

Preliminary Environmental Assessment

HILLS OF GOLD ENERGY PROJECT



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ACRONYMS AND ABBREVIATIONS

ABS	Australian Bureau of Statistics
AEMO	Australian Energy Market Operator
AHIMS	Aboriginal Heritage Information Management System
CEMP	Construction Environmental Management Plan
Cwth	Commonwealth
CCC	Community Consultative Committee
CEC	Clean Energy Council
DP&E	NSW Department of Planning and Environment
DECCW	Department of Environment Climate Change and Water
DPI	Department of Primary Industries
DoE	Department of Environment
DFIG	Double Fed Induction Generator
EEC	Endangered Ecological Community – as defined under relevant law applying to the proposal
EIS	Environmental Impact Statement
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999 (Cwth)</i>
EP&A Act	<i>Environmental Planning and Assessment Act 1979 (NSW)</i>
GWh	Gigawatt hours
ha	hectares
Heritage Act	<i>Heritage Act 1977 (NSW)</i>
IPCN	Independent Planning Commission (NSW)
km	kilometres
LEP	Local Environment Plan
LGA	Local Government Area
m	Metres
MNES	Matters of National environmental significance under the EPBC Act (c.f.)
MW	Mega Watts
NEG	National Energy Guarantee
NEM	National Energy Market
NPW Act	<i>National Parks And Wildlife Act 1974 (NSW)</i>
NSW	New South Wales
OEH	(NSW) Office of Environment and Heritage
PEA	Preliminary Environmental Assessment
PLVA	Preliminary Landscape Visual Assessment
RET	Renewable Energy Target

RMS	Roads and Maritime Services
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy (NSW)
SSD	State Significant Development
VEM	Visual Envelope Map
VIA	Visual Impact Assessment

1 INTRODUCTION

Wind Energy Partners (WEP or the Proponent) proposes to develop a wind farm on the ridgeline between Hanging Rock and Crawney Pass, 60km south-east of Tamworth. The proposed wind farm will have a capacity of up to 410 MW and will supply electricity directly into the national electricity grid through a proposed connection into the TransGrid Liddell to Tamworth transmission line.

This Preliminary Environmental Assessment (PEA) has been prepared to support a request to the Department of Planning and Environment (DP&E) for the Secretary's Environmental Assessment Requirements (SEARs) which will guide the preparation of an Environmental Impact Statement (EIS) for the proposal under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This report provides an outline of the proposal including the site and its surroundings and the statutory framework relevant to obtaining project approval. Further, it identifies potential environmental issues that may be associated with the wind farm proposal and proposes investigation strategies required to properly assess the proposal's impacts.

The information presented in this report is based largely on desktop literature review and a rapid site inspection, undertaken by two senior environmental consultants. WEP have engaged independent consultants to provide on the ground visual impact investigations, noise modelling and community consultation, which is proceeding ahead of other environmental assessment components.

1.1 PRELIMINARY INVESTIGATIONS: WORST CASE APPROACH

As preliminary environmental investigations are proceeding in advance of an indicative infrastructure layout, the results of this work are considered ‘worst-case’ and will present a higher level of impact than will be achieved by a finalised layout that responds to the identified constraints. For example:

- The preliminary visual impact investigations have considered the potential visibility of turbines positioned within and across the development area. This has been considered and analysed in three ways; firstly an analysis of the extent of potential visibility of the development boundary, secondly; an analysis of the total properties that have the potential to experience views within a particular location within the development boundary, and thirdly; an analysis of the potential visibility of turbines from all properties situated within 3km (in accordance with the Visual Impact Assessment Bulletin). The analysis undertaken will inform the design development stage and contribute to the optimisation of the turbine layout in advance of the Environmental Impact Assessment
- The preliminary noise investigations have modelled the noisiest wind turbine model that may be considered, the upper number of wind turbines that are considered feasible for the site at this stage and hard ground across the site, providing the highest opportunity for sound travel.
- The preliminary biodiversity investigations have considered a broad study area, not a more defined Development Corridor.

This ‘worst case’ approach will ensure a comprehensive assessment of potential impacts and provide the best information to inform a finalised infrastructure layout that responds to the identified constraints. This approach is expected however, to show elevated impact predictions at this stage and should be interpreted in this context.

2 THE PROPOSAL

2.1 THE PROPONENT

WEP is an Australian company which develops utility scale renewable energy plants. The company’s leadership has more than 25 years of renewable energy experience in delivering solar and wind energy projects to regional communities in Australia, Europe and Asia. The team involved in the Hills of Gold Energy project have been involved in development of over 2GW of renewable energy projects including a number of projects now in operation in New South Wales, Victoria and Queensland and other international markets.

2.2 LOCALITY DESCRIPTION AND CONTEXT

The locality (defined as 10km from the proposal site) includes the town of Nundle, the town of Hanging Rock, Ben Halls Gap State Forest, Nundle State Forest, Ben Halls Gap National Park, agricultural farmland and industry. The name of the project “Hills of Gold” refers to the economic opportunities brought about by the gold mining history of Nundle and Hanging Rock.

Hanging Rock is a former mining village approximately 4km north of the proposed site. The town began as a pastoral run and is known today for its gold mining history. The main industries within the area are

agriculture, with the main attraction of Hanging Rock lookout giving scenic views of Nundle Valley. The majority of dwellings are lifestyle blocks located on Morrisons Gap Road and to a lesser extent Barry Road. Nundle, 8km north-west of the proposal site, is a small village, 43km south-east of Tamworth, in the New England region of NSW. Services in the village include several cafes and pubs, retail and antique stores and crafting facilities. The population of Nundle in 2016 (ABS) was approximately 496 people. Employment in the area is dominated by agriculture. It is a commutable distance to Tamworth, which will provide more diverse employment opportunities.

Preliminary assessment and community consultation to date has identified approximately 42 confirmed residences or proposed residences within 3km of the proposed Development Corridor, with a number of other non-residential structures located nearby. Of the 42 residential properties, nine are owned by associated landowners, three have planning approval but are yet to be built and five are used as holiday retreats. The location of all dwellings identified is shown in Figure 6-2. Further investigation with Council of proposed dwellings will be undertaken prior to submission of the EIS.

Limited land use conflicts are anticipated between grazing and forestry land uses. As the surrounding towns of Nundle and Hanging Rock are small towns, the wind farm and particularly the construction process and economic implications will likely be of interest to the community. A Community Consultation Plan has been prepared to provide a framework to engage with the community and stakeholders about the proposal and ensure opportunities to provide input into the assessment and development process are understood.

Any land use involving forestry land will be investigated further in the EIS, and in consultation with Forestry Corporation. Given the proximity of the project to the Ben Halls Gap National Park, consultation will be undertaken with the Office of Environmental and Heritage, particularly in relation to relevant guidelines including the *Guidelines for Developments Adjoining Land and Water Managed by DECCW* (now Office of Environment and Heritage; OEH).

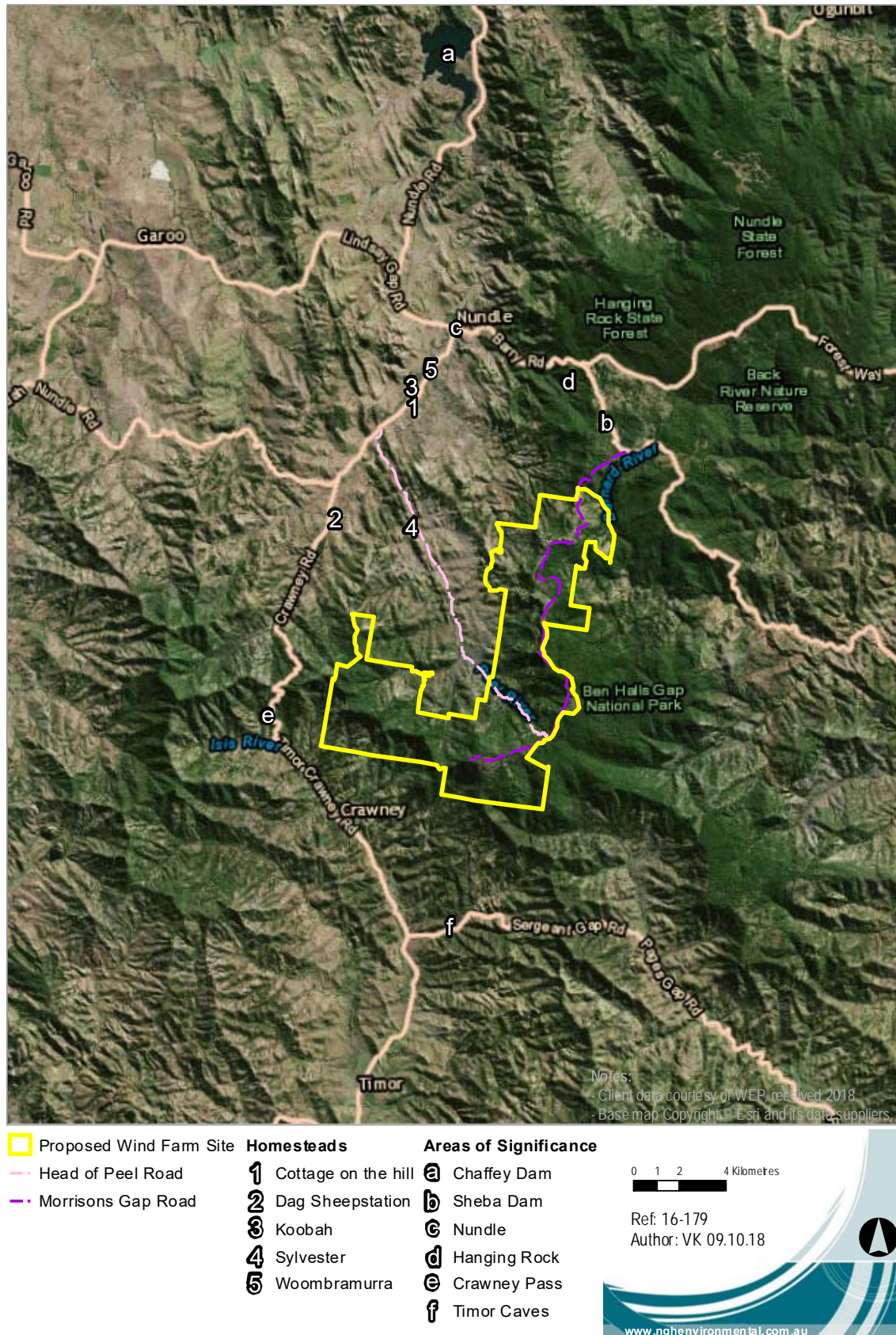


Figure 2-1 Local areas of significance identified by the community

2.3 THE PROPOSAL SITE AND INVESTIGATION AREAS

The proposed Hills of Gold Energy project site is located approximately 4km south of Hanging Rock, 8km south east of the Nundle and 60km south east of Tamworth, within the Tamworth Regional Local Government Area (LGA) and Upper Hunter Shire LGA.

The first site access option is utilising Morrisons Gap Road, located to the north of the site. This Council road is unsealed for approximately 3 km prior to the site boundary. An alternate access point to the site is also considered via Head of Peel Road, currently unsealed from the junction with Crawney Road (a distance of 12 km).

The project proposes to connect to the existing 330kV TransGrid Liddell to Tamworth transmission line which is located approximately 23km west from the proposed wind farm site.

The proposal locality and proposed Development Corridor are shown in Figure 2-3. Photographs of the site are provided in Appendix A.

2.3.1 Wind farm site

The proposed Hills of Gold Energy project site boundaries comprise approximately 6,808ha. Land on which the project is proposed to be located is owned by 6 freehold landholdings and includes Crown land paper roads. Additional land is required to host the transmission line route (see Section 2.3.2 below).

The Development Corridor within the project boundary is predominately agricultural land with a high percentage of overstorey native vegetation adjacent to the Development Corridor and within steeper terrain. The site has a history of agricultural use (grazing cattle). Native understorey has been converted to exotic pastures in many locations.

The wind farm site is primarily located on land zoned RU1 - Primary Production (refer to Figure 2-4 below). The site is located directly adjacent to land zoned RU3 – Forestry and E1 – National Parks and Nature Reserves.

Note: At this stage, an indicative set-back buffer of 91m will be applied where the Development Corridor boundary is adjacent to land zoned E1 – National Parks and Nature Reserves. Set-backs were calculated using *Bats and onshore wind turbine: interim guidance* (Natural England, 2014; Figure 2-2). The minimum potential hub height and maximum blade length and maximum expected tree height were used to provide this maximum set-back buffer.

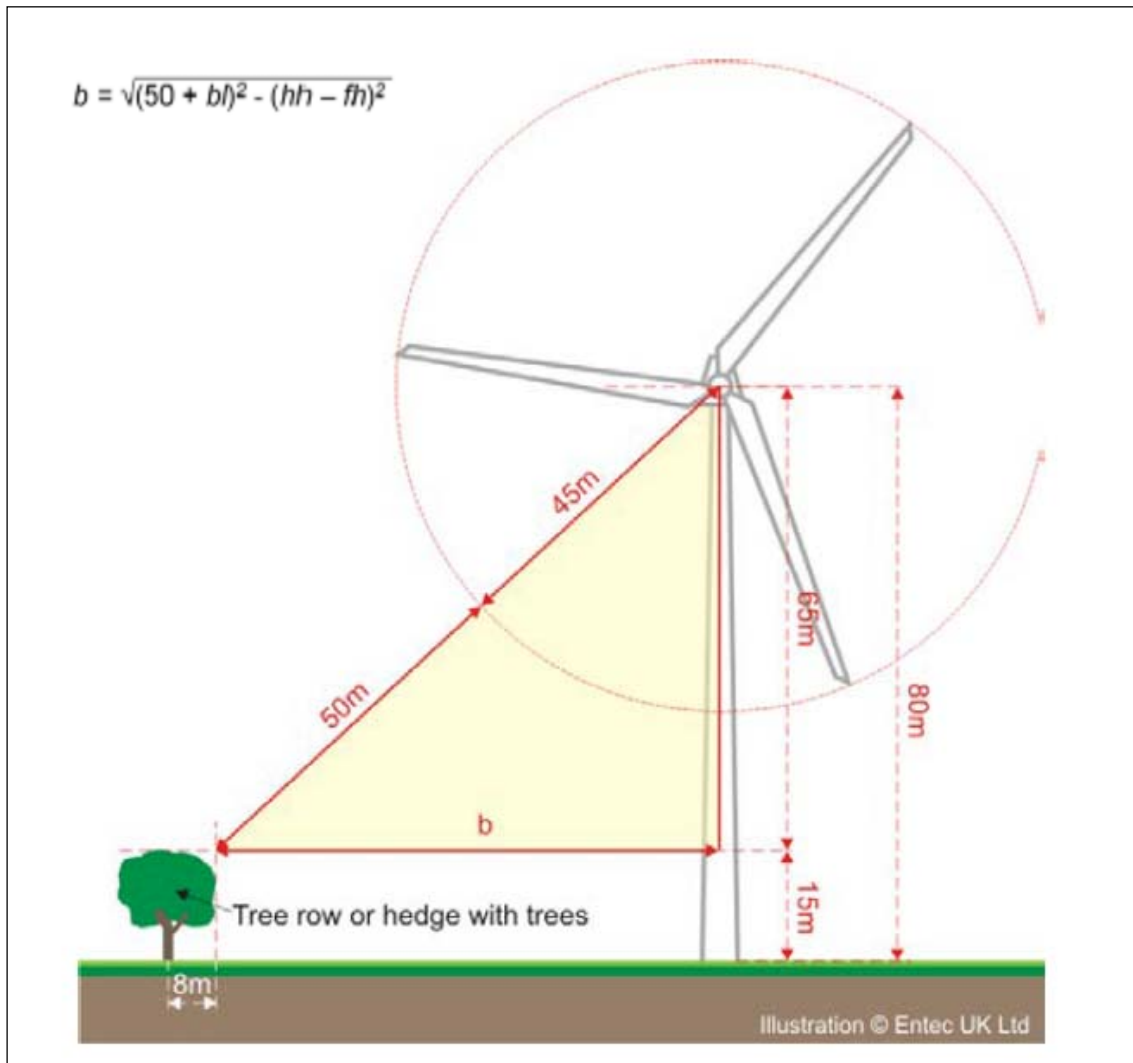


Figure 2-2 Example set-back calculation (New England, 2014)

Small sections of the Development Corridor are located in RU3 managed by NSW Forestry Corporation under the Forestry Act 2012. Only access tracks are proposed in this zone. Consultation with NSW Forestry Corporation has commenced and further consultation with National Parks and Wildlife is planned through the detailed environmental impact assessment.

Crown roads are evident on the cadastre mapping of the site. Adjacent land uses include bison grazing, sheep and cattle grazing as well as forestry and national park estate.

The wind farm site contains the head waters of the Peel River, with several low order streams and springs located in the higher elevations.

Wind turbines and ancillary infrastructure are expected to be located within the cleared, elevated plateau / ridge line land as much as possible.

2.3.2 *Transmission line*

To connect the wind farm to the existing 330kV TransGrid Liddell to Tamworth transmission line, a new overhead transmission line will be required for a distance of approximately 23km. The route has yet to be finalised pending further consultation with the community and further environmental impact assessment. Accordingly, a corridor is proposed for assessment at this stage. The corridor is located on land zoned RU1 - Primary Production and includes Crown paper roads. Predominant land uses in this area currently include sheep and cattle grazing.

It is noted that the Liddell 2,200MW coal fired power station (recently announced to be decommissioned) is located 80km south of the proposed Hills of Gold Energy project site. The Hills of Gold Energy project is proposed to connect to the same 330kV transmission line that Liddell is connected to.

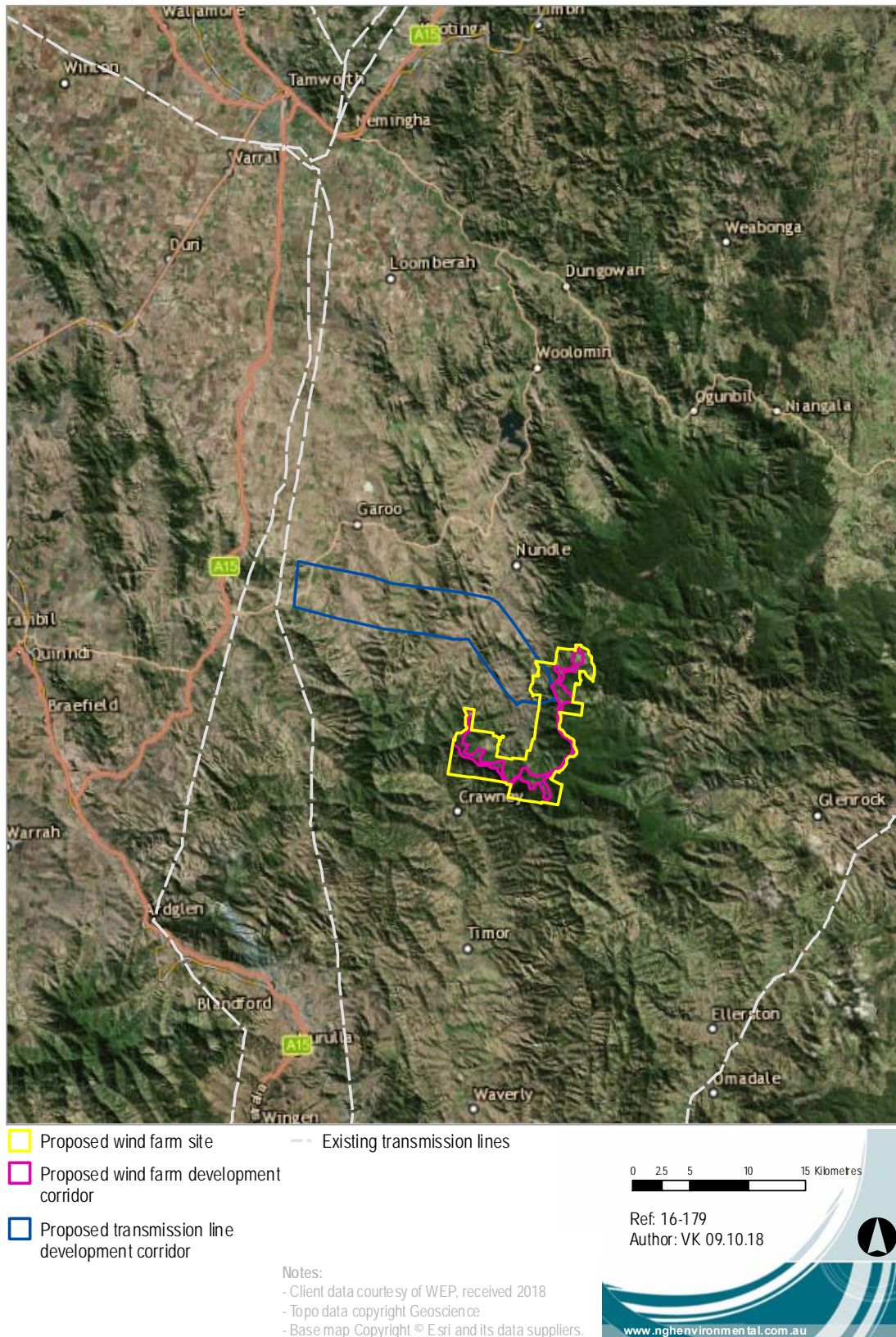


Figure 2-3 Proposal site location, south of Tamworth, NSW, showing the proposed Development Corridor and the wind farm site boundaries

