

Dear Sir/Madam

I am writing to **object** to the Bowmans Creek windfarm as proposed by Epuron (the Proponent). It can be shown that Epuron **have not** met the requirements to address the principles of Ecologically Sustainable Development, **it has not been** assessed in accordance with the *Environmental Planning & Assessment Act 1979*, or as required by the Secretary's Environmental Assessment Requirements.

This assessment has not determined that it is open for the Minister to conclude that the Project is in the public interest and as such should not be approved under the *Environmental Planning & Assessment Act 1979*.

My areas of concern are outlined in my response to the Environmental Impact Statement (EIS) and associated documents as submitted by the proponent.

The underpinning document for renewable energy projects in Australia was the Australian Governments adoption and commitments under the United Nations "Paris Agreement" 2015.

Reference to the Paris Agreement is included in the EIS:

Section 1.2 of the EIS - **PROJECT NEEDS** includes the following.

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

In adopting the Paris Agreement, the Australian government amongst other things acknowledged the following:

"*Acknowledging* that climate change is a common concern of humankind, Parties should when taking action to address climate change, respect, promote and consider their respective obligations on human rights, the right to health, the rights of indigenous peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations and the right to development, as well as gender equality, empowerment of women and intergenerational equity,"

Reference (Attachment 1) The Paris Agreement - with the relevant section of the Paris Agreement, highlighted.

Epuron have cherry picked the references to the Paris Agreement and have chosen not to consider their respective obligations on human rights, the right to health, the rights of indigenous peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations when they have submitted their EIS for the proposed Bowmans Creek wind farm.

For me personally Epuron have not adequately addressed their obligations towards me in regard to my human rights, my right to health, and my vulnerable situation, and they have not respected the human rights of the local communities.

My response and objections will prove Epuron have lied to me personally and the community in general, have attempted to bully and intimidate me, have misrepresented the impact on my home including an increase in risks due to fires, increased noise and the visual impact. I have proven that the wind farm will impact on the value of my properties and my ability to sell if I wanted to. This has already had an impact on the amount of stress I am now constantly living with and the associated impact on my mental health. My health has been adversely affected by the proposed Bowmans Creek wind farm.

In their Opening **Executive Summary** of the EIS Epuron have acknowledged that,

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

Epuron have not consulted with me as indicated above, they have offered me a **neighbour agreement (Reference Attachment's 7, 7A, 7B & 7C)** that was totally unacceptable and would have made my wife and I serfs on our own property. They have not maintained transparency I didn't find out our other homes located just down the road on our other properties will also be adversely impacted until the EIS was released. Epuron have exacerbated the matter by providing me with advice that *there has been no evidence of a causal relationship between wind turbines and adverse health effects in either humans or animals.* Epuron also advised me and referred to a review done by the NHMRC which included the following, *The NHMRC concluded that "there is currently no consistent evidence that wind farms cause adverse health effects in humans".*

Every day when I look out from my garden, I look at the wind monitoring tower that Epuron illegally erected in 2018 and is currently not compliant with any NSW approval requirements, every day my stress levels go up. Please note currently there is one wind monitoring tower which is now only 108m tall and not to the height of 220m of the proposed wind turbines. I will see 17 wind turbines from my garden in their entirety and six others to a lesser degree.

Also included in the Executive summary is the following regarding "MINOR ISSUES"

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

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

Epuron are obviously following the same route the Asbestos and Tobacco industries took regarding health by denying, denial and if that doesn't work denying again.

I also suffer from Asthma the EIS and associated documents have not included any evaluation of the Health impacts for people who suffer from Asthma. It will be shown in my response to dust and air quality there will be an impact on air quality in the region due to the wind farm if it is approved.

In the EIS under the heading **Stakeholder Engagement** the following is quoted:

STAKEHOLDER ENGAGEMENT

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

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

Epuron have indicated that they believe conflict is unavoidable and cannot be eliminated by simply moving the wind farm to a different location.

Sacrificing the interest of local people in the interest of a greater good is not responsible, it does not align with the concepts of equity and fairness that underpin the Paris Agreement.

The solution is pretty simple if the wind farm cannot move allow the families that will be impacted and want to move the means to relocate and not be any worse off.

The consent condition for the wind farm should include acquisition provisions. This will allow the families and people who elect to move away from the location of the wind farm the ability to move. Acquisition provisions need to include adequate compensation for the families, people and businesses impacted, to ensure they will not be worse off. A business may include all the land holdings associated with the running of that business, a lot of farmers run an aggregation of grazing properties and the disposal of one land holding would make the business unviable. In the Approval the acquisition rights should be triggered as soon as the consent is approved. This is common practice for the mining industry and the mines that are also prevalent in the Hunter Valley. It would also allow a buffer zone to be established around the perimeter of the wind farm.

Epurons business model is not to build the infrastructure needed for wind farms and they will on sell before any construction groundwork commences. In fact, Epuron have acknowledged that they are close to a final deal with AGL. The value of the project to Epuron will be \$??? And on top of the projects estimated capital investment value of \$569 million the overall project is valued in excess of the headline number of \$569,000,000. If approved the project will be one of the most expensive projects ever constructed in the Hunter Valley. Approval is being sought in perpetuity for the Project, the supporting infrastructure and systems of work must match the size of the project and its duration for perpetuity.

Despite this Epuron are looking to minimise the consent conditions to the detriment of the local communities and the families that live in those communities, the Mum's, and Dad's the children and Grandparents. The DPIE also have an obligation to ensure the project is approved without sacrificing the interest of local people and the consent conditions ensure alignment with the concepts of equity and fairness that underpin the Paris Agreement.

In response to the EIS I have tried to align my objections following the same format as the main body of the EIS, although this has proven to be difficult with the EIS being prepared in a somewhat fragmented fashion.

I have also reviewed the EIS against industry best practices. It can be demonstrated that Epuron have limited their controls and have not reviewed and are not proposing to put in place controls that align with Industry best practices. In some areas I have also made suggestions that may assist Epuron and the Department to ensure the approval does align with community expectations and Industry best practices.

The EIS includes a lot of photographs trying to indicate the indicative landscape and typical wind farms, including numerous photographs of wind turbines. I have included a more detailed analysis in the relevant sections of my submission objecting to the wind farm for example in my response to the visual assessment.

However, the photographs included in the EIS are not indicative of the landscape in the area or the landscape where the wind turbines will be constructed. By including these photographs, the EIS is trying to deceive the people who will be reviewing the EIS. Examples of this include photographs referred to as **Plate 1 (Attached below)** on page 2 of the main EIS document, **Plate 2 (Attached)** and **Plate 3 (Attached)**.

None of these photographs are representative of the proposed Bowmans Creek wind farm. **The EIS does not actually include a single photograph of a wind turbine with a tip height of 220m fitted with 80m blades.**

Section 1 of the EIS - BACKGROUND

Section 1 of the EIS includes the following three photographs.



Plate 1
Indicative Beef Grazing Country within the Project
Boundary

The photograph **Ref Plate 1** may be Beef Grazing country within the project boundary; however, it is not indicative of the country within the project boundary or where the wind turbines will be located.

This is deception by Epuron trying to indicate the area is only lightly timbered.

The EIS also includes two photographs identified as **Plate 2** (GBD Pty Ltd, 2018a) and **Plate 3** (GBD Pty Ltd, 2018b) illustrates typical wind farm components showing a WTG, overhead reticulation and internal access tracks.



Plate 2
Typical Wind Farm Infrastructure



Plate 3
Typical Wind Farm Internal Access Roads

Plate 2 shows a photograph of a wind turbine; however, this photograph is not a 220m tall wind turbine with blades that are 80m in length.

Plate 3 shows a photograph of internal access roads; however, this photograph is not indicative of the access roads that have been proposed by Epuron for the Bowmans Creek wind farm as illustrated in **Table 2 Indicative Disturbance Parameters (Attached below)**. Table 2 indicates the proposed access tracks will be Variable (7 m – 50 m).

This is deception by Epuron trying to underestimate the wind farms impact on the landscape.

Section 1.4 of the EIS - PROJECT OVERVIEW.

Section 1.4 of the EIS Project overview includes the following:

The Project will generally comprise the following aspects:

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

There are numerous issues in relation to the project overview these being:

- **Project disturbance area**
- **Ongoing use of two temporary wind monitoring masts**
- **The installation of up to four permanent monitoring mast**

I would like to raise my concerns regarding all three issues relating to the project overview.

Project disturbance area

Project disturbance is included in section **3.1.1 Project disturbance** of the EIS and includes but is not limited to the following:

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

Table 2 Indicative Disturbance Parameters

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

The EIS indicating the disturbance area will be 515Ha including but not limited to:

- A hardstand area at each WTG site will generally involve clearing of vegetation, earthworks and compaction of soil. Hardstands and towers will generally be retained in situ after construction to allow for any required maintenance and repairs over the life of the Project. **EIS Reference 3.4.3 Hardstand areas**
- The access tracks established during the initial construction phase will continue to be utilised for refurbishment works. **Reference 3.4.5 Refurbishment,**
- Approximately 30 km of overhead powerlines will be required. **Reference 3.5.1 On-site Electrical Reticulation** (disturbance width 29m).
- Approximately 67 KM of internal roads

The EIS includes but is not limited to the following on Air Quality and dust

Section 7.14 of the EIS - AIR QUALITY

Section 7.14 of the EIS - AIR QUALITY includes **section 7.14.1 Impact Assessment.**

Section 7.14.1 Impact Assessment includes the following:

Project Construction

Air quality impacts during Project construction may include due to:

- Excavation works for the construction of Project infrastructure and access tracks;
- Handling and stockpiling of topsoil, subsoil and vegetation material;
- Blasting activities during construction (if required);
- Crushing and screening activities;
- Operation of concrete batching plants;
- Transport of Project infrastructure components to site; and
- Use of Project construction equipment.

Project Operations

Air quality impacts during Project operations will occur as a result of:

- Emissions from exposed surfaces;
- Use of Project operational equipment; and
- Maintenance works on Project infrastructure, including access tracks, hardstands and laydown areas.

Mitigation and Management of the impacts on Air Quality includes

Mitigation and management measures that will be implemented to minimise air quality impacts from the Project will be described in the CEMP and OEMP.

A summary of key control measures to minimise air quality emissions during the construction and operation of the Project are outlined below.

Construction

Measures to be implemented to reduce visible dust emissions during Project construction will include:

- Minimising the total surface area that is exposed within the Disturbance Area at any one time;
- Completing progressive reshaping and rehabilitation works;
- Minimising dust emissions from exposed areas by application of water and/or dust suppressants;
- Appropriately locating, shaping and seeding longer term topsoil stockpiles to minimise dust erosion from exposed surfaces;
- Minimising the use of construction equipment outside of areas required to be disturbed for Project infrastructure;
- Implementing speed restrictions for equipment operating on unsealed access tracks and disturbed areas;
- Limiting construction activities during unfavourable weather conditions;
- Blasting activities to be undertaken in accordance with the ANZEC Guidelines; and
- Regular inspections of construction activities to ensure appropriate air quality controls are being implemented to minimise dust emissions.

Operations

Measures to be implemented to reduce visible dust emissions during Project operations may include:

- Minimising dust emissions from exposed areas by application of water and/or dust suppressants;
- Implementing speed reductions for equipment operating on unsealed access tracks or hardstand areas;
- Limiting maintenance activities during unfavourable weather conditions; and
- Regular inspections to ensure appropriate air quality controls are being implemented during Project maintenance activities.

It should be noted Epuron have indicated during the proposed 18month construction phase the project will only require a total of 95ML of water and during the operational phase the project will only require 1ML of water per annum.

Reference Section 7.15.2 - Impact Assessment - *Water Balance*.

Table 46
Construction Phase Indicative Water Balance

Component	Volume (ML)
Inputs	
External water supplies	95*
Outputs	
Concrete batching	6
Dust suppression and road construction	89

** Will be adjusted to match actual demand.*

Operations

The operational phase of the Project will only require a small volume of water (approximately 1 ML/year). Water for ongoing operational activities will be supplied by tanks at the O&M Facility. The Proponent does not own the land within the Project Boundary and as such, is not entitled to any harvestable rights. However, there are farm dams located within the Project Boundary that may be consistent with the relevant harvestable rights order. The Proponent will enter into agreements with these landowners if it is necessary to use water captured in these farm dams.

Using the volumes as indicated in the EIS the following amount of water is available for dust suppression.

For a construction project that will run for 18 months say 50 weeks x 5 days per week per year equals 375 days of construction. An indicated usage of 89ML of water for dust suppression will be equivalent of 0.237ML per day for dust suppression. Even if the disturbed area that requires dust suppression is only 200Ha (Not the 515Ha indicated) the amount of water available every 24hours would be equivalent to the area receiving 0.1186mm, even a disturbance area of 20Ha requiring dust suppression would only be the equivalent of 1.186mm being applied every 24hours.

For operations the amount available would be negligible.

Epuron have either underestimated the quantities of water required during the construction period or do not intend to adequately control the dust generated during the construction period.

Epurons proposed controls for dust suppression will not adequately control the generation of dust on site.

Epuron have not evaluated an adequate amount of water to allow for dust control on site and the associated Air Quality issues by not controlling the generation of dust.

Water source for construction

Epuron have indicated in the EIS **Section 4.4.7 Water Management Act 2000** that they will not require a Water Access Licence under the Water Management Act to access water for dust suppression during construction. Epuron have indicated they will only require 95ML of water for the whole construction period and the EIS includes the following commentary, the Project will not require any WALs under the WM Act. All water required during the construction of the Project will be transported to the site using water tankers or as described in “harvestable rights” below. The water suppliers will be responsible for holding the appropriate licences required for their activities.

The EIS also includes the following commentary on Harvestable Rights.

Harvestable Rights

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

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

Harvestable rights in the Water Management Act Section 53 does not entitle the owner or occupier of land to capture water for dust suppression during the construction of a wind farm.

Harvestable rights are included in the Water Management Act - **Part 1 Basic landholder rights (Reference Attachment 11)**.

Part 1 Basic landholder rights includes **Division 2 Harvestable rights, includes section 53 Harvestable rights**. Section 53 includes amongst other things the following clauses:

(5) **This section does not allow a landholder—**

(a) to supply any other land with water that has been captured and stored in exercise of a harvestable right,

AND

Division 2 Harvestable rights includes section 54 Harvestable rights orders. Section 54 includes the following:

(1) The Minister, by order published on the NSW legislation website, may—

- (a) constitute any land as a harvestable rights area, and
- (b) name the area that is constituted, and
- (c) fix the boundaries of the area that is constituted.

(4) The order may also deal with the following matters— Including but not limited to the following

- (f) rules about the purposes for which water may be captured, taken, stored or used,

Section 54 also includes the following Editorial note—

For harvestable rights orders see Gazette No 110 of 1.7.2004, pp 5515, 5517 and **Gazette No 40 of 31.3.2006, p 1628.**

Gazette No 40 includes orders made under the water management Act 2000. These orders include the use of harvestable rights and restricting the use of harvestable water to a domestic and stock right.

Epuron have indicated they would be sourcing water from landholders accessing this water from a landholder's harvestable rights under the **Water Management Act 2000.**

This would not be in line with the Water Management Act and as such water would not be available from that source, it would be illegal to use water from this source.

Dust generation during the construction period and subsequent operation of the wind farm and associated impacts on Air Quality in the region.

I would like to respond to the EIS for the proposed Bowmans Creek Wind farm regarding the impacts of dust management and the impacts on Air Quality.

During their consultation and planning process in the preparation of the EIS and in the EIS, Epuron have downplayed the risks off the dust, and impacts of living in the vicinity of a wind farm.

The scoping document as submitted.

In May 2019 Epuron submitted their Scoping report to The Department of Planning, Industry and Environment (DPIE). The Bowmans Creek Wind Farm Scoping Report, May 2019 (scoping document).

The scoping document included but was not limited to the following:

Section 6 – Risks. The risk assessment included the following:

- This section identifies the currently identified potential environmental and social impacts associated with the Project and identifies high and moderate priorities for further assessment in the EIS.

6.1 Introduction

- Epuron has used its experience in wind farm development, together with a preliminary assessment of the site, to identify the key issues to be assessed in relation to the Project. The risk assessment included a review of the Wind Energy Framework as well as the SEARs for recent wind farm projects. Potential environmental and social impacts identified included:
 - Dust management

The Scoping document also included that the EIS will be prepared generally in accordance with the SEARs to be issued by DPE in response to this scoping report. All assessments (including specialist assessments) will be completed taking into consideration experience from other wind farm projects, consultation with stakeholders, and **industry best practice guidelines.**

6.2 Environmental and Social Risk Assessment

Epuron has carried out its environmental and social risk assessment based on information collected to date on site, at nearby sites, generally within the region and based on similar proposals in other regions. The assessment separates the issues into three priorities;

- High Priority (Key) - addressed through use of an independent specialist assessment;
- Moderate Priority - addressed via desktop assessment, precedent and consultation;
- Low Priority – addressed via minor desktop assessment.

In relation to each risk, Epuron has established the Priority by taking into consideration:

- The level of information already available about that issue;
- The extent to which site-specific assessment is required to define that issue;
- The likelihood of that issue occurring, and potential impacts of that issue if it did occur in consideration of standard industry controls; and
- The extent to which standard industry practice, statutory requirements, and standard consent conditions adequately address the issue.

Where an issue has been established as a Low Priority, this has been on the basis that:

- It is a risk which is well understood;
- Site-specific assessment is not required to understand the risk;
- It has previously been demonstrated to not affect the assessment of wind farm projects or the consent conditions relevant to them;
- It has previously been found not to be relevant to the assessment of wind farm projects; and/or
- An industry standard approach is available which adequately addresses the issue and it is proposed that this approach will be included in the EIS. Issues which fall into the Low Priority category are

Issues which fall into the Low Priority category are discussed in Section 7.2

Table 3 – Risk assessment, Preliminary Direct Mitigations and Assessment Approach includes the following in relation to the risks associated with Dust Management.

Issue	Sources of impact	Priority	Assessment
Dust management	Impacts Construction dust impacts	Low	Main EIS volume
	Mitigation Standard practices apply.	Low	

The risk assessment table 3 is **not actually a risk assessment** it is a table that prioritises Epuron's approach to the matters they have identified as issues.

A risk assessment looks at likelihood and severity, if the severity is death the outcome is always a **HIGH RISK**. Table 3 is misleading - multiple deaths occur from Asthma every year with one of the triggers being dust.

In the introduction Epuron (section 6.1) have also indicated "*Epuron has used its experience in wind farm development*" Epuron have actually had eight projects approved and before construction commenced, have on sold the projects. Epuron do not have experience in wind farm development, they have experience in obtaining approval, this statement is false and misleading.

The design and layout for the proposed Bowmans Creek wind farm includes up to 60 wind turbines, that will be up to 220m tall placed on the highest ridges to the East of Muswellbrook. The wind farm has reviewed the wind generated in this area for at least three years to ensure the wind turbines are placed in the windiest areas.

The wind farm will disturb 515Ha of land, after construction a large percentage of the land will be left disturbed. The approval is linked to the land and is perpetual.

Background information on dust monitoring and reporting in the Upper Hunter Valley

DPIE Monitoring and reporting

The DPIE monitor air quality in the Hunter Valley at various locations and their web site provides background information on how the data is then used.

The DPIE web site includes the following information – About the air quality categories.

Air quality categories help us understand air quality and modify our activities if pollution levels are high.

Air quality categories (AQC) are colour indicators used to summarise air quality measurements. In New South Wales, five colour indicators are used to classify air quality as either 'Good', 'Fair', 'Poor', 'Very Poor' or 'Extremely Poor'.

The AQC is determined by measurements of key air pollutants we monitor at our monitoring locations:

- particles less than 2.5 micrometres diameter (PM2.5)
- particles less than 10 micrometres diameter (PM10)
- ozone
- nitrogen dioxide
- carbon monoxide
- sulfur dioxide
- visibility

The AQC is reported for each station, and for each region comprising the New South Wales Air Quality Monitoring Network.

Data readings for pollutant and visibility measurements are then classified into air quality categories, using the respective cut-off values listed below. These provide pollutant AQCs, which summarise each pollutant measured at the site.

The resulting categories, from Good to Extremely Poor, are labelled and colour-coded for easy interpretation.

Air quality categories (AQC)							
Air pollutant	Averaging period	Units	GOOD	FAIR	POOR	VERY POOR	EXTREMELY POOR
Ozone O ₃	1-hour	pphm	<6.7	6.7–10.0	10.0–15.0	15.0–20.0	20.0 and above
	4-hour rolling	pphm	<5.4	5.4–8.0	8.0–12.0	12.0–16.0	16.0 and above
Nitrogen dioxide NO ₂	1-hour	pphm	<8	8–12	12–18	18–24	24 and above
Visibility Neph	1-hour	bsp	<1.5	1.5–3.0	3.0–6.0	6.0–18.0	18.0 and above
Carbon monoxide CO	8-hour rolling	ppm	<6.0	6.0–9.0	9.0–13.5	13.5–18.0	18.0 and above
Sulfur dioxide SO ₂	1-hour	pphm	<13.3	13.3–20.0	20.0–30.0	30.0–40.0	40.0 and above
Particulate matter < 10 µm PM ₁₀	1-hour	µg/m ³	<50	50–100	100–200	200–600	600 and above
Particulate matter < 2.5 µm PM _{2.5}	1-hour	µg/m ³	<25	25–50	50–100	100–300	300 and above

The DPIE web site also acknowledges; Some people are more sensitive to air pollution than others. Sensitive groups include:

- people with heart or lung condition including asthma,
- people over the age of 65,
- infants and children, and
- pregnant women.

The activity guide therefore has different recommendations for sensitive groups for each air quality category. General advice on actions you can take to protect yourself and your health at each colour category are also provided.

NSW Health also advise that:

The size of particles affects their potential to cause health problems:

- **PM10** (particles with a diameter of 10 micrometres or less): these particles are small enough to pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects.
- **PM2.5** (particles with a diameter of 2.5 micrometres or less): these particles are so small they can get deep into the lungs and into the bloodstream. There is sufficient evidence that exposure to PM2.5 over long periods (years) can cause adverse health effects. Note that PM10 includes PM2.5.

Potential health effects from exposure to particulate matter:

There are many health effects from exposure to particulate matter. Numerous studies have showed associations between exposure to particles and increased hospital admissions as well as death from heart or lung diseases.

Despite extensive epidemiological research, there is currently no evidence of a threshold below which exposure to particulate matter does not cause any health effects. Health effects can occur after both short and long-term exposure to particulate matter.

Short-term and long-term exposure is thought to have different mechanisms of effect. Short-term exposure appears to exacerbate pre-existing diseases while long-term exposure most likely causes disease and increases the rate of progression.

Short-term exposure (hours to days) can lead to:

- Irritated eyes, nose and throat
- Worsening asthma and lung diseases such as chronic bronchitis (also called chronic obstructive pulmonary disease or COPD)
- Heart attacks and arrhythmias (irregular heart beat) in people with heart disease
- Increases in hospital admissions and premature death due to diseases of the respiratory and cardiovascular systems

Long-term exposure (many years) can lead to:

- Reduced lung function
- Development of cardiovascular and respiratory diseases
- Increased rate of disease progression
- Reduction in life expectancy

Why is this important?

Because for the first six months of 2020 there have been more than 250 air quality alerts in the Upper Hunter. **Reference (Attachment 2) Report from Singleton Argus June 13, 2020.**

This figure comes on top of the more than 1000 alerts issued in 2019 which was a record for the region. Even discounting the 2019 alerts because of the drought and bush fires, 250 air quality alerts in six months are an issue for the Upper Hunter Valley. The 2020 air quality alerts have been triggered because of excessive PM10 levels which continue to exceed national standards, even though the area has seen ideal weather conditions. PM2.5 levels are also an issue for the area and contribute to the air quality warnings. It has been reported that the Government's own figures indicate, families in the Upper Hunter have been suffering through 'hazardous' air pollution more than once a week, on average. In a seven-month period, there were 32 days where air pollution in the Upper Hunter was classified as hazardous to human health.

The issue of dust generation in the Upper Hunter Valley was recognised by Muswellbrook and The Upper Hunter shire councils when they made submissions regarding Dartbrook Coal Mine – Modification 7 (DA 231-7 2000 MOD 7) **Reference (Attachment 3)**

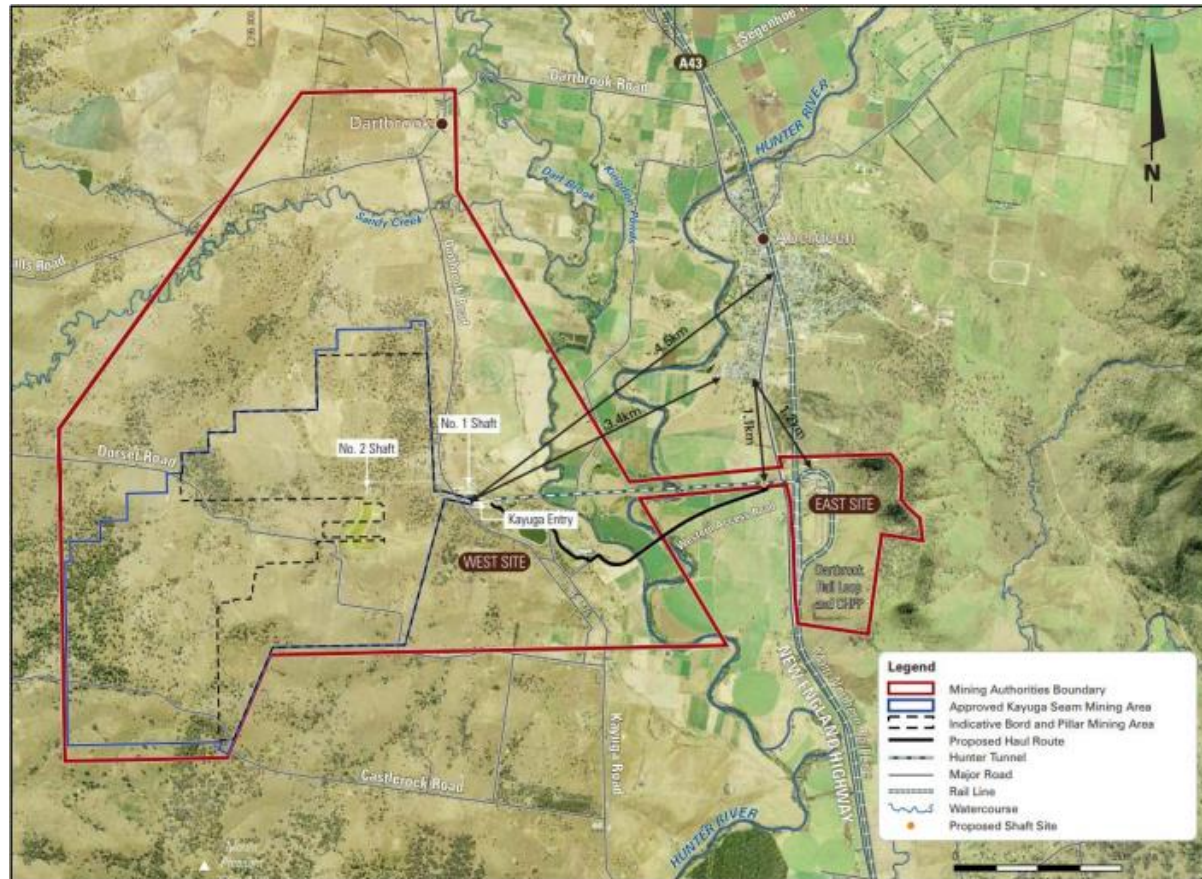
Regarding a section of unsealed road Muswellbrook Shire Council (MSC) in their submission to the Department (now DPIE) raising concerns over the potential generation of dust from the unsealed section of haul road. MSC also stated that the unsealed section of road should be sealed to manage dust, to prevent sediment loss in wet weather, to prevent sediment being tracked onto sealed sections of road and then making dust, and noise generation from potholes.

The Upper Hunter Shire Council (UHSC) also made a similar submission regarding the section of unsealed road.

Both Councils suggested the unsealed road should be sealed. In response to their concerns raised by both councils and pursued by the regulatory authorities the mine agreed to seal the gravel road in its entirety prior to commencing operations in order to minimise dust and achieve a better environmental outcome.

Dartbrook coal mine is located in the Hunter valley approximately 4km East of Aberdeen. The mine is on the valley floor away from the prevailing winds, even in this location it was seen as necessary to seal the road to prevent dust generation. Modification 7 was to change the approval of mining methods used at the mine, however, did not seek an extension of the mine life. The approved mine life is until 2027, seven years. The section of road to be sealed is illustrated in the plan below identified as the proposed haul route and is approximately

4.5km long. This compares to the perpetual approval of the proposed Bowmans Creek wind farm which if approved will contain 67Km of track, **section 3.4.5 of the EIS Refurbishment** confirms the access tracks established during the initial construction phase will continue to be utilised for refurbishment works.



A Plan/map indicating the section of Road Dartbrook mine had to seal

During construction and after commissioning the proposed wind farm has the potential to create both PM10 and PM2.5 dust. The dust could contain:

- crystalline silica
- Organic materials
- organisms or spores
- other irritating particles

These types of dust can lead to various health effects with exposure to

- crystalline silica increasing your risks of getting – Cancer, Lung scarring, and fibrosis.
- Organic materials increasing your risk of getting – Asthma, Allergic and hypersensitivity reactions.
- organisms or spores increasing your risks of getting - Bacterial and fungal infections.
- other irritating particles increasing your risks of getting – Asthma and Irritation of the mucous membranes of the nose and throat.

Air turbulence caused by the wind turbines should also be considered as this will exacerbate dust generation and distribution.

Dust generation will be exacerbated because of the turbulence caused by the wind turbines as described by CASA, wind turbines produce a wake of 'unpredicted and unpredictable turbulence.

In the CASA Guidelines; "GUIDELINE D NATIONAL AIRPORTS SAFEGUARDING FRAMEWORK MANAGING THE RISK TO AVIATION SAFETY OF WIND TURBINE INSTALLATIONS (WIND FARMS)/WIND MONITORING TOWERS."

CASA Guidelines Section 43 - Turbulence

Includes the following advice.

Wind farm operators should be aware that wind turbines may create turbulence which is noticeable **up to 16 rotor diameters from the turbine**. In the case of one of the larger wind turbines with a diameter of 125 metres, turbulence may be present two kilometres downstream.

It should be noted for the proposed Bowmans Creek wind farm Epuron are proposing wind turbines with a blade rotor diameter of up to 164m. At this diameter, the turbulence impacts would be more than 2.6km.

The impacts of wind turbulence are best illustrated in the picture below **(Photo A)**.



Photo A

At this windfarm operated by the Swedish power company Vattenfall, wind turbines create a turbulence a wake of moving air.

It should also be noted that research shows that the atmosphere close to the ground (near windfarms) changes temperature, this brings down warmer air and lowers the moisture content in vegetation. This same effect will also dry out any surrounding terrain including gravel access roads.

Areas of concern

There are two distinct areas about dust generated by the proposed wind farm if it is approved, these being:

- **Construction pre-work and construction**
- **After commissioning.**

Construction pre-work

During pre-work - Dust particles are generated and can become airborne during the extraction and processing activities associated with producing and processing rock and building roads.

These activities include:

- Travelling around the site in preparation of commencing work
- Clearing vegetation
- topsoil stripping handling and stockpiling
- drilling
- blasting
- excavation works.
- loading and tipping
- transporting
- crushing, conveying and screening
- cutting and sawing
- stockpiling including rehandle
- cleaning and maintaining fixed and mobile plant.

Epuron have indicated road building, pad construction and lay down areas will be constructed with material obtained from site and imported from local quarries. The characteristic of local material is high in silica content and contains arsenic.

During construction

During construction works - Dust particles are generated and can become airborne during the ongoing construction stage.

These activities in addition to the pre-construction works include:

- Operation of concrete batching plants
- transporting

- travelling on the formed roads
- travelling on unformed roads
- crushing, conveying and screening
- stockpiling rehandle
- Painting

After commissioning.

After commissioning - Dust particles are generated and can become airborne by the actions of the wind turbines and employees or people engaged by the proponent travelling on site. The EIS has indicated 15 permanent roles will be generated and they will be working on the wind farm.

These activities include:

- travelling on site
- Leaving site and travelling on public roads
- transporting supplies to the turbines
- cleaning and maintenance
- painting

There is also the risks of glass and carbon fibres being released to the atmosphere through the handling of, erosion of and breakage of the wind turbine blades.

Wind turbine blades are constructed from resins, glass fiber reinforced polyester, glass fiber reinforced epoxy, and carbon fiber reinforced epoxy. Combining the glass fibers with the resin matrix.

Erosion is caused by the effect of the turbine blades moving through the atmosphere this is exacerbated with the large turbines as they interfere with one another, due to the turbulence (as illustrated in photo A) which puts more stress on them.

Breakages are common on turbine blades with examples being the brand new Dundonnell wind farm in Victoria losing a 73m 70 tonne blade on October 5, 2020 and in September 2019 at the Lal Lal wind farm in Victoria also losing a blade. Every time a blade breaks micro glass and or carbon fibres are released into the atmosphere with the potential they could be breathed in by a person. These fibres act in the same way as Asbestos in the recipient's lungs.

The proposal in the EIS to leave access roads, pads, laydown area and other areas unsealed is not acceptable. The infrastructure has been constructed to support the wind turbines. As a result, it is located on the highest ridges to the East of Muswellbrook and exposed to the winds that the wind turbines will be harvesting. This will result in the generation of excessive dust contributing to what are already an excessive number of air quality alerts in the Upper Hunter and the associated risks to health.

In addition to the Air Quality risks the majority of residents who live within 5km of the wind farm do not have town water connected and rely on collecting roof rainwater into water tanks for domestic consumption including drinking water. The increased dust from the wind farm will contain contaminants including silica, arsenic, glass, and carbon fibres. These contaminants will impact on the health of the people and could cause their death if ingested.

It can be demonstrated that Epuron:

- Do not have experience in wind farm development, they obtain approvals and then on sell the projects. As a result, they do not have any practical experience in dust control and the subsequent impacts on Air Quality associated with the construction and operation of a wind farm.
- Epuron have not taken into consideration industry best practices, the Hunter Valley has numerous coal mines located in the vicinity of the proposed wind farm who do use industry best practices.
- Epuron have not investigated and or taken into consideration the level of information already available about dust generation. Including information from the DPIE as illustrated above.
- Epuron have not taken into consideration the likelihood of that issue occurring, and potential impacts of that issue if it did occur.
- Epuron have not taken into consideration or understood the extent to which industry best practice, statutory requirements, and standard consent conditions adequately address the issue. They have indicated they have evaluated industry standard practice although there is a requirement to evaluate industry best practices.
- Epurons risk assessment has ranked the risk of dust generation and the impacts on Air Quality as **LOW**
- Epuron and their consultants have not taken the issue of dust generation seriously and the impacts on air quality from the proposed Bowmans Creek wind farm seriously. They have not taken into consideration the consequence of the health impacts for the families who live and will continue to live in the vicinity of the wind farm.

