and vegetation screening)	Low / nil

Residence	Distance to Closest Turbine (m)	Summary of conclusions	Visual impact rating	Recommended mitigation	Residual impact
H05	2243	<ul style="list-style-type: none"> - Existing vegetation screening and wind breaks surrounding residence that blocks views of the Biala Wind Farm. - The cumulative impact with Gullen Range wind farm would be acceptable given the views of Biala wind farm are blocked by vegetation. 	Low	Additional visual impact mitigation (landscaping and vegetation screening)	Low / nil
H06	2004	<ul style="list-style-type: none"> - Existing vegetation screening surrounds residence including conifers to south. - Largely indirect and views from the residence and majority of the cultivated garden area would be screened by the established conifer shelter belt to the south and west of the dwelling. - However, there would be views from sections of the driveway between the property entry at Grabben Gullen Road and residence, and through a gap between the end of the shelter belt planting and driveway to the residence for an arc of about 30°, although additional planting would be effective in screening these limited views. - Gullen Range turbines would not be visible from the residence or residential curtilage (cultivated garden) between the hedge and the driveway and are screened by gently rising and undulating landform with mature tree cover south of Grabben Gullen village and consequently the Department considers there would be no cumulative impact. - The Department considers that landscape planting would be effective in reducing the residual visual impacts to acceptable levels at these residences because the field of view to the turbines is narrow and would supplement existing vegetation. 	Moderate	Additional visual impact mitigation (landscaping and vegetation screening)	Moderate / Low
H07	2062	<ul style="list-style-type: none"> - Views of Biala turbines would be of the upper half of the turbines at a minimum distance of 2 km obstructed by existing tree planting. View of Biala turbines would extend over an arc of about 35° of the field of view. - Gullen Range turbines (northern precinct about 4 km to the east) is visible from the residence and the immediate residential curtilage, as well as more general working areas surrounding farm buildings beyond the residence. Views extend to an arc of 60-90° but are partially screened by clumps and scattered groups of tree cover to the north and northeast of the residence. - Although there is a cumulative view of Gullen Range and Biala (up to 120° field of view), supplementary planting would reduce the residual visual impact of Biala and therefore the overall cumulative impact would also be reduced. - The Department considers that landscape planting would be effective in reducing the residual visual impacts to acceptable levels at this residence because the field of view to the turbines is narrow and it could supplement existing vegetation. 	Moderate	Additional visual impact mitigation (landscaping and vegetation screening)	Moderate / Low



Figure 8: Photomontage of proposed Biala Wind Farm looking south from residence H03



Figure 9: Wireframe of proposed Biala Wind Farm looking south from residence H03a



Figure 10: Photomontage of proposed Biala Wind Farm looking south from residence H06



Figure 11: Photomontage of proposed Biala Wind Farm looking southwest from residence H07

Western Cluster

In general the residences to the west of the site would have restricted views of the project due to topography and existing vegetation.

Although some residences along Sapphire Road (H13, H14 and H15) would be located around 2.4 km from the closest turbine, intervening topography and vegetation would restrict views of the wind farm to small portions of the blades of some turbines. The Department considers that the visual impact at these residences would be moderate to low.

Notwithstanding this, the Department has recommended conditions requiring Newtricity to offer additional visual impact mitigation measures to the owners of these properties.

Residences to the southwest (H19 and H20) would be located about 6-7 km from any turbines, while residences to the northwest (H21-23) would be about 5 km from any turbines. Existing vegetation (H20, H21, H23) and intervening undulating topography (H19, H22) would restrict the views of the project from these residences, resulting in moderate to low visual impacts. Given the distance between these residences and the project, the Department does not consider that any additional mitigation is warranted at these residences.

Eastern Cluster

Residences to the east and south of the project would be located between 2 and 2.4 km from the proposal turbines. These residences could also experience cumulative visual impacts from the Gullen Range Wind Farm.

The Department has carried out a detailed assessment of the potential visual impacts of the project on the residences in this cluster, and summarised the findings of this assessment in Table 8. It has also included selected photomontages of the likely views of the project from some of these residences (see Figures 12 to 14).

In summary, the Department concluded the incremental and cumulative visual impacts of the project on these residences would be moderate to low, largely due to the local topography and existing vegetation. Nevertheless, the Department has recommended that the owners of these residences be given the right to get Newtricity to provide additional landscaping at their residences to further reduce the visual impacts of the project.

Table 8: Visual Impact Assessment - eastern residence cluster

Residence	Distance to Closest Turbine (m)	Comment	Visual Impact Rating	Recommended mitigation	Residual impact
H09	2005	<ul style="list-style-type: none"> - Notwithstanding the distance to the Biala Wind Farm, the gently sloping land and heavily vegetated areas provides screening to the project and to the east to Gullen Range Wind Farm. Consequently, the magnitude of the impact of Biala Wind Farm and cumulatively with Gullen Range is reduced to acceptable levels. 	Moderate / Low	Additional visual impact mitigation (landscaping and vegetation screening)	Moderate / Low
H11	2001	<ul style="list-style-type: none"> - Notwithstanding the distance to the Biala Wind Farm, the residence is surrounded by dense vegetation. - Views toward the proposed Gullen Range turbines (7-8 km to the east) are largely screened by vegetation and tree cover which surrounds the residence and therefore does not result in a cumulative impact at the residence. 	Moderate / Low	Additional visual impact mitigation (landscaping and vegetation screening)	Moderate / Low
H12	2035	<ul style="list-style-type: none"> - The view of Biala turbines would be of the upper half of the turbines at a minimum distance of 2 km obstructed by existing tree planting. - Biala turbines would extend over an arc of about 75° of the field of view. - Views extending toward the north to south sections of the Gullen Range turbines (7-8 km to the east) are largely screened by vegetation and tree cover which surrounds the residence and therefore does not result in an unacceptable cumulative impact at the residence. 	Moderate / Low	Additional visual impact mitigation (landscaping and vegetation screening)	Moderate / Low
H17	2920	<ul style="list-style-type: none"> - Intervening low ridge with significant vegetation screening screens the Biala Wind Farm. - Views to Gullen Range wind farm are restricted and with restricted views to Biala Wind Farm would not result in a cumulative impact less than 120° field of view. 	Moderate / Low	Additional visual impact mitigation (landscaping and vegetation screening)	Moderate / Low
DA18	2119	<ul style="list-style-type: none"> - Intervening hill and the site for the approved (but not yet built) residence has south to southeast aspect screening most of the Biala wind farm turbines either fully or partially with views of up to 2 turbines. - The Department considers that landscape planting would be effective in reducing the residual visual impacts to acceptable levels. - Undulating topography restricts views west to the turbines and east to Gullen Range Wind Farm. With restricted views to the Biala Wind Farm there would not be a resulting unacceptable cumulative impact at the proposed residence. 	Moderate / Low	Additional visual impact mitigation (landscaping and vegetation screening)	Moderate / Low