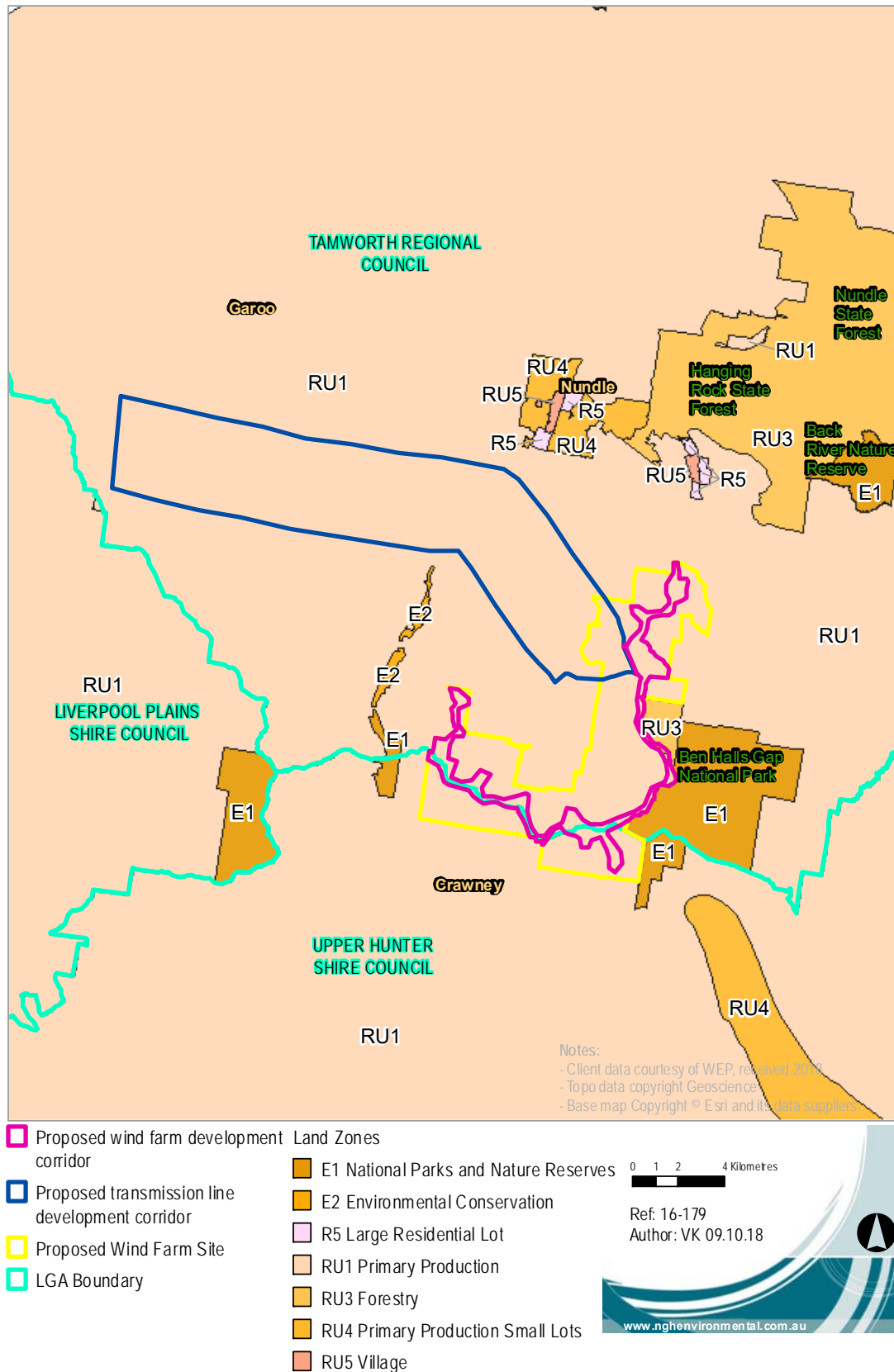


Figure 2-4 Proposal site land zoning in the proposed Development Corridor

No turbines are proposed within state forest; consultation with Forestry Corporation is underway with regard to use for access only. Indicative set backs are proposed along the National Park Estate boundary. No direct impacts in National Park Estate are proposed.

2.4 THE PROPOSAL DESCRIPTION

2.4.1 Overview

Components

The Hills of Gold Energy project proposal would comprise of the installation of a wind farm with a capacity up to 410 MW that would supply electricity to the national electricity grid through capacity available in the TransGrid Liddell to Tamworth transmission line.

It is currently proposed that the wind farm would include development of the following infrastructure:

- Up to 97 wind turbines, mounted on tubular steel towers. It is currently proposed that each turbine will have a maximum tip height of 220m above ground level.
- Construction compound and temporary construction infrastructure, potentially including concrete batching facilities.
- Electrical connections between wind turbines and the substations (likely to be underground, subject to constructability).
- Internal access tracks and upgrades to existing access roads, where required.
- Up to two substations and control room.
- Approximately 23km of high voltage, overhead powerline, connecting the wind farm site to the TransGrid Liddell to Tamworth transmission line.
- Connection infrastructure including a switching station and battery storage.

The wind farm proposal's site boundaries and broad investigation corridor are shown in Figure 2-3 and are described in 2.3.

Table 2-1 Site investigation corridors

Investigation area	Approximate total area (ha)	Approximate area within Tamworth LGA (ha)	Approximate area within Upper Hunter Shire LGA (ha)
Development Corridor including transmission line	11,263	11,010	252
Wind Farm Site	6,808	5,211	1,596
Development Corridor within wind farm site (19% of Wind Farm Site)	1,297	1,044	252

All project infrastructure, including wind turbines, would be located within the Development Corridor. A more precise development area and an indicative infrastructure layout will be informed by detailed site investigations as the assessment, planning and design stages continue.

Presentation of an indicative turbine layout

An indicative turbine layout, including turbine siting, requires agreements with affected landholders. Affected landowners should take into consideration that this layout is based on the maximum number of turbines the site supports based on a wind and land constraints only.

This PEA presents information informed by a worst-case approach. This 'worst case' approach will ensure a comprehensive assessment of potential impacts and provide the best information to inform a finalised infrastructure layout that responds to the identified constraints. The potential impacts are anticipated to reduce throughout the assessment process. Design and turbine siting is an iterative process that will be informed by continued community engagement and specialist assessments. A detailed indicative layout will be presented within the EIS, ensuring the community has the opportunity to discuss concerns and provide feedback prior to its finalisation. Where necessary there is the potential for these detailed studies to provide neighbours sufficient information to understand the impact and inform their views on potential neighbour agreements. These detailed and specialist assessments are important inputs to discussions with neighbouring landowners.

The indicative turbine layout can be found in Appendix C.

Staging

The project will have three stages:

1. Construction - The duration of the construction period will be approximately 24 months.
2. Operation - The operational life of the wind farm is expected to be 35 years.
3. Decommissioning - At this time, infrastructure may be recommissioned or decommissioned and the site rehabilitated to its current land capability for ongoing agricultural or alternative land use.

Associated development

A proposed solar farm is being considered by WEP in the vicinity of the connection corridor and will be the subject of a separate and independent application, following further investigations.

2.4.2 Major infrastructure components

Wind turbines

The more commonly used Double Fed Induction Generator (DFIG) and the Direct Drive turbine would be considered. The main features of the wind turbines considered include:

- 3 (three) variable speed blades for main shaft rotor control
- Upwind design (nacelle rotates into the wind)
- Power convertor on the rotor side of the generator (power exited through slip rings and carbon brushes) for variable speed grid synchronisation and power quality improvements

The main components of turbines that would be suitable for the project are shown in Figure 2-5 and include:

- Nacelle which houses the main-shaft, gearbox (in DFIG) and generator
- Blades

- Hub which connects the blades to the main shaft
- Tower section which connects the nacelle at a height considered between 130-155m
- In built step-up transformer

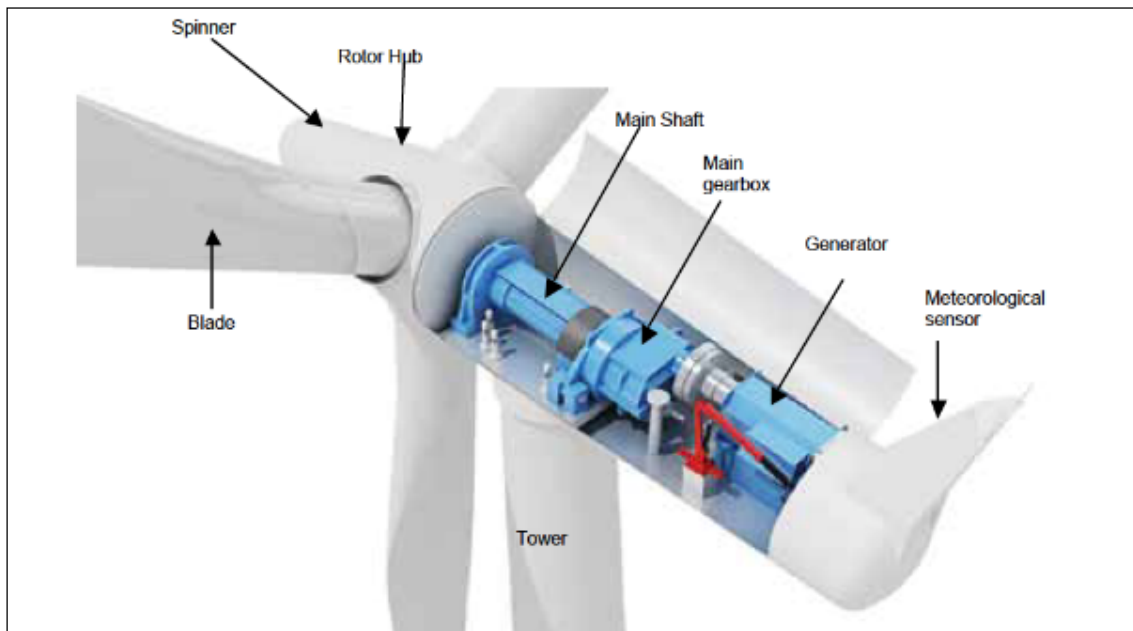


Figure 2-5 Example of main turbine components (Siemens)

BLADES

Turbine blades are responsible for converting the kinetic energy in the wind into mechanical energy through the rotor hub and into the main shaft. Blades work in the same way as an aircraft wing by creating lift and moving the blades forward. The blades are connected into a motor or hydraulic pitch actuator, which allows the blade to change angles and either convert more or less of the available energy depending on the wind speeds.

The Hills of Gold proposal would consider blades between 65-78m in size.

Stronger composite materials have allowed wind turbine blades to increase in length. The larger the blades, the more energy can be captured and converted into mechanical energy. This has been a key factor in reducing the cost of wind energy. Blades have lightning conductors on the tip ends that channel lightning strikes to an earthing point protecting the internal electrical systems.



Figure 2-6 Turbine blade in transport

ROTOR HUB

The blades are connected to the rotor hub, which transfers the mechanical energy captured in the blades into a rotational energy through the main shaft. Inside the hub are the motors or pitch actuators, which allow the blade to change angles so as to control the output.

GEARBOX

In the DFIG turbine, the gearbox acts to increase the speed of the main shaft into a speed that can synchronise with the frequency of the grid through the generator. Direct drive turbines remove the gearbox from the drive train design and instead use a full-scale power convertor to synchronise with the grid. Turbines with gearboxes are becoming more common and gearbox failure is rare in the wind industry.

GENERATOR

The generator is the heart of the turbine and converts the mechanical energy into electrical energy. The gearbox has two main components; the rotor and stator. The rotor is fed from the high speed side of the gearbox and rotates within the stator. The generator is an induction motor being used in reverse, and the power is transmitted through both the rotor and the stator. Power that is transmitted through the stator goes straight to the transformer to be stepped up to the grid voltage.

CONVERTOR

Power that is transmitted to the rotor goes to the converter which matches the voltage and frequency to the grid and then moves the power to the transformer. The converter is a critical component in modern turbines and can provide grid support. The converter can provide power quality improvements to the grid and support the network operator in maintaining its power quality ratings.

TRANSFORMER

The transformer's main role is to transform the voltage from the generating voltage of 690V to the rated grid voltage within the wind farm. In modern wind turbines, the transformer is now located within the nacelle which provides a counter-balance for the larger blades and better cooling capability at hub heights.

TOWER

Towers are generally made up of rolled steel in sections which can be transported to site. Depending on the turbine choice there can be between 4 and 18 tower sections of either steel or pre-cast or cast on site concrete. Tower heights are largely determined by the wind shear or change in wind speed at different hub heights. The Hills of Gold project benefits from increased height due to strong winds and reduced turbulence above the tree canopies.

Turbine towers would be in the range of 130-155m depending on final design and turbine selected.

Laydown area

A storage yard around 5ha of fenced flat land will be required during construction of the project. Construction machinery, turbine components and operational requirements will be stored in the yard. The storage yard will be made by levelling and temporary compaction of top surface and fencing.

This area will also house the facilities required for the temporary workforce, including amenities and drinking water. The yard will include areas for loading and unloading cranes. The storage yard will be located close to access points to reduced transport movements once vehicles have entered the site.

Foundations for towers and other infrastructure

No soil or geotechnical investigations have yet been taken to inform the size and specifications of the turbine foundations and other infrastructure. Geotechnical investigations for roads, foundations, hardstands and any creek crossings would be undertaken in the detailed design phase.

The construction process of a typical 17-21m diameter foundation takes about 9 to 15 days after the soil testing and design is ready. Foundation casting can be completed after the reinforcement steel work is completed.

A batching plant is expected to be installed within the project site to reduce transport movements outside of the project boundaries. Sufficient quantity of raw material will be sourced locally where ever possible and is subject to assessment of available materials.

Crane hardstands

Cranes would be used in lifting materials weighing 70-80 tonnes to the hub heights of 130-155 meters (Figure 2-7). Typically, these are mobile 600-700 tonne cranes. To handle the heavy loads, specific platforms (hardstands) need to be made to place the vehicle body and assembly of boom of the lifting crane.

These areas are designed specifically to the environmental and topographic constraints of the site. These areas range in size but typically require between 2000 - 5000 square meters during construction after which the hardstand area is reduced.



Figure 2-7 Example of crane installation of turbine blades

Road construction

Where required, roads will be upgraded, widened or constructed to accommodate material transportation and access to each turbine within the project area.

The following will be taken into consideration when assessing the design of onsite roads:

- Natural water flow not be blocked and appropriate measures taken for water management and soil conservation.
- Proper cross water drainage to be provided and streams would be connected to natural flow areas to prevent water stagnation.
- Road gradient to be maintained in accordance with local standards.

Substation and connection to the grid

The wind farm will be connected to the existing 330kV TransGrid Liddell to Tamworth transmission line. A new overhead transmission line will be required from the site's north eastern sector, north west, to Lindsays Gap Road; a total distance of approximately 23km. The easement of this transmission line route is expected to be 40-60m wide.

Connection to the wind farm electrical system would involve:

- Up to two onsite 33/132kV substations
- A 23km 132kV transmission line to the TransGrid 330kV Liddell to Tamworth transmission network.

Onsite substations will include main transformers, switchgear, protection equipment and a control room. The 132kV connection is expected to be a double circuit monopole design between 20-25m in height depending on span widths and local topography. This would be confirmed through detailed design investigations.

An easement between 40-60m is expected to be required for the transmission line.

Battery storage

The project is proposed to include battery storage at the connection point and provide firming capability to the output of the wind profile. The Hills of Gold energy proposal wind profile can be complimented by storing energy when there is less demand on the system and injecting when there is higher demand. The project benefits from generation in the early morning and evening, as well as its location in NSW which will provide diversification to other wind generators.

Preliminary system sizing has been carried out for a 100MW/200MWh battery system which would be further refined in line with regulatory policies such as the National Energy Guarantee and closure of coal fired power stations to provide more certainty, as investigations progress.

3 PROPOSAL NEED AND ALTERNATIVES

3.1 PROPOSAL NEED

The development of renewable energy projects is considered to be one of the most effective ways to meet the nation's international commitments to reduce greenhouse gas emissions. The Renewable Energy Target (RET) Scheme, developed in 2009, has a current target for large-scale renewable electricity generation of 33,000 GWh in 2020. Currently, there are over 50 large scale renewable energy projects currently underway or being developed. These projects have the potential to create more than 5,500 jobs and 9.3 billion of investment (CEC, 2018).

The Hills of Gold Energy project proposal would:

- Reduce greenhouse gas emission by offsetting fossil fuel electricity generation methods.
- Assist to meet the RET.
- Assist to decentralise electricity generation, placing power closer to regional areas and thereby reducing transmission losses.
- Be consistent with the objectives of the National Energy Guarantee in increasing competition in the NEM, achieving Australia's emissions reduction targets and providing viable replacement for aging thermal power stations.
- Provide local economic benefits, through the provision of employment opportunities during construction and operation of the project.

The proposed Hills of Gold Energy project is consistent with the current goals and targets for renewable energy generation in NSW. Specifically, Goal 22 of the NSW 2021: A Plan to Make NSW Number One:

Contribute to the national renewable energy target [i.e. 20% renewable energy supply] by promoting energy security through a more diverse energy mix, reducing coal dependence, increasing energy efficiency and moving to lower emission energy sources

The NSW Climate Change Policy Framework aims to achieve the aspirational long-term objectives of achieving net-zero emissions by 2050 and ensuring NSW is more resistant to a changing climate.

The proposal is also consistent with the three goals of the NSW Renewable Energy Action Plan (NSW Government 2013) which include:

1. Attract renewable energy investment and projects.
2. Build community support for renewable energy.
3. Attract and grow expertise in renewable energy.

In December 2015, Australia, among another 194 countries, agreed on the United Nations Paris Agreement on climate change. The Hills of Gold Energy project would contribute to Australia's effort to meet the Paris Agreement. The following are key objectives of the agreement:

- A goal to limit the increase in global temperatures to well below 2 degrees and pursue efforts to limit the rise to 1.5 degrees.
- A commitment to achieve net-zero emissions, globally, by the second half of the century.
- Differentiated expectations for developed nations, including Australia, that they will reduce their emissions sooner than developing nations.

The Hills of Gold Energy project would contribute to the proposed National Energy Guarantee (NEG) which would aim to:

"... retain existing resources and encourage new investment in the National Energy Market (NEM) while ensuring that emissions standards are met and the system operates reliably."

The Energy Security Board (ESB) predicts that 28 – 36% of electricity generation in 2030 will be renewable energy, under the NEG.

The energy generated from the Hills of Gold project would provide opportunities for the electricity sector by supporting two key objectives of the policy:

1. Increased Competition and Improving Affordability: creating additional competition in the generation sector and providing new low cost electricity options for the retail market.
2. Emissions guarantee: meet defined emissions target for wholesale electricity purchased.

The Hills of Gold Energy project is consistent with the vision and goals of Draft New England North West Regional Plan (DP&E, 2016). Achieving the vision of 'a sustainable future that maximises the advantages of the regions diverse climates, landscapes and resources' would be supported by contributing to the following goals:

- A diversified economy through the management of mineral and energy resources, including renewable energy generation by increasing opportunities for renewable energy generation.
- Prosperous urban centres with job opportunities by strengthening the economy through growth of Tamworth.
- Protected water, environment and heritage by adapting to natural hazards and climate change.

During construction, the Hills of Gold Energy project proposal will create local employment and economic stimulus in and around Tamworth, Nundle and Hanging Rock. These benefits could be expected to extend to local service centres including Tamworth. These townships will provide accommodation, food, fuel, trade equipment and services. Most of these benefits would occur during the construction period. Limited

but maintained economic benefits during the approximate 35 year lifetime of the project would continue to occur during monitoring and inspections, maintenance, repair and upgrade of infrastructure at the wind farm.

Generally, wind farm development enjoys community support. OEH commissioned community research regarding attitudes to renewable energy in 2014 found that 81% of people support the use of renewable energy in the form of wind farms in NSW. Furthermore, 73% of respondents supported having a wind farm within the local region. Among the reasons for this were benefits to the environment and local economy. A significant amount (83%) of respondents believed that NSW *should* produce more of its energy from renewables over the following five years (OEH, 2015).

In NSW, just over 9,000MW of coal fired generation is expected to be retired by 2035; 3,500MW by 2028. The Australian Energy Market Operator (AEMO) have stated in their *Electricity Statement of Opportunities 2017* that there will be a 1,000MW gap in generation following the closure of Liddell in 2022. Figure 3-1 shows a timeline for this retirement of coal fired power stations in NSW. The Hills of Gold Energy project is expected to take advantage of modern and efficient wind technology to provide replacement generation for part of this capacity.