Some Solutions aligning with Industry best practice.

Some Solutions during construction – The Approval needs to ensure Epuron or the proponent:

- Will need to always control dust generation when any activity is being conducted on site.
- All areas that are exposed will need to be treated to prevent dust generation before any work activities commence.
 - This may entail water carts or fixed dust suppression (turbo mister style equipment) on roads, pads, erection yards and any other exposed areas and fixed dust suppression units at excavation sites, stockpiles, batching plants, or any other semi fixed facilities.
- Any permanent or semi-permanent pads, carparks, laydown areas etc should be concreted or sealed
- Speed limits should of 20Km per hour should be applied to the whole site (note this will also help with animal strike minimisation)
 - To manage the speed limit requirements every vehicle entering the site should be fitted with GPS tracking devices, the vehicles should be monitored including an alarm system for any vehicles that do not follow the speed limit and an audit process should be put into place.
- Equipment and plant should also be washed down daily to prevent dust generation coming from the equipment.
- Prior to leaving the site and entering any public road equipment will have to be washed down to prevent sediment travelling onto public roads and subsequently generating dust.
 - Any wash down material and or fluids will need to be captured in sumps to allow for the collection of this material and licensed disposal.
- Any work that requires paint to be applied should require the construction of a sealed paint area fitted with extractors and all the extracted air should be filtered to remove any impurities.

Some Solutions post construction – The Approval needs to ensure Epuron or the proponent need to minimise the risks of dust generation by:

- Sealing or concreting all of the access and service roads and any other unsealed areas within the project area.
 - sealing must be by the use of tar spray and pre coated aggregate to ensure the integrity of the seal. The sealed areas will need to be audited on a regular interval but not exceeding 12 months and repaired, as necessary. The audit and subsequent repairs need to be reported to the public annually.
- Speed limits should of 20Km per hour should be applied to the whole site (note this will also help with animal strike minimisation)
 - To manage the speed limit requirements every vehicle entering the site should be fitted with GPS tracking devices, the vehicles should be monitored including an alarm system for any vehicles that do not follow the speed limit and an audit process should be put into place.
- Equipment and plant should also be washed down daily to prevent dust generation coming from the equipment.
- Prior to leaving the site and entering any public road equipment will have to be washed down to prevent sediment travelling onto public roads and the subsequent generation of dust.
 - Any wash down material and or fluids will need to be captured in sumps to allow for the collection of this material and licensed disposal.
 - This process should also be audited, and the audit results reported annually.
- Any maintenance that requires paint, resins or chemicals to be applied should require the construction of a sealed area, fitted with extractors and all the extracted air should be filtered to remove any impurities.
- Dust monitoring stations should be erected on the site and external to the site using the same guidelines the mines must use.
 - The results from the dust monitoring stations must be made available to the public and regional dust monitoring networks. This could be through the DPIE web site in conjunction with the monitoring records from the mine sites and other fixed monitoring facilities in the region.

Wind turbine Blade construction and contamination.

Solution – Epuron working with the manufactures have to develop a new material to allow for the safe construction of wind turbine blades. The industry will complain that alternatives are not available and there is no risks, the asbestos industry did this for years, the risks is not acceptable there is no safe exposure limit for Glass and Carbon fibre as with asbestos there needs to be elimination.

Safe water including drinking water for families living in the vicinity of the project.

Solution - The Approval needs to ensure Epuron or the proponent provide any residents within 8km of the wind farm perimeter have water available that is not contaminated, this may be through fine filtration technology or providing water from the town supply. Epuron or the proponent will have to cover the additional costs incurred by the households provided with any one or mix of these supplies.

Ongoing use of two temporary wind monitoring masts

Section 3.6.5 of the EIS - Wind Monitoring Masts and Monitoring Equipment

Section 3.6.5 includes the following commentary:

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

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

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

The two existing wind monitoring masts.

The two existing temporary wind monitoring masts were not constructed pursuant to the *State Environmental Planning Policy (Infrastructure) 2007 (Infrastructure SEPP)*.

Epuron constructed two wind monitoring masts. One is located in Muswellbrook Shire and another one is located in Singleton Shire. The mast in the Muswellbrook Shire Council (MSC) area was installed during August 2018 to a height of 120m without an approved Development Approval (DA). On September 9th, 2018 I emailed Epuron questioning them about the construction of the wind monitoring mast and asked them how it could be constructed without a DA. On November 18th, 2018 I sent Epuron a follow up email because they had not replied to my email dated September 6th.

On November 24th, 2018, their Project Manager, Julian Kasby, responded to my question. Mr Kasby confirmed the wind monitoring tower did not have an approved DA and it was not an exempt development under NSW legislation. The relevant NSW legislation is The State Environmental Planning Policy (Infrastructure) 2007 (SEPP 2007), Division 4 – Electrical Generating works or Solar energy systems, Clause 39 Exempt development, 1A Wind Monitoring towers. Mr Kasby informed me that Epuron were in discussions with MSC regarding the issue. He also informed me that Epuron were going through this process and that he would be happy to keep me informed as it progressed. Mr Kasby never kept me informed.

The SEPP 2007 legislation states, “wind monitoring masts are considered temporary structures and are considered exempt development to a maximum height of 110 metres”. The masts must also be constructed as described by the legislation to meet the requirements of the clause. The wind monitoring masts were constructed illegally, being above 110 metres in height and not being constructed as described by the Legislation. One of the construction requirements described by legislation is that the construction must comply with the “Blue Book” the blue book – “Erosion and Sediment Control”. Neither Erosion or Sediment controls have been put in place.

On April 24, 2019 in a local paper the “Hunter Valley News”, Muswellbrook Shire Council advertised the Exhibition of Proposed Development Applications. This included DA 36/2019 for the installation of a 120m tall

wind monitoring mast **Reference (Attachment 4)**. The advertisement did not indicate that it was a retrospective DA for the wind monitoring mast that was built 8 months prior.

A copy of the Statement of Environmental Effects prepared by Hansen Bailey Environmental Consultants was also include in the DA as submitted **Reference (Attachment 4A)**. The Statement of Environmental Effects was presented as if the tower had yet to be built and did not indicate the tower had already been constructed. The statement of effect was also written in a manner that indicated Hansen Bailey Environmental Consultants had conducted field work regarding their findings. This was incorrect. The Statement of Environmental Effects report was prepared by Hansen Bailey Environmental Consultants employee, Mr Andrew Wu. During enquiries Mr Wu confirmed to me the report had been prepared as a desk top exercise and neither he nor any other representatives of Hansen Bailey Environmental Consultants had visited the site to assist in the preparation of the report. Mr Wu also confirmed he was aware the tower had been erected however Epuron had instructed on the format required for the report and had also provided the information to be included in the report.

The Statement of Environmental Effects includes the following:

INTRODUCTION

Epuron Projects Pty Limited (Epuron) is seeking development consent for the construction of a wind monitoring tower (the Development) near Bowmans Creek (see Figure 1). Epuron is investigating the suitability of the site for the development of a wind farm. The monitoring tower will provide valuable data on the wind conditions in the area.

Clause 3.1 – Construction: indicates that the site of the monitoring tower is accessible via existing, unsealed access roads off Sandy Creek Road and no new access roads will be developed. This is also wrong. New tracks were established in August 2018.

Mr Kasby indicated the DA for the mast was withdrawn on the January 17, 2020 and the mast height reduction work was undertaken in the last week of January 2020. The mast was lowered to 108 metres.

For a period of 17months the existing wind monitoring masts located in Muswellbrook was not constructed pursuant to the *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP).

The *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP). Also indicates a temporary wind monitoring masts can only be erected for a period of 30 months. The 30-month period ended as of February 2021. The temporary wind monitoring masts located in Muswellbrook shire council area is still erected.

I along with numerous other residents from the vicinity of the proposed Bowmans Creek wind farm have made representation to Muswellbrook Shire Council Executive Manager – Environmental and Planning Services Sharon Pope **Reference (Attachment 5) complaint to Muswellbrook Shire Council**. I also carbon copied in Muswellbrook Shire Council GM Fiona Plesman and DPIE representative Mr Anthony Ko, DPIE. I sent my email on March 11 2021 and to date I have not received a reply from my email.

The two temporary wind monitoring masts were not built and are currently not compliant with the requirements of The *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP).

This is deception by Epuron trying to indicate the two temporary wind monitoring mast are compliant structures.

They should be dismantled immediately.

The installation of up to four permanent monitoring mast

Section 3.6.5 of the EIS - Wind Monitoring Masts and Monitoring Equipment

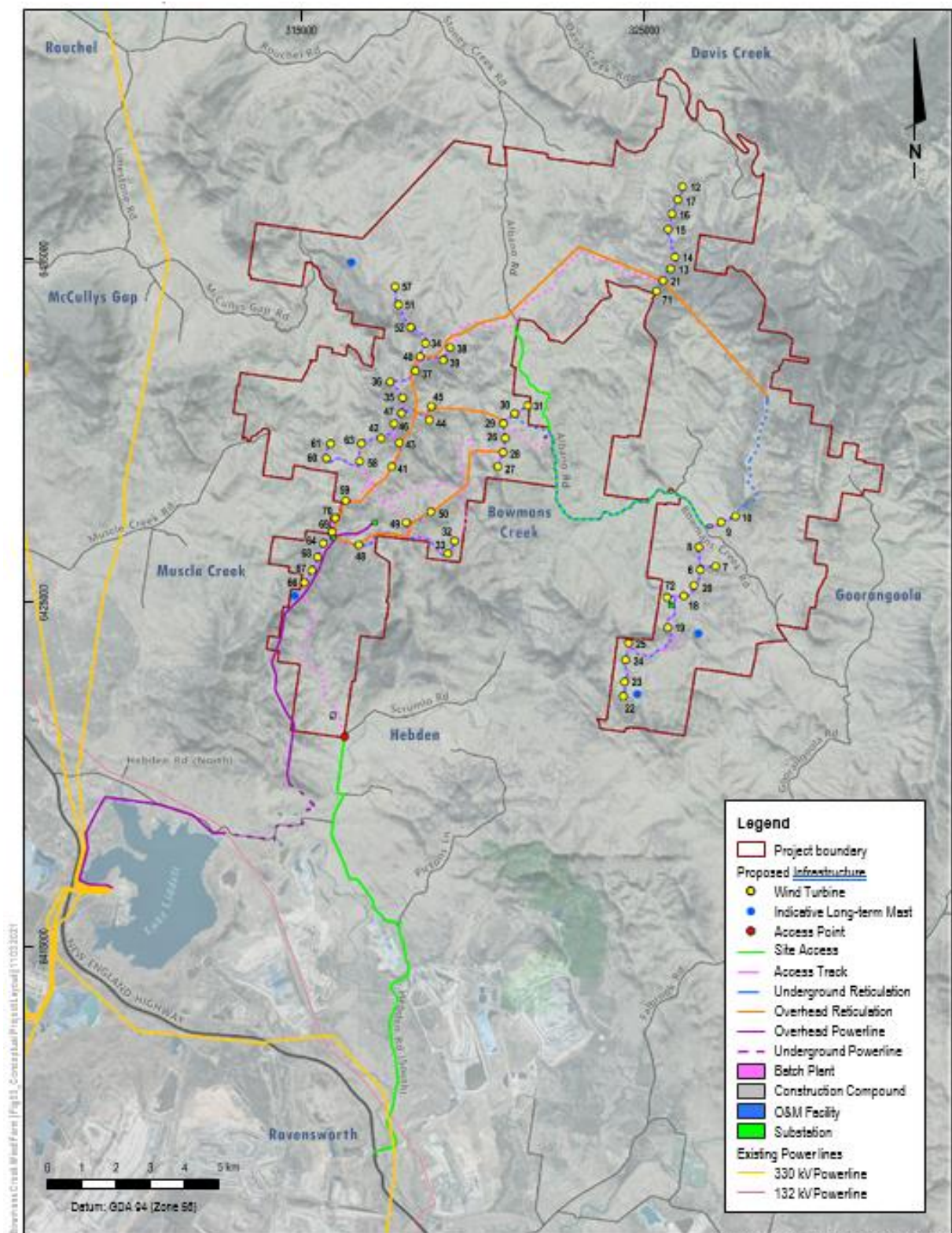
Section 3.6.5 includes the following commentary:

Up to four additional, permanent monitoring masts and associated equipment (including performance monitoring masts and associated communications) may also be constructed and utilised for the Project. There is limited information in the EIS on the four additional, permanent monitoring masts and associated equipment (including performance monitoring masts and associated communications).

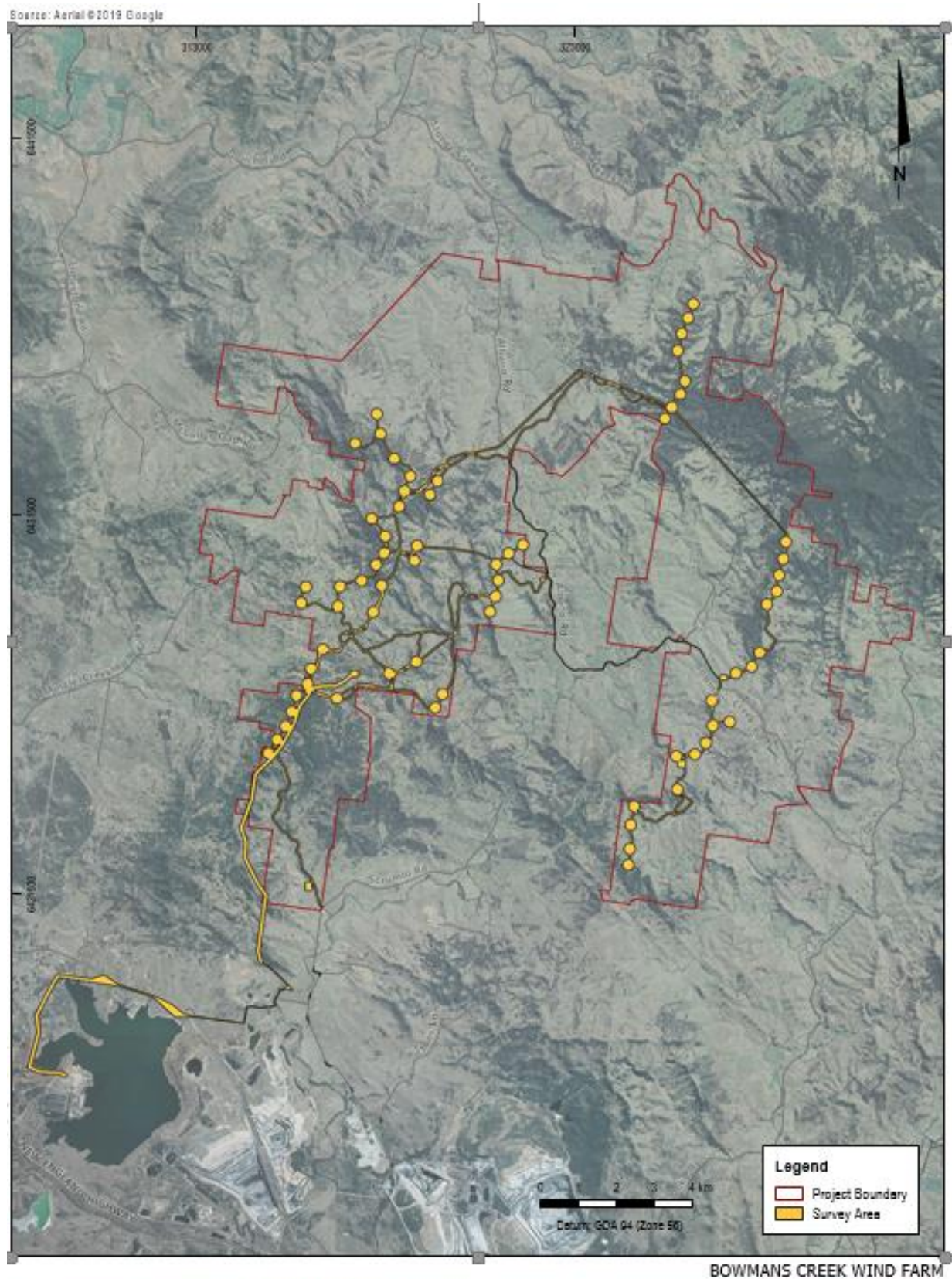
Figure 3 – Conceptual Project Layout (attached below) indicates where the four masts will be located. Figure 3 indicates one of the four masts will be located very close to our family home on a prominent ridge to the North East. I have not been consulted about this development and I am aware my neighbours who are not associated with the project have not been consulted about the development.

The EIS is clearly trying to ignore the construction of these four permanent masts, there are no access tracks into the mast indicated on any of the plans included in the EIS, the area of disturbance has not been calculated, and the design parameters are very limited. The only reference to the design parameters is included in **Appendix H Landscape and Visual**.

Figure 11 (attached) from the EIS also indicates the areas or roads into the four proposed permanent monitoring mast have not been surveyed. The proposed permanent monitoring mast located North West of wind turbine #57 is in a steep heavily wooded area (**Reference Figure 3 the conceptual Project Layout**).

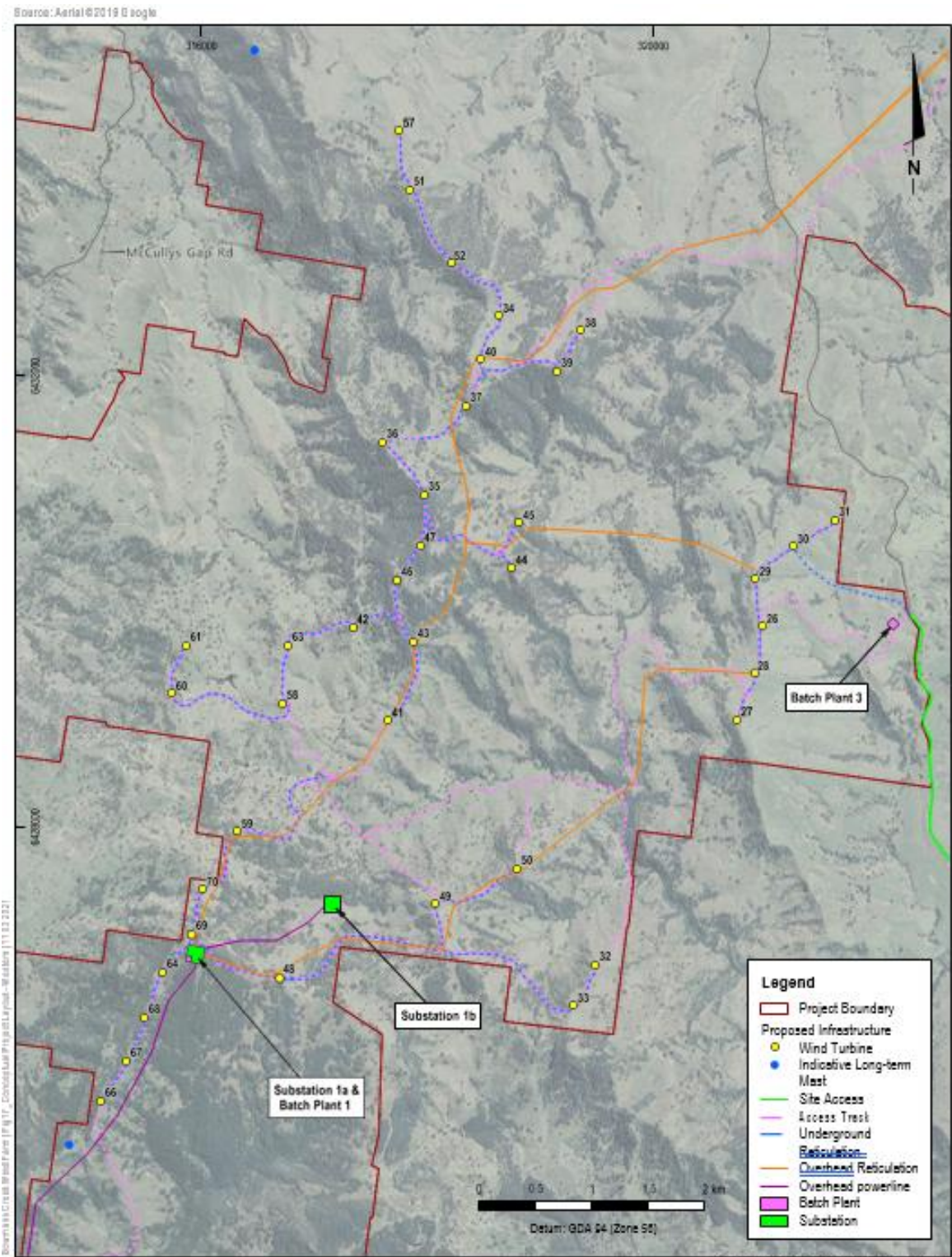


BOWMANS CREEK WIND FARM



Section 3.4.2 Wind Turbine Generator Locations Includes three plans Figure 16, Figure 17 (attached below) and

Figure 18 these three plans indicate the location of the site Access tracks. There are no access tracks indicated for any of the four Long term monitoring masts on figures 16, 17 or 18.



The design parameters for the permanent monitoring mast are only included in one area of the EIS **Appendix H Landscape and Visual**.

Appendix H Landscape and Visual includes the following - **Wind monitoring masts**.

Permanent wind monitoring masts would be installed on-site, generally extending up to the wind turbine hub height. The permanent wind monitoring masts are expected to be of a guyed, narrow lattice or tubular steel design.

The permanent wind monitoring masts would not create a significant visual impact in the context of the overall wind farm development.

They may not create a significant visual impact in the context of the overall wind farm development, however at a proposed height of 140 – 150m **Reference Figure 12 conceptual wind turbine components (attached below)** on a ridge line approximately 300m higher than our home they will tower over our house some 440 – 450m.

AND

Despite the Landscape and Visual Appendix H including the following reference;

3.1 SEARs

The Bowmans Creek Wind Farm SEARs state that the EIS must address Landscape and Visual issues and that:

‘the EIS must include a detailed assessment of the visual impacts of all components of the project (including turbines, transmission lines, substations, lighting and any other ancillary infrastructure) in accordance with the Wind Energy: Visual Assessment Bulletin (DPE, 2016)’.

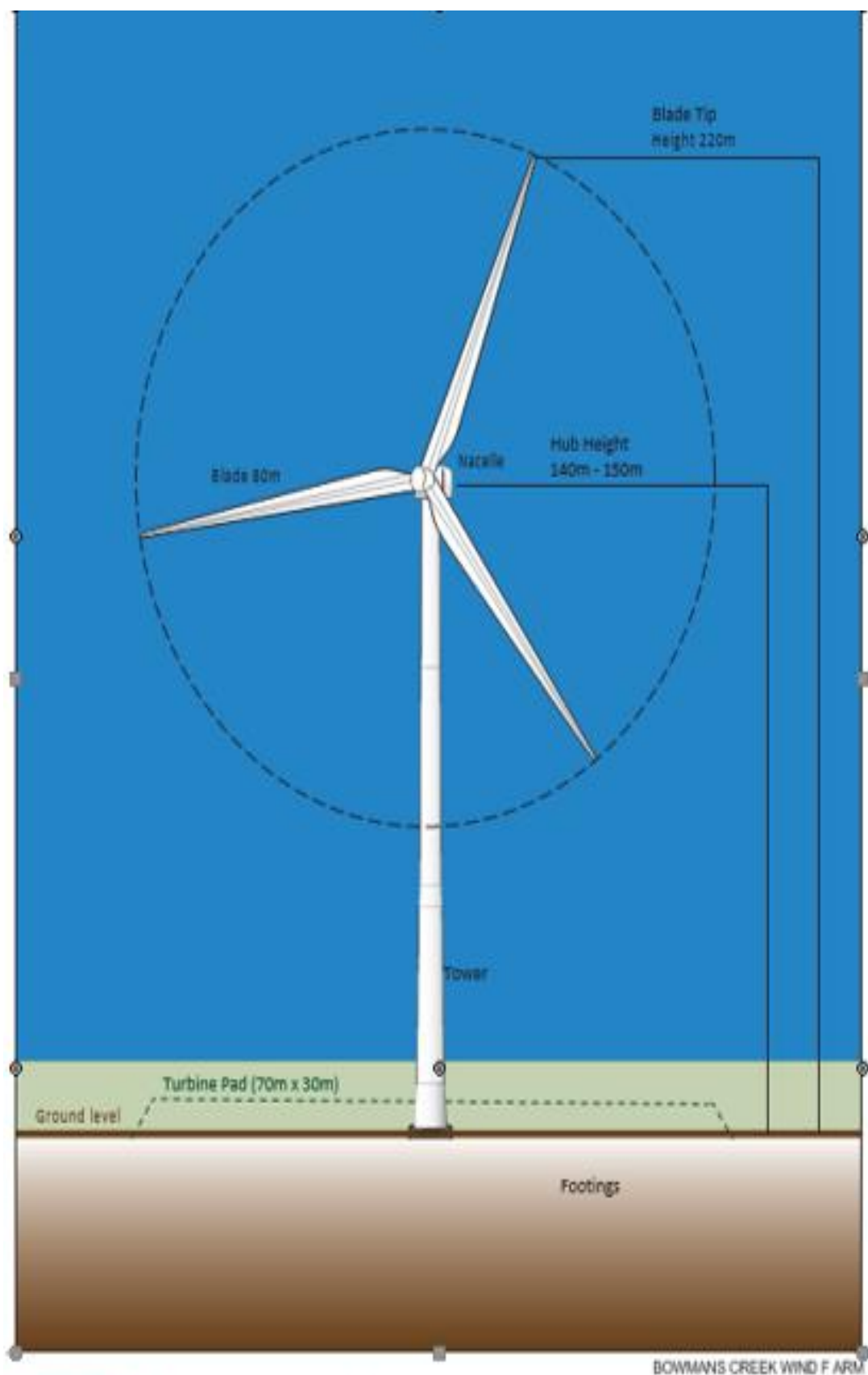
The permanent wind monitoring masts have not been used in evaluating and assessing the impact on my home.

Our home is identified as H12-1 and the assessment from **Appendix H is (attached below)**. Please note the table includes the following. **Ancillary electrical infrastructure including substations, internal electrical reticulation and 330kV transmission line will not be visible from the dwelling (our home).**

The additional monitoring masts will be visible from our home, it will be in an additional 60degree quadrant giving a total of three 60-degree quadrants impacting on our home. It may not be a wind tower however it will be a substantial structure approximately 150m tall. This relates to the visual bulletin BACKGROUND which comments that:

The assessment of potential visual impacts on the landscape that may arise from wind energy projects is different from other forms of SSD in a number of ways:

- wind turbines are large structures which are often required to be located on ridgelines and elevated positions to capture wind resources;
- **wind turbines have distinctive outlines and can be over 150 metres in height;**



BOWMANS CREEK WIND FARM

EPURON

Hansen Bailey

Conceptual Wind Turbine Components

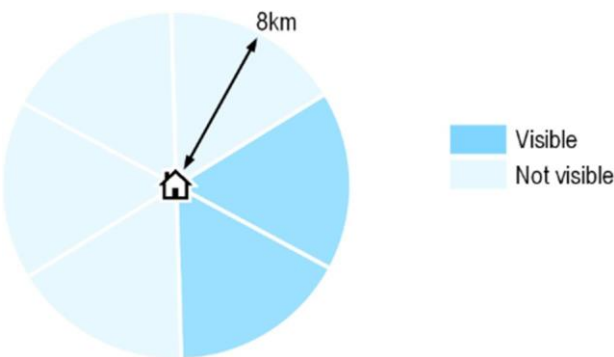
FIGURE 12

Dwelling H12-1

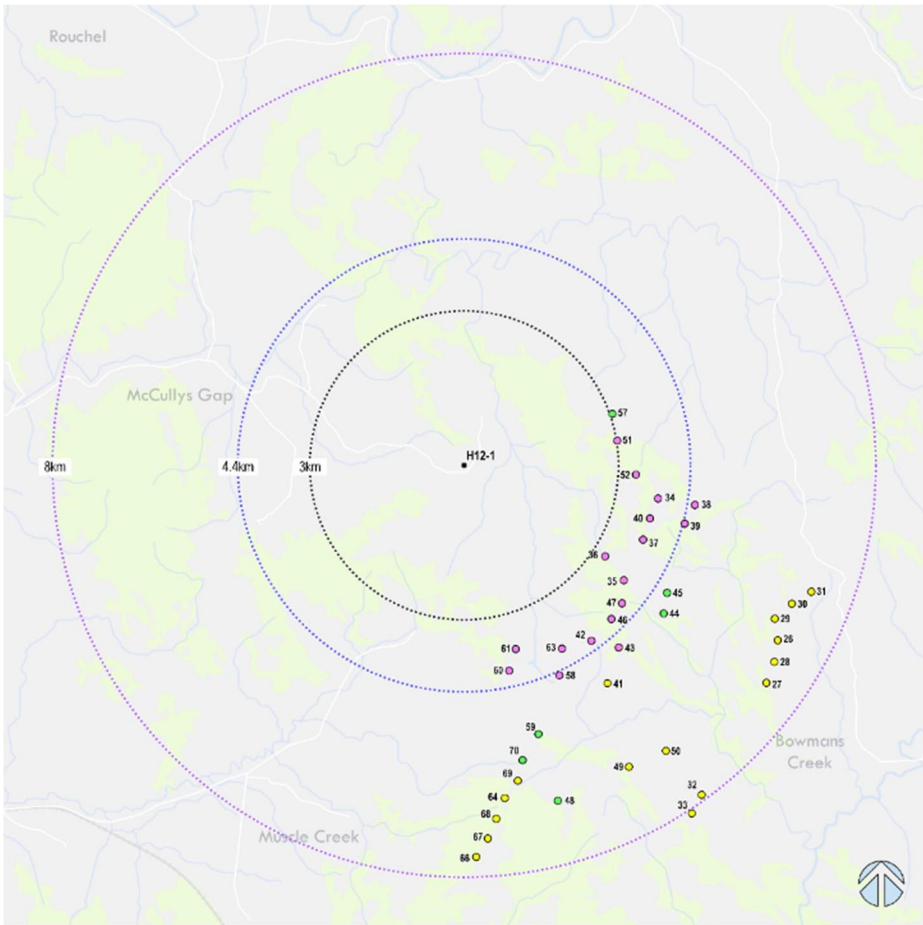
9.8.48 Viewpoint H12-1 aerial photo



9.8.50 Viewpoint H12-1 Visibility rose



9.8.51 Viewpoint H12-1 Multiple Wind Turbine Tool diagram



Wind turbine legend – yellow not visible, purple visible, green blade only visible

Visual Performance Objectives	Visual Influence Zone 2	Evaluation
Visual Magnitude	Objective: Manage impacts as far as practicable, justify residual impacts, and describe proposed mitigation measures below the black line. Consider screening between the blue line and the black line.	Closest wind turbine (51) is located 3.02km (Near Middleground) from dwelling H12-1. The MWTT diagram illustrates 14 wind turbines would be visible (discounting vegetative screening) between the black and blue line with an additional 9 wind turbines extending beyond the blue line east to south of the dwelling. Landform and tree cover beyond the dwelling may offer some filtering of views toward wind turbines east to south south east from the dwelling and at various locations from the surrounding curtilage. Wind turbines within two 60-degree sectors are not considered to dominate the available viewshed. The wind turbines do not impart a vertical dominance over the dwelling or surrounding curtilage. Whilst wind turbines may be visible the potential for visual impact is not significant and partially mitigated by distance and extent. The Bulletin acknowledges that wind turbines are very large structures that will be visible in the landscape.
Landscape Scenic Integrity	Objective: Wind turbines should not cause significant modification of the visual catchment.	Overall wind turbine visibility will not cause any significant modification to the visual catchment with wind turbines not becoming a major element in the landscape or dominating

Table 9-17 Viewpoint H12-1, Rural dwelling V122

Visual Performance Objectives	Visual Influence Zone 2	Evaluation
	Turbines may be visually apparent and could become a major element in the landscape but should not dominate the existing visual catchment. The Bulletin notes that in a Moderate Scenic Quality Class, wind energy projects should not cause significant modification of the visual catchment. Turbines may be visually apparent and could become a major element in the landscape.	the existing visual catchment due to distance and extent within existing view. The wind turbines will not become a major element in the landscape from this view location.
Key Feature Disruption	Objective: Minimise impact of wind turbines or ancillary facilities that result in the removal or visual alteration/disruption of identified key landscape features. This includes any major or visually significant landform, waterform, vegetation or cultural features that have visual prominence or are focal points.	The visible wind turbines will not result in the removal or visual alteration of key landscape features, cultural features or focal points in the landscape.
Multiple Wind Turbine Effects	Objective: Level 2 (moderate sensitivity) – wind turbines visible within the effective horizontal views in three or more 60° sectors.	Visible wind turbines within 8km of the view location are compliant with the Multiple Wind Turbine Effects performance objectives.
Ancillary electrical infrastructure	No performance objectives are noted in the Bulletin.	Ancillary electrical infrastructure including substations, internal electrical reticulation and 330kV transmission line will not be visible from the dwelling.
Mitigation and management options		Proponent to offer neighbour agreement and/or screening to the landowner.

This is deception by Epuron trying to indicate the four permanent wind monitoring mast are non-descript structures and do not need to be evaluated in the project.

Section 2.1 of the EIS - NATURAL ENVIRONMENT

Topography within the Project Boundary fluctuates between 135 m Australian Height Datum (AHD) in the valley floors up to 786 AHD in the escarpments and steeper slopes.

Clause 2.1 Natural Environment includes the following description of Bowmans Creek indicating Bowmans Creek is the major drainage line within the Project Boundary and delivers water to the Goorangoola Creek to the south.

The project is also a major drainage line feeding creek tributaries towards Mc Cullys gap and Muscle Creek

Reference Hydroline spatial data information for the Area (Attachment 12).

As illustrated in the Hydroline spatial data information for the Area and despite the project intersecting numerous order streams. The EIS does not include any recommendations about maintaining the environment and integrity of the water flows into the water ways regarding their contamination from Hydrocarbons.

A Solution to prevent contamination from Hydrocarbons may be to implement Industry best practice. Industry best practice includes prevention, clean up, protocols/process and auditing.