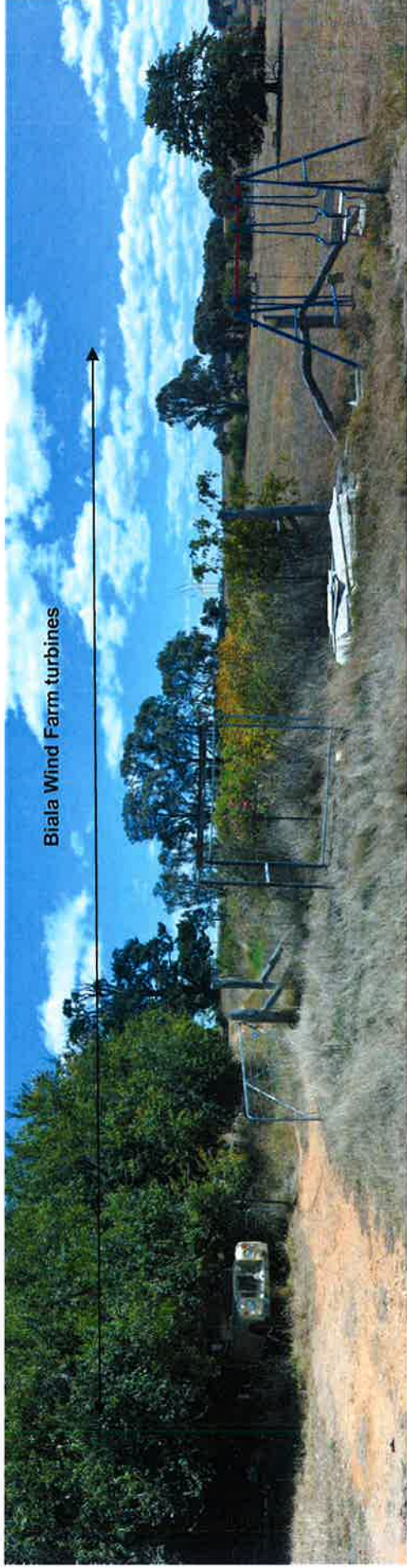


Figure 12: Photomontage of proposed Biala Wind Farm looking northwest from H11



Figure 13: Photomontage of proposed Biala Wind Farm looking northwest from H12



Figure 14: Wireframe of proposed Biala Wind Farm looking northwest from DA18

Road Users

With respect to road users, the Department notes that the Grabben Gullen Road (eastern site boundary) and Biala-Gurrundah Road (to the south of the project) are the only major local roads in the vicinity of the site, and have moderate volumes of traffic. While these roads would be close to several of the turbine clusters, views of these turbines would be fleeting and intermittently blocked by existing roadside vegetation. Consequently, the Department does not consider visual impacts on motorists using these roads would be significant.

Motorists on local unsealed roads, such as Wheeo Road and Sapphire Road, may experience distant views of the turbines. However, given the largely transient nature of views from moving vehicles and the low traffic volumes on these roads, potential impacts on road users would not be significant and do not require any mitigation.

Conclusion

The landscape surrounding the wind farm is characteristic of the Southern Tablelands and is one that has been heavily modified by agriculture. The Department considers this landscape to be of moderate visual significance and the Grabben Gullen village of high visual significance.

The project is comparatively modest in size with a relatively limited visual catchment. The landscape is such that the predominant views to the site occur from the rural residential dwellings located on the elevated ridgelines to the north of the project.

Based on its assessment, the Department is satisfied the project is unlikely to have significant visual impacts at a broader landscape level, particularly as the landscape surrounding the site has not been characterised by areas identified as having high scenic value.

While there are 9 wind farms within 30 km of the site, due to the nature of the undulating landscape views from residences surrounding the site are not dominated by wind farms.

Following detailed assessment, the Department has concluded that the incremental and cumulative impacts of the project would be moderate to low on the local landscape, including the residences in the Grabben Gullen village and its surrounds, and relatively minor on the regional landscape due to:

- the limited number of turbines, and compact layout of the project;
- the limited number of residential dwellings in proximity of the site;
- the limited number of motorists on public roads;
- local topography that would limit views of the turbines on site;
- the surrounding landscape that is characteristic of the Southern Tablelands and heavily modified by agriculture; and
- existing vegetation screening in the form of dense stands of tree planting, windbreaks and garden plantings that block or filter views towards the project.

Nevertheless, the Department has recommended conditions requiring Newtricity to:

- implement additional visual mitigation measures at any residence within 4 km of any turbine as well as residence H03a within 5 years of the construction of the project (if requested by the owner of the residence);
- ensure the wind turbines are painted off white or grey and finished with a surface treatment that minimise the potential for glare or reflection;
- minimise the visual impacts of any ancillary infrastructure through micro-siting and the provision of suitable screening;
- not mount any advertising signs or logos on the wind turbines or ancillary infrastructure;
- minimise any off-site lighting impacts.

With these conditions in place, the Department is satisfied that the incremental and cumulative visual impacts of the project would be acceptable.

5.3 Traffic

Most traffic would be generated during the construction and decommissioning of the project. The construction traffic generation rates would be greater than the decommissioning traffic generation rates, and are summarised in Table 9 below. Construction related traffic impacts would be limited to the construction period of 24 months.

Traffic impacts during operation of the wind farm would be minimal, with only a small full-time workforce (approximately 7 staff) required to access the site for maintenance and monitoring purposes.

Table 9: Construction Traffic Generation Summary – Estimated daily vehicle transport movements

Vehicle Type	Maximum Movements Per Day	Total Movements Over Construction Period	Proportion of construction traffic
Over-size vehicles (restricted access vehicles)	10	704	5%
Heavy Vehicles	36	2,812	16%
Light Vehicles	174	11,260	79%
TOTAL	220	14,774	

Following extensive consultation with Council after the exhibition period, Newtricity has agreed to spread this traffic over the two transport routes for the project, with:

- the over-dimensional vehicles using the northern traffic route to deliver wind turbines to and from the site (see Figure 15);
- all other heavy vehicles using the southern transport route (see Figure 15); and
- light vehicles using either of the two routes.