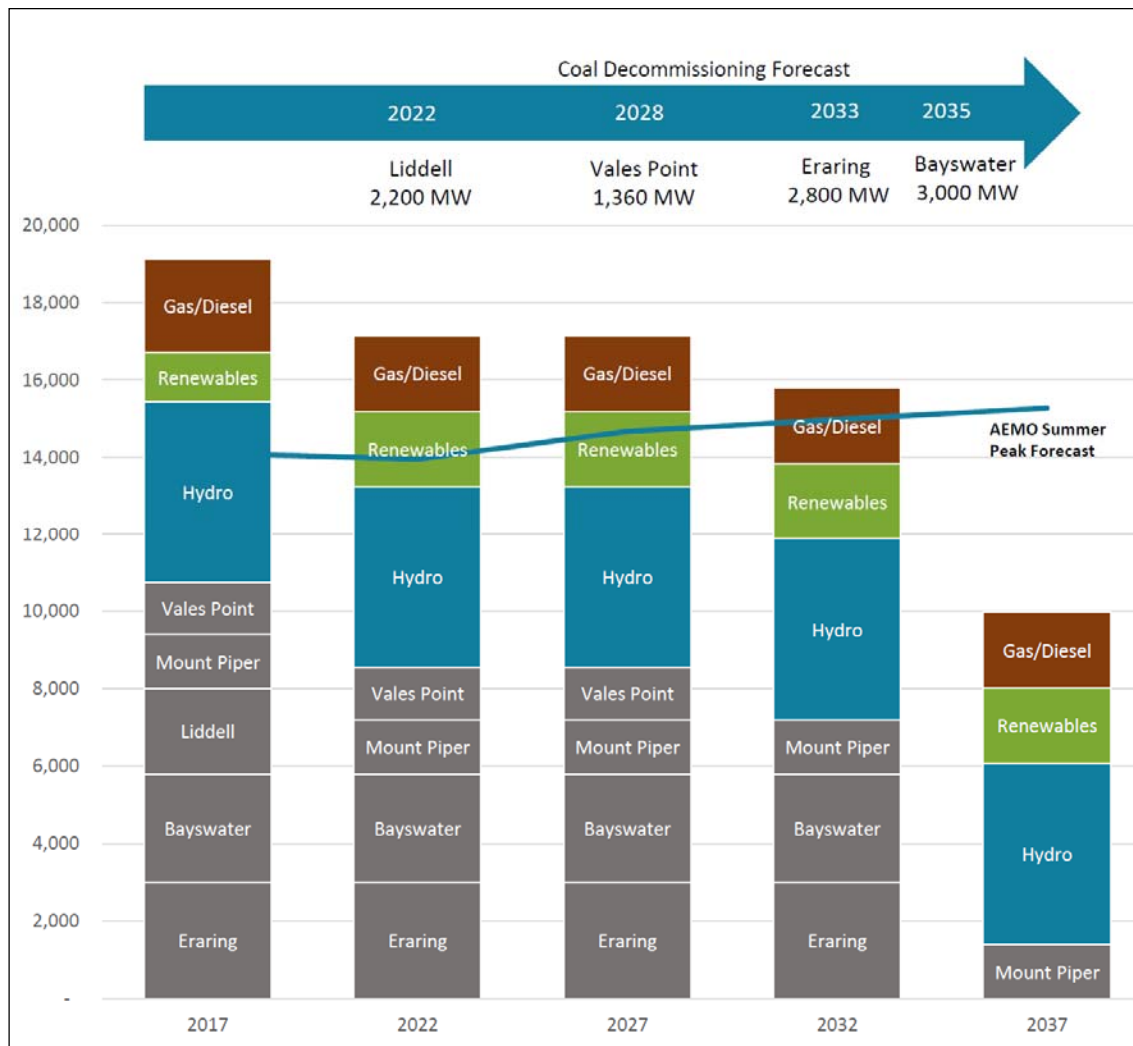


Figure 3-1 Time line for retirement of coal in NSW (source: Someva Pty Limited unpublished)

The NSW DP&E have announced the *Hunter Regional Plan 2036* which includes a goal to diversify the energy supply by promoting new opportunity from the closure of coal fired power stations. This project is located in the Tamworth and Upper Hunter Regions, and would create diversified economic and employment opportunities in a new and growing sector of the economy. Given significant employment will be lost from the closure of coal fired power in the region, employment in new projects such as the Hills of Gold will provide important opportunities for offsetting generation capacity and jobs.

3.2 ALTERNATIVES CONSIDERED

The proposed location for the Hills of Gold Energy project has been driven by:

- A proven strong wind speed;
- Mostly existing agricultural ridgelines and ridge orientation that is exposed to prevailing wind directions; and
- Capacity in existing electrical infrastructure.

The proposal is seeking to take advantage of the existing investment in the transmission infrastructure built to support capacity transfer from the coal fired Liddell 2,200MW Power Plant which will be closed in 2022.

The proposed connection into the Liddell to Tamworth TransGrid line will ensure that the size of the project supports the costs associated with a connection of this type. The proponent is considering the use of higher generation capacity wind turbines that can produce more electricity per wind turbine and improve the amount of clean energy introduced into this connection point currently being used to transmit mostly coal generated electricity in the Hunter Valley.

Several connection routes have been considered to access the Liddell to Tamworth TransGrid connection. While the route has not been finalised, the current 23km route has been selected on the basis of avoiding steep and forested areas that would require greater clearing and excavation. The route also seeks to provide flexibility across existing cleared land where the number of landowners and impact to residential properties is minimised. Preliminary consultation has been held with several landowners along the proposed Development Corridor.

The proponent initially consulted Forestry Corporation to determine whether nearby production hardwood and softwood plantations could be used to host wind turbines. It is understood that the Forestry Act 2012 does not allow for hosting of electricity generating infrastructure. It was decided to progress on private land with further consultation with Forestry Corporation prior to lodging a detailed EIS.

Prior to detailed environmental impact assessments, a proposed Development Corridor has been determined with a narrowly defined area for which the project will be designed within. It is intended to further refine this Development Corridor with turbine locations, access roads and a transmission line corridor based on the outcomes of further in field and technical assessments. This approach will provide greater flexibility to reduce impacts through changes to design or other mitigations strategies.

3.3 SITE SELECTION SUMMARY

The project has been carefully selected to balance the assessed social, environmental and economic aspects of the project and ensure the project proceeds at a scale that takes these into consideration. Table 3-1 and Table 3-2 demonstrates the Hills of Gold Energy project site selection criteria.

Table 3-1 Site selection criteria: preferable site conditions

Preferable site condition	Site observation
Optimal wind resources	Strong wind speed observed through 8 years of wind monitoring on multiple met masts (Figure 3-2). The proposal site is considered feasible as it exhibits a high wind resource for NSW.
Suitable Land	Use of predominately existing agricultural use ridgelines and desirable ridge orientation with existing access tracks in existence.
Local Residents	The site has been selected due to relative isolation of the site and low population density in the region reducing the potential impact particularly around noise, visual and potential shadow flicker impacts.
Local impacts minimised	Limited residents located within 4km of the site boundary and commitments to further investigate impacts on those living within 4km.
Capacity to rehabilitate	The site can be restored to existing agricultural land capability or similar use, after decommissioning.
Community support	The project has received strong community support from the Hanging Rock community with further consultations required with special interest groups within Nundle.
Proximity to electrical network	23km from 330kV TransGrid Liddell to Tamworth transmission line, with capacity to accept the generation capacity following consultation with TransGrid.
Connection capacity	Optimal location to connect to the existing transmission network via a new overhead transmission line.
Regional Skills	Tamworth has been identified as a potential source of skills for construction and operation due to the existence of a variety of sectors and industries as well as strong population of approx. 60,000.

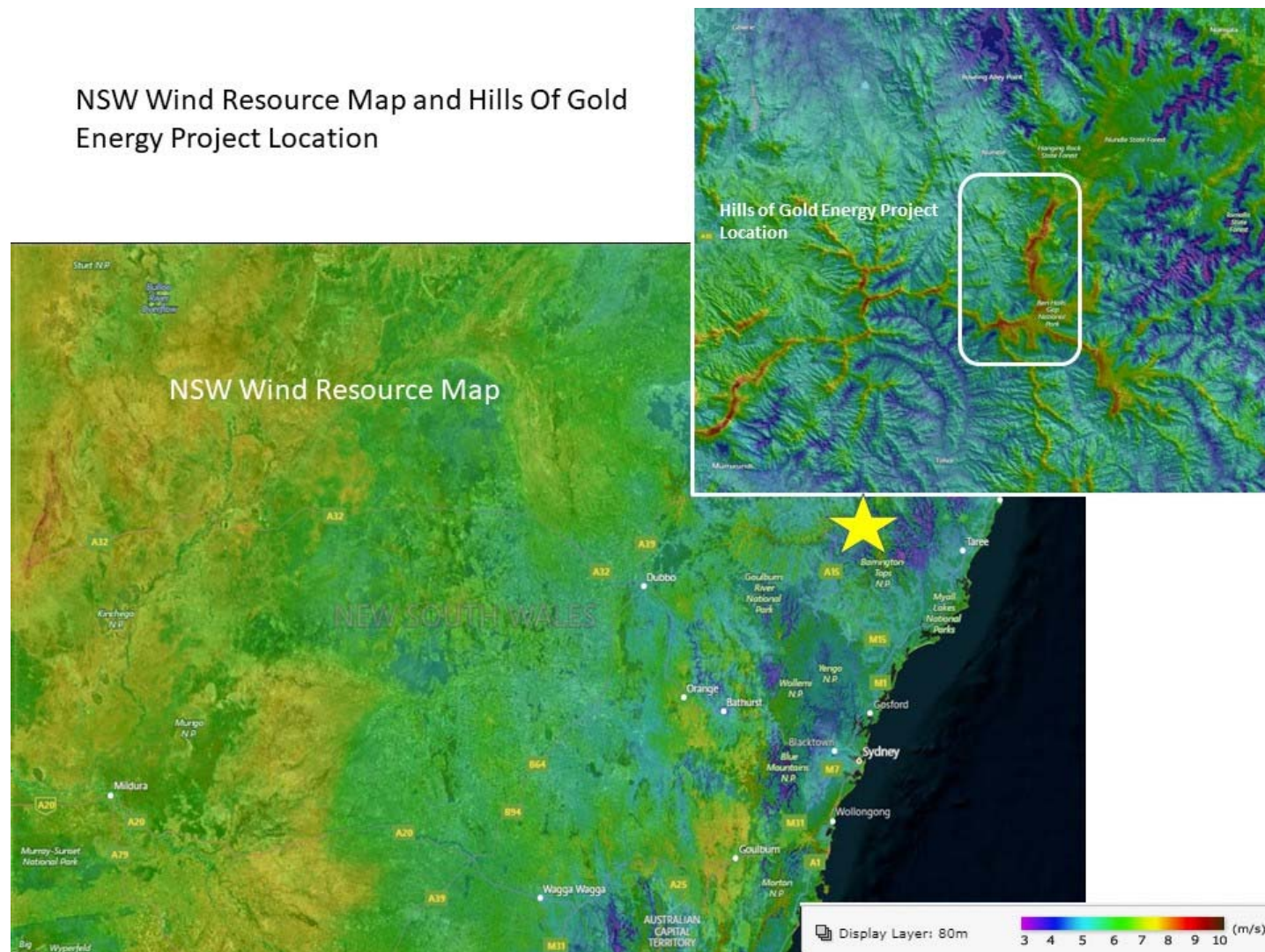


Figure 3-2 Wind resource map indicating high wind yield associated with the proposal site

Table 3-2 Site selection criteria: areas of constraint

Areas of constraint	Site observation
Native vegetation	High percentage of overstory native vegetation present; clearings exist on ridges and lower slopes and conversion of native understory to exotic pastures is prevalent.
Potential residences	Few houses adjacent to the wind farm site, although more located adjacent to the potential transport access haulage route and in the transmission line corridor.
Waterways	All waterways within 250 m of the ridgeline, where the majority of the development would take place, are defined as first order streams.
Aboriginal/Heritage significance	Requires further consultation and investigation.
Important agricultural land	State-wide land and soil capability mapping shows the area has moderate to extremely low land capability. As such, agricultural land use is limited to grazing at best and requires careful management to prevent environmental degradation. The wind farm site is not mapped as Biophysical Strategic Agricultural Land (BSAL).
Residential zones	No residential zones. Refer to zoning map; Figure 2-4.
Resource developments	One exploration license: EL8692 held by PTR Resources Pty Ltd. PTR Resources Pty Ltd will be consulted with during preparation of the EIS.

The turbine selection and contractor identification will be further justified based on the detailed environmental assessment following this PEA. On the basis of a 410MW wind project the following global, regional and local benefits can be expected (Table 3-3).

Table 3-3 Benefit summary

Benefit	Hills of Gold Energy Forecast
Energy Production	Generation of 1,415 gigawatt hours of electricity annually. Estimated to produce enough power to supply up to 193,900 average Australian homes annually and help meet global, Australian, and state emissions reduction targets
Carbon Reduction	Producing renewable electricity that would otherwise have resulted in over 1.2m tonnes of CO ₂ per annum from traditional thermal coal fired generation.
Local Jobs	Up to 272 jobs during construction during a two year construction period and up to 34 operational jobs during the projects 35 year production life.
Community Enhancement Fund	A commitment of \$2,500 per turbine per annum over the operational life of the project has been announced as a commitment to a community enhancement fund. Further details will be finalised during community consultation.
Economic injection	Economic injection due to spending of construction and operations staff in the local towns of Nundle and surrounds.
Cost of Power and Diversification	Wind power is now cheaper than new coal and gas generation. As ageing generation is retired lower cost renewables is expected to replace part of this capacity. There are no other wind projects in the immediate surrounds and this project will create diversification of generation resource across NSW.

3.3.1 *Project timetable*

The project timetable is dependent on the planning assessment process, however Q3 2020 has been identified as a target date for the commencement of construction.

4 CONSULTATION

4.1 GOVERNMENT AGENCIES

A pre-lodgement meeting was held with the Department of Planning and Environment (DP&E) on the 7th of September 2017 and again on the 27th of June 2018 to discuss the proposal and draft PEA. Key comments provided by DP&E included ensuring careful consideration of the Wind Energy Guidelines in the preparation of the PEA and particularly:

- Early community consultation with the community, Tamworth Regional Council and Upper Hunter Shire Council, to understand community values and council interest
- Preliminary view shed analysis, to understand visual impacts
- Evidence that the proposal has reflected preliminary constraints and values (particularly community, visual, noise and biodiversity)
- Early consultation with the Office of Environment and Heritage (OEH) regarding biodiversity impacts and impacts on the adjacent National Park.

OEH were contacted and informed of the status of the project and expected timeframe until lodgement of this PEA. It was discussed that further site visits will be conducted closer to lodgement of the PEA and potentially following lodgement.

Consultation with community and visual impacts assessment in accordance with the Wind Energy Guidelines have been undertaken as summarised in this report and will continue to be undertaken.

Roads and Maritime Services (RMS) were contacted and preliminary project information provided.

Meetings were held with representatives of the Tamworth Regional Council on two occasions and ongoing support has been provided by council staff regarding community consultation in and around the proposed project site.

A representative of the Upper Hunter Regional Council attended one of the public meetings and subsequent discussions were held with additional information provided about the project.

Individual meetings were held with Hon Barnaby Joyce MP, Kevin Anderson, State Member for Tamworth, and Andrew Dyer - National Wind Farm Commissioner.

4.2 COMMUNITY CONSULTATION

A Community Consultation Plan has been prepared by Inclusive Engagement to provide a framework to engage with the community and stakeholders about the proposal and to ensure that opportunities to provide input into the assessment and development process are understood and maximised.

Inclusive Engagement was selected based on their 30 year history in community consultation for large multi-national companies. Inclusive Engagement is located 15 km north of Nundle in the Tamworth community, making it well placed to carry out the consultation due to its understanding of the interest and values of the local communities.

What follows is a summary of the consultation process undertaken to date, provided in full in Appendix D.

4.2.1 Stakeholder engagement strategy

Stakeholders are identified as those potentially being impacted by the proposal or having an interest in the proposal itself. Inclusive Engagement has created a Stakeholder Engagement Strategy that places identified stakeholders into three categories:

1. Category 1

- Those landholders directly or with the potential to host wind turbines, substations, site access and transmission line infrastructure.

2. Category 2

- Adjacent landholders to the proposed Development Corridor generally within 3km as per the NSW wind farm guidelines. It is important for those who are closest to the proposed project to be given information regarding potential impacts, the project benefits and timelines for development, construction and operation.

3. Category 3

- Broader surrounding community, community groups, Tamworth Regional Council, business groups, community groups, planning authorities, relevant government departments and local media.

The information provided to all stakeholders for the Hills of Gold Energy project proposal was the same, however the communication plan and delivery medium was different depending on the category. This allows for open discussion, efficient delivery of information and consultation with category 1 and 2 stakeholders who have a stronger proximity or interest. Where further detail was required, direct communication between the Proponent and stakeholders occurred in follow up meetings.

Category 1 and Category 2 stakeholders were met one on one at their homes. Meetings were held by Inclusive Engagement and in some cases where further detail was required, WEP conducted follow up meetings. This allowed WEP to understand the proximity and specific setting of the stakeholder and also allowed concerns to be voiced in a flexible and two-way manner. The intent was to build relationships that could last during development and construction such that stakeholders could feel comfortable communicating directly with WEP as the project progresses. This also better allowed WEP and Inclusive Engagement to understand the context associated with local concerns. As the project progresses these key stakeholders will continue to be informed, consulted and collaborated with to ensure any impacts of detailed assessments are discussed directly.

Discussions included topics such as co-operating with the proposed development, areas of “No Go” on the affected land, input into suitable access corridors, specific terms of access that address individual landholder concerns including biosecurity and any areas of ecological significance with regard to vegetation mapping. A community survey was provided as part of these meetings for submission to WEP.

Larger special interest group meetings took place with category 3 stakeholders to understand how they might be impacted and specific community values and opinions in relation to the proposal. It should be noted that the community requested a number of additional meetings which WEP subsequently held to provide more information.

At all meetings with all interested parties, a full stakeholder register has been maintained including full property descriptions, names of owners and occupiers, details of topics discussed and any concerns. Surveys and category 3 stakeholder meetings were also helpful in determining potential candidates for a community consultative committee which will comprise a broad representation of community members.

4.2.2 Broader community engagement strategy

In order to engage with the community in the Tamworth region and to promote attendance at the public meetings and interaction with broader community interest's the following was undertaken:

- Media release and interviews with local papers, a local TV station and a local radio station.
- Flyers were dropped in letter boxes and notices put up in public places.
- High profiles clubs such as Rotary, Lions and Country Women's Association were engaged to support public meetings.

These strategies ensured strong participation in public meetings and better knowledge of the project in the region.

A website has been established to communicate the latest news and updates to the community and is accessible at: www.hillsofgoldenergy.com

4.2.3 Consultation summary

To date, the following mediums have been utilised for consultation:

- One on one meetings.
- Surveys returned from one on one meetings (a copy of the survey is provided in Appendix E).
- Input from special interest groups.
- Public meeting questions asked.
- Direct communication including calls and emails received.

Key meetings were held with the following groups:

- Over 50 one on one meetings were held with families in close proximity to the proposed wind farm including along the proposed transmission line route (Category 1 and 2).
- A community forum was held at the Nundle Memorial Hall on 22nd March 2018 at which an estimated 250 people were present (Category 3).
- A community forum was held at the Hanging Rock Memorial Hall on 23rd March 2018 in which an estimated 80 people were present (Category 3).
- Three meetings were held with the Nundle Business and Tourism Group (Category 3).
- The Nundle Business and Tourism Group hosted a meeting prior to the community meeting and provided WEP with information the community specifically wanted addressed in the community forums. This information is summarised below (Category 3).
- Council was met with twice, initially to introduce the proposal, and a follow up meeting was held to brief Councillors, planning and the communication team on the proposal (Category 3).
- A meeting was held with Kevin Anderson, state member for Tamworth and an overview of the project was provided.
- A teleconference was held with the Commonwealth National Wind Farm Commissioner and an overview of the project was provided.

A summary of feedback from consultation activities is shown in Table 4-1, sorted by issue raised.

Table 4-1 Key issues raised during consultation

Key issues raised
<p>Economic opportunity</p> <ul style="list-style-type: none"> There is interest in the opportunities the wind farm will create for local businesses however, concern within the existing tourism businesses as to the impact of the project on regular and existing visitors. This was a mixed opinion with some expecting an increase in tourism and others not. Overall the majority of respondents agreed there will be increased economic opportunities. There was interest from the community in ensuring jobs were provided to local community members. There is interest from the community in how those without businesses or supporting the project will benefit through a community fund. There is concern that the mountain range is an important tourism attraction adding to the appeal of Nundle, additional to the heritage character of the town. There was concern the town could not support accommodating the staff required to construct the project. It was suggested WEP work with the community to promote eco-tourism through open days of the wind farm, walking and mountain bike routes, potential tourism operators to access parts of the wind site and look outs to be established at key vantage points in the proposed Development Corridors.
<p>Sustainability and environment</p> <ul style="list-style-type: none"> Interest was expressed in how towns such as Nundle and Hanging Rock could become 100% renewable, and could this allow businesses and individuals to benefit from lower cost and renewable energy. There was significant interest in renewable energy and how sustainable the generating type is when considering embodied energy in manufacturing and efficiency. Overall, there was strong support for renewable energy however, there were also concerns as to why the specific project site had been chosen. A strong focus on presentations and discussions was on the project justifications. A specific question was raised during a public meeting suggesting the community would be more supportive of the Project if it were moved further East into the heavily forested area. There is no private access to the Ben Halls Gap National Park and local residents and business operators suggested that improved access will provide better utility of the national park. However, it was stated impacts of native and virgin bushland, native animals, birds, peace and quiet of the area should be assessed regarding potential construction and operational impacts. Sheba Dams are an important tourism destination and historically significant area. The community wanted to know whether there were any endangered species in the National Park or on the project site. Concern for the potential effects of micro-climates on the site was raised. Interest in how much vegetation removal will be required to host the project was raised. The project site is the start of watersheds feeding several downstream rivers. Concern was raised about the impact the project may have on these watercourses. Concern for potential erosion on the site and the impact habitat and watercourses on the site. How much water is required and where will the water be sourced for construction was queried. Concern over potential impact on yearly aerial baiting undertaken to mitigate wild dog attacks on sheep. Concern regarding impact on emergency helicopter access that is currently on site.
<p>Visual amenity</p> <ul style="list-style-type: none"> The community seeks a greater understanding of the visual impact of the project based on the likely turbine models, size and layout of the project. Specific areas of significance to the community from which the visual amenity was requested to be assessed included: <ul style="list-style-type: none"> From distances further than 3km from the proposed site. The Hanging Rock lookout and descending the road from Hanging Rock. From within the town of Nundle (specifically from Jenkins St, Oakenville St, and the cemetery).