Prevention is achieved by ensuring that all of the equipment that enters the site is fit for purpose and is designed or modified to minimise any risks of hydrocarbon contamination. Equipment suppliers, contractors and maintainers are all familiar with the requirements of MDG 15 whilst supplying equipment for the regions mining projects. MDG 15 requirements amongst other things includes the segregation of Hydraulic hoses to minimise hoses rubbing and subsequent failure resulting in oil spills, it also includes the requirement to change out hydraulic hoses based on hours of use rather than waiting for a failure, again to minimise oil spills. All the equipment engaged on site should as a minimum comply with the requirements of MDG 15.

Prevention associated with maintenance, maintenance activities include washing down equipment, servicing equipment and repairing equipment. All maintenance activities should be carried out on bunded concrete pads with any residue that is deposited on the pad collected in a concreted sump and collected for disposal by a licensed contractor. If a concrete pad is not initially available or if the equipment is not mobile enough to travel to a concrete pad temporary composite pads with built in bunds can be purchased and should be used following the same protocols for the disposal of any contaminates.

Clean up, protocols/process and auditing during construction and operation the project and site should implement and be a certified using the Environmental Management System ISO 14001. **ISO 14001 Environmental Management System (EMS)** is a systematic framework to manage the **immediate** and **long term** environmental impacts of an organisation's products, services and processes. ISO 14001 EMS also includes an auditing function. The auditing function would allow the project during construction and operation to report their Environmental performance to the public.

Section 2.4 of the EIS - LAND OWNERSHIP

Section 2.4.2 of the EIS includes - **Associated, Near Neighbour and Non-Associated Private Landholders**

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

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

as described above is not in place with the landholder.

Section 2.5 of the EIS LANDHOLDER AGREEMENTS includes

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

Table 1 Landholder Agreements Categories

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

On July 21, 2020 Epurons representative Mr Julian Kasby forward me an email indicating there had been some changes to the proposed Bowmans Creek wind farm and indicating I would be impacted with the family home 3km away from the closest turbine. Due to this impact Mr Kasby informed me Epuron would be forwarding a Neighbour Agreement soon **Reference (Attachment 6) letter enclosed in email dated July 21, 2020.**

On August 7, 2020 Epurons representative Mr Julian Kasby forward me an email containing four attachments, these being:

- A summary letter – Bowmans Creek wind farm Proposed Neighbour Agreement
- A copy of the Neighbour Agreement
- A copy of the Easement to be placed onto a portion of my property.
- A plan indicating the location of our family home identified as H12 – 1 to the closest turbine #51 at 3km.
 - Note the plan refers to our family home as a Dwelling it is a **family home**.

Reference (Attachment's 7, 7A, 7B & 7C).

After making enquiries to the National Wind Farm Commissioner Epuron replied on February 22 2021 that any neighbour agreements are voluntary **Reference (Attachment 7D)**

The Neighbour Agreement is not a genuine attempt to reach an agreement it includes amongst other things the right of Epuron or the proponent:

- Mortgagee consent
- Restrictions on the selling or transfer of the property
- It refers to the wind farm however only compensates for the location of wind turbines.
 - The definition of wind farm in the document lists at least 22 separate items.
- It allows for the site layout to change without consultation &
- The document would take away my right to oppose the wind farm (refer to definition of wind farm)

- The main document is 21 pages with two additional schedules and one Appendix, and they offered up to \$2,000 for my legal advice.
- The conditions of the Neighbour Agreement would make me a serf on my own property and Epuron think this is a fair and just document. **I have been told it is voluntary and I don't have to sign it or agree to enter into an agreement, Epuron do this knowing there are no repercussions for them.**

They have already informed the wind farm commissioner that this is the case when I made representation to him.

This is despite the proposed Neighbour Agreement not coming close to the recommendations the wind farm commissioner has made on numerous occasions regarding Neighbour Agreements. **Reference Wind Farm Commissioner Neighbour Agreements (Attachment 8).** And whilst the Wind Farm Commissioners recommendations may not cover everything, they would have been an improved starting point compared to the document proposed by Epuron.

It should also be noted section 2.4.2 indicates - Consultation with Neighbours **has been ongoing** with Neighbour Agreements offered to address specific issues raised by individual landowners or to mitigate the impacts identified in the specialist assessments as described in **Section 7** of this EIS; **Consultation has not been ongoing. I was told take it or leave it.**

Solution – the Approval consent conditions should include the following:

- If a neighbour within 8km wants to enter into a Neighbour Agreement with Epuron or any future proponent, the Wind Farm Commissioners recommendations should be the starting point.
- Any agreement as a minimum should also include acquisition with compensation if for any reason the landowner wants to sell the property.
- Appendix H – Visual assessment includes a section where it says the Proponent has made a commitment to enter into neighbour agreements. Epuron need abide by this commitment.
- All required neighbour agreements should be agreed and signed before the project receives Approval.

Section 2.7 of the EIS - AUSTRALIAN RENEWABLES INDUSTRY

Section 2.7.1 Overview includes but is not limited to the following.

Local communities – The properties selected for involvement are large land holdings and naturally provide a considerable buffer to non-associated (or neighbouring) dwellings. The low population density of the surrounding area will assist in reducing any residual noise or visual impacts from the Project;

The low population density does not assist in reducing any residual noise or visual impacts from the project. There may not be many of us, but we will be impacted by the noise and impacted by the visibility along with the associated impacts on our lives.

My land is very close to the wind turbines and I have to run my grazing business on this land, I have not agreed for my land to be used as a buffer and restrict its future potential.

This again goes back to the Paris Agreement Epuron think they can ignore our issues and walk all over us.

Construction Hours

Section 3.1 of the EIS - OPERATING HOURS, PERSONNEL AND SCHEDULE

The EIS recommends using the Interim Construction Noise Guideline' (DECC, 2009) (ICNG). The EIS includes the following:

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

Table 4
Standard Construction and Operational Hours

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

The 'Interim Construction Noise Guideline' (DECC, 2009) (ICNG) **Reference (Attachment 9)** do not reflect the operating hours as set out in **Table 4 Standard Construction and Operational Hours from the EIS**.

The 'Interim Construction Noise Guideline' (DECC, 2009) (ICNG) includes a table "**Table 1" (attached below)** Recommended standard hours for construction work.

Table 1: Recommended standard hours for construction work

Work type	Recommended standard hours of work*
Normal construction	Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays
Blasting	Monday to Friday 9 am to 5 pm Saturday 9 am to 1 pm No blasting on Sundays or public holidays

The 'Interim Construction Noise Guideline' (DECC, 2009) are very prescriptive regarding Construction outside the recommended standard hours. **Section 2.3 (referenced below)** covers this issue.

Section 2.3 – Construction outside recommended standard hours.

The five categories of work that might be undertaken outside the recommended standard hours are:

- the **delivery of oversized plant or structures** that police or other authorities determine require special arrangements to transport along public roads.
- **emergency work** to avoid the loss of life or damage to property, or to prevent environmental harm.
- **maintenance and repair of public infrastructure** where disruption to essential services and/or considerations of worker safety do not allow work within standard hours.
- **public infrastructure works** that shorten the length of the project and are supported by the affected community.
- works where a proponent demonstrates and justifies **a need to operate outside the recommended standard hours**.

The guidelines also note:

In the last two categories, the proponent should provide the relevant authority with **clear justification for reasons other than convenience**, such as to sustain operational integrity of road, rail and utility networks. The relevant authority may be the same as the government organisation undertaking the works.

The wind farm does not meet any of the criteria to operate outside the recommended standard hours.

The Executive Summary – Noise and Vibration

Also includes but is not limited to the following comments:

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

The EIS also indicates construction will take approximately 18 months.

There is an Issue that the EIS is not prescriptive regarding – Excessive noise (could be up to 75 a-weighted decibels) for 18 months.

A Solution should as a minimum include –

- Any equipment engaged on site should be fitted with sound attenuation to reduce any noise impacts to below 40 a-weighted decibels. The local mines have been doing this since the 1990's and it is now one of their requirements that all vehicles engaged on the sites are fitted with sound attenuation.
- The equipment must be tested before being engaged on site to ensure it complies with the requirements of the sound attenuation.
- The process must be Auditable with the audit results available on the Proponents Web site
- Beep style reversing alarms must not be used on project site or associated sites.
- Sound monitors must be available for any neighbours within 10km of the project site who request them to ensure they are not being impacted.
- Any processing that cannot be fitted with sound suppression for example rock crushing, impact rock hammering must be screened, with screened embankments being at least twice as high as the equipment being used.
 - process's that require screened embankments should operate to a modified time frame, the hours of operation for these process's should be reduced to five days per week 9.00am to 3.00pm.

Other noise and vibration issues

Issue - The nominated Standard hours of work are excessive for a rural area with minimal background noise to mask any noise.

A Solution should as a minimum include –

- No work or engagement on the project site should be conducted outside of the Standard hours of work nominated in the 'Interim Construction Noise Guideline' (DECC, 2009)
- The standard hours of work referred to in the 'Interim Construction Noise Guideline' (DECC, 2009) need to be modified. "New" Standard hours of work must be referenced in the consent conditions for the approval. These should reflect the following, start and finish times for the project should be 7.00am to 4.30pm Monday to Friday and 8.30am to 12.00 noon on Saturdays. Employees must start and finish at the main office and travel out to the relevant work areas must be within the New Standard work hours.
- There is to be no work outside the New Standard hours of work.

Issue – Disturbance of sleep for shift workers and young children and older people during the New Standard work hours

A Solution should as a minimum include –

If requested the proponent should soundproof the homes of neighbours within 5km to allow adequate sleep.

Issue – Animals especially farm animals (Cattle, Sheep, Horses etc) and even Kangaroo's and Dogs's can easily be spooked by high noises, or vibration, sudden noises, or vibration. This can lead to animals bolting, hurting them selves and or damaging fences. This could be problematic during periods when animals are being mustered with the potential to seriously injure or kill people. Intermittent noise or vibration would have the biggest impact, for example Blasting, Rock hammering, rock crushing.

A Solution should as a minimum include –

- All neighbours who request to be notified within 10Km of the project site must be informed of the work activities and times at least one week in advance.
- If any of the proposed work has the potential to impact on the neighbours ability to carry out their task for example cattle mustering, the project site must reschedule the timing of the proposed work for example Blasts.
- If animals are spooked and a solution cannot be found the landowner can ask for acquisition of their property along with adequate compensation to allow them to move.

Issue – Epuron or the Proponent trying to Cherry Pick the 'Interim Construction Noise Guideline' (DECC, 2009).

Note Epuron have already tried to Cherry Pick the Guideline as can be seen in the EIS for working outside Standard Work Hours, when they don't need to.

A Solution should as a minimum include –

Epuron or the Proponent must not engage in any construction work or any site activities outside the hours identified as standard hours of work in the 'Interim Construction Noise Guideline' (DECC, 2009).

Section 3.4 of the EIS - WIND TURBINE GENERATORS

Section 3.4.1 Wind Turbine Generator (WTG) Design

Includes but is not limited to the following commentary:

- WTGs are fitted with lightning conductors, which direct lightning strikes into the ground. Lightning conductors **reduce the risk** of damage to the WTG and fire by providing a safe path to earth for lightning strikes.
- No obstacle lighting is required as part of the Project (see Section 7.3.3). Therefore, there will not be a requirement for hazard lighting at the top of individual towers. WTGs are proposed to be painted off white/grey and finished with a surface treatment that minimises the potential for glare and reflection.

Note lightning conductors only reduce the risks of fires, during consultation with the community including CCC meetings Julian Kasby from Epuron has been informing the community wind turbines DO NOT cause fires.

Note the comment about obstacle lighting requirements is not true, Epuron do briefly touch on this in Appendix H lighting assessment.

Epuron are again trying to mislead and deceive the community.

Section 3.6.1 Temporary Construction Infrastructure

Includes but is not limited to the following commentary:

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

Section 3.7.3 Externally Supplied Resources

Includes but is not limited to the following commentary:

- Gravel for construction purposes will be produced in situ wherever practicable.

Sections 3.6.1 and 3.7.3 indicate **mining activities** will be taking place on the project site, including the excavation, handling and processing of rock and gravel. It has been indicated that this material will be used around the site for construction purposes. The land associated with the project is not owned by the proponent but individual landowners. The excavation of the gravel and rock will require a mining license and approvals because it is a commercial mining operation exporting material away from an individuals land holdings.

Section 4.3.5 State Environmental Planning Policy 55 – Remediation of Land

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

Old Sheep and Cattle dipping races and troughs not recorded on EPA contaminated land records. Likewise, the location of old wooden power poles and adhoc farm chemical storages are often not recorded on EPA contaminated land records. The sprays, dips and treatments were based on Arsenic, and other chemicals that have a residual impact on land and any feed that grows in the area. Very low concentrations cause residual contamination and if ingested by life stock can cause issues when the livestock are slaughtered for human consumption. Disturbance of these areas has the potential to spread this contamination through run off into waterways. The spreading of these contaminates could then cause contamination down

stream of the project. This is a very serious issue and could impact on Australia's export meat markets. A full site review and ground truthing needs to be conducted across the whole project area, including a review of any historical records.

I have an irrigation license with my irrigation licensed linked to the creek system that has its head waters located in the proposed Bowmans Creek wind farm project area. I require surety that the creek system will not become contaminated.

Fires and Bush Fires

Section 4.4.10 of the EIS - Rural Fires Act 1997

Section 4.4.10 includes but is not limited to the following commentary.

- Measures to reduce the risk of bushfires are outlined in **Section 7.10**. 'Planning for bush fire protection' (RFS, 2019a) (PBP) recommends the establishment of Bushfire Protection Measures (BPMs) to reduce the risk of impacts to assets.
- Given that approvals under the EP&A Act, BC Act or NPW Act are not required, the establishment of BPMs is not included as a component of the Project.

I would like to respond to the EIS for the proposed Bowmans Creek Wind farm regarding the impacts of fire management, bush fires, the increased risks during bush fires and the impacts and community risks of fire due to the proposed Bowmans Creek wind farm.

During their consultation and planning process in the preparation of the EIS and in the EIS, Epuron have downplayed the risks of bush fires, fire, and impacts of living in the vicinity of a wind farm.

Submission to The DPIE on the EIS submitted by Epuron for the proposed Bowmans Creek Wind farm regarding Fires, Bush fires and firefighting.

Bush fires and firefighting.

During their consultation and planning process in preparation of the EIS and in the EIS, Epuron have downplayed the risks due to bush fires and firefighting.

The scoping document as submitted.

In May 2019 Epuron submitted their Scoping report to The Department of Planning, Industry and Environment (DPIE). The Bowmans Creek Wind Farm Scoping Report | May 2019 (scoping document).

The scoping document included but was not limited to the following:

- Electrical Connections – between wind turbines and the on-site substation/s, which will be a combination of underground cable and overhead powerlines linking segments of the site;

Section 6 – Risks. The risk assessment included the following:

- This section identifies the currently identified potential environmental and social impacts associated with the Project and identifies high and moderate priorities for further assessment in the EIS.

6.1 Introduction

- Epuron has used its experience in wind farm development, together with a preliminary assessment of the site, to identify the key issues to be assessed in relation to the Project. The risk assessment included a review of the Wind Energy Framework as well as the SEARs for recent wind farm projects. Potential environmental and social impacts identified included:
 - Safety (including aviation, bushfire, fire and blade throw)

The Scoping document also included that the EIS will be prepared generally in accordance with the SEARs to be issued by DPIE in response to this scoping report. All assessments (including specialist assessments) will be completed taking into consideration experience from other wind farm projects, consultation with stakeholders, and **industry best practice and guidelines**.

6.2 Environmental and Social Risk Assessment

Epuron has carried out its environmental and social risk assessment based on information collected to date on site, at nearby sites, generally within the region and based on similar proposals in other regions. The assessment separates the issues into three priorities:

- High Priority (Key) - addressed through use of an independent specialist assessment.
- Moderate Priority - addressed via desktop assessment, precedent and consultation.
- Low Priority – addressed via minor desktop assessment.

In relation to each risk, Epuron has established the Priority by taking into consideration:

- The level of information already available about that issue.
- The extent to which site-specific assessment is required to define that issue;

- The likelihood of that issue occurring, and potential impacts of that issue if it did occur in consideration of standard industry controls; and
- The extent to which standard industry practice, statutory requirements, and standard consent conditions adequately address the issue.

Where an issue has been established as a Low Priority, this has been on the basis that:

- It is a risk which is well understood.
- Site-specific assessment is not required to understand the risk.
- It has previously been demonstrated to not affect the assessment of wind farm projects or the consent conditions relevant to them.
- It has previously been found not to be relevant to the assessment of wind farm projects; and/or
- An industry standard approach is available which adequately addresses the issue, and it is proposed that this approach will be included in the EIS. Issues which fall into the Low Priority category are discussed in Section 7.2

Table 3 – Risk assessment, Preliminary Direct Mitigations and Assessment Approach includes the following in relation to the risks associated with fires.

Issue	Sources of impact	Priority	Assessment
Hazards and Safety	Impacts Aviation safety (instruments and airspace intrusion) Bushfire safety (hazards and risks) Fire management Blade throw risks. Mitigation Standard practices apply.	Moderate	In house and/or independent specialist assessment

The risk assessment table 3 is **not actually a risk assessment** it is a table that prioritises Epuron's approach to the matters they have identified as issues.

A risk assessment looks at likelihood and severity, if the severity is death the outcome is always a **HIGH RISK**.

Table 3 is misleading - multiple deaths occur from single event bushfires in Australia every year.

In the introduction Epuron (section 6.1) have also indicated "*Epuron has used its experience in wind farm development*" Epuron have had eight projects approved and before construction commenced, they have on sold the projects.

Epuron do not have experience in wind farm development, they have experience in obtaining approval, this statement is false and misleading.

According to the NSW Bushfire Inquiry, during the bush fires that occurred on the East coast of NSW during late 2019 and early 2020:

- 26 people lost their lives
- 2,476 Homes were destroyed
- \$942m in infrastructure was lost
- 601,858Ha of pasture burnt

- 88,832km of agricultural fencing lost

I am sure the people who died and were impacted by these events would not classify these events as Moderate.

Despite Epuron classifying Bushfire safety (hazards and risks) Fire management as requiring Moderate priority, the risk was then covered in section **7.2 Minor issues** in the scoping document. Section 7.2 included the following:

- A Hazards and Safety Assessment will be undertaken in relation to, bushfire risk.
- A Bushfire assessment will be undertaken in accordance with the Rural Fire Service (RFS) 'Guide for Bush Fire Prone Land Mapping', vegetation based on vegetation type and potential risk.

The scoping document was submitted to the DPIE in May 2019, this was two years and four months after the fire at the Infigen Capital wind farm on Taylors Creek Road. On 17 January 2017, wind farm operator Infigen sparked a blaze that ripped across the southern Tablelands of NSW. The fire destroyed 3,400 hectares (8,400 acres), hundreds of sheep and cattle, sheds and at least one home. Other damage included 150km of fencing, 10.5km of windbreaks, three sheds, water tanks a large set of cattle yards and damaged other farm infrastructure.

The RFS found that a bird striking the wind farm's high voltage power line caught alight, dropped to the ground, and set off the fire.

The Capital wind farm fire was subject to a class action with local affected people pursuing compensation for losses incurred because of the fire. The class action was settled out of court with the terms of the agreement subject to a confidentiality clause and Infigen not admitting liability.

It should be noted there was evidence of an ongoing problem of bird strike and that there were other incidents of birds being incinerated at the site.

It was also noted a significant number of people had their lives profoundly impacted both personally and their enjoyment of the land and farming operations.

Other impacts were the loss of amenity on the beautiful rural properties and complete stands of vegetation wiped out and an ongoing impact of erosion and dam siltation.

There has also been an ongoing ramification for some of the people affected suffering psychologically.

The Infigen Capital wind farm fire



A few of the 100's of livestock killed at the Infigen Capital wind farm Fire.



A house was destroyed in the Capital wind farm fire.



The Capital wind farm site is an undulating site with a light cover of trees making the site more accessible compared to the proposed Bowmans Creek wind farm. The proposed Bowmans Creek wind farm consists of steep ridges with large areas inaccessible in vehicles of any description. The proposed Bowmans Creek wind farm is also heavily timbered compared to the Capital wind farm. If a fire were to impact on the proposed Bowmans Creek wind farm area, the ongoing impacts of the loss of amenity on the beautiful rural properties and ongoing impact of erosion and dam siltation would be many times worse than the situation at the Capital wind farm.

Other wind farms and turbines have also caught fire in Australia with examples being:

- **Ten Mile Lagoon** in Western Australia in the mid-1990s.
- **Lake Bonney**, Millicent (SA) in January 2006.
- **Cathedral Rocks Wind Farm**, Port Lincoln (SA) in February 2009.
- **Starfish Hill** (SA) in October 2010 and
- **Ravenshoe's Windy Hill** (Qld) November 2018

Details on these fires were also available at the time the scoping document was prepared and submitted. The information included the following:

Cathedral Rocks Wind Farm turbine fire - 2 February 2009

A wind turbine caught fire near Port Lincoln, starting multiple blazes on the ground as embers fell.

The turbine fire was halfway up **its 60m structure**, making it difficult for the Country Fire Service firefighters trying to deal with it to extinguish the blaze.

The Cathedral Rocks Wind Farm turbine fire



Ravenshoe's Windy Hill wind farm fire - (Qld) 13 November 2018

A WIND turbine went up in flames at Ravenshoe's Windy Hill on November 13th, 2018.

The fire was attended by several Queensland Fire and Emergency (QFES) units.

A QFES spokesperson said crews **stood by for safety** in case it led to a grass fire, the QFES did not have the equipment to fight the fire on the wind turbine. The Emergency services established an exclusion zone around the turbine to ensure no one got hurt.

Ravenshoe's Windy Hill wind farm fire.



Starfish Hill wind farm fire (SA) - 30 October 2010

The information on the Starfish Hill wind farm fire is damning, it includes the following points:

- The South Australian County Fire Service (CFS) is a volunteer-based fire service for SA.
- The CFS have been advised, there is little to nothing the CFS can do in to extinguish a wind turbine fire.
- At the fire at the Starfish Hill Wind Farm, in which a turbine had caught alight. On arrival, CFS officers could do little but watch the blaze from half a kilometre away, as the situation was deemed too dangerous to approach.
- When Work Safe SA arrived at the scene, CFS officers were told to retreat a further 500 metres away from the fire. The blades continued to spin, with the tips of the blades flying some distance.
- A safety exclusion zone was set to prevent people going no closer than within one kilometre.
- CFS officers were told to watch for spot fires, but not to extinguish those within 1km of the turbine.
- Even if they could reach the towers from 1km away, the turbines stand from ground to blade tip, at 100 metres tall. The CFS were advised they could not use water extinguish the wind turbine fire, as the turbine's hub contains a large electrical network.
- CFS Group had received a bulletin from the management team at the Starfish hill wind farm advising that little can be done in the event of a wind turbine fire due to the threat it poses to CFS officers.
- A spokesperson from Starfish Hill Wind Farm advised all safety precautions were taken (during the incident).

Starfish Hill wind farm fire



Despite indicating in the scoping document and the EIS Epuron have not assessed the risks of fire considering the level of information available at the time either of the reports were prepared and submitted.

Epurons Bowmans Creek wind farm web site information includes:

1. A section under Frequently Asked Questions (FAQ) pertaining to fire risks.
2. Project update July 2020 Bowmans Creek wind farm flier including an article on Bushfire risks.
3. A presentation that was given as part of Zoom community consultation sessions held in July, including a slide on Bushfire Risk Bowmans Creek Wind Farm

1) - Epuron Web site – FAQ - Fire risks – Includes

Do wind farms have a Bushfire Management Plan?

All projects are required to assess the risk of bushfire and ability to fight a fire in the development application.

All wind farms in Australia are required to develop Bushfire Management Plans in consultation with the Rural Fire Service (or equivalent organisation) and in case of a fire in the vicinity of the wind farm, provide assistance to fire fighters and other emergency services as much as possible.

The bushfire management plan would also establish procedures in the event of a fire moving through a wind farm.

During construction, the project would also ensure that firefighting equipment was available on site.

Despite the comments above section 4.4.10 of the EIS includes but is not limited to the following commentary.

- Measures to reduce the risk of bushfires are outlined in **Section 7.10**. 'Planning for bush fire protection' (RFS, 2019a) (PBP) recommends the establishment of Bushfire Protection Measures (BPMs) to reduce the risk of impacts to assets.
- **Given that approvals under the EP&A Act, BC Act or NPW Act are not required, the establishment of BPMs is not included as a component of the Project.**

What is the risk that a turbine starts a fire?

Wind monitoring masts and wind turbines are designed using materials to provide a safe path for lightning strikes to the ground. They are also designed with materials to limit fire risk and with systems that can monitor and respond automatically to conditions inside the turbine by following shutdown and isolation procedures.

Despite the comments above Section 3.4.1 of the EIS includes but is not limited to the following regarding Wind Turbine Generator (WTG) Design

- WTGs are fitted with lightning conductors, which direct lightning strikes into the ground. Lightning conductors **reduce the risk** of damage to the WTG and fire by providing a safe path to earth for lightning strikes.

How do turbines impact aerial firefighting?

The Rural Fire Service (RFS) has in the past assessed the risk of wind turbines when fighting fires and stated the following:

"It is the position of the NSW RFS that fire moving across the area of a wind farm is generally managed in the same way as any other bush fire. Firefighting strategies by ground-based resources would continue and be

subject to prevailing weather and topographic conditions.” “... aircraft would avoid wind turbines in the same manner as they avoid other obstructions, such as power lines”.

The web site then includes the following reports - Bushfire on a Neighbouring Property

Bushfire on a Neighbouring Property

In 2017 when an accidental spark from machinery operating in a neighbouring field to the Waterloo Wind Farm caused a grass fire that travelled up the hill towards the Waterloo ridge line, the bushfire management plan was enabled.

1:55pm - Country Fire Service (CFS) and Waterloo Wind Farm were notified of a grass fire.

2:02pm - Wind farm operations manager checked in with the safety of the ground crew members

2:17pm – Ground crew ensured all access points were open for fire crews to enter and 18 turbines were paused. For the next hour ground and air crew worked to bring the fire under control including multiple runs with fixed-wing water bombers expertly manoeuvred through turbines.

3:15pm - Ground crew attended 6 paused turbines to manually apply brakes and further assist water bombing aircraft.

6:00pm – Turbines not in the fire ground area were restarted.

The response crew grew to 32 CFS and 25 private farmer fire unit vehicles, four fixed wing water bombers and a surveillance helicopter responding to the incident. In all, over 200 people were involved in responding to the fire.

Wind farm access roads aid firefighters

In 2013, during a grass fire at a wind farm in South Australia started by lightning, it was revealed that a significant benefit was brought by the access roads built for a local wind farm. “They were absolutely of great benefit in helping us fight the fires,” said the Snowtown Country Fire Service (CFS) Captain. “If it weren’t for those roads, the fires, which were going at a fair rate of knots, would have just kept going. They acted as a natural fire break, giving us an edge to work back to and enabling us to back burn if we’d needed to. These new access roads provided an unexpected bonus, but they’ll help us control fires in the future.”

It was said that access tracks installed to build and maintain a wind farm increased the accessibility onsite and therefore had a positive impact on the response time and ability to fight fires onsite or on neighbouring properties.

The information provided on their web site indicates that wind farms do not generate any additional risks to firefighting including the use of aerial firefighting. Again, Epuron are downplaying the impact wind farms and wind turbines have on firefighting efforts and indicating firefighting efforts will be improved.

2) - Project update July 2020 Bowmans Creek wind farm flier including an article on Bushfire risks.

The Epuron project update flier for the Bowmans Creek wind farm dated July 2020 included the following article on Bushfire risk.

Bushfires

Bushfire risk and access to fight fires on a wind farm site will be assessed for the Environmental Impact Statement. Wind monitoring masts and wind turbines are designed using materials to provide a safe path for lightning strikes to the ground. They are also designed with materials to limit fire risk and with systems that can monitor and respond automatically to conditions inside the turbine by following shutdown and isolation procedures.

The issue of fire safety is taken seriously with bushfire management plans being established at all wind farms and developed in consultation with the Rural Fire Service (RFS). The bushfire management plan would also establish procedures in the event of a fire moving through a wind farm.

Drawing from examples around Australia, when fires have started on neighbouring properties and travelled towards a wind farm, the turbines have been stopped remotely and access to the site provided to local RFS to utilise the access tracks between turbines. Access tracks have also served as natural fire breaks for grass fires. The RFS has in the past assessed the risk of wind turbines when fighting fires and stated the following position: "A fire moving across the area of a wind farm is generally managed in the same way as any other bush fire. Firefighting strategies by ground-based resources would continue and be subject to prevailing weather and topographic conditions." Aircraft would avoid wind turbines in the same manner as they avoid other obstructions, such as power lines." – NSW Rural Fire Service's submission to the Select Committee on Wind Turbines, 2015.

3) - Zoom community consultation presentation sessions held in July, including a slide on Bushfire Risk Bowmans Creek Wind Farm.

Zoom presentation - Slide # 19 - Bushfire Risk Bowmans Creek Wind Farm

- Assessment of the risk of bushfire from the wind farm including potential impacts to aerial firefighting.
- Development of Bushfire Management Plan in consultation with RFS.
- RFS position that fire on a wind farm managed in the same way as any other bush fire.
- Examples in Australia of bushfires fought on a wind farm with fixed wing water bombers.
- Access tracks can provide benefit for ground-based fire fighters.

The information provided on Epurons Bowmans Creek wind farm web site is incorrect, out of date and it could be suggested misleading.

The South Australian Waterloo wind farm is not typical of aerial firefighting in Australia. The information could lead people to think there are no increased fire risks if a wind farm is built resulting in the loss of life.

By their actions Epuron and the information provided in the EIS have deceived the communities that will be impacted by the proposed wind farm including the relevant local councils and the DPIE.

The incorrect information could influence people's interpretation of the information provided and they will assume it is correct.

It should be evident that members of the community rely on the information to be accurate and correct. People will then decide whether to make a submission to the DPIE objecting to the proposed wind farm during the Public exhibition of the EIS. People's decisions could influence the number of submissions submitted objecting to the proposed wind farm. This could then determine if an IPC hearing is held.

Epuron have indicated they will review the project area using the Rural Fire Service (RFS) 'Guide for Bush Fire Prone Land Mapping', vegetation based on vegetation type and potential risk.

The RFS advice on their web site, is that the whole wind farm is built on Vegetation Category 1. Vegetation Category 1 is considered to be the highest risk for bush fire. It is represented as red on the bush fire prone land map and will be given a 100m buffer. This vegetation category has the highest combustibility and likelihood of forming fully developed fires including heavy ember production. Vegetation Category 1 consists of:

- Areas of forest, woodlands, heaths (tall and short), forested wetlands and timber plantations.

The majority of the properties surrounding the wind farm are also Vegetation Category 1.

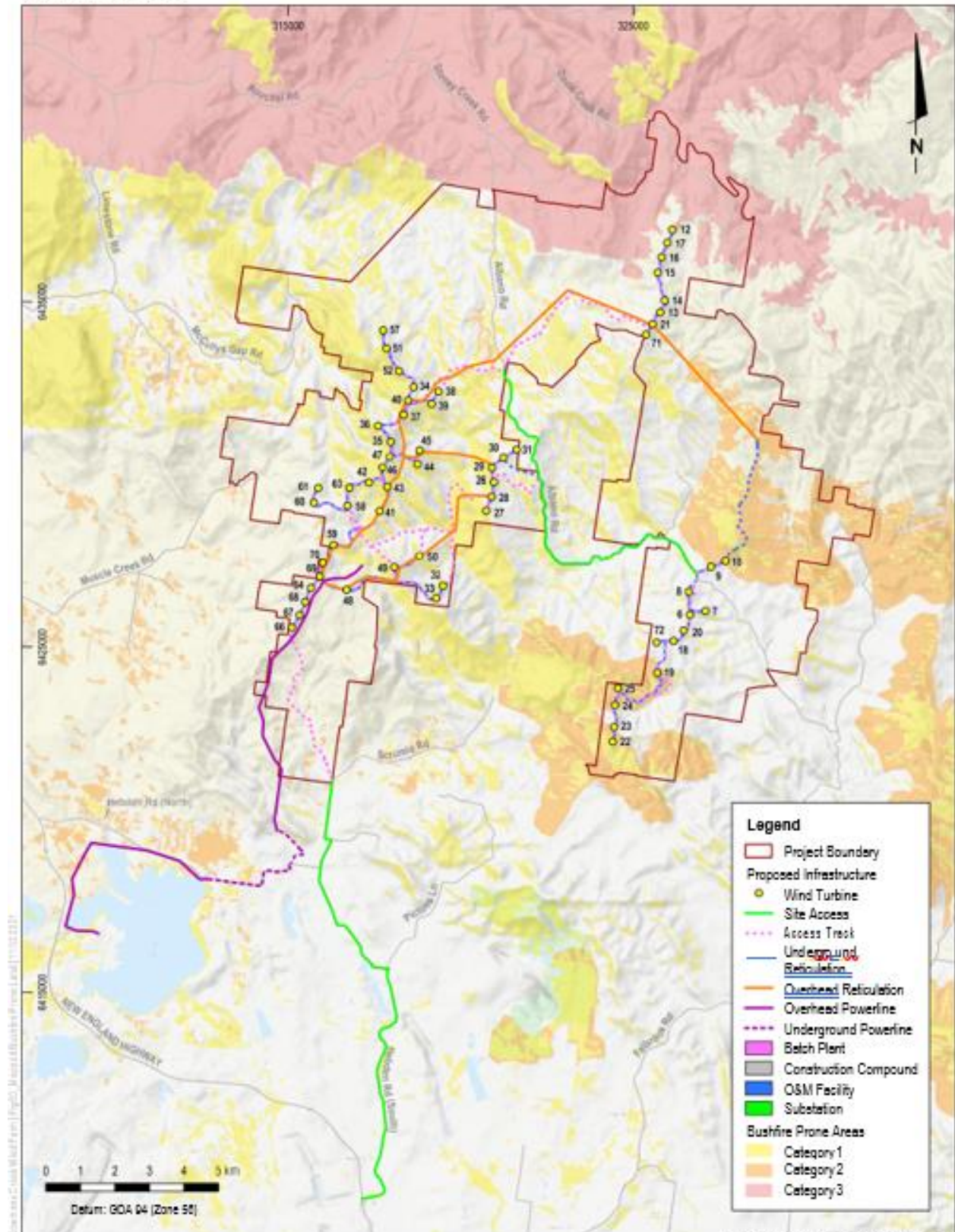
However, in section **7.10 BUSHFIRES Reference EIS**

Section 7.10.3 Impact Assessment Includes but is not limited to the following statements:

- The risk of fires is influenced by the available fuel load (i.e. vegetation). Areas of dense vegetation are present along the ridgelines and upper slopes (see **Section 7.5**). However, the majority of the land within the Project Boundary is previously cleared agricultural land (see **Section 2.3**).