Road Upgrades & Maintenance

The traffic impact assessment of the project shows the southern route can safely accommodate all project traffic without upgrades, but that the northern route would require significant road upgrades before it is used by any over-dimensional vehicles for the project.

Council has prepared a detailed schedule of the required upgrades, which include:

- *Drainage/causeway works:* replace 9 causeways (7 along Kialla Road and 2 along Range Road) with pipe culverts to enable long vehicles to cross without 'bottoming out' on the pavement;
- *Pavement rehabilitation:* rehabilitate 2.1 km of pavement along Kialla Road and 7.3 km of pavement along Range Road; and
- *Intersection treatments:* treat 5 intersections (Goulburn Road/Range Road, Grange Road/Cullen Street, Cullen Street/Kialla Road, Kialla Road/Range Road and Range Road/Grabben Gullen Road) to facilitate turning with long/wide loads.

The Department has recommended conditions requiring these upgrades to be carried out to the satisfaction of Council prior to any use of the northern transport route by over-dimensional vehicles.

It has also recommend conditions requiring Newtricity to:

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

Council has advised the Department that it is satisfied with the recommended conditions.

Site Access

Access to the site would be via three access points (one optional) along Grabben Gullen Road. The internal road network to turbines and ancillary infrastructure would be via a network of 8 m wide access roads. The proposed location of site access points and the internal road network is shown in Figure 2.

These site access points have been micro-sited in consultation with Council to address concerns about the provision of adequate sight distances off Grabben Gullen Road. Council is satisfied with the revised location of these access points.

The Department has recommended a condition requiring the main site access point (the northern access) to be constructed to the satisfaction of Council prior to the commencement of any construction on site.

Stock Movements

One submitter (landowner H07) was concerned that project traffic would disrupt the movement of stock across Grabben Gullen Road from one part of his property to another. These stock movements occur every four to six weeks, and are authorised under an existing stock movement permit.

The Department has visited the property and discussed the detailed nature of the stock movement concerns with the landowner. Given the project would generate a maximum of 2 over-dimensional vehicle movements an hour along the stretch of Grabben Gullen Road where the stock movements would occur, and these movements would only occur during the construction and decommissioning of the project, the Department is confident that any potential conflicts between project-related traffic and the landowner's stock movements could be managed with the implementation of standard traffic control measures.

The Department has recommended conditions requiring Newtricity to develop a Traffic Management Plan for the project, which includes identifying the specific measures that would be implemented to minimise any conflicts with the adjoining landowner's or stock movements.

Conclusion

With suitable road upgrades, regular road maintenance, and the implementation of a detailed Traffic Management Plan, the Department is satisfied that the project would not result in unacceptable impacts on the road network capacity, efficiency or safety of the road network.

To ensure this occurs, the Department has recommended conditions requiring Newtricity to:

- undertake all necessary road upgrades for the project to the satisfaction of the relevant roads authority prior to any over-dimensional vehicles accessing the site;
- undertake dilapidation surveys of the relevant transport routes prior to construction and decommissioning, and repairing any damage resulting from project-related traffic;
- prepare a detailed Traffic Management Plan in consultation with the relevant roads authorities, that includes provisions for:
 - temporary traffic controls, including detours and signage;
 - notifying the local community about project-related traffic impacts;
 - minimising potential for conflict with school buses and stock movements;
 - responding to any emergency repair requirements or maintenance during construction and/or decommissioning;
 - a traffic management system for managing over-dimensional vehicles; and
 - include a driver's code of conduct that addresses travelling speeds and procedures to ensure that drivers implement safe driving practices.