- From Hanging Rock.
- From residences along Morrisons Gap Road.
- From the New England Highway and Lindsays Gap Road near the New England Highway.
- From the Golf Course and Bowling Club in Nundle.
- Historic homesteads including Woombramurra, Koobah, the DAG Sheep Station and Cottage on the Hill.
- The road over Crawney looking North towards the ridge.
- Properties along Morrisons Gap Rd.
- The homestead on Head of the Peel Rd.
- Homesteads on the other side of the Crawney Pass near Timor.
- It was requested that visual photomontages be used to express the visual impact from areas of significance.
- There were misconceptions to the location of the wind farm above Nundle and the visual impact if the project were in that location.
- Comments were received that the forestry plantation along the ridge further to the North of the proposed Development Corridors had already altered the visual amenity of the ridge in parts.
- A number of people living with views of the area of the site expressed it be a priority to minimise visual impacts.
- The colour of the turbines should be such that they minimise the visual impact. It was also stated that those hills are often shrouded in clouds, particularly in the morning.
- Detail was requested by those living closer to the project on how shadow flicker will be assessed on nearby residents.

Health impacts

- There were concerns for whether there could be health impacts for those living nearby caused by powerlines, wind turbines or construction related activities.

Transport and access

- Concern was raised over the impact of dust on nearby residents on the unsealed Head of the Peel Rd and Morrisons Gap Rd if either are used for access to the site as currently considered. It was suggested to prioritize upgrade of Morrisons Gap Road to a tarred road due to increased traffic from trucks etc, and a speed limit imposed.
- Concern was raised by residents in Nundle and Hanging Rock as to construction traffic volumes and timings. Members of Hanging Rock community suggested WEP look at overtaking bays on the Barry Rd on route to Hanging Rock. Nundle community members mentioned specific concern to the location of the primary school and school bus routes.
- Further detail was requested on where roads will need to be upgraded and the size of equipment being transported.
- There is an expectation that construction jobs for two years initially will increase income in hotels/general store/service station/takeaway.
- Creation of 34 jobs during project lifetime potentially increasing pre/primary school sustainability and participation in community groups, injected income from the project into community projects.

General interest

- Residents along Morrisons Gap road and Shearers road complained about the poor telecommunications in the area and requested installation of a mobile phone tower to service the area
- More information was requested on layout, turbine types and sizes and transmission line route and structures required.
- Regular community updates were requested and representation by certain community members.
- Several suggestions and requests for inclusion in a potential Community Consultative Committee were received
- Was there a greater risk of fires during construction and operation.
- Neighbouring landowners to the project currently use aerial methods for fertilising their land. Concern was raised as to whether this practise can continue and if not the impact on the value of their land.
- One resident with a greater viewshed of the proposed Development Corridor raised concerns of reduced property values.
- Suggestions to reduce the size of the project to just provide power to Nundle and surrounds rather than the whole state.

- Further information on whether turbines will require aviation lighting.
- Concern the technology will be outdated in 5-10 years.
- Concern wind power is more expensive than traditional power.
- Interest from some of the community in how they can benefit from being allowed to invest in the project.
- There was concern raised of the potential proximity of turbines to lifestyle blocks on Morrisons Gap Road in the north of the site, particularly with regard to dust during construction and operational transport routes, visual impact, noise and shadow flicker. It was requested that turbines are located further down the ridge given the extent of ridgeline available.
- How can the community benefits offered through the community enhancement fund be ensured to be paid by the company?

4.2.4 Ongoing community engagement

During meetings, contact details were collected in order to provide the community with regular updates in their preferred medium. WEP will maintain several mediums of communication to continue to provide information to the community. Further to formal communication channels, Inclusive Engagement will continue to maintain ongoing contact with the community as the key proposal contact.

It is proposed that a Community Consultative Committee (CCC) will be established once the Hills of Gold Energy project SEAR's have been issued. As the proposal progresses, engagement will continue in the form of community information days, a regularly updated website and quarterly newsletters. A summary of ongoing engagement strategies at key milestones is provided in Table 4-2.

Specialist assessment and the scope for the EIS will be developed not only from SEAR's but will also take into consideration specific issues and locations that have been raised during ongoing consultation.

Table 4-2 Ongoing engagement strategies

Stakeholder	Strategy	Medium
Pre-Submission of Preliminary Environmental Assessment		
<p>Category 1:</p> <ul style="list-style-type: none"> Landholders directly or with the potential to host wind turbines, substations, site access and transmission line infrastructure <p>Category 2:</p> <ul style="list-style-type: none"> Adjacent landholders to the supplied proposed Development Corridor generally within the 3km as per the NSW wind farm guidelines. <p>Category 3:</p> <ul style="list-style-type: none"> Local Community around Hanging Rock and Nundle. Tamworth Regional Council, Nundle Business and Tourism Marketing Group, Lions, CWA, Rotary, relevant government departments. Media and broader community around Tamworth Regional Local Government Area. 	As discussed in Section 4.2.1, 4.2.2 and 4.2.3	As discussed in Section 4.2.1, 4.2.2 and 4.2.3
Following receipt of Secretary's Environmental Assessment Requirements		
<p>Category 1:</p> <ul style="list-style-type: none"> Landholders directly or with the potential to host wind turbines, substations, site access and transmission line infrastructure. <p>Category 2:</p> <ul style="list-style-type: none"> Adjacent landholders to the proposed Development Corridor, generally within the 3km as per the NSW wind farm guidelines. 	Ensure timely updates are received that might directly affect properties. Ensure there is consultation during the scoping and execution of impact assessment work where this is relevant to potentially affected properties. Provide an opportunity to guide the proposal design such that concerns are understood and assessed by WEP.	<ul style="list-style-type: none"> One on one meetings Newsletters, Website updates Community Consultative Committee (CCC) Membership
<p>Category 3:</p> <ul style="list-style-type: none"> Local Community around Hanging Rock and Nundle. 	Ensure factual information is available at all times for the community. Provide this in forums that suit a range of stakeholders (note internet is not always the most convenient way to receive information).	<ul style="list-style-type: none"> Newsletters, Website updates CCC Membership
<p>Category 3:</p> <ul style="list-style-type: none"> Tamworth Regional Council, Nundle Business and Tourism Marketing Group, Lions, CWA, Rotary, relevant government departments. 	Maintain regular contact based on major project milestones being achieved and communicating progress towards milestones. Ensuring that project information is shared early.	<ul style="list-style-type: none"> One on one meetings Website

Stakeholder	Strategy	Medium
	<p>Collaboration to ensure existing interests are understood and the opportunities and impacts for these groups are discussed regularly.</p> <p>Provide an opportunity to guide the proposal design such that concerns are understood by WEP.</p>	
<p>Category 3:</p> <ul style="list-style-type: none"> Media and broader community around Tamworth Regional Local Government Area. 	<p>Provide regular updates of the proposal progress and relevant opportunities that may be available for the broader community.</p>	<ul style="list-style-type: none"> Website and press releases
Prior to submission of Environmental Impact Assessment as further assessment on layout and suitable turbines is determined		
<p>Category 1:</p> <ul style="list-style-type: none"> Landholders directly or with the potential to host wind turbines, substations, site access and transmission line infrastructure. <p>Category 2:</p> <ul style="list-style-type: none"> Adjacent landholders to the proposed Development Corridor, generally within the 3km as per the NSW wind farm guidelines. 	<p>Ensure timely updates are received that might directly affect property.</p> <p>Provide an opportunity to guide the proposal design such that concerns are understood and assessed by WEP.</p>	<ul style="list-style-type: none"> One on one meetings Newsletters Website updates CCC Membership
<p>Category 3:</p> <ul style="list-style-type: none"> Local Community around Hanging Rock and Nundle 	<p>Ensure factual information is available at all times for the community.</p> <p>Provide this in forums that suit a range of stakeholders where internet is not always the most convenient way to receive.</p>	<ul style="list-style-type: none"> Newsletters Website updates CCC Membership
<p>Category 3:</p> <ul style="list-style-type: none"> Tamworth Regional Council, Nundle Business and Tourism Marketing Group, Lions, CWA, Rotary, relevant government departments. 	<p>Collaboration to ensure the results of detailed impact assessments are clearly communicated to specific groups.</p> <p>Provide opportunities for two-way communication and discussion on areas of the impact assessment that cause concern or require further explanation.</p>	<ul style="list-style-type: none"> One on one meetings Website
<p>Category 3:</p> <ul style="list-style-type: none"> Media and broader community around Tamworth Regional Local Government Area. 	<p>Provide regular updates of the proposal progress and relevant opportunities that may be available for the broader community.</p>	<ul style="list-style-type: none"> Website and press releases

Stakeholder	Strategy	Medium
Following submission of Environmental Impact Assessment (EIS) and during public exhibition of EIS		
Category 1: <ul style="list-style-type: none"> Landholders directly or with the potential to host wind turbines, substations, site access and transmission line infrastructure. Category 2: <ul style="list-style-type: none"> Adjacent landholders to the proposed Development Corridor, generally within the 3km as per the NSW wind farm guidelines. 	Provide an opportunity for questions to be asked directly about the details in the EIS.	<ul style="list-style-type: none"> One on one meetings
Category 3: <ul style="list-style-type: none"> Local Community around Hanging Rock and Nundle. 	Ensure the broader community is aware the detailed assessment is available and how they can learn more about this and ask questions.	<ul style="list-style-type: none"> Community forums Website Media
Category 3: <ul style="list-style-type: none"> Tamworth Regional Council, Nundle Business and Tourism Marketing Group, Lions, CWA, Rotary, relevant government departments. 	Provide a link to the Major Projects website and an opportunity to discuss any queries before lodging any responses.	<ul style="list-style-type: none"> One on one meetings Newsletters
Category 3: <ul style="list-style-type: none"> Media and broader community around Tamworth Regional Local Government Area. 	Provide information to the broader community that detailed assessments are available for review on the Major Projects website	<ul style="list-style-type: none"> Website and press releases
Pending determination by the Department of Planning and Environment		
To be determined through project evaluation period and responses from key stakeholders through the assessment of state environmental assessment requirements.		

5 PLANNING CONTEXT

This section sets out the environmental planning context of the Hills of Gold Energy project proposal. Relevant provisions are noted that will affect the planning and assessment of the proposal.

5.1 NSW LEGISLATION

5.1.1 *Environmental Planning and Assessment Act 1979 (EP&A Act)*

Development in NSW is subject to the requirements of the EP&A Act and its associated regulations. Environmental planning instruments prepared pursuant to the Act set the framework for approvals under the Act.

The *Environmental Planning & Assessment Act* (EP&A) includes the following objectives:

- Encourage:
 - The proper management, development and conservation of natural resources for the purpose of promoting the social and economic welfare of the community and a better environment.
 - The provision of land for public purposes.
 - The protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities and their habitats.
 - Ecologically sustainable development.

The Hills of Gold Energy project proposal will be assessed under Part 4 of the EP&A Act.

5.1.2 *State Environmental Planning Policy (State and Regional Development) 2011*

Clause 20 of Schedule 1 of *State Environmental Planning Policy (State and Regional Development) 2011* states that the following is considered a state significant development:

Development for the purpose of electricity generating works or heat or their co-generation (using any energy source, including gas, coal, biofuel, distillate, waste, hydro, wave, solar or wind power) that:

(a) has a capital investment value of more than \$30 million, or

The Hills of Gold Energy project proposal will have a capital investment cost of more than \$30 million. Therefore, the proposal is classified as “State Significant Development” under Part 4 of the EP&A Act.

State Significant Developments are major projects which require approval from the Minister for Planning. While the Minister for Planning is the consent authority for State Significant Development, the Minister may delegate the consent authority function to the Independent Planning Commission NSW (IPCN), the Secretary or to any other public authority.

If substantial numbers of submissions are received to the EIS, the proposal may be determined by the PAC, with reference to the DP&E Determination Report.

5.1.3 State Environmental Planning Policy (Infrastructure) 2007

Clause 34 of State Environmental Planning Policy (Infrastructure) 2007 provides that development for the purpose of electricity generating works may be carried out by any person with consent on any land in a prescribed rural, industrial or special use zone.

Relevant to the proposal, prescribed rural, industrial or special use zones are defined to include land zoned as RU1 – primary production and RU3 – forestry. No part of the proposal would be located on E1 land, which is not included in the prescribed zones.

5.1.4 Tamworth Regional Local Environmental Plan 2010

The majority of the site is located within the Tamworth Regional Council LGA to which the provisions of the *Tamworth Regional Local Environmental Plan 2010* apply. The wind farm site is located on land zoned RU1 – Primary Production. The objectives of this zone is as follows:

RU1 - Primary Production (within the proposal site boundaries)

- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.
- To encourage diversity in primary industry enterprises and systems appropriate for the area.
- To minimise the fragmentation and alienation of resource lands.
- To minimise conflict between land uses within this zone and land uses within adjoining zones.
- To permit subdivision only where it is considered by the Council to be necessary to maintain or increase agricultural production.
- To restrict the establishment of inappropriate traffic generating uses along main road frontages.
- To ensure sound management of land which has an extractive or mining industry potential and to ensure that development does not adversely affect the extractive industry.
- To permit development for purposes where it can be demonstrated that suitable land or premises are not available elsewhere.

Clearing and excavation will be required for a network of turbine footings, hardstand areas, access tracks and substation(s) and control buildings. Having a dispersed and small overall impact footprint in comparison to the land available for agriculture within the proposal boundary, allowing for mixed agricultural activities concurrent with wind farm operation and being highly reversible at the end of the project's life, the proposal is considered compatible with this land zoning.

The site is located directly adjacent to land zoned RU3 – Forestry. The objectives of this zone are as follows:

RU3 – Forestry (located adjacent to the site)

- To enable development for forestry purposes.
- To enable other development that is compatible with forestry land uses.

The proposal is not inconsistent with these objectives.

The proposal currently shows minimal direct impact on these zones; small sections of the proposed Development Corridor are located in RU3 – forestry; limited to access tracks that may be utilised. The proposal will improve access, due to upgrades to Morrisons Gap Road and these access tracks. This will be an operational benefit to the forestry and national park estates. It will also improve vehicular response time and access in the case of a bushfire in the area.

5.1.5 Upper Hunter Shire Local Environmental Plan 2013

A small component of the site is located within the Upper Hunter Shire LGA to which the provisions of the *Upper Hunter Local Environmental Plan 2013* apply. The wind farm site is located on land zoned RU1 - Primary Production. The objectives of this zone is as follows:

RU1 - Primary Production (within the proposal site boundaries)

- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.
- To minimise the fragmentation and alienation of resource lands.
- To minimise conflict between land uses within this zone and land uses within adjoining zones.
- To protect the agricultural value of rural land.
- To maintain the rural landscape character of the land in the long term.
- To ensure that development does not unreasonably increase demand for public services or public facilities.
- To ensure that development for the purposes of extractive industries, underground mines (other than surface works associated with underground mines) or open cut mines (other than open cut mines from the surface of the flood plain) will not:
 - a) destroy or impair the agricultural production potential of the land or, in the case of underground mining, unreasonably restrict or otherwise affect any other development on the surface, or
 - b) detrimentally affect the quantity, flow and quality of water in either subterranean or surface water systems, or
 - c) visually intrude into its surroundings, except by way of suitable screening.

Clearing and excavation will be required for a network of turbine footings, hardstand areas, access tracks and substation(s) and control buildings. However, in terms of overall landforming and landscape changes, the proposal would have a dispersed and small overall impact footprint. This will mean the site will retain large areas of land available for agriculture within the proposal boundary, allowing for mixed agricultural activities concurrent with wind farm operation. It is also considered highly reversible. At the end of the project's life, above ground infrastructure can be removed, returning the site to its current agricultural capability or an alternative land use. The proposal is considered compatible with this land zoning.

5.1.6 Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2016* relates to the conservation of biodiversity. The Act repeals the *Threatened Species Conservation Act 1995*, the *Nature Conservation Trust Act 2001* and the animal and plant provisions of the *National Parks and Wildlife Act 1974*. The Act commenced on the 25th of August 2017.

The purpose of this Act is to maintain a healthy, productive and resilient environment for the greatest well-being of the community consistent with the principles of the ecological sustainable development, and in particular:

- a) To conserve biodiversity at bioregional and State scale
- b) To maintain the diversity and quality of ecosystems and enhance their capacity to adapt to change and provide for the needs of future generations
- c) To improve, share and use knowledge, including local and traditional Aboriginal ecological knowledge, about biodiversity conservation
- d) To support biodiversity conservation in the context of a changing climate
- e) To support collating and sharing data, and monitoring and reporting on the status of biodiversity and the effectiveness of conservation actions
- f) To assess the extinction risk of species and ecological communities, and identify key threatening processes, through an independent and rigorous scientific process
- g) To regulate human interactions with wildlife by applying a risk-based approach
- h) To support conservation and threat abatement action to slow the rate of biodiversity loss and conserve threatened species and ecological communities in nature
- i) To support and guide prioritised and strategic investment in biodiversity conservation
- j) To encourage and enable landholders to enter into voluntary agreements over land for the conservation of biodiversity
- k) To establish a framework to avoid, minimise and offset the impacts of proposed development and land use change on biodiversity
- l) To establish a scientific method for assessing the likely impacts on biodiversity values of proposed development and land use change, for calculating measures to offset those impacts and for assessing improvements in biodiversity values
- m) To establish market-based conservation mechanisms through which the biodiversity impacts of development and land use change can be offset at landscape and site scales
- n) To support public consultation and participation in biodiversity conservation and decision-making about biodiversity conservation and,
- o) To make expert advice and knowledge available to assist the Minister in the administration of this Act.

The ecological assessment to be included in the EIS will be carried out consistent with the requirements under the *Biodiversity Conservation Act 2016*.

5.1.7 Protection of the Environment Operations Act 1997

The *Protection of Environment Operations Act* aims to reduce pollution of the environment and governs the way discharge of pollutants is to be managed. This includes pollution of waters.

This Act also requires Environment Protection Licences to be obtained for the conduct of certain activities, including the construction and operation of wind farms which are approved as SSD under the EP&A Act.

5.1.8 Rural Fires Act 1997

The objects of the Rural Fires Act 1997 include:

- (a) For the prevention, mitigation and suppression of bush and other fires in local government areas (or parts of areas) and other parts of the State constituted as rural fire districts, and
- (b) For the co-ordination of bush firefighting and bush fire prevention throughout the State, and
- (c) For the protection of persons from injury or death, and property from damage, arising from fires, and
- (c1) For the protection of infrastructure and environmental, economic, cultural, agricultural and community assets from damage arising from fires, and
- (d) For the protection of the environment by requiring certain activities referred to in paragraphs (a)–(d1) To be carried out having regard to the principles of ecologically sustainable development described in section 6 (2) of the *Protection of the Environment Administration Act 1991*.

Section 63(1) of the *Rural Fire Act* states “It is the duty of a Public Authority to take the notified steps (if any) and any other practicable steps to prevent the occurrence of bush fires on, and to minimise the spread of a bush fire on or from:

- a) Any land vested in or under its control or management, or
- b) Any highway, road, street, land or thoroughfare, the maintenance of which is charged to the authority.”

The site is not mapped as bushfire prone. An assessment of both the potential to cause a fire and impede access to fight a fire will be required in the impact assessment. It is likely that the project infrastructure and track establishment will facilitate firefighting access in the locality. Provisions to fight fire and allow access will be required as part of the construction and operational environmental management of the wind farm.

5.1.9 National Parks and Wildlife Act 1974

The NPW Act establishes the fundamental functions of the NSW National Parks and Wildlife Service. These include the conservation of nature, objects, features, places and management of land reserved under the Act. Specifically, the conservation of nature includes:

- Landforms of significance, including geological features and processes, and
- Landscapes and natural features of significance including wilderness and wild rivers.

Animal and plant provisions of the *National Parks and Wildlife Act 1974* have been repealed and replaced by the *Biodiversity Conservation Act 2016* that commenced on the 25th of August 2017.

The NPW Act regulates access to National Parks.

The NPW Act also sets out to protect and preserve Aboriginal heritage values. Part 6 of this Act refers to Aboriginal objects and places and prevents persons from impacting on an Aboriginal place or relic, without consent or a permit.

Additional to the NPW Act, OEH codes set out required assessment and consultation protocols for Aboriginal heritage impact assessments.

5.1.10 Forestry Act 2012

This act sets out the establishment of the Forestry Corporation of New South Wales as a statutory State owned corporation and land manager of forestry areas. The objectives of the Forestry Act 2012 include:

- a) *to be a successful business and, to this end:*
 - i. *to operate at least as efficiently as any comparable businesses, and*
 - ii. *to maximise the net worth of the State's investment in the Corporation,*
- b) *to have regard to the interests of the community in which it operates,*
- c) *where its activities affect the environment, to conduct its operations in compliance with the principles of ecologically sustainable development contained in section 6 (2) of the [Protection of the Environment Administration Act 1991](#),*
- d) *to contribute towards regional development and decentralisation,*
- e) *to be an efficient and environmentally sustainable supplier of timber from Crown-timber land and land owned by it or otherwise under its control or management.*

Section 59 (1) states “*The land manager of a forestry area has the following objectives in the exercise of functions as land manager of the area:*

- a) *To facilitate public access to the forestry area,*
- b) *To promote the recreational use of the forestry area,*
- c) *To conserve fauna (other than feral animals) living in the forestry area”.*

The Development Corridor incorporates land zoned as RU3, managed by NSW Forestry Corporation. Access roads in this zone may be utilised to provide access to the proposed wind farm site, as such, consultation is underway with NSW Forestry Corporation. The Hills of Gold Energy project is not inconsistent with the objectives of the Forestry Act 2012.