Figure 50 (attached below) indicatively shows the mapped bushfire prone land within the Project Boundary.

Source: 1:50,000 scale topographic



BOWMANS CREEK WIND FARM

Section 7.10.3 Impact Assessment Includes but is not limited to the following statements:

Bushfire prone land is categorised into three categories according to level of risk, namely:

- Vegetation Category 1 represents the highest bushfire risk and includes forests, woodlands, heaths and timber plantations.
- Vegetation Category 2 represents the lowest risk and includes rainforests, remnant vegetation and land that is actively managed; and
- Vegetation Category 3 was the most recently introduced category and falls between categories 1 and 2. Vegetation Category 3 includes grasslands and shrublands.

The most prevalent vegetation category within the Project Boundary is Vegetation Category 1. However, there is also a substantial proportion of the site that is not mapped as bushfire prone. Some areas of Vegetation Category 2 are in the eastern and south-eastern extents of the Project Boundary. An area of Vegetation Category 3 is in the northern portion of the Project Boundary.

Figure 50 does not reflect the statements Epuron made **“The most prevalent vegetation category within the Project Boundary is Vegetation Category 1”**.

Figure 50 and commentary in the EIS is not supported by ground truthing or the reports available from the **RFS advice on their web site is the whole wind farm is built on Vegetation Category 1.**

The following information will support the facts that there are increased risks of Bush fires if a wind farm is constructed.

Aerial firefighting

Regarding the utilising of aerial firefighting methods there have been numerous enquiries and reports evaluating the risks, these include the following:

A Parliamentary enquiry

Chapter 5 - Parliamentary enquiry - Fauna and aircraft

Submissions to the enquiry from the **RFS** included but not limited to:

The NSW Rural Fire Service (NSW RFS) noted that: Aerial firefighting suppression in close proximity to wind turbines may be inhibited at times, given that the **aircraft operate under the [CASA] Visual Flight Rules for navigation** by visual reference. Pilots are necessarily required to maintain standard distances from wind turbines, as is the case with any other potential hazard such as power lines, transmission towers, mountains and valleys. That means that they will not operate in low light or after light, or through cloud, or smoke.

Submissions to the enquiry from **CASA** included but not limited to:

The National Airports Safeguarding Framework note that wind farms can be hazardous to aviation as they are tall structures with the potential to come into conflict with low flying aircraft. They have the potential to impact on the safety of low flying commercial, private and defence aircraft.

Wind farms are similar to tall buildings, communications towers. They differ by virtue that they are generally located in areas remote from other tall structures and are generally deployed along ridgelines (further exacerbating the potential impacts) and they involve components moving through shared airspace. Thus, the

primary impact of a wind farm is the potential safety risk it may pose to aircraft operating at **low levels (below 350 metres above ground level) in vicinity of a wind farm.**

CASA also contributed to the enquiry in regard to turbulence caused by the wind turbines. Wind turbines produce a wake of 'unpredicted and unpredictable turbulence the turbulence presents a risk to aerial firefighting operations. The major concern being the risk to safety of flying aircraft operating at low level and high weights (water load). This is a requirement of firefighting aircraft, they have to fly at low levels with high load weights.

CASA Guidelines CASA also has its own guidelines the,

“GUIDELINE D NATIONAL AIRPORTS SAFEGUARDING FRAMEWORK MANAGING THE RISK TO AVIATION SAFETY OF WIND TURBINE INSTALLATIONS (WIND FARMS)/WIND MONITORING TOWERS.”

The Purpose of Guideline is to provide guidance to State/Territory and local government decision makers, airport operators and developers of wind farms to jointly address the risk to civil aviation arising from the development, presence and use of wind farms and wind monitoring towers.

Section 43 of the CASA Guidelines - Turbulence - Includes the following advice.

Wind farm operators should be aware that wind turbines may create turbulence which is noticeable **up to 16 rotor diameters from the turbine**. In the case of one of the larger wind turbines with a diameter of 125 metres, turbulence may be present two kilometres downstream. At this time, the effect of this level of turbulence on aircraft in the vicinity is not known with certainty. However, wind farm operators should be conscious of their duty of care to communicate this risk to aviation operators in the vicinity of the wind farm. CASA will also raise awareness of this risk with representatives of aerial agriculture, sport aviation and general aviation.

It should be noted for the proposed Bowmans Creek wind farm Epuron are proposing wind turbines with a blade rotor diameter of up to 164m. At this diameter, the turbulence impacts would be more than 2.6km.

The impacts of wind turbulence are best illustrated in the picture below.

At this windfarm operated by the Swedish power company Vattenfall, wind turbines create a turbulence a wake of slow-moving air.



The Final Report of the NSW Bushfire Inquiry - 31 July 2020, after the bush fires of late 2019, early 2020

The report included 76 recommendations for future improvements to and how NSW plans and prepares for, and responds to, bush fires. And commentary on reports findings.

The focus of the report is to provide analysis and recommendations for change to ensure that, when bush fires like this happen again, there is less damage to property and our environment and, as much as possible, there are no lives lost.

The report included:

Firefighting strategies

The extraordinary nature of the 2019-20 season highlighted the need to **review traditional firefighting methodologies** to ensure they were able to be used in extreme conditions. Early suppression of fires played a critical role; however, weather conditions sometimes hampered the ability to deploy remote firefighting crews which meant some fires grew quickly and fire suppression was extremely difficult.

The Inquiry found that fire authorities were acutely aware of the limited supply of water and adapted 'dry' firefighting strategies, accordingly, including using heavy plant to actively support fire suppression.

Due to the geographically spread out the fires, **aviation also played a crucial role in firefighting**, personnel, and resource movement as well as surveillance and reconnaissance missions.

The report highlighted the importance and emphasis on getting fires out early including the right mix of aerial firefighting assets, **and increased aerial night firefighting**. The report also looked at Strategies to control the spread of fires including early suppression and initial aerial attack.

It was recognised that Aviation played a crucial role in firefighting during the 2019-20 season in NSW. Aircraft are particularly valuable for fires in difficult terrain or fast-moving fires that are too dangerous for ground crews to confront. It was also noted **Aerial firefighting at night** would provide an additional fire suppression tool. It was acknowledged that aerial firefighting at night has the potential to enhance current firefighting capability. It could enable advantage to be taken of more favourable conditions – lower temperatures and higher humidity – and could assist ground crews for extended periods of time.

It should be noted:

- As identified by CASA Aerial firefighting requires a pilot, to operates an **aircraft under the [CASA] Visual Flight Rules for navigation**. This would mean Aerial firefighting at night would be too great of a risk in the vicinity of a wind farm.
- Aerial firefighting requires a pilot to fly approximately 60m above the fire before dropping their load of water or retardant. The indicated height of the turbines for the proposed Bowmans Creek wind farm is 220m, and CASA identify the potential safety risk to aircraft is operating at **low levels (below 350 metres above ground level) in vicinity of a wind farm**.

A plane dropping retardant on a fire front within the recommended height zone.



A Smokey bush fire – Aerial firefighting near a wind farm would be impossible due to the lack of visibility and the inability to see the 220m tall wind turbines.



The NSW Bushfire Inquiry - 31 July 2020 also investigated how fires start.

How did the fires start?

- Lightning was the suspected, immediate cause of ignition for the majority of the largest and most damaging fires across NSW in the 2019-20 season. The dryness of the landscape meant that lightning 'caught' well to start fires and provided suitable conditions for them to spread once they were alight.
- Also, some new fires started as a result of other fires through ember spotting.
- NSW RFS has also reported that **power lines** were a suspected cause of a few of the larger, damaging fires.
- Some fires were also started by people – either deliberately or by accident.
- There were also instances of suspected arson during the 2019-20 season.

The risks of fires starting is increased if the proposed wind farm is built. Epuron are proposing to build 60, 220m high wind turbines, numerous substations and **30km of overhead power lines**.

Epuron have stated that Wind monitoring masts and wind turbines are designed using materials to provide a safe path for lightning strikes to the ground. However, **section 3.4.1 Wind Turbine Generator Design Reference EIS** includes the following statement WTGs are fitted with lightning conductors, which direct lightning strikes into the ground. Lightning conductors **reduce the risk** of damage to the WTG and fire by providing a safe path to earth for lightning strikes.

It should be noted this is not a fail-safe system and lightning strikes to wind turbines have been the source of numerous fires.

Epuron have also indicated the wind turbines are also designed with materials to limit fire risk, this is not correct. The materials used in a wind turbine nacelle include many litres of oil that is highly flammable, plastics, resins and fibreglass. The blades are made of composite material that is also highly flammable, in fact one way of disposing of old blades is to grind them down and use them as a fuel source for cement making. Most turbine fires originate in the nacelle, typically at three points of ignition: converter and capacitor cabinets, nacelle brake and transformer. **Fires are the second most common type of catastrophic wind turbine accident** behind blade failure.

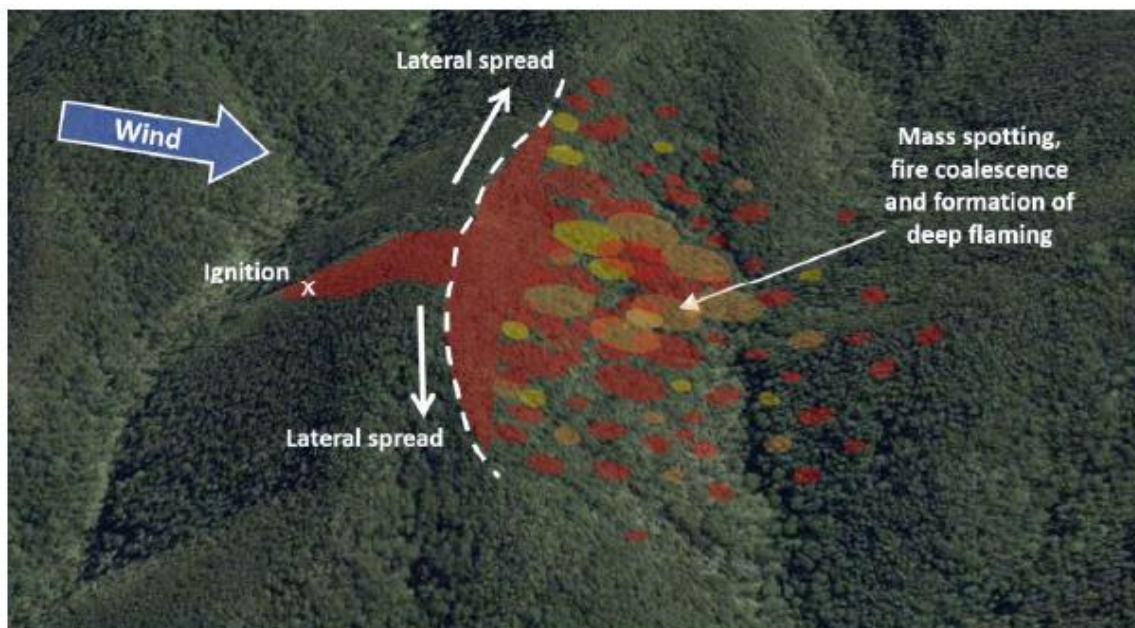
Epuron have also indicated the project will have at least **67Km of access tracks/roads** that will be constructed will be available for firefighting crews. Whilst this might be the case the access roads also open the area allowing arsonist easier entry to light fires.

It should be noted **The NSW Bushfire Inquiry** report also recognised that embers were spotting far ahead of the fire front to start new fires with some examples up to 7.4 km ahead of the main fire. There was also evidence of fires spotting over large water bodies or other features that would otherwise have contained a fire.

The NSW Bushfire Inquiry - 31 July 2020 also heard evidence on bush fire spread.

Evidence was provided by a Professor Sharples, Professor Sharples stated that eruptive fire behaviour, vorticity-driven lateral spread and mass spotting all involve dynamic fire propagation, and all are highly likely to have contributed to escalation of the 2019-20 fires into extreme bush fires.

Schematic diagram below illustrates vorticity-driven lateral spread and associated downwind spotting, spot-fire coalescence and formation of deep flaming. The fire has ignited mid-slope on a windward facing slope and initially spreads up the slope with the wind. As the fire encounters the ridge line (white dashed line), dynamic fire-atmosphere interactions drive the fire laterally (VLS). The regions of lateral spread act as an enhanced source of embers, which are deposited downwind as a dense ember attack (prepared by Professor Jason Sharples).



This is remarkably like the terrain for the proposed Bowmans Creek wind farm.

This is contrary to the advice in the EIS in which **section 7.10.3 Impact Assessment** includes the following statement:

- The risk of fires spreading is affected by topography. Fires increase in speed when burning uphill and decrease in speed when burning downhill.
- PBP recommends that development on wooded slopes steeper than 18° should be avoided if possible (NSW RFS, 2019a).
- The topography within the Project Boundary is characterised by a series of ridges running north-south with moderate to steep slopes (between 1-3 %).

The first and third statements are incorrect and in the case of the third statement the risk should be assessed for the locality including properties surrounding the project site. Properties surrounding the site and the project site have a considerable amount of steep country.

It was noted in **the NSW Bushfire Inquiry** if a fire was not brought under control quickly the fires would escalate into extreme bush fires through the occurrence of one or more blow-up events, which involve a sudden increase in Fireline intensity or rate of spread sufficient to preclude direct control or to upset existing suppression plans.

The most efficient method of bringing fires of these types under control quickly is to use aerial firefighting. Targeting the fire front as it reaches the ridgeline, however it is proposed to build 60 220m tall wind turbines along the top of the ridgelines. This will prevent the use of aerial firefighting the fire will spread quickly.

It should also be noted that research shows that the atmosphere close to the ground (near windfarms) changes temperature, this brings down warmer air and lowers the moisture content in vegetation. The vegetation with lower moisture content will burn a lot more readily.

The NSW Bushfire Inquiry - 31 July 2020 also noted issues regarding **Only one road in and one road out**.

It was noted that many communities were at risks when access is via a single road.

This was recognised in recommendation 31.

Recommendation 31 included:

That, in order to improve bush fire planning and protection of road infrastructure and to ensure communities, freight movers and firefighting agencies have appropriate access and egress in a bush fire event, Government, working with local government as needed:

- develop a formal bush fire risk assessment process for all State roads and bridges, to identify:
 - 'high-risk' communities where access and egress in the event of a fire will be affected, for example rural communities connected by a single road surrounded by bushland.

The proposed Bowmans Creek wind farm includes many roads leading to numerous homes, with 100's of family members living in the homes, that are **Only one road in and one road out**. Access to the Muscle Creek area is via Muscle Creek road, and numerous other roads coming off Muscle Creek road, all are one road in and one road out. In the vicinity of Bowmans Creek, Goorangoola there are numerous one road in and one road out roads. Access to the McCullys gap area is via Sandy Creek Road with numerous other roads coming off Sandy Creek road, all are one road in and one road out. Approximately 15km along Sandy Creek road, the road goes over a large timber culvert and becomes a single lane road until the end of the road is reached 20km out. One 2km section of the single lane road is steep with a steep rock face on one side and a severe drop of on the other side, cars have to stop to squeeze past each other. Muswellbrook Shire Council has also placed a restriction on this section of road limiting it to local traffic and prohibiting heavy vehicles.

Muswellbrook Council sign on Sandy Creek Road



Section 7.10.3 Impact Assessment Includes but is not limited to the following statements:

Risk Assessment

Bush Fire Risk Management Plans (BFRMPs) provide likelihood, consequence and risk ratings for the assets identified by local Bush Fire Coordinating Committee’s (BFMCs).

Table 39 outlines the likelihood, consequence and risk ratings for the assets listed in **Table 37**.

Table 37 is attached below and only includes five properties.

Table 37 - Bushfire Risk Management Plans Listed Assets

BFRMP	Asset ID	Description
Muswellbrook	54	Rural properties on Albano Road and Bowmans Creek Road
	16*	Liddell Coal Mine
	39*	Tree-line properties at McCullys Gap
	56*	Rural properties at Hebden
Singleton	89*	Rural properties at Goorangoola

** Located outside but near the Project Boundary.*

Note the risk assessment is not attached as an appendix and does not allow interrogation of who was involved from the local Bush Fire Coordinating Committee’s. It should be noted the Bush fire brigade Captain for Muscle Creek is one of the main benefactors being an associated landowner hosting wind turbine with the project.

Table 39 - Risk Assessment for Assets Identified in Bushfire RMPs

BFRMP	Asset ID	Description	Likelihood	Consequence	Risk
Muswellbrook	54	Rural properties on Albano Road and Bowmans Creek Road	Likely	Minor	Medium
	16*	Liddell Coal Mine	Likely	Major	Very High
	39*	Tree-line properties at McCullys Gap	Likely	Moderate	High
	56*	Rural properties at Hebden	Likely	Minor	Medium
Singleton	89*	Rural properties at Goorangoola	Likely	Minor	Medium

** Located in close proximity (<5 km) of Project Boundary.*

As previously noted, this is not a risk assessment, a true risk assessment would identify fatalities associated with bushfires and the consequences would always be high. Regarding the risks of fires and bush fires, Epuron have not assessed the risks by considering the level of information available at the time the EIS was prepared and submitted. They have not used information or learnings gained from previous wind farm fires, from Government enquiries particularly the recommendation made after the 2019/20 bush fires, or other industries learnings. They have misrepresented the situation and deceived members of the community, and various Government entities. They have done this trying to minimise scrutiny in this area. They have done this, knowing fires are the second most common type of catastrophic wind turbine accident behind blade failure, knowing about the Capital wind farm fire, and fires at other wind farms in Australia. Everyone who lives in Australia knows how devastating bush fires can be including employees of Epuron and their consultants.

As previously indicated **26 people lost their lives** during the recent bush fires in NSW. Epuron do not care, they just want an approval at any costs.

All the latest reports and information should be used by Epuron, perhaps using the **NSW Bushfire Inquiry** findings and recommendations as the foundation of any fire risk mitigation for the proposed Bowmans Creek wind farm.

The NSW bushfire enquiry used as an example the Royal Commission into the 2009 Black Saturday bush fires in Victoria. Lessons learned from that event, were critical in saving lives during the 2019-20 season.

The 2017 Capital wind farm was approved with minimal fire controls in place and people got lucky no one lost their life. Before the capital wind farm was approved members of the local community raised their fears with the Department of Planning and the developer, about the risks of fire. They were at best assured the risks were manageable and controllable and at worst ignored. Prior to the fire the risks were not managed or controlled they were ignored.

Safety Management is not about luck it is about identifying all of the risks, and if the risks cannot be controlled eliminating the risks.

In line with the recommendations made by the NSW enquiry it was identified there is a need for improved telecommunications, both to ensure the community can access the information it needs to make timely and appropriate decisions, and to enhance firefighting capability.

Issue – Improved telecommunications. The outlying areas of the proposed wind farm do not have a mobile phone service, do not have reliable landlines, rely on satellite internet access & satellite TV (which require electricity) and the power is susceptible to interruption.

Solution – The Approval needs to ensure Epuron or the proponent provide to any homeowner who request one a diesel-powered generator as a backup system and satellite mobile phones including rental. Whilst not eliminating all the communication risks it will go some of the way to assist in an emergency.

Issue - Only one road in and one road out

A Solution as a minimum - The Approval needs to ensure Epuron or the proponent up grade all of the roads to ensure they have a minimum running width to adequately allow for the passing of medium sized water trucks used in firefighting (22,000 litre capacity). Where possible construct additional roads to allow for a second means of egress/exit. Reach agreement with the various landowners to remove any vegetation from the sides of the roads that would support combustion and or have the potential to block the roads and a maintenance regime to maintain the cleared area. Replace the timber culvert on Sandy Creek road with a durable fireproof concrete structure.

It will be suggested that the families who live along these roads should evacuate early. **What is early**, previously people considered evacuation on days with a fire rating of Catastrophic and prepared to leave if the fire rating was Extreme. However, this was based on all firefighting resources being available and used including aerial. With the added risks of the wind turbines, substations, switch yards and numerous additional power lines does that change the risks ratings and families will have to evacuate if the fire rating is Severe or even Very High??? During the summer months families could be spending more time in evacuation centres than at home.

Issue - Fires starting. It has been proven that wind farms start fires for a variety of reasons and any fire that starts when the fire rating is Very High or above has the potential to grow into a Catastrophic event very quickly.

A Solution as a minimum – The Approval needs to ensure Epuron or the proponent ensure the wind farm is turned off and any maintenance field work suspended when the district fire rating is Very High or higher. The wind farm should not recommence operations until the district fire rating has been below Very High for a minimum of 24 hours or 15mm of rain has been received over the area of the whole wind farm. The District would be classified as any area receiving the fire rating for any of the three local government areas encompassed by the wind farm (Singleton, Muswellbrook and Upper Hunter LGA's).

The NSW enquiry also recognised that the lack of water was an issue and dry fire fighting techniques were used where suitable or aerial firefighting was deployed. Dry firefighting techniques include using dozers or similar equipment to push in fire breaks or to attach the fire. Due to the steep terrain in the proposed wind farm dry firefighting would only be a limited option. And aerial firefighting cannot take place near the wind farm. As a last and only resort ground firefighting resources will need to be deployed, ground firefighting relies on a reliable supply of water.

Issue – Lack of water supply close to the fire area.

A Solution as a minimum - The Approval needs to ensure Epuron or the proponent construct concrete firefighting reservoirs throughout the area of the wind farm. The reservoirs would need to be constructed to allow fire trucks to be gravity fed, hold a minimum of 1,000,000 litres each with a minimum total supply of 16 reservoirs. This is in line with planning legislation for homes in the area to ensure they have a reservoir of water for firefighting purposes. As a backup all the access roads constructed for the project need to be capable of allowing the safe access of bulk water tankers to assist in case of a prolonged fire, a bulk tanker would be a tanker capable of supplying a minimum of 45,000 litres per load.

Safety equipment for firefighting.

Recommendation 38 and 39 of the NSW enquiry makes recommendations about adequate personal safety equipment for firefighting.

Recommendation 38 includes,

That, in order to ensure the safety of local landholders on firegrounds, the NSW RFS emphasises the importance of local landholders using protective clothing while firefighting.

Recommendation 39 includes,

That, in order to ensure frontline personnel, have appropriate personal protective clothing during bush fires:

- a) FRNSW review the current design of its bush fire jacket, noting improvements that have been made since 2002 that meet AS/NZS4824:2006 Protective clothing for firefighters, and increase the allocation of bush fire coats to two jackets per member
- b) NSW RFS issue two sets of personal protective clothing to operational members, and others as appropriate

Issue – inadequate personal protective equipment to fight fires for neighbours of the proposed wind farm.

A Solution as a minimum - The Approval needs to ensure Epuron or the proponent provide two sets of personal protective clothing including jackets that meet AS/NZS4824:2006 Protective clothing for firefighters standards to any neighbour that request them. Epuron or the proponent must replace the protective equipment as required and as a minimum every 2 years. Epuron or the proponent should also provide two sets of personal protective clothing including jackets that meet AS/NZS4824:2006 Protective clothing for fire fighters' standards to any new comers to the area.

Neighbours in this case is anyone living within 10km of any wind turbine, bearing in mind how quickly fires can spread.

Any immediate neighbour should if they request be provided with firefighting equipment as a minimum, they should be provided with a 1000l firefighting tank fitted to a trailer and equipped with a pump, hose and spray system that facilitates on and off provisions, adequate ground tools and a last chance water halo system to adequately cover the trailer and any vehicle towing the trailer. Epuron or the Proponent need to provide Initial firefighting training and ongoing training should be provided at not costs to the people who are supplied with this equipment. Registration, running and maintenance costs for the firefighting equipment must be provided by Epuron or the proponent.

Immediate neighbour in this case is anyone living within 5km of any wind turbine.

Recommendation 40 of the NSW enquiry makes recommendations about adequate safety equipment for fire fighting.

Recommendation 40 includes,

That, in order to improve firefighter safety, Government fire authorities:

- a) ensure all light tankers used as part of active frontline bush firefighting operations are fitted with a single point crew protection safety spray system and radiant heat protection blankets as a minimum standard across all NSW fire authorities.
- b) ensure all medium/heavy tankers are fitted with radiant heat protection blankets, wheel and 'halo' sprays fitted as a minimum standard across all NSW fire authorities.
- c) undertake additional research to determine the most appropriate cabin protection for the

different frontline vehicles.

- d) provide ongoing investment for NSW RFS fleet upgrades.

It has been shown that as a last and only resort ground firefighting resources will need to be deployed to fight any fires in the vicinity of the proposed wind farm.

Issue – The firefighting tankers in the area do not meet the requirements as described in recommendation 40.

A Solution as a minimum - The Approval needs to ensure Epuron or the proponent within 12 months of any construction commencing all of the equipment based in the three local Government areas of Singleton, Muswellbrook and Upper Hunter and as described in recommendation 40 is up graded or replaced to meet the recommended requirements.

Recommendation 42 of the NSW enquiry makes recommendations about adequate mental health support.

Recommendation 42 included.

That, to ensure firefighters can access mental health support through GPs, Government work with the Commonwealth Government to:

- a) provide a free mental health screen to firefighters post-fire event and waive any gap payments if additional treatment is required
- b) create a new Medicare Benefits Scheme item number to enable Governments to track demand for mental health services from firefighters over time and ensure an appropriate level of support is available.

Issue – Lack of Mental health support for people impacted by the wind farm.

A Solution as a minimum - The Approval needs to ensure Epuron or the proponent pay for any mental health support for anyone involved in firefighting or impacted by the wind farm in the three local government areas of Singleton, Muswellbrook and Upper Hunter for an uncapped period of time as recommended by their GP or medical provider.

Other issues to be addressed.

The EIS includes but was not limited to the following:

- Electrical Connections – between wind turbines and the on-site substation/s, which will be a combination of underground cable and overhead powerlines linking segments of the site.

Issue - Additional overhead power lines in the area will

- a) increase the number of bird strikes,
- b) shorts between the wires and
- c) wires down,

these issues all have the potential to cause bush fires in the vicinity of the wind farm.

A Solution as a minimum - The Approval needs to ensure Epuron or the proponent ensure that all electrical connections between wind turbines and the on-site substation and any feeder lines to any off-site substations or connections allowing connection to the grid system are underground cables.

Issue – Inadequate Hazard/Risk assessment conducted. The DPIE issued SEAR's for the proposed wind farm

The SEAR's included a section on Hazards/Risks – the EIS did not include an adequate assessment of the Hazards/Risks.

A Solution as a minimum - Epuron need include an assessment of the following:

Bushfire – identify potential hazards and risks associated with bushfires / use of bushfire prone land, including the risks that a wind farm would cause bush fire and any potential impacts on the aerial fighting of bush fires and demonstrate compliance with Planning for Bush Fire Protection 2006 (if located on bushfire prone land).

The DPIE must remember that when assessing the project for approval they also have a role to play by, ensuring they have the correct information and putting adequate measures into the approval or rejecting the approval. The DPIE have an obligation to ensure the safety of the families, the Mums and Dads, the Children and Grandparents who make up the communities who will be impacted.

The Approval needs to ensure Epuron or the proponent, as a minimum must provide adequate resources to prepare for fire risks to ensure the safety of the hundreds of people who will be living with the increased risks of fires and bush fires if the wind farm is approved.

No one wants to get it wrong and live with the guilt of a lost life or lives.

Remember fire risk will increase and firefighting capability will be greatly reduced by the presence of a wind farm.

Could a ground crews fight this fire?



Aerial Attack

An aerial attack can dump a huge amount of fire retardant, or water on a fire in a short space of time. DC-10s can drop about 30,000 litres along a fire control line of about 1 kilometre while MD-87s can drop about 11,000 litres over about 400 metres. Because of their speed, they can go back to a base, reload and quickly be on scene again a long control line can be built in a relatively short space of time.

Erickson S-64 helicopters can drop approximately 9,463 litres of water at any one time and have the capability of reloading from any open water source. During the period from November 1, 2019 to March 31, 2020 the Erickson fleet based in Australia made approximately 10,565 drops.

This capability will not be available to fight bush fires in the vicinity of a wind farm.

Epuron have indicate that the wind turbines can be shut down in the event of a fire, however this does not mitigate any of the risks. They will still be there creating an obstacle to aerial firefighting and even with the turbines shut down as the wind passes through the blades a turbulence will still be created.

67km of new tracks and roads Or it may be 80Km as referenced in the visual assessment.

The 67km of new tracks and roads will also make it easier for people to enter the proposed wind farm and light fires. We have already been subject to this type of behaviour in the past and there is ample evidence of it happening on a regular basis, for example:

Teenage volunteer firefighter charged with arson offences

Police will allege the teenager started several fires, left the scene and then returned to fight them as part of his role as a volunteer.

A teenage volunteer firefighter has been charged with lighting fires on the New South Wales Far North Coast. Detectives from NSW Police have been investigating a series of grass fires between Burringbar and Mooball. More than a dozen fires were lit between October 7 and November 3.

The most recent was a suspicious grass fire started near a property at Stokers Sliding on Tuesday evening. It was extinguished by the NSW Rural Fire Service.

Following extensive inquiries, police stopped a vehicle on Wednesday morning and arrested an 18-year-old man. He was taken to Tweed Heads Police Station and charged with nine counts of deliberately lighting a fire. A search of his home allegedly found a replica pistol, with resulted in another charge. He was refused bail to appear at Tweed Heads Local Court on Thursday.

Police will allege in court the man lit several blazes in the area before returning to respond to the fire as part of his duties as a volunteer.

Those fires raged across 10 million hectares, took 33 lives and destroyed 10,000 homes and other structures. More than 80,000 head of livestock were killed, and millions of native plants and animals were lost.

A lot of bush fires are started every year by birds hitting overhead powerlines or overhead powerlines dropping down to the ground. Epuron have proposed a mix of underground power reticulation and overhead powerlines 30km's. To prevent any fires and subsequent bush fires starting from the additional 30KM's of overhead powerlines all power on site should be reticulated by underground cables. The consent condition needs to include the requirement to reticulate all power on site underground.

Earth moving equipment and supplementary plant for example crushing plants, generators, pumps etc catch fire every year these fires can spread and cause larger fires including bush fires. Industry best practice is for all mobile and fixed plant on site except any road registered vehicles to be fitted with automatic fire suppression and for all road registered vehicles to be fitted with fire extinguishers of 80BE rating. This equipment is available and is a requirement for equipment working on mine sites in the Hunter Valley. The consent conditions needs to include the requirement that all non-road registered equipment and plant is fitted with automatic fire suppression, the consent conditions need to include the requirement for all road registered vehicles to be fitted with a minimum of one 80BE rated fire extinguisher.

Hot work including but not limited to grinding, oxy cutting & heating, and welding cause multiple fires every year including bush fires. A hot work protocol needs to be included as one of the requirements of the consent conditions.

The Risk to my Family and myself.

If the Bowmans Creek wind farm is approved and constructed, I see the increased fire and bush fire risk for my family and myself as unacceptable.

We live nearly 17km from the New England Highway along Sandy Creek road. This is on the wrong side of the section of road that is a 2km section of single lane road it is steep with a steep rock face on one side and a severe drop of on the other side, cars have to stop to squeeze past each other. Muswellbrook Shire Council has also placed a restriction on this section of road limiting it to local traffic and prohibiting heavy vehicles. Some of the wind turbines are approximately 3kms from this section of road.

We also own three other properties at the very end of Sandy Creek road with the front gate being approximately 20km from the New England Highway. In total we own approximately 3,500 acres and run it as a single enterprise, an aggregation of the properties as cattle grazing business. We rely on the property as our sole source of income. The property is not just two big paddocks there are many kilometres of fencing, extensive infrastructure including cattle yards and over \$1m worth of plant to manage the business. This will all be at risk if a fire starts on the wind farm or if a bush fire cannot be controlled because of the wind turbines.

We don't run the property from our lounge room we have to go out and work the property. Sometimes depending on the equipment being used we may be at least 3hours travel time from Sandy Creek Road remembering this is still 20km from the New England Highway. Our property is steep country with areas heavily timbered a lot of the access tracks are located through the heavily timbered country.

When we are on the majority of the property, we do not have any mobile phone or even local radio reception. At our house we rely on an unreliable land line and we can sometimes use our mobile phone through our Satellite NBN internet. Our internet and TV services are provided through Satellite connections and these go down regularly. If a fire alert were issued whilst we are on the farm, we would not receive it and if we are in the house, we may receive it.

We cannot afford to evacuate every time a very high fire rating is placed in the area, we would hardly be running the business for 4 - 5 months of the year.

At one community session and in various sections of the EIS Epuron have indicated we could plant trees around our house to act a visual screen to reduce our visual exposure to the wind turbines. I have also read other wind farm approvals that indicate this is one of the conditions placed on numerous wind farms to assist with visual impacts. This is obviously a voluntary condition for landowners. However, notwithstanding we didn't buy properties with views to then hide those views, vegetation that is substantial enough to screen 220m tall wind turbines will create an unacceptable fire danger for our home.

As advised by The RFS on their web site our home and farms are Vegetation Category 1. Vegetation Category 1 is considered to be the highest risk for bush fire. It is represented as red on the bush fire prone land map and will be given a 100m buffer. This vegetation category has the highest combustibility and likelihood of forming fully developed fires including heavy ember production. Vegetation

Category 1 consists of: Areas of forest, woodlands, heaths (tall and short), forested wetlands and timber plantations.

Wind farms do cause fires, they prohibit the use of the most acceptable firefighting methods (aerial) and the Bowmans Creek wind farm will have numerous wind turbines approximately 1km from my property/business boundary and approximately 3km from our home.

My wife suffers from Epilepsy, Epileptic seizures can be triggered by many events including stress, the stress on a hot summer's day worrying about a wind farm causing a fire or preventing a fire to be adequately controlled less than 1km from our business could be enough to trigger a seizure. The NSW enquiry also made comment regarding the need to evacuate as inherently stressful. One woman's submission described leaving her property. She and her 15-year-old son were in one car, and her husband behind them in the second car:

My husband had difficulty getting out due to flames in the grass, but he managed to stamp on them and then drive through. My son ran back to me in the car running over/around the grassfire ... I wasn't thinking straight and realised I was driving with the handbrake on.

Hundreds of people die every year because of suffering an Epileptic seizure.

I also suffer from Asthma; Asthma also has many triggers and even with medication bush fire smoke can still trigger fatal asthma attacks.

The NSW enquiry made recommendations regarding public health messages recommendation 35.

Recommendation 35 Included:

That, in order to improve the provision of evidence-based public health messaging about air quality during bush fire events, Government develop a public education campaign and supporting systems before the next bush fire season.