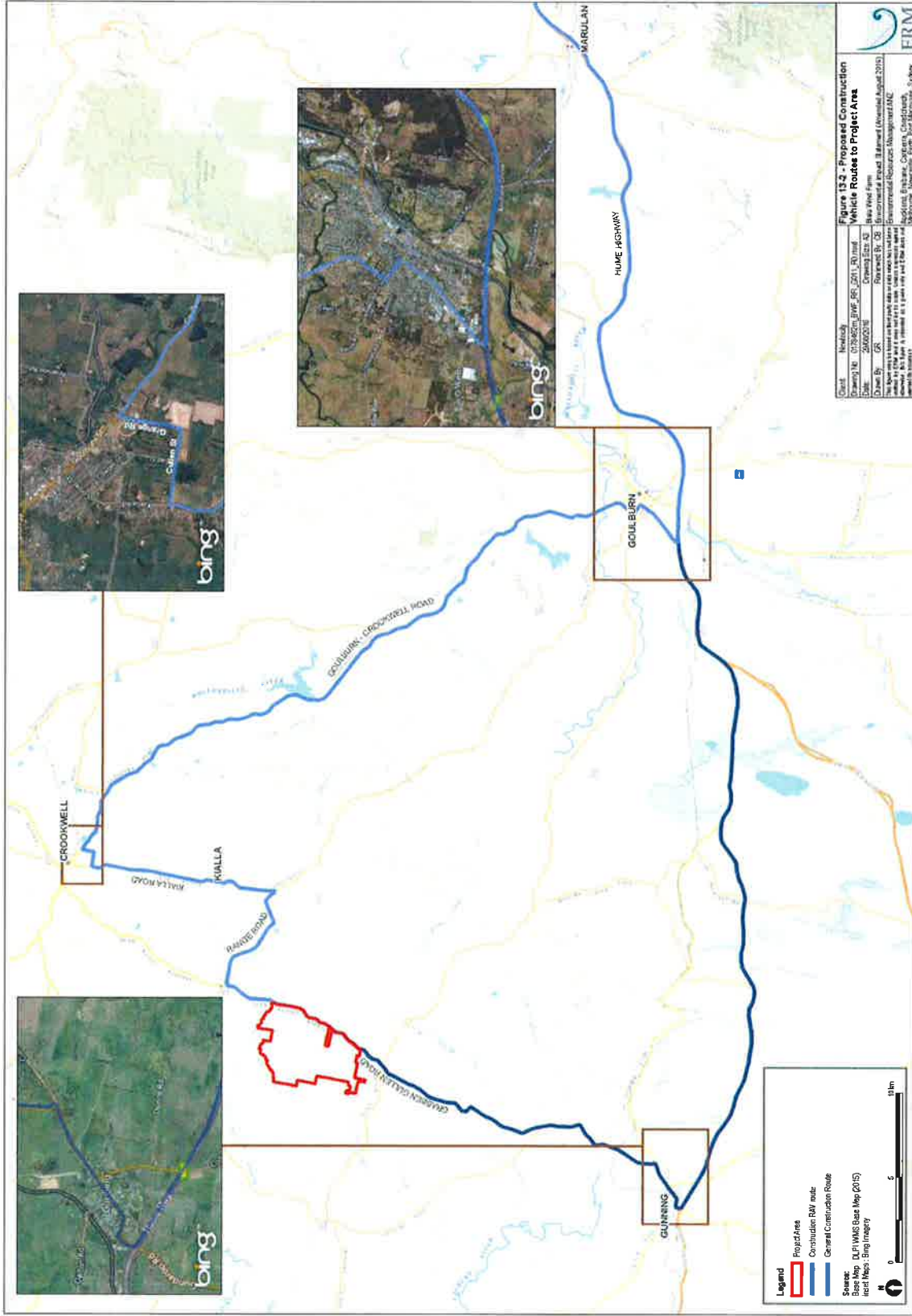


Figure 15: Proposed Construction Vehicle Routes

5.4 Wind Turbine Noise

The site sits within a quiet rural area. Background noise levels are below 30dB(A) during calm weather conditions, which is expected in a rural setting, and there is very little extraneous noise (such as traffic noise).

Noise Impact Assessment

DNV-GL carried out a comprehensive assessment of the potential noise impacts of the project, including wind turbine noise impacts (see Annex G of the EIS), and this was supplemented with further assessment of low frequency noise (see Appendix F).

Several submissions were critical of this assessment, saying:

- the background noise monitoring was flawed;
- the noise predictions were based on generic sound power levels rather than levels of the specific turbines that would be used;
- it failed to properly consider the cumulative noise impacts of the project operating in conjunction with other wind farms in the region; and
- failed to consider the potential low frequency noise or infrasound impacts of the project.

Both the Department and the EPA have reviewed these criticisms in detail.

Extensive background noise monitoring was carried in September and October 2014 at 10 locations in proximity to the site, and the monitoring results were used to assign background noise levels to all non-associated residences. At two locations, background noise data identified non-typical elevated levels at night. Whilst the source of this noise was not identified, it was considered extraneous and removed from calculations as a conservative measure. One of these properties has now been demolished, however inspection of the data indicates that monitoring which was conducted prior to demolition provides a valid reference for surrounding properties and could still be referenced if another dwelling is subsequently constructed in that location.

For noise predictions, a turbine sound power level envelope was derived using noise data from five potential turbine models. This is a common methodology used in NSW, and is expected to result in predictions that are both representative of the likely impacts of the project and conservative. Further, the predictions were based on the assumption that all turbines would be operating at full capacity, with no sector management (operating turbines at lower speeds to reduce noise impacts).

The assessment considered the potential cumulative wind turbine noise impacts of the project, taking the contributions of both the Gullen Range and Gunning Wind Farms. Given both of these wind farms are located over 5 km from the site, the assessment concluded that any cumulative impacts would be negligible. Furthermore, in reality, any residence between these wind farms and the project would receive noise from one wind farm or the other depending on the wind direction.

Consequently, both the Department and the EPA are satisfied that the noise assessment has been carried out in accordance with the South Australian EPA's *Environmental Noise Guidelines – Wind Farms (2009)*, as modified for use in NSW; and provides a conservative assessment of the potential wind turbine noise impacts of the project.

Noise Criteria and Predictions

The noise criteria and predictions for the project under different wind speeds are summarised in Table 10 below.

Table 10: Summary of the Noise Criteria and Predictions

Receiver No. ^a	Noise (dB(A)) with Reference to Hub Height Wind Speed (m/s) Criteria shown in bold. Prediction in standard text									
	3	4	5	6	7	8	9	10	11	12+
HN03	35	35	36	37	38	39	40	42	43	46
	<30	<30	<30	<30	30	33	34	35	35	36
HN04	35	35	36	37	38	39	40	42	43	46
	<30	<30	<30	<30	30	32	34	35	35	35
HN05	35	35	35	35	35	37	38	39	41	43
	<30	<30	<30	<30	31	33	35	35	36	36
HN06	35	35	35	35	35	36	38	40	43	46
	<30	<30	<30	<30	31	34	35	36	36	36
HN07	35	35	36	37	38	40	41	44	46	50
	<30	<30	<30	<30	31	34	35	36	36	36
HN09	36	37	38	40	41	42	44	45	47	48
	<30	31	32	33	35	37	38	39	39	39
HN11	35	35	35	36	37	39	40	42	43	46
	<30	31	32	33	35	37	38	39	39	40
HN12	35	35	37	39	40	42	43	45	46	48
	<30	<30	30	31	33	36	37	37	38	38
HN13	35	35	36	37	38	39	39	40	40	40
	<30	<30	<30	<30	<30	31	33	33	34	34
HN14	35	35	36	37	38	39	39	40	40	40
	<30	<30	<30	<30	<30	31	33	33	34	34
HN15	35	35	35	35	36	36	37	37	38	39
	<30	<30	<30	30	32	34	36	36	37	37
HN17	36	37	38	40	41	42	44	45	47	48
	<30	<30	<30	<30	31	34	35	36	36	36
All other non-associated residences ^b	35	35	35	35	35	35	35	35	35	35

Notes:

a To identify the receivers referred to in Table 10, see Figure 7.

b The criteria shall be the higher of 35 dB(A), or the existing background noise level (LA90_(10-minute)) correlated to the integer wind speed at hub height at the wind farm site plus 5dB(A).

These predictions show the project would be able to comfortably comply with the relevant noise criteria at all non-associated residences under all wind speeds.

Consequently, the Department is satisfied that the noise impacts of the project will be acceptable, and has recommended conditions requiring Newtricity to:

- comply with the noise criteria in Table 10;
- undertake noise monitoring within 6 months of the commencement of operations to determine whether the project is complying with the relevant noise criteria;
- require a penalty of 5dBA to be added to any noise monitoring results if excessive tonality or low frequency noise is detected; and
- carry out sector management in the unlikely event of there being any exceedances of the relevant noise criteria.