5.1.11 Fisheries Management Act 1994

This Act sets out to conserve fish stocks and key fish habitats, threatened species, populations and ecological communities of fish and marine vegetation and biological diversity. Further, it aims to promote viable commercial fishing, aquaculture industries and recreational fishing opportunities.

Key fish habitat is defined as aquatic habitat important to the maintenance of fish populations generally and the survival and recovery of threatened aquatic species. Assessment of the Tamworth Regional LGA and Upper Hunter Shire LGA Key fish habitats (DPI, 2017) identified Key fish habitat within the proposal site boundaries (refer to Appendix B preliminary constraints mapping). These are generally in the lower slope positions and unlikely to be directly affected by the proposal. The environmental assessment will include assessment of the water way crossings as well as clearing and excavation near Key fish habitat and include measures designed to ensure that any impacts on aquatic habitat and pollution risks are mitigated.

5.1.12 Water Management Act 2000

Under the WM Act, water access licences and controlled activity approvals are required for certain activities.

A controlled activity approval confers a right on its holder to carry out a specified controlled activity at a specified location in, on or under waterfront land (i.e. in or within 40 metres of a river, lake or estuary). A controlled activity approval is not required for SDD. The design of waterway crossings, installation of cables and any associated in-stream works would be prepared in accordance with DPI Water's Guidelines for Controlled Activities on Waterfront Land (2012) however, as a best practice measure.

Water access licenses may however be required. Water sources for construction and operations will be identified and quantified within the EIS and all required licences and approvals obtained prior to the commencement of relevant construction activities.

5.1.13 Roads Act 1993

Approval from the roads authority (RMS and/or Council) is required under section 138 of the Roads Act to erect a structure or carry out a work in, on or over a public road. These will be obtained prior to the commencement of relevant works.

The road upgrades required for the proposal and an impact assessment of the upgrades will be assessed and identified in the EIS.

5.1.14 Crown Lands Act 1989

The objective of the Crown Lands Act is to ensure that Crown land is managed for the benefit of the people of New South Wales. The Lands Division, Department of Primary Industries (DPI) is responsible for the sustainable and commercial management of Crown land. This involves the management of state-owned land, linking with other agencies, local government, the private sector and communities to provide social and economic outcomes for NSW.

Section 11 of *Crown Lands Act 1989* sets out principles for Crown land management including that:

- Environmental protection principles be observed in relation to the management and administration of Crown land.
- The natural resources of the Crown land (including water, soil, flora, fauna and scenic quality) be conserved wherever possible.
- Public use and enjoyment of appropriate Crown land be encouraged.
- Where appropriate, multiple use of Crown land be encouraged.

Easements, licences or permits will be required if the proposed works are within Crown Land. Several 'paper roads' that are designated as Crown Land occur onsite.

Consultation will be required with Department of Primary Industries - Lands. All relevant tenure arrangements with Crown lands will be obtained prior to the commencement of relevant construction activities.

5.2 COMMONWEALTH LEGISLATION

5.2.1 *Environmental Protection and Biodiversity Conservation Act 1999*

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is administered by the Commonwealth Department of the Environment (DoE). Under the EPBC Act, if the Minister determines that an action is a 'controlled action' which would have or is likely to have a significant impact on a Matter of National Environmental Significance (MNES) or Commonwealth land, then the action may not be undertaken without prior approval of the Minister.

The EPBC Act identifies the following nine MNES:

- World Heritage properties.
- National heritage places.
- Ramsar wetlands of international significance.
- Threatened species and ecological communities.
- Migratory species.
- Commonwealth marine areas.
- The Great Barrier Reef Marine Park.
- Nuclear actions (including uranium mining).
- Water resources (in relation to coal seam gas development and large coal mining development)

When a person proposes to take an action which may be a 'controlled action' under the EPBC Act, they must refer the proposal to the DoE for a decision about whether the proposed action is a 'controlled action'.

A search of the Commonwealth Protected Matters Search Tool indicates that there are no World Heritage or National Heritage areas or items within the proposal site. Search results listed four Wetlands of International Importance that are either known to occur or have potential to occur within 10km, however these are not relevant to the site or proposal. The proposed development is not likely to impact Commonwealth land. Section 6.2.3 discusses the results of searches in relation to threatened species, ecological communities and migratory species.

Further flora and fauna studies will confirm biodiversity impacts, during the preparation of the EIS. At this stage however, given the nature and scale of the proposal, an EPBC referral on the basis of a potential to significantly impact Commonwealth listed birds and bats is considered likely.

On this basis, recognition of the need to address Commonwealth matters is sought in the SEARs.

If impacts are deemed significant, the project will become a controlled action and Commonwealth approval will be required under the EPBC Act.

5.3 OTHER POLICIES - LAND MANAGED BY OEH

The EIS must meet the requirements of the *Guidelines for Developments Adjoining Land Managed by the Office of Environment and Heritage 2013*. The goal of this guideline is to guide consent and planning authorities when assessing development applications that adjoin land managed by OEH. Issues within the guideline would be addressed within the EIS.

6 PRELIMINARY ENVIRONMENTAL ASSESSMENT

6.1 METHODOLOGY

A preliminary environmental risk analysis has been conducted to assist in the identification of key environmental matters that will require detailed assessment within the EIS. This included:

1. Investigation of the planning pathway and relevant legislation that may impact the project
2. Desktop review, including database searches relating to:
 - Threatened flora and fauna species and ecological communities
 - EPBC Matters of National Environmental Significance
 - Aboriginal heritage
 - Land use / nearby receivers
 - Key fish habitat
 - Historic heritage
3. Field inspection. A Senior Project Manager and Senior Ecologist inspected the site on 15 August 2017. The inspection was undertaken to validate the desktop information. The inspection covered all ridges proposed for development and a vehicle-based inspection of the transmission route from public roads.

A summary of the *key* environmental issues is provided in Section 6.2. These are expected to require specialist investigations. They include:

- Visual amenity
- Noise
- Biodiversity
- Aboriginal heritage
- Community impacts, social and economic impact
- Access and traffic
- Aviation
- Telecommunications

The potential impacts and management of other (less substantive) issues are discussed in Section 6.3. These are expected to be able to be addressed through desktop investigation. These include:

- Soils and contaminated land
- Hydrology and groundwater
- Air quality
- Hazard and risk
- Waste management
- Non-Aboriginal heritage

6.2 ASSESSMENT OF KEY ISSUES

6.2.1 Visual amenity

Arup Pty Ltd was commissioned to prepare a Preliminary Landscape and Visual Assessment (PLVA) of view sheds for the proposed wind farm. The PLVA is provided in full in Appendix F and summarised below.

The PLVA considers the landscape and visual context of the proposed wind farm and identifies potential impacts and matters which will require further investigation, assessment, management and mitigation as part of the EIS. In accordance with the *Visual Impact Assessment Bulletin, Wind Energy* (DP&E, 2016) the assessment defined a visual study area through the preparation of a Visual Envelope Map (VEM). The visual study area does not include the transmission corridor and was not assessed as part of the PLVA.

The Visual Impact Assessment Bulletin (VIA Bulletin) requires the distance and height of potential turbines to be considered relative to residential or other locally identified viewpoints of significance. The assessment considers the maximum tip height currently proposed for the turbines which is 220m.

The VIA Bulletin recommends the use of the visual magnitude assessment to assess a ratio of turbine height to distance in order to determine the distance for which the basis of the visual assessment is to apply.

Based on the visual magnitude graph presented in Figure 6-1, further detailed assessment is required for residential dwellings located within 3 km of turbines. An 8.0km view extension is also used in the assessment for key viewpoints as determined by preliminary consultation around landscape features and nearby dwellings with a viewshed to the proposed project site. The VIA Bulletin expresses that beyond 8.0km turbines become less visible and recede into the background.

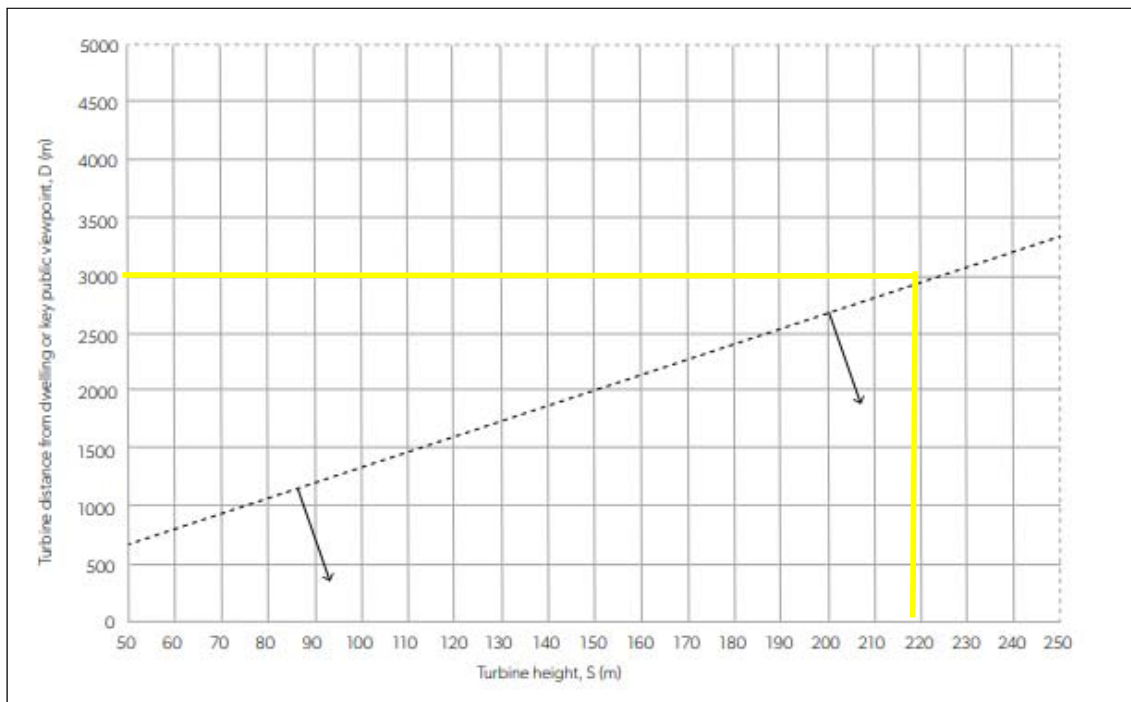


Figure 6-1 - Visual Magnitude Tool - Visual Assessment Bulletin

A combination of desktop analysis and community consultation was undertaken to identify habitable dwellings within 3km of the proposed projects ridgeline. Habitable dwellings within a 4.4km buffer of the proposed Development Corridor in which turbines are likely to be located are presented in Figure 6-2. In summary a total of 42 habitable dwellings were identified during the community consultation within 3.0km. Of these, 9 dwellings are owned by landowners potentially hosting wind turbines or project infrastructure, and 3 are yet to be built.

Visual baseline analysis has been undertaken on select properties and others outside of the 8km radius providing the potential visual catchment through the Visual Envelope Maps (VEM). It should be noted that the assessment does not include local screening provided by dwellings, structures and vegetation and presents a worst case analysis that is likely to be reduced due to local screening influences.

Presentation of an indicative turbine layout

An indicative turbine layout, showing potential turbine siting has been prepared on the basis of the maximum number of turbines that could be located on the project. This indicative layout is preliminary in nature and requires further detailed studies on the site as well as agreements with affected landholders and neighbours. This indicative turbine layout is presented in Appendix C.

To reduce the potential of misleading landholders and neighbours at this preliminary stage, and to ensure the proposed layout best responds to the site's constraints a worst-case scenario for preliminary impact assessments has been completed, with a focus on a wind farm development corridor, rather than specific turbine locations. This 'worst-case' approach ensures a comprehensive assessment of the potential extent of landscape and visual influence, which will inform the finalisation of the wind turbine and infrastructure layout.

The preliminary visual impact investigations have considered the potential visibility of turbines positioned within and across the development area. This has been considered and analysed in three ways; firstly an analysis of the extent of potential visibility of the development boundary, secondly; an analysis of the total properties that have the potential to experience views within a particular location within the development boundary, and thirdly; an analysis of the potential visibility of turbines from all properties situated within 3km (in accordance with the Visual Impact Assessment Bulletin). The analysis undertaken will inform the design development stage and contribute to the optimisation of the turbine layout in advance of the Environmental Impact Assessment.

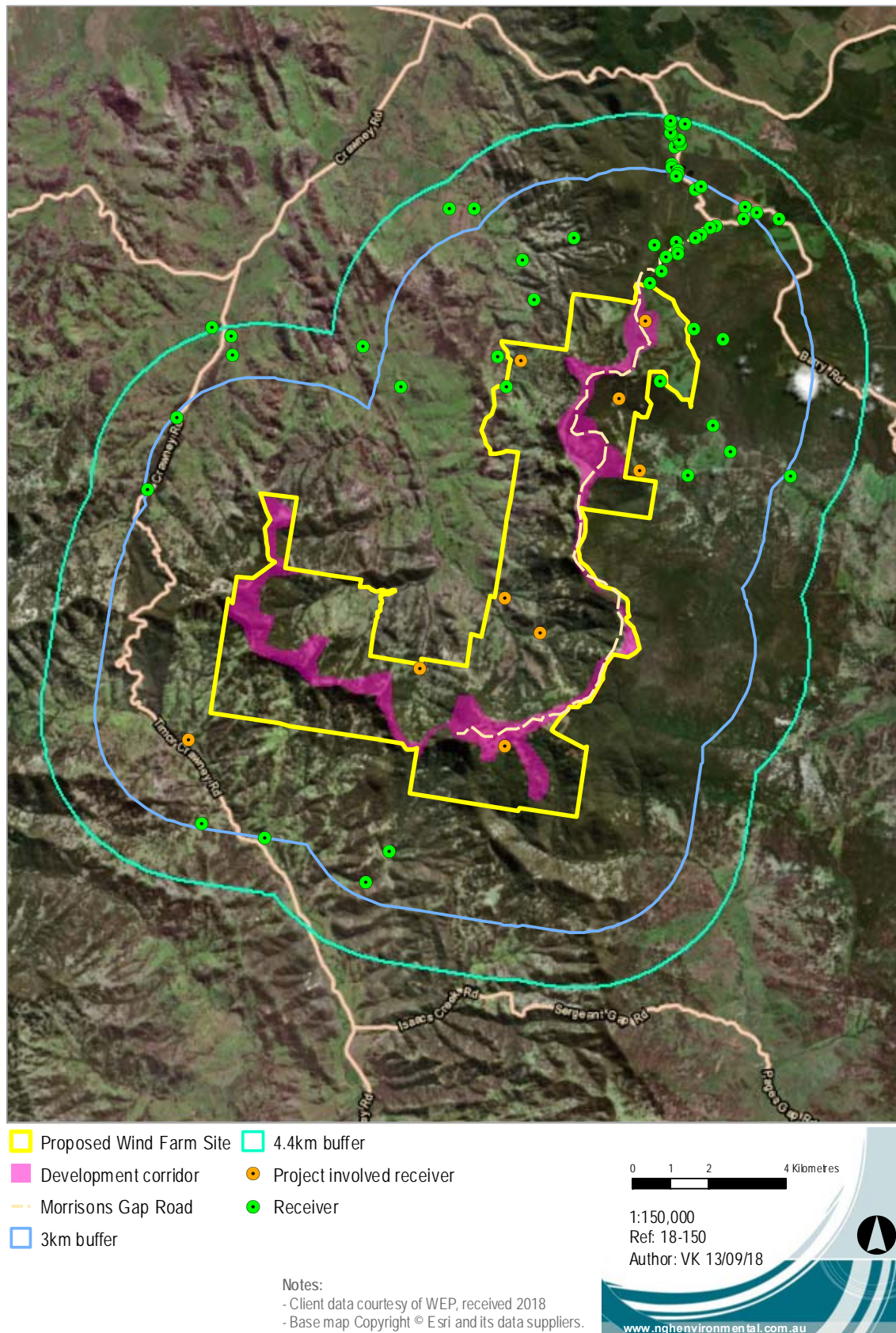


Figure 6-2 Residences within 4km

The assessment included:

- Landscape baseline analysis: An analysis of the local context with a focus on landscape features, including topography, land use, vegetation cover and a review of designated landscapes.
- Landscape character assessment: An analysis of the existing landscape features to divide the landscape in to broad homogeneous units to assist with determining the preliminary impacts that may result from the project.
- Visual baseline analysis: Desktop analysis to ascertain the visual catchment of the proposal through the preparation of Visual Envelope Maps (VEM). The VEM analysis has been approached in three ways:
 - VEM based on the development corridor boundary, determining the extent of potential visibility from the surrounding landscape
 - VEM to determine the number of dwellings that have the potential to experience view towards the development area
 - VEM's from dwelling locations to determine the potential extent of visibility from each dwelling
- Representative viewpoint selection: An onsite field inspection was undertaken to review the VEM outputs, gain an understanding of the project area in context and gather onsite information. Through the analysis of the VEM and in consultation with the community, representative viewpoints have been identified to illustrate a more complete understanding of the project and potential change that may arise as a result of the project.
- Landscape and visual assessment: A preliminary analysis of the sources of impact and magnitude of change that may arise as a result of the project based on an understanding of the development boundary and provision for wind turbines within the existing landscape and visual context.
- Community input: The visual impacts associated with wind farm projects is a common underlying concern of nearby residents and the community. To address this concern, and in accordance with the Bulletin, a community consultation process has been undertaken by Hills of Gold Energy concurrently to establish an understanding of the key landscape features, areas of scenic quality and key public viewpoints valued by the community (Figure 2-1).

The feedback received from the community on the specific areas of value has informed the selection of representative viewpoints for this assessment. These viewpoints are considered to have an inherently elevated level of sensitivity. The assessment associated with these viewpoints takes a worst case approach to inform the design development stage and the ongoing refinement of turbine locations.

Landscape context

TOPOGRAPHY

The substantial mountains of the Great Dividing Range define the centre of the proposal area with a range of plateaus, ridgelines and escarpments broadly positioned in a north-south direction, wrapping around the southern extent to Crawney Pass National Park. The undulating foothills decline towards the centre of the proposal area with creeks and tributaries carving through the landscape, converging at the Peel River

and Nundle Creek along Nundle valley floor. Ben Halls Gap straddling the Great Dividing Range, with Crawney Pass National Park marking the western stretch of the study area.

LAND USE

The proposal area has a strong history of agricultural use, specifically cattle and sheep grazing, classified as 'Grazing modified pastures' and 'Grazing native vegetation.' Cropping is also recorded to occur along the Nundle Valley. 'Other minimal use' is predominantly characterised as areas of steep and/or heavily vegetated terrain, offering reduced opportunities for agricultural use. Areas of hardwood and softwood forestry are present to the north with Ben Halls Gap and Crawney Pass National Park estates to the east and west.

VEGETATION COVER

Extensive agricultural pastures along ridgelines and low-lying topography is used as grazing land, existing access roads, tracks and fence lines. Scattered and intermittent tree cover is present within cattle land parcels and along creek lines. Grassy woodlands dominate the undulating foothills and escarpments with an increase in tree canopy cover towards the forested mountain tops, which are dominated by dense, mature forests, most notably associated with Ben Halls Gap National Park to the east, Hanging Rock to the north and Crawney Pass National Park.

Landscape impacts

NUNDLE VALLEY PASTURES

The low lying modified agricultural landscape is considered to be valued at a local level as an important agricultural resource. Direct impacts on the Nundle valley pastures Landscape Character Area (LCA) are not anticipated to arise from the turbines, however the turbines may contrast with the perceived sense of remoteness and enclosure offered by the surrounding foothills and mountainous range.

ROLLING FOOTHILLS

The topography and ridgelines offer an agricultural function considered to be valued at a local level. The majority of the turbines are located within this LCA and they will become the dominant visual feature in the landscape. The direct impact arising from the turbines is likely to result in a localised reduction of agricultural land, although this will increase with the provision of access roads and additional infrastructure.

FORESTED MOUNTAIN RANGE

This LCA offers a high degree of perceived naturalness, remoteness and inaccessibility, with the value of the landscape in areas considered to be of a national level, inherent to the National Parks status, and state level inherent to State Forests. The siting of any infrastructure in this area has the potential to result in vegetation removal within or in close proximity to the Ben Halls Gap State Forest and Ben Halls Gap National Park. During the EIS stage careful consideration should be given to the siting and design of turbines and further consultation with State Forests and OEH to determine impact and mitigations measures appropriate.