When we purchased our properties, we knew the shortfalls with the properties, including the communication issues however the risks on balance were not considered so great that we would not purchase the properties.

If the proposed Bowmans Creek wind farm is approved and built, the risks profile will change to the extent that we will not be able to safely live on our properties and run our business.

We believe the approval should include acquisition rights for people in our situation. The acquisition would need to include compensation to allow us to buy a property with similar attributes and not be financially disadvantaged.

Visual Impact and Assessment

The Impacts of the proposed Bowmans Creek wind farm has to be assessed to meet the criteria of the:

Wind Energy: Visual Assessment Bulletin – For State Significant wind development December 2016.

The Wind Energy: Visual Assessment Bulletin in its:

- **Purpose statement** includes the following:
 - This *Visual Assessment Bulletin* has been developed **to guide the appropriate location** of wind energy development in NSW and to establish an assessment framework for the assessment of visual impacts associated with wind energy.
 - The Bulletin **provides guidance** on site selection, environmental assessment and decision-making.
- **Objective's statement** includes the following:
 - provide the community, industry and decision-makers with a framework for visual impact analysis and assessment that is focused on minimising and managing the most significant impacts;
 - facilitate improved wind turbine and ancillary infrastructure siting and design during the pre-lodgement phase of a project, and encourage early consideration of visual impacts to minimise conflicts and delays where possible, and provide for a better planning outcome;
 - provide the community and other stakeholders with greater clarity on the process along with an opportunity to integrate community landscape values into the assessment process; and
 - provide greater consistency in assessment by outlining appropriate assessment terminology and methodologies.

The Wind Energy: Visual Assessment Bulletin also includes the following:

Stage1:PreliminaryEnvironmentalAssessment(pre-lodgement)

At the scoping and design phase, the proponent must undertake a preliminary environmental assessment that considers the landscape in which a proposed wind energy project will be located. The analysis must include:

- undertaking community consultation to establish key landscape features valued by the community, **key viewpoints in the area** (both public and private) along with information about the relative scenic quality of the area;
- production of a map detailing key landscape features (**informed by community consultation and any ground- truthing undertaken**), the preliminary wind turbine layout, **the location of dwellings** and key public viewpoints and an overlay of the wind resource; and
- results of the application of the preliminary assessment tools for both the visual magnitude and multiple wind turbine parameters.

Community consultation

Consultation with the community at this early stage may be broad, but should include discussions about the proposed project area, likely corridors for development, or preliminary turbine layouts **and must involve people from the visual catchment.**

The purpose of early communications is to:

- establish the key landscape features, areas of scenic quality and key public viewpoints valued by that community;
- allow the community to have input into the ranking of those features and scenic quality into high, moderate or low visual significance;
- inform landholders about the proposed project area, likely corridors for development, preliminary turbine layouts and access routes; and
- inform the community about the proposed project, listen to the community's concerns and suggestions for alternative siting and location designs, and discuss potential visual impacts.

Epuron

Did not meet the requirements of the **Wind Energy: Visual Assessment Bulletin – For State Significant wind development December 2016** in relation to **Stage1: Preliminary Environmental Assessment(pre-lodgement).**

Consultation

Epuron contacted me prior to the Public Meeting Muswellbrook Shire Council called in July 2018.

Julian Kasby organised a meeting at our home, present were Sandra Wood (my wife) Julian Kasby and a second person from Epuron and myself.

During the meeting Julian informed Sandra and me about Epuron who they were, and they were looking at the possibility of building a wind farm at Bowmans Creek. Julian informed us that we would not see any infrastructure from our home however they would like to discuss the possibility of a power line running from the wind turbines to the power lines feeding from the power stations.

I told Julian I wasn't really interested I didn't want the powerline impeding on our visual views of the property and we were looking at the option of building a new house sometime in the future on one of the ridges overlooking our property and the Hunter Valley. I told Julian we were very lucky we had managed to purchase an aggregation of properties that were not only good grazing but very beautiful with distinct hills, waterfalls and timbered creek lines fenced off from cattle.

I also asked where Bowmans Creek was and the location of the proposed wind towers, he showed both Sandra and I on a small map and indicated the wind turbines would only be erected at the top of Bowmans Creek.

At the end of the meeting, I wasn't concerned thinking the wind farm would not impact on us at all. When the meeting organised by Muswellbrook Shire Council for July 2018 was advertised because we had been informed by Julian that we would not see any infrastructure we didn't attend. I actually wondered what all the fuss was about.

In August 2018 all that changed when Epuron constructed a 120m tall wind monitoring masts on a ridgeline approximately 3.5km to the East of our home. Attached below is a photograph of the wind monitoring masts taken from our home.



120m tall wind monitoring masts

To say I was surprised is an understatement. We were told we would not see any infrastructure from our home and we not made aware that the wind monitoring mast was being erected.

Subsequent enquiries to Epuron confirmed the wind monitoring mast did not meet the requirements under the NSW SEPP 2007 as an exempt development (Clause 39 (2)). The requirements of the SEPP require a temporary wind monitoring mast to be below 110m in height and to only be in place for 30 months. Note the temporary wind monitoring mast has been in place more than 30 months.

Due to the erection of the wind monitoring masts Sandra attended the next community meeting in October 2018 and came out of the meeting really upset when she was shown the proposed locations of the wind monitoring towers. Our home was to be inundated with wind turbines towering over the home.

Between Sandra and I we would be one of the largest landowners (between us we own 3500 Acres) who will be impacted by the proposed Bowmans Creek wind farm however Epuron have not at any stage:

- Discussed Key viewpoints in the area.
- The relative scenic quality of the area.
- Had input into the ranking of those features and scenic quality into high, moderate or low visual significance.
 - Or had the opportunity to have input.
- Formally inform us about the proposed project area or
- discuss potential visual impacts.
- Ever discussed the impacts on our two homes located on our properties Arkana and Happy Valley.

The Wind Energy: Visual Assessment Bulletin – For State Significant wind development December 2016 also includes:

Visual Magnitude

Refers to Figure 2 (attached below) as a preliminary Assessment tool, the Bulletin also includes. Conversely, there may be circumstances where dwellings or key public viewpoints located above the line may **require further consideration due to topography or other landscape features. The further detailed assessment and ground-truthing at the visual assessment stage must also consider impacts on these dwellings** or key viewpoints. The relative position of the viewpoints in relation to a dwelling is also an important consideration that should be outlined in the EIS. For example, views to the turbines from the primary living areas of the dwelling would be considered more important than views from non-habitable areas.

the EIS does not adequately take into consideration the impact of the topography or other landscape features or adequate ground-truthing.

Table 17 from the EIS The EIS section **Visual Performance Evaluation to 4.4 km where Screening will be Offered**, includes commentary on two of the homes we own these being identified as H8 – 1 and H12 – 1.

The table includes the following on two of our homes.

ID	Impact Summary
H8 - 1	- T57 is located 4.03 km (Far Middleground) from dwelling H8-1. - The MWTT diagram illustrates 1 wind turbine would be visible (discounting vegetative screening) between the black and blue line with additional wind turbines extending beyond the blue line south to south-east of the dwelling. - The dwelling curtilage includes some tree cover with views toward the wind turbine partially screened or filtered from the dwelling and curtilage. - The wind turbine within one 60-degree sector is not considered to dominate the available viewshed. Whilst the wind turbine may be visible the potential for visual impact is not significant and partially mitigated by distance and extent.
H12 -1	- T51 is located 3.02 km (Near Middleground) from dwelling H12-1. The MWTT diagram illustrates 14 wind turbines would be visible (discounting vegetative screening) between the black and blue line with an additional 9 wind turbines extending beyond the blue line east to south of the dwelling. - Landform and tree cover beyond the dwelling may offer some filtering of views toward wind turbines east to south south-east from the dwelling and at various locations from the surrounding curtilage. - Wind turbines within two 60-degree sectors are not considered to dominate the available viewshed. The wind turbines do not impart a vertical dominance over the dwelling or surrounding curtilage. - Whilst wind turbines may be visible the potential for visual impact is not significant and partially mitigated by distance and extent. See additional mitigation in Table 18.

Extracts from Table 17 for the two properties Epuron have identified on our properties.

It should be noted: Regarding H12 – 1 the wording in the EIS indicates the MWTT diagram illustrates **14 wind turbines** would be visible (discounting vegetative screening) between the black and blue line with an additional 9 wind turbines extending beyond the blue line east to south of the dwelling.

Appendix H Visual Assessment includes: Section 9.8 Visual Performance Evaluation Overview

The visual performance objectives are set out in **Tables 9-1 to 9-41** for all non-associated dwellings out to 4.4km from the wind turbine locations.

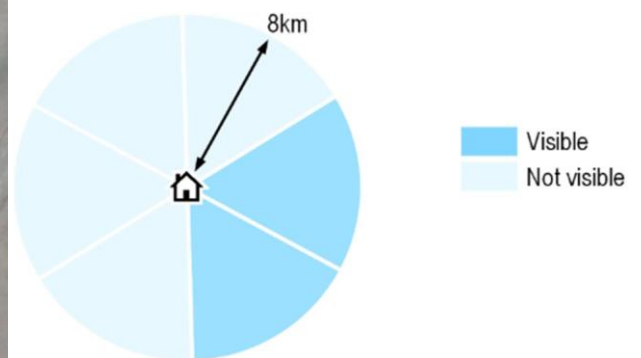
The table includes the following for the property identified as H12 – 1 Our home - Attached below.

Dwelling H12-1

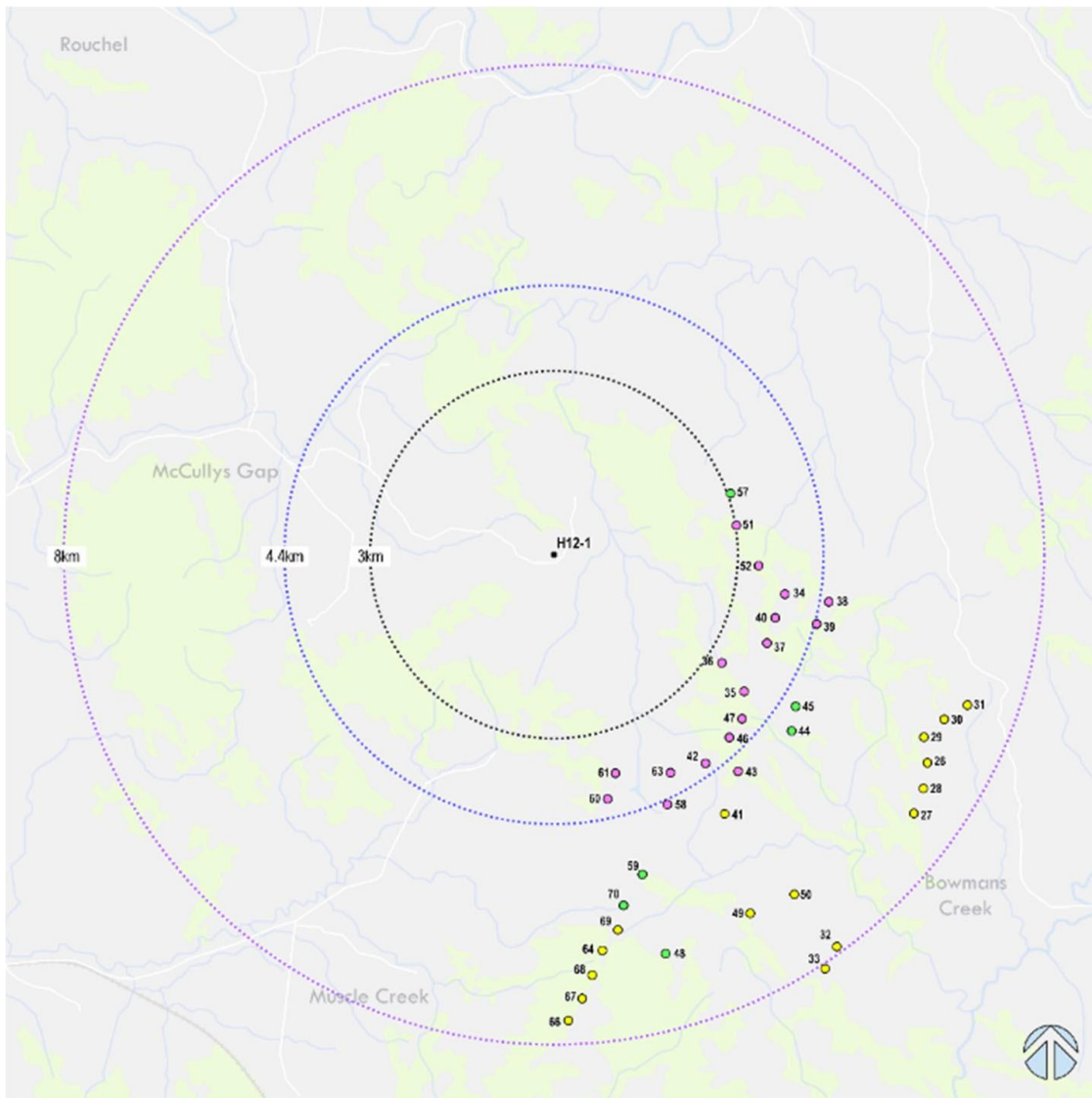
9.8.49 Viewpoint H12-1 aerial photo



9.8.50 Viewpoint H12-1 Visibility rose



9.8.52 Viewpoint H12-1 Multiple Wind Turbine Tool diagram



Wind turbine legend – yellow not visible, purple visible, green blade only visible

Table 9-17 Viewpoint H12-1, Rural dwelling VIZ2

Visual Performance Objectives	Visual Influence Zone 2	Evaluation
Visual Magnitude	Objective: Manage impacts as far as practicable, justify residual impacts, and describe proposed mitigation measures below the black line. Consider screening between the blue line and the black line.	Closest wind turbine (51) is located 3.02km (Near Middleground) from dwelling H12-1. The MWTT diagram illustrates 14 wind turbines would be visible (discounting vegetative screening) between the black and blue line with an additional 9 wind turbines extending beyond the blue line east to south of the dwelling. Landform and tree cover beyond the dwelling may offer some filtering of views toward wind turbines east to south south east from the dwelling and at various locations from the surrounding curtilage. Wind turbines within two 60-degree sectors are not considered to dominate the available viewshed. The wind turbines do not impart a vertical dominance over the dwelling or surrounding curtilage. Whilst wind turbines may be visible the potential for visual impact is not significant and partially mitigated by distance and extent. The Bulletin acknowledges that wind turbines are very large structures that will be visible in the landscape.
Landscape Scenic Integrity	Objective: Wind turbines should not cause significant modification of the visual catchment.	Overall wind turbine visibility will not cause any significant modification to the visual catchment with wind turbines not becoming a major element in the landscape or dominating

Table 9-17 Viewpoint H12-1, Rural dwelling VIZ2

Visual Performance Objectives	Visual Influence Zone 2	Evaluation
	Turbines may be visually apparent and could become a major element in the landscape but should not dominate the existing visual catchment. The Bulletin notes that in a Moderate Scenic Quality Class, wind energy projects should not cause significant modification of the visual catchment. Turbines may be visually apparent and could become a major element in the landscape.	The existing visual catchment due to distance and extent within existing view. The wind turbines will not become a major element in the landscape from this view location.
Key Feature Disruption	Objective: Minimise impact of wind turbines or ancillary facilities that result in the removal or visual alteration/disruption of identified key landscape features. This includes any major or visually significant landform, waterform, vegetation or cultural features that have visual prominence or are focal points.	The visible wind turbines will not result in the removal or visual alteration of key landscape features, cultural features or focal points in the landscape.
Multiple Wind Turbine Effects	Objective: Level 2 (moderate sensitivity) – wind turbines visible within the	Visible wind turbines within 8km of the view location are compliant with the Multiple Wind Turbine Effects performance objectives.

Table 9-17 Viewpoint H12-1, Rural dwelling VIZ2

Visual Performance Objectives	Visual Influence Zone 2	Evaluation
	effective horizontal views in three or more 60° sectors.	
Ancillary electrical infrastructure	No performance objectives are noted in the Bulletin.	Ancillary electrical infrastructure including substations, internal electrical reticulation and 330kV transmission line will not be visible from the dwelling.
Mitigation and management options		Proponent to offer neighbour agreement and/or screening to the landowner.

In reference to the 14 wind turbines; “It should be noted: Regarding H12 – 1 the wording in the EIS indicates the MWTT diagram illustrates **14 wind turbines** would be visible (discounting vegetative screening) between the black and blue line with an additional 9 wind turbines extending beyond the blue line east to south of the dwelling”.

The Viewpoint H12 – 1 Multiple wind turbine tool Wind turbine legend – yellow not visible, purple visible, green blade only visible, indicates 17 wind turbines (purple) would be visible being wind turbines identified as: 34, 35, 36, 37, 38, 39, 40, 42, 43, 46, 47, 51 (closest), 52, 58, 60, 61, & 63.

The EIS is trying to discount any wind turbines that are visible more than 4.4km away although they acknowledge that the turbines will be visible and references the Bulletin acknowledges that wind turbines are very large structures that will be visible in the landscape. The Bulletin includes various sections including:

Background in reference to the Bulletin - Includes.

The assessment of potential visual impacts on the landscape that may arise from wind energy projects is different from other forms of SSD in a number of ways:

- wind turbines are large structures which are often required to be located on ridgelines and elevated positions to capture wind resources;
- **wind turbines have distinctive outlines and can be over 150 metres in height;**
- the size, colour and movement of wind turbines contributes to their visibility within the rural landscapes where they are predominantly located;
- **wind energy projects, including ancillary infrastructure, can cover large areas, sometimes more than 100 square kilometres;**

The proposed wind turbines for the Bowmans Creek wind farm are 220m tall this is 46% taller than envisaged in the Bulletin.

The proposed area for the Bowmans Creek wind farm is nearly 170 square kilometres this is 70% larger than envisaged in the Bulletin.

The impact the 17 visible wind turbines would have on our home – Diamond T.

In relation to the impact the 17 visible wind turbines would have on our home. The view from our home and garden naturally draws your eye towards the East. The house is built on the lower part of an Eastern facing slope, with the topography of the slope running from the slope behind the house towards the South, and the valley naturally forming to the East. Reference photos attached, Home photo's 1, 2, & 3.



Photo 1 from our Home

Showing the view to the East of our Home, the wind turbines will be visible along the skyline from above the middle of the two forefront trees (in front of the dam) all the way to the right of the photo.



Photo 2 from our Home

Showing the view to the East of our Home, the wind turbines will be visible along the whole skyline from above the left side of the photo (linking up with photo 1 above), to the right side of the photo.



Photo 3 from our Home

Showing the view to the East South East of our Home, this photo links up with photo 2. The eye is naturally drawn from the middle of this photo towards the natural valley shaped view scape in photos 1 and 2.

The impressive rock/cliff formation to the right of this photo (Darkies Hill) is at approximately 500m AHD and approximately 2km from the house. This will give you some feel for the height of the wind turbines ranging from 746m AHD all the way up to 911m AHD.

How high will the wind turbines be compared to our Home?

The information in the table below indicates how high the wind turbines will be compared to our home.

Our home is at approximately 350m AHD and the 17 wind turbines are as follows (Reference EIS Appendix D - Wind Turbine Generator Towers, Coordinates and Maximum Heights).

Table indicating how high the wind turbines will be relative to our Home Diamond T.

ID	Latitude	Longitude	Base elevation (AHD m)	Tip elevation (AHD m)	Tip Elevation above our home
34	-32.2292	151.075	616	836	486m
35	-32.2434	151.068	684	904	554m
36	-32.2392	151.064	674	894	544m
37	-32.2364	151.072	657	877	527m
38	-32.2305	151.083	528	748	398m
39	-32.2337	151.081	621	841	491m
40	-32.2327	151.074	673	893	543m

42	-32.2539	151.061	589	809	459m
43	-32.2552	151.067	599	819	469m
46	-32.2502	151.065	691	911	561m
47	-32.2475	151.067	688	908	558m
51	-32.2190	151.067	606	826	476m
52	-32.2250	151.071	617	837	487m
58	-32.2599	151.054	526	746	396m
60	-32.2589	151.044	472	692	342m
61	-32.2552	151.045	526	746	396m
63	-32.2552	151.055	539	759	409m

In relation to our home the recommendations indicated in the table below

Visual Performance Objectives	Visual Influence Zone 2	Evaluation
Mitigation and management options		Proponent to offer neighbour agreement and/or screening to the landowner.

Screening will not work due to the height of the wind turbines compared to our home. The added risk of screening is the location of any trees or shrubs is the added fire risks. We live in an area that is classified as **Category 1** advised by The RFS on their web site our home and farms are Vegetation Category 1. Vegetation Category 1 is considered to be the highest risk for bush fire. It is represented as red on the bush fire prone land map and will be given a 100m buffer.

Epuron have approached me regarding a neighbour agreement **Reference (Attachments 7, 7A, 7B & 7C)**. As discussed previously this would make us surfs on our own property and does not align with any of the recommendations made by the Wind Farm Commissioner regarding neighbour agreements **Reference (Attachment 8)**.

Appendix H Visual Assessment includes: Section 9.8 Visual Performance Evaluation Overview

The visual performance objectives are set out in **Tables 9-1 to 9-41** for all non-associated dwellings out to 4.4km from the wind turbine locations.

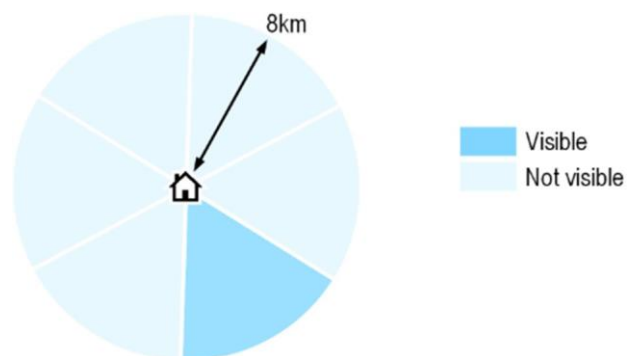
The table includes the following for the property identified as H8 – 1 another home we own - Attached below.

Dwelling H8-1

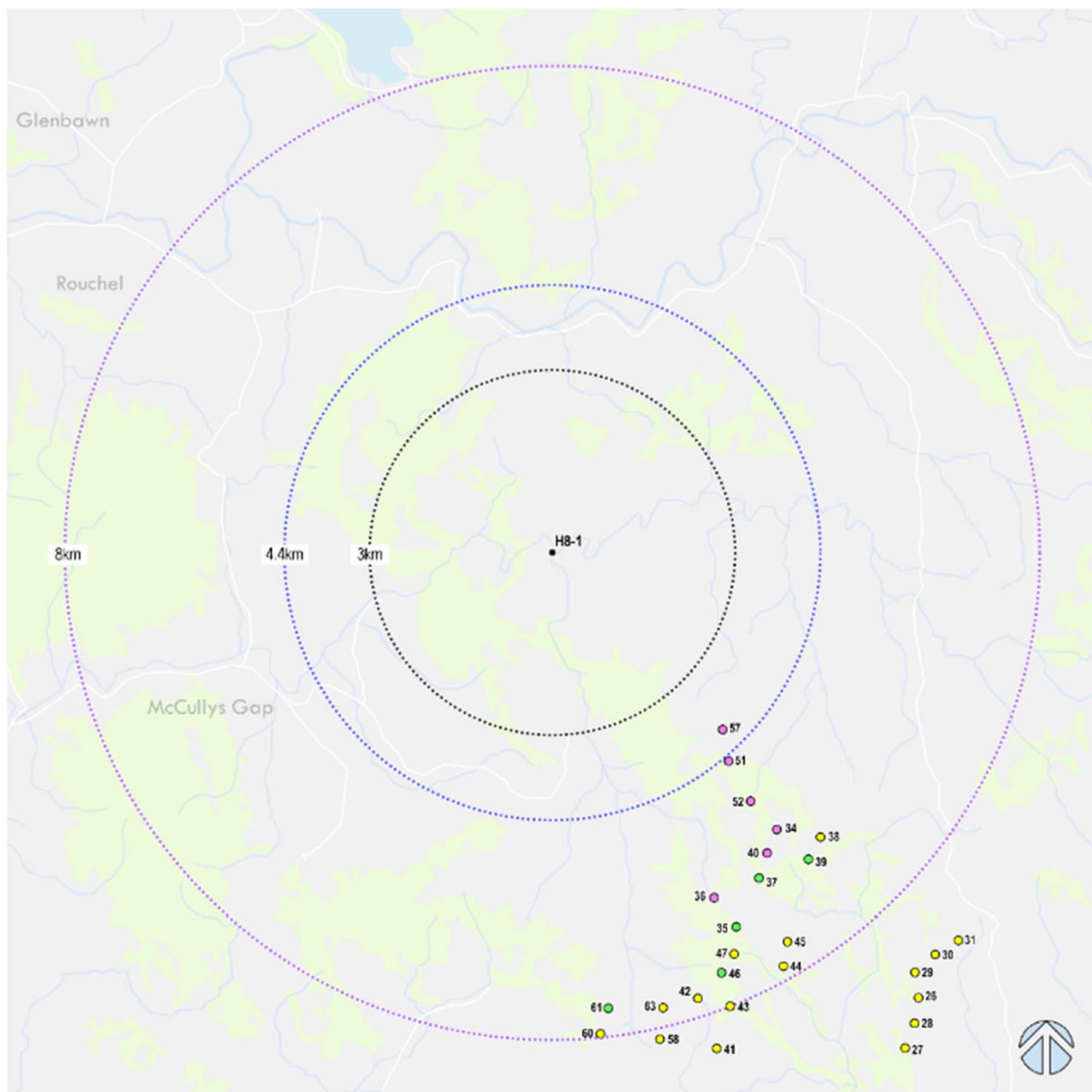
9.8.42 Viewpoint H8-1 aerial photo



9.8.44 Viewpoint H8-1 Visibility rose



9.8.45 Viewpoint H8-1 Multiple Wind Turbine Tool diagram



Wind turbine legend – yellow not visible, purple visible, green blade only visible

Table 9-15 Viewpoint H8-1, Rural dwelling VIZ2

Visual Performance Objectives	Visual Influence Zone 2	Evaluation
Visual Magnitude	Objective: Manage impacts as far as practicable, justify residual impacts, and describe proposed mitigation measures below the black line. Consider screening between the blue line and the black line.	Closest wind turbine (57) is located 4.03km (Far Middleground) from dwelling H8-1. The MWTT diagram illustrates 1 wind turbine would be visible (discounting vegetative screening) between the black and blue line with additional wind turbines extending beyond the blue line south to south east of the dwelling. The dwelling curtilage includes some tree cover with views toward the wind turbine partially screened or filtered from the dwelling and curtilage. The wind turbine within one 60-degree sector is not considered to dominate the available viewshed. Whilst the wind turbine may be visible the potential for visual impact is not significant and partially mitigated by distance and extent. The Bulletin acknowledges that wind turbines are very large structures that will be visible in the landscape.
Landscape Scenic Integrity	Objective: Wind turbines should not cause significant modification of the visual catchment. Turbines may be visually apparent and could become a major	Overall wind turbine visibility will not cause any significant modification to the visual catchment with wind turbines not becoming a major element in the landscape or dominating the existing visual catchment due to distance and extent within existing view.

Table 9-15 Viewpoint H8-1, Rural dwelling VIZ2

Visual Performance Objectives	Visual Influence Zone 2	Evaluation
	element in the landscape but should not dominate the existing visual catchment. The Bulletin notes that in a Moderate Scenic Quality Class, wind energy projects should not cause significant modification of the visual catchment. Turbines may be visually apparent and could become a major element in the landscape.	The wind turbines will not become a major element in the landscape from this view location.
Key Feature Disruption	Objective: Minimise impact of wind turbines or ancillary facilities that result in the removal or visual alteration/disruption of identified key landscape features. This includes any major or visually significant landform, waterform, vegetation or cultural features that have visual prominence or are focal points.	The visible wind turbines will not result in the removal or visual alteration of key landscape features, cultural features or focal points in the landscape.
Multiple Wind Turbine Effects	Objective: Level 2 (moderate sensitivity) – wind turbines visible within the effective horizontal views in three or more 60° sectors.	Visible wind turbines within 8km of the view location are compliant with the Multiple Wind Turbine Effects performance objectives.

Table 9-15 Viewpoint H8-1, Rural dwelling VIZ2

Visual Performance Objectives	Visual Influence Zone 2	Evaluation
Ancillary electrical infrastructure	No performance objectives are noted in the Bulletin.	Ancillary electrical infrastructure including substations, internal electrical reticulation and 330kV transmission line will not be visible from the dwelling.
Mitigation and management options		Screening (between the blue line and the black line) will be offered to the landowner in accordance with the consent conditions.

In reference to the 1 wind turbine; “It should be noted: Regarding H8 – 1 the wording in the EIS indicates the MWTT diagram illustrates **1 wind turbines** would be visible (discounting vegetative screening) between the black and blue line with an additional 9 wind turbines extending beyond the blue line east to south of the dwelling”.

The Viewpoint H8 – 1 Multiple wind turbine tool Wind turbine legend – yellow not visible, purple visible, green blade only visible, indicates 6 wind turbines (purple) would be visible being wind turbines identified as: 34, 36, 40, 51, 52, & 57 (closest).

The EIS is trying to discount any wind turbines that are visible more than 4.4km away although they acknowledge that the turbines will be visible and references the Bulletin acknowledges that wind turbines are very large structures that will be visible in the landscape. The Bulletin includes various sections including:

Background

The assessment of potential visual impacts on the landscape that may arise from wind energy projects is different from other forms of SSD in a number of ways:

- wind turbines are large structures which are often required to be located on ridgelines and elevated positions to capture wind resources;
- **wind turbines have distinctive outlines and can be over 150 metres in height;**
- the size, colour and movement of wind turbines contributes to their visibility within the rural landscapes where they are predominantly located;
- **wind energy projects, including ancillary infrastructure, can cover large areas, sometimes more than 100 square kilometres;**

The proposed wind turbines for the Bowmans Creek wind farm are 220m tall this is 46% taller than envisaged in the Bulletin.

The proposed area for the Bowmans Creek wind farm is nearly 170 square kilometres this is 70% larger than envisaged in the Bulletin.

The impact the 6 visible wind turbines would have on our other home Arkana (H8 – 1).

In relation to the impact the 6 visible wind turbines would have on our home.

How high will the wind turbines be compared to our Home Arkana?

The information in the table below indicates how high the wind turbines will be compared to our home.

Our home is at approximately 350m AHD and the 6 wind turbines are as follows (Reference EIS Appendix D - Wind Turbine Generator Towers, Coordinates and Maximum Heights).

Table indicating how high the wind turbines will be relative to our Home Arkana.

ID	Latitude	Longitude	Base elevation (AHD m)	Tip elevation (AHD m)	Tip Elevation above our home Arkana
33	-32.2845	151.081	525	745	485m
36	-32.2392	151.064	674	894	634m
40	-32.2327	151.074	673	893	633m
51	-32.2190	151.067	606	826	766m
52	-32.2250	151.071	617	837	577m
57	-32.2143	151.066	548	768	508m

In relation to our home Arkana the recommendations indicated in the table below

Visual Performance Objectives	Visual Influence Zone 2	Evaluation
Mitigation and management options		Screening (between the blue line and the black line) will be offered to the landowner in accordance with the consent conditions.

Screening will not work due to the height of the wind turbines compared to our home. The added risk of screening is the location of any trees or shrubs is the added fire risks. We live in an area that is classified as **Category 1** advised by The RFS on their web site our home and farms are Vegetation Category 1. Vegetation Category 1 is considered to be the highest risk for bush fire. It is represented as red on the bush fire prone land map and will be given a 100m buffer.

And I am not sure of the full context of the Evaluation *Screening (between the blue line and the black line) will be offered to the landowner in accordance with the consent conditions.* The land between the blue and black line also includes land owned by my neighbours.

In relation to our home Arkana, this property is not accessible without contacting Sandra (my wife) or myself, this did not happen. Ground truthing has not been carried out regarding this property.

In relation to another home, we own Happy Valley it would also be within 4.4km of the closest wind turbine however there is no reference to that home in the EIS. Ground truthing would have also indicated this property will be impacted if the wind farm is approved.

Epuron have consulted with me (and may I say the consulting has been very weak) regarding our home at Diamond T. Epuron have not consulted with Sandra or myself regarding our homes at Arkana or Happy Valley. The first we knew Arkana would be impacted was when we read the EIS, and we did not know the home at Happy Valley had been missed until we read the EIS.

The Wind Energy: Visual Assessment Bulletin also includes a table indicating the Visibility distance zones (**Table 6 attached below**) The visual performance objectives as attached for our properties identified as H8 – 1 and H12 – 1 include in the table for the Criteria “Visual Performance Objectives” – Visual magnitude for this criterion our home at Arkana (H8 – 1) has been Evaluated as Far Middleground and our home where we live (Diamond T) has been evaluated as Near Middleground.

Ground truthing has not been carried out on the Visual magnitude in reference to the material used for the basis of Table 6 The report prepared by Sullivan it can be demonstrated from the evaluation of this report (attached below) our home at Arkana would have a visibility rating of “5”, our home where we live at Diamond T would have a visibility rating of “6” and the home that has not been assessed would have a visibility rating of “5”.

These ratings rank all three of our homes views of the multiple wind turbines as a **Major focus of visual Attention**.

The research conducted by Sullivan –

Wind Turbine Visibility and Visual Impact Threshold Distances in Western Landscapes

Robert G. Sullivan Program Manager/Coordinator Environmental Science Division Argonne National Laboratory Argonne, IL

Includes the following observations:

- 377 observations of five wind facilities in Wyoming and Colorado were made under various lighting and weather conditions.
- The facilities were found to be visible to the unaided eye at >58 km under optimal viewing conditions, with
- turbine blade movement often visible at 39 km.
- Under favorable viewing conditions, the wind facilities were judged to be major foci of visual attention at up to 19 km. and
- likely to be noticed by casual observers at >37 km.
- A conservative interpretation suggests that for such facilities, an appropriate radius for visual impact analyses would be 48 km.
- that the facilities would be unlikely to be missed by casual observers at up to 32 km. and
- that the facilities could be major sources of visual contrast at up to 16 km.