Infrasound & Health Impacts

Several submissions were concerned about the potential health impacts from low frequency noise and infrasound (noise in the frequency range below 20 Hz, below human detection).

The assessment indicates 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). With respect to low frequency noise, the Department and the EPA require that if the C-weighted noise (measured from 20Hz upwards) from a wind farm is repeatedly greater than 65dB(C) during the daytime or 60dB(C) at night, then a 5dB(A) penalty must be added to the measured noise of the project. Additional low frequency noise information provided by Newtricity during the assessment process (see Appendix E) indicates that low frequency noise would not fall within this threshold.

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"*.

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

Further, the Department notes that 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.

As a safeguard, the Department has recommended conditions requiring Newtricity to monitor the low frequency noise of the project, and apply a penalty of 5dBA in the unlikely event that excessive low frequency noise is detected.

The EPA has advised the Department that it is satisfied with this approach.

5.5 Biodiversity

The site has limited conservation value, apart from the scattered stands of remnant vegetation across the site, principally in the northeastern and southwestern corners of the site (see Figure 16).

Generally, the vegetation is a combination of grasslands (both native and non-native pastures) with isolated, scattered patches of woodland. Most of this vegetation (74%) comprises non-native pastures, with the remaining vegetation being comprised of native woodland vegetation, including some endangered ecological communities (EECs).

Fauna habitat across site is primarily associated with pasture and open woodland areas, and several threatened bird and bat species are known to inhabit the area.

By locating most of the wind turbines and associated infrastructure outside the areas of higher conservation value, Newtricity has sought to avoid and minimise the biodiversity impacts of the project (see Figure 16).

During the assessment process, OEH asked Newtricity to investigate alternative options to widening the existing access track through the remnant vegetation in the northeastern corner of the site; but after receiving additional information, accepted that these impacts were justified due to the design constraints of shifting the access track further north around the remnant, including the relatively steep banks to the north of the remnant vegetation, and the need to cross a 2nd order stream running into Wattle Creek.

Vegetation and Habitat Clearing

Detailed biodiversity assessment shows the project:

- would disturb around 43 hectares of the site, mostly comprising non-native pastures, and clear less 1% of the native vegetation on site (see Table 11 below);
- would clear a maximum of 1.05 hectares of the *Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland endangered ecological community* (EEC);
- would cause some disturbance to the habitat or potential habitat of around 156 flora and 118 fauna species, although most of this habitat would remain unaffected by the project, and consequently the flora and fauna impacts of the project as a whole are expected to be minor;
- could affect four threatened flora species - the Yass Daisy (*Ammobium craspedioides*), Doubletail Buttercup (*Diuris aequalis*), Hoary Sunray (*Leucochrysum albicans*) and Austral Toadflax (*Thesium austral*) – or the potential habitat for these species, although none of these species were detected in any of the flora surveys carried out for the project, and project's impacts on these species could be avoided or minimised during suitable micro-siting of the turbines and infrastructure on site; and
- could affect up to 8 vulnerable fauna species (5 birds and 3 bats) and the potential habitat of a further 15 threatened fauna species – 13 birds and 2 mammals, although these impacts are also expected to be minor.

Newtricity proposes to further reduce these impacts during the detailed design of the project through micro-siting, and offset the residual biodiversity impacts of the project in accordance with the requirements of *NSW Biodiversity Offsets Policy for Major Projects*.

The Department is satisfied that the vegetation and habitat clearing of the project would be relatively low for a project of this size and nature, and is unlikely to result in significant impacts on any threatened species, populations or ecological communities, or their habitats.

Table 11: Vegetation Community Impacts

Plant Community Type (PCT)	Condition Classes	Conservation Significance (TSC Act)	Area in Project Area (ha)	Area to be Cleared (ha)
Native Vegetation				
PCT ID 351: Brittle Gum – Board-leaved Peppermint – Red Stringy open forest in the northwestern part (Yass to Orange) of South Eastern Highlands Bioregion	Moderate_Good_Moderate	-	260.39	0.67
	Moderate_Good_Sparse	-	97.05	0.24
	Moderate_Good_DNG	-	92.92	1.11
PCT ID 1097: Ribbon Gum – Narrow-leaved Peppermint grassy open forest on basalt plateaux, Sydney Basin Bioregion and South Eastern Highlands Bioregion	Moderate_Good_Moderate	EEC	53.24	1.05 (incl 0.37 for northern access road)
PCT ID 1100: Ribbon Gum – Snow Gum grassy forest on damp flats, eastern South Eastern Highlands Bioregion	Moderate_Good_Moderate	EEC	2.10	0.00
Planted native vegetation	-	-	3.60	0.30
Sub-total Native Vegetation			509.30	3.37
Non-native Vegetation				
Non-native pastures and other land cover types	-	-	1420.35	39.52
Total (ha)			1929.65	42.89

Nevertheless, the Department has recommended conditions requiring Newtricity to:

- offset the residual biodiversity impacts of the project, by retiring the ecosystem credit requirements of the project in accordance with NSW Biodiversity Offsets Policy and to the satisfaction of OEH;
- update the baseline mapping of vegetation communities and key fauna habitat on site prior to construction;
- ensure that no more than 1.05 hectares of the EEC is cleared for the project;
- minimise the impacts of the project on threatened flora and fauna species and its habitat, including hollow-bearing trees and termite mounds;
- minimise vegetation and habitat clearing in the disturbance footprint;

- protect the vegetation and habitat outside the disturbance footprint from any impacts; and
- rehabilitate and revegetate the disturbed parts of the site following construction and decommissioning.

Bird and Bat Strike

Newtricity has sought to minimise the bird and bat strike risks of the project, principally by locating the wind turbines as far as possible from hollow bearing trees and other important bird and bat habitat on site. It also proposes to implement a range of standard mitigation measures during operations, such as removing carcasses from below turbines and minimising any lighting impacts to deter bats.

Detailed assessments concluded that the bird and bat strike impacts of the project are likely to be low, as most of the bird and bat species recorded on site would fly below or outside the swept path of the wind turbine blades.

Mortality rates are predicted to be similar to other wind farms in the region, ranging from 1.4 to 1.8 bird/bat strikes per turbine each year, with most of these strikes affecting commonly occurring species.