Visual impacts

Nineteen representative viewpoints have been selected (shown in Figure 6-3 and summarised in Table 6-1) from the detailed analysis to provide:

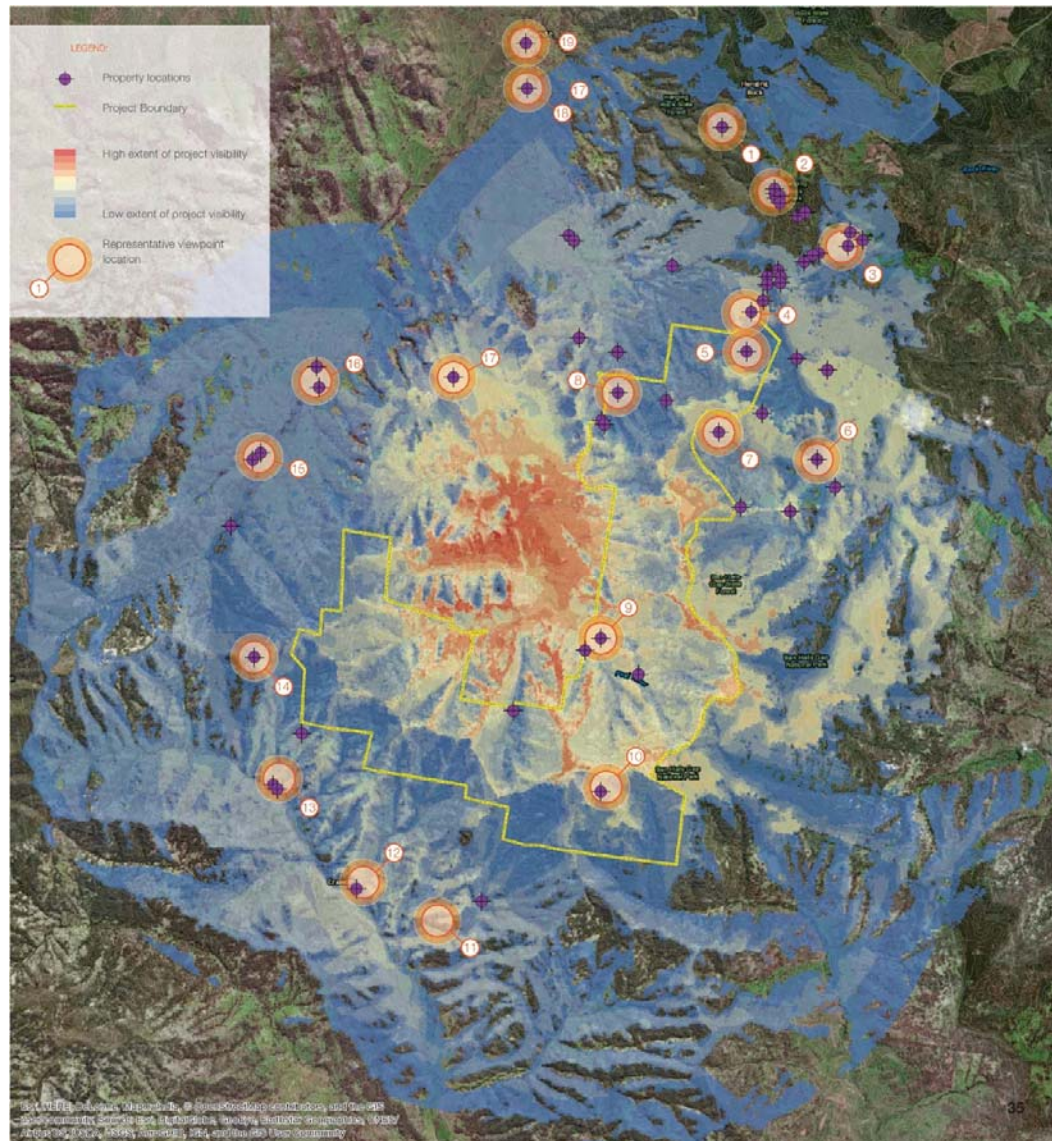
- Visual baseline descriptions
- Representative photographs from the proposal area several of these requested from the local community
- Analysis of the potential magnitude of change

The number of dwellings within 4.4km that could potentially see a turbine if it was placed in that location is shown in Figure 6-4.

Figure 6-3 Representative viewpoints

Representative viewpoints

- 1 Hanging Rock lookout
- 2 Properties situated on Barry Road
- 3 Properties situated on Barry Road (east)
- 4 Properties situated on Morrisons Gap Road
- 5 Properties situated on Morrisons Gap Road (further south)
- 6 Properties situated on Shearers Road
- 7 Arc-en-Ciel Trout Farm
- 8 Properties situated on Nundle Creek Road
- 9 Properties situated on Nundle Creek Road
- 10 Property along Morrisons Gap Road (H16)
- 11 Property along Mountain View Road (H17)
- 12 Properties along Timor Crawney Road (JH19)
- 13 Properties along Timor Crawney Road (H32)
- 14 View from Crawney Pass National Park (Ridge Trail)
- 15 View from properties along Crawney Road (JH14)
- 16 View from properties along Crawney Road (JH17)
- 17 Properties along Head of Peel Road (JH6)
- 18 Southern edge of Nundle
- 19 Nundle Town



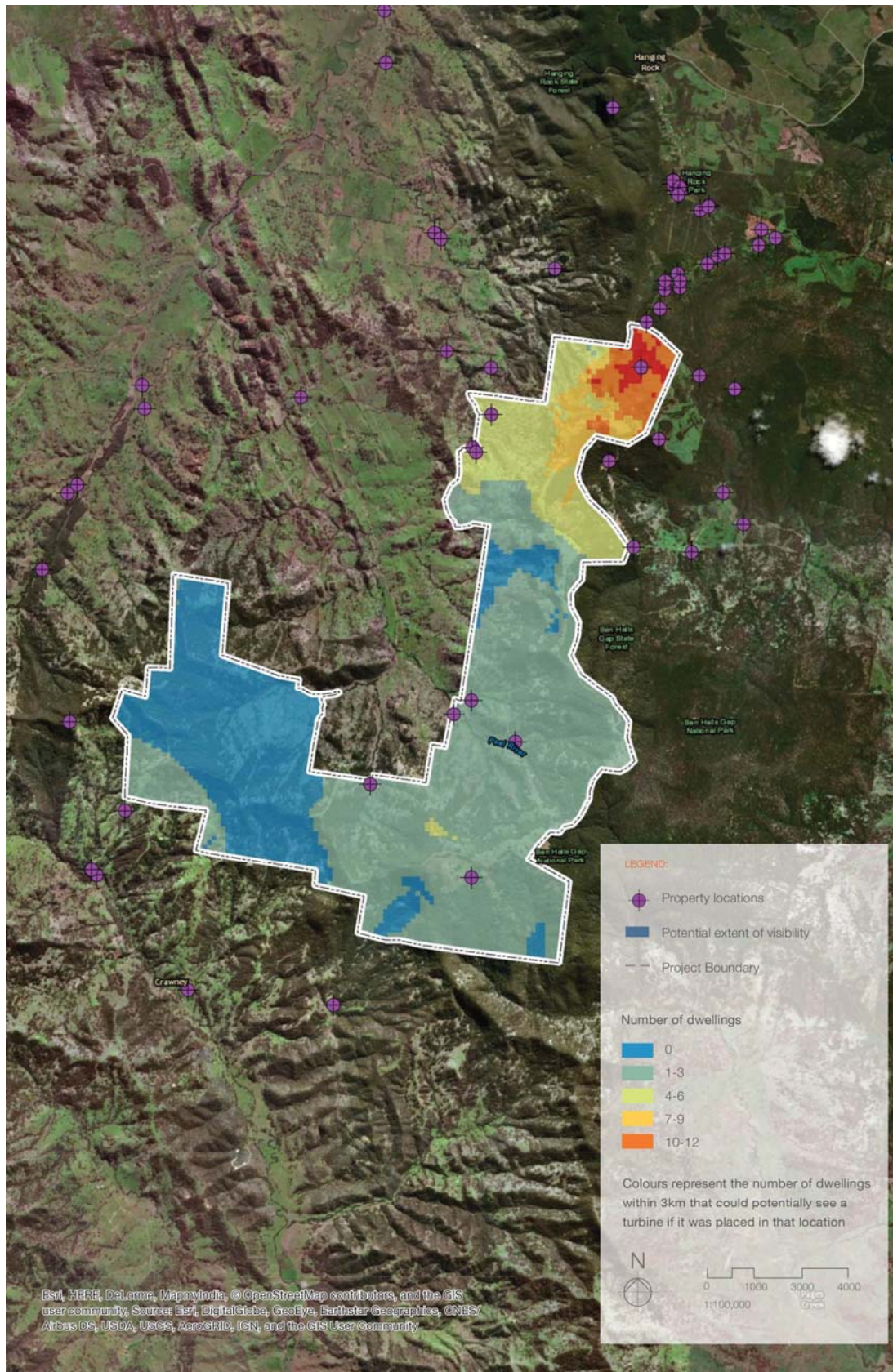


Figure 6-4 Number of dwellings within 3km that could potentially see a turbine if it was placed in that location

Table 6-1 Visual Impacts from representative viewpoints

Viewpoint (ID and type)	Distance from proposal	Potential Impacts	Further Investigation
1 Hanging Rock Lookout	4690m south	Turbines anticipated to be visible from this location, although vegetation adjacent to the lookout would filter views. No turbines would be present within a 3km radius of this property.	During the EIS stage, further consideration will be given to the location of substations and overhead powerlines, which have the potential to be visible traversing the valley floor.
2 Properties situated on Barry Road	3225m south	Wind farm is not anticipated to be visible from this location. No turbines would be present within a 3km radius of this property.	During the EIS stage, detailed consideration will be given to the location of substations and overhead powerlines. Consideration will be given to preparing a photomontage to confirm the location and visibility of turbines on the horizon.
3 Propertied situated on Barry Road (east)	896m south-west	Turbines are anticipated to be visible, although partially filtered by intervening vegetation. No turbines would be present within a 3km radius of this property	During the EIS stage, detailed consideration will be given to the location of substations and overhead powerlines. Where possible, access will be agreed with land owners to confirm the visual outlook and potential impacts from properties within this location.
4 Properties situated on Morrisons Gap Road	114m south	A clear view from elevated position to the wind farm development boundary is anticipated from this location.	Further detailed analysis will be undertaken during the EIS stage to capture the anticipated extent of visibility. Consideration will be given to preparing a photomontage to confirm the location and visibility of turbines on the horizon and from sensitive receptors in this area.
5 Properties situated on Morrisons Gap Road (far south)	Within the wind farm development boundary	It is anticipated that wind turbines would be situated in close proximity and would be fully visible from this location.	During the EIS stage, detailed consideration will be given to the location of substations and overhead powerlines. Consideration will be given to preparing a photomontage to confirm the location and visibility of turbines on the horizon.
6 Properties situated on Shearers Road	2518m west	Wind turbines would potentially be visible to the west from this location.	During the EIS stage, detailed consideration will be given to the location of substations and overhead powerlines. Detailed assessment of the screening value of intervening vegetation through the preparation of a photomontage.
7 Arc-En-Ciel Trout Farm	462m south, west and north	It is anticipated that wind turbines would potentially be visible above the existing vegetation.	During the EIS stage, detailed consideration will be given to the location of substations and overhead powerlines. Detailed assessment of the screening value of intervening vegetation through the preparation of a photomontage.

Viewpoint (ID and type)	Distance from proposal	Potential Impacts	Further Investigation
8 Properties situated on Nundle Creek Road	Within the wind farm development boundary	It is anticipated that wind turbines would potentially be visible along ridgelines.	During the EIS stage, detailed consideration will be given to the location of substations and overhead powerlines. Detailed assessment of the screening value of intervening vegetation through the preparation of a photomontage.
9 Properties situated on Nundle Creek Road	Within the wind farm development boundary	It is anticipated that wind turbines would potentially be visible along ridgelines to the east.	During the EIS stage, detailed consideration will be given to the location of substations and overhead powerlines. Detailed assessment of the screening value of intervening vegetation through the preparation of a photomontage. Exploration of the delivery of localized planting to reduce impacts arising from the visibility of turbines.
10 Property along Morrisons Gap Road (H16)	Within the wind farm development boundary	It is anticipated that wind turbines would potentially be visible above the existing vegetation to the north, south, east and west of this location.	During the EIS stage, detailed consideration will be given to the location of substations and overhead powerlines. Detailed assessment of the screening value of intervening vegetation through the preparation of a photomontage.
11 Property along Mountain View Road (H17)	1650m north	It is anticipated that wind turbines would potentially be visible above the existing vegetation to the north and north east.	During the EIS stage, detailed consideration will be given to the location of substations and overhead powerlines. Detailed assessment of the screening value of intervening vegetation through the preparation of a photomontage.
12 Properties along Timor Crawney Road (UH19)	3000m north	It is anticipated that wind turbines would potentially be visible to the north above the undulating topography and along the ridgeline in the distance.	During the EIS stage, detailed consideration will be given to the location of substations and overhead powerlines. Detailed assessment of the screening value of intervening vegetation through the preparation of a photomontage.
13 Properties along Timor Crawney Road (H32)	1738m north	It is anticipated that wind turbines would potentially be visible to the north above the undulating topography and along the ridgeline in the distance	During the EIS stage, detailed consideration will be given to the location of substations and overhead powerlines.
14 View from Crawney Pass National Park (Ridge Trail)	925m east	It is anticipated that wind turbines would potentially be visible to the east, although existing vegetation would filter or limit views towards a number of turbines.	During the EIS stage, detailed consideration will be given to the location of substations and overhead powerlines. Detailed assessment of the screening value of intervening vegetation through the preparation of a photomontage.

Viewpoint (ID and type)	Distance from proposal	Potential Impacts	Further Investigation
15 View from properties along Crawney Road (UH14)	2845m south-east	It is anticipated that wind turbines would potentially be visible along the ridgeline and the undulating terrain. No turbines would be present within a 3km radius of this property.	During the EIS stage, detailed consideration will be given to the location of substations and overhead powerlines. Detailed assessment of the screening value of intervening vegetation through the preparation of a photomontage.
16 View from properties along Crawney Road (UH17)	4157m south	It is anticipated that wind turbines would potentially be visible above the ridgeline and the undulating terrain. No turbines would be present within a 3km radius of this property.	During the EIS stage, detailed consideration will be given to the location of substations and overhead powerlines.
17 Properties along Head of Peel Road (UH6)	3597m south-east, south and east	It is anticipated that wind turbines would potentially be visible along the ridgeline in the distance. No turbines would be present within a 3km radius of this property.	During the EIS stage, detailed consideration will be given to the location of substations and overhead powerlines. Detailed assessment of the screening value of intervening vegetation through the preparation of a photomontage.
18 Southern edge of Nundle	6949m south-east	It is anticipated that wind turbines would potentially be visible along the ridgeline in the distance. No turbines would be present within a 3km radius of this property.	During the EIS stage, detailed consideration the study area will be increased to fully illustrate the impact of wind turbines from Nundle town. Detailed consideration will also be given to the location of substations and overhead powerlines.
19 Nundle town	7955m north	It is anticipated that wind turbines would potentially be visible along the ridgeline in the distance. No turbines would be present within a 3km radius of this property.	During the EIS stage, detailed consideration the study area will be increased to fully illustrate the impact of wind turbines from Nundle town. Detailed consideration will also be given to the location of substations and overhead powerlines.

Conclusions and need for further assessment

Turbines proposed to be located in the northern area of the site have the potential to be seen by more dwellings than those located to the south and west. There are few dwellings within 3km that will see a high extent of project visibility. A more precise indicative layout will be informed by detailed site investigations, assessment, wind farm design and neighbour agreements where required. A Visual Impact Assessment, including view shed analysis and community consultation input will be prepared as part of the EIS to further investigate visual impacts and mitigation options. The EIS will meet the requirements of The NSW *Wind Energy: Visual Assessment Bulletin 2016*, and in preparation of the visual impact assessment it is a requirement to take into consideration relevant local environmental plans (Tamworth Region Local Government Authority). Concerns raised in community consultation will be considered when preparing the layout and when finalising the scope of Visual Impact Assessment. WEP will finalise turbine layouts based on detailed studies presented in the final EIS and seek neighbour agreements are offered in accordance with the findings of further detailed studies and the NSW Wind Guidelines.

6.2.2 Noise

The NSW Department of Planning and Environment released the Wind Energy Noise Assessment Bulletin for State significant wind energy development in December 2016. During the Scoping and Pre-lodgement phase of a project it requires that the noise assessment be undertaken in accordance with the scoping and pre-lodgement requirements of the *Wind Energy Noise Assessment Bulletin for State significant wind energy development* (DP&E, 2016).

SLR Consulting Australia Pty Ltd was commissioned to prepare a Preliminary Noise Assessment for the proposed Hills of Gold energy project. The assessment is provided in full in Appendix G and summarised below. Specifically, the assessment considers the following:

- *Proponents of wind energy projects are required to consider the potential noise impacts of a wind energy project at all stages of the project, including during the site selection and project design phase, where the development should be designed to minimise noise impacts.*
- *At the pre-lodgement stage, a proponent should undertake an indicative noise impact assessment of noise levels expected at all receivers. ...While it is recognised that a project's design may change at the development application stage, it is important to provide early indicative noise predictions using simple modelling techniques and conservative assumptions. Such assumptions would include using the maximum sound power level of the likely turbine proposed and calculated under the worst case noise propagation conditions. These indicative predictions should be compared against the base criteria adopted in NSW of 35 dB(A), unless detailed studies support more elevated criteria on the basis of prevailing background noise levels.*

Presentation of an indicative turbine layout

This preliminary noise assessment has modelled the noisiest wind turbine model that may be considered and the maximum number of wind turbines that are considered feasible for the site at this stage. It is expected however, to show elevated impact predictions at this stage and should be interpreted in this context.

Wind farm layout

The Hills of Gold project could consider blades between 65-78 m in length such that they don't exceed the final development envelope. The project proposes a turbine hub height of between 130 m and 155 m above ground. For the purposes of noise predictions, a wind turbine hub height has been modelled at the maximum height of 155 m.

A maximum and highest impact layout comprised of 97 wind turbines of 4.5 MW capacity has been considered. The wind turbines follow an elevated ridgeline, forming a "U" shape, that spans approximately 24 km in length.

The preliminary noise assessment has assumed a maximum sound power Level of 106.8 dBA, which is consistent with the estimates provided by the manufacturer for a wind turbines of this capacity.

Noise sensitive locations

The majority of nearby residential receptors (within approximately 4.4 km of wind turbines) are located to the north of the wind farm site. The map in Figure 6-5 shows the location of the nearest noise sensitive locations, indicating which receptors are currently considered to be project involved.

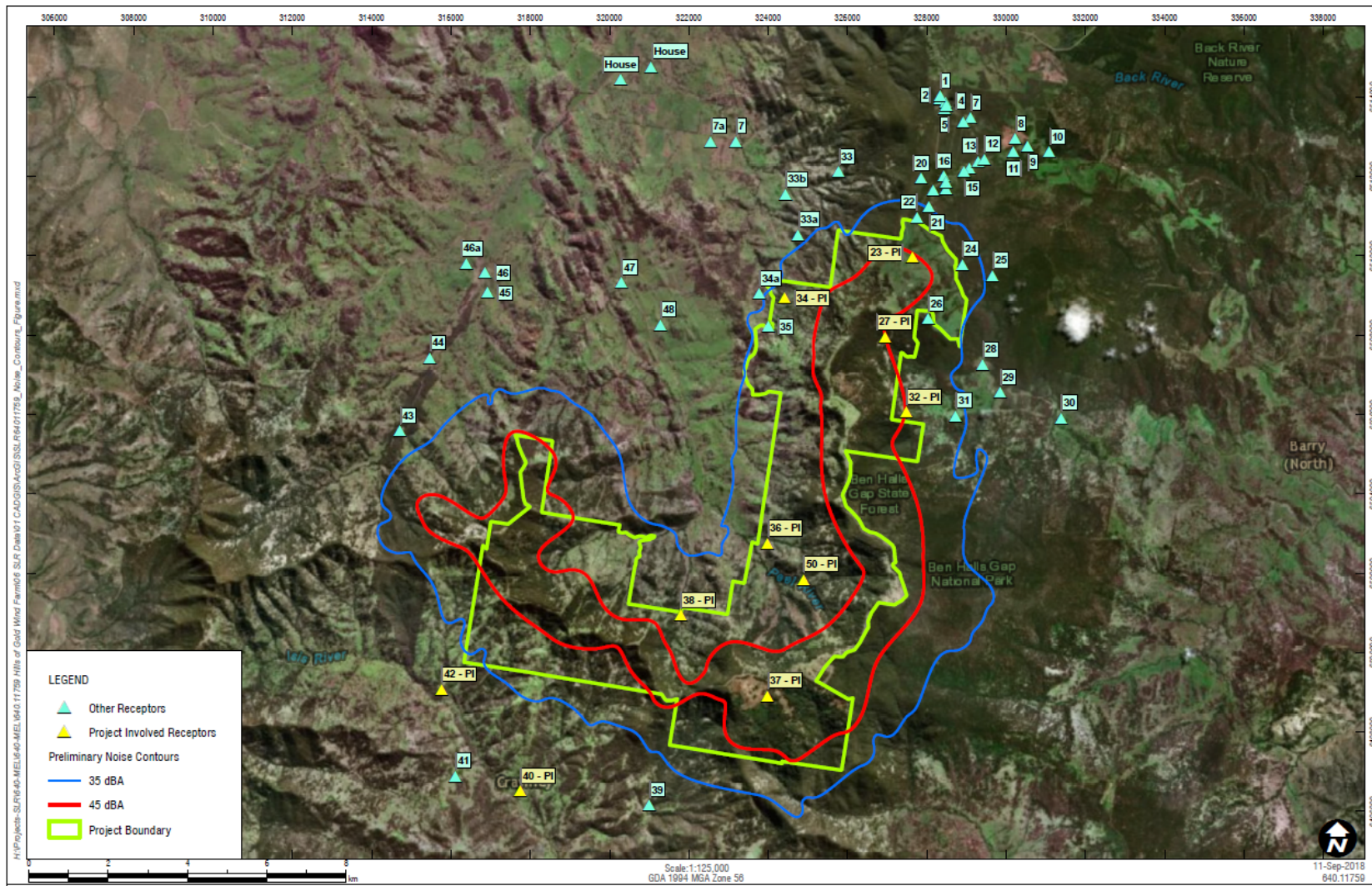


Figure 6-5 Location of the nearest noise sensitive locations, indicating which receptors are currently considered to be project involve

Noise predictions

The NSW Government has adopted the South Australian EPA document Wind farms – environmental noise guidelines – 2009 as basis of the regulatory noise standard and assessment methodology.