It should be noted the observations were on three wind farms Cedar Creek, Seven Mile Hill wind farm & Dunlap Ranch wind energy project. **The wind turbines tip height was 119m at Cedar creek and 117m at the other two wind farms.**

The report also includes the following;

In order to address scenic resources, the Bureau of Land Management (BLM) employs the Visual Resource Management (VRM) system (BLM, 1984). This system provides a means of systematically describing and evaluating potential impacts on the visual integrity and scenic qualities of affected landscapes. It defines a visual impact as the contrast that observers perceive between an existing landscape and a proposed project or activity (BLM, 1986a). The VRM Class Objectives are determined through the BLM's land use planning process. These management classes guide the BLM on the appropriate level of landscape contrast allowed on public lands. The VRM process begins with the Visual Resource Inventory (VRI), which documents the scenic quality, sensitivity, and relationship of distance (BLM, 1986b). Then, through the land use planning process, other management issues are considered; adjustments to VRM classes may be made to resolve resource allocation conflicts.

The VRM system specifies **three distance zones: "foreground-middleground" (0 to 3-5 mi) (4.83 – 8.045Km), "background" (3-5 to 15 mi) (4.83 – 8.045km to 24.14Km), and "seldom seen" (beyond 15 mi).** BLM's VRI Manual 8410-1 (BLM, 1986b) indicates that these zone boundaries are tied to landscape characteristics, such as "the point where the texture and form of individual plants are no longer apparent in the landscape" (for the foreground-middleground zone), that are associated with potential impact levels. The foreground-middleground zone is described as the distance zone "where management activities might be viewed in detail" and where "changes are more noticeable and are more likely to trigger public concern," with similar boundary designations/descriptions for the other zones. The VRI manual asserts that the VRM distance zones are important to VRI sensitivity analyses that measure the public's concern for the visual qualities of an area, and provide data used during the land use planning process.

The report indicates the wind turbines could be 120m tall including the following commentary.

The height of utility-scale wind turbines may exceed 400 ft, with dozens of widely spaced wind turbines per facility. The enormous height of the wind turbines and the size of large arrays can make them visible for very long distances, particularly in the western United States, where atmospheric conditions in some locations and under some circumstances lead to extended visibility. Potentially strong color contrast and blade motion can also attract views and increase long-distance visibility.

The report does not indicate that **at eight kilometres, turbines and objects recede into the background in terms of visibility.**

And the report does not envisage wind turbines with a tip height of 220m.

The Bulletin also indicates that Table 6 Appendix 1 (**attached below**) is based on the research conducted by Sullivan et. al. (2012), Bishop (2002), Shang and Bishop⁷ (1999) and others.

However this is not the case the findings from Sullivan are as attached below, and this is for wind turbines with a maximum tip height of 119m.

Table 6 is not based on the research conducted by Sullivan et. al. (2012), Bishop (2002), Shang and Bishop⁷ (1999) and others.

Sullivan's study included A review of the visibility ratings for each rating level provides data needed to develop threshold distances that may be appropriate for wind facilities in settings similar to those observed in study.

Summary of Observations with Visibility Rating of "1"

Maximum observed distance: 58.3 km (36.2 mi)

Minimum observed distance: 20.9 km (13.0 mi)

As noted above, a visibility rating of "1" describes facilities near the limit of visibility. In this study, the maximum distance at which turbines were visible was 58.3 km (36.2 mi). For most observations, the turbines were not visible at this distance, and while it is likely that in other locations on even clearer days and with different facilities, this distance might be extended slightly, in the authors' judgment, this is a reasonable practical limit, and visibility beyond this distance may be regarded as exceptional.

It should be noted that average visibility ratings of "1" at shorter distances are almost all observations made when the wind turbines were shaded, a circumstance that reduces visual contrast between the turbines and their visual backdrop, or, for the Seven Mile facility, when views of the facility were partially obstructed.

Summary of Observations with Visibility Rating of "2"

Maximum observed distance: 54.7 km (34.0 mi)

Minimum observed distance: 15.6 km (9.7 mi)

Recommended threshold distance: 48 km (30 mi)

As noted above, a visibility rating of "2" describes facilities that would likely be missed by casual observers but would be visible when scanning the landscape or looking closely at an area, without extended viewing. In this study, the maximum distance at which facilities received an average visibility rating of "2" was 54.7 km (34.0 mi), with another observation at 48.3 km (30.0 mi) receiving an average rating of 2.13. There are five observations with average visibility ratings of "2" at distances of approximately 45 km (28 mi), and two additional observations with one rating of "2" between 45 and 47 km (28 and 29 mi), a strong argument that the threshold should not be set lower than that distance. On the assumption that the longest distance views might be regarded as exceptional, a more conservative distance for the threshold would be 48 km (30 mi).

Summary of Observations with Visibility Rating of "3"

Maximum observed distance: 36.9 km (22.9 mi)

Minimum observed distance: 12.4 km (7.7 mi)

Recommended threshold distance: 32 km (20 mi)

As noted above, a visibility rating of "3" describes facilities that would be visible after a brief glance, and unlikely to be missed by a casual observer." At this level of visibility, impacts may rise to a moderate level, depending on circumstances and landscape context. In this study, the maximum distance at which facilities received an average visibility rating of "3" was 36.9 km (22.9 mi), with several observations receiving ratings of "3" by some observers up to distances of 50.4 km (31.3 mi).

There are four observations with average ratings of “3” at distances exceeding 32 km (20 mi), and an additional three observations with average ratings of 2.88 beyond 32 km (20 mi). Observations for Seven Mile extended to just under 32 km (20 mi), and are slightly lower than those for the Cedar Creek facility, possibly because of the mixed sky/ground backdrop, or possibly because of partially obstructed views. Factoring in the Seven Mile observations, a very conservative distance estimate for the threshold would be 32 km (20 mi)

Summary of Observations with Visibility Rating of “4”

Maximum observed distance: 31.9 km (19.8 mi)

Minimum observed distance: 6.4 km (4.0 mi)

A visibility rating of “4” describes facilities that would be obvious, and of sufficient size or contrast to compete with other landscape elements, but not large enough or contrasting strongly enough to attract and hold visual attention. This rating level makes clear reference to the surrounding landscape elements, and thus is context-specific, but is useful as an indicator of likely perceived impact, as a rating of “4” would be expected to correspond to a moderate visual impact in most settings. In this study, the maximum distance at which facilities received an average visibility rating of “4” was 31.9 km (19.8 mi), but with no additional ratings reaching an average of “4” until approximately 22.5 km (14.0 mi). While Visibility Rating Level “4” is not suitable for use as an impact threshold, the data suggest that in the case of the Cedar Creek facility, which has a somewhat cluttered foreground/midground in the distance range of 22.5 km (14.0 mi), the facility would likely be causing moderate impacts for sensitive viewers at this distance.

Summary of Observations with Visibility Rating of “5”

Maximum observed distance: 19.3 km (12.0 mi)

Minimum observed distance: 3.2 km (2.0 mi)

Recommended threshold distance: 16 km (10 mi)

A visibility rating of “5” describes facilities that would be a major focus of visual attention, tending to attract and hold visual attention because of strong contrast in form, line, texture, color, or motion. In this study, the maximum distance at which facilities received an average visibility rating of “5” was 19.3 km (12.0 mi), with several observations receiving ratings of “5” by some observers up to distances of 21.4 km (13.3 mi). Observations for Seven Mile and Dunlap include these distance ranges and are slightly lower than those for the Cedar Creek facility. Factoring in the Seven Mile and Dunlap observations, a conservative distance estimate for the threshold would be 16 km (10 mi).

Summary of Observations with Visibility Rating of “6”

Maximum observed distance: 6.4 km (4.0 mi)

Minimum observed distance: 0.8 km (0.5 mi)

A visibility rating of “6” describes facilities that are a major focus of visual attention, but also of such large size that they occupy much of the observer’s field of view and cannot be “taken in” in one view; i.e., the observer’s head must be turned significantly to see the entire facility in focus. In these situations, the wind facility is a commanding visual presence that may completely fill or exceed the visible horizon in the direction of view. This rating level is ultimately dependent on the size of the facility in view, and thus is context-specific, but is useful as an indicator of likely perceived impact, as a rating of “6” would almost always correspond to a major visual impact. In this study, the maximum distance at which facilities received

an average visibility rating of “6” was 6.4 km (4.0 mi), with several observations receiving ratings of “6” by some observers up to distances of 9.7 km (6.0 mi).

Applying the results of the visibility ratings discussed above to the threshold model proposed above results in the visual impact threshold distances shown in Figure below. **Table from Sullivan’s research.**

This can also be supported by the Photomontage Reference figure 43 Appendix H – Landscape and Visual Photomontage PM4 McCullys Gap Road, (actually Sandy Creek Road) McCullys Gap – October 2020 Conceptual Projects Layout. (Photo attached below).

Approximate distance to closest visible turbine is 7,840m (Turbine 57)



Photomontage PM4 McCullys Gap Road, McCullys Gap – October 2020 Conceptual Project layout. Note the description is wrong it is actually Sandy Creek Road, McCullys Gap.

It should also be noted the EIS indicates - Whilst a photomontage can provide an image that illustrates a very accurate representation of a wind turbine in relation to its proposed location and scale relative to the surrounding landscape, this LVIA **acknowledges that large scale objects in the landscape can appear smaller in photomontage than in real life** and is partly due to the fact that a flat image does not allow the viewer to perceive any information relating to depth.

The Table from Sullivan’s research.

IMPACT RANGE	THRESHOLD DESCRIPTOR, MAXIMUM DISTANCE, CONSERVATIVE ESTIMATE	AVERAGE VISIBILITY RATING
 Not visible	Limit of visibility Maximum = 58 km (36 mi)	VR=1 <i>“Near the extreme limit of visibility”</i>
 No impact Minimal impact - - - Low impact	Suggested limit of analysis Maximum = 55 km (34 mi) Conservative = 48 km (30 mi)	VR=2 <i>“Visible when scanning”</i>
 Low impact	Limit of casual visibility Maximum = 37 km (23 mi) Conservative = 32 km (20 mi)	VR=3 <i>“Unlikely to be missed by casual observer”</i>
 Moderate impact	Limit of visual preeminence Maximum = 19 km (12 mi) Conservative = 16 km (10 mi)	VR=5 <i>“A major focus of visual attention”</i>
 High impact		

Table 6 Appendix 1 From the Bulletin

Table 6. Visibility distance zones ¹⁴

Distance of view	Distance zone	Relative Visual Magnitude and Influence
0 – 500 m	Near Foreground (NF)	Zone of Greatest Visual Influence
500 m – 1 km	Mid Foreground (MF)	
1 – 2 km	Far Foreground (FF)	
2 – 4 km	Near <u>Middleground</u> (NM)	
4 – 8 km	Far <u>Middleground</u> (FM)	
8 – 12 km	Near Background (NB)	
12 – 20 km	Mid Background (MB)	
20 – 32+ km	Far Background (FB)	Zone of Least Visual Influence

¹⁴ Based on visibility research conducted by Sullivan et. al. (2012), Bishop (2002), Shang and Bishop (1999) and others.

Multiple Wind Turbine Model

The Wind Energy: Visual Assessment Bulletin – For State Significant wind development December 2016 includes a requirement for the EIS to include the following.

This tool will provide a preliminary indication of potential cumulative impacts arising from the proposed wind energy project. To establish whether the degree to which dwellings or key public viewpoints may be impacted by multiple wind turbines, the proponent must map into six sectors of 60° any proposed turbines, and any existing or approved turbines within eight kilometres of each dwelling or key public viewpoint.

The distance from the turbine will be a relevant factor influencing the level of impact of a turbine at a particular viewpoint that will be considered in more detail during the EIS Stage. The apparent size (visual magnitude) of wind turbines decreases with distance.

The application of the cumulative tools to a distance of eight kilometres from a dwelling or public viewpoint is based on visibility research conducted by Sullivan⁵ et. al. (2012), Bishop⁶ (2002), Shang and Bishop⁷ (1999) and others. At eight kilometres, turbines and objects recede into the background in terms of visibility. See Figure 3 and Table 6 in Appendix 1

Again **Ground truthing has not been carried out on the Visual magnitude** in reference to the material used for the basis of Table 6 The report prepared by Sullivan it can be demonstrated from the evaluation of this report our home at Arkana would have a visibility rating of “5”, our home where we live at Diamond T would have a visibility rating of “6” and the home that has not been assessed would have a visibility rating of “5”.

These ratings rank all three of our home’s views of the multiple wind turbines as a **Major focus of visual Attention.**

In reference to, The Wind Energy: Visual Assessment Bulletin it also includes.

Scenic Quality Classes.

Ultimately, the baseline study inputs, including key landscape features and sensitive land use designations, should lead to the identification of Scenic Quality Classes. Scenic quality refers to the relative scenic or aesthetic value of the landscape based on the relative presence or absence of key landscape features known to be associated with community perceptions of high, moderate or low scenic quality. It is both a subjective and complex process undertaken by experts in visual impact assessment, taking into account community values identified in early community consultation.

Appendix 1 (Visual Assessment process) includes further details of how to identify scenic quality classes.

Appendix 1 - Scenic Quality Class Includes

The scenic quality classes will be identified taking into account many of the baseline study inputs outlined above and the results of the community consultation undertaken for the project. Scenic quality refers to the relative scenic or aesthetic value of the landscape based on the relative presence or absence of key landscape features known to be associated with community perceptions of high, moderate or low scenic quality. This can be determined through community perception surveys and consultations and using an objective frame of reference. It is both a subjective and complex process undertaken by experts in visual impact assessment, taking into account community values identified in early community consultation.

In order to assess and map scenic quality classes (i.e., high, moderate and low), a descriptive scenic quality “*frame of reference*” will need to be developed that is suitable for identifying those landforms, vegetation, waterform and, sometimes, cultural features that may be considered to be scenically outstanding or of high quality for the area. The frame of reference can categorise features that are more commonly occurring or of moderate scenic quality and those that may be considered low or below the average for the area due to their lack of variety, distinctiveness or their degree of alteration.

The EIS included in Appendix H Visual Assessment included the following in regard to Scenic Quality Class.

Landscape Character Type and Key Landscape Features

The project site is located within the Sydney Basin and North Coast Bioregions as delineated in the Interim Biogeographic Regionalisation for Australia (IBRA) Version 7. The project site is located within 2 Sub Regions including the Hunter (within the Sydney Basin Bio Region) and Manning-Macleay (within the North Coast Bioregion). The following Scenic Quality Classes have been derived from landscape character data for the Sydney Basin and North Coast Bioregions.

Table 6-1 Scenic Quality Classes

Description	High Scenic Quality	Moderate Scenic Quality	Low Scenic Quality
Landforms	Isolated peaks, tabletop hills, escarpments with distinctive form and/or colour contrast that become focal points. Larger areas of distinctive rock outcrops or boulders Well defined, steep sided valley gorges	Rounded hills, ridges and peaks which are visually prominent but not dominant. Broad shallow valleys Moderately deep gorges or moderately steep valley walls Minor rock outcrops	Large expanses of indistinctly dissected or unbroken landforms that provide little illusion of spatial definition or landmarks with which to orient
Vegetation	Strongly defined patterns with combinations of eucalypt forest, naturally appearing openings, streamside vegetation and/or scattered exotics Distinctive stands of vegetation that may create unusual forms, colours or textures in comparison to surrounding vegetation.	Predominantly open forest or woodland combined with some natural openings in patterns that offer some visual relief Vegetative stands that exhibit a range of size, form, colour, texture and spacing	Extensive areas of similar vegetation, such as grasslands, pasture or plantations with very limited variation in colour and texture
Waterform	Visually prominent lakes, reservoirs, rivers, streams and swamps	Intermittent streams, lakes, rivers, swamps and reservoirs	Waterform absent

To support the Visual Baseline Study GBD prepared several figures to illustrate the results of site work. The figures details landscape character types and key landscape features associated with Scenic Quality Areas (SQA's). The landscape character types are generally defined by land use, land cover and topography. A landscape analysis identified 10 landscape areas within and surrounding the project site. These included:

- Landscape Character Type 1 Prominent hills and mountains
- Landscape Character Type 2 Low undulating hills
- Landscape Character Type 3 River flood plain
- Landscape Character Type 4 Mining activities
- Landscape Character Type 5 Township-urban
- Landscape Character Type 6 Rural properties
- Landscape Character Type 7 Water body
- Landscape Character Type 8 Power generation
- Landscape Character Type 9 Ridgelines timbered and
- Landscape Character Type 10 Hills and ridges (pasture).

The EIS appendix H also indicates that:

Each landscape area was photographed and described for the purpose of the community consultation 'drop in' sessions. The figures presented at the four 'drop-in' information sessions were used to inform the community about the approach to landscape analysis and processes involved in the determination of scenic quality.

If the information was provided the explanation was not given to members of the community and how this would be used in the determination of scenic quality. Sandra and I and others who attended the information sessions were not aware of the determination of scenic quality until we read the EIS. I am also a member of the proposed Bowmans Creek wind farm CCC, Epuron or their representatives never explained this at any of the CCC meetings held.

The Bulletin also includes the following. When mapping scenic quality classes, aerial photos, topographic maps (and the like) and field visits should all be utilised. The frame of reference criteria should be **used as a guide**; however, it is not intended that boundary lines necessarily are placed around individual features unless they are of a larger scale or extremely outstanding within a much broader area of lesser scenic quality. Community views on the scenic quality classes also need to be canvassed in the community consultation required prior to issues of SEARs.

However, the EIS appendix H ranks the Landscape Character for the **Scenic Quality Assessment** and does not take into consideration the table (Table 6-1) they have for the Scenic Quality Assessment.

The descriptions in Appendix H for the Landscape Character Types includes but is not limited are as follows:

Landscape Character Type 1 Prominent hills and mountains

- Prominent timbered hills and mountains are visually prominent and large-scale landscape features.
- They introduce a degree of visually strong topographical variety and are visually uniform in colour and texture.
- The prominent timbered hills and mountains can be viewed within both close and distant views and can form backdrop and skyline views.



Photo 1 Landscape Character Type 1 Prominent Hills and mountains (Image: ©GBD Pty Ltd 2019)

Landscape Character Options:

- Naturally evolving
- Natural Appearing
- Cultural (minor)

Scenic Quality Assessment - Moderate

Landscape Charter Type 2 Low undulating hills

- Low undulating hills are not overly visually dominant within the landscape and are generally located below more prominent distant hills to the west of the Hunter River flood plain.
- They introduce a degree of moderate topographical variety and are largely visually uniform in colour and texture. Scattered tree planting across slopes and ridgelines introduces some visual interest.
- The low undulating hills can be viewed within close and distant views occasionally forming backdrops and skyline views.



Photo 2 Landscape Character Type 2 Low undulating hills (Image: ©GBD Pty Ltd 2019)

Landscape Character Options:

- Natural Appearing
- Pastoral
- Cultural (minor)

Scenic Quality Assessment - Moderate

Landscape Charter Type 8 Power Generation

- Power generation is largely associated with the Liddell and Bayswater coal fired power station sites. Both power stations contain moderate to large scale constructed elements; however, both sites are not considered to be visually prominent within the local landscape, with views largely screened by tree cover. Taller constructed elements including stacks and cooling towers are visible from moderate to distant view locations but are not overly dominant.



Photo 8 Landscape Character Type 7 Power Generation (Image: ©GBD Pty Ltd 2019)

Landscape Character Options:

- Large scale built form
- Industrial modification
- Power generation

Scenic Quality Assessment - Moderate

Landscape Charter Type 10 Hills and ridges (pasture)

- Pasture hills and ridges form a moderate scale landform, that is partially visually contained between timbered ridgelines and prominent hills and mountains to the east.
- They introduce a degree of visually strong topographical variety and are visually uniform in colour and texture.
- Pasture hills and ridges can be viewed within both close and distant views, but do not tend to form distinct backdrops and skyline views.



Photo 10 Landscape Character Type 10 Hills and ridges (pasture) (Image: ©GBD Pty Ltd 2019)

Landscape Character Options:

- Natural Appearing
- Pastoral
- Cultural (minor)

Scenic Quality Assessment - Moderate

I cannot for the life of me see how **Photo 8** Landscape Character Type 7 Power Generation, can be classified as having a Moderate Scenic Quality Assessment compared to **Photo 1** Landscape Character Type 1 Prominent Hills and mountains and **Photo 10** Landscape Character Type 10 Hills and ridges.

It should also be noted the EIS Appendix H includes a **table 8-2 Visual influence zone analysis**. The table includes the Scenic Quality Class for the properties assessed in the document. Every property has been ranked as having a Scenic Quality Class as Moderate. This is the same ranking as **Photo 8** Landscape Character Type 7 Power Generation, the Liddell and Bayswater power stations.

And if the landscape Character Type 7 Power Generation is classified as having a Moderate Scenic Quality Assessment, why are the Liddell and Bayswater power station sites surrounded by buffer land of approximately 10,000Ha. With a Moderate Scenic Quality Assessment, the power stations at Liddell and Bayswater could be surrounded by housing. They are not because no one would want to live there, just like people and families do not want to live next to a wind power Generation site.

The evaluations of the Scenic Quality Class for the properties assessed in the document does not have any credibility based on these comparisons.

In relation to our two homes that have been assessed and the third that has not been assessed the two homes have been ranked as having a Scenic Quality Assessment of moderate.

This does not line up with **Table 6-1 Scenic Quality Classes** included in the EIS and the ranking has been achieved without ground truthing.

In relation to my properties please refer to the photos attached below.



Diamond T property Photo 1- Darkies Hill.

Diamond T property photo 1 is located East, South East of our home the wind turbines will impact on our view from our house as we look towards Darkies Hill. Note Darkies Hill is at approximately 500m AHD and the wind turbines that will be fully visible will have tip heights of between 692m and 911m AHD on the Eastern side of our Home.

This is a section of my property identified and known as “Diamond T” located at 1661 Sandy Creek Road Muswellbrook.

Darkies Hill is an Isolated peak, with an escarpment with distinctive form and colour contrast, it is a distinctive rock area that is dominant in the skyline.

This is a Landform that would be described as having a High Scenic Quality in accordance with Table 6-1 in Appendix H in the EIS



Diamond T property **Photo 2- Darkies Hill**

Diamond T property Photo 2 showing it is a distinct escarpment the escarpment in the background is the escarpment running up to McCullys Gap.

The foreground (bottom 2/3rds of the photo) is a section of my property "Diamond T".



Diamond T property **Photo 3 - Darkies Hill**

Diamond T property Photo 3 showing the face of Darkies Hill and the distinct escarpment. This escarpment runs around and is the second escarpment face running into McCullys Gap.

Note the escarpments in photo's 2 & 3 running into McCullys Gap are in excess of 6km. They are not minor features in the landscape but distinct features of beauty.



Diamond T Property Photo 4 - Valley, Creek and Waterfall below Darkies Hill.

Diamond T property photo 4 is located East, South East of our home the wind turbines will impact on our view from our house as we look towards Darkies Hill. Note Darkies Hill is at approximately 500m AHD and the wind turbines that will be fully visible from our home will have tip heights of between 692m and 911m AHD.

The Gorge/Valley, Creek and Waterfall below Darkies Hill consists of vegetation that would be described as having Strongly defined patterns with combinations of eucalypt forest, naturally appearing openings, streamside vegetation and scattered exotics Distinctive stands of vegetation that may create unusual forms, colours or textures in comparison to surrounding vegetation.

Except for the very tip of Darkies Hill this is a section of my property "Diamond T"

The Gorge/Valley, Creek and Waterfall below Darkies Hill is on my property "Diamond T". The Gorge/Valley encompasses over 1.5Km of Gorge/Valley covering an area of approximately 16Ha.



Diamond T **Property Photo 5** – The Creek and Rock Pools above the Waterfall in the Gorge/Valley.

This is located on my property “Diamond T”.



Diamond T **Property Photo 6** – The Creek and Rock Pools at the top of the Waterfall in the Gorge/Valley. The waterfall drops from the edge in the top third of the photo approximately 20m into the Gorge below.

This is located on my property “Diamond T”.



Diamond T **Property Photo 7** – The Creek and Rock Pools below the Waterfall in the Gorge. The Gorge would be approximately 50m deep in this area.

This is located on my property “Diamond T”.



Diamond T Property **Photo 8** – The gorge floor and Creek

This is located on my property “Diamond T”.



Diamond T Property **Photo 9** – Looking down into the Gorge.

This is located on my property “Diamond T”.



Diamond T Property **Photo 10** – The evening sky taken from our Garden.



Diamond T Property **Photo 11** – The evening sky taken from our Garden. The 220m tall wind turbines will dominate this skyline if the Bowmans Creek wind farm is approved.

Photographs taken at Arkana and Happy Valley

Note both properties will be affected by the proposed wind farm.



Arkana & Happy Valley **Photo 12** This photo is taken from the garden at Arkana and is one of the many valleys and creek systems on our Arkana & Happy Valley properties. We call it the Arkana stepped waterfall.

This is a section of our (owned by my wife Sandra and myself) property identified known as “Arkana & Happy Valley” located at 1986 Sandy Creek Road Muswellbrook. This section of property runs beyond the skyline in the photo.

This section of the Arkana stepped waterfall is 2.6Km long covering an area of approximately 21Ha. On our whole aggregation located at Arkana, Happy Valley and including Snake Gully (which is also owned by Sandra and me) There would be approximately 150Ha of similar country to the area surrounding the Arkana stepped waterfall.



Arkana & Happy Valley **Photo 13** a section of the Arkana stepped waterfall valley wall. This wall is extremely steep with rock screes on either side and monumental tree's dominating the wall. Platypuses occupy the creek in this area.



Arkana & Happy Valley **Photo 14** a section of the Arkana stepped waterfall valley wall.



Arkana & Happy Valley **Photo 14** a section of the Arkana stepped waterfall valley floor.



Arkana & Happy Valley **Photo 15** a section of the Arkana stepped waterfall valley floor.



Arkana & Happy Valley **Photo 16** a section of the Arkana stepped waterfall valley floor.

The photographs attached and identified as Photo 1 to photo 16 and located on our properties "Diamond T, Arkana and Happy Valley indicate this is a Landform with vegetation that would be described as having a **High Scenic Quality** in accordance with Table 6-1 in Appendix H in the EIS.

I believe some of the Scenic Quality as illustrated and located on our properties would exceed High Scenic Quality bearing in mind that photos can not capture the scale or beauty of an area.

However, are property being not the only property in the area with these attributes

One of the property owners associated with the project Ross Clydsdale, was featured in the local paper "The Hunter River Times" Issue 01, Friday 19th June 2020 (**Reference attachment B**). The article contained amongst other things:

"Taking in the 4000 acres in the head of a naturally stunning valley, **the property comes complete with remnant rainforest, naturally flowing waterfalls and crystal-clear pools, soaring escarpments and giant grass tree forest**". The property referred to in the article is "Strathclyde" Epuron are proposing not to only build wind turbines on the property but to also construct and erect major infrastructure on the property. The main access into the project is through Strathclyde.

Regarding the Scenic Quality Assessment, it has been shown that Epuron and their consultants have not adequately fulfilled the requirements as required in the **The Wind Energy: Visual Assessment Bulletin for Scenic Quality Classes**.

- Epuron have not assessed the relative scenic or aesthetic value of the landscape based on the relative presence or absence of key landscape features known to be associated with community perceptions of high, moderate or low scenic quality.
- Epuron have not conducted a combination of desktop and field evaluations. Epuron or their consultants **did not step foot onto Arkana or Happy Valley**.
- Epuron have not adequately Consultation with affected landowners as required prior to submission of the EIS.
- Epuron have not adequately Consultation with the affected community as required prior to submission of the EIS.
- Epuron did not conduct adequate ground truthing.

It has been shown that Epuron and their consultants have however tried to manipulate the results for the Scenic Quality Assessment, in multiple areas.

In reference to, The Wind Energy: Visual Assessment Bulletin it also includes.

Visual Influence Zones

Three zones of visual influence (low, moderate and high) are established for the project area from dwellings and key public viewpoints. This establishes the relative landscape significance against which the potential impacts of wind turbines may be assessed. The visual influence zones are determined utilising **Table 8 in Appendix 1 (attached below)** and take into consideration data gathered for the baseline study, including viewer sensitivity levels, scenic quality classes, and visibility distance zones.

Each visual influence zone has a corresponding set of visual performance objectives that guide the proponent and the consent authority by establishing different visual objectives and levels of landscape protection for the assessment and determination of the project.

Table 8 from Appendix 1 is also referenced in the EIS **Appendix H Landscape and Visual**. It has been referenced and is has not been modified, however it has been used to manipulate the visual impacts of the wind farm on the community.

Despite the Wind Energy: Visual Assessment Bulletin including in the:

- **Purpose statement**
 - The Visual Assessment Bulletin has been developed as **a guide**.
 - The Bulletin provides **Guidance** on site selection.
- **Objective's statement**
 - provide the community, industry and decision-makers with a framework for visual impact analysis and assessment that is focused on **minimising and managing the most significant impacts**;

As a result, Table 8 should have been modified in regard to viewer sensitivity Level Distance Zones, bearing in mind the Zones referenced in **Table 6 Appendix 1 From the Bulletin** did not represent the findings from **Sullivan's research**. And Sullivan's research was only conducted on Wind Turbines with a tip Height of 117 too 119m tall. **Ground truthing should have been undertaken.**

Table 8 also includes a column for the Scenic Quality Class of a properties land scape. It has been shown the evaluation of property Scenic Quality Class has not been carried out correctly.

Table 8. Visual Influence Zones based on view sensitivity level-distance zones and scenic quality class combinations

Viewer Sensitivity Level – Distance Zone	Scenic Quality Class		
	High	Moderate	Low
Level 1 Viewpoints			
Near Foreground 0 – 500 m	VIZ1	VIZ1	VIZ1
Mid Foreground 500 m – 1 km	VIZ1	VIZ1	VIZ1
Far Foreground 1 – 2 km	VIZ1	VIZ1	VIZ1
Near Middleground 2 – 4 km	VIZ1	VIZ2	VIZ2
Far Middleground 4 – 8 km	VIZ2	VIZ2	VIZ2
Near Background 8 – 12 km	VIZ2	VIZ2	VIZ2
Mid Background 12 – 20 km	VIZ2	VIZ2	VIZ3
Far Background 20 – 32+ km	VIZ2	VIZ2	VIZ3
Level 2 Viewpoints			
Near Foreground 0 – 500 m	VIZ1	VIZ1	VIZ1
Mid Foreground 500 m – 1 km	VIZ1	VIZ1	VIZ1
Far Foreground 1 – 2 km	VIZ1	VIZ1	VIZ2
Near Middleground 2 – 4 km	VIZ2	VIZ2	VIZ2
Far Middleground 4 – 8 km	VIZ2	VIZ2	VIZ3
Near Background 8 – 12 km	VIZ2	VIZ3	VIZ3
Mid Background 12 – 20 km	VIZ2	VIZ3	VIZ3
Far Background 20 – 32+ km	VIZ3	VIZ3	VIZ3
Level 3 Viewpoints			
Near Foreground 0 – 500 m	VIZ1	VIZ1	VIZ2
Mid Foreground 500 m – 1 km	VIZ2	VIZ2	VIZ2
Far Foreground 1 – 2 km	VIZ2	VIZ2	VIZ3
Near Middleground 2 – 4 km	VIZ2	VIZ3	VIZ3
Far Middleground 4 – 8 km	VIZ2	VIZ3	VIZ3
Near Background 8 – 12 km	VIZ3	VIZ3	VIZ3
Mid Background 12 – 20 km	VIZ3	VIZ3	VIZ3
Far Background 20 – 32+ km	VIZ3	VIZ3	VIZ3
Areas Not Visible	VIZ3	VIZ3	VIZ3

Note:

- Column 1 codes represent a combination of the viewer sensitivity level (1-high, 2-moderate, 3-low) and the distance zones
- Columns 2 – 4 indicate visual influence zones varying by row according to the combination of viewer sensitivity level-distance zone and scenic quality class.

Nigel And Sandra Wood's Homes

In relation to visual influence zones Regarding Nigel and Sandra Wood's homes the EIS Appendix H report includes the following:

Table 8-2 Visual Influence Zone analysis

Representative view location (and other proximate dwellings) and Sensitivity Level	Distance from representative dwelling to closest wind turbine and wind turbine ID (visible or not visible)	Scenic Quality Class	Visual Influence Zone
H8-1 (H7-1) Level 2	4.03km Turbine 57 (H7-1 at 4.41km)	Moderate	VIZ2
H12-1 Level 2	3.02km Turbine 51	Moderate	VIZ2

A true evaluation of the two homes would be as indicated below our third home would be the same as the home identified as H8 - 1

Representative view location (and other proximate dwellings) and Sensitivity Level	Distance from representative dwelling to closest wind turbine and wind turbine ID (visible or not visible)	Scenic Quality Class	Visual Influence Zone
H8-1 (H7-1) Level 2	4.03km Turbine 57 (H7-1 at 4.41km) Major focus of visual Attention*	High	VIZ 1
H12-1 Level 2	3.02km Turbine 51 Major focus of visual Attention*	High	VIZ 1

*** Reference Table from Sullivan's research.**

The Wind Energy Visual Assessment Bulletin also includes.

Visual performance evaluation

Visual assessment requires an evaluation of the proposed wind energy project and its various components, turbines and ancillary facilities against the visual performance objective of the project, using a combination of desktop and field evaluations.

Visual performance objectives are used as a framework for evaluation that enables potential impacts and management options to be considered objectively, against the varying levels of landscape significance established by the baseline study. Application of the visual performance objectives will allow for a transparent and robust assessment process, which still provides flexibility for proponents and consent authorities. The visual performance objectives are set out at **Table 2 (attached below)**.

Table 2 includes:

Visual Magnitude

Visual magnitude is a key visual parameter in the preliminary assessment tool. The respective threshold lines on the graph at **Figure 5** (attached below) indicate where turbines may potentially have significant visual magnitude impacts based on their **relative height** and their distance from viewpoints.

The EIS Appendix H Visual Assessment includes reference to Figure 5 from the Wind Energy Visual Assessment Bulletin. However, they have **modified Figure 5 (Modified Figure 5 attached)** Reference section 9.2 of the EIS appendix H.

Modified Figure 5 includes extra lines (in orange) with two horizontal lines coming across from two distance parameters being 3km and 4.4km, these lines intersect with a vertical line from the parameter wind turbine height 220m.

And whilst modified Figure 5 may be accurate for any properties that have the wind turbines located at a relative height of 220m (both the homes and wind turbines being built on the same m AHD Hight). It is not accurate for the majority of homes impacted by the wind turbines with the relative height of the wind turbines being well in excess of 220m. This can be demonstrated in reference to the two table I have included in this response document. The tables being:

Table indicating how high the wind turbines will be relative to our Home Diamond T.

Table indicating how high the wind turbines will be relative to our Home Arkana.

Our other home at Happy Valley will also be impacted to a similar degree as the home at Arkana.