If these predictions are correct, then the project is unlikely to result in any adverse impacts to threatened or 'at risk' bird and bat populations in the locality. However, the Department notes the data sets used to underpin these predictions is still small, and consequently the predictions should be treated with some caution.

Consequently, the Department has recommended conditions requiring Newtricity to carry out detailed monitoring of the bird and 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 (see below).

OEH remains concerned about the proximity of two turbines (T29 and T30) to an existing wedge-tailed eagle nest on the site (see Figure 16), given these eagles rise swiftly from their nests and fly at heights of between 40 and 400 m putting them at significant risk of being struck by the blades of these turbines, and the recorded impacts on this species at other wind farms in the region (17 strikes in 2015).

Although the wedge-tailed eagle is not a threatened species, OEH has recommended that these turbines be located at least 500 m from the existing nest on site. Turbine T30 is already located 615 m from the nest and would comply with OEH's recommended setback, but turbine T29 is located only 340 m from the nest.

While it has committed to trying to increase the distance between this turbine and the nest during micro-siting, Newtricity has highlighted that its ability to achieve the recommended setback would be constrained by the location of a nearby Aboriginal heritage site.

The Department has consulted further with OEH on this matter, and concluded that strict adherence to the recommended 500 m setback is not warranted in this case, given the setback is based on anecdotal rather than scientific evidence, the wedge-tailed eagle is not a threatened bird species, alternative conservation initiatives could be implemented to enhance the species if the project results in adverse impacts on the local population, and the importance of striking an appropriate balance between minimising the biodiversity and Aboriginal heritage impacts of the project and maximising the development of the significant wind resources on site.

Consequently, the Department has recommended conditions requiring Newtricity to ensure wind T29 is located at least 350 m away from this nest, and if practicable, 500 m away from the nest.

It has also recommended conditions requiring Newtricity to:

- update the baseline data of the threatened and “at risk” bird and bat populations in the locality prior to constructing any wind turbines;
- minimise the bird and bat strike risks of the project through micro-siting (particularly through locating wind turbines at least 50 m from any hollow-bearing trees), prompt carcass removal from below turbines; controlling pests, and using best practice measures for bat deterrence (such as minimising any potential lighting impacts);
- monitor an report on bird and bat strikes during operations; and if necessary,
- implement additional measures to minimise the bird and bat strikes of the project, including restricting the operations of various turbines during certain periods or carrying out conservation initiatives to enhance the local population of any bird or bat species that are adversely affected by the project.

With these conditions in place, the Department is satisfied that the bird and bat risks of the project can be suitably managed.

5.6 Other Issues

The Department’s consideration of other issues is summarised in Table 12.

Table 12: Other Issues

Issue	Consideration	Recommendation
Shadow Flicker	<ul style="list-style-type: none"> Due to the separation distances between turbines and non-associated residences, the project is predicted to comply with the relevant shadow flicker requirements at all non-associated residences. 	<ul style="list-style-type: none"> Ensure that shadow flicker from operational wind turbines does not exceed 30 hours a year at any non-associated residence.
Blade Glint	<ul style="list-style-type: none"> Newtricity proposes to minimise the impacts of the project by implementing standard turbine treatments, such as the use of low sheen and matt finishes. With the implementation of these measures and the separation distances between turbines and non-associated residences, blade glint impacts are predicted to be negligible. 	<ul style="list-style-type: none"> Require the wind turbine blades to be finished with a surface treatment that minimises the potential for glare or reflection.
Construction & Decommissioning Noise	<ul style="list-style-type: none"> Construction noise impacts would generally be negligible, and comply with the relevant criteria in the <i>Interim Construction Noise Guideline</i> at all non-associated residences. The only exception would be when site access road works occur close to residences on Grabben Guillen Road. The noise from these works would only occur for a short period, and is not expected to exceed 55 dB(A) at any of these residences, which is still well below the maximum noise levels in the <i>Interim Construction Noise Guideline</i>. Small blasts may be used during construction, but the vibration and overpressure impacts of this blasting would be well below the relevant annoyance criteria. 	<ul style="list-style-type: none"> Minimise the construction and decommissioning noise of the project by implementing the best practice requirements outlined in the <i>Interim Construction Noise Guideline</i>. Restrict construction and decommissioning activities to the day, with no activities allowed to occur on Sundays or public holidays Restrict any blasting on site to between 9 am and 5 pm Monday to Friday and 8 am and 1 pm on Saturday. Require compliance with set strict blasting criteria.
Traffic Noise	<ul style="list-style-type: none"> Traffic noise impacts would be restricted largely to the construction and decommissioning phases of the project. Newtricity proposes to reduce the project-related traffic noise of these phases by scheduling traffic deliveries during the day, maintaining vehicles, and notifying local residents of any night-time deliveries. During these phases, Newtricity would be able to comfortably comply with the relevant criteria in the <i>Road Noise Policy</i> during the day, but could exceed the night-time criteria by up to 5 dBA at residences within 30 m of the road. However, the Department notes that there would be limited vehicle movements at night, and these impacts would need to be addressed in the traffic management plan and in accordance with the <i>Interim Construction Noise Guideline</i>. 	<ul style="list-style-type: none"> Restrict construction and decommissioning activities to the day, with no activities allowed to occur on Sundays or public holidays The project must comply with the best practice requirements outlined in the <i>Interim Construction Noise Guideline</i>.
Noise from Ancillary Infrastructure	<ul style="list-style-type: none"> The ancillary infrastructure of the project would generate very little intrusive noise. Noise levels are predicted to be well below the lowest possible intrusive noise criteria (35 dBA) in the <i>NSW Industrial Noise Policy</i>. It is noted that the substation would be located more than 1.5 km from the closest residence. 	<ul style="list-style-type: none"> Ensure the noise generated by the operation of ancillary infrastructure does not exceed 35 dB(A) $L_{Aeq}(15 \text{ minute})$ at any non-associated residence. Undertake monitoring to confirm compliance with this limit.