The minimum noise criteria are:

- 35 dBA, and
- 45 dBA for project involved receptors.

Noise modelling of the worst-case layout was completed using SoundPLAN V7.4 software implementing algorithms from ISO9613-2:1996 Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation.

The ISO9613 method are for downwind noise propagation, and as such the prediction model assumes downwind noise propagation from all sources to all receptors. It should be noted that this assumption is conservative and can yield an unrealistic overprediction in some circumstances as it is not possible for the wind to blow from all directions simultaneously. In the predictive assessment of wind farm noise, the actual frequency distribution of wind directions is not used.

The preliminary noise model conservatively assumes an acoustically hard ground, which is a worst-case assumption.

The predicted noise level at residential receptors is detailed in Table 6-2.

Table 6-2 Predicted wind turbine noise level (PI = Project Involved)

Receptor	Wind turbine Noise level dBA	Minimum criteria dBA	Compliant	Exceedance is non-compliant
1	20.8	35	Y	
2	21.1	35	Y	
3	21.2	35	Y	
4	21.4	35	Y	
5	21.6	35	Y	
6	22.1	35	Y	
7	21.6	35	Y	
7	25.8	35	Y	
7a	25	35	Y	
8	25.5	35	Y	
9	24	35	Y	
10	24.3	35	Y	
11	26.7	35	Y	
12	27.7	35	Y	
13	25	35	Y	
14	29.9	35	Y	
15	30.2	35	Y	
16	31.4	35	Y	
17	32.4	35	Y	
18	33	35	Y	

Receptor	Wind turbine Noise level dBA	Minimum criteria dBA	Compliant	Exceedance is non-compliant
19	32.5	35	Y	
20	28.1	35	Y	
21	35.9	35	N	0.9
22	37.7	35	N	2.7
23 – PI	46.7	45	N	1.7
24	36.8	35	N	1.8
25	34.4	35	Y	
26	42	35	N	7
27 – PI	44.5	45	Y	
28	32.6	35	Y	
29	31.8	35	Y	
30	28.7	35	Y	
31	36.8	35	N	1.8
32 - PI	47.9	45	N	2.9
33	30.7	35	Y	
33a	34.5	35	Y	
33b	29.6	35	Y	
34 – PI	37.8	45	Y	
34a	34.7	35	Y	
35	36.7	35	N	1.7
36 – PI	36.5	45	Y	
37 – PI	52.4	45	N	7.7
38 – PI	40.2	45	Y	
39	29.2	35	Y	
40 – PI	27.3	45	Y	
41	27.6	35	Y	
42 – PI	29.3	45	Y	
43	31.9	35	Y	
44	28.6	35	Y	
45	22.8	35	Y	
46	19.8	35	Y	
46a	19.1	35	Y	
47	28	35	Y	
48	29.7	35	Y	
50 – PI	39.2	45	Y	

Conclusions and need for further assessment

The preliminary noise predictions of a worst-case layout with no mitigation applied indicate that:

- The minimum 35 dBA noise criteria are able to be met for most project non-involved receptors, with the exception of:
 - 5 non-involved receptors were predicted to potentially exceed this minimum noise criteria by up to 2 dBA to 3 dBA, and
 - A single project non-involved receptor which is predicted to potentially exceed this minimum noise criteria by up to 7 dBA.
- The minimum 45 dBA noise criteria are able to be met for most project involved receptors, with the exception of:
 - 2 non-involved receptors were predicted to potentially exceed this minimum noise criteria by up to 2 dBA to 3 dBA, and
 - A single project involved receptors which is predicted to potentially exceed this minimum noise criteria by up to 7 dBA.

A detailed noise impact assessment would be undertaken as part of the EIS and is anticipated to include the following:

- Baseline noise monitoring at nearby receptors to quantify the existing ambient noise environment. Background noise levels will be statistically regressed with wind speed. The background noise 'curve' is then used to determine the relevant noise criteria for each site across the full operating wind speed range.
- Refinement of the noise model input assumptions e.g. wind turbine sound power level, ground terrain and hardness etc.
- Refinement and consolidation of the wind farm layout.
- Noise optimised operation of wind turbines.
- Finalisation of project involved land-holders and neighbour agreement where required.

During the detailed noise impact assessment, it is anticipated that the marginal level of exceedance currently predicted at most receptors will be resolved and it is not the intention to submit a detailed EIS without mitigating these exceedances. In the event that exceedances cannot be avoided for the optimised turbine layout, neighbour agreements will be sought or turbines will be moved or eliminated to produce an acceptable layout.

The Proponent will be seeking to undertake detailed studies and consult with nearby landowners who are potentially affected in refining the indicative turbine layout and with further information on the proposed turbine. These studies will be undertaken in accordance with the Interim Construction Noise Guideline (Department of Environment Climate Change and Water, 2009). The EIS must meet the requirements of the *NSW Wind Energy: Noise Assessment Bulletin* 2016 and relevant policies and guidelines in preparation of the noise assessment. Concerns raised in community consultation will be considered when finalising the scope of noise assessment.

6.2.3 Biodiversity

Threatened species and ecological communities

A search of the OEH BioNet Atlas database was conducted on the 14th of August 2017 using a 25km buffer for the proposal site. This search identified 34 Threatened Ecological Communities (TECs), 17 threatened flora species and 45 threatened fauna species recorded within this area. This included 26 bird

species, two amphibian species, one reptile and 16 mammal species - including 10 bats recorded or with the potential to occur within the search area. Details of threatened species and ecological communities recorded within the proposal site are detailed below.

A search of the EPBC Protected Matters Search Tool was conducted on the same day using a 25km buffer for the proposal site. The search identified eight Endangered Ecological Communities (EECs), 14 migratory species and 39 threatened species that have potential to occur at the site.

These searches are undertaken on a broad scale to capture all entities that may be of interest and guide investigations. Detailed site investigations will be carried out to identify all species and communities relevant to the site.

Biodiversity constraints

A preliminary ecological site inspection was undertaken by a senior ecologist and senior environmental consultant (15 person-hours; 15 August 2017). The site inspection focused on two main areas within the proposal site:

- The main ridgeline where turbines and the main access tracks are proposed.
- The lower slopes and valleys along the proposed transmission line route.

It was possible to drive along the majority of the ridgeline where infrastructure is proposed. It was not possible to access the vast majority of the transmission line route and inspection of this area was limited to what could be seen from public roads. Extrapolations were made based on the distribution of vegetation communities seen in accessible areas.

GENERAL VEGETATION TYPES, DISTURBANCE AND CONDITION

Native vegetation along the ridgelines where turbines and access roads are proposed, comprised mostly tall Wet Sclerophyll Forests intergrading into Grassy Woodlands. Based on existing vegetation mapping (OEH 2015: VIS ID 4467) and rapid assessments conducted during the survey, the Plant Community Types (PCTs) that occur along the ridgelines at the proposal site include:

- Snow Gum - Mountain Gum - Mountain Ribbon Gum open forest on ranges of the NSW North Coast Bioregion and eastern New England Tableland Bioregion (PCT ID 1194)
- Mountain Ribbon Gum - Messmate open forest of escarpment ranges of the NSW North Coast Bioregion and New England Tableland Bioregion (PCT ID 954)
- Messmate open forest of the tableland edge of the NSW North Coast Bioregion and New England Tableland Bioregion (PCT ID 934)
- Mountain Ribbon Gum - Messmate - Broad-leaved Stringybark open forest on granitic soils of the New England Tableland Bioregion (PCT ID 526)
- Forest Ribbon Gum - Silvertop Stringybark - Mountain Gum tall open forest on basalt on the Liverpool Range, mainly Brigalow Belt South Bioregion (PCT ID 491)

Based on the existing vegetation mapping and observations made across the landscape in adjacent similar topographic situations, the most likely PCTs that occur along the transmission line route include:

- Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion (PCT ID 510)
- White Box grass shrub hill woodland on clay to loam soils on volcanic and sedimentary hills in the southern Brigalow Belt South Bioregion (PCT ID 434)

- Silvertop Stringybark - Rough-barked Apple grassy open forest of southern Nandewar Bioregion, southern New England Tableland Bioregion and NSW North Coast Bioregion (PCT ID 541)

Along the ridgelines, clearing has occurred along existing fence lines, for the establishment of farm tracks and an airstrip and to create grazing lands. In the areas where overstorey has been removed, the groundcover has been highly modified through the application of herbicides, fertilisers and seeding of exotic pasture species.

Along the transmission line route, the woodland and forest are more cleared and fragmented. Grazing appears to be the dominant land use and there is likely to have been some degree of pasture improvement through fertiliser application and seeding along the majority of the route. It is noted that even a small component of native species in such pastures can be classed as native vegetation and require offsetting if cleared.

One noxious weed species, Blackberry (*Rubus fruticosus* sp. agg) was observed during the surveys. Blackberry occurred in isolated thickets along the northern and western sections of the ridgeline. Most occurrences in the north of the proposal site showed evidence of recent control. Large patches of Blackberry were observed on properties to the east of the proposal site which are likely to be acting as a seed source.

FAUNA HABITAT TYPES

Along the ridge lines fauna habitats comprise tall wet sclerophyll forests and tall grassy woodlands that generally border the cleared areas. An open shrub layer is generally present over a diverse grassy ground cover except for wetter areas where tree ferns are dominant in the midstorey. Measurements taken during the field survey estimated maximum tree heights to be in the range of 25 – 40m. The wooded areas support scattered to occasional hollow-bearing trees and abundant fallen timber. Rocky outcrops were not observed during the survey however, there was some scattered surface rock in areas. The forest and woodland habitats support a wide range of fauna species.

Within the cleared areas, there is little value in terms of fauna habitat. The high levels of disturbance and introduction of exotic pasture species has substantially diminished the habitat values in these areas. Scattered surface rock was abundant in some areas particularly where ploughing activities had occurred. Evidence of feral pig, goat and rabbit activity was observed. Deer are also known to be present at the site.

Below the ridgeline there are numerous gullies and drainage lines. To the west and north of the ridgeline where infrastructure is proposed, these draining lines form generally permanent creeks that flow into the Peel River. The creeks provide habitat for a number of amphibian and possibly fish species.

Along the transmission line route, open woodlands are the dominant habitat type. The woodlands have generally been partially to completely cleared and grazing appears to have generally eliminated the midstorey and in many areas, degraded the groundcover. Large mature trees are present which may support hollows. These woodlands are likely to mostly support highly mobile species such as birds and bats with other fauna groups (such as other mammals and reptiles) in lower abundance.

MOVEMENT CORRIDORS

Continuous forest and woodland occurs to the east and south of the main ridgeline where infrastructure is proposed, particularly within Ben Halls Gap National Park and Ben Halls Gap State Forest. To the west and north, the vegetation is more fragmented but there is still good connectivity between patches of more intact vegetation. Clearing has occurred along much of the ridgeline for fencing, access tracks, an airstrip

and to create grazing land essentially creating a cleared corridor which fragments the vegetation to the east and the west. The width of the corridor is variable generally ranging from 50-200m and up to 450m at a few locations.

There is a very steep area in one location that supports an intact corridor of wooded vegetation 100m wide that crosses the ridgeline from north to south (shown on the constraints mapping as 'sensitive land; steep'). The clearing along the fence line is also generally narrower in this area and it may provide a key movement corridor across the ridge. Movement of fauna species across the ridge is also expected to occur in other areas, particularly where the clearing width is less.

As discussed above, overstorey vegetation along the transmission line route is highly fragmented. There are no continuous vegetated corridors that occur along the route on a locality scale. More intact patches of treed vegetation occur in relatively close proximity to each other to the east and west of Crawney Road. Movement of birds and bats may be higher in these areas compared to those that have been more highly cleared.

THREATENED ECOLOGICAL COMMUNITIES (TECS)

Along the ridgeline, PCT 1194 - Snow Gum - Mountain Gum - Mountain Ribbon Gum open forest on ranges of the NSW North Coast Bioregion and eastern New England Tableland Bioregion, meets the definition of Ribbon Gum-Mountain Gum-Snow Gum Grassy Forest/Woodland of the New England Tableland Bioregion Endangered Ecological Community (EEC) listed under the *NSW Biodiversity Conservation Act 2016* (BC Act). This community was observed in several locations on the wind farm site. Native grasslands that are derived from the clearing of this community are also considered part of the EEC and as such, adjacent cleared areas may also comprise the EEC where native groundcover species are still present.

Along the transmission line route, PCT 510 - Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion and PCT 434 - White Box grass shrub hill woodland on clay to loam soils on volcanic and sedimentary hills in the southern Brigalow Belt South Bioregion meets the definition of White Box Yellow Box Blakely's Red Gum Woodland EEC listed under the BC Act. Higher quality patches may also meet the criteria of White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland Critically Endangered Ecological Community (CEEC) listed under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This community can also exist as a derived grassland.

There is potential for other TECs to occur at the proposal site, however such communities were not observed during the preliminary site assessment.

THREATENED FLORA AND FAUNA SPECIES

No threatened flora species were observed during the survey. One threatened flora species has previously been recorded on the proposal site; Broad-leaved Pepperbush (*Tasmannia purpurascens*), listed as Vulnerable under the BC Act. There are also records within Ben Halls Gap National Park. There is a high potential for this species to occur on the proposal site in this area and within similar habitats.

One threatened fauna species was observed during the survey; two Flame Robins (*Petroica phoenicea*) listed as Vulnerable under the BC Act were observed foraging around rocks and fallen timber in the location as indicated in Appendix B. Three other threatened fauna species have been recorded within the proposal site along the ridgeline (These locations are mapped in Appendix B):

- Greater Glider (*Petaurus volans*) – Vulnerable EPBC Act
- Koala (*Phascolarctos cinereus*) – Vulnerable BCA Act and EPBC Act

- Spotted-tailed Quoll (*Dasyurus maculatus*) – Vulnerable BC Act and Endangered EPBC Act

Numerous other threatened fauna species have been previously recorded in the surrounding area (but not within the project site). Detailed surveys specific to the proposal will be undertaken to determine those relevant to the site.

IMPLICATIONS OF THE BEN HALLS GAP NATIONAL PARK BOUNDARY – COLLISION RISKS

Bird and bat activity levels are generally concentrated around areas of intact native overstorey vegetation. Extensive areas of dense continuous vegetation occur to the east of the ridgeline with the most dense and continuous forested areas situated within Ben Halls Gap National Park and the State Forest to the north. The risk of bird and bat strike will be fully considered and assessed as part of the EIS.

Conclusions and need for further assessment

Since the site inspection, additional areas have been added to the proposal and it is expected the proposal layout will be refined further as investigations progress. As part of the EIS, the detailed ecological surveys and further investigation and assessment will be undertaken including:

- Floristic plot data (to confirm the PCTs and their distribution)
- Targeted surveys for subject species (generated by the SEARs and new biodiversity assessment process)
- Bird and bat collision surveys
- Offset planning

The Biodiversity Assessment Method (2016 Order, under the Biodiversity Conservation Act) will apply to the assessment, generating a NSW offset requirement for the project.

As the proposal could significantly impact Matters of National Environmental Significance, EPBC Act assessment requirements are also considered likely and would be addressed.

6.2.4 Aboriginal heritage

The NSW Office of Environment and Heritage (OEH) maintains the Aboriginal Heritage Information Management System (AHIMS) database. A search of the AHIMS register for Aboriginal sites and places provides an indication of the presence of previously recorded Aboriginal sites, these include:

- Information about Aboriginal objects that have been reported by archaeologists, the Aboriginal community and members of the public.
- Information about Aboriginal places which have been declared by the Minister for the Environment to have special significance with respect to Aboriginal culture.
- Archaeological reports

A search of the Aboriginal Heritage Information Management System (AHIMS) database for the site with a 25km buffer on the 24 August 2017 identified no known Aboriginal sites or places within the proposal area, however ten sites are recorded in the wider region. These include two grinding grooves, a stone quarry, a rock shelter with art, a scarred tree and stone artefacts as both isolated finds and scatters.

Inspection of the site determined that the proposal area has the potential to contain archaeologically sensitive landscape features. Generally, the landforms retain their natural soil profile and form, suggesting that any archaeological material that may be present has not been subject to significant disturbance. The ridgetop that the wind turbines follow is relatively flat and may have provided a means for Aboriginal people to traverse the landscape. Consequently, it is expected that artefact scatters and isolated finds may

be present. The ridgetops in this study area are considered to have moderate to high archaeological potential. The less traversable ridgelines, however, are unlikely to have the same level of potential.

Based on a high-level interpretation of potentially sensitive landscape features within the study area the flats associated with waterways that are intersected by the transmission line including Peel Creek, Middlebrook Creek, Goonoo Goonoo Creek and the associated tributaries and drainage lines are expected to have moderate to high archaeological potential.

Conclusions and need for further assessment

An Aboriginal Cultural Heritage Assessment (ACHA) will be required to investigate the presence of any Aboriginal sites and to assess the impacts and management strategies that may mitigate any impact. The significance of any Aboriginal heritage sites that may be potentially affected by the proposal will be determined in accordance with the Guide to Investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW (DECCW 2010).

Consultation with Aboriginal stakeholders in accordance with clause 80C of the *National Parks and Wildlife Amendment (Aboriginal Objects and Aboriginal Places) Regulation 2010* is required.

6.2.5 Community impacts, social and economic impact

The proposal site is located within to Local Government Areas:

1. Tamworth Regional LGA
2. Upper Hunter Shire LGA

Tamworth Regional LGA

Tamworth Regional LGA had a population of 59,663 in 2016. The proposal site is located between 8km and 24km from the village of Nundle, which had a population of 496 people in 2016. The main employment industry in the locality is agriculture.

Upper Hunter Shire LGA

Upper Hunter Shire LGA had a population of 14,112 in 2016. The proposal site is located between 14km and 30km from the locality of Timor, which had a population of 55 people in 2016. The main employment industry in the locality is agriculture.

The construction of the proposal will generate jobs for the duration of the construction period (approximately 24 months). The construction period may also generate additional use of services such as accommodation, retail and attractions. Detailed community, social and economic impacts are provided in Section 3.1.

Conclusion and need for further assessment

The EIS will assess potential social and economic impacts of the proposal.

Preliminary consultation with the local community has been undertaken and results are summarised in Section 4.2.3. The Community Consultation approach and results to date are provided in Appendix D.

Preliminary results have indicated that the community is interested in potential impacts of the wind farm including: economic opportunities, sustainability and environment, visual amenity, health impacts and transport and access. Further to formal communication channels, Inclusive Engagement will continue to maintain ongoing contact with the community as the key proposal contacts. Specialist assessment and the

scope for the EIS will be developed in consideration of specific issues and locations that have been raised during ongoing consultation. A detailed indicative layout will be presented within the EIS, ensuring the community has the opportunity to discuss concerns and provide feedback.

It is proposed that a Community Consultative Committee (CCC) will be established once the Hills of Gold Energy project SEAR's have been issued. As the proposal progresses, engagement will continue in the form of community information days, regularly updated website and quarterly newsletters.

6.2.6 Access and traffic

Existing public roads will be utilised following further consultation with RMS, Tamworth Regional Council and community members along proposed routes.

Proposal site and transmission access

Preliminary investigations have identified access via Morrisons Gap Road, located to the north of the site. This Council road is unsealed for approximately 3km prior to the site boundary (Figure 6-6).

An alternate access point to the site is also considered from Head of Peel Road, accessed from Crawney Road. This road is unsealed along its full length and new and upgraded roads may be required when entering the site boundary to access the proposal ridgeline (Figure 6-6).

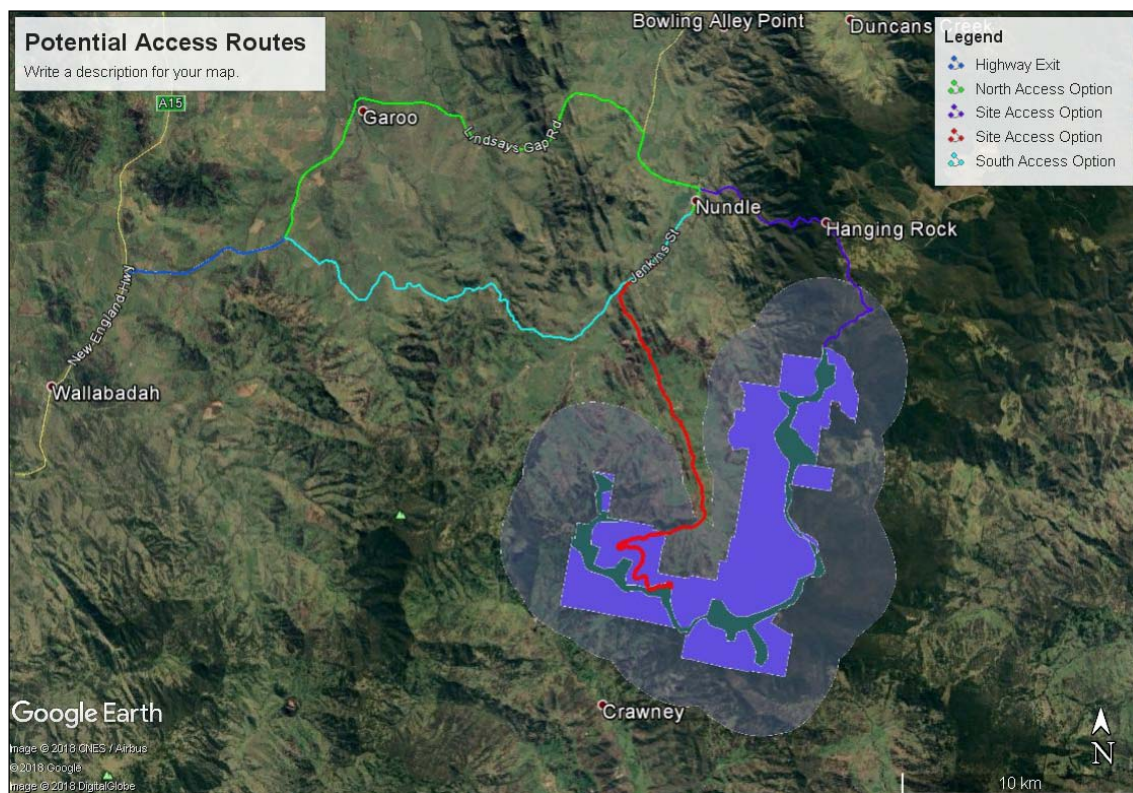


Figure 6-6 Potential access routes under consideration

Maintenance access tracks during operation will also be required across the wind farm site and along the easement of the proposed transmission line.