The tables indicate the home we live in at Diamond T and identified as H12-1 will be impacted by 17 completely visible wind turbines that will have a relative height compared to our home ranging from 409m to 561m relatively higher than our home. Note wind turbine 51 has been identified as the closest wind turbine to our home at 3.02Km away and it will be 476m relatively higher than our home.

The home at Arkana will be impacted by 6 completely visible wind turbines that will have a relative height compared to our home ranging from 485m to 766m relatively higher than the home.

The home at Happy Valley will be impacted to the same degree as the home at Arkana.

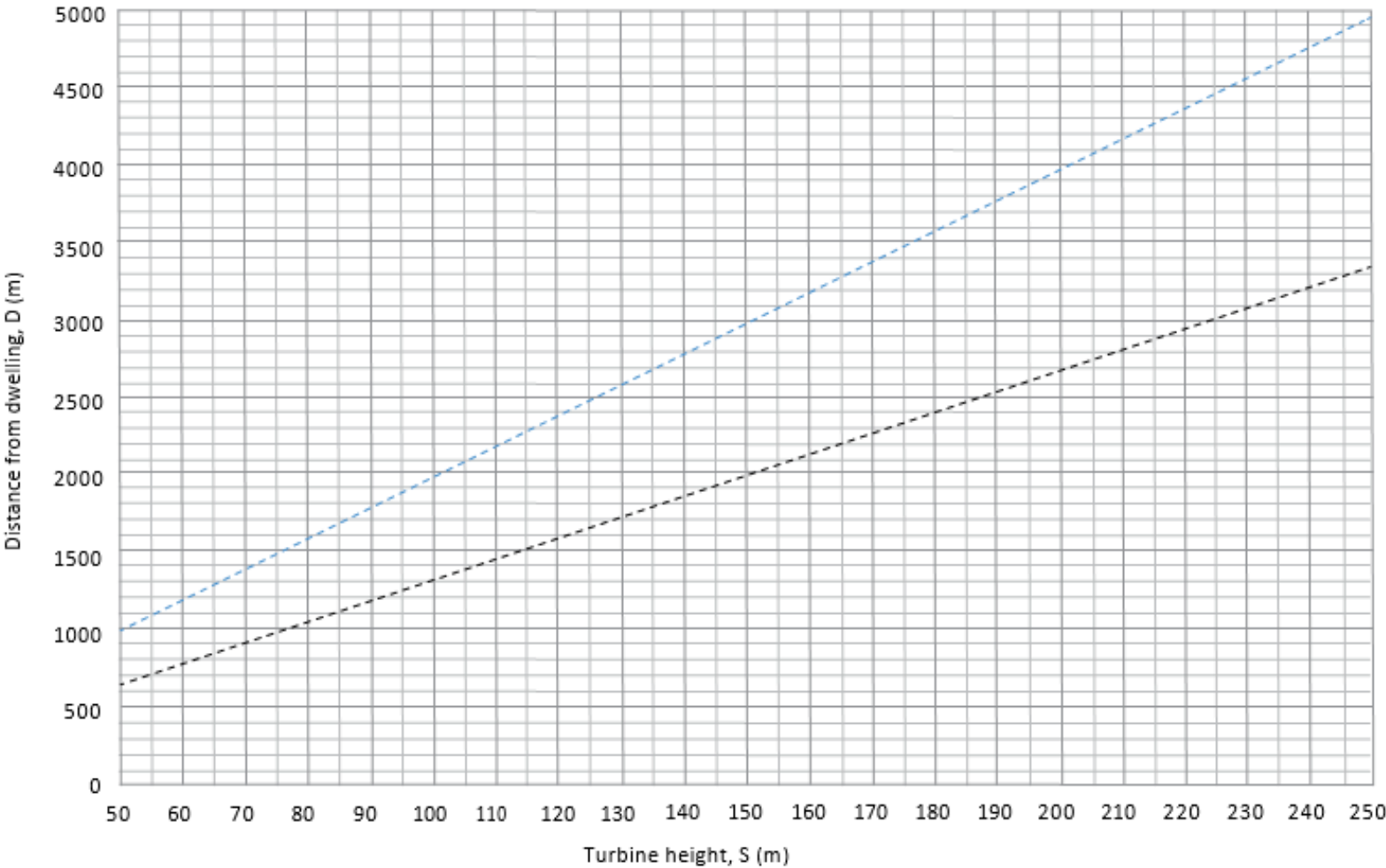
Modified Table 5 does not reflect the true impact of the wind farm on homes and families and misrepresents the requirements of the Wind Energy Visual Assessment Bulletin in regard to visual Magnitude.

The visual performance objectives that apply to all three visual influence zones, are outlined below:

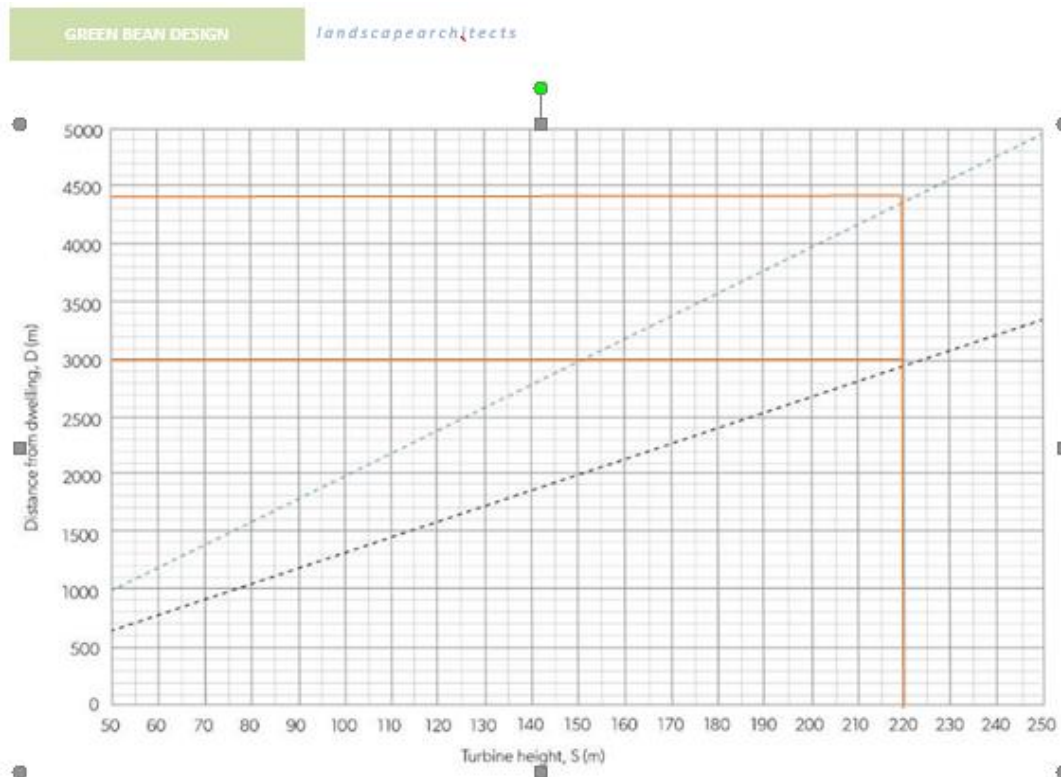
Table 2. Visual Performance Objectives

Visual Performance Objectives	Visual Influence Zone 1	Visual Influence Zone 2	Visual Influence Zone 3
Visual Magnitude Visual magnitude is a key visual parameter in the preliminary assessment tool. The respective threshold lines on the graph at Figure 5 indicate where turbines may potentially have significant visual magnitude impacts based on their relative height and their distance from viewpoints. For the visual assessment, an additional threshold distance line has been added to the visual magnitude graph which identifies potentially high visual magnitude impacts, to allow more detailed assessment as part of the EIS. However, as stated above, the black and blue lines in Figure 5 are not determinative of acceptability. Instead, they provide a basis for the assessment to be undertaken. There may be reasons why the proposed turbine will not have the impact identified by Figure 5 and detailed justification can be provided for proposed turbines in the EIS – for example, ground-truthing may identify that existing vegetation or topography will screen views to a proposed turbine at a particular location. The assessment of potential impacts relating to visual magnitude is a key factor as it is acknowledged that wind turbines are very large structures that will be visible in the landscape.	Objective: Avoid turbines or provide detailed justification of turbines below the blue line.	Objective: Manage impacts as far as practicable, justify residual impacts, and describe proposed mitigation measures below the black line. Consider screening between the blue line and the black line.	Objective: Consider screening below the black line.

Figure 5. Visual magnitude thresholds for visual assessment



Turbine height, S (m)



Source: *The Visual Bulletin*, 2016 (Figure 5 Visual magnitude thresholds for visual assessment)

Modified Figure 5 from the EIS Appendix H Visual Assessment

Aviation Hazard Lighting

The EIS Appendix H Visual Assessment also includes in section 9.7 Aviation Hazard Lighting.

Section 9.7 Aviation Hazard Lighting includes. The Bulletin notes that ‘wind turbines located in the vicinity of an aerodrome are subject to standards imposed by the National Airports Safeguarding Framework 10. **CASA must be notified by the proponent if a proposed wind turbine or wind monitoring tower is greater than 150 metres in height or infringes on the Obstacle Limitation Surface (OLS) of an aerodrome. CASA may determine, and subsequently advise a proponent and relevant planning authorities, whether night-lighting is required.**

If such lighting is required, the CASA guidelines recommend that to minimise visual impacts “obstacle lights **may be partially shielded**, provided it does not compromise their operational effectiveness. Where obstacle lighting is provided, **lights should operate at night, and at times of reduced visibility.** All obstacle lights on a wind farm should be turned on simultaneously and off simultaneously.”

Aviation hazard lighting has been assessed in the Aviation Impact Assessment (Aviation Projects, 2020) which concluded that ‘**Aviation Projects has assessed that the Project will not require obstacle lighting to maintain an acceptable level of safety to aircraft.**

The EIS Appendix H Visual Assessment also includes in section 11.1 Aviation Hazard Lighting.

Aviation Hazard Lighting

The Proponent commissioned an aviation assessment which was undertaken by Aviation Projects. The aviation assessment included a detailed consideration with regard to obstacle lighting needs and requirements for the installation and operation of obstacle lighting. The aviation assessment concluded that ***'the Project will not require obstacle lighting to maintain an acceptable level of safety to aircraft'*** (Aviation Projects May 2020).

Whilst Civil Aviation Safety Authority (CASA) **has not made a recommendation** that the Bowmans Creek wind turbines, at an approximate 220 metre tip height be lit, the Proponent has advised they are unlikely to operate nighttime obstacle lighting unless required by CASA to do so.

Accordingly, the Bowmans Creek Wind Farm LVIA has not undertaken an assessment of potential visual effects associated with obstacle lighting.

The wind farm should have undertaken an assessment of the potential visual effects associated with obstacle lighting and the other potential lighting requirements CASA indicate they require. CASA's requirements are included in the **Guideline D. National Airports Safeguarding Framework**

Managing the risk to Aviation of wind turbine installations (wind farms)/wind monitoring towers. (Reference Attachment 10).

Guideline D includes - Obstacle lighting standards for wind turbines.

When lighting has been recommended by CASA to reduce risk to aviation safety, medium- intensity obstacle lights should be used. Where used, lighting on wind farms should be installed:

- to identify the perimeter of the wind farm;
- respecting a maximum spacing of 900m between lights along the perimeter, unless an aeronautical study shows that a greater spacing can be used;
- where flashing lights are used, they flash simultaneously; and
- within a wind farm, any wind turbines of significantly higher elevation are identified wherever located.
 - To minimise the visual impact on the environment, obstacle lights may be partially shielded, provided it does not compromise their operational effectiveness. Where obstacle lighting is provided, lights should operate at night, and at times of reduced visibility. All obstacle lights on a wind farm should be turned on simultaneously and off simultaneously.

And yet again the visual assessment falls short, it cannot be assumed CASA will not require lighting as prescribed in their Guideline D.

The local residence and the wider community need to be aware of the impacts of any requirement CASA may impose. Epuron and their consultants are again trying to manipulate the process by not evaluating and then being able to use a defence if lighting has to be installed by saying well it was raised in the EIS as a risk.

It cannot be left to chance; the approval process needs to allow the full evaluation of the project in every aspect. Obtaining an approval and then saying oops we didn't think that would happen is not good enough. Approval cannot be given on an assumption. The EIS should be withdrawn until CASA have made a recommendation and the correct assessments can then be included in the EIS.

Impact Mitigation Options

Appendix 11 Section 12 Includes Section 12.4

Re-colouring of the wind turbines.

The EIS Appendix H Visual Assessment section 12.4 includes a section on the Re-colouring of the wind turbines including the blades.

Section 12.4 includes: **Re-colouring.**

The Bulletin notes that *'one of the key reasons that wind turbines and other alterations may be detected as alterations in the landscape is that they can be visually distinguished from their surrounding landscape due to their degree of colour contrast. If these alterations had no colour contrast at all with their surrounding landscape, they would be virtually undetectable'*.

The Bulletin also notes that *'white colours will always produce the most extreme colour contrast in every situation except when white clouds form the backdrop. Hence selecting turbine colours to achieve the greatest average contrast reduction under the various sky lighting conditions may provide a better solution when wind turbines are located on ridgetops'*.

Wind turbines are commonly installed in a white to off white colour across Australia as well as most other countries around the world. This industry standardised colour has likely been adopted for a number of reasons. White is a neutral colour and whilst visible against blue sky backdrops it will tend to blend readily on cloudy or partly cloudy days. The white colour also assists with protecting wind turbine infrastructure by reflecting ultraviolet rays rather than absorbing them and helps to protect the generator from overheating. Wind turbines are also painted white to provide contrast between the wind turbine structures and the ground when viewed from aircraft flying above the wind farm.

The Bulletin references the National Airports Safeguarding Framework (NASF), Managing the Risk to Aviation Safety of Wind Turbine Installations (Wind Farms)/Wind Monitoring Towers, Guideline D. Guideline D provides guidance on the risks to civil aviation arising from wind farms and wind monitoring equipment. It notes *'the implementation of the guidelines will have the additional benefit of being applicable in areas away from airports to address the risk posed by wind farms to air navigation in those areas'*.

Guideline D notes that *'During the day, large wind turbines are sufficiently conspicuous due to their shape and size, provided the colour of the turbine is of a contrasting colour to the background. Rotor blades, nacelle and upper 2/3 of the supporting mast of wind turbines should be painted white, unless otherwise indicated by an aeronautical study. Other colours are also acceptable unless the colour of the turbine is likely to blend in with the background.'*

Appendix H then goes on to say, **the advice provided in the Bulletin to select 'turbine colours to achieve the greatest average contrast reduction' appears to be at odds with the NASF Guideline D.**

Appendix H Visual Assessment section 12.4 also includes as sub section on wind turbines with significant colouring differences the section includes:

The following photographic plates 12 and 13 illustrate wind turbines with significant colouring differences and demonstrate the effect of cloud and partial cloud conditions on wind turbine colour. Plate 14 illustrates wind turbines

at the Windy Hill Wind Farm in Far North Queensland. The wind turbines have been painted with concentric bands of green paint, from dark green at the base to light green approximately one third of the tower height. The success of painting the wind turbine tower is dependent on the viewpoint location, elevation and backdrop.



Plate 12 – Wind turbines at Crookwell 2 Wind Farm NSW (Image: ©GBD Pty Ltd 2018)



Plate 13 – Wind turbines Boco Rock Wind Farm NSW (Image: ©GBD Pty Ltd 2017)



Plate 14 – Wind turbines with coloured base Windy Hill Wind Farm QLD (Image: ©GBD Pty Ltd 2017)

It appears as if this subsection of Appendix H Visual Assessment section 12.4 is suggesting a solution to some of the visual impacts for the proposed Bowmans Creek wind farm is to paint the wind turbines different colours. This is despite section 12.4 indicating the advice provided in the Bulletin to *select ‘turbine colours to achieve the greatest average contrast reduction’* appears to be at odds with the NASF Guideline D.

If this subsection is not alluding to the re-colouring of the wind turbine’s, why is it included in the visual assessment?

It should also be noted that the three wind farms that have used re-colouring to minimise their visual impacts are not 220m tall they are:

- Crookwell 2 Wind Farm NSW - **129m tip height.**
- Boco Rock Wind Farm NSW – **130m tip height.**
- Windy Hill Wind Farm QLD – **68m tip height**

All three are below the threshold for mandatory reporting by CASA and may not have to meet the requirements as indicated in Guideline D.

Impact Mitigation Options

Appendix 11 Section 12 Includes Section 12.5

Visual mitigation through vegetative screening

Section 12.5 Visual mitigation through vegetative screening includes – The potential visual impact of the Project from specific view locations can be mitigated by planting vegetation as on-site or off-site work. On-site landscape works within and around smaller items of project infrastructure such as sub stations and operation/maintenance buildings may assist in screening views. buildings dwelling curtilages. **For instance, tree or large shrub planting within a dwelling curtilage can screen potential views to individual or clusters of turbines.**

The location and design of screen planting used as a mitigation measure is site specific and requires detailed analysis of potential views and consultation with surrounding landowners. It is noted that screen planting cannot provide effective mitigation in all circumstances but **can reduce the extent of existing and desirable views available from dwellings** or other key view locations.

It should be noted the planting of vegetative screening will greatly impact on our quality of life and introduce additional risks if we must stay and live in our home. This includes:

- The planting of vegetative screening has the potential to increase a homes risk in a bush fire, (this is covered in my submission fire risks and bush fires).
- I am not sure how the planting of vegetative screening will screen our home from wind turbines that will on average tower over our home by 500m.
- Section 12.5 indicates that screen planting can **reduce the extent of existing and desirable views available from dwellings. I do not want our desirable views reduced we bought our properties for their beautiful views not to hide them or be locked in our home.**
- I do not want to plant tree in my garden (dwelling curtilage) or on my property where someone else tells me I must plant trees because of their project. We run a commercial grazing operation, a commercial grazing operation requires grass for the cattle to eat and the smooth flow of fence lines to allow mustering. Planting trees will have an impact on the commercial operation of our business, including less grass, extra fences to maintain and prohibit the smooth flow of cattle for mustering.

Response to the Visual Assessment Summary and Additional Points

My response to the summary contained in the EIS Appendix H Visual assessment is that **the proponent has not undertaken significant community consultation**. The proponent has indicated they have held meetings at Bowmans Creek, McCullys Gap, Hebden and Muscle Creek and approximately 200 people attended.

The project is being built in three local government LGA's being Upper Hunter, Muswellbrook & Singleton. In reference to the 2016 Census the population of these three LGA's is approximately 53,694 people. Epuron have managed **to consult with 0.38% of the population** of the three LGA's where the proposed wind farm is to be built.

The visual assessment includes photomontages of the following areas:

- Photomontage PM2 **Lynch Street, East Links, Muswellbrook**
 - It is indicated the closest wind turbine is located 11,420m away from Lynch Street, **however 33 wind turbines can be seen from this location.**
- Photomontage PM5 **Ruth White Avenue, Muswellbrook**
 - It is indicated the closest wind turbine is located 13,600m away from Lynch Street, **however 18 wind turbines can be seen from this location.**

I bet London to a brick the impact on Muswellbrook will be a lot more than these two locations, it has already been demonstrated that wind farms have a detrimental impact on real estate values. However, Epuron have decided these hard-working families did not need to be consulted regarding the proposed Bowmans Creek wind farm. Most of them would not be aware that they will be able to see the wind turbines from their homes.

The proponent needs to undertake adequate community consultation before the project can be approved.

It has been demonstrated that the LVIA will adversely impact on the visual amenity of the families living in the vicinity of the wind farm. This is because:

- The Project will result in an alteration or disruption of views toward significant landform, vegetation or cultural features.
- The Visual Baseline Assessment that was prepared **did not** incorporate community input to establish residential and public viewpoints and inform the LVIA of key landscape features and relative scenic quality.
- Most of the area within and surrounding the project site is not of moderate scenic quality landscape. A lot of the area would be of a High scenic quality landscape.
- The Bowmans Creek Wind Farm will result in a significant impact upon landscape scenic values or quality.
- Most viewpoints within the LVIA are not VIZ 2 viewpoints including the rural residential homes beyond 2km from the wind turbines. Most of the viewpoints within the LVIA should be VIZ 1. Manipulation of the inputs has provided a false summary regarding evaluation of the viewpoints.
- Most dwellings within 4.4km of wind turbines are not compliant with the Bulletin performance objectives including visual magnitude and multiple wind turbine effects.

Note where a dwelling is considered non-compliant (generally against multiple wind turbine effect or visual magnitude) **the Proponent has committed to a range of mitigations measures including neighbour agreements, relocation and/or removal of wind turbines.** **The proponent has not committed to neighbour agreements,** the

proponent has indicated these are voluntary agreements and neighbours can basically take one or leave it. The proponent has supported this position in replies to the Wind Farm Commissioner when neighbours made enquiries regarding the neighbour agreements not aligning with the recommendations made by the wind farm commissioner.

If Epuron are prepared to indicate in their EIS that they have committed to mitigation measures including neighbour agreements the consent conditions should include that Epuron have to have an agreement with neighbours in place before construction can commence. The neighbours who have to agree to a neighbour agreement would have to include any neighbours who have previously been offered an agreement and any neighbours who can see a wind turbine up to 8km from their home (As identified in Appendix H). In addition any homes that have not been identified in appendix H who will also be able to see wind turbines up to 8km away will also have to be offered and accept neighbour agreements.

Visual Impacts for Sandra and Nigel Wood

For Sandra and me it has been demonstrated that the information has been manipulated and moulded to try and indicate our homes will not be adversely impacted. **They will be.**

Epuron have not:

- Adequately consulted with us they have:
 - Lied to us about not being able to see any infrastructure from our home at Diamond T.
 - Have never discussed our other homes and any impact even though Arkana home (H8-1) has been identified in the EIS.
 - Tabled a neighbour agreement that would make us serfs in our home and on our property.
 - There has been no consultation regarding the construction of the proposed permanent monitoring masts. Note this monitoring mast will tower over our home less than 3km away and will be in a third 60 degree quadrant.
- Engaged in adequate ground truthing, they have never even been to the house at Arkana, however they make comments as if they understand the layout of the property.
- Followed NSW planning legislation and constructed an illegal wind monitoring mast that can be seen from our garden.
- Undertaken an adequate topography evaluation.
- Undertaken ground truthing regarding the visual distance zone evaluation, ground truthing would have:
 - recognized that Sullivan only reviewed wind turbines up to a tip height of 119m. and
 - Table 6 in the bulletin did not reflect Sullivans findings even at tip height of 119m.
- Adequately assessed the Scenic Quality for the areas associated with our three homes.
- Correctly reviewed the visual magnitude thresholds by taking into consideration the fact turbines may potentially have significant visual magnitude impacts based on their **relative height** and their distance from our homes.
- Recognised that in relation to visual magnitude all three of our homes will be impacted by the proposed wind farm and all will have a Major Focus of Visual Attention in relation to the wind farm.

- Conducted a review of the impacts of the requirement for Aviation lighting.

As a result it can be demonstrated the inputs for Table 8 indicating our properties are all categorised as VIZ 2 is incorrect, they should all be categorised as VIZ 1.

Property Values

Section 7.12 of the EIS – Property Values.

Section 7.12 of the EIS – Property Values Includes a **reference to Appendix O Economic Impact Assessment**

Section 3.6 of Appendix O includes the following commentary:

The economic value of private land is determined by the interaction of demand and supply in the market, with the market price for land reflecting the willingness to pay of a potential purchaser. Willingness to pay reflects the discounted future potential returns from the land (whether from agriculture, rural residential uses, mining and extractive industries, recreation uses and potential (real or otherwise) to convert to higher value uses e.g. rural residential, urban, industrial or commercial uses. These potential future returns reflect the structural, access and environmental attributes of the land.

Structural attributes include lot size and shape, house attributes, other property improvements, land capability, resource endowments, current zoning, future subdivision potential, road frontage, water, sewerage, electricity, communication services etc.

Access includes proximity to major cities and the employment and community and the social services this offers.

Environmental attributes may include:

- noise, water quality and scenic amenity - all of which positively impact land values;
- the presence of native vegetation and biodiversity - which can have a positive impact on private land values in terms of amenity and a negative impact on private land values in terms of restrictions on current and potential use of the land; and
- the presence of hazards such as flood prone land and bushfire hazard - which reduce private land values by limiting land use opportunities or increase land values by supporting particular farming activity e.g. floodplains.

The value of private lands on the urban fringe are potentially determined by both agricultural characteristics of the land (i.e. future potential agricultural returns) and urban influences including access to the urban area (and associated physical and social infrastructure including employment, schools, hospitals etc.) and potential for urban conversion.

Where no potential for urban conversion exists in the next say 20 to 30 years, potential agricultural production and/or access to urban areas (employment and physical and social infrastructure) are likely to be major potential determinants of land values. Given enough distance from an urban area, land parcels are valued for agricultural uses only (Guiling *et al* 2009) and land values increase linearly with size.

Preston Rowe Patterson (2009) in a study of the impact of windfarms on property values found that properties in rural/agricultural areas appeared to be the least affected by wind farm development, with no reductions found near any of the eight windfarms investigated. The only properties where a possible effect was observed were lifestyle properties in Victoria within 500 m of a windfarm.

A literature review by Urbis (2016) of Australian and international studies found that the majority of published reports conclude that there is no impact or a limited defined impact of windfarms on property values. Those studies which identified a negative impact are based in the northern hemisphere and are associated with countries with higher population densities and a greater number of traditional residential and lifestyle properties affected by wind farms. This is generally contrary to the Australian experience, with most wind farms being located in low population density environments that derive the majority of their value from productive farming purposes (Urbis 2016).

Urbis (2016) undertook an assessment of the impact of windfarms on surrounding land values in NSW and Victoria. It found that there is insufficient sales data to provide a definitive answer utilising statistically robust quantitative analysis techniques. However, from its case study assessments it did not identify any conclusive trends that would indicate that wind farms have negative impacts on property values. Its property resale analysis indicated that all of the properties examined demonstrated capital growth that aligned with the broader property market at the time. Consequently, Urbis (2016, p. 21) concluded:

"In our professional opinion, appropriately located windfarms within rural areas, removed from higher density residential areas, are unlikely to have a measurable negative impact on surrounding land values."

Epuron are relying on the above assessment from Appendix O and have included extracts from Appendix O in the main text of the EIS. However, they didn't include the following from Appendix O in the main text:

- Structural attributes include lot size and shape, house attributes, other property improvements, land capability, resource endowments, current zoning, future subdivision potential, road frontage, water, sewerage, electricity, communication services etc.
- Access includes proximity to major cities and the employment and community and the social services this offers.
- Environmental attributes may include:
 - noise, water quality and scenic amenity - all of which positively impact land values;
 - the presence of native vegetation and biodiversity - which can have a positive impact on private land values in terms of amenity and a negative impact on private land values in terms of restrictions on current and potential use of the land; and
 - the presence of hazards such as flood prone land and bushfire hazard - which reduce private land values by limiting land use opportunities or increase land values by supporting particular farming activity e.g. floodplains.
- The value of private lands on the urban fringe are potentially determined by both agricultural characteristics of the land (i.e. future potential agricultural returns) and urban influences including access to the urban area (and associated physical and social infrastructure including employment, schools,

hospitals etc.) and potential for urban conversion.

- Where no potential for urban conversion exists in the next say 20 to 30 years, potential agricultural production and/or access to urban areas (employment and physical and social infrastructure) are likely to be major potential determinants of land values. Given enough distance from an urban area, land parcels are valued for agricultural uses only (Guiling *et al* 2009) and land values increase linearly with size.

The executive summary from the EIS also includes the following:

Minor Issues.

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

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

Throughout the whole process Epuron have downplayed the impact on property values, they have misquoted both the Preston Rowe Patterson (2009) study and the Urbis 2016 report.

Even in the main body of the EIS they have cherry picked the contents of Appendix O again trying to downplay the impacts of the proposed Bowmans Creek wind farm on property values. Gillespie Economics prepared Appendix O **Economic Impact Assessment**. In their assessment Gillespie Economics have identified that property values are impacted by the following:

- future subdivision potential
- noise,
- water quality
- scenic amenity
- the presence of native vegetation and biodiversity

The wind farm will have a negative impact on the area and there will be a flow on effect of negative impacts for property values in the area.

I have also included an evaluation **Reference (Attachment A) Property value analysis**.

I prepared the evaluation using the two reports Epuron have continuously referred to over the last 3 years the 2009 report prepared for the NSW valuer **Reference (Attachment A1)** and the 2016 Urbis Report **Reference (Attachment A2)**. I managed to identify every property from both reports and have included a lot more information in my evaluation on the properties. As you will see from the evaluation both reports are wrong, they did not evaluate the available information correctly and have misrepresented the facts.

It can be shown the majority of properties with views of wind farms loose value and some people cannot even sell their properties.

A really good example is the Blayney wind farm evaluation included in the 2009 report. The Blayney wind farm is only 15 wind turbines with a tip height of just over 65m. If you read the evaluation the losses are unbelievable, every property lost value/money when they sold compared to other property sales in the area that could not see the wind turbines.

The report is accurate, I have forensically checked and double checked the information to make sure I haven't misrepresented any information. I used numerous real estate web sites, local council minutes and reports, State and local government reports and Core Logic.

The Property value analysis report (Attachment A) proves beyond doubt that wind farms adversely impact on property values. The property value analysis also contains a lot of additional information on the majority of the properties compared to the original reviews conducted in 2009 and 2016. This also assures the accuracy of the new information.

Epuron have provided misleading information to amongst others the public and the DPIE regarding the impact on property values if the proposed Bowmans Creek wind farm is approved. They have provided the incorrect information during group consultation sessions, during face-to-face meetings, on their web site, in their community newsletters and in the EIS.

They may plead ignorance because they relied on the Preston Rowe Patterson (2009) preliminary review and the Urbis 2016 review. Ignorance is not a defence and perhaps they should have taken heed from the Urbis 2016 review which indicates that the information contained in the report should not be relied on and expert advice should be sought as to the relevance, accuracy, completeness or fitness for purpose of this document in respect of any particular user's circumstances.

There is no evidence Epuron have engaged an expert to ensure either of the reports are fit for purpose for the needs of the proposed Bowmans Creek wind farm.

Ignorance is not a defence, Epuron and their consultants have an obligation to Ensure the information they present is accurate they have not done this.

Consultation

Section 5 of the EIS - STAKEHOLDER ENGAGEMENT

Section 5 of the EIS - STAKEHOLDER ENGAGEMENT includes:

The development of a Stakeholder Engagement Plan with **Table 9 Stakeholder Engagement Plan Objectives** attached below included in the EIS.

Table 9
Stakeholder Engagement Plan Objectives

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

In relation to table 9 Scoping report SEP Epuron have:

- **Not** Maintained and further develop cooperative landowner and community relationships with both associated and non-associated landholders. Some non-associated landholders with property boundaries approximately 1km from proposed wind turbines have not been approached or spoken to. For Sandra (my wife) and me we didn't find out one of our houses was going to be impacted until we read the EIS.
- **Not** Engage with stakeholders so views, concerns and aspirations are heard and understood. Sandra and I had a meeting with Epuron in 2018 and they told us we would not see any infrastructure from our home, they lied to us. Other people have also had discussions with Epuron and they have lied to them also.
- **Not** Provided multiple opportunities for dialogue in various forms to allow the community to receive information and provide feedback about the Project. They have held a few meetings at four rural halls and admit they had about 200 people attend in total. They have not given the wider community any opportunities to understand the project or the impact it will have on them. For example
 - The families who live at Eastbrook Links Muswellbrook are not aware they will see approximately 30 wind turbines from their homes reference photomontage PM2 - Appendix H Visual assessment.
 - The families who live at Ruth White Avenue Muswellbrook are not aware they will see approximately 10 wind turbines from their homes reference photomontage PM5 - Appendix H Visual assessment.
- **Not** undertaken significant community consultation. The proponent has indicated they have held meetings at Bowmans Creek, McCullys Gap, Hebden and Muscle Creek and approximately 200 people attended.
 - The project is being built in three local government LGA's being Upper Hunter, Muswellbrook & Singleton. In reference to the 2016 Census the population of these three LGA's is approximately 53,694 people. Epuron have managed **to consult with 0.38% of the population** of the three LGA's where the proposed wind farm is to be built.
- **Not** Built positive, trust-based relationships with members of the local community. Epuron have misled the community from the very beginning Lying and Telling is not consultation. This included:
 - building two wind monitoring towers that were not constructed pursuant to the *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP).
 - Submitting a DA to Muswellbrook Shire Council that was not correct.
 - Lying when question about the wind monitoring towers to local journalist.
 - Telling numerous families they will not see the wind turbines and they then find out they will.

This attitude has continued throughout the EIS process.

In relation to table 9 EIS SEP Epuron have:

- **Not** Maintained and further develop cooperative landowner and community relationships with both associated and non-associated landholders. This included:
 - Numerous non-associated landholders were offered neighbour agreements along the same conditions to the agreement Epuron proposed for me reference Attachments 7,7A,7B & 7C.
 - Refusing to attend meetings with concerned members of the community.
 - Not notifying people that the EIS is on public display, even though they will be impacted by the proposed wind farm. This includes families with property within 1Km of the proposed wind turbines and families just outside the 4.4Km zone who will see numerous wind turbines. Some of my neighbours on Sandy Creek road were not notified by anyone regarding the EIS being on public display.
- **Not** Ensured the community continues to be fully informed about the Project, its likely impacts, its likely benefits, opportunities for input and the planning approval's process. The majority of the communities of Singleton, Muswellbrook and Upper Hunter LGA's are not aware of the project and the impacts it could have on them. Particularly the community in Muswellbrook who will see the wind turbines. When Epuron have informed the community the information they have provided has been wrong as already demonstrated in my response to the EIS.
- **Not** Ensure the community continues to be fully informed about the Project, its likely impacts, its likely benefits, opportunities for input and the planning approval's process. Or provided multiple opportunities for dialogue in various forms to allow the community to receive information and provide feedback about the Project They have had a couple of interviews on the radio and some sessions at four rural halls (attended by 200 people in total). They have also organised the meetings during work hours and have even organised them during school holidays when people are away on holiday. Epuron have not followed industry best practice, they have not:
 - **Advertised on the local radio stations**
 - **Advertised in the local papers**
 - **Held larger community information sessions in the larger communities in the three LGA's**
 - **Informed anyone in the community about the four additional monitoring masts that are proposed even though they will be very close to their Homes.**

They have tried to minimise the number of people who are aware of the wind farm and its impacts.

- **Not** incorporated feedback into the Project design to address issues raised.