Issue	Consideration	Recommendation
Dust	<ul style="list-style-type: none"> During construction and decommissioning, the dust impacts of the project would be kept to a minimum with the implementation of standard dust control measures, such as minimising surface disturbance, watering exposed areas regularly, and progressively rehabilitating the site. 	<ul style="list-style-type: none"> Minimise the off-site dust and blast fume emissions of the project Minimise the surface disturbance of the site. Progressively rehabilitate the site, and employ interim rehabilitation strategies to minimise dust generation on parts of the site that cannot be permanently rehabilitated.
Water Use	<ul style="list-style-type: none"> The surface and groundwater take of the project is expected to be low, given the site only has ephemeral creeks and groundwater levels are generally 23 m below the ground surface. Water demand would be low, although during the two year construction period the project would require up to 33 megalitres of water for concrete batching and dust suppression. This water would be obtained from the site or trucked in from other licenced water sources. DPI Water has confirmed there are unlikely to be any constraints to Newtricity being able to secure the water it needs for the project. 	<ul style="list-style-type: none"> Require Newtricity to ensure it has sufficient water for all stages of the project; and if necessary, adjust the scale of development on site to match its available water supply.
Water Pollution	<ul style="list-style-type: none"> With the implementation of standard water pollution control measures, the project is not expected to generate any water pollution. 	<ul style="list-style-type: none"> Comply with section 120 of the <i>Protection of the Environment Operations Act 1997</i> which prohibits any water pollution. Minimise any soil erosion associated with the construction and decommissioning of the project by implementing the relevant in the <i>Managing Urban Stormwater: Soils and Construction</i> guidelines. Store and handle all dangerous or hazardous materials on site in accordance with <i>AS1940-2004: The storage and handling of flammable and combustible liquids</i>. Ensure the concrete batching plants and substation are suitably bunded.
Riparian Areas	<ul style="list-style-type: none"> The project has 10 watercourse crossings for internal access roads and cabling. These watercourses are generally low order, ephemeral creeks (7 first order, 1 second order and 2 third order watercourses), comprising broad, open, vegetated grass depressions without incised channels or defined beds or banks. Newtricity proposes to construct these crossings in accordance with DPI Water's relevant guidelines. 	<ul style="list-style-type: none"> Ensure all waterway crossings are constructed in accordance with the relevant <i>Water Guidelines for Controlled Activities on Waterfront Land</i>.
Aboriginal Heritage	<ul style="list-style-type: none"> 21 Aboriginal heritage sites were identified on site, including 9 Potential Archaeological Deposits (PADs). Most of these sites are considered to have low archaeological significance, although the PAD areas are considered to potentially have moderate to high archaeological significance. Newtricity has located the turbines on site to avoid impacts on most of these sites, however: 	<ul style="list-style-type: none"> Avoid impact to the heritage items outside the disturbance area Minimise impacts on BWF13, BWF19 and BWF PAD 1 through micro-siting. Carry out test excavations and salvage on BWF PAD 1 prior to constructing the proposed access track (if it is to be impacted). Salvage the artefacts at BWF8 and BWF18.

Issue	Consideration	Recommendation
	<ul style="list-style-type: none"> - 2 sites (BWF8 and BWF18), both isolated artefacts with low archaeological significance, would be affected; and - 3 PAD areas (BWF13, BWF19 and BWF PAD1) are located immediately adjacent to or within the proposed disturbance footprint, and may be affected. • Newtricity has committed to trying to avoid impacts on BWF13 and BWF19 during the micro-siting of the turbines, but is unlikely to be able to avoid having an impact on BWF PAD1 due to local topographic constraints on the design of the relevant access track. • Even with the impacts on BWF 8, BWF 13, and BWF PAD 1, the Department is satisfied that the Aboriginal heritage impacts of the project would be relatively minor. 	<ul style="list-style-type: none"> • Prepare a detailed Heritage Management Plan for the project in consultation with OEH and Aboriginal stakeholders.
Historic Heritage	<ul style="list-style-type: none"> • No historic heritage sites were identified. 	<ul style="list-style-type: none"> • None
Aviation	<ul style="list-style-type: none"> • There are two aerodromes (Crookwell and Goulburn Airports) and two aircraft landing areas within a 30 nautical mile radius of the site. • Newtricity's aviation impact assessment concluded that the project would not pose unacceptable safety risks to aircraft flying in the vicinity of the site, provided aircraft are operated in compliance with applicable regulatory and operational control requirements; and consequently that the installation of obstacle lighting was unnecessary. • In its submission, however, CASA recommended that obstacle lighting be installed. • Newtricity has agreed to consult further with CASA before the turbines are installed, and install obstacle lighting in accordance with CASA's requirements. 	<ul style="list-style-type: none"> • Require Newtricity to: <ul style="list-style-type: none"> - notify the relevant aviation authorities of the final location and specifications of the wind turbines and any wind monitoring masts; - install aviation hazard lighting in accordance with CASA's requirements; and - minimise the off-site lighting impacts of the project.
Visual impact of night-lighting	<ul style="list-style-type: none"> • While further consultation with CASA about the necessity of night-lighting is required, the Department notes that under the <i>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 (NASAG), 2012 (NASAG guidelines)</i>, obstacle lighting can be partially shielded to reduce any visual impacts, provided this shielding does not compromise the operational effectiveness of the lighting. • Given the limited number of turbines and the fact that the layout of the project is relatively compact, and with the ability to partially shield aviation lighting, the Department considers that the visual impact on residences in the area is unlikely to be significant. 	<ul style="list-style-type: none"> • Minimise the off-site lighting impacts of the project.