The transmission line will be accessed from Wallabadah Nundle Road and cross Crawney Road and Lindsay Gap Road.

Construction and haulage route

Construction traffic may impact residences along Morrison Gap Road, Crawney Road and Head of Peel Road. The construction access will result in dust, vibration, noise and safety impacts most relevant to residences along affected roads.

Wind farms in the New England region have successfully delivered turbine components into Newcastle Port and used the New England Highway which is expected to be the main thoroughfare for project components (Figure 6-7). The total distance from Newcastle Port to the Hills of Gold site entrance is 270km of which 230km is on the New England Highway.

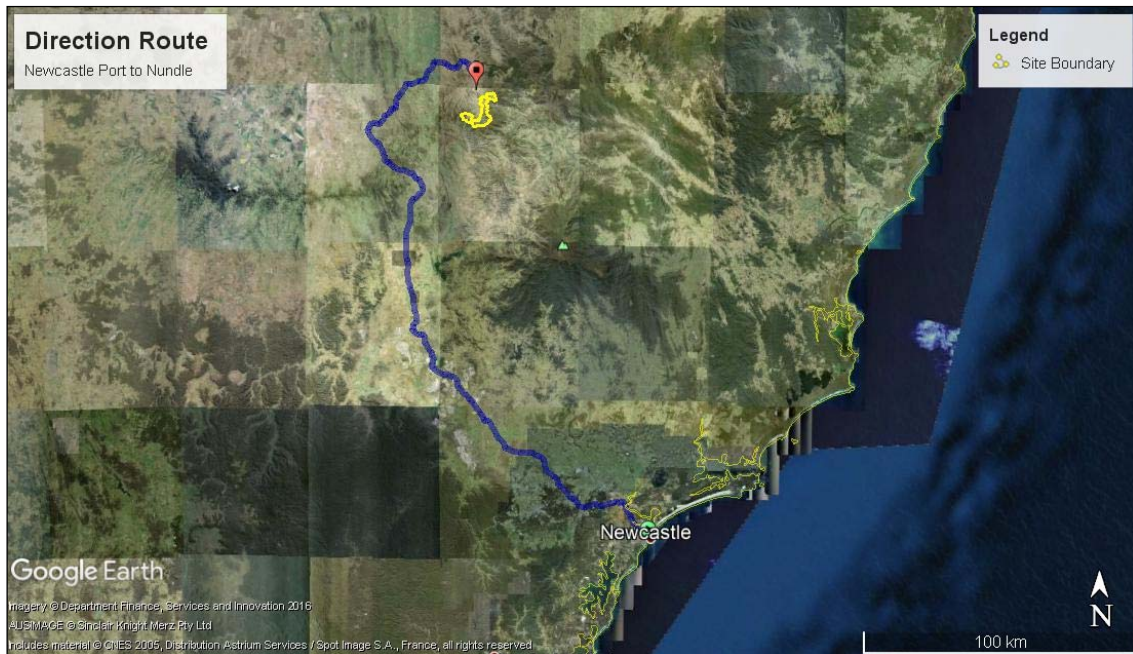


Figure 6-7 Proposed haulage route from port to proposal Nundle

These investigations are preliminary in nature and will be assessed in the EIS.

Conclusions and need for further assessment

A Traffic Impact Study will be undertaken to investigate construction traffic impacts and take into consideration existing traffic volumes and any requirements for road upgrades. Consultation will be undertaken with RMS and the local council regarding the works that may affect roads or traffic. Concerns raised in community consultation will be considered when finalising the scope of the Traffic Impact Study.

6.2.7 Aviation

Two airstrips facilities are located within the Tamworth Regional LGA. The closest airstrip is located 13km north-west of the site. The second airstrip is located in Tamworth and is the Tamworth Regional Airport. The Tamworth airport is located approximately 60km north west of the site and accommodates for regional flights and aviation training schools. Additionally, a third air strip is located onsite and used for weed spraying and sowing seed on the wind farm site. It is not used by external parties.

Scone and Upper Hunter Airport is located approximately 52km south west of the site and is relied on by businesses including aerial agricultural companies associated with aerial spraying and helicopter and aircraft charter businesses.

Potential risks posed to aircraft from the proposed wind farm that require consideration include:

- Physical obstruction – this is most notable for aircrafts that are closest to the ground such as those during take off
- Interference with safe flight – the presence of excessively tall structures may present an en-route hazard
- Reduction of areas available for pilots to use in the event of forced landing, such as engine failure after take off
- Impact on use of emergency helicopter access
- Additional wind turbulence – the effect of wind turbine induced turbulence may affect aircrafts that are smaller or lighter
- Electrical transmissions interfering with technical equipment – The electromagnetic field generated by the transmission line and wind farm may cause interference with technical equipment.
- Impact on neighbouring farmers that use aerial spraying to manage their agricultural businesses.
- Impact on aerial baiting programs (wild dogs).

Conclusions and need for further assessment

The EIS will include a specialist consideration of aviation impacts provide information about collision impacts related to aviation and concerns raised in community consultation. This would include mitigation and consultation strategies with the aim of maintaining aerial spraying and baiting and emergency helicopter landing facilities.

Due to the height of the wind turbines, potential impacts to aviation safety would be assessed in the EIS for the construction, operational and decommissioning phases of the proposal. The Proponent would commit to assessing the potential aviation related impacts with reference to the applicable requirements included in the *Civil Aviation Regulation 1988 (CAR)*, *Civil Aviation Safety Regulations 1998 (CASR)* and associated Manuals of Standards. This would include an assessment of the impacts on aerial agricultural applications, aerial fire fighting and aerial emergency services.

Consultation with the Civil Aviation Safety Authority (CASA) would be undertaken with CASA in relation to aviation safety lighting requirements, notification and reporting requirements, marking of turbines, marking of wind monitoring towers and marking of overhead transmission lines and poles to maintain an acceptable level of aviation safety. Not all wind farms require aviation safety lighting and this requirement would be assessed in detail as part of the EIS.

Mitigation measures to minimise potential aviation related impacts of the proposal would be prepared as part of the EIS.

6.2.8 Telecommunications

Telecommunication services such as television and radio broadcast services, mobile phone services, radio communication services and aircraft navigation services are relied upon in the towns of Nundle and Hanging Rock as well as residences within the locality. The operational wind farm has the potential to cause interference with electromagnetic signals.

A search of the Australian Communication and Media Authority (ACMA) database was carried out on the 19th July 2018 and identified several registered sites associated with licenses and point to point links within 25km of the proposal site. These included sites held by Telstra Corporation Limited, State Emergency Service and NSW Police; one Telstra site is located on site in the south east corner (Figure 6-8).

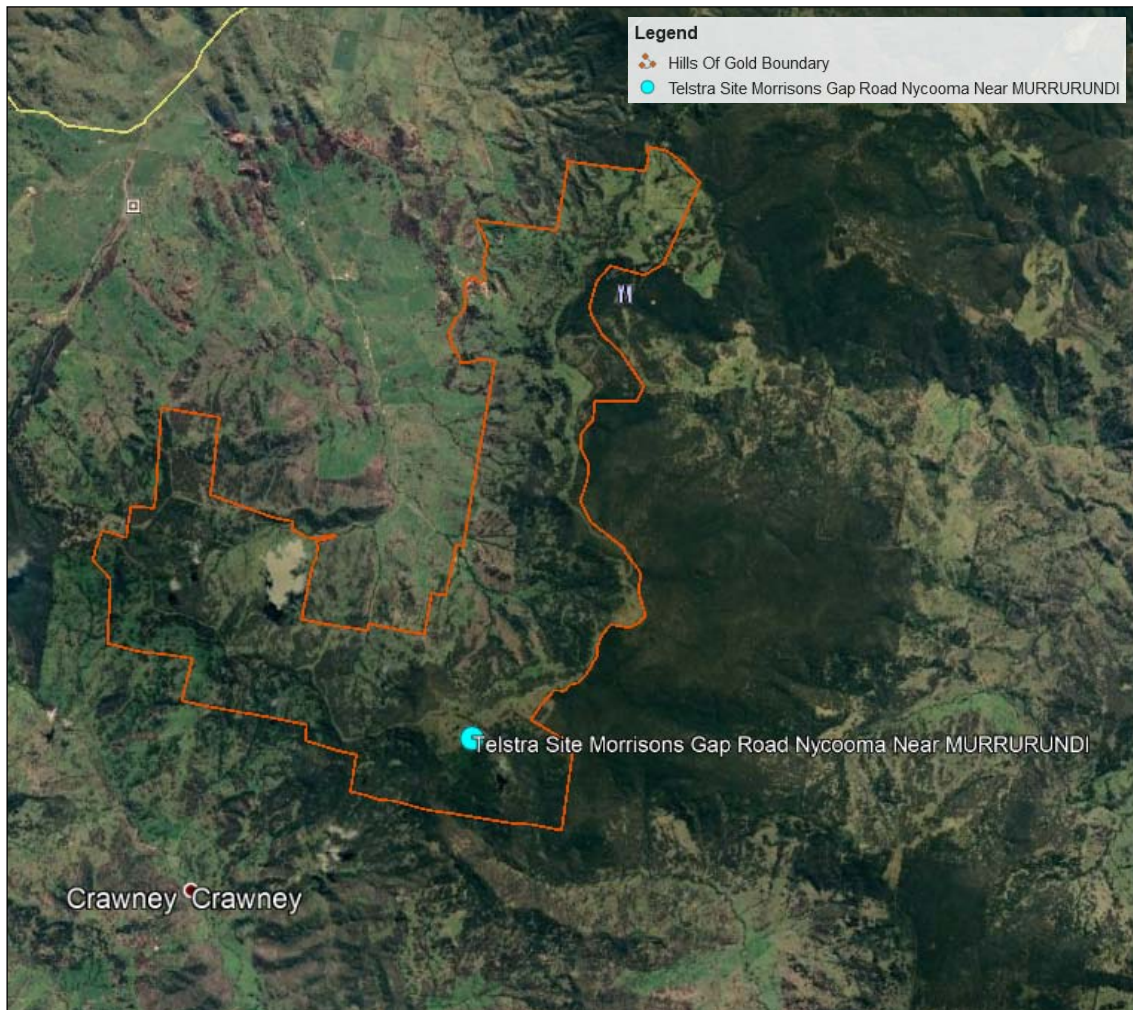


Figure 6-8 ACMA registration on proposal site

Conclusion and need for further assessment

The EIS will include a specialist assessment considering telecommunication impacts with reference to required legislation and guidelines including the *Australian Radio and Communications Act 1992*, *NSW Wind Energy Guideline for State Significant Wind Development* (DP&E, 2016) and the *Clean Energy Council Best Practice Guidelines* (Auswind, 2006).

The assessment will identify ACMA registrations associated with licenses and point to point links that have the potential to be adversely affected by the proposed wind farm.

Mitigation measures to minimise potential impacts on telecommunications would be prepared as part of the EIS.

6.3 OTHER ENVIRONMENTAL ISSUES

There is a range of additional potential environmental issues associated with the Hills of Gold Energy project which are not considered to be key issues. These issues are considered secondary issues for investigation, given the characteristics of the proposal and the availability of appropriate safeguards for mitigation. These issues are outlined in Table 6-3.

These issues will be addressed by desktop assessment. It is anticipated that any impacts identified will be able to be managed through appropriate mitigation measures and management plans.

Table 6-3 Other environmental issues

Issue	Existing environment	Potential impacts	Investigation strategies
Soils and contamination	<p>The soils across the wind farm and transmission line appear stable and well vegetated in most locations. They are heavy soils. The wind farm site has several perched springs and even in the dry conditions during winter, the site appeared to retain good ground cover, resisting erosion. Soil constraints are considered manageable but factors affecting erosion during construction and access in wet conditions and means to control erosion during construction and operation will need to be considered in the design stage and proposal description.</p> <p>Agricultural areas can have buried rubbish including contaminants such as herbicides that may be encountered during excavation.</p>	<p>Construction activities would include minor excavations and vegetation removal which have the potential to cause soil erosion and sedimentation and weed ingress.</p> <p>A search of the NSW OEH Contaminated Sites Register identified two sites within the Tamworth LGA and two sites within the Upper Hunter Shire LGA. The sites are however located within Tamworth and Scone, over 50km from the proposed site and are not relevant to the proposal. The proposed site does not appear on the List of NSW contaminated sites notified to the EPA.</p>	<p>The EIS will provide thorough consideration of soil impacts and proposed mitigation measures during construction and operation.</p> <p>It is considered unlikely that contamination is present at the site and therefore no detailed investigation is likely to be required within the EIS.</p> <p>If contamination is identified during site construction, it would be managed in accordance with a Construction Environmental Management Plan (CEMP) and relevant EPA guidelines.</p>

Issue	Existing environment	Potential impacts	Investigation strategies
Hydrology and groundwater	<p>Twenty-one waterways and approximately 85 wetland/farm dams occur within the proposal site. Seven waterways located to the west and south western area of the site, are tributaries of the Peel River to the east within the proposed site that is the main river system running through the town of Nundle.</p> <p>Eight waterways and 11 wetland/farm dams are located within 250m of the ridgeline, where the majority of the development will take place. Four of these waterways are tributaries to the Peel River. Of the waterways present on the ridgeline, all are defined first order streams (stream order classification system; DPI <i>n.d.</i>).</p> <p>Assessment of the Tamworth LGA and Upper Hunter Shire LGA Key fish habitats (DPI, 2017) identified approximately 9 creeks and/or river systems that enter from the west, south western and southern sections of the proposed site to be classified as Key fish habitats.</p>	<p>Most impacts will be concentrated in the higher catchment affecting first order streams.</p> <p>There is potential that groundwater will be encountered during excavations and earthwork requirements for the proposal and pole placements for the transmission lines. Contamination of groundwater is unlikely given that chemicals and fuels will be appropriately stored, and spills procedures will be implemented.</p>	<p>The EIS will provide thorough consideration of soil and water impacts and proposed mitigation measures during construction and operation.</p>

Issue	Existing environment	Potential impacts	Investigation strategies
Air quality	The air quality in Nundle is generally expected to be good and typical of that found in a rural setting in NSW due to low population numbers. Existing sources of air pollution in such a location is expected to comprise dust from agricultural practices. During colder months, there may be a minimal increase in air contaminants due to smoke emissions from the operation of solid fuel heating.	The construction of the proposal is not anticipated to have a significant impact on air quality, and will mostly be related to dust during dry periods and vegetation removal. Impacts to air quality during operation are likely to be negligible.	A CEMP that addresses air quality will be a commitment of the proposal, prepared to manage air quality impacts during the construction of the project.
Hazard and risk	Electromagnetic fields (EMFs) would be generated from overhead transmission lines and the substation(s).	EMFs can affect human health and will be investigated.	Mitigation measures to address hazards and risks will be included in the EIS.
	Battery storage is proposed.	Increased fire risk and potential contamination.	
	The proposal site is not mapped as bushfire prone but has steep vegetated landforms.	The proposal is unlikely to be affected by bushfire, or pose a significant bushfire risk. Access to the site and surrounding areas will be improved, reducing response times to local fires.	
Waste management	The proposal would generate a number of waste streams and utilise a variety of materials during the construction phase.	During construction, excavated material and green waste will be generated as waste. Limited operational waste will be associated with this proposal.	A Waste Management Plan (WMP) will be a commitment of the project.

Issue	Existing environment	Potential impacts	Investigation strategies
Non-Aboriginal heritage	<p>A search of the NSW Heritage Register for the Tamworth Regional LGA identified 9 listed items under the NSW Heritage Act and 306 items listed under the Tamworth Regional LEP and by state agencies.</p> <p>A search of the NSW Heritage Register for the Upper Hunter Shire LGA identified 8 listed items under the NSW Heritage Act and 340 items listed under the Tamworth Regional LEP and by state agencies.</p> <p>The closest listed heritage items are located:</p> <ul style="list-style-type: none"> • within Nundle, approximately 7km north west of the proposed site. Historic items that have the potential to be affect by the proposed development include the Courthouse museum that is located on Crawney Road in Nundle. • Timor Caves and geological site on Sergeants Gap Road, approximately 4.5km south of the southern boundary <p>No items were identified during the site inspection that were considered likely to have historic heritage significance.</p>	<p>Consideration of potential dust and vibration impacts on items near to the haulage route should be investigated in more detail as part of the environmental assessment.</p>	<p>The potential to impact non-Aboriginal heritage will be considered in the EIS. Appropriate management measures implemented if required.</p>

7 RESPONSE TO CONSTRAINTS

The key constraints identified to date for the proposal include:

- Visual amenity – the community concerns raised in preliminary consultation to be incorporated where practical into the wind turbine layout for which detailed visual impact assessment will be carried out.
- Noise – impacts from traffic and turbines will be assessed with reference to a detailed noise assessment and be reflected by the wind turbine layout. It is likely that turbines located in the north of the site may require greater setback from residential dwellings to be assessed and discussed with affected residents.
- Biodiversity – direct and indirect impacts to be investigated further in consultation with OEH and the turbine and infrastructure layout to respond appropriately.
- Community impacts – the scope for the EIS will be developed not only from SEAR's, but will also take into consideration specific issues that have been raised during ongoing community consultation.
- Land tenure – the ability to impact State Forest, National Park and Crown land will be investigated further with these agencies.

The proposal, at this early stage, can be seen to be responding to the site's constraints:

- The wind turbine sites now incorporate additional landowners who will economically benefit from hosting turbines, reducing direct impacts on local residents.
- The proponent is engaging with the community to identify opportunities early in the planning stages to maximise benefits and minimise adverse impacts.
- The proposal maximises use of an existing road network and agricultural pastures on the proposal site. Upgrades to access may have benefits for local residents as well as forestry and park management and establishment of public viewpoints.
- Wildlife corridors and connectivity to better areas of habitat will be investigated to minimise further fragmentation of habitat.
- The key excavation activities (for turbine footings, hardstands and access) will be predominantly located on the elevated plateau / ridge line, out of more incised waterways with more permanent flows, reducing soil and water risks.
- The development envelope for the transmission line is broad to allow ongoing investigations to identify a route that minimises impacts on landowners and the environment.
- The proponent is considering the use of higher hub height turbines to increase the separation distances between neighbouring overstorey canopy and blade tips and potential impact on low flight path birds and bats.
- Use of experienced consultants in the wind energy sector will apply industry best practice and the results of detailed impact assessment to provide a layout that considers all potential impacts with mitigation strategies or redesign where required.

As the specialist studies progress and community consultation continues, the proponent will look for further opportunities to respond to the site's constraints. The following good industry practise will be considered as high level constraints:

- Turbines will be located at least 500m from any residential dwelling or further depending on the results of detailed noise, shadow flicker and visual impact assessment.
- Setbacks for turbines and other infrastructure typical within the industry for identified hollow bearing trees, nests and other environmental constraints determined in the detailed environmental assessments.
- Transmission line setback from residential properties and environmental constraints following further community consultation and environmental assessments.
- A final turbine layout and transmission line corridor within land boundaries of landowners agreeing to host project infrastructure.
- Results of geotechnical studies and civil design to mitigate soil erosion and impacts on water courses.
- Consideration for wildlife corridors where contiguous over-storey vegetation is prevalent.

Refer to Appendix B preliminary constraints mapping.

8 CONCLUSION

This report has outlined the proposal to further develop the Hills of Gold Energy project including wind turbines and ancillary infrastructure and established the planning context of the proposal. The proposal will be assessed under Part 4 of the EP&A Act and classed as State Significant Development under *State Environmental Planning Policy (State and Regional Development) 2011*.

Preliminary assessment and consultation have been undertaken to shape the preliminary proposal description, for visual impacts and community impacts specifically.

Potential environmental impacts associated with the proposal have been categorised as key issues or other issues. Based on this Preliminary Environmental Assessment, an indicative scope for the EIS has been developed, focusing on the key issues:

- Visual amenity
- Noise
- Biodiversity
- Aboriginal heritage
- Community impacts, social and economic impacts
- Access and traffic
- Aviation
- Telecommunications

Further investigation of these potential impacts will be used to guide the detailed work to be assessed by the EIS. It is noted that further flora and fauna studies will confirm biodiversity impacts, during the preparation of the EIS. However, given the nature and scale of the proposal, an EPBC referral on the basis of potential to significantly impact specific Commonwealth listed birds and bats is considered likely.

On this basis, recognition of the need to address Commonwealth matters is sought in the SEARs.

The other issues are expected to be able to be addressed through desktop investigation to inform appropriate mitigation and management measures.

The EIS will be prepared in accordance with the SEARs. Mitigation measures will be developed for inclusion in the EIS and will address the management of key issues and other issues identified in the assessment process.

The project specific SEARs for the Hills of Gold Energy project are now sought on the basis of this preliminary assessment.

9 REFERENCES

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