It should be noted Epuron have indicated that they held a Project Briefing with local brigade captains (June 2020). Seek issues and requested commitments. Epuron have not identified who the local brigade captains are. However at least one brigade captain has agreed to host numerous wind turbines and associated infrastructure and will gain financially if the project is approved. If brigade captains are also host this is a gross conflict of interest.

Consultation with Sandra and Nigel Wood

Epuron contacted me prior to the Public Meeting Muswellbrook Shire Council called in July 2018.

Julian Kasby organised a meeting at our home, present were Sandra Wood (my wife) Julian Kasby and a second person from Epuron and myself.

During the meeting Julian informed Sandra and me about Epuron who they were, and they were looking at the possibility of building a wind farm at Bowmans Creek. Julian informed us that we would not see any infrastructure from our home however they would like to discuss the possibility of a power line running from the wind turbines to the power lines feeding from the power stations.

I told Julian I wasn't really interested I didn't want the powerline impeding on our visual views of the property and we were looking at the option of building a new house sometime in the future on one of the ridges overlooking our property and the Hunter Valley. I told Julian we were very lucky we had managed to purchase an aggregation of properties that were not only good grazing but very beautiful with distinct hills, waterfalls and timbered creek lines fenced off from cattle.

I also asked where Bowmans Creek was and the location of the proposed wind towers, he showed both Sandra and I on a small map and indicated the wind turbines would only be erected at the top of Bowmans Creek.

At the end of the meeting, I wasn't concerned thinking the wind farm would not impact on us at all. When the meeting organised by Muswellbrook Shire Council for July 2018 was advertised because we had been informed by Julian that we would not see any infrastructure we didn't attend. I actually wondered what all the fuss was about.

In August 2018 all that changed when Epuron constructed a 120m tall wind monitoring masts on a ridgeline approximately 3.5km to the East of our home. Attached below is a photograph of the wind monitoring masts taken from our home.

Between Sandra and I we would be one of the largest landowners (between us we own 3500 Acres) who will be impacted by the proposed Bowmans Creek wind farm however Epuron have not at any stage:

- Discussed Key viewpoints in the area.
- The relative scenic quality of the area.
- Had input into the ranking of those features and scenic quality into high, moderate or low visual significance.
 - Or had the opportunity to have input.
- Formally inform us about the proposed project area or
- discuss potential visual impacts.
- Ever consulted with us regarding the construction of the proposed permanent monitoring masts.

Note this monitoring mast will tower over our home less than 3km away and will be in a third 60 degree quadrant.

- Ever discussed the impacts on our two homes located on our properties Arkana (Identified in the EIS as H8 – 1) or Happy Valley. We are not even sure if they are aware of our home at Happy Valley.

Epuron have consulted with me (and may I say the consulting has been very weak) regarding our home at Diamond T. and they have:

- Tabled a neighbour agreement that would make us serfs in our home and on our property.
- Told us our health will not be impacted.
- Told us that the temporary wind monitoring masts are constructed pursuant to the *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP).
- Treated us with contempt.

This is far from Industry best practice and is not adequate consultation for a project that has an estimated construction costs of \$569,000,000, sixty 220m tall wind turbines fitted with 80m blades, up to 80km of internal roads, numerous other items of supporting infrastructure covering 16,720Ha over three Local Government Areas.

Before the project is approved Epuron must ensure that they have engaged in meaningful and adequate consultation with the whole community. Really with consultation process needs to start again, they haven't got first principles of consultation right.

Noise and Vibration

I would like to raise the following points regarding Noise and Vibration.

Vibration

The EIS does not include any evaluation of vibration resulting from Drill and Blast activities.

Noise

The EIS does not include adequate evaluation of noise in the following areas.

- Industry best practice is continuous real time evaluation of continuous real time monitoring, this is to allow operations to be listened to by a person and operations to be modified in a real time to ensure operations do not exceed their noise limits.
 - Noise monitors should be established around the perimeter of the project and at peoples homes if they request them.
 - The noise results should be available in real time and historical results on the proponents Web site.

- Background noise monitoring was only conducted at four sites around the project area, this level of background monitoring is not adequate to establish a true indication of the background noise for a project area of nearly 17,000Ha.
- The Background noise monitoring was conducted between the period between October 28 to December 9 2019 for three properties sites and the periods between October 28 to October 30 2019 & December 9 2019 to January 16 2020 for the fourth property site. This does not give any indication of the background noise levels in winter when there is a lot less noise.
 - Additional noise monitoring needs to be carried out at more sites and
 - Noise monitoring needs to be conducted for other periods of time including during the winter months.
- It is advised that the noise monitoring equipment was located in accordance with SA 2009. That is, conducted within 30 metres of the dwelling in the direction of the wind farm. The background noise measurement locations were selected to represent the acoustic environment experienced in the immediate vicinity of the dwelling whilst also being removed from extraneous noise sources, such as pumps and air conditioning units. Photographs of the monitoring equipment at each location are provided in Appendix B.
 - Except as can be seen in photographs in **Appendix B (Noise and Vibration assessment) from the EIS** below the noise monitors are located next to fences and shrubs, the breeze or wind blowing through the fences or trees has the impact of increasing any noise recorded in their vicinity.
 - The noise monitoring equipment should be should located away from any external influences including fences and shrubs as well as the houses.

The background noise monitoring results have been compromised and are not a true indication of the project sites back ground noise levels.

APPENDIX B: Monitoring Equipment

Figure B1: G15-3 Monitoring Equipment.



Figure B3: P22-1 Monitoring Equipment.



Figure B2: G17-1 Monitoring Equipment.



Figure B4: S17-2 Monitoring Equipment.



Appendix B from Appendix I – Noise and Vibration

Section 3 - Appendix B (Noise and Vibration assessment) from the EIS also includes the following:

PROPAGATION MODEL

The predictions of environmental noise from the Project utilise the CONCAWE noise propagation model and SoundPLAN noise modelling software. The sound propagation model considers the following influences:

- sound power levels of each individual noise source;
- the locations of noise sources;
- separation distances between noise sources and residences;
- local topography;
- influence of the ground;
- air absorption; and,
- meteorological conditions.

The CONCAWE system divides meteorological conditions into six separate “weather categories”, depending on wind speed, wind direction, time of day and level of cloud cover. Weather Category 1 provides the weather conditions associated with the “lowest” propagation of noise, whilst **Weather Category 6 provides “worst-case”** (i.e. highest noise level) conditions. Weather Category 4 provides “neutral” weather conditions for noise propagation (that is, conditions which do not account for the effects of temperature inversion or wind on propagation).

Appendix B (Noise and Vibration assessment) also includes the following:

The assessment has been based on the following input conditions:

- **weather category 6 (representing weather conditions conducive to the propagation of noise);**
- atmospheric conditions at **10°C and 80% relative humidity** (representing atmospheric conditions with low acoustic absorption rates being conducive to the propagation of noise);
- wind direction from all noise sources to the particular residence under consideration, even in circumstances where sources are located in opposite directions from the residence (representing wind conditions which result in higher noise levels than can occur in practice); and,
- maximum barrier attenuation from topography of 2 dB(A) (representing a conservative assessment of any shielding provided by topography – much higher barrier attenuation can occur for WTGs which do not have line of sight to residences).

There are issues with the noise propagation model including the following:

- The noise propagation modeling report indicates that the assessment has been based on the following input conditions.
 - weather category 6 (representing weather conditions conducive to the propagation of noise).
 - atmospheric conditions at 10°C and 80% relative humidity (representing atmospheric conditions with low acoustic absorption rates being conducive to the propagation of noise).

However model is not accurate because it has not taken into consideration the weather conditions that present themselves in the locality of the proposed Bowmans Creek wind farm during the cooler months when the air temperature is below 10°C and 80% relative humidity.

Whilst the EIS reports that weather category 6 (representing weather conditions conducive to the propagation of noise and atmospheric conditions at 10°C and 80% relative humidity (representing atmospheric conditions with low acoustic absorption rates being conducive to the propagation of noise). May be correct it does not represent the weather conditions that will have the most influence on homes regarding their exposure to noise.

The noise a home is exposed to depends on amongst other criteria the **Acoustic wave velocity** (sounds velocity as it travels through air). The velocity of sound is a function of the medium through which it travels, and it generally travels faster in more dense mediums. As the velocity increases the noise levels at a home increases. Air increases in density as the air temperature and relative humidity drop and air pressure rises. During the cooler months the night-time air temperature drops below 0°C and the relative humidity also drops, these weather events are associated with high pressure weather systems.

As indicated the modelling conducted at 10°C and 80% relative humidity will not give accurate results for the predictive noise modelling included in the EIS.

The noise modelling has indicated it has taken into consideration the local topography. However the modelling has not taken into consideration frost hollows. Some areas, on a regional scale, are particularly prone to frost. These are sometimes referred to as frost hollows, or frost pockets if they are very small. Frost hollows often occur in valleys due to cold air drainage. As the air at the top of a hill cools at night, it becomes dense and heavy compared to surrounding air, and will drain to lower levels. This is referred to as a katabatic wind, and can result in frost forming in valleys when surrounding areas remain frost-free.

The project area for the proposed Bowmans Creek wind farm is prone to frost hollows due to the topography and the clear weather during the cooler months. During these weather events the wind speed on the ridges where the wind turbines will be located will be higher than cut in (**3 m/s**), the wind turbines will be operational. The atmospheric conditions below the ridges will cause the air to be dense and cold and the prevailing weather will be influenced by a High-pressure weather system. In Australia, frost is more likely to form under a clear sky, with low humidity and light surface winds.

The project area for the proposed Bowmans Creek wind farm is prone to frost during the months from and including April through to and including October a period of six months. As already noted, the back ground noise monitoring did not commence until October 28th 2019 and was completed by January 16th 2020.

The EIS also includes the criteria for the noise propagation model and includes the following:

- The sound propagation model considers the following influences:
 - sound power levels of each individual noise source;
 - the locations of noise sources;

- separation distances between noise sources and residences;
- local topography;
- influence of the ground;
- air absorption; and,
- meteorological conditions.

The noise propagation model does not include temperature gradient it actually assumes the temperature is the same at the source and at the receiver.

The information and data collected from the four noise monitors has not been made public even when people have asked for it. The inputs into the modelling have not been made public again even when people have asked for it. Even basic information including the noise filter assumptions used in the modelling are not available. It should be recognised Significant differences in predicted noise levels can result, depending on which noise propagation algorithm is used in the modelling. It appears a very basic 2-D sound ray theory for aerodynamic noise propagation from wind turbine rotating blades has been used to model the noise impacts on the homes surrounding the proposed Bowmans Creek wind farm.

The EIS does not even mention the type of noise generated by wind turbines, the noise is not a constant noise, the noise level varies as the turbine blades rotate and pass the actual wind turbine power. Just as a dripping tap may not be very loud, a dripping tap in a home at night when everyone is in bed carries throughout the house causing annoyance and must be turned off. Whilst a louder constant white noise for example rain does not have the same effect on sleep disturbance.

The inputs cannot be independently clarified to give any confidence in the reports' final conclusions. And the noise generated by the wind turbines has been simplified and underestimated to get the project approved without the required controls in place.

The noise and vibration assessment included in the EIS is not accurate, and has not predicted the true noise impacts on the homes surrounding the proposed Bowmans Creek wind farm.

The results of this will mean families living in homes that will be adversely impacted by noise will be fighting and fighting for justice whilst Epuron or any future owner hide behind the lies included in this section of the EIS.

As noted in the EIS

The recommendations of the WHO Guidelines are repeated below:

"For a good night's sleep, the equivalent sound level should not exceed 30 dB(A) (inside the bedroom) for continuous background noise".

However, it should also be noted:

- A change in sound level of 5 dB will typically result in a noticeable community response.
- A 6 dB increase is equivalent to moving half the distance towards a sound source.
- A 10 dB increase is subjectively heard as an approximate doubling in loudness.

The EIS has indicated that back ground noise levels in the vicinity of the proposed Bowmans Creek wind farm are as low as 20dB, and the noise guidelines allow the wind turbines to be as high as 35dB in these circumstances with no recourse for the families impacted.

It should also be remembered that average sound pressure measurements might not indicate when a sound is detectable by a listener. Just as a dog's barking can be heard through other sounds, or a vehicle reversing beeper, sounds with particular frequencies or an identifiable pattern may be heard through background sounds that is otherwise loud enough to mask those sounds.

Sound emissions from wind turbines will also vary as the turbulence in the wind through the rotor changes. Turbulence in the ground level winds will also affect a listener's ability to hear other sounds. Because fluctuations in ground level wind speeds will not exactly correlate with those at the height of the turbine, a listener will be subject to times when the wind turbines can be heard over the ambient sound.

The impacts of Noise and Vibration on the home of Sandra and Nigel Wood

In addition to the points already raised regarding noise impacts, the EIS has indicated identified two of our homes and ignored the third however all three homes will be adversely impacted by excessive noise for prolonged periods of time if the Bowmans Creek wind farm is constructed.

Exacerbating the impacts already included our homes are all built in valleys that are frost hollows we have an extended period of time when we are subject to frost with the majority being in the period from April including April through to October including October. However, we have received frost outside these times. The temperatures often get below 0°C and down as low as -10°C and the frost do not clear until mid-morning and start to settle again early in the evening. Epuron have not conducted any ground truthing on our homes regarding this.

Our homes are also a lot lower in elevation than the proposed wind turbines reference the two tables included in my objection to the visual assessment in this document **How high will the wind turbines be compared to our Home?** We will be adversely impacted by temperature gradient with the subsequent impacts of excessive noise.

Our homes but particularly the home we live in at Diamond T is built in a large natural amphitheatre, this has the effect of amplifying any noises in the area. It is proposed that 17 wind turbines will be constructed around the elevated edges of the natural amphitheatre.

We did request along with others that Epuron would conduct background noise monitoring on our property they declined our request.

In relation to noise impacts Epuron have not adequately assessed the impacts for homes surrounding the project site and have certainly not assessed the impacts on our homes. They have not met the requirements as prescribed by the DPIE.

Biodiversity

The EIS includes **Appendix L Biodiversity** Section 1.3.3 of appendix L Biodiversity includes the following: The subject land covers a total area of ~542 ha while the disturbance area covers a total of ~515 ha. The survey area covers a total area of ~1,052 ha. The survey area, subject land and disturbance area are shown in **Figure 4**.

Only 1,052Ha out of a project area of 16,720Ha has been surveyed as part of the biodiversity assessment. On face value the total area surveyed for the biodiversity assessment is only 6.3% of the project area.

However, the surveyed area did not actually include the whole of the 1,052Ha reported. As noted in **Appendix L Biodiversity** Section 3.10

Limitations and Adjustments

Section 3.10.1 Survey Coverage includes the following:

Coverage of the entire survey area was not possible due to limited access constraints from the existing terrain (very steep slopes, areas with no access tracks), land access permissions and safety concerns over exposure to water in Lake Liddell. Therefore, due to the size of the survey area and access restrictions, not all vegetation patches or areas of fauna habitat within the survey areas could be surveyed in detail in the time allowed. Therefore, representative areas were surveyed in detail with vegetation patches that could not be accessed being assessed from the roadside or nearest ridgeline/vantage point where possible, including use of binoculars to estimate dominant canopy trees and community structure (e.g. open forest, shrubby woodland, grassy woodland) where feasible. Condition for these areas was then extrapolated from other known areas of similar vegetation that had been surveyed in detail following review of aerial imagery. Field data collected during the 2019 – 2020 and 2020 – 2021 surveys, combined with database records, background research and aerial photography analysis, is considered to provide an adequately detailed assessment of the biodiversity values that occur and are likely to occur within the survey area.

The report doesn't actual identify the total area surveyed during the Biodiversity Assessment.

Not only is the area assessed in the Biodiversity assessment inadequate considering the size of the project the time spent assessing the Biodiversity impacts is not adequate. The EIS indicates limited time spent on the components of the assessment, the EIS indicates a total of 24.5 person hours were spent on the bird survey, if you compare this to the project area of 16,720Ha this equates to 5.27seconds survey time per Hectare, or if it is equated to the nominated survey area of 1052Ha this equates to 84seconds survey time per Hectare. How can a survey be carried out in such a short time frame and accurately evaluate the biodiversity of an area in relation to birds? It cannot.

The Biodiversity Assessment has not covered any of the access tracks or areas identified in the EIS for the location of the four permanent monitoring masts.

Karsts, Caves, Crevices, Cliffs and Areas of Geological Significance

As noted in **Appendix L Biodiversity Section 4.2.5** - Karsts, Caves, Crevices, Cliffs and Areas of Geological Significance No karsts, caves, crevices, cliffs or areas of geological significance have been identified within the subject land.

Topographic map 9133-3N Dawsons Hill indicates the presence of a small cliff in an area known as Yellow Rock (the 'Yellow Rock cliff'). This mapped cliff is not located within the subject land but is present in the assessment area in close proximity to a section of proposed underground reticulation in the eastern parts of the subject land.

Areas of Outstanding Biodiversity Value

As noted in **Appendix L Biodiversity Section 4.2.6** - Areas of Outstanding Biodiversity Value

No areas of outstanding biodiversity value have been mapped within the subject land or assessment area.

However, one of the property owners associated with the project Ross Clydsdale, was featured in the local paper "The Hunter River Times" Issue 01, Friday 19th June 2020 (**Reference attachment B**). The article contained amongst other things: "Taking in the 4000 acres in the head of a naturally stunning valley, the property comes complete with remnant rainforest, **naturally flowing waterfalls** and crystal-clear pools, **soaring escarpments** and giant grass tree forest". The property referred to in the article is "Strathclyde" Epuron are proposing not to only build wind turbines on the property but to also construct and erect major infrastructure on the property. The main access into the project is through Strathclyde.

The biodiversity assessment has been conducted in an overly simplistic approach to portray the message that the proposed wind farm will not have a major impact on the biodiversity of the area. This approach means the biodiversity assessment is totally flawed. It has not found evidence of fauna that is present in the area is for example:

Koalas have a range covering up to 50Ha living in an overlapping network but live as solitary animals getting together for breeding.

Spotted Quolls have a range of up to 500Ha and can travel 6km in one night from their nesting site.

Grey headed flying fox travel up to 50km in a single night from their camps to their feeding grounds.

Koalas

The assessment has not

- Identified the true extent of the Koala habitat and the number of Koalas in the project area or in the vicinity of the proposed project area.
 - There is a large area of Biodiversity offset land associated with mining projects bordering the proposed Bowmans Creek wind farm. A large number of Koalas have been sighted and reported on this land.
 - Other neighbours have had to organise Koala assessments in relation to smaller private projects. The assessments confirm Koalas live in the area.
 - One of the property owners associated with the project Ross Clydsdale, was featured in the local paper "The Hunter River Times" Issue 01, Friday 19th June 2020 (**Reference attachment B**). The article contained amongst other things Ross and his plans to create a refuge for the "other residents on the property" Ross **identified Koalas** and Quolls as living on the property.
 - We are also aware that the University of Newcastle have also conducted research on Koalas on Ross Clydsdales property "Strathclyde". The research also found evidence of extensive Koala populations on the 4000-acre property and the research team also have video footage of Koalas within 150 – 200m of proposed wind turbine construction.

However, the assessment has included the following in relation to Koalas:

- Microhabitats within the subject land are degraded, such that the species is unlikely to utilise the habitat. Subject land occurs in a highly cleared agricultural landscape with limited occurrence of preferred food trees.

Appendix L Biodiversity includes

Section 2.6 of State Environmental Planning Policy (Koala Habitat Protection) 2020

State Environmental Planning Policy (SEPP) (Koala Habitat Protection) 2020 (Koala SEPP 2020) commenced on 30 November 2020, replacing the repealed SEPP (Koala Habitat Protection) 2019 that was in place from 1 March 2020 – 29 November 2020. Koala SEPP 2020 essentially replicates the objectives and provisions of the prior SEPP 44 – Koala habitat protection (SEPP44) in relation to the processes for preparing koala plans of management, determining whether land contains potential or core koala habitat, and determining development applications on core koala habitat.

The Koala SEPP 2020 aims to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current trend of koala population decline. The Project is located across the Muswellbrook, Singleton and Upper Hunter LGAs which are listed in Schedule 1 of the SEPP. However, this policy only applies to local developments and does not apply to SSDs or State Significant Infrastructure. **Therefore, this policy has not been considered** further *per se* within this BDAR. Nonetheless assessments of potential impacts for Koalas have been conducted in accordance with the requirements of the BAM which also covers Commonwealth requirements under the Bilateral Agreement between the Federal Government and NSW.

The Biodiversity assessment has not considered the requirements of the **State Environmental Planning Policy (SEPP) (Koala Habitat Protection) 2020 (Koala SEPP 2020)**.

Epuron and their consultants should hang their collective heads in shame, they have:

- Not assessed the correct Koala population, distribution or habitat in the vicinity of the wind farm.
- Ignored available information and data regarding Koala numbers, distribution, and habitat in the area.
- Decided to not meet the requirements of the *State Environmental Planning Policy (SEPP) (Koala Habitat Protection) 2020 (Koala SEPP 2020)*.
 - The new *State Environmental Planning Policy (SEPP) (Koala Habitat Protection) 2020 (Koala SEPP 2020)*. Was legislated because it has been recognized that Koala's in Australia are extremely vulnerable, and all measures should be taken to protect Koala's.
 - The Koala SEPP 2020 identifies the requirement for a developer to determine whether land contains potential or core koala habitat. Not only have Epuron chosen not to meet the requirements of Koala SEPP 2020 (because they just don't need to) they have also determined contrary to the true facts, that the site does not contain potential or core koala habitat.

This is not industry best practice it is environmental vandalism. The proposed Bowmans Creek wind farm project area and surrounding area does contain numerous Koala's, does contain core habitat with the potential to expand this habitat. Epuron obviously do not think Koala's, should have any bearing or impact on building wind turbines and destroying the Koala populations in the area.

The decline in Koala populations is exacerbated by the loss of their habitat and fragmentation of their habitat and home ranges by roads. Epuron have decided it is acceptable to accelerate the demise of the Koala population in the region by destroying their habitat and causing the fragmentation of their habitat and home range by proposing to build up to 80km of roads.

Spotted Quolls

The assessment has not Identified the presence of Spotted Quolls in the area despite:

- One of the property owners associated with the project Ross Clydsdale, was featured in the local paper "The Hunter River Times" Issue 01, Friday 19th June 2020 (**Reference attachment B**). The article contained amongst other things Ross and his plans to create a refuge for the "other residents on the property" Ross **identified** Koalas **and Quolls** as living on the property.
- I also have numerous photographs of Spotted quolls located on all our properties with photographs within 2km of proposed wind turbine sites and out to 4km of proposed wind turbine sites. As previously notes Spotted Quolls have a range of up to 500Ha and can travel 6km in one night from their nesting site. They do not stop at my property's boundaries.

However, the assessment included minimum information in relation to Spotted Quolls:

Grey Headed Flying Foxes.

The assessment has not Identified the presence of flying foxes in the area despite:

- The fact flying foxes do feed on properties surrounding the proposed wind farm, I have photos of grey headed flying foxes feeding at our home 3km away from the proposed wind turbine sites. As previously noted, Grey headed flying foxes travel up to 50km in a single night from their camps to their feeding grounds. They do not skirt around the project site of the proposed Bowmans Creek wind farm. And they do fly at a height that will cause them to interact with the blades fitted to the wind turbines, they will be killed by this interaction.

However, the assessment has included the following in relation to Grey Headed Flying Foxes:

Habitat constraints constraint absent from the subject land - i.e. no breeding camps are present within or adjacent to the subject land.

I have not had time to investigate other individual claims made in the Biodiversity Assessment however it has been demonstrated that Epuron and their consultants have not adequately addressed the issues regarding biodiversity in the project area for the proposed wind farm.

However, it should also be noted they have:

- Not identified all the migratory birds that as a minimum fly through the proposed project site. Including the Channel Billed Cuckoo and Koels.
- Not identified migratory butterflies that fly through the proposed project site.

It should also be noted they have not identified industry best practice in relation to minimising any impacts the proposed Bowmans Creek wind farm will have in relation to the Biodiversity of the project site. Industry best practice includes but is not limited to:

- The relocation of any minimum size trees including older stag trees that must be cleared for the project.
- Identified clearing windows to ensure they do not impact on breeding and nesting seasons. Including the nursing windows.
- Identified crucial weather events when clearing will not be undertaken including below and above certain temperatures.
- Identified the treatment of any topsoil's, and subsoils that will be disturbed for the project.

- Identified the treatment of any mulched vegetation that will be disturbed for the project.

The EIS also indicates “Although the Wedge-tailed Eagle is not a listed threatened species in NSW, this species was also included in the targeted raptor searches as it is considered a high-risk strike species for wind farm projects”.

However, no controls have been put in place to protect the Wedge-tailed Eagle or other birds that may be impacted by the wind turbine blades.

The EIS indicates a risk assessment was carried out and included the following:

Based on the outcome of the Risk Assessment, the risk of blade strike/collision for most birds was rated as negligible. No species were rated as Severe or High. Species assessed as a Moderate to Low risk include:

- Wedge-tailed Eagle;
- Spotted Harrier;
- Regent Honeyeater; and
- Swift Parrot

The EIS identifies birds will be killed by the wind turbine blades and one control identified in the EIS is to count the dead birds to see if the kill rate is larger than the estimate. The EIS does not identify the actions that will be taken if the kill rate is larger than the estimate.

Conclusion Biodiversity assessment

If you believe the Biodiversity assessment the project area could nearly be described as a degenerated sterile landscape devoid of any meaningful plant and wildlife.

It is even claimed in the EIS that “*With the implementation of proposed avoidance, management and offsetting measures the proposal is considered likely to maintain or improve biodiversity values in the long term and is considered to meet the no net loss standard required under the BAM*”.

This claim is made despite clearing over 500Ha, building 60 wind turbines, constructing up to 80km of access roads building a multitude of infrastructure and killing countless animals and birds.

The Biodiversity Assessment included in the EIS, through its omissions and misinformation has not adequately assessed the impacts the proposed Bowmans Creek wind farm will have on the Biodiversity of the project site and surrounding area.

Conclusion

The attached assessment of the EIS and associated documents has demonstrated that the EIS has not adequately addressed the legislated requirements either through misrepresentation or omission. As a result, the EIS and associated assessment has not determined that it is open for the Minister to conclude that the Project is in the public interest and as such it **should not be approved** under the *Environmental Planning & Assessment Act 1979*.

The Minister will ultimately take advice from the DPIE and the Independent Planning Commission (IPC). Both Government bodies have an obligation to the residents of the Hunter Valley to ensure all the impacts of the proposed Bowmans Creek wind farm are correctly assessed and understood. This may take time however as indicated in the EIS Epuron have already been successful in obtaining approval for wind energy projects in NSW totalling over 2,300 megawatts of this only 570 megawatts have been constructed and commissioned. There are still over 1,730 megawatts of Epuron approved wind farm capacity idle in NSW.

The attached assessment also proves the basic legislated requirements and associated guidelines for a wind farm have not been met and cannot be met by the project in its current format.

The project will have a detrimental impact in the following areas:

- Air Quality impacts through dust generation
 - During construction &
 - During operation
- Noise generation impacts
 - During construction &
 - During operation
- Fires and Bushfires impacts
- Visual impacts
- Biodiversity impacts
- Health impacts including mental health.
- Property valuations

Epuron have not conducted adequate consultation, consulting with approximately 0.38% of the population in the three LGA's.

During consultation Epuron and their agents have lied to individuals, they have distributed information by various means that was incorrect.

Epuron have included material in the EIS that is not correct including misinformation in the following areas:

- Water rights and Harvestable rights
- The construction of the two temporary wind monitoring masts and legislated requirements
- Land ownership and Neighbour Agreements
- Construction requirements omitted the need for a mining/quarrying approval.
- Property valuations
- Air Quality impacts through dust generation
 - During construction &
 - During operation
- Noise generation impacts
 - During construction &
 - During operation
- Fires and Bushfires impacts
- Visual impacts
- Biodiversity impacts
- Health impacts including mental health.

If the ultimate decision is that the Bowmans Creek wind farm project is approved all of these issues need to be adequately addressed. And if residents within 8km of the wind farm do not want to be exposed to the impacts of the wind farm the approval should include acquisition rights including compensation for any losses. The acquisition rights should be triggered on the date the project is approved.

Sandra and me and our neighbours bought our properties because of the attributes at the time. We should not be expected to spend the rest of our lives subject to the monstrosities of the wind turbines, the monitoring towers, and the associated daily impacts on our lives. And for this we are expected to take a massive hit on the values of our properties.

This does not align with the requirements of the Paris Agreement or our Human Rights.

Whilst my attached assessment of the EIS may seem extensive, I have not had time to fully evaluate the whole EIS. Despite attempts to obtain an extension of the public exhibition period I was not successful however I was advised by Anthony Ko reserve my right to forward additional information after May 11, 2021. I have attached a copy of the email Anthony forwarded regarding this advice. However, I do not want that to be at the detriment of my objection to date and want this objection to be included towards the 50 objections required for the trigger of a IPC hearing.

I would also like to raise another issue and believe this is also especially important. If the Company engaged by Epuron to prepare the EIS Hansen and Bailey are prepared to attach a signed statement declaring the information contained in the statement is neither false nor misleading. When it clearly is with one example being the temporary wind monitoring masts, I am very concerned about the integrity of the Company preparing the EIS and believe this should be investigated by the DPIE. Mr James Bailey has not complied with the terms of the Expert Witness Code of the Land and Environment Court of NSW.

At the beginning of the EIS James Bailey signed the Environmental Impact Statement (**attached below**).

James Bailey includes the following statement: *I further certify that I have prepared the contents of this EIS and to the best of my knowledge.*

The last two points of the statement are:

- It contains all available information that is relevant to this EIS for the activity to which the Statement relates; and
- The information contained in the statement is neither false nor misleading.

It has been shown that the EIS does not contain all of the information that is relevant to this EIS for the activity the statement relates to.

AND

The information contained in the statement is neither false nor misleading.

The statement has not been prepared to the best of James Baileys knowledge. To support this claim, I include the following information included or not included in the EIS:

- There isn't a single photograph included in the EIS illustrating a 220m tall wind turbine fitted with 80m blades.
- No obstacle lighting is required as part of the Project (see **Section 7.3.3**). Therefore, there will not be a requirement for hazard lighting at the top of individual towers.
 - This statement is not correct CASA have not advised the proponent regarding obstacle lighting.
 - James Bailey is aware of this and presented this fact to the CCC on meeting held on April 14. 2021.

- The two existing, temporary masts were constructed pursuant to the *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP). The Project involves the continuing use of these monitoring masts, which may be relocated from time to time within the Project Boundary.
 - James Bailey was aware that the two existing temporary masts were not constructed pursuant to the *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP).
 - Hansen and Bailey prepared the Statement of Environmental Effects (**Attachment 4A**) to support a DA for the construction of the wind monitoring masts.
 - The Statement of Environmental Effects was prepared months after the wind monitoring mast had been constructed and was required because they were not constructed pursuant to the *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP).
- The EIS contains misleading information regarding the impact on property values James Bailey may have relied on the Preston Rowe Patterson (2009) preliminary review and the Urbis 2016 review. However, the reviews are fundamentally incorrect, and he should have checked the information. Expert advice should be sought as to the relevance, accuracy, completeness or fitness for purpose and inclusion in the EIS.
- The EIS indicates that during construction the proponent will be able to procure water from the associated Landholders under the harvestable rights provisions of the Water Management Act 2000
 - This statement has been shown not to be correct.
- The EIS indicates they will use the Interim Construction Noise Guideline' (DECC, 2009) (ICNG).
 - However then includes tables and advice that do not align anywhere near the ICNG.
 - James Bailey is aware of the requirements of the ICNG.

There are numerous other examples contained in the EIS statements which are false and misleading.

Epuron and their main Consultant James Bailey of Hansen Bailey are relying on a relative short period of display for the EIS. They are relying on people not understanding the EIS and being too busy to thoroughly review its contents.

I believe the DPIE need to undertake an investigation into the conduct of Hansen Bailey and in particularly James Bailey regarding the signed statement supporting the EIS.

Attached below is a copy of the “Environmental Impact Statement” attached to the opening of the EIS.

ENVIRONMENTAL IMPACT STATEMENT

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

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

A copy of the Email forward from Anthony Ko regarding the ability to supply other information after May 11, 2021.

RE: Proposed Bowmans Creek wind farm public exhibition period

Anthony Ko <Anthony.Ko@planning.nsw.gov.au>
To: Nigel Wood

Thu 22/04/2021 2:30 PM

Hi Nigel,

Thank you for the follow-up conversation over the phone today. As discussed, I encourage those with concerns to put in a submission before the close of exhibition, however, they should not feel pressured into thinking they must include every single detail in this submission.

I want to emphasize that we are happy to receive and will consider any additional information provided by concerned community members outside the exhibition window.

Kind Regards
Anthony

From: Nigel Wood <ndwood61@outlook.com>
Sent: Thursday, 15 April 2021 5:47 PM
To: Anthony Ko <Anthony.Ko@planning.nsw.gov.au>; Jim Betts <Jim.Betts@dpie.nsw.gov.au>
Cc: StopTheSpinMailList <StopTheSpinMailList@diamondfi.com.au>
Subject: RE: Proposed Bowmans Creek wind farm public exhibition period

Dear Anthony,

It is very disappointing that you would not extend the exhibition period for the proposed Bowmans Creek wind farm. As indicated in my first email the actual EIS and attached documents are in excess of 1500 pages and reference documents in addition are many 1000's of pages. I am finding multiple mistakes and issues with the EIS and believe the 42 days is not sufficient time for members of the community to adequately respond and have meaningful engagement within the planning process.

Would you be able to provide feedback to me on a couple of points, being:

- How does the decision align with the DPHE's own document "Undertaking Engagement Guide (attached)"?
Guidance for State Significant Projects particularly:
 - 3.4 Proportionate engagement
 - The proposed engagement activities for a State significant project should be proportionate to the scale of the project, the likely impacts of the project and the likely interest the community might have in the project.
 - Proportionate engagement is important so that the engagement is meaningful, prevents consultation fatigue and ensures reasonable costs and time implications
- Why have other similar projects had exhibition periods greater than 42 days.
- How does the position taken align with the Paris Agreement 2015 (Attached) particularly the commitment
 - Acknowledging that climate change is a common concern of humankind, Parties should, when taking action to address climate change, respect, promote and consider their respective obligations on human rights, the right to health, the rights of indigenous peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations and the right to development, as well as gender equality, empowerment of women and intergenerational equity,

The proposed wind farm will adversely impact on an extensive number of people for perpetuity, for example the stop the spin mailing lists will reach out to 100's of people.

I look forward to your response.

Kind regards
Nigel Wood

Windows taskbar: 11:21 AM 29/04/2021