Issue	Consideration	Recommendation
<p>Radio communications</p>	<ul style="list-style-type: none"> The wind turbines on site could interfere with the: <ul style="list-style-type: none"> fixed point to point microwave links across the site, which are used by Council and the Rural Fire Service; and television reception at four non-associated residences, This interference can either be avoided by re-routing the fix point-to-point microwave links or "made good" with the implementation of standard radio communication mitigation measures. 	<ul style="list-style-type: none"> Require Newtricity to: <ul style="list-style-type: none"> re-route the fix point-to-point microwave links crossing the site prior to the construction of any wind turbines; implement mitigation measures at residences H03, H05, H06 and H07 to make good any disruption to television broadcasting; and 'make good' any disruption to radio communication services as soon as possible following disruption.
<p>Bushfire</p>	<ul style="list-style-type: none"> Several public submissions were concerned the project would increase the bushfire risks of the region The Bushfire Hazard and Risk Assessment (see Annex Q of the EIS) concluded the bushfire risks of the project would be low given the wind turbines and associated infrastructure would be located in areas mapped as low fire hazard and the project would have advanced on-board control systems designed to mitigate any risk of fire. The Department agrees with this assessment. Further the RFS has provided a policy position (2014) that wind turbines are not expected to pose unacceptable risks and aerial fighting operations treat the risk of turbine towers as tall structures as part of routine procedures. On this basis, the project is unlikely to restrict the aerial bushfire fighting capabilities of the region beyond the site; and any impacts on site would be mitigated by the provision of improved access tracks for fire-fighting equipment. 	<ul style="list-style-type: none"> Require Newtricity to: <ul style="list-style-type: none"> implement standard asset protection measures on site in accordance with the RFS's <i>Planning for Bushfire Protection</i>; ensure the site is suitably equipped so it can respond to any fires on site; develop procedures to manage any potential fires on site, in consultation with the RFS; and assist the RFS and emergency services as much as possible if there is a fire in the vicinity of the site.
<p>Land</p>	<ul style="list-style-type: none"> Given its limited footprint, the project is unlikely to affect the agricultural capability of the site or surrounding area. There are also currently no mining entitlements on site. Newtricity has committed to removing the wind turbines and rehabilitating the site for agricultural use after decommissioning the project. Several public submissions were concerned that Newtricity would seek to avoid its rehabilitation obligations, and that there was a risk the wind turbines and other infrastructure would be abandoned on site and become a blight on the landscape. The Department believes this risk can be addressed by imposing suitable conditions on the project. Under the EP&A Act, these conditions would apply to the land rather than exclusively to Newtricity, and the Department would be able to use its enforcement powers under the Act to require either Newtricity or the relevant landowner to comply with the rehabilitation obligations in the consent. 	<ul style="list-style-type: none"> Require Newtricity to: <ul style="list-style-type: none"> progressively rehabilitate the site as soon as possible following construction and decommissioning; rehabilitate the site to the satisfaction of the Department within 18 months of the cessation of operations; comply with strict rehabilitation objectives, which require the removal of all above ground wind turbine infrastructure (excluding the wind turbine pads, which must be covered with soil and or rocks and revegetated); and dismantle any wind turbine if it has ceased to operate for more than 12 consecutive months.

Issue	Consideration	Recommendation
<p>Economic</p>	<ul style="list-style-type: none"> • The project would make a positive contribution to the local economy by creating jobs, providing income to the associated landowners, and facilitating the development of the renewable energy industry in the region. • The project is not expected to generate any significant demand for infrastructure or services in the region, apart from the road upgrades required along the over-dimensional vehicle route which are incorporated into the design of the project. • Notwithstanding, Newtricity has agreed to pay Council \$2,500 per wind turbine each year in accordance with the requirements in the <i>Upper Lachlan Development Control Plan</i>. These payments would be spent on various community enhancement projects in the local area, consistent with other benefit-sharing agreements in NSW. • Several submissions were concerned that the project would have an adverse impact on property values in the region, principally as a result of its visual and noise impacts. • In response to these concerns, the Department notes: <ul style="list-style-type: none"> - there is no clear evidence at this stage to suggest that wind farms in NSW are adversely affecting property values, albeit that wind farm development has only emerged as an important industry in NSW over the last decade and there is still very little data available on the matter; - the project is permissible with development consent under both State and local environmental planning instruments; - a detailed assessment of the merits of the project has found that the project is unlikely to generate any significant economic, environmental or social impacts; - the impacts of the project can be further minimised by imposing suitable conditions on the project, and requiring a range of standard mitigation measures to be implemented; and finally, - that the Land and Environment Court has ruled on several occasions² that the assessment of the impacts of projects on individual property values is not generally a relevant consideration under the EP&A Act, unless the project would have significant and widespread economic impacts on the locality, which is not the case in this instance. 	<ul style="list-style-type: none"> • Require Newtricity to enter into a voluntary planning agreement with Council prior to the commencement of construction for the proposed community enhancement payments to Council, setting out the proposed governance arrangements for allocating and managing these funds.

² See, for example, *Taralga Landscape Guardians Inc v Minister for Planning and RES Southern Cross Pty Ltd* (2007) 161 LGERA 1, *Alphatex Australia v The Hills Shire Council* (No 2) [2009] NSW LEC 1126, and *King & Anor v Minister for Planning, Parkesbourne-Mummel Landscape Guardians Inc v Minister for Planning, Gullen Range Wind Farm Pty Limited v Minister for Planning* [2010] NSW LEC 1102.

6 RECOMMENDED CONDITIONS

The Department's 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 conditions used 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, blasting and shadow flicker;
- set strict limits for clearing EECs;
- 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.

Other key recommended conditions include:

- *micro-siting* – allowing micro-siting of turbines within a 100 m radius and comply with the other restrictions in the consent;
- *visual mitigation* - additional visual impact mitigation for non-associated residences within 4 km;
- *biodiversity offsets* – retire biodiversity credits in accordance with the *NSW Biodiversity Offsets Policy for Major Projects*;
- *roads* – requiring the over-dimensional vehicle route to be upgraded prior to delivery of any wind turbines
- *community contributions* – formalising community contributions of up to \$77,500 a year through a voluntary planning agreement with Council; and
- *decommissioning and rehabilitation* – requiring the wind turbines to be removed and the site rehabilitated to a good condition.

7 CONCLUSION

The Department has assessed the development application, EIS, submissions, RTS and additional information provided by Newtricity in accordance with the requirements of the EP&A Act. The Department has also considered the independent expert review of the project's visual assessment.

The Department considers that the site is suitable for the project, as it is within a region recognised as having some of the best wind resources in NSW, has access to existing electricity distribution networks and is a permissible land use on the subject land. The project is a modest and compact layout.

The operation of the project would also not compromise the long-term use of the land for agricultural purposes and 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 a biodiversity offset strategy.

The Department has carefully considered the 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 local 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.

Based on its assessment, the Department is satisfied that Newtricity has designed the project in a manner that achieves a reasonable balance between maximising the efficiency of the wind resource development and minimising the potential impacts on surrounding land users and the 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.

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 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. The project would also 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 Newtricity's proposed community funding contributions

Given these benefits can be achieved without causing any significant adverse impacts, the project is considered to be approvable, subject to strict conditions.

8 RECOMMENDATION

It is recommended that the Planning Assessment Commission:

- considers the findings and recommendations of this assessment report;
- approves the development application for the Biala Wind Farm; and
- signs the attached recommended conditions of consent (Appendix G).

 9/12/16.

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 9/12/16.

Mike Young
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